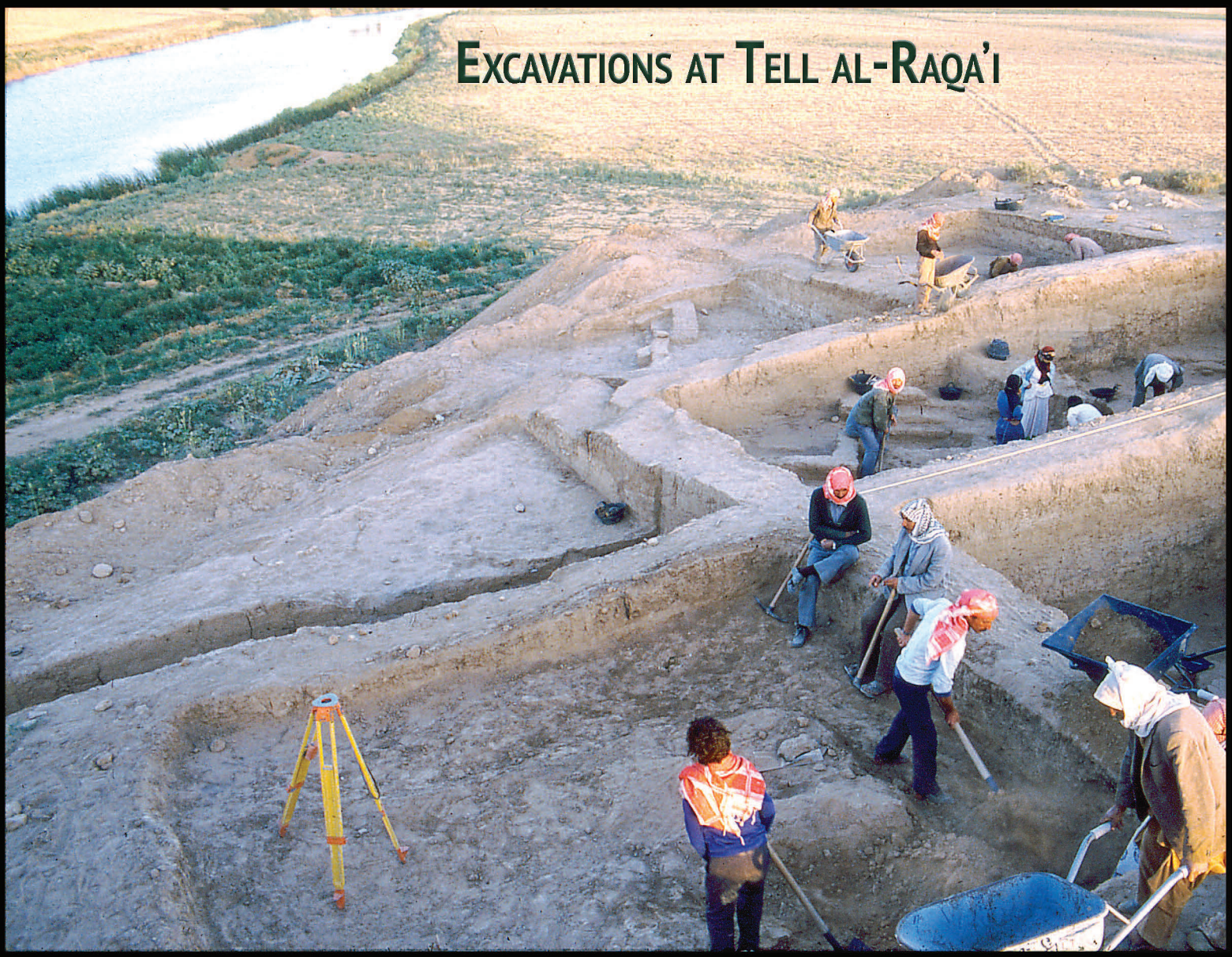
Rural Archaeology in Early Urban Northern Mesopotamia

Excavations at Tell al-Raqa'i



Edited by **Glenn M. Schwartz**

Rural Archaeology in Early Urban Northern Mesopotamia: Excavations at Tell al-Raqa'i

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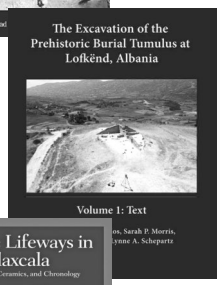

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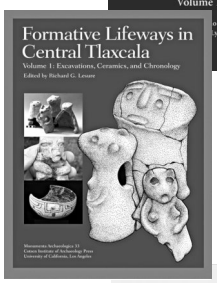

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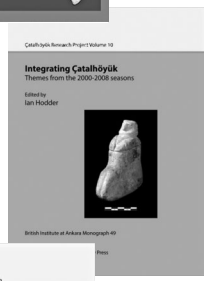

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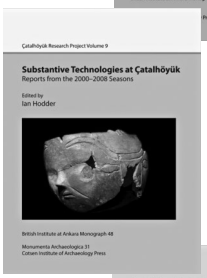

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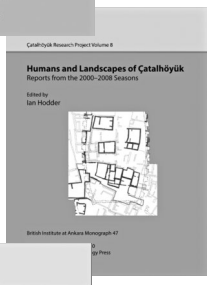

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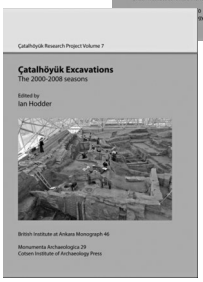

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Rural Archaeology in Early Urban Northern Mesopotamia: Excavations at Tell al-Raqa'i

Edited by Glenn M. Schwartz

With contributions by Jacques Chabot, Peter Chomowicz, Sally S. Dunham, Kristina A. Franke, Eric E. Klucas, Samuel K. Nash, Vincent C. Pigott, Scott J. Rufolo, Barbara Stuart, and Willem van Zeist

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Back cover image: Tell al-Raqa'i. Photograph by Glenn Schwartz.

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Preface

The Tell al-Raqa'i project gratefully acknowledges the support and encouragement of the Directorate-General of Antiquities and Museums of Syria, Damascus, with particular thanks to Dr. Sultan Muhesen, Dr. Ali Abu Assaf, and Dr. Afif Bahnassi, directors-general during the tenure of the project, and Dr. Adnan Bounni, director of excavations. We also acknowledge Jean-Simon Lazar, Department of Antiquities, Hasseke, for his unstinting assistance. Our Department of Antiquities representatives, whose help was invaluable, included Ibrahim Nano (1986), Najah Toueir (1987–1990), Ibrahim Murad (1992), and Husein Yusuf (1993).

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1986 excavation season: Sally Dunham, object registrar and site supervisor; Sandra Bakker, Frank de Boer, Ron Leenheer, Marga Schoenmaker, Ferdinand Smit, Barbara Stuart, Henriette Tammes, Melanie Tangkau, Gerard Tichelman, Lineke van der Perk, and Caroline van Dorth, site supervisors.

1987 excavation season: Inge Rossmeisl, object registrar and site supervisor; Jeffery Clark, Eric Klucas, Ron Leenheer, Mark Meehl, Els Sprangers, Barbara Stuart, Lineke van der Perk, and Caroline van Dorth, site supervisors.

1988 excavation season: Sally Dunham, object registrar and site supervisor; Klaas van Harten, architect and photographer; Sandra Bakker, Frank de Boer, Beth Grindell, Gloria Ikosi, Eric Klucas, Nel Loosbroek, Barbara Stuart, Caroline van Dorth, Joost Vermeulen, and Jacqueline Zoon, site supervisors.

1989 excavation season: Sally Dunham, registrar and site supervisor; Cees Metselaar, photographer; Inge Rossmeisl, conservator; Ben Claasz Cookson, Ann Foster, Elvira Groenewoud, Piet Kok, Gerda Luxwolda, Marga Schoenmaker, Barbara Stuart, Caroline van Ophem-Vermey, Lineke van der Perk, Eveline van der Steen, and Joost Vermeulen, site supervisors.

1990 excavation season: Sally Dunham, object registrar and site supervisor; Klaas van Haarten, architect and photographer; Carolyn Higginbotham, Nel Loosbroek, Gerda Luxwolda, Olivier Nieuwenhuyse, Cherie O'Neil, and Barbara Stuart, site supervisors.

1991 excavation seasons: P. Kok, Caroline van Ophem-Vermey, Marga Schoenmaker, Barbara Stuart, site supervisors (spring); Petra Boekstal, Anneke Dekker, Ernst Dekker, Elisabeth Donatello, Yvonne Kleiks, Barbara Stuart, and Marieke van den Enden, site supervisors (fall).

1992 excavation season: Sally Dunham, object registrar and site supervisor; Marga Schoenmaker, pottery analyst; Simone Burger, Fokke Gerritsen, and Barbara Stuart, site supervisors.

1993 excavation season: Nel Loosbroek and Barbara Stuart, site supervisors.

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About the Author

Glenn M. Schwartz is Whiting Professor of Archaeology and Chair, Department of Near Eastern Studies, Johns Hopkins University. Schwartz is a Near Eastern archaeologist whose research concentrates on the emergence and early history of urban societies in Syria and Mesopotamia. He received his PhD from Yale in 1982.

Schwartz has conducted fieldwork in Syria for most of his career and co-authored, with Peter Akkermans, *The Archaeology of Syria: From Complex Hunter-Gatherers to Urban Societies, ca. 16,000–300 BC* (Cambridge University Press, 2003), a synthesis of archaeological results and interpretations. His research interests include the archaeology of rural communities in early urban societies, the regeneration of urban societies after periods of crisis, and the role of mortuary ritual in the establishment and maintenance of hierarchical social systems.

Schwartz's field project at Tell Umm el-Marra, western Syria, included a focus on an elite necropolis from the Early Bronze Age with well-preserved tombs and evidence of ritual and sacrificial installations. His previous excavation project was based at Tell al-Raqa'i in northeastern Syria, investigating the character of a small village in the period of urban formation. Both were joint expeditions with the University of Amsterdam, co-directed by Hans Curvers.

At present, Schwartz is directing excavations at the urban Bronze Age site of Kurd Qaburstan near Erbil in the Kurdistan region of Iraq.

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Chapter 1

Research Framework: The Archaeology of Rural Communities in Early Complex Societies

Glenn M. Schwartz

Traditionally, research on the development of urban civilization in Mesopotamia and Syria has proceeded almost exclusively from the vantage point of the city. Archaeological excavations concentrated at large urban centers, where the chances of discovering monumental architecture, artifacts of artistic value, and written records were thought to be greater than at smaller settlements. Analysis of texts suffers from a similar bias, since fourth- and third-millennium BCE cuneiform documentation were the products of an urban and elite-centered worldview (Adams 1984; Schwartz and Falconer 1994).

The consequence of this urban-oriented research has been an incomplete understanding of early Near Eastern urban civilizations, since the city was only one component of those societies. Also important, if virtually undocumented, were the small settlements where a large segment, if not the majority, of the population resided (Adams 1981:138; Redman 1978:238; Stone 2005:153–154). In the absence of systematic work on the smaller, "rural" sites, many questions have been left unanswered. Were nonurban sites primarily agricultural and occupied by non-elite individuals, or were they characterized by social and economic diversity? What role did they play in the formation and maintenance of the first urban societies?

In his work, Robert McC. Adams has been among the most vocal in decrying the neglect of small sites, advocating the study of rural communities as well as urban metropolises:

> Always most difficult to establish from the written sources will be the behavior, to say nothing of the motivations, of the agrarian population. Perhaps the major initiative in this respect must eventually be taken by the archaeologist, since at least the material residues of outlying peasant settlements should be fairly simple to recover (Adams 1984: 95).[1]

The importance of studying rural as well as urban communities had long since been underscored by such scholars as the *Annales* historians, who adopted a holistic approach to the study of human societies. All social strata, not only urban-based elites or "great men," were identified as a proper focus of investigation (Bloch 1966; Knapp 1992; Ladurie 1975).

Despite the research potential offered by small sites, Near Eastern archaeologists have rarely sought to examine early urban societies systematically from the point of view of rural contexts, with the salient exception, to be sure, of survey work (Adams 1965, 1981; Adams and Nissen 1972; Hole 1987; Johnson 1973; Wilkinson 2003). However, even survey work tended to view Near Eastern society from the city outward (Schwartz and Falconer 1994) and was accompanied by little or no analysis of individual non-urban communities. In Syria, almost all third-millennium sites where significant excavated samples have been retrieved, outside of salvage regions, have been large urban centers. The same problem applies to Mesopotamia, where excavation of early-urban-period small sites was virtually absent until salvage operations began in the Hamrin and Eski Mosul regions (Fujii 1981; Gibson 1986; Killick et al. 1988; State Antiquities Organization of Iraq 1986); the exception to this pattern was Henry Wright's work at Sakheri Sughir near Ur (Wright 1969).

The initiation of archaeological rescue operations in regions distant from urban conglomerations provided an opportunity to rectify the problem. In this context, small, non-urban sites, ordinarily neglected by

excavators, became the foci of investigation. Nevertheless, many projects excavating small sites from the early urban period concentrated on chronological sequences or on the largest buildings on-site rather than attempting to obtain a broader picture of the nature of these rural communities.

In contrast, the Tell al-Raqa'i project was explicitly framed as an opportunity to study a small community from the period of the formation of complex societies in northern Mesopotamia and Syria. The excavations at Raqa'i, a small third-millennium BCE site, were undertaken in the context of rescue operations in the middle Khabur region of northeastern Syria (see project history below). The small size of the site would allow for the majority of at least one level to be excavated comprehensively, facilitating a synchronic understanding of the nature of the entire community; more limited exposures throughout the range of deposits at the site would allow for diachronic investigation. Our primary concern was the study of the social and economic organization of the third-millennium community at Tell al-Raqa'i, particularly with regard to its relationship to the ongoing development of societal complexity and urbanization in northern Mesopotamia and north Syria in the early to middle third millennium.[2]

Small sites in complex societies were traditionally expected to have been economically and socially "homogeneous" (Redfield 1953; but see Liverani 1999), with a limited range of functions predominantly related to subsistence. Such a perspective is at least partly to be attributed to the assumption that the size of a community is correlated with the range of functions it performs (Schwartz and Falconer 1994). However, early results of excavations at rural sites revealed evidence of economic and administrative specialization (Adams 1981:77–78, 137; Alden 1982; D'Altroy and Hastorf 1984; Falconer 1987; Wright and Johnson 1985; Wright, Redding, and Miller 1980). Whether Tell al-Raqa'i might be identified as an undifferentiated, homogeneous, and self-sufficient agricultural village (Adams 1982; Diakonoff 1975; Schwartz and Falconer 1994) or, alternatively, as a community with specialized functions associated with emerging societal complexity, was an important research focus of the project from its inception. Put somewhat differently, we were interested in exploring whether villages of early complex societies remained socially and economically "Neolithic/Chalcolithic" or whether their character and functions changed significantly as a result of the development of urban societies.

Among the research issues considered were the following:

1. The economic role of small sites, and the economic relationship between small rural sites and urban centers. State and urban economies are characterized by highly specialized productive activities (Brumfiel and Earle 1987; Clark and Parry 1990; Costin 2001; Wattenmaker 1998; Zeder 1988, 2003), but the extent of such specialization in the Mesopotamian small site was largely unexplored. Similarly undocumented was the putative role of the small site as provider of the agricultural surpluses that complex societies and urban centers depended on for their very existence (Adams 1966; Childe 1946:18; Wilkinson 1994). Can mobilization of surpluses from villages to supply larger centers be observed in small sites? How were such surpluses obtained, and what were the mechanisms for their extraction and distribution?

2. Social and economic differentiation. Social and economic stratification is an essential element of complex societies (Trigger 2003; Yoffee 2005), but its presence on the rural level in Syria or Mesopotamia was undemonstrated (see Nichols 2004: 280 on this issue with respect to Aztec Mexico). Were small Syro-Mesopotamian communities socially and economically homogeneous, or was a development "from kin to class" evident in rural sites as has been proposed for urban ones? Tools for the identification of economic and social stratification in the archaeological record include the recognition of differentiation in the size of household architectural units, construction materials and techniques, household possessions, personal ornaments, and exotic materials and foods (Curet and Pestle 2010; Kramer 1979; Netting 1982; Rathje 1983; Steadman 2011). Material culture differences may not only *reflect* status but can shape how individuals think and act with respect to social relations (Hutson 2010).

3. The extent of small site integration into urban or state administrative systems. Direct institutional control may have been established over small settlements in order to extract agricultural surpluses or other valued resources (Johnson 1987); evidence of such control in the archaeological record could include the presence of administrative artifacts such as seals, sealings, clay bullae, and tablets. However, such recording devices could have been

used by local households for their own purposes without any reference to political authorities (Akkermans and Duistermaat 1997).

4. Regional political and economic systems. In the middle Khabur, a surface survey conducted in 1983 (Monchambert 1984) indicated a striking proliferation of settlements in the third millennium, all of a relatively small size and none larger than 5 hectares. Was this development a "colonization" associated with the emergence of larger-scale urban or quasi-urban systems in the upper Khabur or elsewhere (e.g., Mari to the south), or, alternatively, is it to be seen as an autonomous development?

5. Subsistence patterns. Issues concerning local agricultural and pastoral strategies and their relationship to social and economic organization include possible specialized pastoral (Zeder 1991, 2003) or agricultural production, the employment of irrigation as opposed to dry-farming agriculture, and possible intra-site spatial differentiation in production and consumption. Since the middle Khabur region is currently beyond the bounds of dry-farming agriculture, the appearance of numerous villages in the early third millennium raises the question as to whether irrigation agriculture was practiced or a favorable climate allowed for rainfall cultivation.

In recent years, the study of villages in early urban societies has incorporated ideas from agency or practice theory (Ashmore 2007; Bourdieu 1977), focusing on individual actors and how their choices affected social change. Studies such as Vaughn's (2009) emphasize that villages were not passive objects acted upon by the changes effected elsewhere but could have played a significant role in development of the "urban" revolution. Similarly, Small (2006) proposes that cities could dominate in some areas while rural sectors dominated others, whether it be economics, politics, or religion. This perspective echoes that of our original research outlook, although we were not influenced by agency theory at the time.

Recent research has also critiqued the distinction between urban and rural, arguing that smaller and larger sites have many shared characteristics (Iannone and Connell 2003:1; Levi 2003:84; Schloen 2001).[3] In his discussion of the late third-millennium BCE countryside around the Sumerian city of Umma, Steinkeller (2007) maintains that the city and countryside formed a continuum, with a close integration of urban and rural institutions and activities, such that a sharp urban–rural differentiation is not applicable (see also Stone 2007; Yoffee 2005:61). Whether Raqa'i was distinctly different from larger centers or was a smaller node in a continuum was also a research concern of the project.

Given the large exposures obtained especially from levels 4 and 3 at Raqa'i, we had the opportunity to consider the organization and functioning of households, whose material remains are likely to be associated with individual house structures (Allison 1999; Blanton 1994; Hendon 2010). As Allison observes (1999), the material culture associated with households, both architectural and portable, is influential in shaping the *praxis* and *habitus* of household members, the ways in which they act and think in the world. Evidence of shared as opposed to individual storage or production activities could indicate differences in social and economic organization, elucidating the possibilities of communal, corporate organization, autonomous households, or communities owned by larger institutions or landlords (Faust 2000, 2005; Liverani 1982; Magness-Gardiner 1994). Likewise, indications of spaces where specific activities were conducted could provide important insights into the economic and social structures of the community (Hodder and Cessford 2004; Kent 1990, 1991), along with observations on kinship organization manifested by material culture patterning.

Early Societal Complexity in Syro-Mesopotamia

As an early third-millennium village in northern Mesopotamia (modern northeastern Syria), Tell al-Raqa'i flourished in the period leading up to and including the first appearance of urban societies in the region. In recent decades, archaeologists have devoted considerable attention to the emergence and functioning of urban societies in Syria and upper Mesopotamia, as a counterpoint to the well-known paths to urbanism in southern Mesopotamia (Akkermans and Schwartz 2003; Algaze 2008; Cooper 2006; Porter 2012; Stein 2004; Ur 2010; Weiss et al. 1993). The two regions are environmentally distinct: irrigation is the only practical agricultural strategy in arid southern Mesopotamia, but large areas of northern Mesopotamia and Syria receive enough rainfall to facilitate an extremely productive dry-farming regime (Perrin de Brichambaut and Wallen 1963: 10–19; 54–56; Weiss 1986). The high agricultural productivity afforded by irrigation has been considered a decisive variable in the development of urban civilization in the south

(Adams 1981:243; Algaze 2008), but Weiss has shown that the northern dry-farming plains also had the potential to produce an agricultural surplus extensive enough to support urban and state development (Weiss 1983; 1986). The differences between the complex societies sustained by these two different agricultural systems have called attention to considerable variability in early Near Eastern urban societies (Earle 1997:64; Falconer and Savage 1995, 2009; Stein 2004). At the same time, the question of the role played by southern Mesopotamia, the earlier, "primary" locus of urbanization, in the development of societal complexity in Syria and northern Mesopotamia has been the subject of inquiry and debate (Mazzoni 1991; Schwartz 1994; Weiss 1990).

According to current evidence, the origins of urban societies in northern Mesopotamia and Syria must be traced at least as far back as the early–middle fourth-millennium BCE (Late Chalcolithic 3), when a community of urban proportions and characteristics appeared at Tell Brak in the upper Khabur (Ur 2010). Other sites such as Tell Hamoukar, east of Brak, also show evidence of the development of societal complexity in the same time frame. This episode of nascent indigenous complexity is followed in the mid-late fourth millennium by an era of substantial contact with southern Mesopotamia, the "Uruk expansion," whose interpretation and significance are a subject of debate (Algaze 1993, 2008; Rothman 2001, 2004; Stein 1999).

Evidence of urbanism or related social characteristics becomes scarce in subsequent centuries of the late fourth and early third millennium (Akkermans and Schwartz 2003). While larger centers existed, such as Tell Brak, they were significantly smaller than those of preceding or succeeding eras, and they have yielded no evidence of large-scale political organization or writing. By ca. 2600 BCE, a new intensification of complexity is evident, a "second urban revolution," in which cities and large-scale polities, in some cases accompanied by the use of writing, emerged throughout Syria and northern Mesopotamia (Akkermans and Schwartz 2003:133–187; Cooper 2006; Ur 2010; Wattenmaker 1998, 2009). The new urban centers included Tell Mardikh/Ebla and Tell Mishrifeh/Qatna in western Syria, Tell Chuera, northeast of the Balikh drainage, Tell Mozan, Tell Brak, Tell Leilan, and Tell Hamoukar in the upper Khabur plains, and Tell Taya and Tell Khoshi on the Sinjar plain of northern Iraq. The onomastica of the archives of Ebla and, more recently, Tell Beydar indicate that the population of northern Syria in this period was predominantly Semitic-speaking; small states with Hurrian rulers in the Khabur triangle appear in the latter part of the millennium (Buccellati and Kelly-Buccellati 2000).

The period when northern cities emerged is stratified in the sequence from Tell Leilan in the upper Khabur plains (Schwartz 1988; Weiss et al. 1993); Leilan expands from 15 to 90 hectares in the Leilan IIId sub-period (ca. 27th/26th century), datable to the Early Jezirah 2 period, ca. 2600 BCE (Lebeau et al. 2000; Pfälzner 1998; Quenet 2011). Recent results from Chuera (Meyer 2010) also reveal that the site expanded to an impressive size in Early Jezirah 2. If this chronology is applicable to the Khabur region in general, we may conclude that Raqa'i was occupied in Early Jezirah 1 for several centuries prior to the advent of cities and during the first two or more centuries of urbanization in third-millennium BCE, northern Mesopotamia. The site therefore provides a document of change from the pre-urban to urban periods at a small site in the region.

Raqa'i is one of several small villages founded in the early third-millennium BCE along the Khabur river south of the juncture of its many tributaries near modern Hasseke. Investigated in the archaeological salvage operations inaugurated in the mid-1980s, these sites flourished in the early–middle third millennium and were usually abandoned by the third quarter of the millennium or perhaps slightly later. As a result, Raqa'i and its neighboring sites offer a window into life in small communities in the period leading up to and during the first few centuries of the emergence of cities and states in the "second urban revolution." The proliferation of these small communities in what is now an area outside the boundaries of rainfall agriculture, the emphasis on grain storage facilities at the sites, and the relationship of their appearance to the subsequent development of urbanism in northern Mesopotamia have precipitated considerable discussion and debate (see Chapter 11) (Fortin 2001; Hole 1991; Pfälzner 2003; Schwartz 1994). The evidence from Raqa'i has been crucial to this debate, and it is to be hoped that the results presented in this volume will assist in further deliberations and research on the issue.

THE MIDDLE KHABUR REGION (FIGURES 1.1, 1.2)

Tell al-Raqa'i is located in the middle Khabur region of northern Mesopotamia/northeastern Syria, at the juncture of the two major components of the Khabur re-

gion, the northern upper Khabur "triangle" and the narrow lower Khabur river valley to its south. In the north, the Khabur triangle consists of broad rainfall farming plains traversed by the Khabur River and a set of its tributaries. The river, which forms the western side of the triangle, flows southeast from its source of 13 karst springs near Ras al-'Ain.[4] In the Hasseke vicinity, the river changes course and proceeds south past the volcano Kawkab, maintaining a southerly direction for some 150 kilometers until its junction with the Euphrates. This lower Khabur region consists of a relatively narrow river floodplain of alluvial soil flanked by a gypsiferous or calcareous plateau (Blackburn and Fortin 1994; Kühne 1991, 2008; Lebeau 1993: 26); the ready availability of limestone in the area is reflected by the frequent use of lime plaster in the architecture of third-millennium Raqa'i.

The middle Khabur, where archaeological salvage operations have been concentrated, consists of the northern segment of the lower Khabur valley. In this area, the river valley provides a passage between the Jebel 'Abd-al-'Aziz mountain range to the west and the Sinjar range of the northern Iraq to the east. Although annual rainfall is relatively plentiful in the Khabur triangle to the north, the middle Khabur has an average rainfall of 200–250 mm per year, too low to cultivate crops without extensive risk (Blackburn and Fortin 1994:59; Kühne 1990; Wirth 1971:Karte 3). The predominant subsistence strategy historically attested for this area is irrigation agriculture, utilizing Khabur river water to cultivate fields on either side of the river (Dussaud 1927; LeStrange 1905; van Liere and Lauffray 1954). Settlement was restricted to the river valley, ca. 0.5–3.0 kilometers wide (Ergenzinger 1991:38; Geyer 1986; Kühne 1990; Reculeau 2010).

A significant question is the role that dry farming might have played in the area, despite the typically low rainfall (Blackburn and Fortin 1994; Hole 1991; McCorriston 1998; van Zeist, Chapter 9, this volume). As an alternative to irrigation, one might hypothesize the existence of a dry-farming strategy involving a reliance on stockbreeding as a hedge against crop failure. Or a significantly higher level of precipitation in the period under consideration may have allowed for a more successful dry-farming strategy than would be the case in the present day.

Pastoral nomadism is likely to have been an important mode of life in the Khabur area since at least

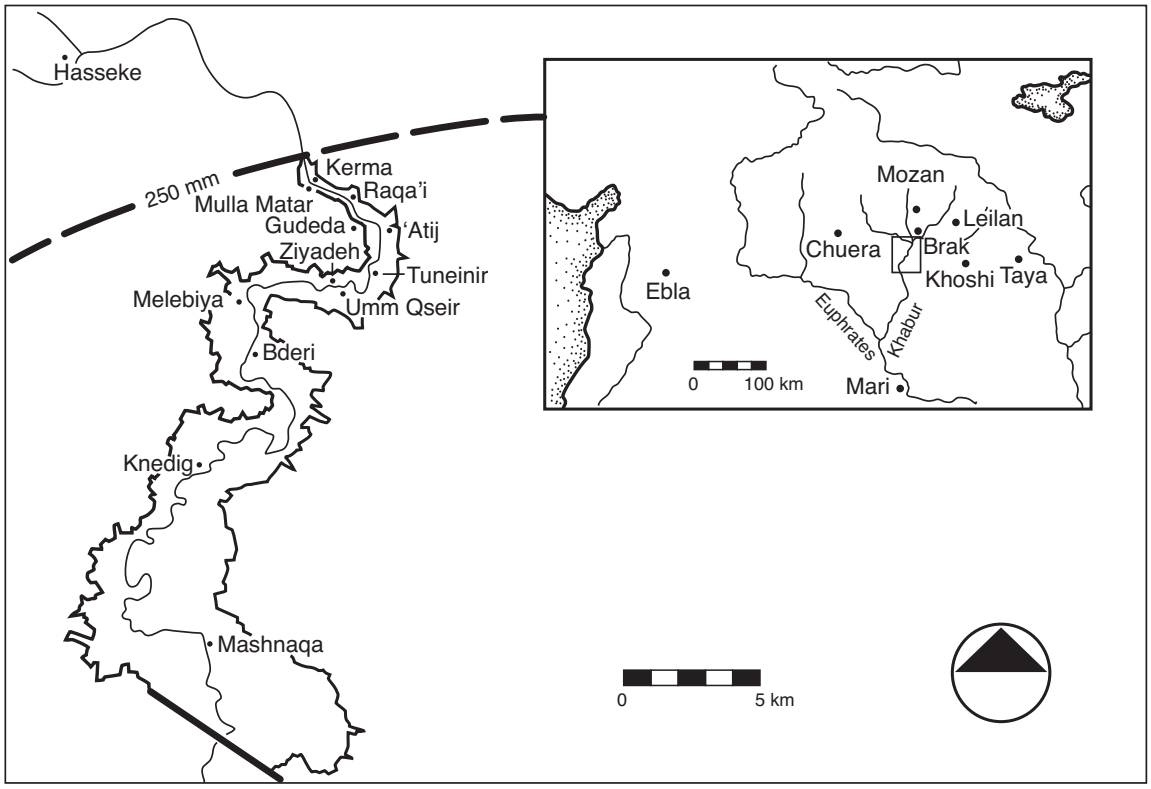

FIGURE 1.1. The Middle Khabur region. *Illustration prepared by Harley King.*

FIGURE 1.2. View of middle Khabur valley, downstream from Tell Gudeda toward Tell 'Atij. *Photograph by Glenn Schwartz.*

the early second-millennium BCE, when it is amply attested by the texts from Mari. In periods of weak central authority such as the 19th century CE, pastoral nomads appear to have formed the majority of the population in the region. However, the question of the antiquity and character of mobile pastoralism remains a controversial one (Hole 1991; Kouchoukos 1998; Schwartz 1995; Wossink 2009; Zarins 1989), and its extent in the third millennium is unclear. The relationship between settled communities and hypothesized groups of mobile herders operating in the steppe is an important issue to explore, as is the possibility that the villages included groups of herders who took their flocks to graze on the steppe for certain times of the year (Hole 1999; Kouchoukos 1998; Porter 2012).

With the establishment of the French Mandate in Syria after World War I, sedentary occupation in the Khabur area intensified (Wirth 1971) as the government parceled out land to tribal sheikhs and encouraged sedentarization. In the Raqa'i vicinity, the present-day inhabitants are predominantly Sunni Muslim Arabs, often affiliated with the Sharabin tribe (von Oppenheim 1939:255–261), in contrast to the mix of Kurds, Christians and Muslim Arabs found to the north in the Khabur triangle (Lebeau 1993:22).

For a more detailed discussion of the physical environment of the middle Khabur area, the reader is referred to the results of two projects specifically concerned with the environment of the region, that of the Sheikh Hamad team (Tübinger Atlas des Vorderen Orients [TAVO]) (Kühne 1991, 2008) and that sponsored by Yale University directed by Frank Hole (Hole 2002–2003; Kouchoukos 1998). Also relevant are the geomorphological studies conducted by the Tell 'Atij team (Blackburn and Fortin 1994) and the Umm Qseir project (Akahane 1998).

PREVIOUS RESEARCH IN THE MIDDLE KHABUR

Before the Syrian Directorate-General of Antiquities' initiation of salvage operations in 1983, no archaeological excavations had been conducted in the middle Khabur. The earliest scholarly attention consisted of brief references by 19th- and early 20th-century scholar-explorers to the more prominent tells of the region (see Fortin 1991 for a review of these sources, including Layard 1853; Musil 1927; Sachau 1883; Sarre and Herzfeld 1911; and von Oppenheim 1900). Sarre and Herzfeld's account of their travels in the Khabur area provides the first published reference to Tell al-Raqa'i

of which I am aware (1911:193), in which the (unnamed) tell is briefly mentioned.

Max Mallowan (1936) conducted a survey of the entire Khabur valley in 1934, but his results were only published in a short summary. In 1975 and 1977, the TAVO sponsored the first systematic survey of the lower Khabur valley, directed by Wolfgang Röllig and Hartmut Kühne (1974–1975; 1978–1979; Kühne and Röllig in press). In this survey, Tell al-Raqa'i is designated as no. 116, Tell Raga'i (Kühne 1991). Jean-Yves Monchambert's 1983 survey of the middle Khabur, conducted as a framework for the planned salvage operations, records the site of Raqa'i as no. 35, with a "Bronze Ancien" date (1984:200). Finally, the Tall al-Hamidiya team visited the site in its survey of Khabur area tells (Eichler et al. 1985:49), recording it as Tall Raga'i and noting pottery of the second (sic) and first millennium BCE as well as Islamic material.

With the initiation of salvage excavations in the middle Khabur, at least 13 sites with third-millennium occupations have been sampled through excavation. They are, from north to south, Rad Shaqrah (Bielinski 1993), Mulla Matar (Sürenhagen 1990), Kerma (Saghieh 1991), Raqa'i, Gudeda (Fortin 1993), 'Atij (Fortin 1993), Tuneinir (Fuller and Fuller 1994), Umm Qseir (Hole and Johnson 1987), Ziyadeh (Buccellati, Buia, and Reimer 1991; Hole 1999), Melebiya (Lebeau 1993), Bderi (Pfälzner 1990, 2001), Knedig (Klengel-Brandt, Kulemann-Ossen, and Martin 2005), and Mashnaqa (Monchambert 1987). The retrieval of excavated samples from a large number of sites in a restricted region allows for the integration of a sizeable quantity of data from individual sites and the consequent reconstruction of regional developments.

Tell al-Raqa'i: Location and Physical Environment (Figures 1.3–1.7)[5]

Tell al-Raqa'i (the meaning of the site name is unknown) is an oval mound ca. 118 × 58 meters at its base, covering ca. 0.46 hectare in area, and standing a

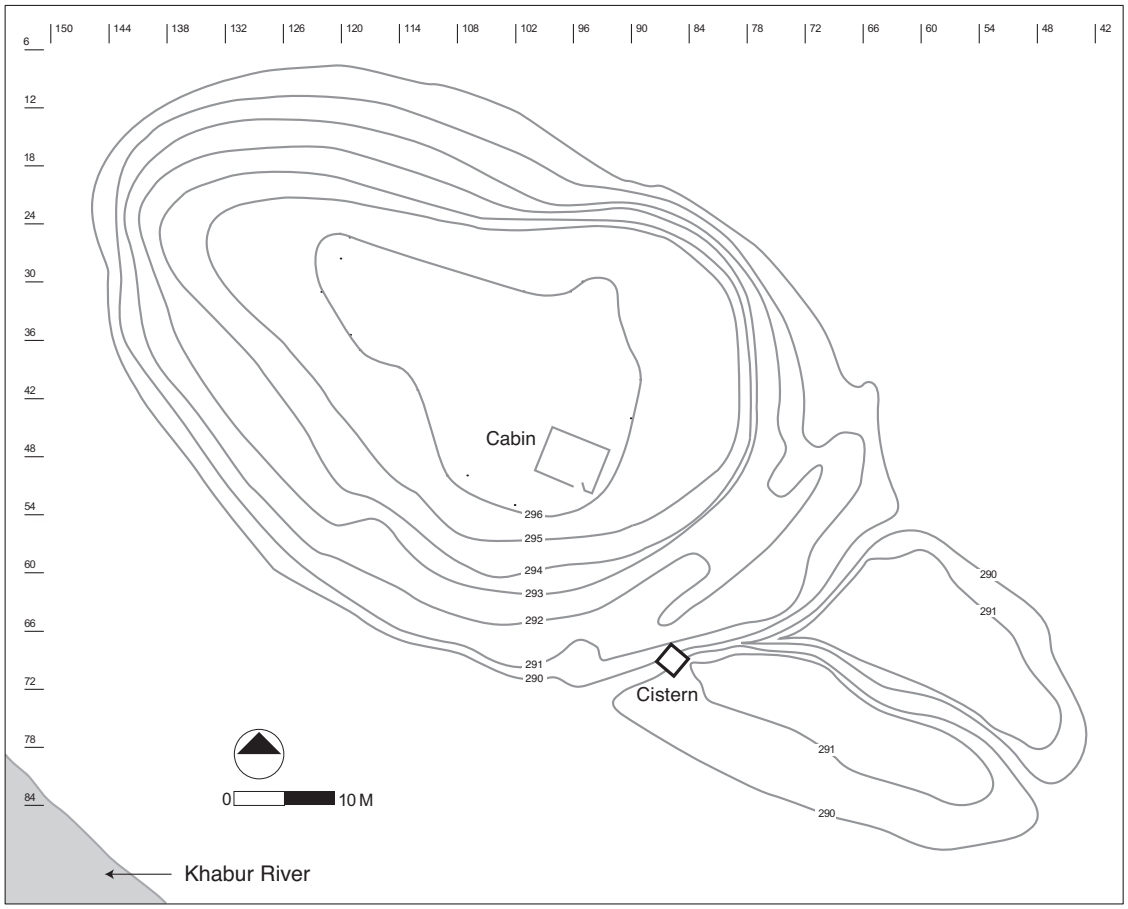

Figure 1.3. Tell al-Raqa'i. *Illustration prepared by Harley King.*

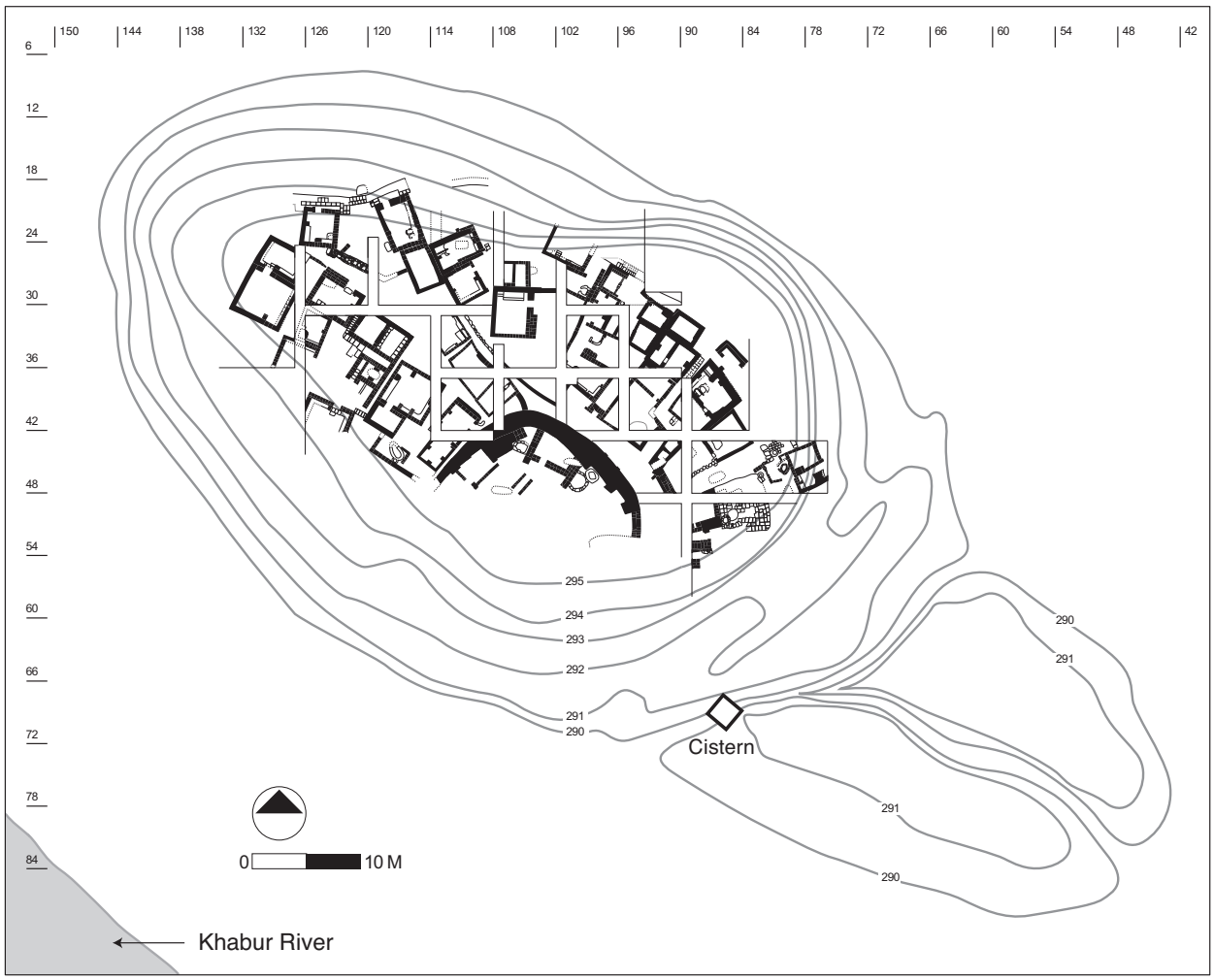

FIGURE 1.4. Tell al-Raqa'i with level 3 excavated exposure. *Illustration prepared by Harley King.*

FIGURE 1.5. Tell al-Raqa'i. *Photograph by Glenn Schwartz.*

Figure 1.6. Corona image of the Khabur valley in the Raqa'i vicinity; Raqa'i indicated by arrow.

bit over 6 meters high.[6] The site is located on the left bank of the Khabur River, 12 kilometers downstream from Hasseke, the modern provincial capital, at the northern end of the middle Khabur rescue area.

In the Raqa'i vicinity, the Khabur River is between 50 to 100 meters wide and ca. 2 meters deep, with an average discharge of 50 cubic meters per second (Ergenzinger 1991:38; Kühne 1990:16). The tell is located ca. 30–40 meters to the northeast of the present-day bed of the Khabur. Although there is evidence of erosion and damage to the south slope of the mound (see below), it is not clear if any of this can be attributed to riverine action, as has been suggested for the nearby sites of 'Atij, Melebiya, and Bderi (Fortin 1997; Lebeau 1993:41–42, 46; Pfälzner 1988). The site is founded on alluvial deposits of the Khabur floodplain (Blackburn and Fortin 1994; Ergenzinger 1991; Geyer 1986), which is ca. 600–900 meters wide in the Raqa'i vicinity at present (Kühne 1991: abb. 121). On either side of the floodplain is a plateau with gypsiferous soils (Wirth 1971).

The present-day configuration of the site has been particularly affected by two variables. One is the use of the top of the tell as a burial ground by inhabitants of the area in this century and probably earlier, a practice observed at many other tells of the region. As a result, the top of the mound was pitted with scores of recent burials sunk into earlier contexts.

The second factor affecting the present-day state of the tell was the establishment of a large water pump on the river just to the south of the site (see Kühne and Röllig in press for further details on the environs of the site). Pipes installed across the southeast part of the tell resulted in serious damage to that part of the site, to the extent that we were compelled to avoid excavation in the area. Further, a small shelter was built on top of the tell to house caretakers of the pump, and their garden on the east part of the tell and on its southern slopes was responsible for very wet conditions in those areas when excavation began in 1987 (cf. Monchambert 1984: figure 15). The shelter was moved to the

FIGURE 1.7. View west from Tell al-Raqa'i, with Khabur river and stone cataract. *Photograph by Glenn Schwartz.*

southeast part of the tell in 1988, allowing for excavation of the central part of the mound, and a new garden was planted in the area of the new shelter. In addition, a bulldozer created a dirt road at the south edge of the mound, resulting in cuts into the base of the tell.

We were unable to discern any indication of ancient occupation extending beyond the tell itself. Examination of the fields around the mound in each excavation season, albeit unsystematic, revealed no surface sherds. Similarly, queries made to local inhabitants yielded no evidence of off-site occupation. It would appear that in this particular stretch of the middle Khabur, at least, significant permanent ancient occupation was restricted to the tells, a conclusion also reached by Wilkinson (1994) for the Iraqi North Jazira.

For the duration of the expedition, the tell was bordered on three sides by the cultivated fields of the floodplain. The fields were employed for cotton and wheat cultivation, via motor pump irrigation. The yearly agricultural cycle consisted of sowing in October and harvesting in May–June, with an alternate fallow system commonly used. Animal husbandry, particularly of sheep and goat, was also of considerable economic importance for the local inhabitants.

Present-day settlement consisted of clusters of perhaps four or five mudbrick houses distributed across the landscape, rather than larger villages. These house clusters are collectively referred to as Saba'a Skur ("seven dams/waterfalls"), East. The "seven dams" refer to the numerous cataracts of stone boulders and their associated waterfalls found at intervals along the Khabur in this area. It has been suggested (Ergenzinger and Kühne 1991:164; Sürenhagen 1990:127, n. 5) that at least some of the cataracts are artificial creations dating to the Roman period employed to divert water for irrigation to adjacent fields. Tell al-Raqa'i itself is located next to one of the cataracts, which includes a set of low waterfalls stretching across the river (Figure 1.7). If the formation was not a Roman artifact, then this location may be relevant to the function of the site.[7] The existence of a third-millennium canal east of the Khabur near Kerma, Raqa'i, and 'Atij has been hypothesized (Ergenzinger and Kühne 1991:166), but soundings by the 'Atij team failed to discern evidence of this feature (Blackburn and Fortin 1994).

PROJECT HISTORY

In 1983, the Directorate-General of Antiquities of Syria announced the inauguration of a program of salvage excavations in the middle Khabur region south of Hasseke in northeastern Syria. The aim of the project was the emergency excavation of sites along a 20-kilometer stretch of the river, due to be flooded by the creation of a dam on the Khabur some 28 kilometers south of Hasseke. In 1986, Maurits van Loon, director of the University of Amsterdam Hammam et-Turkman excavations, acquired a permit for the excavation of Tell al-Raqa'i, one of the middle Khabur salvage sites. Hans Curvers was appointed field director and conducted a season of preliminary operations in July 1986 (Curvers 1987).

The project became a collaborative effort in 1987, when field director duties were shared by Curvers and Glenn Schwartz of the Johns Hopkins University. Two joint excavation seasons were held in September–October of 1987 and 1988 (Curvers and Schwartz 1990). With van Loon's retirement in 1988, Curvers and Schwartz assumed project co-direction and conducted two additional seasons in September–October 1989 and 1990 (Schwartz and Curvers 1992). Curvers also conducted two brief seasons of study and small-scale excavation in April and September–October 1991. A short joint excavation season directed by Curvers and Schwartz took place in June 1992, followed by a season of small-scale work directed by Curvers in May 1993.

The 1986 season (Curvers 1987) focused on the mapping of the site, the excavation of late burials (20th century CE and earlier) below the mound surface, the excavation of a small sample of third-millennium (level 3) architecture in excavation unit 36/120, and the beginning of the 2-meter–wide stratigraphic step trench sounding 42/116 down the south slope of the mound.

In 1987, large areas of mid-to-late third-millennium architecture were excavated (levels 2 and 3), and step trench 42/116 was excavated to virgin soil. The 1988 season saw the beginning of the excavation of the Round Building, concentrating primarily on its level 3 phase, the continued enlargement of the level 3 and 2 samples, and an extension of the exposure of the earliest contexts on the site, level 5, first encountered in step trench 42/116 (see Curvers and Schwartz 1990).[8]

Work in the 1989 season included the first large-scale excavation of level 4 contexts, both inside the Round Building and to its northwest, in addition to further level 3 excavation. The 1990 season continued the excavation of the level 4 Round Building, level 5 "grill" architecture to its south, and levels 4 and 3 exposures in other parts of the site (Schwartz and Curvers 1992).

In 1991, a micro-stratigraphic experiment conducted by Curvers in the spring and fall seasons yielded more data on the relationship between levels 4 and 3 in excavation units 29/114 and 29/120. The 1992 season, with Curvers and Schwartz both present again, involved the excavation of deep soundings below the Round Building. Further exposures of level 5 were achieved in the southern part of the mound, revealing more grill-type architecture, additional level 4 architecture was excavated in the northern part of the tell, and a set of level 3 retaining walls were identified along the north slope.

In 1993, further experiments in excavation methods supervised by Curvers resulted in the exposure of the western part of the level 4 rectangular storage complex, possibly contemporary with the Round Building. Since the work of this brief season was conducted as an experimental exercise by Curvers without the participation of the Johns Hopkins component of the project, the 1993 results are not included in this publication and will be disseminated elsewhere.

Preliminary reports on the results of the excavations at Raqa'i were published in diverse journals and book chapters (see Schwartz and Curvers 1993–1994; Fortin and Schwartz 2003; and Schwartz and Curvers 2007 for bibliography). In addition, data from Raqa'i were employed in two doctoral dissertations (Klucas 1990; MacCormack 2001) and one master's thesis (Nieuwenhuyse 1991). While these studies contain many useful insights, the studies in the current volume provide an updated and more comprehensive presentation of data and interpretations.

Project Methodology

The goal of the Raqa'i excavations was the investigation of the social and economic structure of a third-millennium small rural site. In order to implement this goal, our excavation strategy was threefold:

1. Excavation of a step trench to document the entire sequence of site occupation for use as a chronological and stratigraphic framework.
2. Retrieval of a broad horizontal exposure of the uppermost third-millennium occupation levels, in order to gain a broad synchronic view of the entire community. The later third-millennium contexts were chosen because of their accessibility relatively close to the mound surface.
3. Retrieval of a large sample of early occupation levels to document diachronic change in the settlement.

The site was divided into a grid of 6-meter squares. Within each 6 × 6–square meter unit, excavation was conducted in the northeastern 5 × 5 square meters. As a consequence, 1-meter balks were retained on all sides of each excavated 5 × 5 meter square. When balks were removed, the excavation units were correspondingly enlarged. Each excavation unit was identified by two numbers, the first referring to a north–south coordinate, the second to an east–west coordinate (e.g., 36/120; cf. Figure 1.3).[9] Units on the edge of the tell were

begun, not as squares, but as rectangular trenches 5 meters wide extending out to the edge of the tell. In addition, step trench operations were carried out on the south (excavation unit 42/116), north (excavation unit 17/114), east, and west slopes of the tell.

Excavation was conducted in a "locus" or "lot" system, in which each stratigraphically discrete unit (e.g., pit, ash deposit, floor, wall, etc.) is assigned a separate sequential number specific to each excavation unit, with artifacts and other materials found in association with that unit also identified with that number. The "loci" at Raqa'i were referred to as "archons";[10] the archons for each excavation unit were numbered separately.

Excavation was conducted using large picks for large-scale removal of soil and small picks and trowels for definition of architectural features, floors, pits, and so on. Each site supervisor worked with some three to eight workers hired from the local population. The workers were responsible for excavation with large picks, removal of excavated dirt in baskets or wheelbarrows, and for screening excavated contexts. There are two exceptions to this process. One was the 1986 season, when all excavation was conducted by student staff members, and local workers were employed only to remove and screen excavated soil. The other consisted of excavations in trenches 29/114 and 29/120 in the northwest part of the site in the 1991 and 1991–1992 seasons, under the supervision of Hans Curvers. During these seasons, only the small pick was employed, and the excavated soil was wet-screened as well as dry-screened.

In general, excavation proceeded with a rectangular test trench 1–1.5 meters wide along one balk in order to delineate the history of deposition, after which larger areas were excavated by following the stratigraphic units recognized in the test trench. Considerable effort was expended in cleaning excavated areas as thoroughly as possible in order to recognize architectural and other features horizontally before defining them vertically.

All excavated material from levels 3 through 5 except for architectural components (mudbricks, etc.) and areas disturbed by recent intrusions was dry-screened with a 1-centimeter mesh, except for level 3 area 86 when excavated in the 1992 season.[11] All screened faunal material was saved for analysis. Flotation samples were taken from a large selection of different types of deposits, including pits, oven areas, floors, trash deposits, and so on; flotation was conducted using field methods developed by Willem van Zeist, Biologisch-Historisch Instituut, Groningen.

Recording of field notes was conducted by the relevant site supervisors. These included free-form descriptions and sketches of the day's activities and observations as well as a standardized form used to describe each archon (locus). Architectural plans were made at a scale of 1:20 (1:50 in 1986 and 1987), with burial plans at 1:10; sections, drawn at a scale of 1:20, were usually completed for all balks unless so little information was observable that it was deemed redundant.

Pottery, distinguished by archon number, was collected in buckets or baskets during excavation. At the end of each day's excavation, the sherds were washed, laid out to dry in the sherd yard, sorted into diagnostics and body sherds, and bagged and labeled for subsequent analysis.

Small finds were delivered in separate labeled plastic bags by the excavation supervisors to the small finds administrator. The small finds administrator made a preliminary description of the objects, registered them in the Raqa'i object master file, assigned them a Raqa'i object number, drew them, and selected objects to be photographed.

PROJECT RESULTS

The excavations at Raqa'i achieved two particularly important results. One is the retrieval of an unusually large sample of the mid–third-millennium community of Raqa'i level 3, permitting the examination of a small community in an early complex society as a functioning whole, rather than as a small fraction of a larger entity (Figure 1.4).[12] The second important result is the identification of the specialized character of the material remains at the site, particularly with respect to grain storage facilities, and their possible association with the emergence of societal complexity in the region.

One major drawback of the project results is the relative paucity of primary contexts in the excavated remains: very few spaces contained evidence of in situ materials, except for burials. Therefore, we must remain aware of the fact that the artifactual and ecofactual materials recovered from Raqa'i almost always derived from secondary contexts at best. This situation is, of course, more or less the norm for most ancient Near Eastern sites except those yielding burned "destruction levels" or similar remains, an issue that should be borne in mind when considering the spatial or chronological distribution of artifacts or ecofacts.

To guide the reader, I offer a brief sketch of the occupation sequence and its characteristics. Level 5, the

earliest occupation at Raqa'i, was mainly sampled in small excavations in the south part of the tell, and yielded several examples of "grill" architecture consisting of adjacent parallel walls, usually interpreted as facilities for the drying or storage of grain. The ceramics retrieved from these soundings belong to the Early Jezirah 1 period (Leilan IIIa or IIIb) and probably date to the earlier centuries of the third millennium, perhaps ca. 2800 BCE.

In level 4, the large Round Building (ca. 20 meters in diameter) was constructed in the south central part of the site. This structure included doorless vaulted rooms probably intended for (grain) storage, mudbrick platforms, brick ovens, and additional rooms with intact doorways. Outside the Round Building, level 4 included small-scale domestic architecture and a group of semi-subterranean storage emplacements in the northwestern part of the mound. The level 4 ceramic assemblage is comparable to that of Leilan IIIb or IIIc, later Early Jezirah 1/early Early Jezirah 2, perhaps ca. 2700 BCE.

In level 3, the Round Building was reconstructed, small-scale architecture was erected around it, and an apparent temple or shrine to its north was built inside a thin enclosure wall. The pottery from this occupation compares closely to that of Leilan IIId and indicates a later Early Jezirah 2 period date, perhaps ca. 2600 BCE.

Level 2, the latest third-millennium occupation, consists of fragmentary architectural remains and many graves of young children. The ceramics from level 2, which post-date the Ninevite 5 period, are assignable to Early Jezirah 3a, perhaps ca. 2500 BCE.

Level 1 primarily consists of the limestone foundations of a large rectangular building in southern part of the tell and is tentatively dated to the Hellenistic period.

Following the level 1 occupation, the tell was used as a cemetery, particularly in the 20th century CE, resulting in the intrusion of scores of grave pits into earlier contexts.

Notes

[1] Urbanocentrism (Schwartz and Falconer 1994) is not restricted to Near Eastern archaeology (cf. Iannone and Connell 2003). Mesoamerican archaeologist Joyce Marcus wrote: "Future archaeologists will need to be less 'city-centric'.... They will need to look beyond the capital and its immediate environs to the many nested or concentric parts that make up a whole state—the lower levels of the hierarchy such as hamlets and households" (School of American Research 1993).

[2] A project with similar aims to study urban–rural interrelationships at a Bronze Age village site was that based at Tell al-Hayyat in the Jordan Valley (Falconer and Fall 2006).

[3] Trigger (2003:120) states that "cities, towns, and service villages are at best arbitrary units of a continuum of size and function, not structurally or functionally distinct entities."

[4] Perhaps one should say "flowed" southeast, since the amount of water in the Khabur has seriously declined in recent years (Herculeau 2010).

[5] The topographic maps of the site provided in this volume (Figures 1.2 and 1.3) differ from the version published previously (Curvers 1986; Curvers and Schwartz 1990), which was based on a map produced during the 1986 field season. Subsequent work at the site revealed this map to have significant errors on the western edges of the tell, underestimating the extent of the mound. The revised map was produced with data from elevations taken at diverse points on the mound during excavation, Corona and Google Earth images, and the map produced by the Tübinger Atlas des Vorderen Orients (TAVO) survey team in the 1970s (Kühne and Röllig in press). I am grateful to Manfred Tonch, Freie Universität Berlin, for producing the topographic maps presented here, and to Hartmut Kühne, Freie Universität Berlin, for providing a copy of the TAVO map.

[6] Absolute elevations were taken with respect to the fixed datum point on Tell 'Atij, 2 kilometers to the south.

[7] Examining the cataract adjacent to Raqa'i in 2009, when the Khabur was dry, Hartmut Kühne (personal communication, 2011) concluded that the feature was a human construction. I am grateful to Kühne for sharing this information.

[8] In previous publications, level 5 is referred to as levels 5–7, but expansion of excavations beyond the original step trench revealed that the stratigraphy was more complex than originally understood and does not consist of three discrete strata.

[9] Note that the north–south grid numbers used in figures 66–69 in Schwartz and Curvers 1993/1994 are less by one than those used here and elsewhere in the preliminary reports (e.g., grid point 43 in this volume is equivalent to grid point 42 in the cited figures). Although the smaller number was used in the field notes, the larger number was used in the published reports due to an editorial error, except for figures 66–69 in Schwartz and Curvers (1993/1994). It was decided to maintain consistency by continuing to use the system with larger numbers in the publications.

[10] The term "archon," coined by H. Curvers, refers to the smallest discrete archaeological unit, analogous with terms such as "neutron" or "electron," elementary particles in chemistry; it is also a facetious allusion to the former

Dutch national archaeological funding agency Archon.

[11] Obviously the decision to begin screening was made on an imprecise basis, since the stratigraphic distinctions between levels 2 and 3 were often not understood until after excavation had concluded in a given area. In general, screening began when excavating below level 2 contexts or their stratigraphic equivalent.

[12] The excavated area in toto measured ca. 1,700 square meters.

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Chapter 2

Stratigraphic and Architectural History[1]

Glenn M. Schwartz

When work began on the excavations at Tell al-Raqa'i, the small size of the mound led us to expect no more than a few small houses at most per stratum. But the reality was quite different: levels 2–5 contained a dense packing of numerous structures of mudbrick, whose stratigraphic and functional interpretation was often extremely challenging. Individual rooms were often modified through time, with walls moved and features rebuilt or eliminated, and it was often difficult to synchronize the changes in one room with those of another (let alone with those of another building), since living surfaces in one room were often not traceable to the next room due to the obstacle of a wall or threshold. Further, we often did not obtain the entire sequence of use for a given structure, given limited time and the need to adhere to our research goals. Therefore, the often incomplete, complex, and ambiguous character of the results described below should be kept in mind.

Despite these problems, we have recognized regularities and patterns in the data that allow for the delineation of five major levels of occupation at Tell al-Raqa'i. While the designation of occupation levels would be useful if only for heuristic purposes, there is also reason to believe that Raqa'i levels 5–1 at least partly correspond to distinct periods of rebuilding and site alteration, contrary to expectations of "spiral stratigraphy" in the third-millennium occupation. These levels are distinguished by changes in architectural layout and, in most cases, by significant changes in the ceramic assemblage.

We define level 5 to comprise contexts deposited prior to the construction of the Round Building, while level 4 refers to contexts contemporaneous with the first construction of the Round Building. Level 3 consists of contexts contemporaneous with the reconstruction of the Round Building, and level 2 entails small-scale, third-millennium architectural remains later than those of level 3, post-dating the use of the Round Building. The latest occupation, level 1, consists of the vestiges of a stone building constructed subsequent to level 2.

Significant changes can be observed among the levels. In the southern part of the tell where level 5 was most extensively sampled, there was a major revision of architecture from levels 5 to 4, with little comparability between the two levels except for a similar northwest-southeast orientation and construction of the enclosure wall of the level 4 Round Building directly above level 5 wall 15A. While important level 4 buildings were reconstructed or reused in level 3, level 4 domestic architecture was succeeded by substantially different residential structures in level 3. After the floruit of level 3, there is evidence suggestive of a period of abandonment or minimal occupation prior to construction of level 2 architecture, including ovens and burials built above or sunk into the fill of level 3 rooms prior to the construction of level 2 buildings.[2] Finally, level 1 is clearly post-third millennium and is tentatively assigned to the Hellenistic period.

Despite the utility of recognizing five episodes of occupation at Raqa'i, there is also evidence for the reuse or reconstruction of architectural units from level to level in the third-millennium settlement. In the west central area (deep sounding 36/120), the earliest level 4 phase is clearly a continuation of the architecture in level 5 (Figures 2.2, 2.9, 2.11–2.13, 2.71). Evidence of continuity is also substantial between levels 4 and 3:

1. The "silos" of areas 56–58 in level 4, designated areas 4–6 in level 3, were originally constructed in level 4 and re-used in level 3.
2. The Round Building, originally built in level 4, was reconstructed in level 3.
3. There is consistent placement of ovens in the northern part of the Round Building in both levels 4 and 3.
4. Walls of level 3 domestic architecture are aligned with the walls of level 4 domestic architecture below (e.g., level 3, areas 1/2 and 8).

Continuity between levels 3 and 2 is manifested by:

1. Level 2, area 23, a virtual rebuild of level 3, area 64.
2. The southwest wall and the southern half of the northwest wall of level 2, area 11, built on top of and largely replicating the southwest and northwest walls of level 3, silo 6.
3. General orientation of both levels 2 and 3 architecture in a northwest-southeast direction.
4. The practice in both levels 2 and 3 of employing several wide foundation courses of mudbrick headers surmounted by courses of narrower bricks.

In general, the architecture in the third-millennium levels at Raqa'i was constructed of sun-dried mudbricks without the use of a stone foundation or substructure. Unless otherwise indicated, the mudbrick walls were mud plastered.[3]

A variety of features such as benches, basins, pits, and ovens were excavated in the third-millennium levels at Raqa'i and are detailed in the descriptions of each excavation area. Ovens are defined as pyrotechnic installations with enclosure walls, generally showing signs of burning and often with a fill of ash. Particularly common are *tannurs*, circular clay structures that probably had a truncated conical shape when complete, as is the case with *tannurs* in present-day Near Eastern villages (Crawford 1981; Kramer 1982; Sweet 1960:121; van der Steen 1991). Although modern *tannurs* often have a small vent hole near the bottom, no such openings were noted in the excavated Raqa'i examples from levels 2 through 5. The *tannur* is traditionally used for baking bread, which is done by applying flat discs of dough to the heated interior surface of the oven and removing them when baked. *Tannurs* may also be used for cooking by placing a vessel on the top of the feature (Crawford 1981:108; van der Steen 1991).

With the exception of burials and the occasional large storage jar left in situ, no excavated area at Raqa'i yielded an inventory of pottery or other artifacts in a primary context. Thus, it appears that people had the opportunity to take usable or valuable objects with them when they abandoned a room or house, either for a dwelling elsewhere or for a new abode on the Raqa'i mound. Therefore, the artifactual and ecofactual material at Raqa'i is almost always from secondary or tertiary contexts, having been discarded after its period of use.

In this chapter, a list of recovered small finds and complete vessels or profiles is appended to the description of each context. Unless otherwise noted, these derived from the debris that accumulated within the designated space and are thus likely to have come from a secondary context. For further details on individual small finds, see the tables, catalogue, and discussion in Chapter 5. The listed pottery consists of vessels that were intact or had a complete profile and the majority of the vessel still extant.

It should be noted, when considering the patterns of object distribution, that level 2 and 3 contexts in trenches 29/114 and 29/120 in the northwest part of the site sometimes display a much larger number of object fragments than areas elsewhere in the site. This is likely to be at least partly due to the fact that this area was the site of a different excavation technique in the 1991 and 1991–1992 seasons than was otherwise employed on the site, utilizing only the small pick (as opposed to the frequent use of the large pick in the other excavation seasons in addition to the small pick) and employing wet screening in addition to dry screening. It is probable that one reason the dramatic increase in small object fragments occurred is because the small pick produces smaller clumps of soil to be screened. On the other hand, it is also possible that the profusion of small finds in this area is related to the dumping of considerable amounts of trash on the sides of the mound in antiquity.

Two varieties of architectural fill and midden material were particularly common in the Raqa'i tell matrix: relatively hard, red-brown bricky soil and soft gray ashy material, with the two types often deposited in alternating layers. In the following discussion, information on fill accumulating above floors or in exterior areas is provided when it diverges from this general pattern or when otherwise relevant. Wright, Redding, and Pollock (1989:108) have suggested that alternating layers of bricky red and ashy gray can be construed as artifacts of seasonal deposition: the bricky layers are

interpreted as products of the construction and repair of mudbrick architecture conducted during the summer, and the ashy layers are seen as residues of the fires particularly necessary in the chilly winters. However, the sequence of alternating red and gray layers observed in the Raqa'i Round Building, with its putative specialized activities, might be interpreted inversely: the bricky layers could be artifacts of the wet winters, when mud plaster and brick material were eroded by rainwater, and the gray ashy material could be associated with the drier parts of the year when specialized oven-related activities took place.

Several significant factors influencing post-depositional processes at Raqa'i can be identified (Schiffer 1987). Particularly obvious were the activities of animals, especially burrowing rodents, whose holes were found in virtually every excavation unit. Loci markedly disturbed by such activity are noted in the discussion of individual areas below. Other intrusive activities that affected third-millennium deposits include the gardening and construction activities of the late 20th-century CE caretakers of the water pump next to the site and the excavation of numerous pits for 20th-century burials.

In the sections that follow, each architectural unit is discussed separately, but when its phases of construction and use can be synchronized with architecture or soil deposits outside it, this information is provided.[4] Occupational phases within individual architectural units are given letter designations (e.g., area 1, phase a, etc.).

Level 5

Level 5 comprises those contexts deposited above virgin soil prior to the construction of the Round Building (for relevant section drawings, see Figures 2.1, 2.2). In preliminary reports, these deposits were designated as levels 5–7, based on the recognition of three levels in the step trench 42/116 excavated in 1986–1987 (Curvers 1987; Curvers and Schwartz 1990) (Figure 2.3). Exposure of strata pre-dating level 4 in other excavation areas, however, revealed that there was no clear continuity of three discrete levels across the site. Therefore, we now designate the contexts above virgin soil and earlier than level 4 as level 5, although they may contain several phases of construction or strata.

Due to the relative inaccessibility of the level 5 contexts, buried below later levels with substantial architecture often built on top of them, only small samples of this occupation were obtained. Relevant excavations were primarily concentrated on the south slope of the present-day tell, south of the area of the level 4–3 Round Building, but deep soundings elsewhere on the site also acquired evidence of this occupation.

Although the level 5 excavated sample is too small to draw any conclusions about the general organization of the settlement in its earliest phase of occupation, some observations can be made. Striking is the frequent attestation of grill architecture, consisting of parallel walls with narrow spaces between them. Such architecture is often associated in the literature with grain storage or drying, since an apparent purpose is to elevate floors and materials on them in order to minimize humidity and vermin infestation.[5] These appear in the south area (areas 1, 4, 16–18, 19, phases a and c), southeast (below the floor of level 4, silo 1), and west. Whether this frequency of grill architecture was characteristic of the entire site in level 5 or only the sampled areas is impossible to determine. In addition to the grill architecture is evidence of more conventional rectilinear structures, and the grill structures might well be understood as ancillary to the latter constructions. None of the non-grill structures clearly conform to the "two-room house" type that we observe in level 3. In one room, area 21, phase a, were remains of lime-plastered benches set against the walls, a feature common in the excavated domestic architecture from levels 2–4.

Construction Materials and Methods

In general, level 5 architecture consisted of mudbrick walls preserved no more than 1 meter high, and usually much less. The typical building material of level 5 was sun-dried mudbrick, generally of a reddish-brown color, with mud mortar. A wide range of brick sizes was employed, all with a height of 8–10 centimeters. The widened foundations and other elaborate foundational features observed in level 3 were not evident here. In general, the walls are one brick wide and thus are not likely to have exceeded a single story.

Presumably the architectural units not part of the grill structures were roofed (e.g., areas 9, 13, 21) while the areas (e.g., areas 10, 14, 16) too large to be spanned by available roof-beam timber were unroofed, open zones. Sometimes interior buttresses were used (areas 4, 8, 9, 13, 19).[6] Although only occasional attestations of lime plastering were encountered—on the floors but

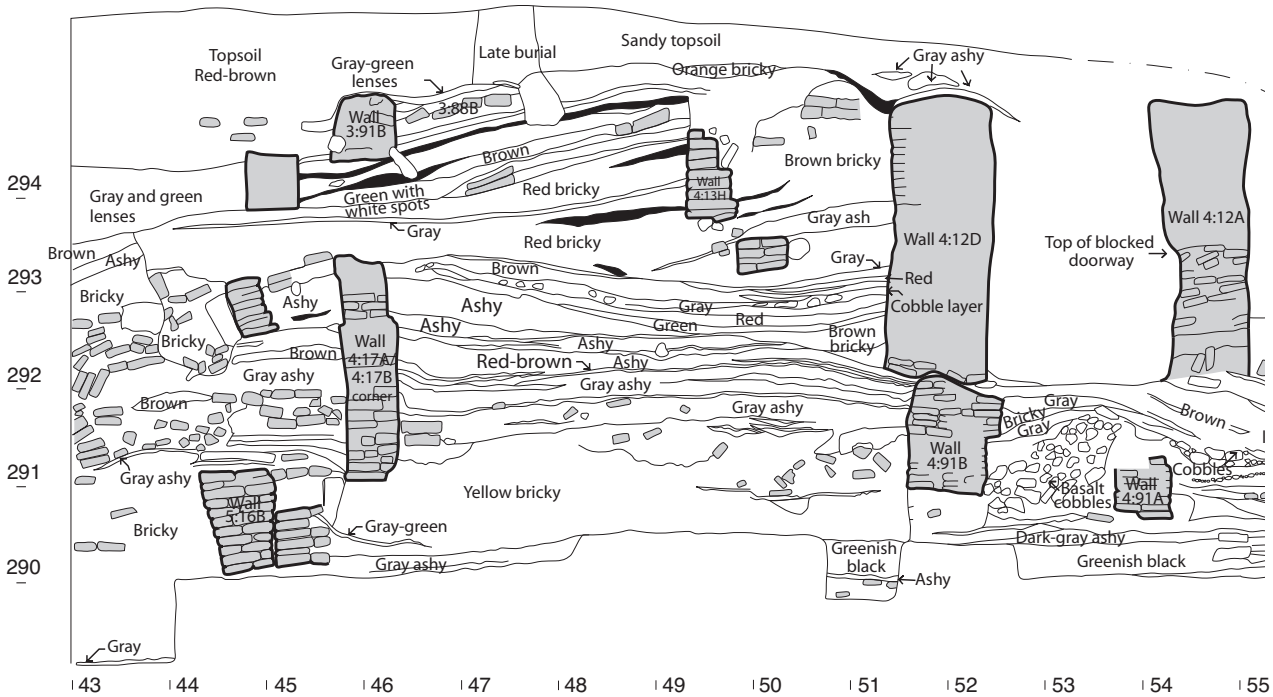


FIGURE 2.1. East balk section, 108 north-south grid line (edge of trench veered from grid line in some segments, extending as far west as 108.3 in lower elevations) *(continued on facing page)*. Black = ash; a = animal burrow. Walls and features indicated by level and feature number (e.g., Wall 4:91B = level 4 wall 91B). *Illustration prepared by Violaine Chauvet.*

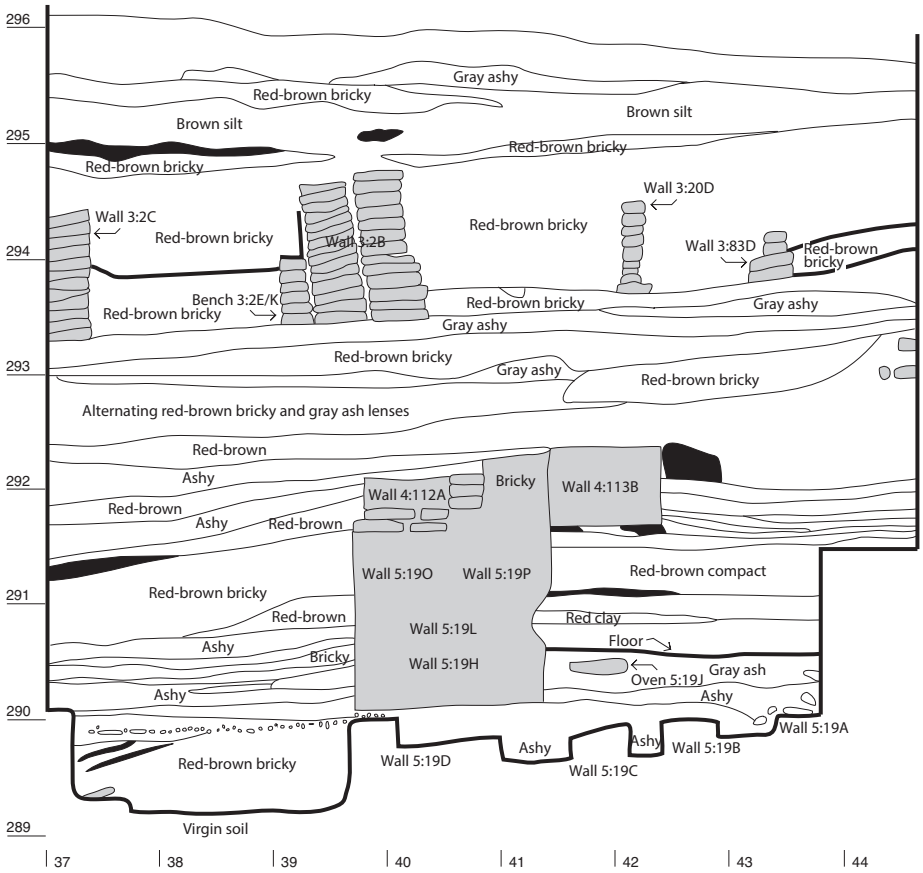


FIGURE 2.2. East balk section, 114 north-south grid line. Black = ash. Solid black line = lime plaster floor. Walls and features indicated by level and feature number (e.g., Wall 4:112A = level 4 wall 112A). *Illustration prepared by Harley King.*

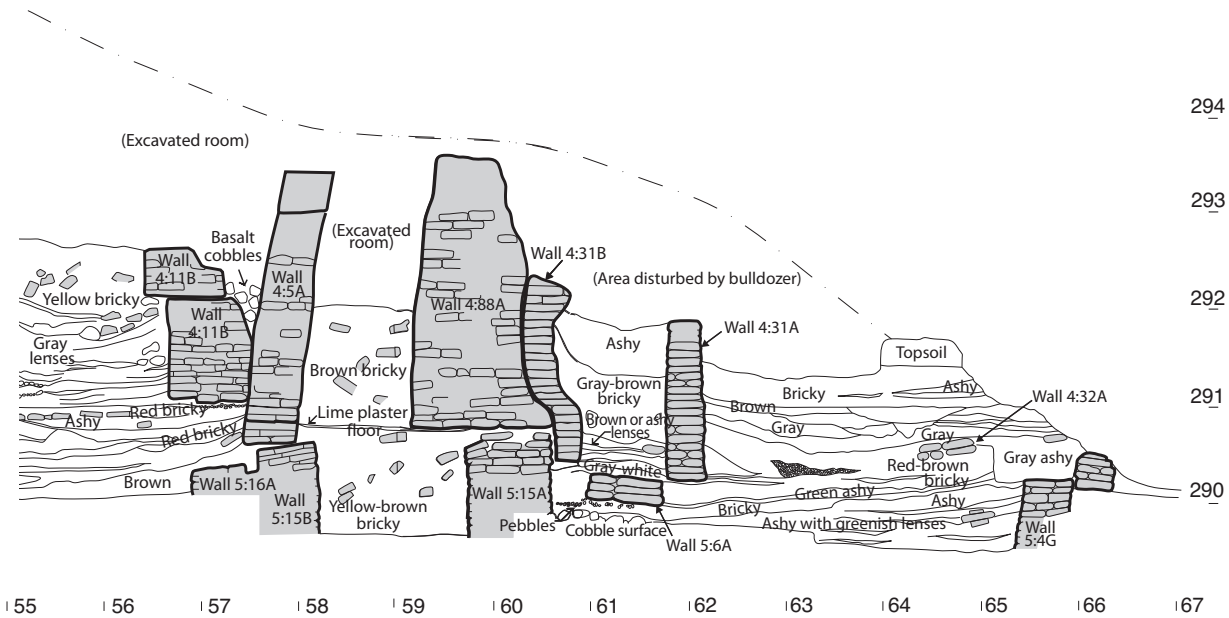


FIGURE 2.1 (*continued*). East balk section, 108 north-south grid line.

FIGURE 2.3. North section, fourth and lowest step of 42/116 step trench, at grid line 60 (trench located between grid lines 43-68 and 114-16). *All photographs by Hans Curvers/Glenn Schwartz.*

not walls of areas 13, 19–21, 22—these appeared to be restricted to areas expected to be roofed. In addition, the grill element 16B–C in area 16 had lime-plastered walls. Otherwise, when wall plaster was evident it was composed of mud plaster on both exterior and interior wall faces.

If lime-plastered floors were not utilized, interior surfaces usually yielded evidence of mud floors. In addition, there were some attestations of pebble, cobble, or stone slab surfaces, in some cases in what are likely to be outdoor contexts (e.g., area 14).

FEATURES

In the south and west central areas, ovens were of a large (diameter 1–1.5 meters), thick-walled variety, sometimes with a mudbrick lining, rather than thin-walled clay *tannur* ovens. They were found in outdoor contexts (area 3, if 3B is to be interpreted as an oven), inside a small, lime-plastered enclosure (area 13), and in a room of uncertain character (area 19, phases b and d). Oven 19Q in area 19, phase d, had a mudbrick packing around it, ostensibly to enhance heat insulation. Area 19 in the west central area consisted of only a small excavated sample but contained one large and two small ovens in two different phases.

No fireplaces (frequent in level 3) or lime-plastered bins or basins were identified in level 5. In the northern step trench 29/114 was a mud-plastered feature with a line of burned upright mudbricks (22C) in phase c and a lime-plastered channel adjacent to a rectangular ashy depression (22E) in phase d.

Level 5 yielded remains of only two pits. One was small, circular, clay-lined, and burned, perhaps a fire pit (see below) in area 19, phase d, while the other was a small circular, lime-plastered pit in area 3.

AREA DESCRIPTIONS, LEVEL 5

South Area (Figure 2.4)

The excavated units on the south slope of the mound provide the largest exposure of level 5 remains, although the architecture was fragmentary, difficult to interpret coherently, and often disturbed by recent bulldozing and other intrusive activities.

Areas 1/2: The excavated portion of a brick feature in area 1, the segment of a grill-like structure or bin preserved five courses high, consisted of a narrow space delineated by three walls of ca. 30-centimeter width (Figure 2.5) (designated Grill Building 2 in Schwartz and Curvers 1993/1994:247).[7] Inside was a gray-brown earthen surface with lime flecks, with ashy and bricky debris having collected above it. The remains of this structure were identified below the entryway to the level 4 Round Building (level 4, area 6). Whether wall (?) 1D was part of the feature is uncertain.

The open area 2 yielded a sequence of layers of either red bricky or gray ashy material. A painted Ninevite 5 sherd (one of perhaps two recovered from the site) derived from this area (Figure 4.17:4).

Objects: area 2—bone awl fragment.

Area 3: Above virgin soil at the south edge of the 42/116 step trench was part of a circular mud feature (3B) with walls preserved only 7 centimeters high. Inside it were four mudbricks apparently forming a floor, with thick mortar lines between the bricks. The feature, associated with an ash surface (elevation 288.93), resembles an oven but showed few signs of burning. To the north was a small, circular lime-plastered pit (3A), inside of which stone boulders were found.

Area 4: South of the open area 2 was another mudbrick grill structure with 30-cm wide walls in two perpendicular segments preserved up to seven courses (Figures 2.5, 2.6) (see Grill Building 3 in Schwartz and Curvers 1993/1994). The debris inside the long narrow spaces was primarily gray ashy material. A row of upright mudbricks had been placed against the south face of wall 4E.

Areas 5/6: Perhaps an eastern segment of the architectural unit (minimally) attested in area 1, this zone is demarcated to the north by wall 15A, which was located under the outer wall of the level 4 Round Building (level 4, 88A). The south face of 15A lined up directly with the outer face of the Round Building outer wall above it. In an early phase, a surface of cobbles was installed against the southwest face of wall 15A (elevation 289.73); later, wall 6A was built perpendicular to 15A (elevations 289.94–290.04, three courses high).

Objects: area 5—worked equid phalanx; area 6—bone needle.

Areas 7/8: Southeast of the area 4 grill are segments of additional structures difficult to interpret given incomplete excavation. A trench excavated next to wall 11A indicated that the wall was built directly on virgin soil (elevation 289.00), which is probably the case for the adjacent walls 8A–B and 7A and, perhaps, the area 9 structure.

Areas 9/10: Adjacent to the architecture of areas 7/8 is the northern segment of a structure (area 9) ex-

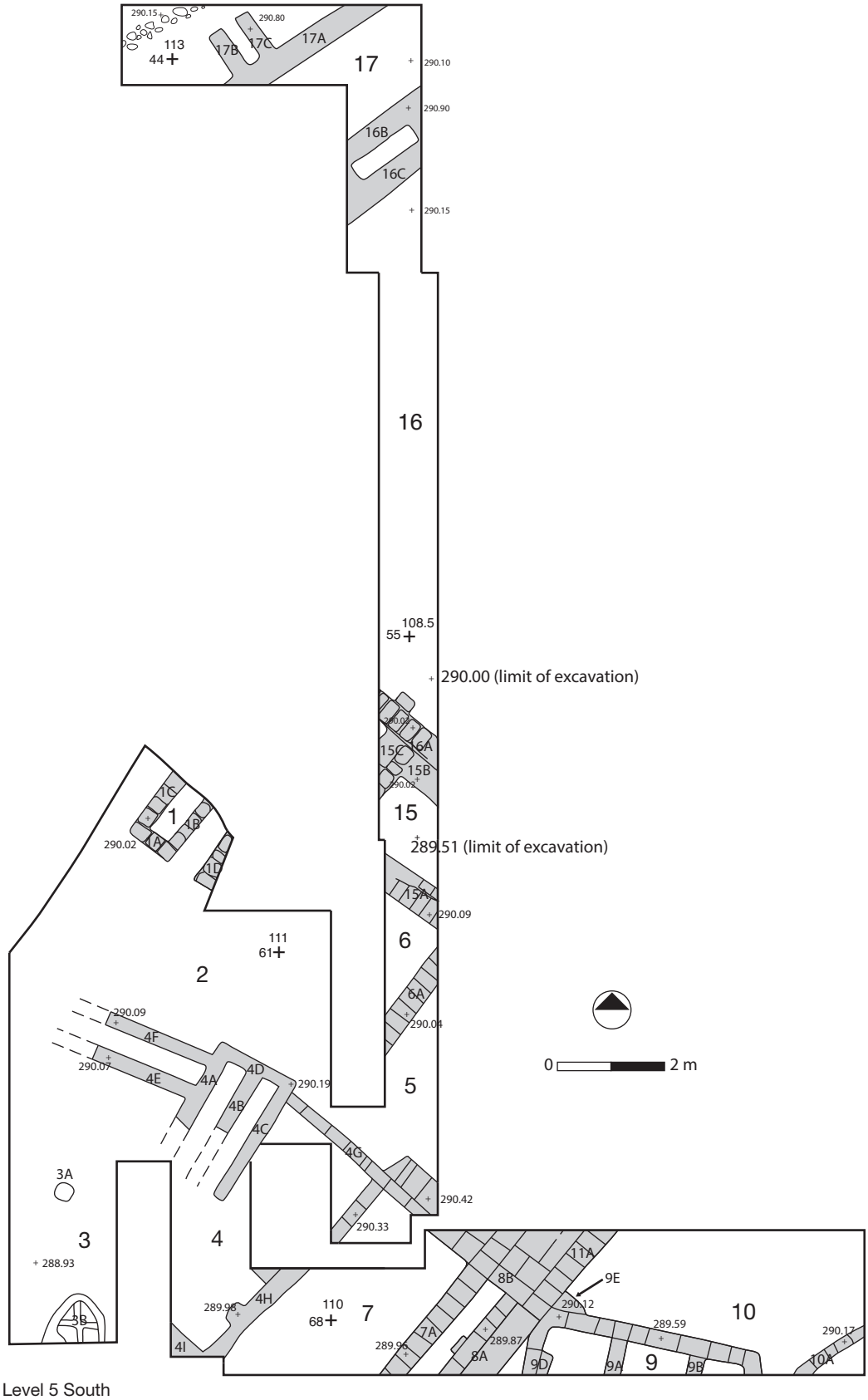


FIGURE 2.4. Level 5, south area. *Illustration prepared by Violaine Chauvet.*

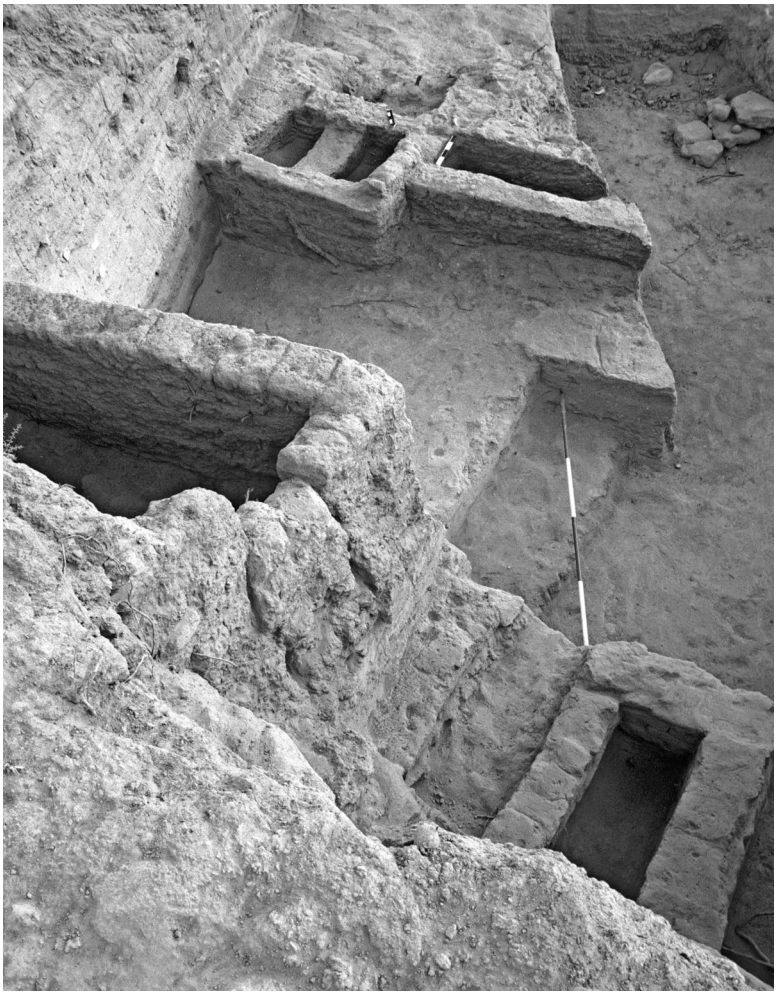


FIGURE 2.5. Level 5, areas 1/4. Looking south. Level 4, area 31 visible to left.

FIGURE 2.6. Level 5, area 4. Looking northwest.

tending out of the south balk of the excavation unit 65/108. Brick features 9A–B are either interior buttresses or walls partitioning the space. An unusual exterior round buttress (9E) was located in the corner formed by the meeting of walls 9C and 11A. The interior of the area 9 structure was not significantly investigated, and the limit of excavation immediately outside the building was about 289.50, ca. 9 centimeters below the extant area 9 wall tops. In area 10 was abundant orange bricky fill with some ash, with another structure intimated by wall 10A in the southeast corner of the trench.

Areas 13/14 (Figure 2.7): In a phase subsequent to the area 9/10 architecture, a new room (area 13) was constructed of crudely arranged walls utilized along with the still extant wall 10A. A greenish-yellow lime plaster floor was exposed inside the room, but there was no trace of lime plaster on the walls. Cooking ware sherds were discovered resting flat against the south face of wall 13B. A surface of stone slabs was located in area 14 west of wall 13C, and a pebble surface was noted outside wall 13B.

Subsequent to the use of the area 13 floor, a clay oven (13D) was installed against wall 13A.

Central South Area

Two 1.5- to 2-meter-wide trenches were excavated below the level 4 Round Building in 1992. These formed an L and consisted of an east-west trench (42/114 North) and a north-south trench (42/114 East) (Figure 2.8), revealing architecture to the north of the remains described above in the south area. The earliest occupation reached in these trenches consisted of a level 5 phase with architecture evident in 42/114 North and the southern extent of 42/114 East.

Areas 15/16 (42/114 East) (Figure 2.4)**:** In the southern part of the trench, part of a room was identified (area 15) whose southwest wall (15A, noted above in area 6) is located below the outer wall of the level 4 Round Building. A wall (16A) belonging to a later or separate architectural entity was parallel to and adjacent to the northeast wall (15B) of the area 15 room. When excavation terminated in area 15, a relatively hard surface had been reached that might have been the earthen floor of the room, but this conclusion was not confirmed.

Areas 16–18 (42/114 North) (Figure 2.4): The small excavated sample indicates the presence of two grill structures characterized by sets of parallel walls separated by narrow empty spaces (walls 16B–C, 30 centimeters wide; walls 17B–C, 40 centimeters wide), as in the west central area, phases a and c (see Grill Building 4, Middle Phase in Schwartz and Curvers 1993/1994:248, abb. 68). The box-shaped space between grill walls 16B and 16C was filled with ash; its walls had a coat of yellow lime plaster. No floor surfaces were noted in this phase, which appears to be contemporaneous with level 5, phases b–d, in the west central area.

Southeast Area

Excavation in a very small exposure (2.1 square meters) below the floor of silo 1 in the level 4 Round Building (see below) revealed a small segment of apparent grill architecture (identified as Grill Building 1 in Schwartz and Curvers 1993/1994:247). Exposed were two parallel walls 30–32 centimeters wide with a 30-centimeter-wide space between them. Other examples of grill architecture on the site have similar wall widths.

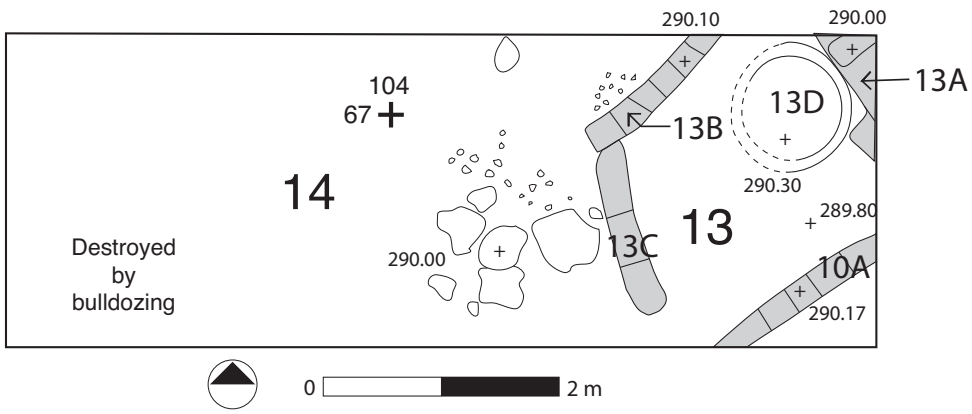


FIGURE 2.7. Level 5, southeast. *Illustration prepared by Violaine Chauvet.*

West Central Area

A 7.5 × 2-meter-deep sounding was excavated next to the east balk of unit 36/120 in 1990, yielding a sequence of level 5 and early level 4 occupations (for location of this and other deep soundings; see Figure 2.8).[8] The east section of this trench was published by Schwartz and Curvers (1992: figure 26). In that publication, level 5 (then called levels 5–7) was assigned only to the earliest phase of architecture in the trench, which included a grill building. However, further excavations in the Round Building and below it necessitated a revision of the level designations in the 36/120 deep sounding (Schwartz and Curvers 1993/1994:248) (see Figure 2.2). In this reassessment, the three thick walls represented in the center of the published section, stratigraphically linked to the level 4 Round Building, belong to early level 4, but the earlier phases of the two northernmost walls as well as the grill architecture in the lowest stratum are now assigned to level 5, since continued excavation to the south revealed that they pre-date the level 4 Round Building.

The four level 5 phases recognized in the 36/120 deep sounding alternate between strata with grill architecture and strata with large ovens.

Phase a (Figures 2.9, 2.10)**:** The earliest phase observed in the 36/120 deep sounding, founded above virgin soil, consisted of a grill building with four 30-centimeter-wide parallel walls (19A–D) separated by open spaces of a similar width filled with ashy debris (see Grill Building 4 Early Phase in Schwartz and Curvers 1993/1994:247–248, abb. 67). Adjacent to the grill building to the southwest was room 21 with a lime-plastered mudbrick bench (21A) and lime-plastered floor. A white lime-plastered floor was also identified in area 20 north of the grill building, but not to the west in area 19. This phase predates the level 5 phase exposed in areas 16–18 (see above).

Phase b (Figure 2.11)**:** The grill building of phase a was replaced by a structure with a similar orientation but without the parallel walls of the grill. Instead, there is an area with two large ovens (19I–J) separated by a thin partition wall (19G) (see Grill Building 4, Middle Phase, in Schwartz and Curvers 1993/1994:248, abb. 68). Ovens 19I–J consisted of a thin clay ring with a packing of small mudbricks around it. No obvious floor surface was detected in area 19 apart from the apparent stone paving near wall 19F, but a pebble surface was identified in area 20. Phase b and its successors, c and d, are contemporaneous with the level 5 phase exposed in areas 16–18.

Objects: area 19—clay handle (?).

Phase c (Figure 2.12)**:** Phase c continues the basic orientation of the preceding phases and seems to entail a new grill construction, indicated by two parallel walls 30 centimeters wide (19M–N) with a space of similar width between them (see Grill Building 4, later phase, in Schwartz and Curvers 1993/1994:248, abb. 69). These walls were covered by a single course of mudbricks that might represent the base of a superstructure, as in the granary at Telul eth-Thalathat, Tell V (Fukai et al. 1974). Yellow-white lime-plaster floor surfaces were observed in area 19 southeast of the grill, in area 21, and in area 20.

Objects: area 19—clay andiron.

Phase d (Figure 2.13)**:** In the latest level 5 phase, a new wall surmounting the earlier ones separating area 19 from 20 was constructed (19O), along with a kind of platform or thick buttress (19P). As in phase b, the main features are pyrotechnic, including a large oven (19Q) with a surrounding packing of mudbricks, and a burned clay-lined (fire?) pit with cobbles inside (19R). No floor surfaces were noted in this phase.

Objects: area 19—small clay wheel (probable spindle whorl), animal figurine fragment.

North Area

A step trench excavated on the north slope of the mound was designated unit 17/114 (Figure 2.14). From this trench, which had five steps, a small sample of contexts was retrieved, most likely deposited above virgin soil given the absolute elevation, although virgin soil was not definitively identified. Four phases above virgin soil were considered likely to belong to level 5, given their ceramic content and architectural coherence. In the earliest phase a, the top of a small part of a circular clay feature (oven?) (22A, elevation 289.80) was exposed in the southwest corner of step 5 near grid point 11.8/114. In phase b was a wall (22B) running northwest-southeast across the trench. Phase c had an installation composed of a line of burned upright mudbricks (22C) (length by width of each brick 18–22 × 8 centimeters), coated with thick mud plaster (ca. 3 centimeters) on its southern face. In phase d, the latest level 5 phase, wall 22D extended northwest- southeast across the trench. North of wall 22D was a greenish-white, lime-plastered surface (elevation 290.47). A grinding stone was found resting on this surface near a depression of the same shape as the grinding stone. South of wall 22D was a feature (22E) consisting of a lime-plastered channel leading to a rectangular depression filled with ashy material.[9]

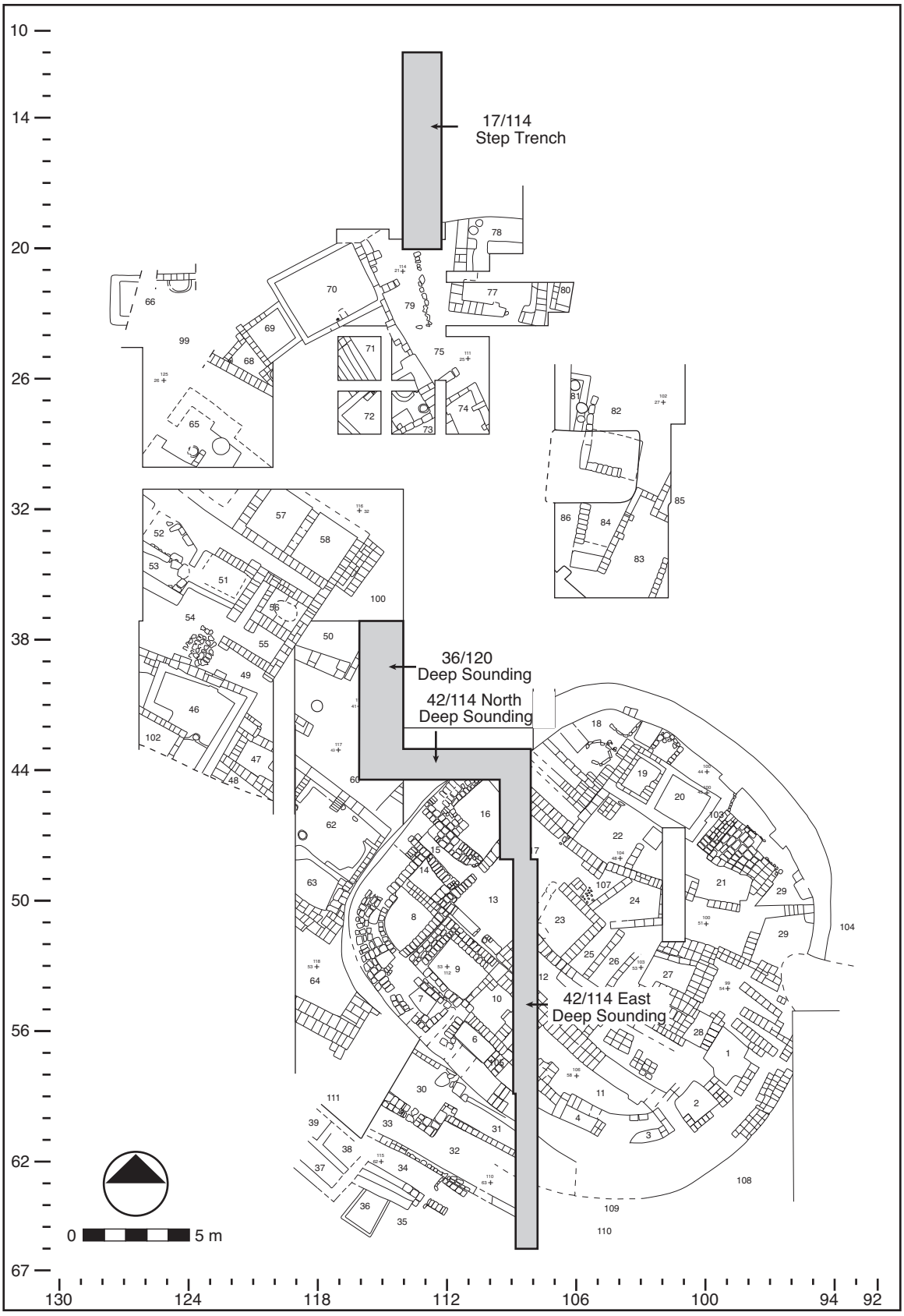


FIGURE 2.8. Location of deep soundings. *Illustration prepared by Harley King.*

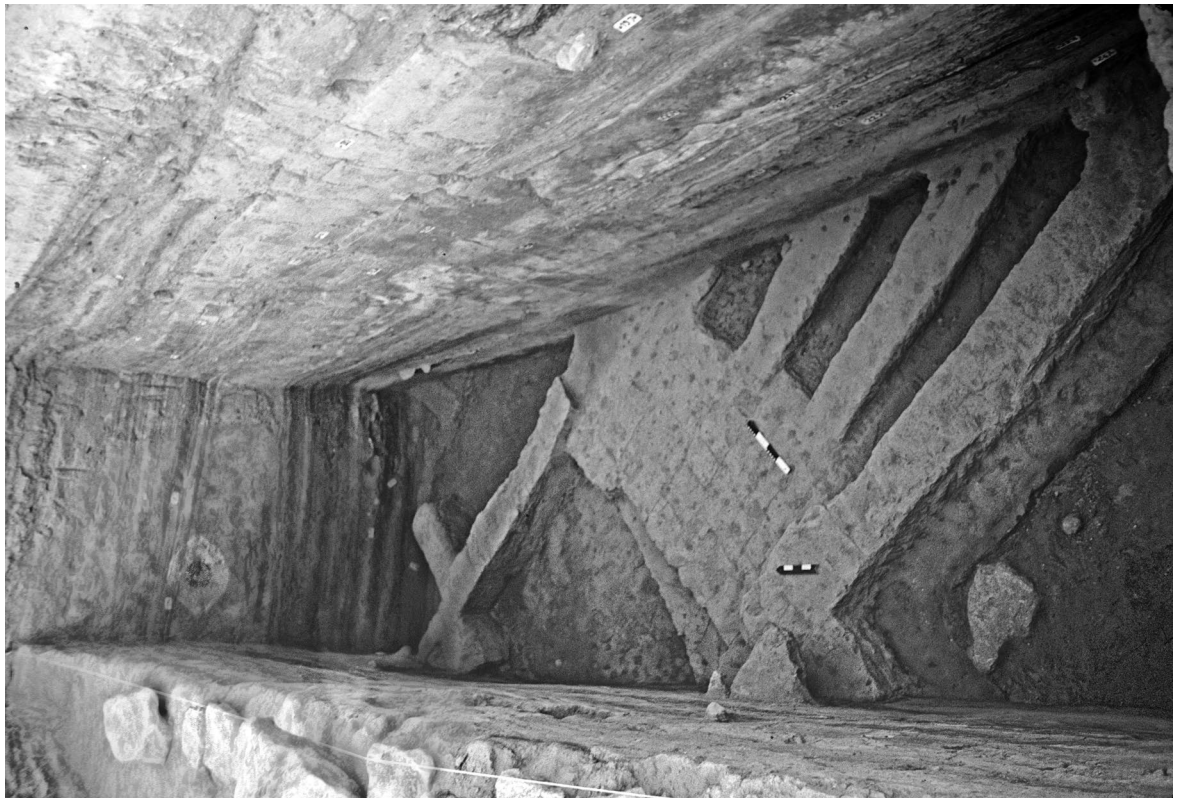


FIGURE 2.10. Level 5, area 19. Looking north.

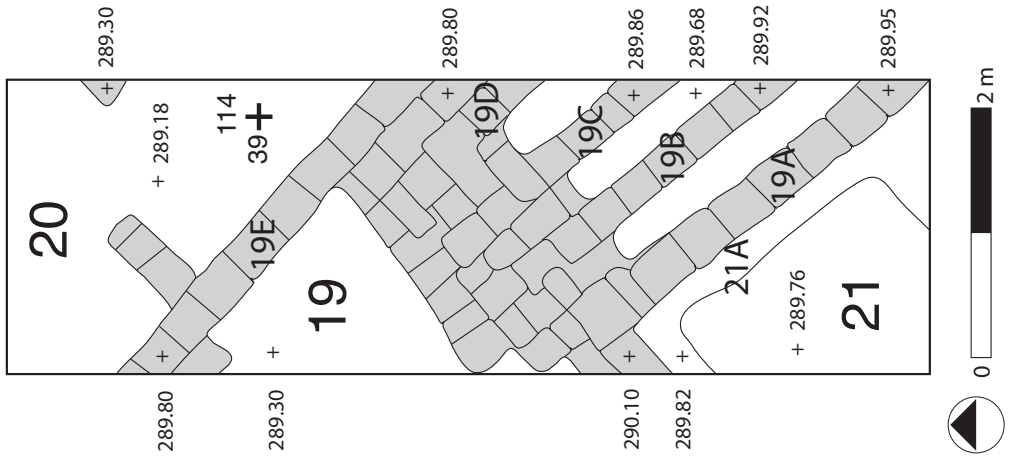


FIGURE 2.9. Level 5, west central area (36/120), phase a. *Illustration prepared by Violaine Chauvet.*

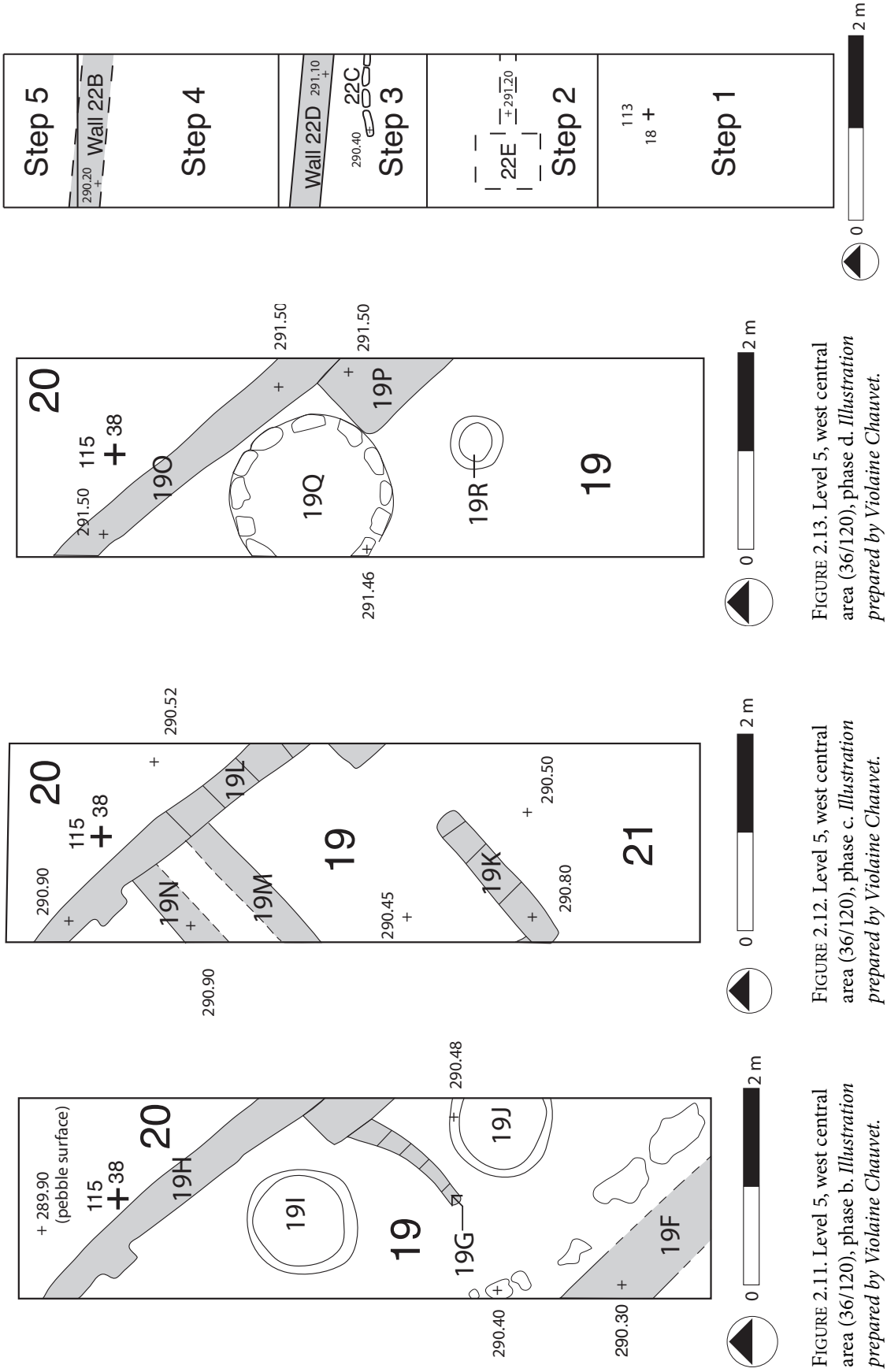


FIGURE 2.11. Level 5, west central area (36/120), phase b. *Illustration prepared by Violaine Chauvet.*

FIGURE 2.12. Level 5, west central area (36/120), phase c. *Illustration prepared by Violaine Chauvet.*

FIGURE 2.13. Level 5, west central area (36/120), phase d. *Illustration prepared by Violaine Chauvet.*

FIGURE 2.14. Level 5, 17/114 step trench. *Illustration prepared by Harley King.*

Objects: area 22—basalt grinding stone type A fragment.

Complete vessels/profiles: area 22, phase b, Medium Simple Ware funnel (?) (Figure 4.17:30).

West Area

A small segment of a possible grill building (see Grill Building 5, Schwartz and Curvers 1993/1994:248) was found in the 80-centimeter-wide step trench 29/136 on the west slope at elevations 288.65–289.25, in the second phase above virgin soil. The narrow area exposed indicated the presence of two parallel walls ca. 30 and 35 centimeters wide, oriented southeast-northwest with a space ca. 30–35 centimeters between.

LEVEL 4

Level 4 is defined as those contexts contemporaneous with the earlier of the two major phases of the Tell al-Raqa'i Round Building. Excavations of Level 4 remains were concentrated in the area of the Round Building in the south-central portion of the mound and to the west and north. In general, the preservation of level 4 architecture varied from just a few centimeters high to as high as 4 meters inside the Round Building. The "silos" of areas 56–58 remained extant almost up to 3 meters.

In the sample exposed (Figures 2.15, 2.16), comprising ca. 880 square meters, the level 4 community consists of structures radiating around the Round Building, implying that the latter edifice was constructed first and was a center of attention and activity within the community. A similar radial arrangement existed at Tell Gubba, an early third-millennium site organized around a round building in the Hamrin region of Iraq[10] (Fujii 1981: figure 8), as well as at Early Jezirah 1–2 period Tell Hazna in the upper Khabur (Munchaev, Merpert, and Amirov 2004) and in Early Jezirah 3 Melebiya in the middle Khabur south of Raqa'i (Lebeau 1993:42) and Beydar in the upper Khabur (Ristvet 2011a:6, figure 3).

South of the Round Building and outside its entrance in room 6 are a set of long, narrow rooms and other spaces. Their location between the Round Building entrance and the river may be relevant to their function. The domestic architecture excavated to the west and north of the Round Building was generally not exposed with enough completeness to comment on house plans. The two-room house type well attested in level 3 is difficult to recognize here.[11]

Distinguishing roofed from unroofed space in level 4 can be accomplished by considering the size of architectural units, since roofed areas would have been limited in size by the length of available roof-beam timber. Unroofed spaces would include, in the west, area 60 and the areas 49/54–55 zone to its west (but see below on the presence of lime plaster in this zone); in the north, the areas 75/79 passage; and, in the northeast, areas 83/86.

Areas 75/79 between the areas 69–74 and areas 77/78 architecture in the north appear to be an open-air passageway or alley, and the same might be said for the zone between areas 57–59/65 and 67–74 in the northwest. In the west, a passage leads west from the open zone 60 to area 49 and down the area 54 stone stairway, ostensibly providing access to the "silos" 51–53 and 56, whose point of access was deeper than the floors associated with adjacent architecture.

A number of structures are designated as "silos" in level 4. Their storage function is indicated by their doorless and/or (semi-)subterranean character. Stored grain requires a dry and air-tight environment to resist pests and humidity, often implemented through subterranean storage or air-tight superstructures (Currid 1986; Sigaut 1981; for cross-cultural perspectives on methods of grain storage, cf. Gast and Sigaut 1979 and 1981). Tower-like silos with vaulted roofs, upper windows, and access from the top are attested in Near Eastern glyptic art from the fourth and third millennia BCE (Schwartz and Curvers 1992: figure 15) and resemble Raqa'i silos as described below. Akkermans (1989:65) observes that domed roofs are preferable to flat ones in mudbrick grain storage facilities, since domes allow more heat to escape. When considering the interpretation of the "silos" at Raqa'i, it is important to note that none contained any significant amounts of carbonized grain in situ.

Silos found inside the Round Building include areas 1, 2, and 21 in the eastern part of the building, each containing evidence of roofs with corbelled vaults of a type recalling the representations of silos in glyptic art noted above. Area 1 also contained a window just below the roof, again recalling glyptic representations of grain storage structures. Areas 27 and 28, also found in the eastern part of the Round Building, likewise had evidence of vaulted roofs and might be considered silos. Most of these structures showed only signs of mud plastering, but area 2 had evidence of lime plaster and even, perhaps, black paint at a deep elevation. Bearing this in mind, area 3, with a vaulted

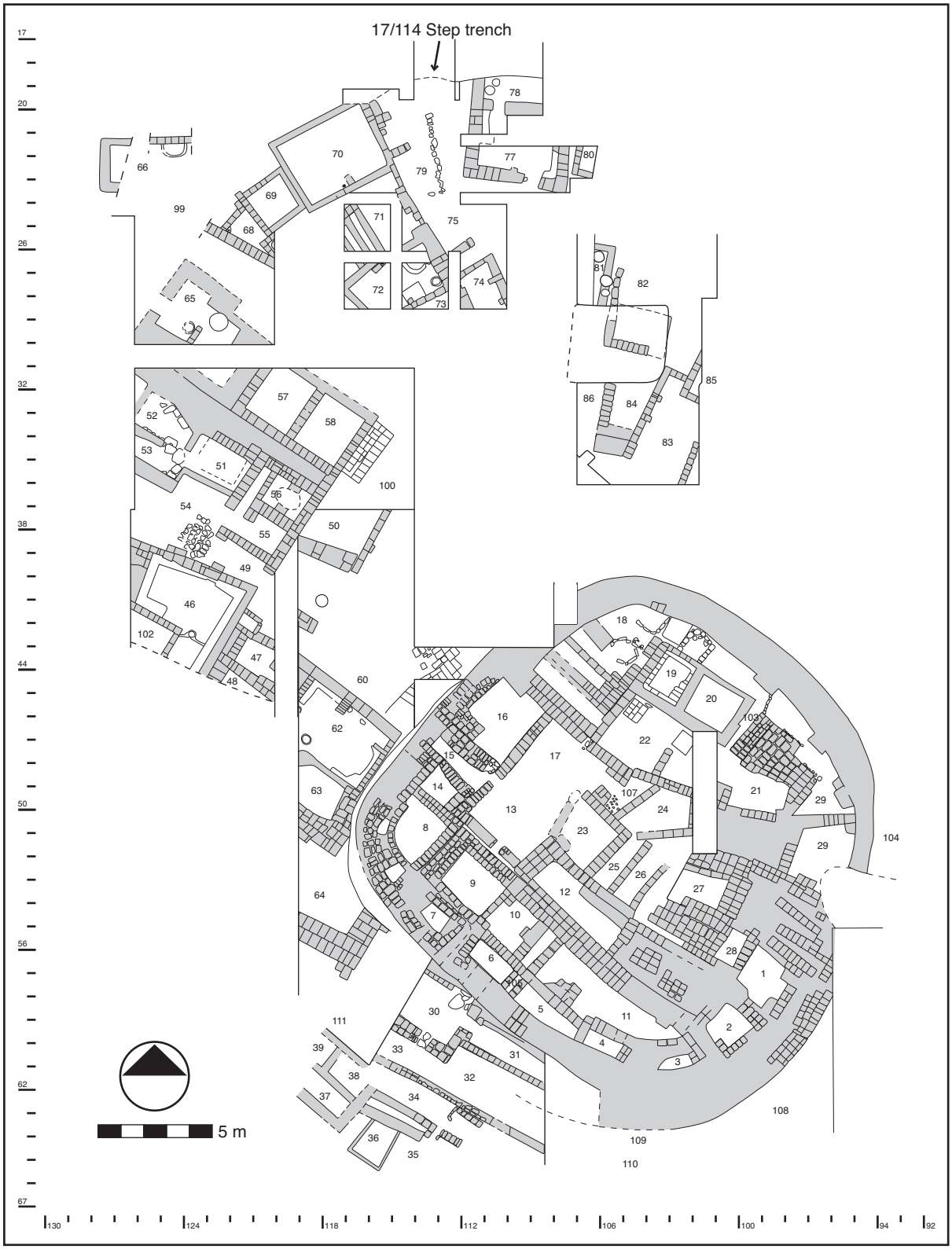


FIGURE 2.15. Level 4. *Illustration prepared by Violaine Chauvet.*

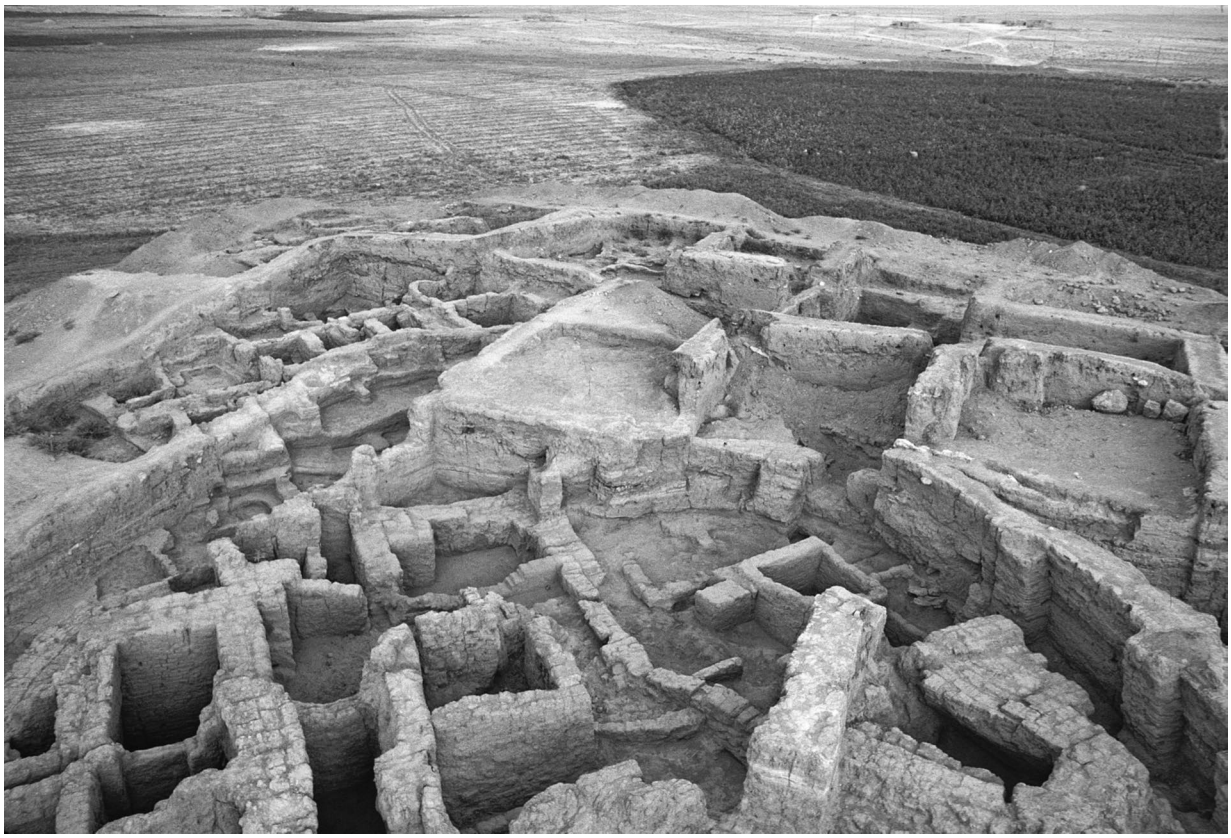


FIGURE 2.16. View of level 4 Round Building (foreground), and level 4, northwestern architecture (background, left). Looking northwest.

ceiling, although a very small chamber, might also be considered as a possible silo, given the lack of doorway access. In the southwest part of the building is another small room that might be considered a possible silo; like room 3, room 7 is doorless and has a vaulted roof. It had no evidence of lime (or any other) plastering, however. To the west, rooms 4 and 5, just inside the exterior wall of the Round Building on its south side, had no evident doors but did have windows or window-like features, recalling silo 1 as well as silos 57 and 58 outside the Round Building; it is possible that these rooms also served for storage. In the northern part of the Round Building, near a cluster of ovens, were the "twin" square silos 19 and 20, which were doorless but had no evidence of a vaulted roof, contrary to the silos elsewhere in the building. Also setting these rooms apart from other Round Building silos was a mudbrick step or small platform located outside each chamber to its south, presumably a mode of access to the silo.

Silos outside the Round Building include a set of rooms in the northwest part of the site. Areas 57 and 58 were doorless but included a window-like passage between them, and a window was also located in the northwest wall of area 57. Area 56, to their south, had a doorway and a set of steps leading down into the room, attesting to its semi-subterranean state; the room surface was well below the lowest step, also indicating a storage function. This latter feature had two pairs of facing vaulted buttresses that also indicate the presence of a vaulted roof, similar to silos excavated at ʾAtij. In a later phase of use, a mudbrick platform was constructed against the west wall of area 56, and a similar platform was found against the southeast wall of area 58. One presumes that both were used to gain access to the silos and that the doorway and steps down into area 56 were no longer in use by this time.

The identification of rooms 51–53 as silos is more tenuous than other cases in level 4, particularly given the apparent doorway allowing access between all three rooms. However, there is no exterior doorway, and the stairway to the south indicates that access to the rooms required a descent, indicating a (semi-)subterranean character. Further, room 51 contains a low mudbrick shelf along the south and east walls, recalling

the shelf of silo 19 inside the Round Building. Area 51 also had vaulted buttresses and indications of a vaulted ceiling, similarly recalling the silos inside the Round Building. In addition, rooms 51–53 contain no domestic features such as ovens or bins.

At 'Atij, facilities interpreted as grain storage silos are often lime plastered, but the Raqa'i examples in both levels 3 and 4 are usually mud plastered. Given the uniform lime plastering of Raqa'i 3 domestic architecture, the use of lime plaster as a defining criterion for grain storage units (Fortin 1990b:541) may require reconsideration (see also Pfälzner 2001).

Construction Materials and Methods

As in the other third-millennium levels, the normal building material in Raqa'i 4 was sun-dried mudbrick, usually of a reddish-brown color, with mud mortar and with a wide range of brick sizes employed. Occasional examples of stone foundations were noted (area 13/17, phase d, wall 13H, "silo" 52, wall 53B, "silo" 53, walls 53A and 53B). Stones were also found interspersed in the brickwork of wall 30A in area 30.

There appears to be little reason to think that buildings had multiple stories in level 4. No stairway to an upper floor was recognized, and walls were usually of a minimal width, ca. 25–50 centimeters, unlikely to function effectively as a second floor support (Kramer 1982:99). Generally, the walls were constructed of a single row of mudbricks. The obvious exception is the Round Building, with a thick outer wall, but the interior spaces inside the building generally have relatively thin walls.

The use of interior buttresses is attested in diverse parts of the excavated architecture outside the Round Building, usually composed of a stack of single mudbricks, while the Round Building itself contained substantial interior buttresses against its enclosure wall in the northeast (see also one interior buttress on wall 10A, area 10). Two arched interior buttresses were preserved in "silo" 51 along the northeast wall, and two pairs were in silo 56. Area 77 probably had two perpendicular pairs of facing interior buttresses, at least one of which was vaulted, while area 62 had two buttresses observable on perpendicular walls and area 74 had two interior buttresses on the same wall.

Pfälzner (2001:120–121) has proposed that interior buttresses in small-scale architecture from this period and region were generally arched and supported a flat roof. Certainly there is evidence that at least some of the buttresses were arched (cf. area 77), although the interior buttresses in domestic contexts are usually not preserved high enough to determine if they were. The presence of only one interior buttress in some rooms suggests that in such cases, if not many others, they were used to stabilize the walls rather than support the roof (see also Kolinski 2000:37). Lone interior buttresses include examples in area 10 inside the Round Building (on wall 10A added to the space in phase b), in areas 70, 72, phase b, to the north, and areas 112 and 113, phase a, in the west central zone. Examples of single walls with two buttresses and no counterparts on an opposite wall were found in areas 51 (with slightly arching buttresses), 74, and 83 (the latter example could be understood as exterior buttresses to area 84 as well).

In the Round Building, buttresses in silos 1 and 2 in the Round Raqa'i Building supported a vaulted roof: silo 1 in the Round Building contained two buttresses in its two eastern corners, one of which was arched and the other (1E) was not; silo 2 also had a buttress in each of its eastern corners. It should be noted that these were in room corners, not in the middle of walls, as is common in the domestic architecture at Raqa'i. Likewise the two arched buttresses in silo 51 in the northwest area were in the room corners. A corbel-vaulted buttress was found in room 11 in the Round Building next to the doorway, but it had no mate on the opposite wall.

Surfaces paved with pebbles are sometimes apparent, with at least one example each in the north, west, south, and inside the Round Building. These might be understood as denoting unroofed areas, but sometimes this is not necessarily clear.[12] Inside the Round Building, a surface partly covered by pebbles in area 29 north may suggest that this zone between the exterior wall of the building and the rooms inside it was unroofed. More enigmatic is the cobble surface area 107/area 24, phase a, as well as the layer of large cobbles in the west end of area 11, phase a. Paving with flat stone slabs was also evident in area 92 in an early phase of the Round Building.

The use of lime plaster for coating floors, benches and wall interiors is fairly common in the architecture of level 4, particularly inside the rooms of what appear to be domestic structures in the north and west (areas 46, 62, 66, 69–71, 73, 77/78) as well as rooms south of the Round Building (areas 30, 42, 97/98). Ordinarily, one would expect lime plastering to be characteristic of roofed spaces, and the identification of lime-plastered

floors and walls in the somewhat ambiguous spaces 49 and 55 in the west may imply that these were roofed spaces. Inside the Round Building, attestations of lime plaster were not so frequent: lime-plastered, interior wall surfaces were found in the small room 3 in the southeast, "silo" 2, area 13/17, phase a (walls 13A and 17A); and room 9, phase a, with evidence of wall painting. Small samples of rooms excavated in the earliest phases of the building in the south (deep soundings 42/114 East and North) also yielded evidence of lime-plastered floor surfaces. No lime plaster was detected for exterior wall faces, which were mud plastered only. Interior floor and wall surfaces tended to be composed of mud when they were not lime plastered.

Doorways were sometimes provided with stone slab thresholds, as in the "silo" 53 in the northwest and in the entry to the Round Building leading to area 6. Doorways with corbelled arches were attested with some frequency in the southern part of the Round Building, all oriented in a northeast-southwest direction, and all having been blocked with mudbricks (Figures 2.43, 2.51, 2.55, 2.57). The corbelled doorways in walls 6B (area 6) and 12C (area 12) were widened before they were blocked.

In numerous cases, the means of access between rooms or into buildings was not clear, either because access was from above or because our excavation failed to detect ancient doorways. The latter circumstance could have been the result of a mudbrick threshold being indistinguishable from the rest of its wall, due to the low preservation of the wall. In the Round Building, the means of access into areas 8, 14, 16, 22, and 25–26 is unclear and may have entailed access from above. Rooms 4 and 5 have no doors but do have windows or window-like features, also suggesting access from above. The blocking of doorways with mudbricks was a frequent practice. Windows are noted in several of the silos, both inside the Round Building and outside.

FEATURES

Ovens are found in diverse areas of level 4, usually with evidence of ash or fire darkening in association. One can distinguish between larger mudbrick ovens of rectilinear, oval, or round shapes and smaller circular clay *tannurs*. Inside the Round Building are mudbrick ovens in a cluster in area 18 in the northernmost part of the building, in addition to an example from area 17, phase b. Outside the Round Building in the west and north are a number of smaller circular clay ovens, which seem to derive from roofed contexts in most cases (areas 62, 65, 67, 72, 81, 82, and 112). No ovens were noted in the area south of the Round Building. No fireplaces of a type common in level 3 were identified in the level 4 occupation. Also in contrast to level 3, there were no examples of pits identified in the exposed remains, apart from burials.

A few examples of mud and/or brick bin features were identified in level 4 contexts, only two of which were lime plastered. These tended to be located inside domestic architecture (in areas 46 and 66, both lime-plastered examples, and in area 72, phase c) and in the zone south of the Round Building (areas 34/35, 36, 41, 42, phase b). In the area south of the Round Building, two of the bins (the example in area 36 and feature 42D in area 42, phase b) were fairly large rectangular structures with thin walls dug into earlier contexts. None of the level 4 bins had multiple segments like the lime-plastered examples of level 3 (see below); they were relatively simple rectangular enclosures, sometimes comprising three walls appended to a larger structure (e.g., 66D, 72I, 72J, 36).

Three examples of domestic architecture (rooms 46, 62, 77) had lime-plastered mudbrick benches against the room walls, which are common in the domestic architecture of level 3 (see below). Whether these features were actually used for sitting is uncertain but not unlikely; other possible functions could include "working platforms" (Pfälzner 1986–1987:293) or, as attested in the ethnographic record, storage of vessels (Sweet 1960:119) or bedding (Watson 1979:172).

AREA DESCRIPTIONS, LEVEL 4

The Round Building[13] (Figures 2.17–2.19)

The largest architectural component of the excavated level 4 sample, the Round Building was preserved as high as 4 meters, with almost the entirety of its architectural plan exposed. Since a number of rooms still had portions of vaulted ceilings preserved, we at least can assert that the first story of the building was some 3–4 meters high; the question of a possible second story is not definitively resolved. The building is not circular but rather gives the appearance of a square with rounded corners; its "diameter" ranges from ca. 20–24 meters.

In previous publications, we have discussed the problem of ascertaining whether the level 4 phase of the building was its earliest phase of construction and use (Schwartz and Curvers 1992, 1993/1994). Excava-

FIGURE 2.17. Level 4 Round Building, with routes of access in south and west. Corbel arched doorways indicated by thick dashed lines; windows indicated by thin dashed lines. *Illustration prepared by Harley King.*

tions conducted in 1992 strengthened the case against the existence of a pre-level 4 Round Building, since trenches 42/114 North and East dug below the level 4 Round Building revealed earlier architecture of a different orientation than that of the level 4 Round Building above. However, the walls of the Round Building were sometimes built directly above earlier walls (see Figure 2.1), indicating a certain degree of continuity.

In general, the Round Building exterior wall (88A) was constructed of discrete, abutting rectangular segments ca. 1–2 meters wide, with the gaps toward the outside filled in with mud and mudbrick debris and the exterior face of the wall plastered with mud. The wall was supported by three interior buttresses in the northeast (Figure 2.17), of which the easternmost (29C) consisted of two discrete but adjacent segments.

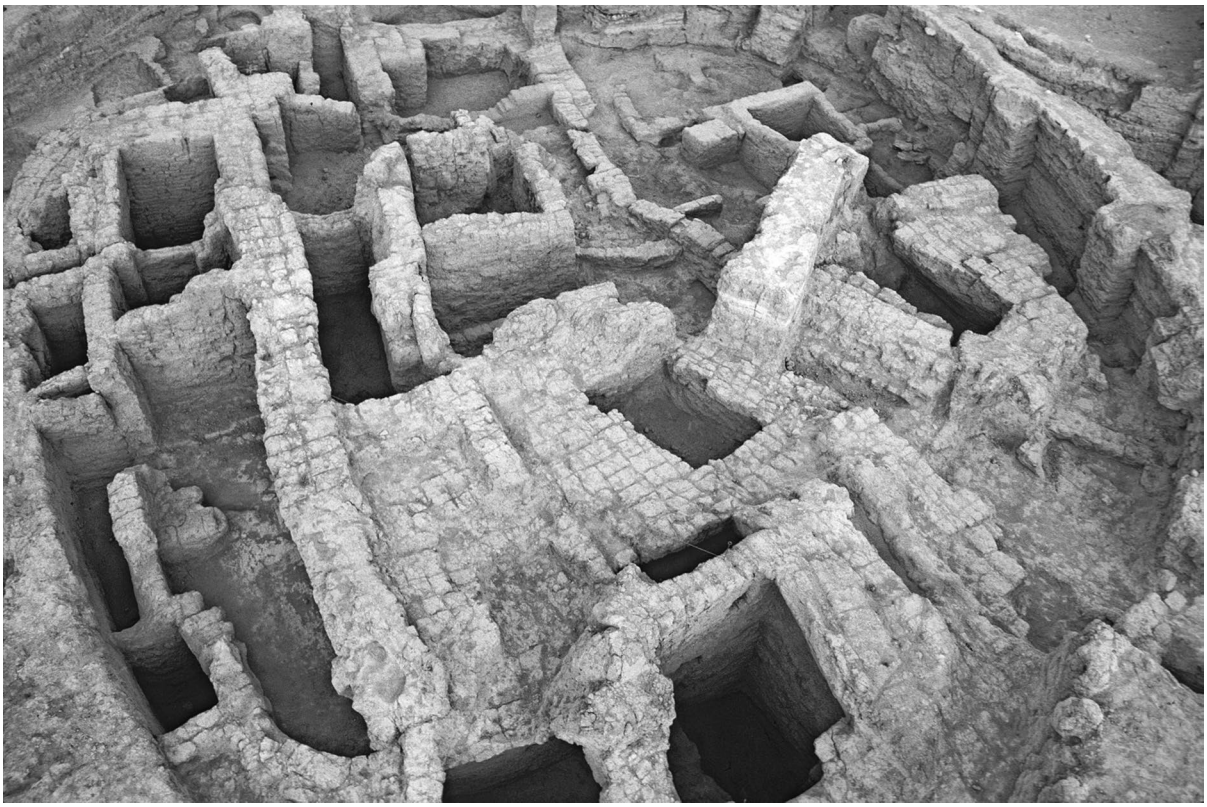


FIGURE 2.18. Level 4 Round Building. Looking northwest.

FIGURE 2.19. Level 4 Round Building, area 21, and interior buttresses 29A–C. Level 3 Round Building erected immediately above level 4. Looking north.

Exploration of the southwest corner of the Round Building enclosure wall revealed two small empty spaces inside the thick brickwork of this area (8C–D), perhaps left as small casemate features to minimize the expense of creating a thick mudbrick outer wall.

The inner face of the exterior wall often seemed to be slightly corbelled (e.g., in the vicinity of areas 7, 15, and 18). Despite this vaulted effect, it is unlikely that the outer wall had a roof of its own, given the dimensions of the building and the nature of the architecture inside. In this respect, the Raqa'i level 4 Round Building differs from the contemporaneous circular buildings of similar scale excavated in the Hamrin region of Iraq, which included concentric circular walls supporting a roof (Gibson 1986).

Because the outer wall of the Round Building in its level 3 phase was not removed during the excavations, the outer face of the level 4 construction was sometimes not clear in the north and northeast. A trench sunk in front of the level 3 Round Building outer wall in excavation unit 42/96, outside the northeast corner of the building, as well as other trenches (see section drawings Figures 2.1 and 2.20 for the northern part of building), indicated that the level 4 outer wall was narrower than its level 3 successor in much of its northern extent.

In its southern extent, the outer wall of the level 4 Round Building had two discernible phases, with the later phase entailing a widening of the wall in the south and southeast through the packing of mudbrick courses against the original structure (see Figure 2.41). When preserved, this later, wider version of the exterior wall was present just below the modern tell surface. In some locations the outer face of the later phase of the enclosure wall appeared to consist of mud-plastered brick faces that stepped out as they descended.

In some cases, the rooms of the Round Building were excavated to the lowest floors (e.g., areas 1, 3, 4, 5, 7, 9, 11, 12, 13/17, 16), but in others the earliest phases were not significantly investigated. It is clear from diverse bodies of evidence (and well illustrated by the east section of deep sounding 42/114 East; see Figure 2.1) that many modifications to the building occurred during its history. For example, the section and its associated deep sounding reveal that walls 17A/B in the north and 5A and 88A in the south remained intact throughout the building's occupation, while walls 12D/91B and 11B in the central part of the structure had two phases of construction, and two phases are also indicated for area 91/area 12, with a widening of the room suggested by the replacement of wall 91A with wall 12A, farther to the south.

These data, plus the evidence from the deep soundings 42/114 East and North (see below), suggest two major phases of construction in the western part of the building. Another major modification may be indicated when rooms in the eastern part of the building were filled in with mudbricks, creating a series of mudbrick platforms, as attested by the deep excavations in areas 95/96 (see below, southeast area).

Although Schwartz and Curvers (1993/1994:248) suggested that the Round Building was built on stepped terraces, the reassignment of level 5 and level 4 contexts made subsequent to the writing of that article negates this interpretation. A slight terracing of room 31 adjacent to the Round Building to its south is apparent, however. In general, the earliest floors and the bottoms of the earliest walls in the level 4 Round Building are at an elevation of 291.00 or slightly lower. Since the bottoms of silos 1 and 7 were observed at the same elevation, these structures were not originally constructed to be semi-subterranean but were built on the same level as the other rooms of the structure. The same is likely to be true of the silos whose bottoms were not reached.

The Round Building can be seen to have several recognizable sectors. In the east are doorless silos and brick platforms that may originally have consisted of rooms that were filled in. Two of the silos (19, 20) had no trace of a brick ceiling and may have been covered in another way, while others (e.g., 1, 2, 21) had evidence of corbel-vaulted ceilings. Two silos (1, 2) were integrated with the exterior wall of the building, and a set of additional casemate-like rooms can be observed along the southern extent of the outer wall (3–7). In the western part of the Round Building, entry room 6 with a corbel-vaulted doorway gave access to rooms with similar doorways; many of these had been filled in and their doorways blocked in a secondary phase of use. The small area 7 room in the southwest is a vaulted space akin to the silos of the eastern segment.

Given the frequency of spaces interpreted as silos for grain storage in the Round Building, one may propose that the mudbrick platforms, large ovens, and marked profusion of cooking ware sherds (see Chapter 4) in the building were functionally related with the silos. Perhaps the platforms were used for the drying of grain and the ovens for its parching, prior to storage (Ferchiou 1979:194; Hillman 1985:12; Schwartz 1994: 25). Mesopotamian texts refer to parching or roasting

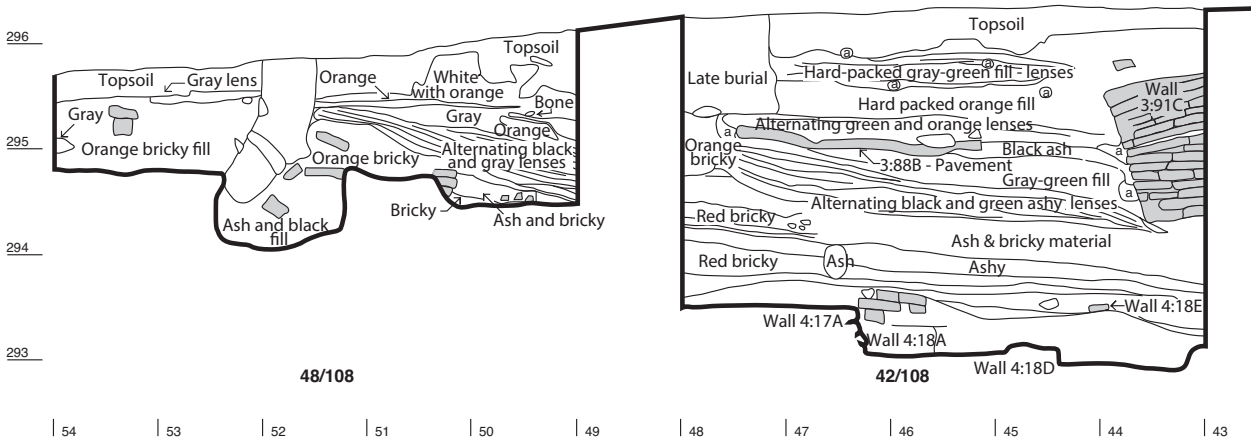


FIGURE 2.20. West balk section, 107 north-south grid line *(continued on facing page)*. Black = ash; a = animal burrow. Walls and features indicated by level and feature number (e.g., Wall 4:18A = level 4 wall 18A). *Illustration prepared by Julie Perlmutter.*

of barley, as do Classical sources (Schwartz 1994:25). Roasting is also used to produce *frikke* (Hubbard and al-Azm 1990).

The level 4 Round Building had only one obvious entryway, a doorway located in the south leading to room 6. Such restricted access to the building is also indicated by the architecture outside it, with the space taken up by long corridors without an obvious straight passageway leading to the building entrance. The doorway leading to room 6 had a corbelled arch of similar width to those found elsewhere in the western part of the building. Like those doorways, this feature was blocked with mudbricks in a later phase of the Round Building level 4 use. Its exterior face was plastered with mud after it had been blocked. The doorway had a threshold or foundation of stone boulders.

Considering patterns of access indicated by the extant doorways in the center and southwest part of the building (Figure 2.17), we can observe that after one entered the building it was necessary to proceed through room 10 to room 12 in order to reach other parts of the structure. As such, room 12 with its three corbelled doorways functions as a controlling room affording access to the southeast (through room 11) and northwest (through room 23). Room 9 is a dead end off of room 10, perhaps indicating a special function for the room that is also indicated by its doorway, whose sides were vertical and non-corbelled in contrast to other blocked doorways in the building.

The frequency of rooms without doorways (e.g., rooms 1–5, 7–8, 14, 19–21) implies that access to such rooms was provided through other means, presumably from above. Rooms 1, 4, and 5 each had a window in the wall of the room parallel to the outer wall of the Round Building, suggesting one means of access.

An important but difficult question to address is why the doorways in the western part of the Round Building, including the one entryway, were blocked. Schwartz (1994) suggested that this may have been done in order to use the rooms for additional storage. A problem with this suggestion is the blocking of the entry—how would one get into the building? Of course, it is possible that a second entry existed in the damaged part of the enclosure wall on the east (Figures 2.17, 2.34), but this cannot be confirmed. One might propose that the doors were blocked by users of the building who intended to abandon the site for some time, wanted to protect the contents left within, and never returned to the village. Such an explanation would be apt for blocking the entryway, but blocking the other doors would seem to be "overkill." Likewise, one might expect to find the objects intended to be preserved for the users' return, but there was very little in situ within the building. Admittedly, the main items to be protected may well have been foodstuffs that left no archaeological traces. Perhaps the answer involves a combination of both ideas—the interior room doorways were blocked to add storage space, while the

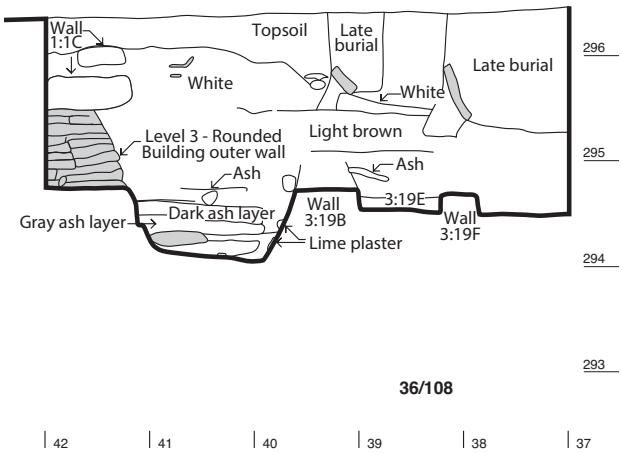


FIGURE 2.20 *(continued)*. West balk section, 107 north-south grid line.

outer door had been blocked in a period of intended temporary abandonment.

Relevant to the timing of the door blockings is evidence from area 11 in the southeastern part of the Round Building. A corbel-arched doorway in the eastern part of the room (see dashed lines on wall 11A east of buttress 11C, Figure 2.41) led to a space that had been filled in with bricks during the construction of platform 27D (see discussion of areas 95/96, below). It thus seems likely that the door was blocked when platform 27D was created. Whether we can conclude that all the doors in the building were blocked at the same time that brick platforms 27D and 29E were constructed is unknown, but it is a possibility to bear in mind.

The construction of a large circular building that dominates the landscape of a small community is not unique to Raqa'i in the ancient Syro-Mesopotamian landscape. Early-to-middle third-millennium BC, mudbrick circular structures excavated in the Hamrin region of central Iraq display a similar shape and scale to the Raqa'i 4 (and 3) Round Buildings, as well as evidence of vaulting and mudbrick platforms. However, the round structures at the best-documented examples, Tell Razuk and Tell Gubba, differ from the Raqa'i 4 and 3 buildings in their complete circularity and their two concentric circular walls. The early fourth-millennium BCE Round House of Gawra XI might also be compared (Tobler 1950), but it too is much more precisely circular and its interior structures much more regular and linear than those of the Raqa'i examples. Closer to Raqa'i is circular architecture exposed at Early Jezirah 1–2 period Kashkashok III in the upper Khabur (Suleiman 2002: figure 5). These examples show that a tradition of large round buildings existed in northern and central Mesopotamia in the fourth and third millennia BCE at small sites, but considerable variability in layout and, presumably, function can be observed.

Deep Soundings 42/114, North and East
(see Figure 2.8)

In some cases, the rooms of the Round Building were completely excavated (e.g., areas 1, 3, 4, 7, 9, 11, 13/17), but in others the earliest phases were not significantly investigated. To sample early phases that had not been documented, two deep trenches forming a right angle were excavated in 1992, an east-west trench (42/114 North) and a north-south trench (42/114 East).

Phase a: As was the case for the level 5 contexts in this trench (see above), there were two zones of architectural activity in early level 4, areas 88–90 in the north and areas 90–94 in the south. In Areas 88–90 (Figures 2.21, 2.22), room 89 with thick walls and a possible mudbrick threshold (89C) was built inside the enclosure wall of the Round Building (88A). This exposed area of this room represents a predecessor to the eastern corner of the later Area 16 (see below).

To the south in areas 91–94 (Figure 2.23) was the corner of a room (area 91) that represents an early phase of the west corner of the later area 12 (see below). South of area 91 was wall 5A and the outer wall of the Round Building (88A), both of which were retained in subsequent phases. Area 94 had a white lime-plastered floor surface, and traces of a similar gray-white surface were identified in area 92 as well.

Phase b: In areas 88–90, room 89, built inside the enclosure wall of the Round Building, was slightly modified but retained its basic plan including the northeast doorway with a mudbrick threshold one course high (89F) (Figure 2.24). A cooking pot was found outside the Round Building's exterior wall to the northwest.

To the south (Figure 2.23), room 91 had a basalt cobble packing in this phase, and wall 92A was added. A green lime plaster surface (elevation 290.82) and, above it, a stone paving were installed in area 92, and a new wall (11B) set above pebbles and sand.

Objects: area 89—clay animal figurine fragment.

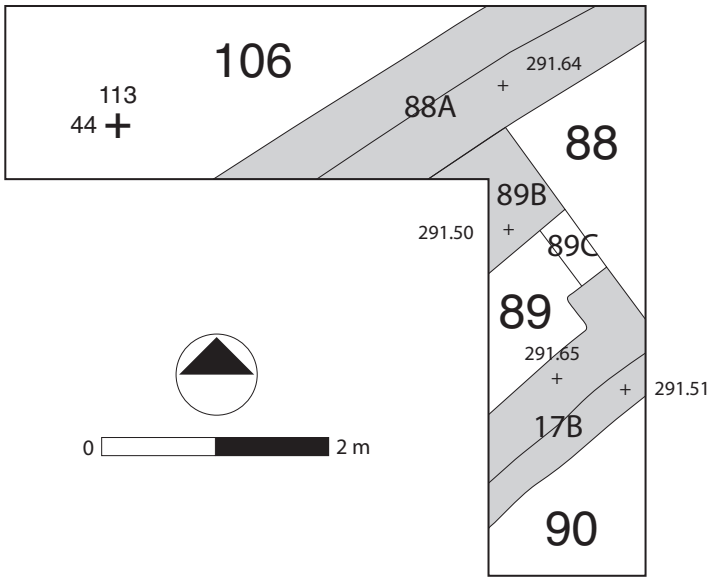


FIGURE 2.21. Level 4 Round Building, deep sounding 42/114 north and east, phase a. *Illustration prepared by Violaine Chauvet.*

FIGURE 2.22. Level 4, deep sounding 42/114 north and east, phase a, areas 88–90. Looking south.

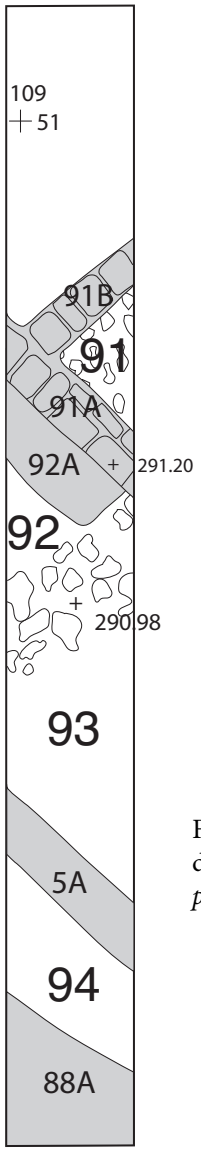


Figure 2.23. Level 4 Round Building, deep sounding 42/114 east. *Illustration prepared by Violaine Chauvet.*

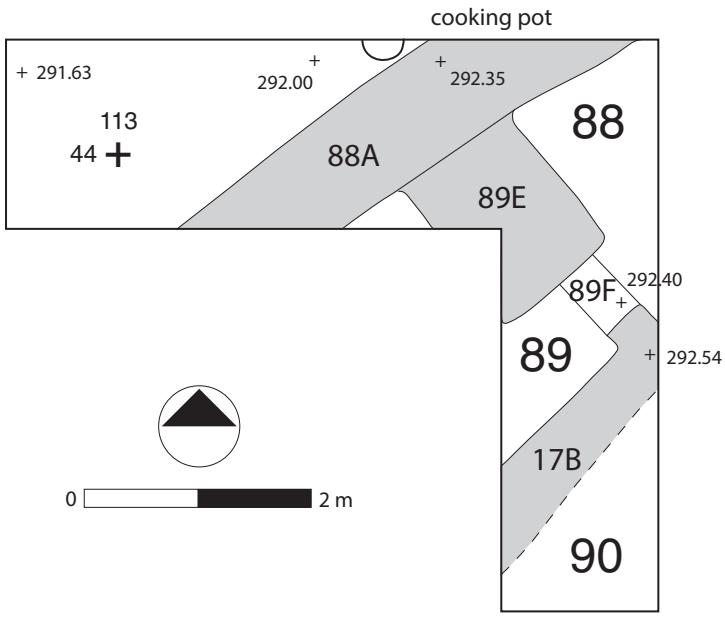


Figure 2.24. Level 4 Round Building, deep sounding 42/114 north and east, phase b. *Illustration prepared by Violaine Chauvet.*

North (Figure 2.25)

Phase a: The central features of this area are the twin silos 19 and 20 (Figure 2.26), so identified because of the absence of doors. No evidence of a corbelled vault or ceiling as in other silos of the level 4 Round Building (e.g., areas 1, 2, 21) was apparent. Preserved to a height of ca. 1.5 meters, the two structures may not have been not much higher in antiquity, given the small square mudbrick platforms to the south (22D–E, each 80 centimeters square in plan) and northwest (18K), perhaps used as access to the silos and preserved to a similar elevation. The step-like brickwork west of silo 19 (18C–H) may also represent a means of access to that structure. The brick wall or feature 18F, only partly excavated, is of unclear significance. No floors were identified or reached in areas 18 or 22 in this phase.

The interior faces of the silo 19 and 20 walls were mud plastered, with an earthen surface at the bottom of the structure. The south wall of silo 20 (20A) sloped outward as it ascended. At the bottom of silo 19, what appeared to be a brick shelf or ledge one mudbrick wide and two courses high extended out of each wall; perhaps these were the visible portions of the walls'

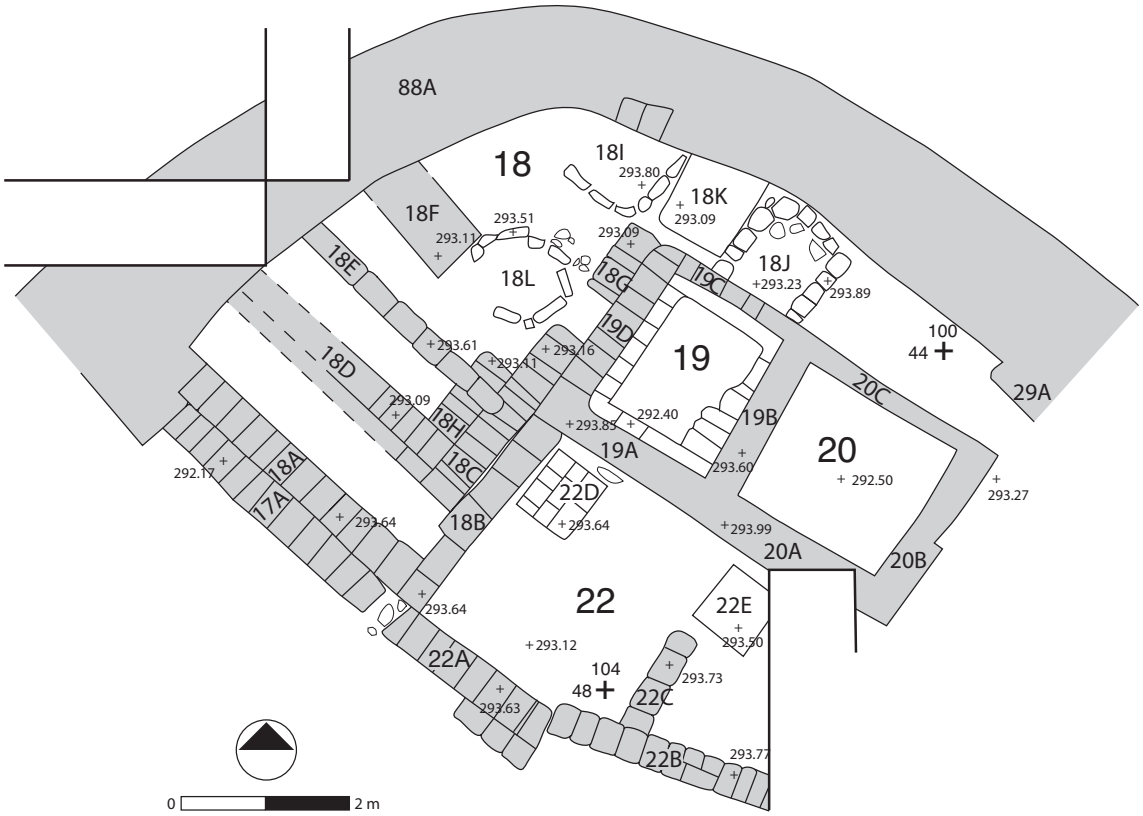


FIGURE 2.25. Level 4 Round Building, north area. *Illustration prepared by Violaine Chauvet.*

FIGURE 2.26. Level 4 Round Building, areas 19/20. Looking southwest.

foundations, wider than the superstructures above.[14] The debris inside silo 19 was ashy with bricky fragments, while that of silo 20 consisted of brown to black material with many sherds and some animal bones under ashy layers with mudbrick fragments.

Objects: area 18—clay spindle whorl, clay animal figurine fragment.

Phase b: In phase b, silos 19 and 20 remained extant, but new features were constructed to the west and north. A greenish earthen floor surface in area 18 (elevation ca. 293.24–293.48) sloping down toward the west and north covered the phase a step-like walls 18 C, D, G, and H. New walls 18A and 18B were constructed and, at a slightly later date, wall 18E was added on top of the greenish floor. Also in area 18 was an oval oven composed of upright bricks (18L), preserved only ca. 5 centimeters high (Figure 2.27). Northwest of silo 19, three mudbrick ovens were installed sequentially one on top of the other (293.41–293.80), with only a brick course or two preserved of each (18I). Another mudbrick oven was appended to the north east of silo 19 (18J), discovered full of ashy debris. The silos' proximity to these ovens in phase b might be related to the silos' ashy contents.

In area 22, an earthen surface at elevation 293.42 was installed in this phase. The small mudbrick platforms 22D and 22E still protruded above this surface, and a new wall (22C) was added against the earlier wall 22B. Earlier wall 22A also remained extant.

Objects: area 19, phases a-b—clay disk (tablet-like) fragment, bronze fragment, bone awl fragment; area 20, phases a–b—bronze fragment, bone awl, three bone awl fragments; area 22, phases a-b—clay spindle whorl.

Northeast Area (Figure 2.28)

The area 21 "silo" appeared to be embedded inside a broad platform of mudbricks extending to the north (21B–C) and south (29E). The bricks of the northern edge of silo 21 were corbel vaulted, but no unequivocal evidence of vaulting was noted elsewhere (Figure 2.29). The west wall (21D) was problematic and disturbed; in its opening were remains of a cooking pot. Because the bricks of the vault showed dangerous evidence of

Figure 2.27. Level 4 Round Building, oven 18L. Looking southeast.

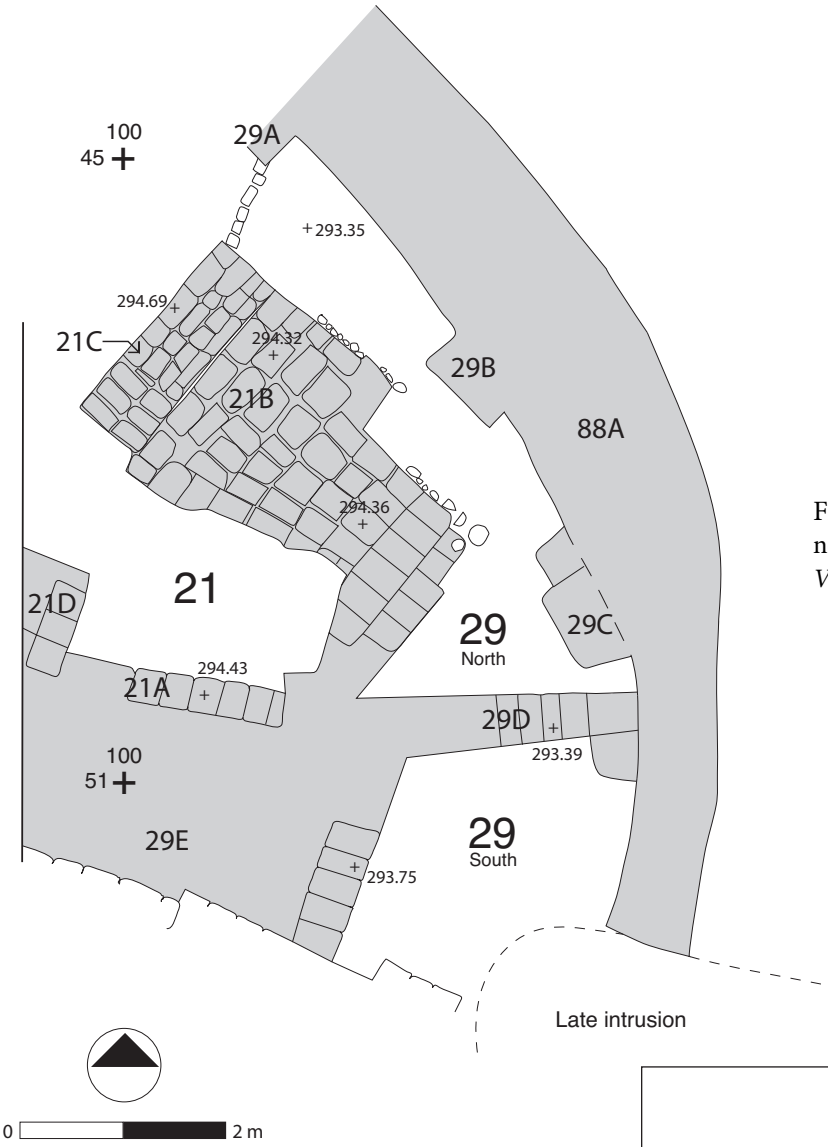


FIGURE 2.28. Level 4 Round Building, northeast area. *Illustration prepared by Violaine Chauvet.*

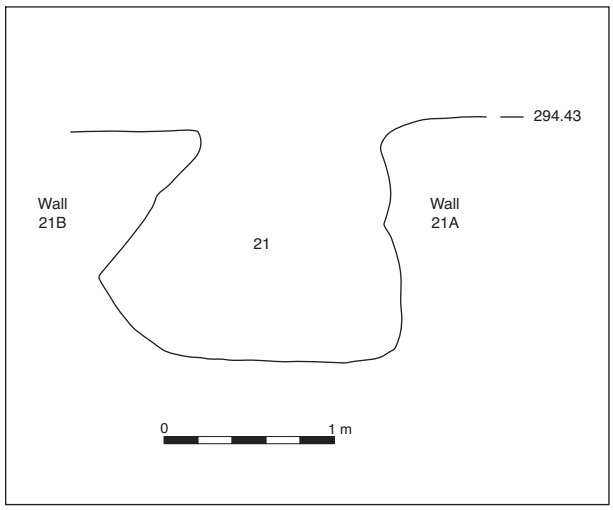


FIGURE 2.29. Level 4 Round Building, area 21, north-south section, facing east. *Illustration prepared by Violaine Chauvet.*

cracking, the room was only excavated down to ca. 1.4 meters below the preserved top of the 21B bricks; judging from silos 1 and 2, the floor was probably at a much greater depth (Figure 2.30). The northern segment of the mudbrick platform encasing silo 21 included a western segment (21C) that appeared to be discrete from the brickwork to its east (21B) (Figure 2.31).

Debris inside the silo included gray ash and abundant collapsed mudbrick. Two courses of bricks,

Figure 2.30. Level 4 Round Building, area 21, vaulted silo, incompletely excavated. Looking northwest.

Figure 2.31. Level 4 Round Building (below level 3 reconstruction), with area 21 in foreground. Looking northeast.

presumably collapsed from the southern side of the structure (21A) were found as if stacked together on their edges against the northern vault of the room, parallel to the slope of the vault.

Outside silo 21 in area 29 north was a gray surface partly covered by pebbles and sloping down to the east. Stone cobbles were found against the outer wall of the area 21 construction and were also positioned against the inner face of the exterior wall of the Round Building (wall 88A), its interior buttress 29C, and between 29C and buttress 29B. Debris above the gray surface included numerous white, gray, and black ash lenses with occasional mudbrick debris.

Objects: area 21—3 clay unimpressed sealing fragments, quartz bead; area 29—clay animal figurine (?) fragment, bone awl, worked sheep/goat metatarsal, pestle type B, clay model wheel, clay model wheel fragment.

Southeast (Figures 2.32, 2.33)

The southeast part of the level 4 Round Building consisted of vaulted structures ("silos") adjacent to solid mudbrick masses or platforms. Excavations below mudbrick platform 29E (Figure 2.34) revealed that the construction of this platform involved the filling in of two rooms (areas 95/96) with mudbricks. It is possible, then, that platform 27D was also a later construction entailing the filling in of previously extant rooms. Floor surfaces were not reached in areas 95/96. East of area 29, south, the outer wall of the Round Building (88A), destroyed at higher elevations by a late pit, was visible in these deeper excavations.

Area 1 (Figures 2.35, 2.36): Area 1 is a "silo" with a vaulted corbelled ceiling. The interior wall faces of the room were mud-plastered, and a squarish window (31–36 × 31–39 centimeters) was located in the northwest wall (1C) just under the ceiling (Figure

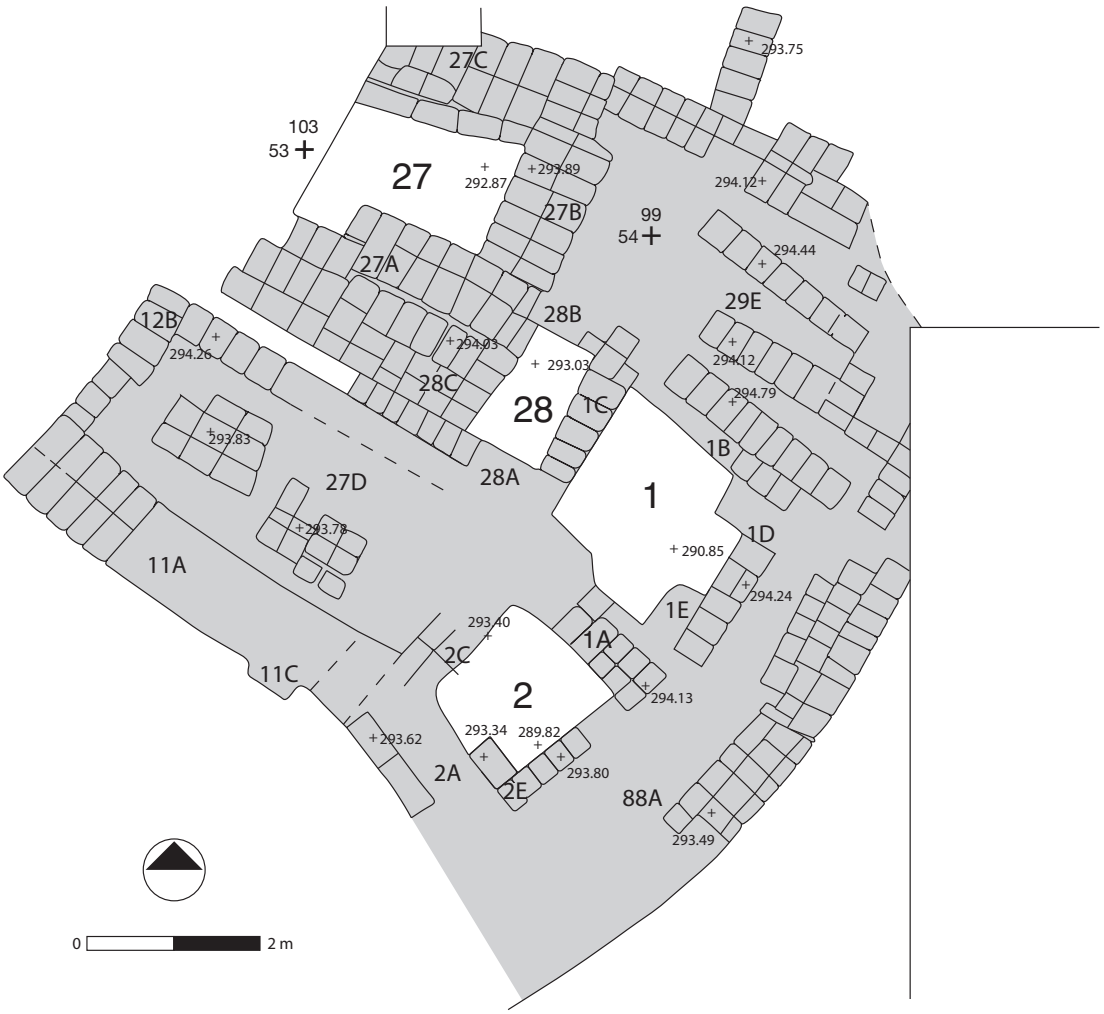


FIGURE 2.32. Level 4 Round Building, southeast area. *Illustration prepared by Violaine Chauvet.*

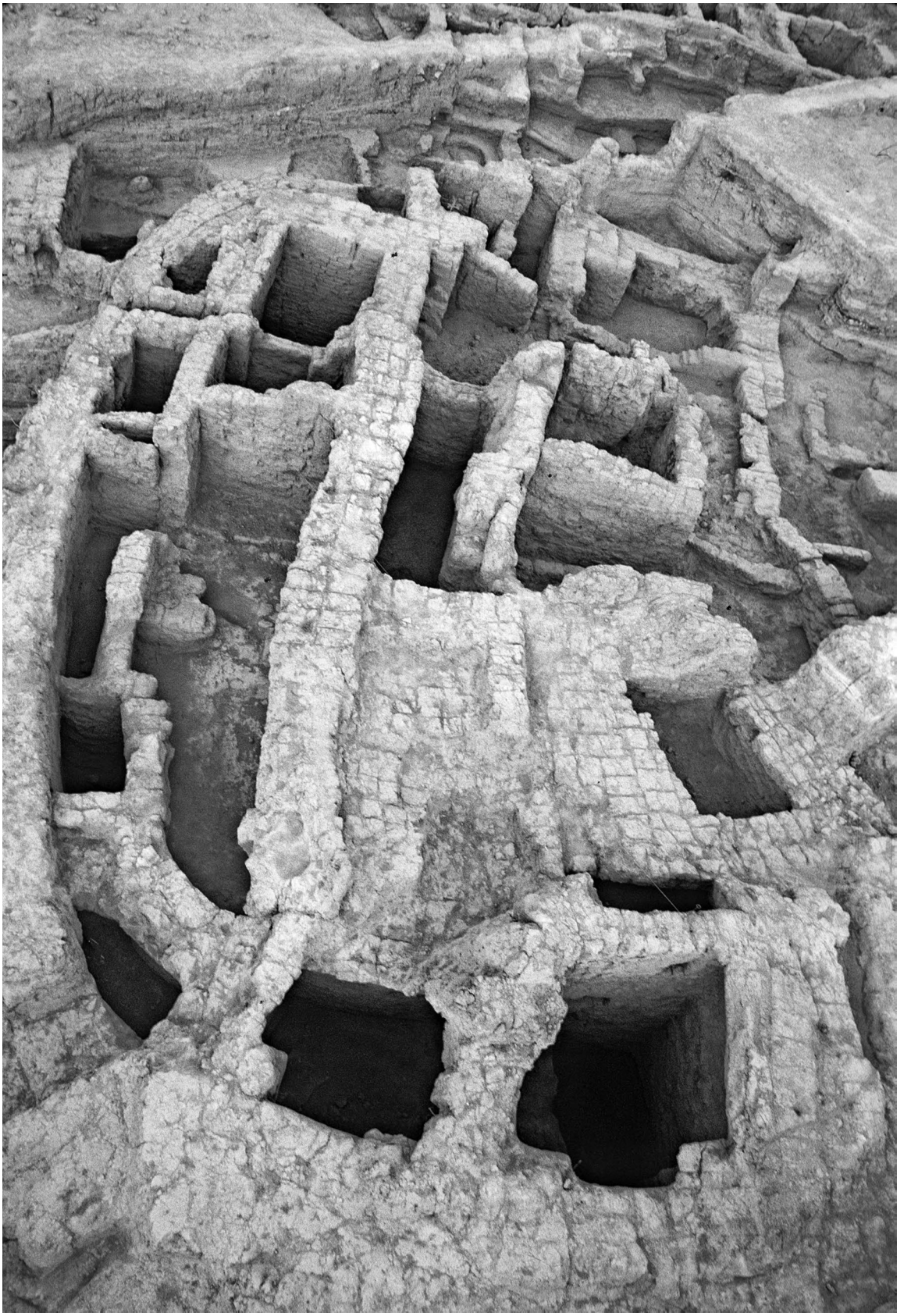


Figure 2.33. Level 4 Round Building, south and southeastern areas. Looking northwest.

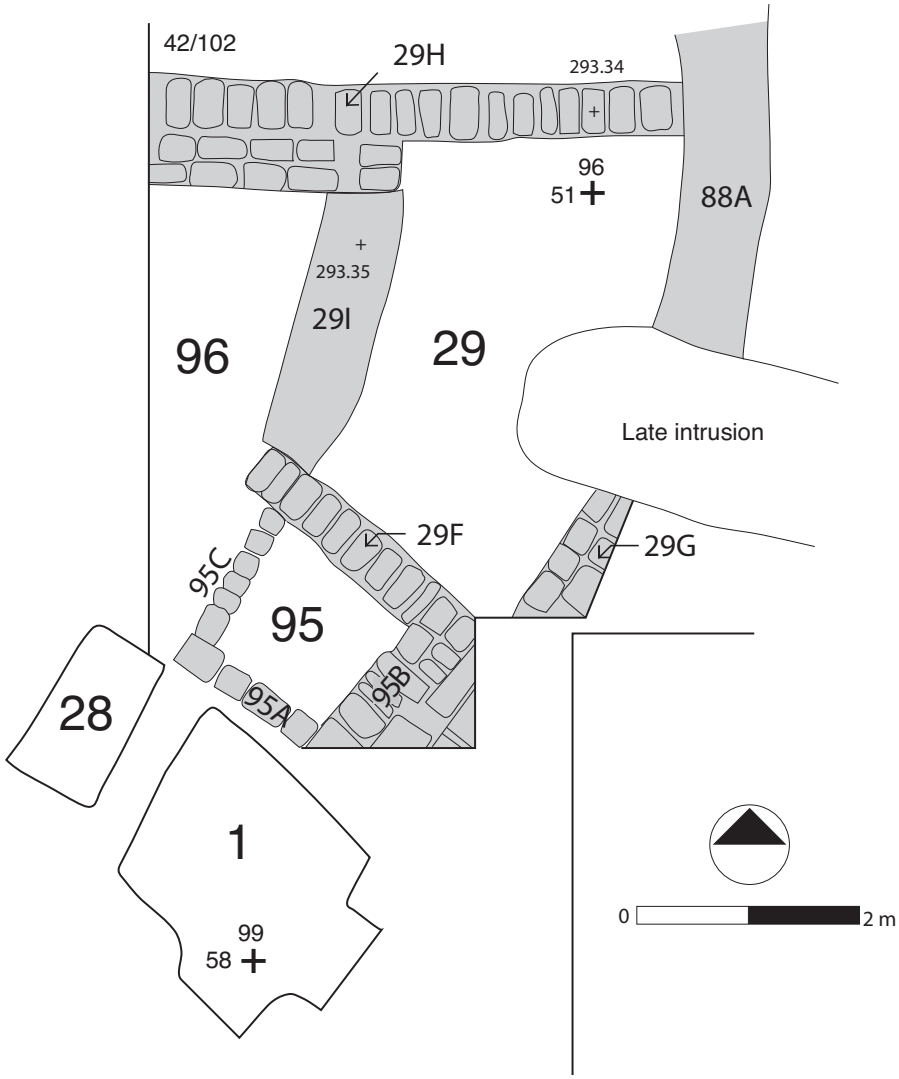


FIGURE 2.34. Level 4 Round Building, southeast, area below mudbrick platform 29E.
Illustration prepared by Violaine Chauvet.

2.37). Associated with the northeast wall (1B) was a corbeled vaulted ceiling, and a buttress (1D) consisting of a stack of single mudbricks (32 × 32 × 8 centimeters) was situated in the northeast corner of the room and extended up in a vault of 10 bricks supporting the ceiling, parallel to the 1B vault (Figure 2.38). The southwest wall of the room (1A) also had remains of a vaulted ceiling in its northwestern portion, with a buttress (1E) comprised of a stack of single mudbricks (45 × 30 × 8 centimeters) in the southeast corner of the room. The higher segments of this buttress were damaged by later intrusive activity, but apparently the buttress was not vaulted like its northeastern counterpart. Neither the northwest wall of the room (1C) nor the southeast wall had corbeled vaults in evidence, indicating that the room had a barrel-shaped vault extending from northeast to southwest rather than a circular or beehive dome.

Debris found in the silo consisted of ashy material mixed with collapsed mudbricks and brick debris; found in it, apart from the objects listed below, were four sherds of a failed kiln product, basalt cobbles, and some animal bone at the bottom of the silo deposited adjacent to the walls. The significance of the ca. 300 stone or hard clay balls found in the debris is uncertain. No clear floor or surface was recognized either in excavation or in examination of the profile of a block of debris left unexcavated in the southwest half of the room, although the bottoms of the room walls had clearly been reached.

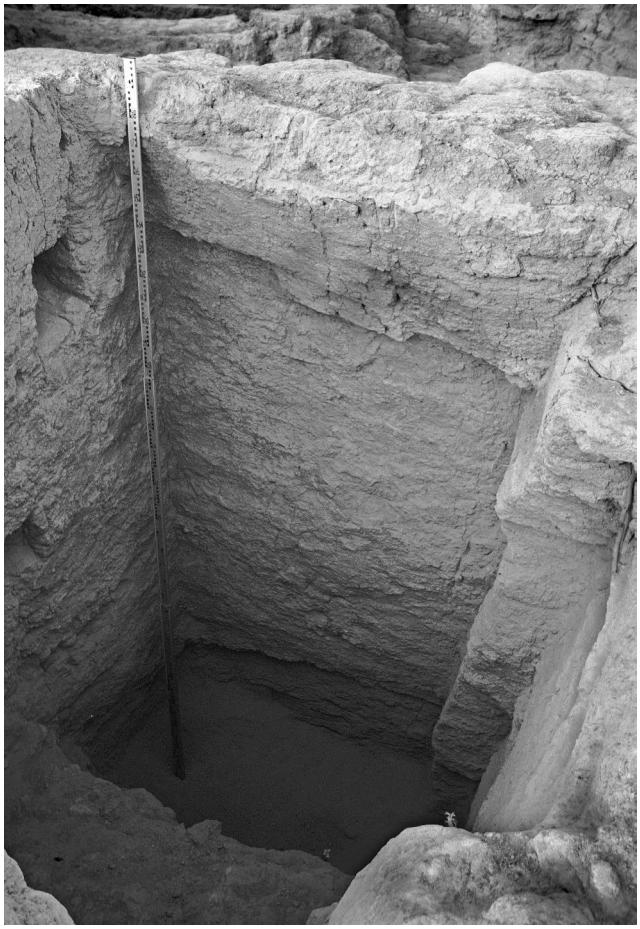


FIGURE 2.35. Level 4 Round Building, silo 1. Looking north.

FIGURE 2.36. Level 4 Round Building, silo 1. Vaulted buttress 1D (left), buttress 1E on right. Looking southeast.

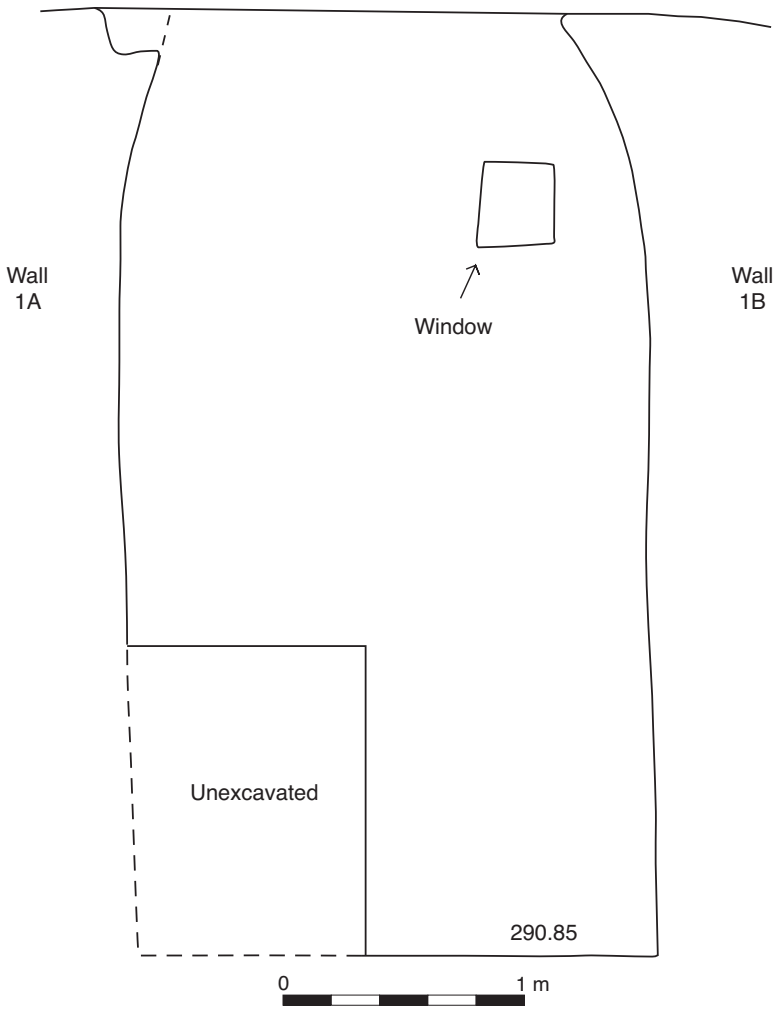


Figure 2.37. Level 4 Round Building, area 1, northwest wall (1C), elevation. *Illustration prepared by Harley King.*

Objects: 6 animal figurine fragments, white stone bowl segment, 2 incised gypsum (?) pieces, gypsum (?) lid or sealing fragment, ca. 300 stone or hard clay balls 3.5–15 centimeters in diameter.

Area 2 (Figure 2.39): Another vaulted silo, this room was not fully excavated, and the bottom of the walls was not reached, although they were probably not much deeper than the limit of excavation, given the elevations of other excavated rooms. The northeast wall (1A) displayed evidence of a corbel-vaulted ceiling, and a buttress against the eastern corner of the room (2D, hidden by the vault in Figure 2.32) consisted of a stack of single mudbricks (33 × 33 × 8 centimeters). Buttress 2D was only preserved below the vault of the ceiling, so it is not clear whether it originally supported the vaulted ceiling or not. The southwest (2A) and northwest (2C) walls also showed the beginnings of a vaulted ceiling at their tops; a buttress in the south corner of the room was composed of a stack of single mudbricks (45 × 28 × 8 centimeters). The southeast wall of the room was the only wall without signs of a ceiling vault. The vaulted ceiling of area 2 was slightly lower than that of its neighbor, area 1 (note elevations on Figure 2.32).

In general, the interior wall faces of the room had evidence of mud plastering, but, in a surprising discovery, on the southeast wall of the room at the relatively low elevation of 290.08–290.32 we discerned a patch of white lime plaster, applied in at least four layers, with traces of what appeared to be black paint applied to the latest of the four layers, reminiscent of the situation in room 9 (see above).

Objects: clay lid (?) fragment.

Area 27: Adjoined by mudbrick platforms to its north, south, and east, area 27 was excavated down to

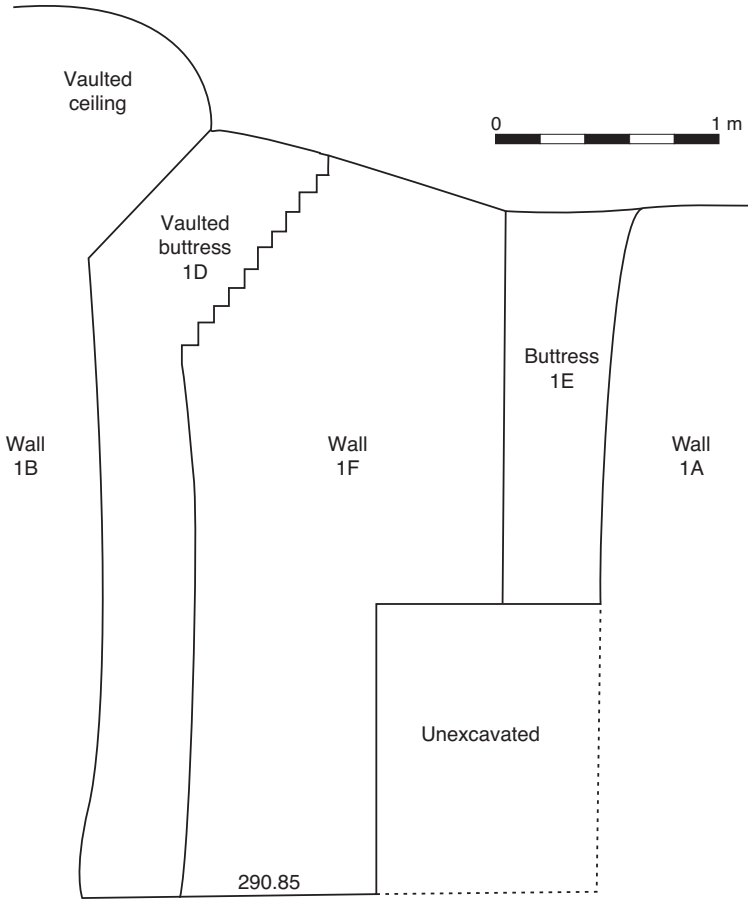


Figure 2.38. Level 4 Round Building, area 1, southeast wall, elevation.
Illustration prepared by Harley King.

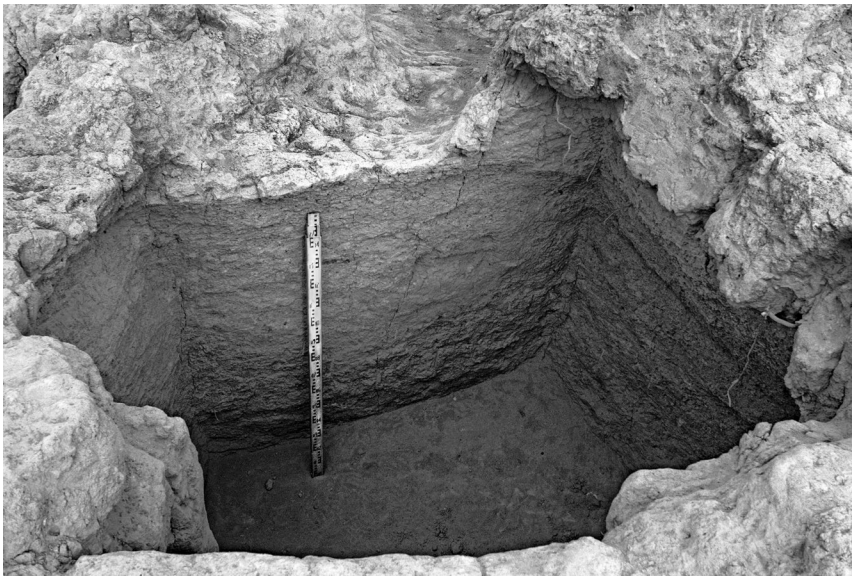


FIGURE 2.39. Level 4 Round Building, silo 2. Looking northwest.

an earthen floor surface at elevation 292.87. The north (27C) and south (27A), and, less certainly, east (27B) walls of the room, which were thickly mud plastered (3 centimeters), appeared to have the beginnings of corbelled vaults (Figure 2.40 shows the tops (dashed lines) and bottom limits of excavation indicating the vaulting in areas 27 and 28). In the southwest corner was a niche, and a gap in the brickwork in the southeast corner may represent a window or doorway leading to area 28 (see area 28 below). A stack of mudbricks three courses high and three to four bricks long was found in the northwest corner of the room above the floor, perhaps part of an intentional filling-in of the room.

Objects: basalt grinding stone type A, gray stone bead, stone spindle whorl.

Area 28: Area 28 is a small rectangular room whose north and west walls (28B–C) were corbel-vaulted (see Figure 2.40). A window in the eastern wall (1C) looked into silo 1, and a door or window in the northwest corner of the room apparently connected to the southeast corner of area 27. Fill in the room consisted of soft dark gray ashy material with a large amount of animal bones and sherds, including two small four-lugged jars. To the south and west was the brick platform 27D.

Complete vessels/profiles: Medium Simple Ware four-lugged, round-base jar (Figures 4.21:15); Fine Simple Ware four-lugged, pointed-base jar, missing rim (Figure 4.20:18).

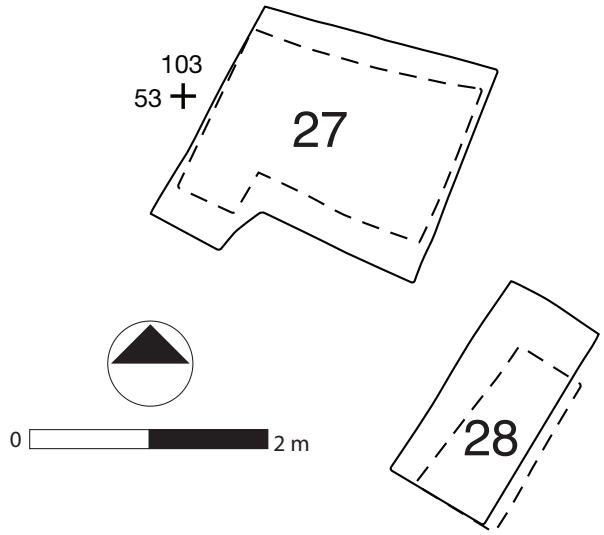


FIGURE 2.40. Level 4 Round Building, areas 27–28. Dashed lines = preserved top of room, solid lines = bottom of room at limit of excavation. *Illustration prepared by Violaine Chauvet.*

South (Figures 2.33, 2.41)

Area 3: A small doorless room ("silo"?), area 3 is in the southeast corner of the Round Building. The curvilinear north wall of the room (3B) had evidence of a corbelled vault and a coating of white lime plaster. The inner face of the south wall (=the exterior wall of the Round Building, 88A) also had evidence of lime plaster. The lowest debris in this room had a profusion of very small pebbles in it, deposited above an earthen floor surface at elevation 291.48.

Objects: clay animal figurine fragment, bronze bead.

Area 4: This area is a small room against the outer wall of the Round Building. A small rectangular window was at a low elevation (291.37–291.87) in the north wall (4A) near the northeastern corner of the room, 34–38 centimeters wide and 50 centimeters high (Figure 2.42; see dashed lines indicated on wall 4A on Figure 2.41). Inside the room was ashy debris that included pebbles, cobbles, boulders, and abundant sherds including large vessel fragments. A possible earthen floor was noted below this debris at ca. 291.30, under which was brown bricky material. The bottoms of the room walls were identified at ca. 291.00.

Objects: quartz bead.

Area 5: A long narrow room against the outer wall of the building, area 5 had what appeared to be a long window in the western part of its northeast wall 5A measuring 36 centimeters high and 103 centimeters long (its western edge is indicated as a dashed line on wall 5A on Figure 2.41), with its top at elevation 292.39. Below the level of the window was an earthen surface (elevation not recorded), with ashy and bricky debris underneath. In deep sounding 42/114 East (see above), a lime plaster surface was exposed at the same elevation as the bottoms of the room walls (290.90). Wall 5B abutted the walls to the north (5A) and south (88A); the small space between 5B and 6A had an accumulation of ashy debris.

Area 105: Area 105 is the small and narrow space between areas 5 and 6 (see Figure 2.15).

Objects: basalt pestle type B.

Area 6: The small entry room into the Round Building, area 6 had corbeled arched doorways in its

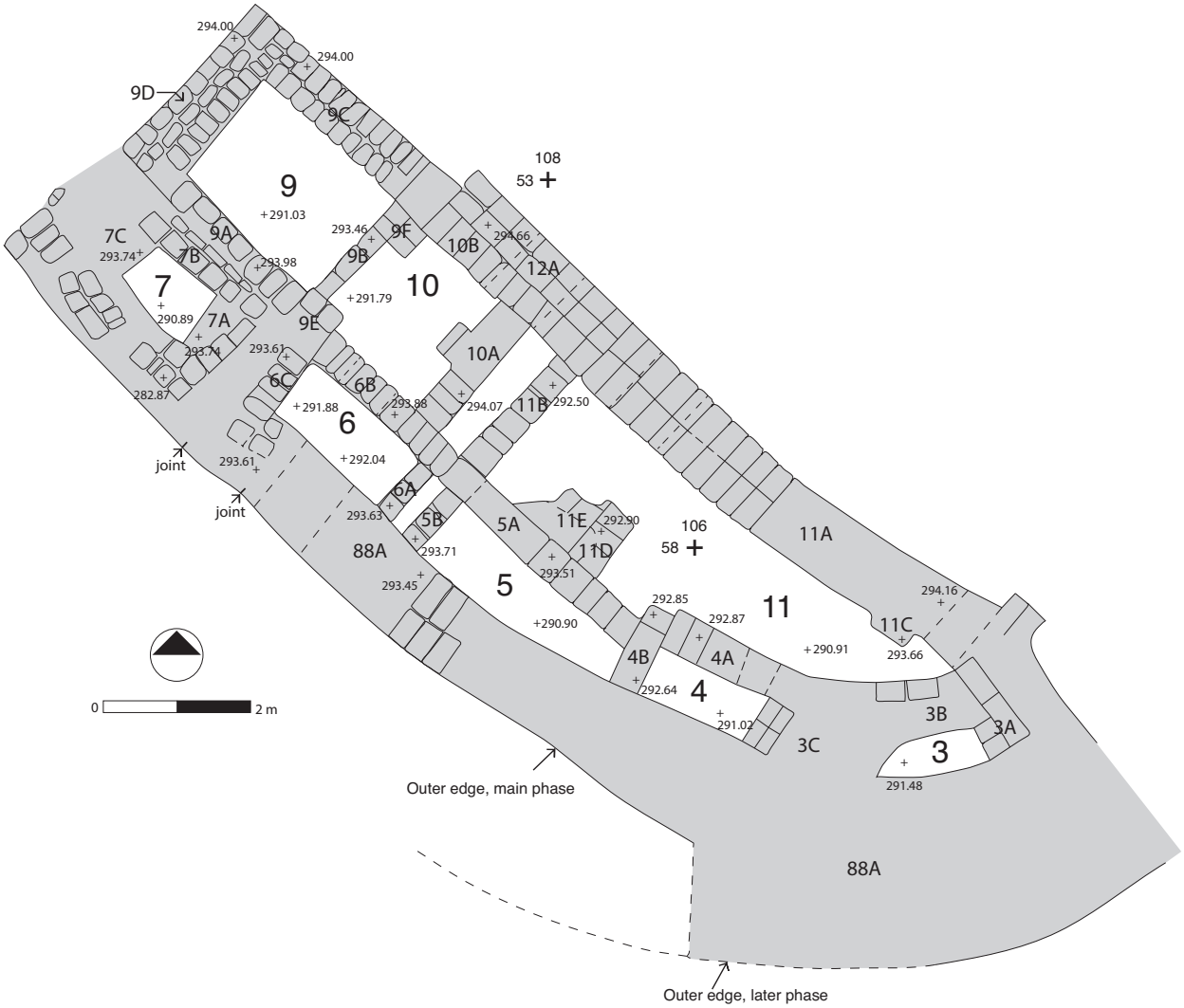


FIGURE 2.41. Level 4 Round Building, south area. *Illustration prepared by Violaine Chauvet.*

southwest (88A) and northeast (6B) walls (Figure 2.43). The room and its southwest wall, part of the outer wall of the Round Building (88A), were much disturbed by later intrusions, including a (level 3?) pit grave (burial 19). A modern gully cut through northwest wall 6C. Northwest wall 6C abutted wall 6B, and southeast wall 6A abutted walls 88A and 6B.

At the limit of excavation was an earthen floor surface. At a point probably contemporary with areas 9/10, phase b, both doorways in area 6 were blocked with mudbricks, and the doorway in the outer face of exterior wall of the building (88A) was completely plastered over with mud. The door in wall 6B appears to have been widened shortly before it was blocked, as had also been the case with the north door of area 12.

In the uppermost debris of the room (ca. elevation 293.71), a fragment of a greenish-white lime plaster surface was noted adjacent to the northeast wall (6B), perhaps the remnant of a late floor otherwise destroyed by the intrusive burial 19 and other disturbances.

Objects: potsherd disk.

Complete vessels/profiles: Medium Simple Ware round-base, carinated evert neck jar (Figure 4.19:27) (Note: It is possible that this vessel derived from the intrusive level 3 burial 19 found nearby.)

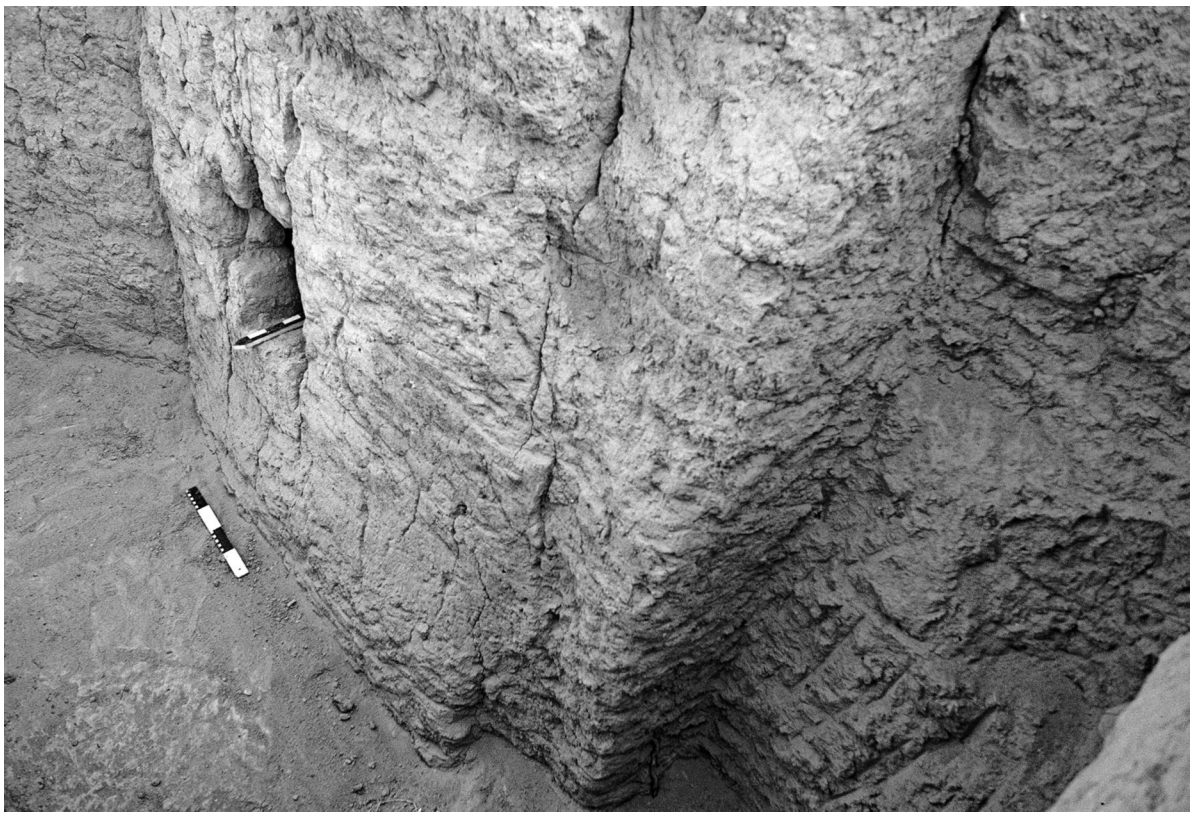


FIGURE 2.42. Level 4 Round Building, area 11, with window into area 4. Looking southeast.

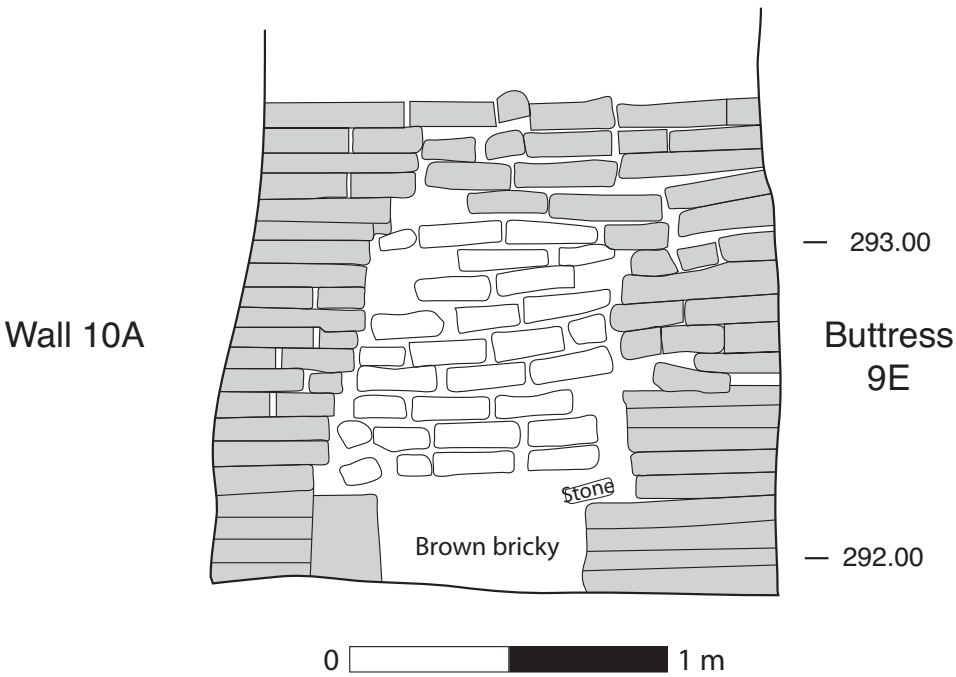


FIGURE 2.43. Level 4 Round Building, area 10, southwest wall (6B), elevation.
Illustration prepared by Violaine Chauvet.

Area 7 (Figures 2.44, 2.45): A small room without doors, area 7 is in the southwest corner of the Round Building. Although its lack of doors and its vaulted ceiling suggest another "silo," the room's small size, eccentric shape, and distance from the other silos in the eastern part of the building should be noted. The northeast wall of the room (7B, discrete from adjacent wall 9A), of which 31 courses were preserved, was largely bereft of mud plaster; it had a corbeled vault of nine brick courses that extended above niches located in the east and northwest corners of the room and met the topmost bricks of the southeast (7A) and northwest (7C) walls (Figure 2.46 shows the outline of the room at its bottom, under the vaulted veiling; Figure 2.47 provides a section of the vaulted northwest wall or "buttress" 7C). The northwest wall of the northwest niche, part of wall 7C, was also vaulted. The inner faces of the room walls had traces of mud plaster, but very little plaster was evident on the northeast wall 7B. In this area, the top of the outer wall of the Round Building (88A) was disturbed by a modern gully.

Excavations in area 7, conducted until the bottoms of the room walls were reached, had difficulty identifying a floor, with the possible exception of a red and yellow possible surface with lime flecks noted at elevation 291.64. Pieces of unimpressed sealing clay were found in the debris above and below this putative surface, along with small bits of charcoal (often adhering to the bricks of wall 7B and its vault) and numerous sherds.

Objects: 2 clay unimpressed sealings, 1 clay sealing with possible seal impression, clay disk (tablet-like) fragment, potsherd disk, 2 clay animal figurines, 3 bone awls, basalt pestle type B, clay model wheel.

Areas 9/10 (Figures 2.48–2.50): These areas comprise a two-room unit in the southwest part of the Round Building with a wide doorway separating the rooms. Doorways with corbelled arches were located in the northeast (10B) and southwest (6B) walls of area

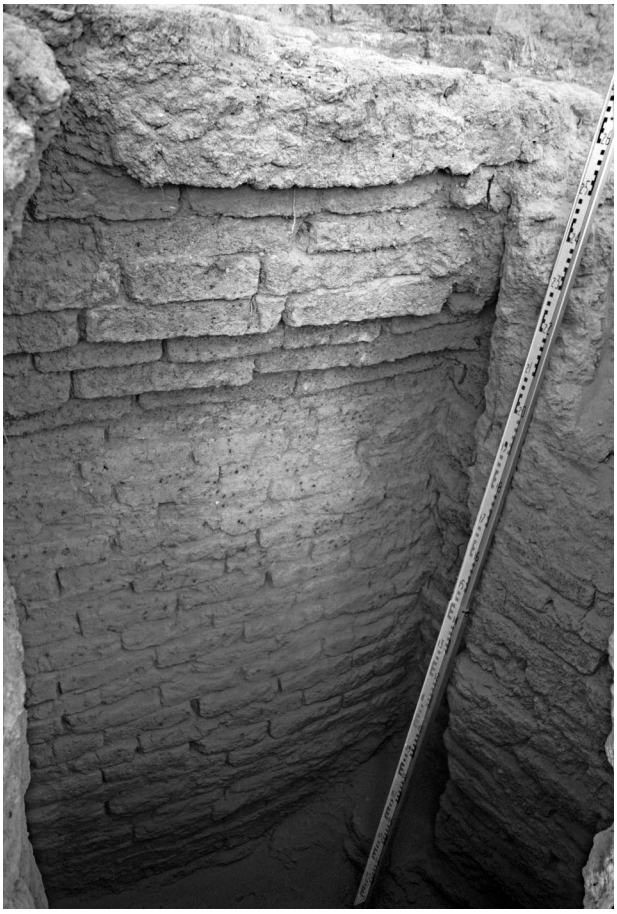


Figure 2.44. Level 4 Round Building, area 7. Looking northeast.

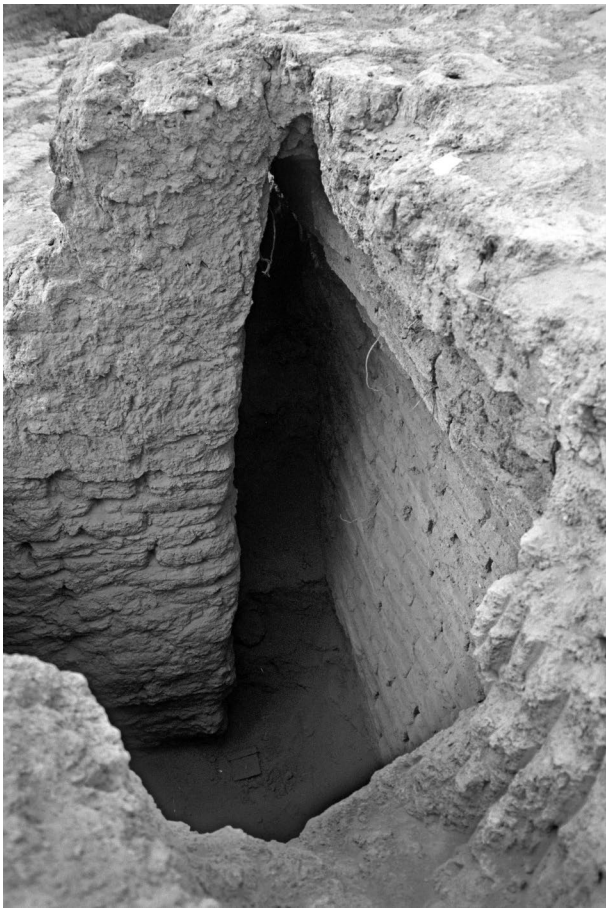
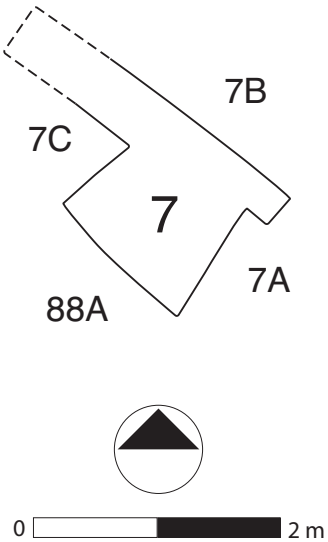
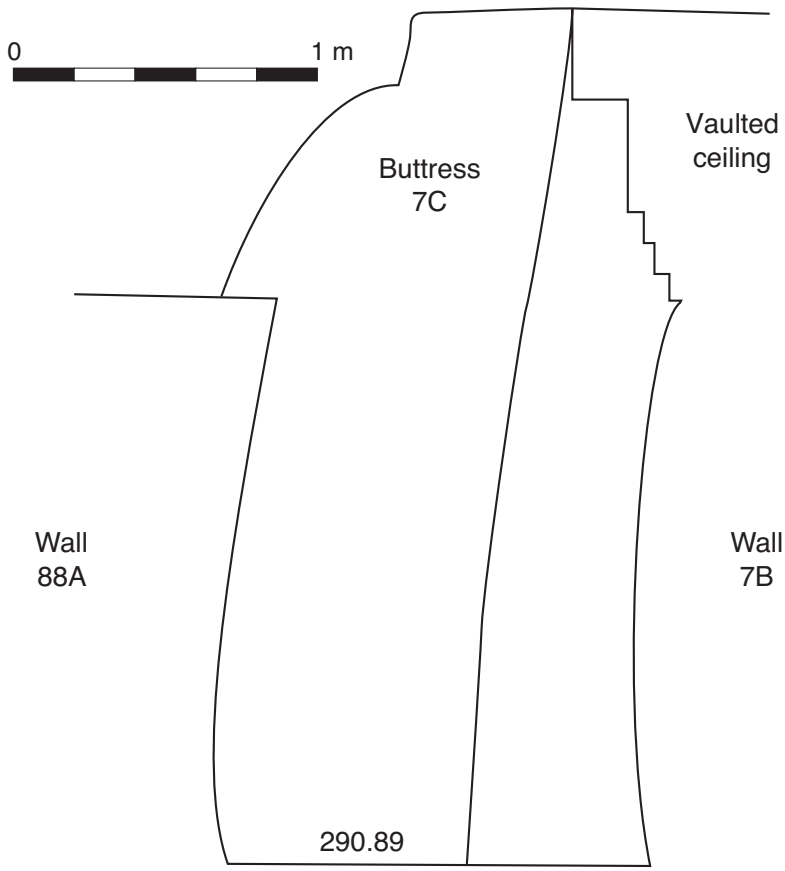


Figure 2.45. Level 4 Round Building, area 7, looking northwest. Buttress 7C to left.





(Above): FIGURE 2.46. Level 4 Round Building, area 7, outline of room at its bottom. *Illustration prepared by Violaine Chauvet.*

(Right): FIGURE 2.47. Level 4 Round Building, area 7, vaulted northwest wall or buttress (7C), section from southeast. *Illustration prepared by Harley King.*

10. The doorway separating areas 9 and 10 had no evidence of an arch, however; the bricks of the two door jambs 9E and 9F made a vertical straight line as high as they were preserved.

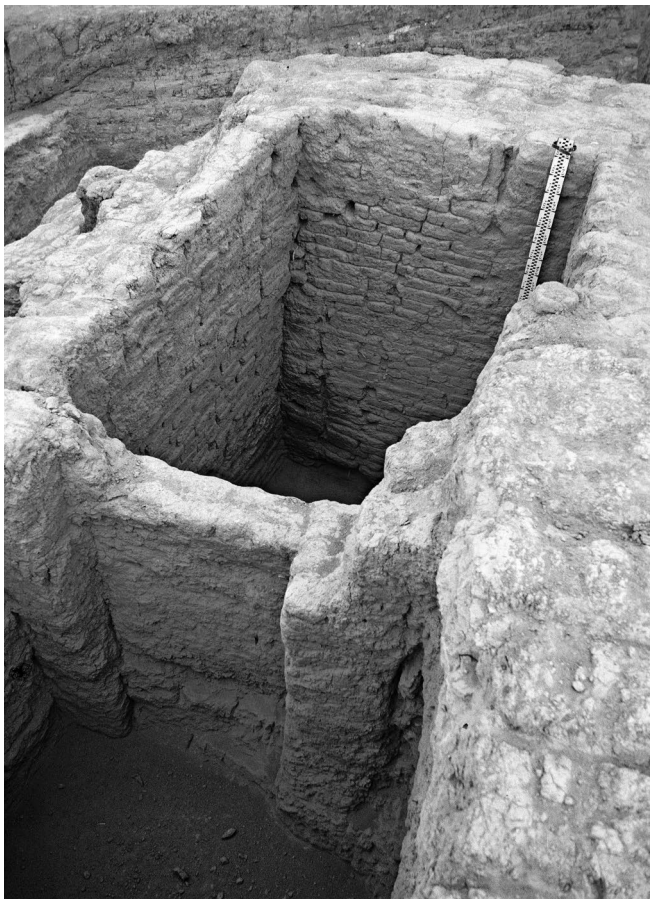
Areas 9/10, phase a: In phase a, area 10 was separated from area 11 by wall 11B; wall 10A had yet to be built. Area 9 had a brown earth surface that had been covered with ashy debris with abundant mudbrick collapse and occasional pieces of unimpressed clay sealings. A burned area with many tannur fragments but no extant oven was located in the western corner of the room.

Tiny fragments of white lime plaster found on the southwest and northeast walls of area 9 (9A, 9C) suggest that the room walls were originally lime plastered, and indications are that at least one wall of area 9 had a painted mural in phase a (see discussion in phase b below). Dunham (1993) at first suggested that this room was used for ceremonial or cultic purposes, given the presence of the mural, the room's position near the Round Building entryway, and the buttress-like door jambs separating areas 9 and 10 that resemble the cella and ante-cella of third-millennium religious architecture; however, in her discussion below (Chapter 5), Dunham proposes that the room was more of an "office" for personnel managing the affairs of the Round Building, given the sealings found.

Area 10 was not excavated to its bottom, but a gray earthen surface was identified at an elevation of 291.79 inside this room.

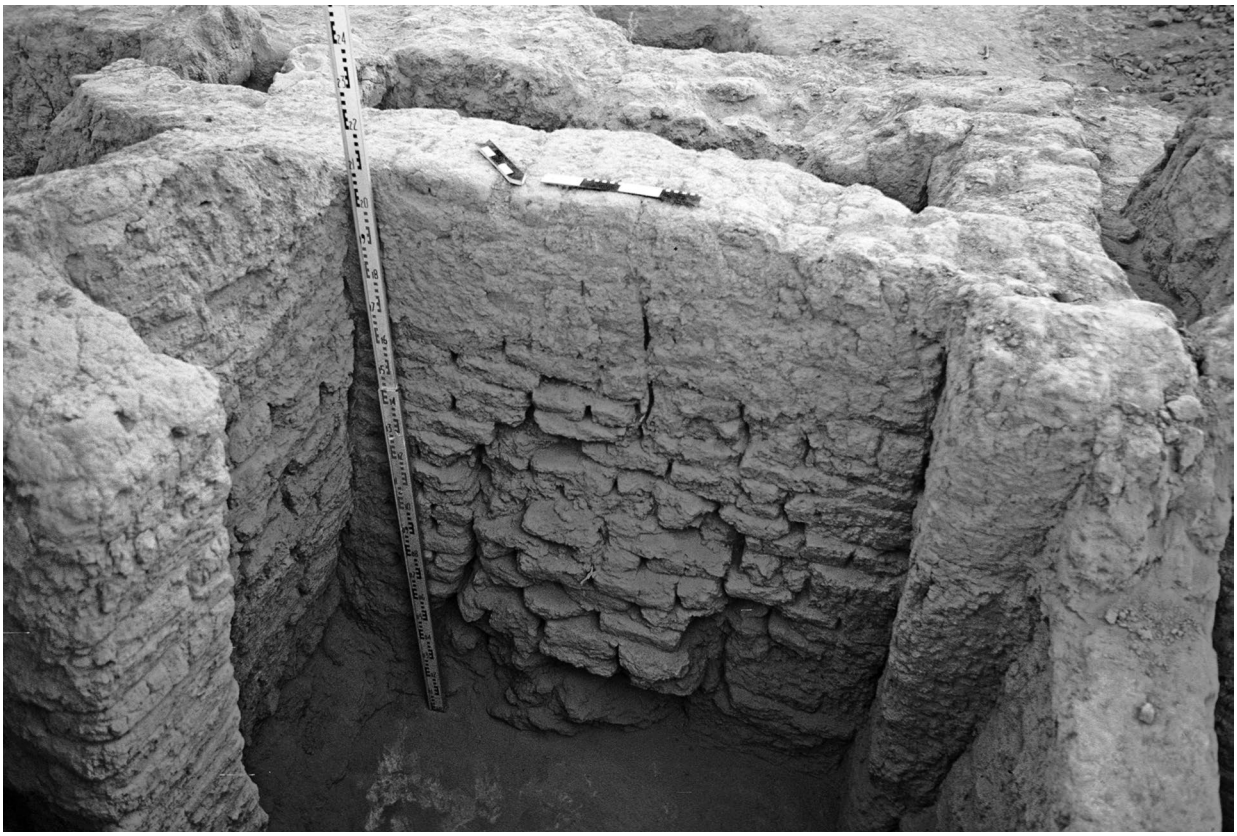
Objects: area 9—19 clay unimpressed jar sealing fragments, clay animal figurine fragment, clay andiron (?) fragment, clay cylindrical fragment, worked sheep/goat metatarsal, basalt grinding stone type B, pestle type A, pestle type E, clay model wheel, clay model wheel fragment.

Areas 9/10, phase b: In phase b, the space between two buttressed door jambs 9E–F of the doorway between areas 9 and 10 was blocked with a mudbrick wall (9B) whose southeastern face was mud plastered (bottom elevation 292.29), and the arched doorways in walls 6B and 10B were blocked with bricks. After the



(Left): Figure 2.48. Level 4 Round Building, area 10 (foreground) and area 9 (background). Looking northwest.

(Below): Figure 2.49. Level 4 Round Building, area 10, with blocked doorway into area 6. Looking southwest.



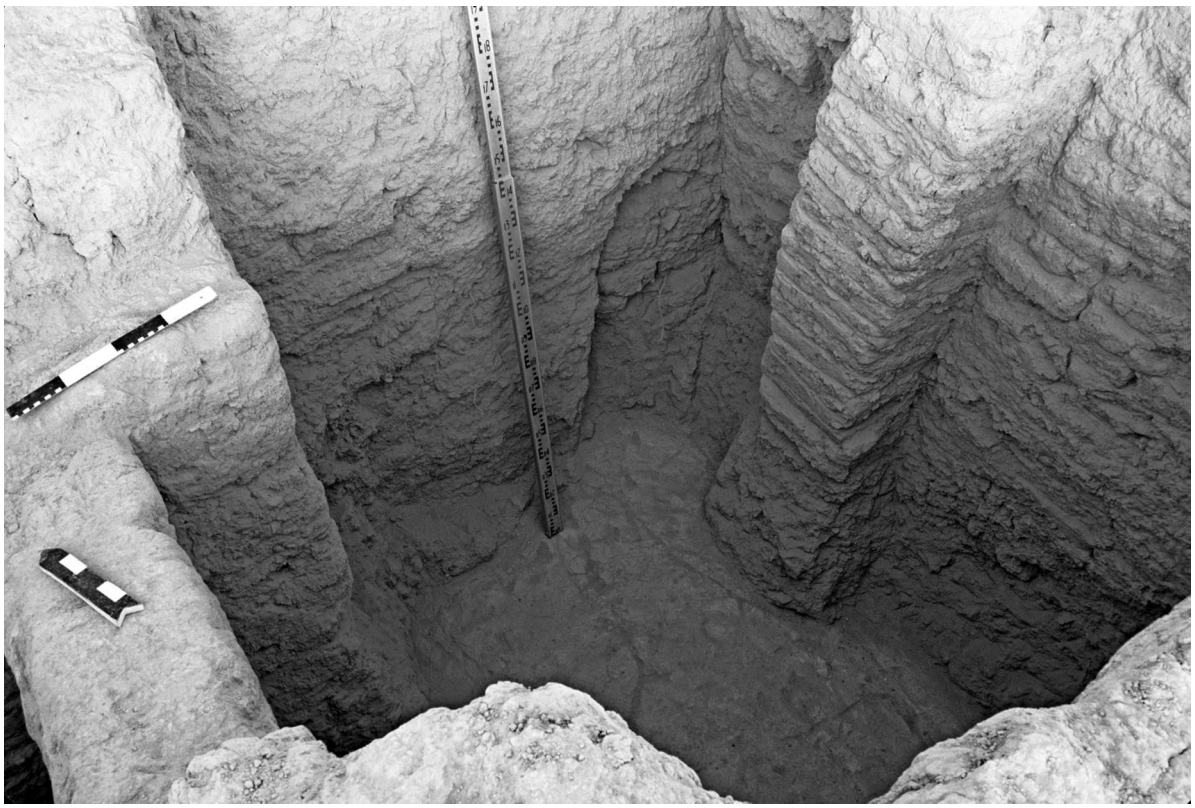


FIGURE 2.50. Level 4 Round Building, area 10, with blocked phase a doorway in wall 10B and phase b wall 10A (upper right) above phase a debris. Looking northeast.

doors were blocked, a new wall (10A, bottom ca. 292.58) with an interior buttress was installed to the southeast abutting walls 6B and 10B, partly obstructing the blocked doorway of wall 10B and reducing the area 10 space. The buttress of wall 10A slanted as if falling over to the southwest, probably as a result of pressure from the Level 1 limestone structure erected in the area above it. Comparable to the addition of wall 10A and the resultant reduction in the size of room 10 is the addition of wall 6A and the reduction of room 6 (see above).

No obvious floor surface was noted in area 9 coincident with the blocking of the doorway. Debris in this area contained many fallen mudbricks as well as a concentration of ash over 1 meter high in the northwest corner of the room that yielded a bone awl and a small jar.

One fallen mudbrick found close to the juncture of the southwest buttress 9E and the blocked doorway 9B was found to have a coating of white lime plaster with the representation of a human figure applied to it in black paint (see below, Chapter 5; Schwartz and Curvers 1992: figures 18 and 19; Dunham 1993). This brick was located ca. 50 centimeters above the bottom of the blocked doorway (elevation ca. 292.80). Twenty-two other small fragments of white plaster with traces of black paint were identified in the brick collapse of the south and eastern end of the room, none large enough to identify any painted pattern. A tiny piece of black paint (d = ca. 1.5 mm) was also apparent on one of the bricks of wall 9A at the same height as the fallen brick with painted plaster. All of this seems to indicate that at least one wall of area 9 was decorated with a mural (see also similar indications in area 2, above). As Dunham has noted (1993:127):

> Since the painting fragments were found fallen, their original position must have been higher on a wall that existed at the time the doorways were blocked, but that possibly was one of the original walls of the room. From its findspot the painting seems most likely to have been on the southwest wall of the room. The painting, as found, was plastered over, probably more than once, so it may belong to an earlier phase of the room before the door was blocked.

In area 10, a possible earthen surface (elevation 292.29) associated with the blocking of the doorway was noted, but its identification as a floor was extremely tentative.

Objects: area 9—clay disk, clay incised cube, bone awl; area 10—bone awl fragment, shell bead.

Complete vessels/profiles: area 9—Fine Simple Ware miniature round-based jar with everted rim (Figure 4.20:19).

Area 11, phase a: Area 11 is a long narrow room in the southeast part of the Round Building excavated to an elevation of 290.91, which is probably very close to the bottoms of the room walls, judging from wall elevations in adjacent rooms. In this phase, area 11 was demarcated to the west by wall 11B (see discussion, area 10). A layer of large cobbles was noted in the west end of the room, while traces of a mud floor were sometimes identified elsewhere. A brick platform-like feature (11E) was added on top of the mud floor, placed against the southwest wall 5A and buttress 11D.

Two corbel arched doorways were located in wall 11A. The western doorway (Figures 2.51, 2.52) led to area 12, while the eastern doorway (see dashed lines on wall 11A east of buttress 11C, Figure 2.41) presumably led to an unexcavated room that had been filled in with bricks during the construction of platform 27D, as in areas 95/96 (see above). To the west of the eastern doorway was a corbelled buttress (11C) one brick wide (42 centimeters) located midway up the wall, with seven courses preserved. The buttress may have served to support a corbelled ceiling. For the window in wall 5A, see the discussion of area 5.

Objects: clay animal figurine fragment.

Area 11, phase b: In a later period of use, wall 11B was no longer extant, and the western edge of the room was marked by the new wall 10A abutting walls 6B and 10B (bottom ca. 292.58). The two corbel arched doorways in wall 11A were blocked with mudbricks and brick fragments in this period as well.

Complete vessels/profiles: phases a-b—Cooking Ware round-based, flat rim bowl (Figure 4.24:13).

Area 11, phase c: A third phase in area 11 (see plan of late level 4 Round Building, Figure

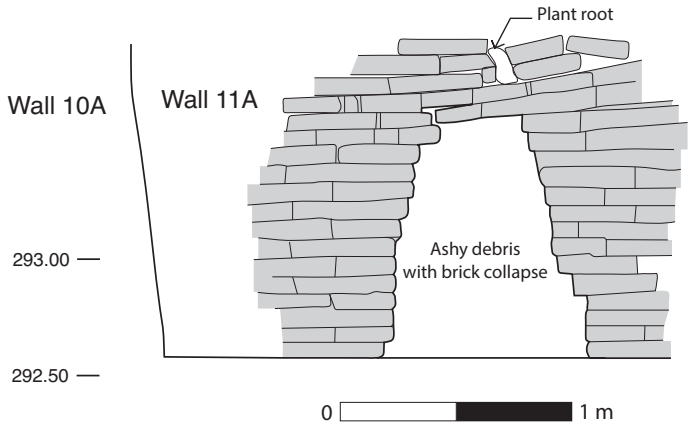


FIGURE 2.51. Level 4 Round Building, area 11, elevation of western doorway in northeast wall (11A). *Illustration prepared by Violaine Chauvet.*

FIGURE 2.52. Level 4 Round Building, area 5 (foreground) and 11 (background) with blocked western doorway in wall 11A. Looking northeast.

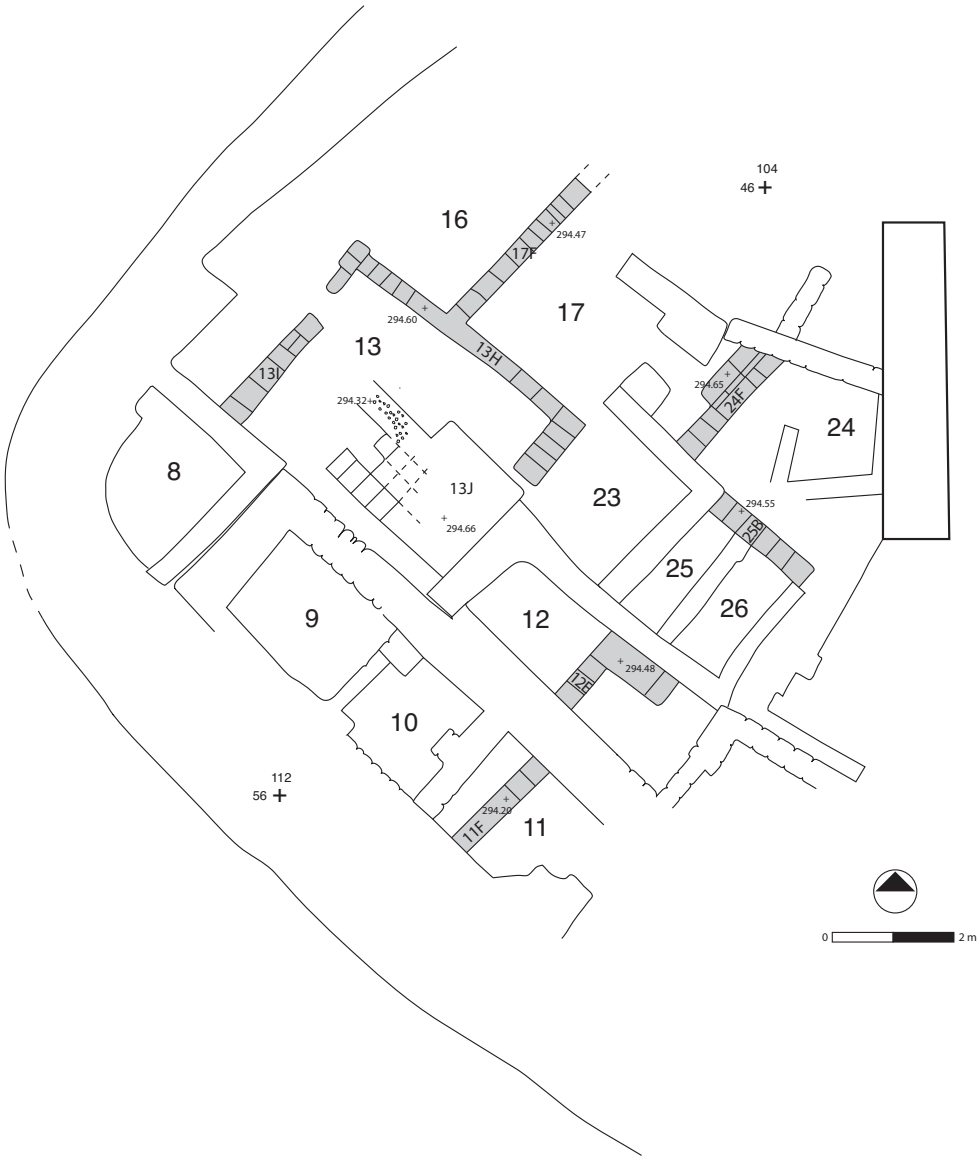


FIGURE 2.53. Level 4 Round Building, later occupation. *Illustration prepared by Violaine Chauvet.*

2.53) is marked by the construction of wall 11F east of 10A, at a point when debris in the room had risen above the top of the western doorway in wall 11A. Wall 11F (bottom ca. 293.80) had three to four courses preserved.

Objects: phase c—bone awl; phases b-c—small clay wheel (spindle whorl?), quartz bead.

Center (Figure 2.54)

Area 12: Area 12 is a long, narrow room with three doorways with corbelled arches, one in the northeast wall 12C (Figures 2.55, 2.56), and two in the southwest wall 12A (=10B) (Figures 2.57, 2.58). The northeast wall 12C abutted wall 12B to the east and was bonded to wall 12D. The face of wall 12A had a pronounced slope towards the room interior as it proceeded down.

Area 12, phase a: In the earliest phase excavated, an earthen surface was identified at the limit of excavation (291.91–292.10). Above this, brown debris with mudbrick and ash accumulated for ca. 50–70 centimeters.

Objects: clay human figurine fragment, clay animal figurine fragment

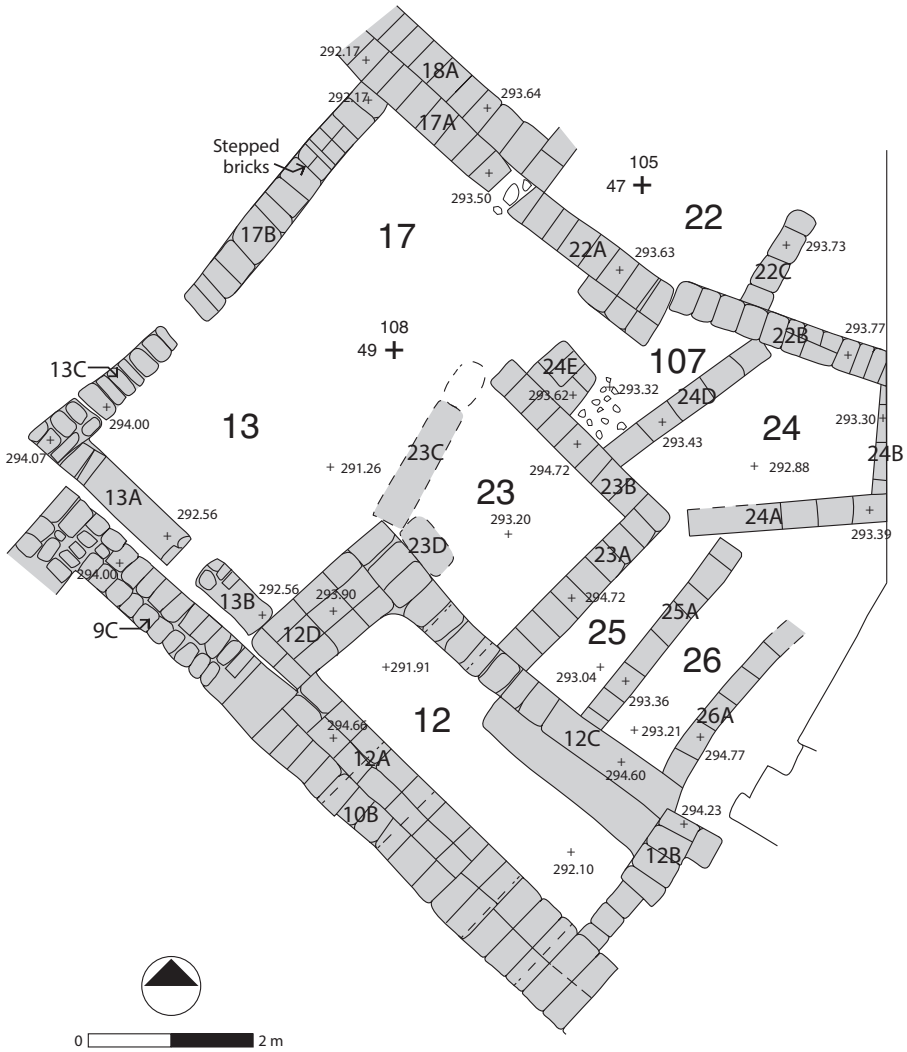


FIGURE 2.54. Level 4 Round Building, central area. *Illustration prepared by Violaine Chauvet.*

Area 12, phase b: In this second phase, the door in wall 12C was widened, after which the upper portions of all three doorways were blocked with mudbricks (elevations of the bottoms of the blockings are 292.60–293.00). A fire took place in the room sometime later, leaving the walls with darkened traces of burning at the same elevation as the lowest courses of the doorway blockings. The fire was also attested by a 40 centimeters thick deposit of black ash.

Objects: basalt grinding stone type B, pestle type B, oyster shell bead.

Complete vessels/profiles: Medium Simple Ware flat-based, incurving simple rim bowl (Figure 4.18: 9).

Area 12, phase c: The latest room phase is marked by the construction of an L-shaped brick wall or feature (12E) with three preserved courses on top of the ashy debris of phase b, separating the room into two small spaces (see Figure 2.53).

Area 23: In this room, debris included orange bricky and ashy soft material with numerous sherds, with frequent mudbricks found at the lower elevations. The inner face of the northeast wall (23B) had an unusually thick coat (3–4 centimeters) of mud plaster. Between the northeast end of wall 23C and the northwest end of wall 23B was a limestone threshold measuring 60 × 38 × 10 centimeters. The northwest end of wall 23B was slightly arched, likewise implying a doorway,

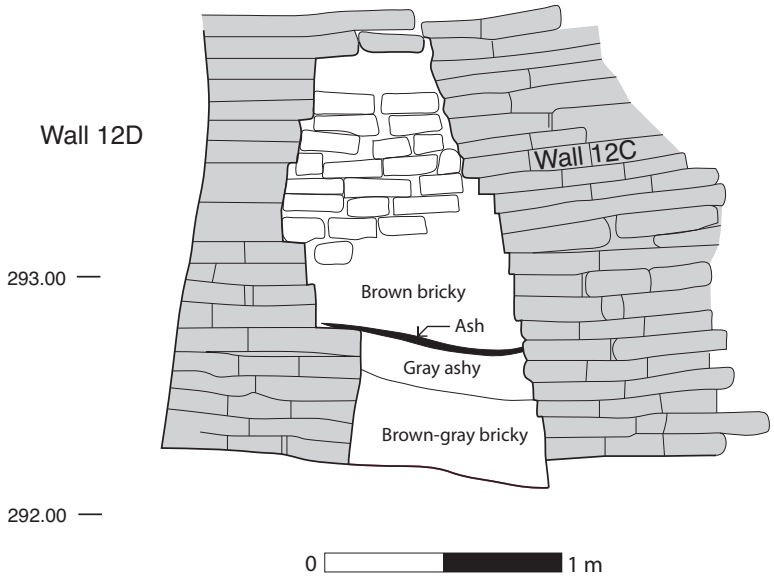


FIGURE 2.55. Level 4 Round Building, area 12, elevation of doorway in northeast wall (12C). *Illustration prepared by Violaine Chauvet.*

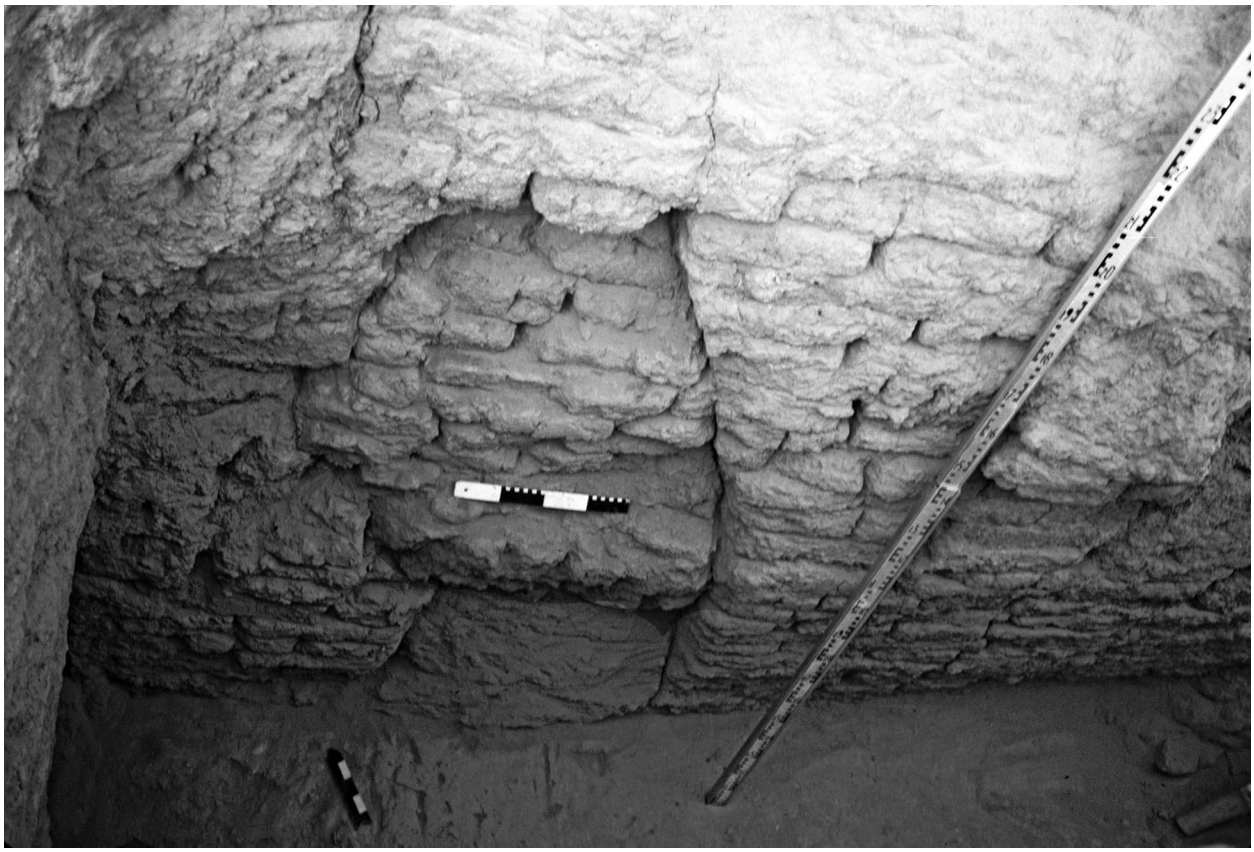


FIGURE 2.56. Level 4 Round Building, area 12, showing blocked doorway in northeast wall 12C. Looking northeast.

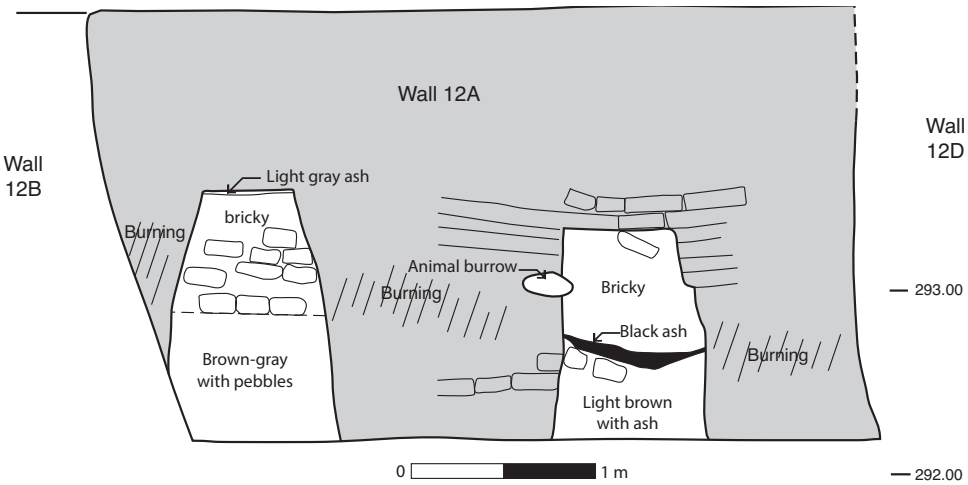


FIGURE 2.57. Level 4 Round Building, area 12, elevation of southwest wall (12A). *Illustration prepared by Violaine Chauvet.*

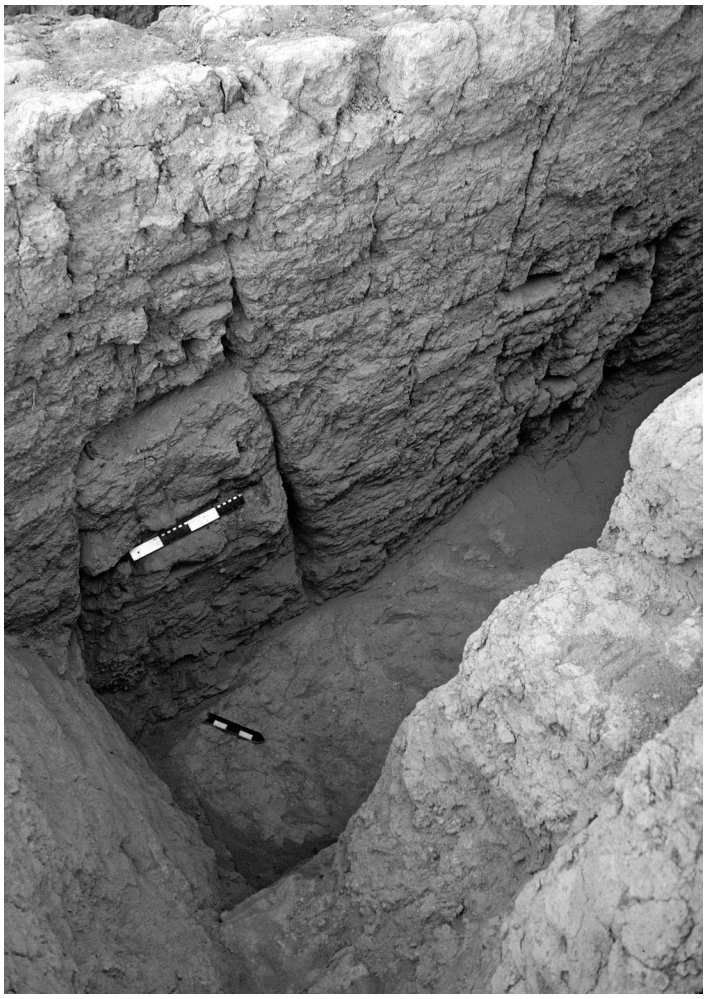


FIGURE 2.58. Level 4 Round Building, eastern doorway in southwest wall 12A. Looking southwest.

but it is difficult to interpret how such a doorway would have functioned given the absence of a wall facing 23B in area 13.[15]

Objects: basalt pestle type F.

Area 24, phase a: Area 24 is difficult to interpret given the peculiarity of its architecture and its incomplete excavation. A cobble surface between wall 24D and buttress 24E is the only indication of a floor for the space, but this must have been a surface associated with a secondary phase of use perhaps associated with wall 24D that abuts walls 22B and 23B. Area 107 is the small space to the west of area 24.

Objects: area 24—clay animal figurine fragment; area 107—gypsum (?) jar sealing, quartz bead.

Area 24, phase b: Wall 24F was constructed above the remains of 24D in phase b (see Figure 2.53).

Areas 25/26: Areas 25 and 26 are two narrow rooms, neither excavated to a floor surface. An early phase a is followed by phase b in which wall 25B was added to the northeast (see Figure 2.53). How access to these rooms was gained is difficult to ascertain, and it may be that they served as storage units accessed from above, at least in phase b (and note their proximity to the mudbrick platform 27A to the east).

Objects: area 26—clay cylinder fragment.

Areas 13/17: These areas comprise a large rectangular room later divided into two segments.

Areas 13/17, phase a (Figure 2.59): In the earliest phase of the Round Building (see Figure 2.1), areas 13/17 comprised a large single room with an earthen floor surface, above which a set of dark gray ash lenses accumulated. In the southwest, the room was demarcated by abutting wall segments: 13A, 13B, and 13C are discrete segments not bonded to other walls. The northwestern end of 13A was preserved significantly higher than the rest of 13A, as well as 13B. The significance of the gap between walls 13A and 13B is unclear; it is unlikely to be a doorway, since wall 9C must have been contemporaneous with 13A–B. Traces of white lime plaster were observed on the inner face of walls 13A and 17A.

Objects: area 17—clay unimpressed sealing (?), clay animal figurine, clay animal figurine fragment.

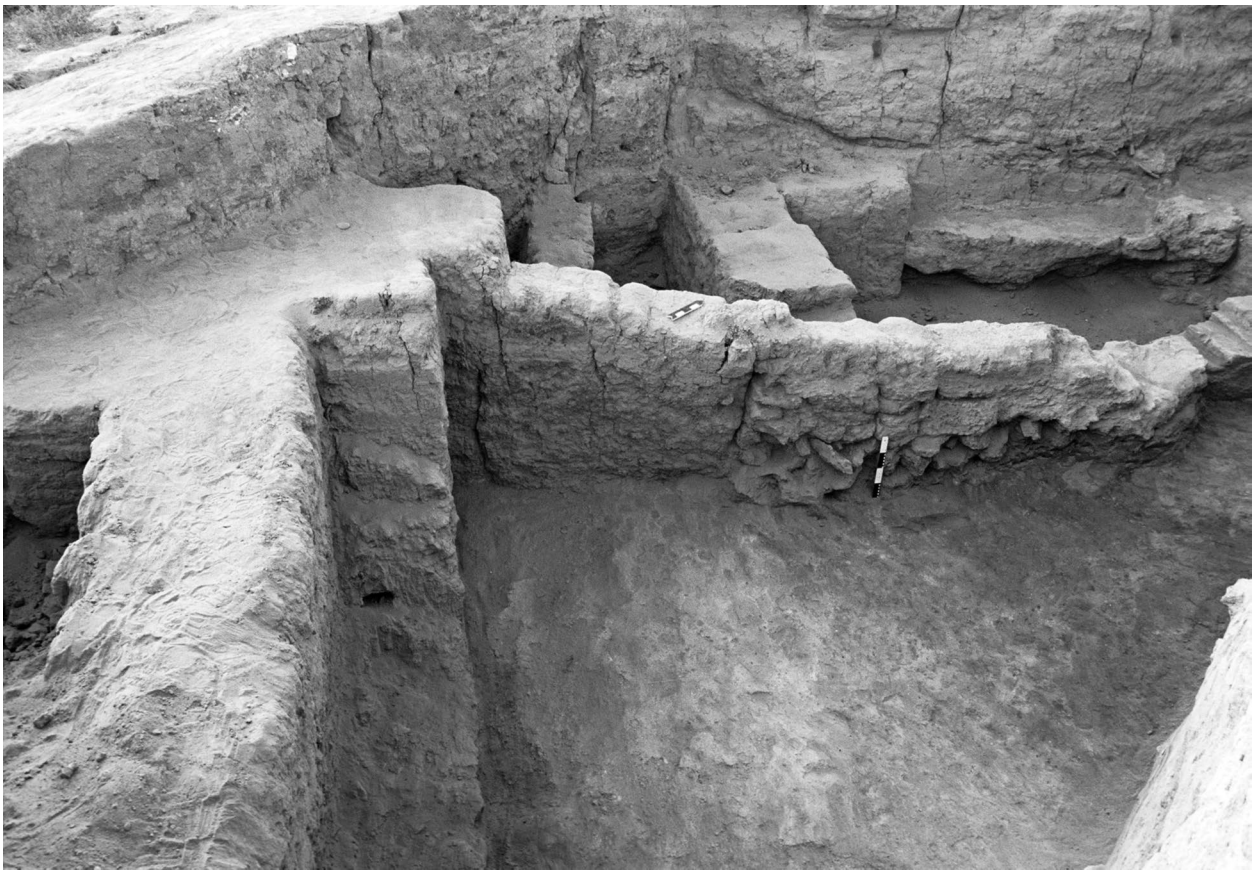


FIGURE 2.59. Level 4 Round Building, area 13/17, phase a. Looking northwest.

Areas 13/17, phase b (Figures 2.60, 2.61): After phase a, a layer of stone cobbles, pebbles, and boulders as thick as 40 centimeters in loose brown soil was installed over area 13/17 (see Figure 2.1), including the tops of phase a walls 13A (except for the northwest corner), 13B, and 17B. These walls must have been levelled or cut down in preparation for new architecture to be built on top. Indeed, the northeast half of the preserved top of phase a wall 17B was stepped, as if the bricks had been neatly removed in preparation for the construction of phase b architecture.

The new architecture in phase b consisted of a new northwest wall segment (17C) and a wall (13D) dividing areas 13 and 17 into two segments. Since wall 13D was only preserved to the height of one course and was very poorly preserved in its southeastern half, it may well have had a doorway undetected by excavation. In area 13, a large number of round (riverine?) limestone cobbles 10–20 centimeters in diameter were found, particularly in the west corner of the room.

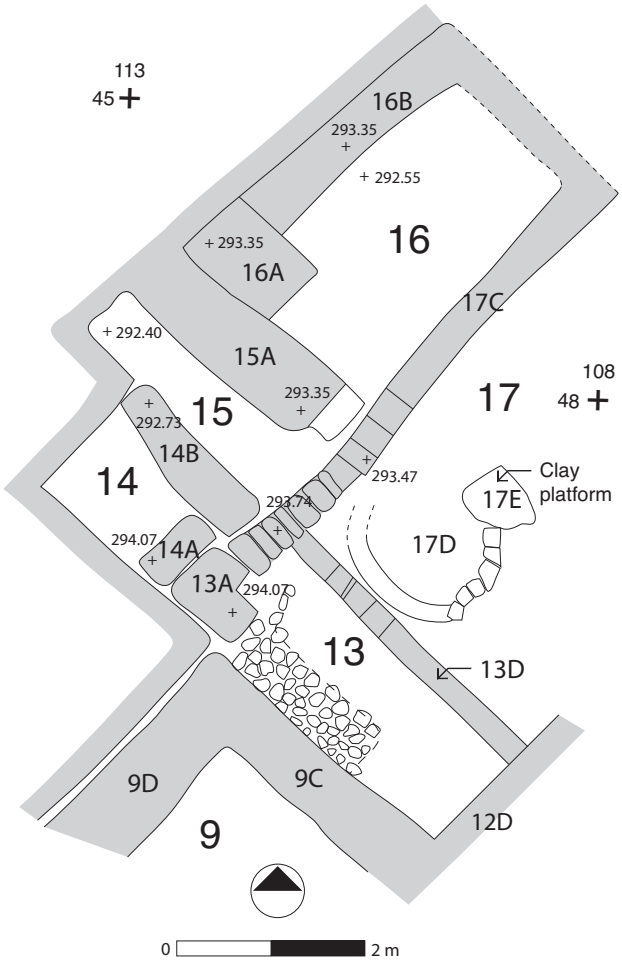


FIGURE 2.60. Level 4 Round Building, area 13/17, phase b. *Illustration prepared by Violaine Chauvet.*

FIGURE 2.61. Level 4 Round Building, area 13/17, phase b. Looking west.

Area 17 contained a large round mudbrick oven (17D) preserved one course high with black ash distributed around it. A hard-packed clay surface or platform adjacent to the oven (17E), encircled by a ring of ash, was presumably a working surface associated with the oven.

Phase b is probably contemporary with the blocking of the doorways in rooms 6 and 9–12.

Objects: area 17—clay animal figurine fragment, 2 bone awls, basalt grinding stone type C, clay model wheel fragment.

Areas 13/17, phase c (Figures 2.62, 2.63): A heap of basalt cobbles (average diameter 20 centimeters) designated 13E was piled up against walls 9C, 12D, 13A, and 13C in an area approximating that of room 13 in phase b. This pile of stones was highest in the west corner of the room and sloped down to the north and east. The purpose of this pile is not completely obvious, but if the hypothesis that the doorways of areas 6, 9, 10, 11, and 12 were blocked in order to facilitate use of those rooms as storage spaces with access from

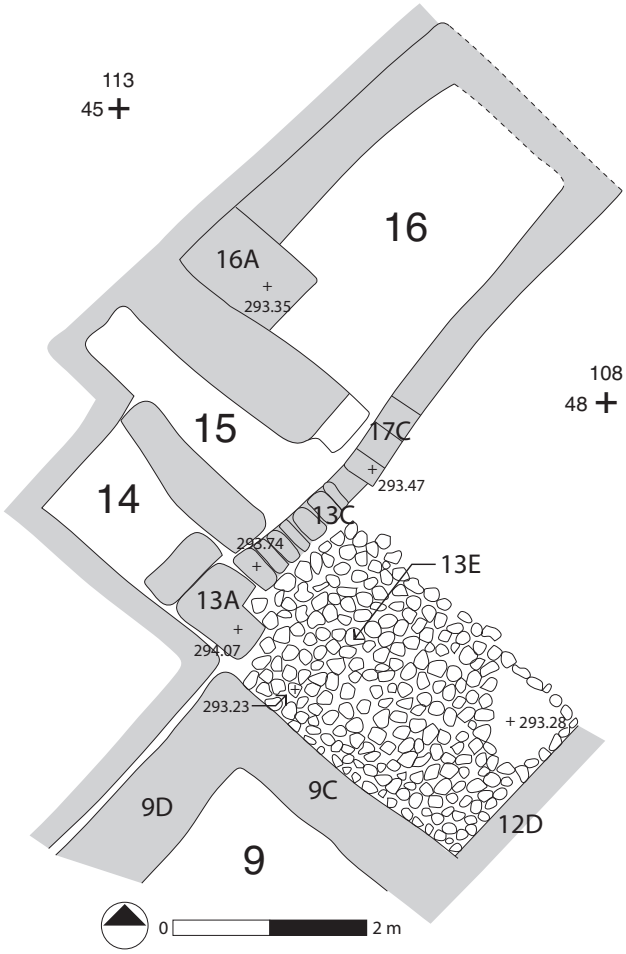


FIGURE 2.62. Level 4 Round Building, area 13/17, phase c. *Illustration prepared by Violaine Chauvet.*

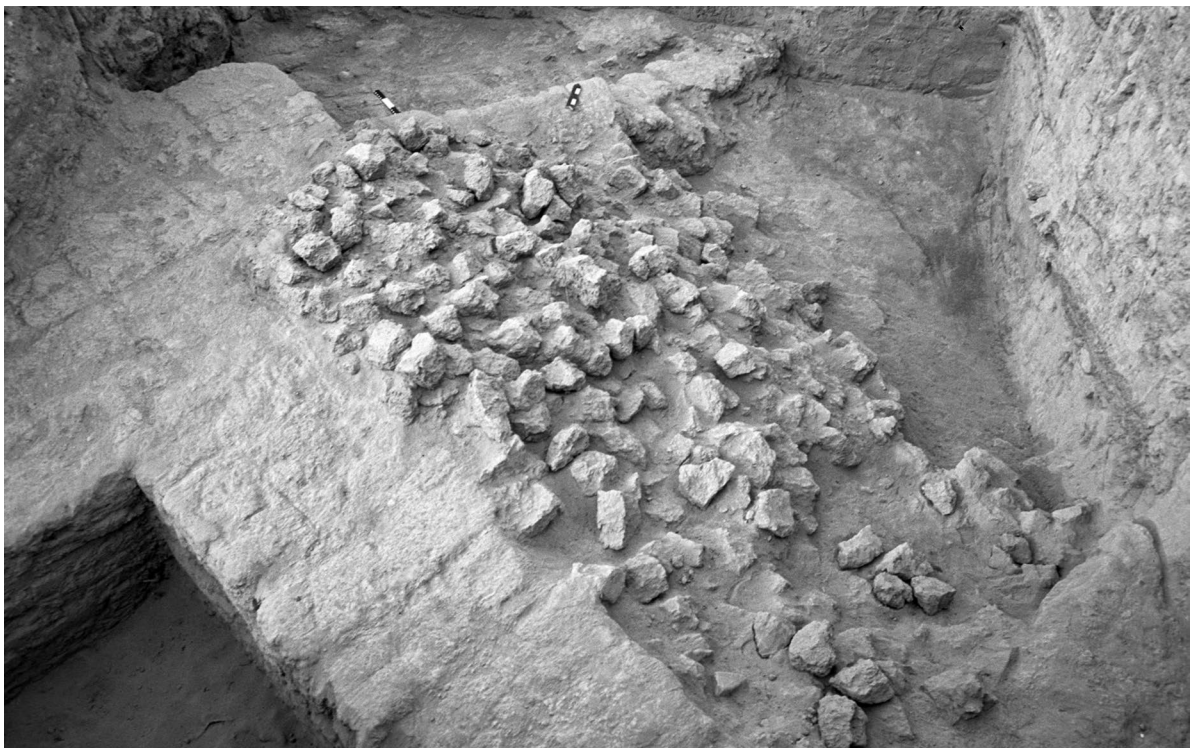


FIGURE 2.63. Level 4 Round Building, area 13/17, phase c. Looking north.

above, then the basalt pile might have served as an access ramp to the contents of areas 9 and 10.

In this phase, area 17 was a large empty zone that accumulated bricky debris.

Areas 13/17, phase d: In this latest level 4 phase of use in areas 13/17, a new room with a doorway to the northwest was built against the still extant original walls of areas 8, 9, and 12 (see Figure 2.53). The new walls 13H–I enclosed a mudbrick platform 13J, constructed above the area of the basalt cobble heap in phase c.[16] Platform 13J, of which ca. 80 centimeters were preserved of its height, was comprised of two to three mudbrick courses above a mass of mud and mudbricks. The feature appeared to be stepped in the southwest, but this may have been the result of erosion. Access up to the platform from the northwest was obtained via a pebble ramp with traces of lime plaster.

Wall 13H was built on top of a foundation of one course of basalt cobbles near its northwestern end. In area 17, a new wall, 17F, was constructed, preserved only to the height of one or two courses.

Objects: clay sealing with seal impression, found northwest of area 13; bone awl, bone awl fragment, basalt grinding stone type A, pestle type D.

Complete vessels/profiles: two complete vessels in debris above architecture of this phase, assigned level 4/3 designation, including Medium Simple Ware round-base, evert rim jar (Figure 4.26:10), and flat-based, vertical-walled Cooking Ware bowl (Figure 4.26:14).

Southwest (Figure 2.64)

Area 8: This area is a space demarcated by two perpendicular walls (8A–B) built against the curving

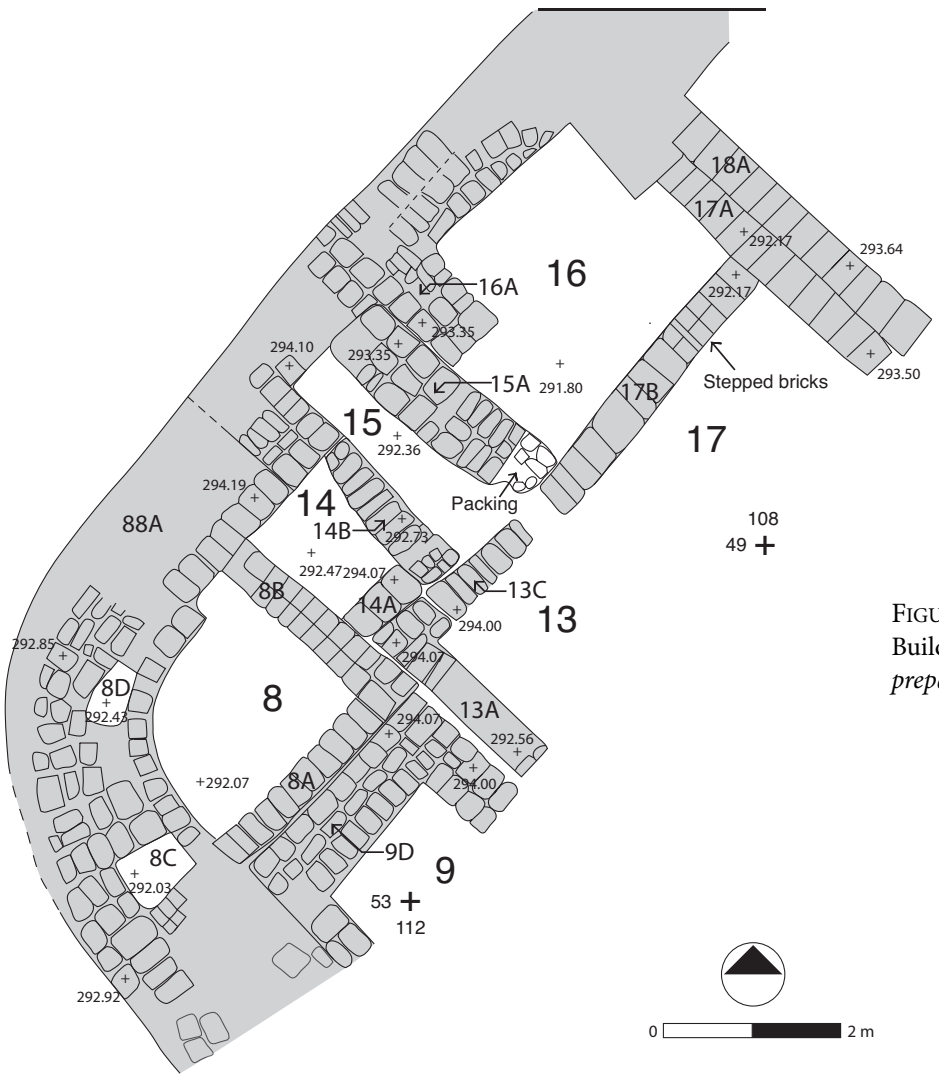


FIGURE 2.64. Level 4 Round Building, west area. *Illustration prepared by Violaine Chauvet.*

outer wall of the Round Building (88A). Walls 8A–B were constructed as a separate unit and abutted the adjacent walls of neighboring rooms. No floor surface was identified —but the bottoms of the room walls were not reached inside the room—and the room had been completely filled with mudbricks, perhaps to strengthen the outer wall of the Round Building in a later phase of its use, or to provide access to areas 9/10. Two small empty spaces were noted inside the thick brickwork of the Round Building enclosure wall in this area (8C–D), perhaps to be understood as casemate features.

Area 14: A small room without doors, area 14 is demarcated by the construction of two discrete walls (14A–B) abutting walls 8B, 13A, 13C and the outer wall of the Round Building (88A). Above a reddish earth surface at the limit of excavation was soft ashy debris that yielded numerous clay lumps, many or most of which had impressions of receptacles such as jars or baskets and two of which had cylinder seal impressions. Given the elevations of adjacent rooms in the building, remains of an earlier phase probably existed below the floor of this excavated phase. It is possible, in fact, that areas 14–16 were originally a single large area later partitioned by walls 14A–B and 15A (see below, areas 15/16, phase a).

Objects: 2 clay sealing fragments with seal impression, 56 unimpressed clay sealing fragments, 2 clay animal figurine fragments, clay miniature spoon, small clay lid (?), bone awl fragment, 3 clay model wheels.

Areas 15/16, phase a: Areas 15/16 consist of two rooms built against the outer wall of the Round Building that were demarcated by a set of discrete, abutting walls. In the earliest excavated phase, mainly investigated in area 16, areas 16 and 15 were divided only by a short, wide buttress (16A) extending from the outer wall of the Round Building, with wall 15A added in phase b. It is possible that walls 14B and 14A were also added as partitions to an originally larger room constituting areas 14–16; since excavation did not reach the same depths in areas 14 and 15 as it had in area 16, this must remain an unconfirmed hypothesis. A floor surface was not reached in this phase.

Objects: area 16—bone needle, clay spindle whorl.

Areas 15/16, phase b: In this phase, a new wall (15A) was built against buttress 16A, closing off area 16 from area 15 (bottom elevation, 291.92). Wall 15A did not extend all the way to wall 17B; instead a space of some 30–40 centimeters between them had been filled in with a packing of mud, mudbricks, and cobbles. Area 15, a narrow room built against the exterior wall of the Round Building, was delineated by the discrete, abutting wall segments 13C, 14B, and 15A. A brown earth surface with white flecks was identified in area 15 at elevation ca. 292.50, comparable to the elevation of the floor excavated in area 14. No floor surface was identified within area 16.

Objects: area 16—clay animal figurine fragment, bone awl, clay spindle whorl.

Areas 15/16, phase c (see Figure 2.60, areas 13/17, phase b)**:** Phase c, equivalent to phase b of areas 13/17, saw the construction of wall 17C delimiting the southeast edge of area 15. In area 15 was a possible floor of brown sandy material associated with numerous sherds, as well as some basalt cobbles and mudbricks, perhaps part of the areas 13/17, phase b stone foundation packing. In area 16, a new wall segment (16B, elevations 292.47–293.35) was added against the exterior wall of the Round Building and the buttress 16A. A greenish floor layer was observed near wall 16B at elevation 292.55 but was not detected elsewhere in the room. In the upper part of the debris in area 16, a circular depression 45 × 55 centimeters in area (a posthole?) was found, with three basalt cobbles at the bottom and a 10-centimeter deposit of pebbles and sand above.

Objects: area 15—clay unimpressed sealing fragment, pestle type E, pestle type K, clay cone, clay model wheel, clay bead, quartz bead; area 16, phases b-c—clay unimpressed peg (?) sealing, 2 clay animal figurine fragments.

Western Area (Figure 2.65)

The western area in level 4 consisted of a complex of lime-plastered rooms of apparent domestic character in the southwest, semi-subterranean storage emplacements ("silos") in the northwest, and a largely open area in the east.

Area 46: This area is a room cut to the south by level 2 intrusive activity. The room floor had yellowish-white lime plaster, best preserved near the mudbrick benches 46F–H. In the southeast corner was a rectangular lime-plastered mud feature (46I) whose surface led north into a pot sunk into the room surface (Figure 2.66). Debris found in the bin included a bronze fragment and basalt cobbles.

The interior face of the room's north wall (46D) had white lime plaster only in the section east of a blocked doorway or window; wall 46C was also lime

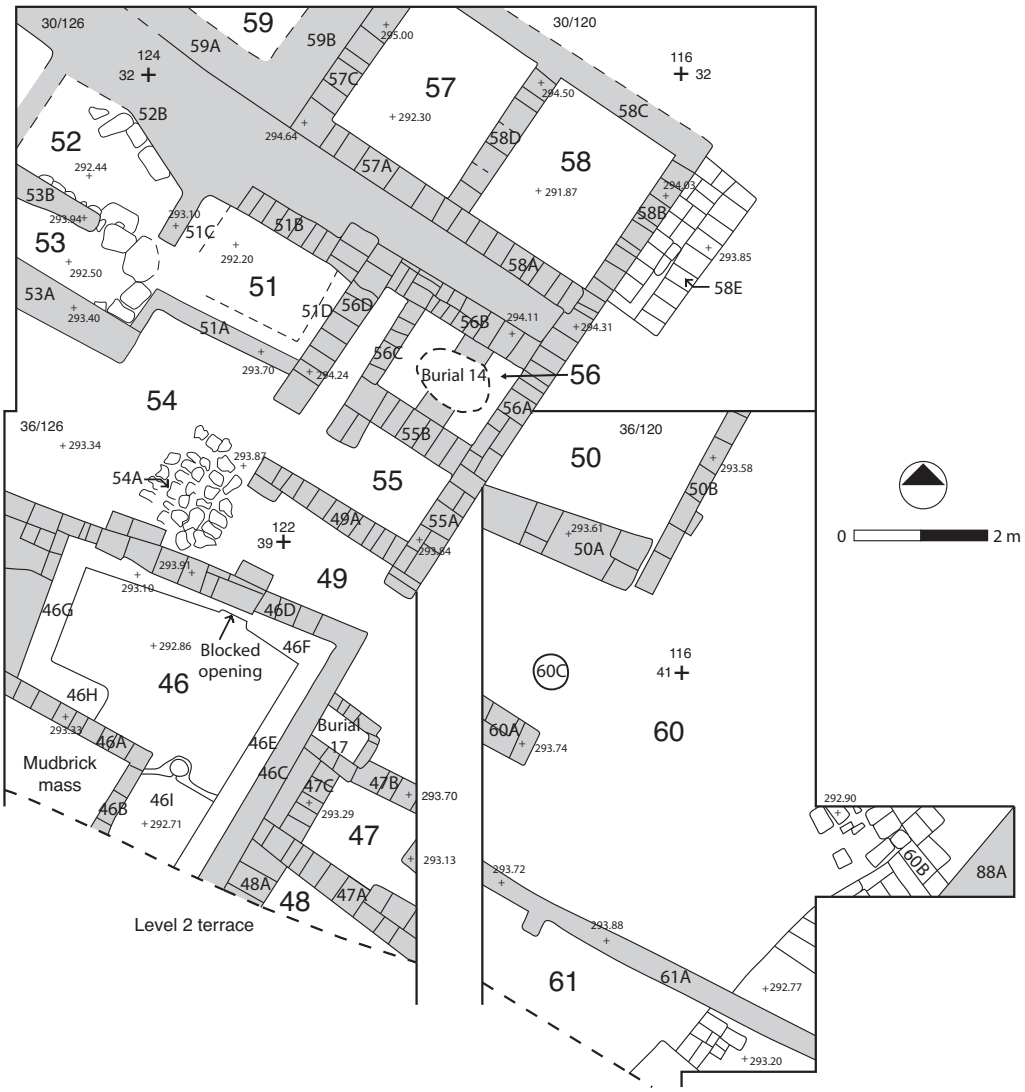


FIGURE 2.65. Level 4, western area. *Illustration prepared by Violaine Chauvet.*

plastered. Similarly, the 15-centimeter high mudbrick bench 46F against the north wall was only lime plastered to the east of the blocked opening, along with bench 46E, also 15 centimeters high. The single mudbrick north of wall 46D by the blocked opening may have served as a doorstep.

Wall 46A to the southwest was built atop the plastered room floor and was a later addition. The area south of wall 46A had much mudbrick material evident, but its interpretation (a platform?) was difficult due to poor preservation and the level 4 remains' truncation by the level 2 terrace. Above the mudbrick material was a grayish white lime plaster surface sealing against wall 46A.

Objects: bronze fragment found in bin 46I.

Areas 47/48: Area 47 is a small cubicle demarcated by mud-plastered walls. No floor surface was identified, but an incompletely preserved large jar was found in debris next to wall 47C. To the northwest, a small rectangular mudbrick enclosure (92 × 82 × 47 centimeters) was installed against wall 46C subsequent to the construction of wall 47B, which it damaged. Inside this enclosure was the skull of a child and other objects. This feature, designated burial 17, could either be understood as having a late level 4 or a level 3 date (see chapter 6).

Area 48 to the south was largely destroyed by the level 2 terrace and had no distinctive features.

FIGURE 2.66. Level 4, area 46, feature 46I. Looking southwest.

Area 49: Both faces of wall 49A had yellow lime plaster, as did a floor surface in this space. A stairway (54A) to the west appears to have been contemporary with the plastered floor and led down to a floor in area 54 (elevation 293.34). Stairway 54 was composed of five steps of limestone slabs, with the three middle steps each consisting of two courses of slabs (Figure 2.67). The feature was partly built against a mudbrick buttress abutting the north wall (46D) of area 46.

Areas 51–55: Areas 51–55 consists of structures tentatively identified as silos due to their (semi-?) subterranean character and absence of lime-plastered interior wall faces. Not as well preserved as "silos" 56–58, their character is more difficult to ascertain.

Area 51, phase a (Figure 2.68): Area 51 is located west of the area 56 silo and gives the appearance of having been built against it. The north wall (51B) had an interior buttress in each corner (hidden by the vault of wall 51B in Figure 2.65), and the buttresses and the wall between them were slightly vaulted, curving in toward the southwest, the higher the brick course. The west wall (51C) was poorly preserved and difficult to articulate. Along the base of the south wall (51A) and the east wall (= the west wall of area 56, wall 56D) was a reinforcement of mudbricks and mudbrick debris (51D), which recalls the mudbrick "ledge" extending from the walls at the bottom of silo 19 inside the Round Building. The room surface consisted of gray to light green earth with many charcoal fragments.

Area 52, phase a: West of area 51, area 52 is another deep (semi-)subterranean room. The western part of the room was poorly preserved, and thus its reconstruction is tentative. The south wall 53B had a foundation of two courses of stone boulders and cobbles, and several boulders were found against the north wall (52B). An upright stone slab against the south edge of wall 52A may have been part of a doorway into area 51. No floor surface was identified in this room.

Objects: 3 clay andiron fragments.

Area 53, phase a: South of area 52, this small space had a gray-green earth floor. Two large flat stones were found on top of the floor in the southeast corner against walls 53A and 51A. Walls 53A and 53B were built on a foundation of ca. two courses of stone boulders and cobbles. Apparent doorways between areas 53 and 52 and between areas 53 and 51 had pavings of flat stone boulders.

Area 55, phase a: A yellow lime-plastered floor was identified in this small space; wall 49A's north face also had yellow lime plaster. Brown debris with pebbles accrued atop the floor, and a second, earth surface with pebbles was installed (elevation 293.36).

Areas 51–55, phase b: In this phase of later level 4, the architecture of 51–53 had fallen out of use and

Figure 2.67. Level 4, area 54 stairway. Looking southwest.

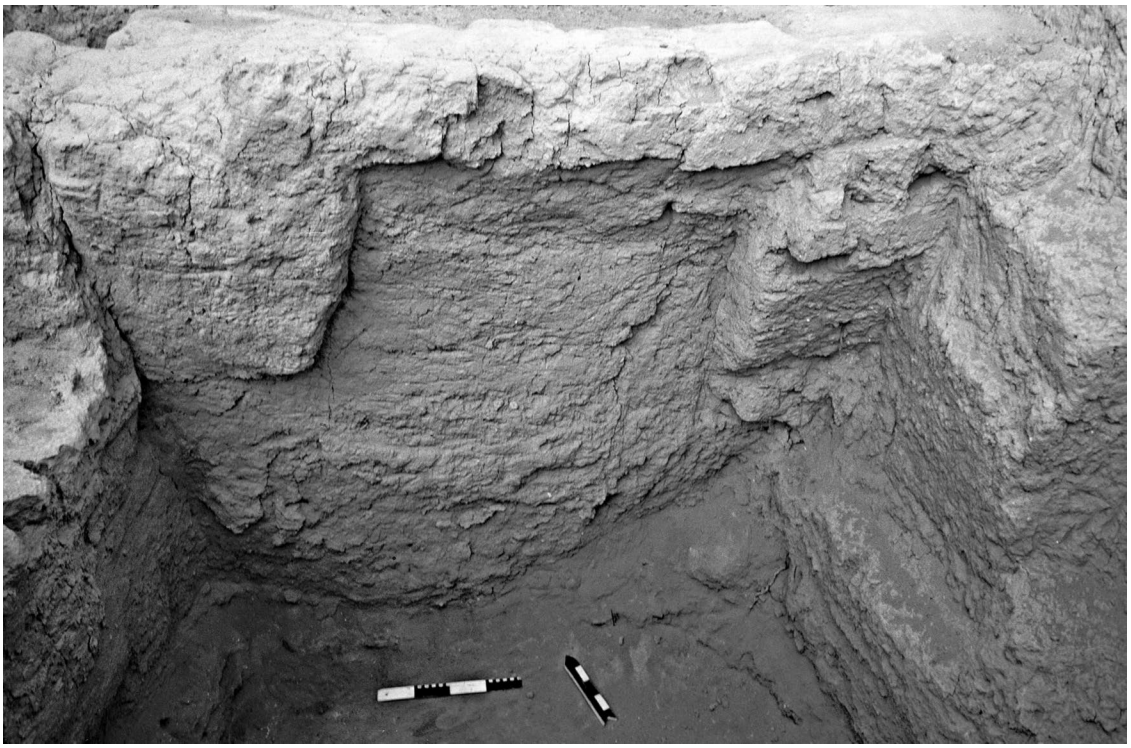


Figure 2.68. Level 4, area 51. Looking northeast.

was covered with debris. A mudbrick platform (56E) preserved to a height of seven brick courses (63 centimeters high) was constructed against the west wall of area 56 (56D) (compare platform 58E against area 58) (Figure 2.69). Wall 49B, 45 centimeters high, also belongs to this phase.

Objects: above area 52—pestle type B, pestle type C.

Complete vessels/profiles: above area 52—miniature Fine Simple Ware round-based, hole-mouth goblet/pot (Figure 4.20:16).

Areas 56–58: Another set of (semi-)subterranean rooms without lime plastering and exterior doorways, areas 56–58 are tentatively identified as silos. All three structures remained extant in level 3, so the contemporaneity of activities within the structures and those outside of it in levels 4 and 3 is uncertain. The pottery found inside the structures did not contain diagnostics that would conclusively indicate that the relevant deposits belonged to a level 4 as opposed to a level 3 horizon (see Chapter 4), although some observations can be made (see below, level 3, areas 4–6 and Chapter 4). The structures and their internal history are discussed in the level 3 section below.

Area 56 (see discussion of level 3, area 6, below).

Area 57 (see discussion of level 3, area 5, below).

Area 58 (see discussion of level 3, area 4, below).

Area 65 (Figure 2.70): In what appears to be the northwest corner of the silo complex, area 65 had a gray-green earthen floor surface, with a shallow (depth = 3 centimeters) round depression (65A) in the northeast corner. Apparently associated with an occupation slightly later than the gray-green surface was a circular tannur (65B) and an adjacent line of three bricks extending from the south wall, perhaps a backing or lining for the tannur.

West Central Area

Phase a (equivalent to deep sounding 42/114 north, level 4, phase a): A 7.5 × 2-meter-deep sounding was excavated against the east balk of unit 36/120 in 1990, yielding a sequence of early level 4 and level 5 occupations. In the published east section of this trench (Schwartz and Curvers 1992: figure 26), level 4 was assigned to contexts extending approximately from elevation 290 to 293, but further excavations in the Round Building and below it necessitated a revision of the level designations in the 36/120 deep sounding (Schwartz and Curvers 1993/1994:248) (see Figure 2.2). In this reassessment, the three thick walls

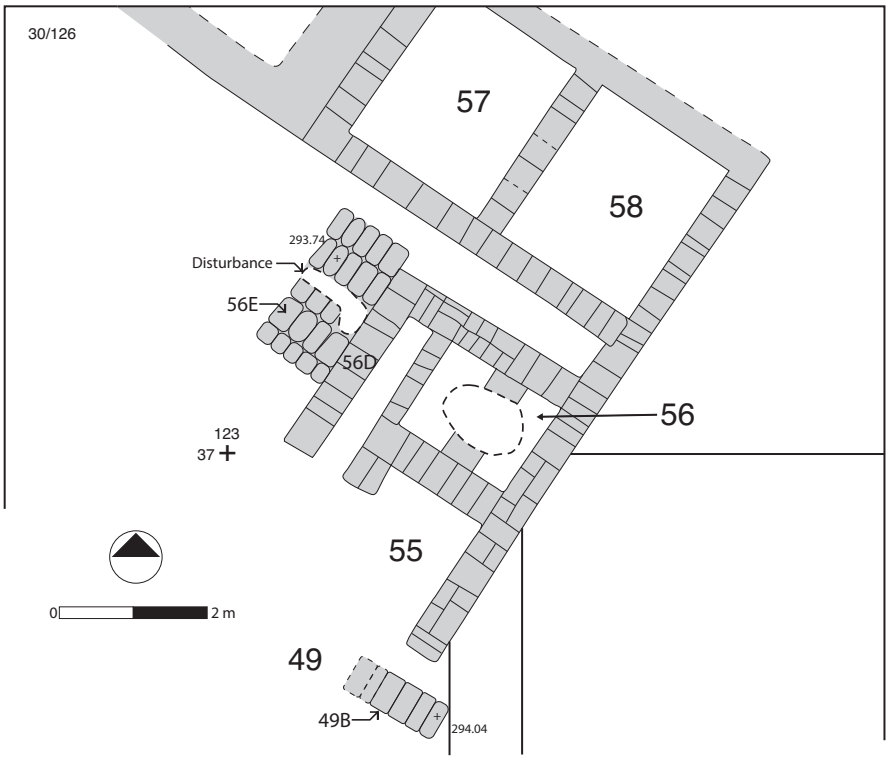


FIGURE 2.69. Level 4, western area, areas 51–55, phase b. *Illustration prepared by Violaine Chauvet.*

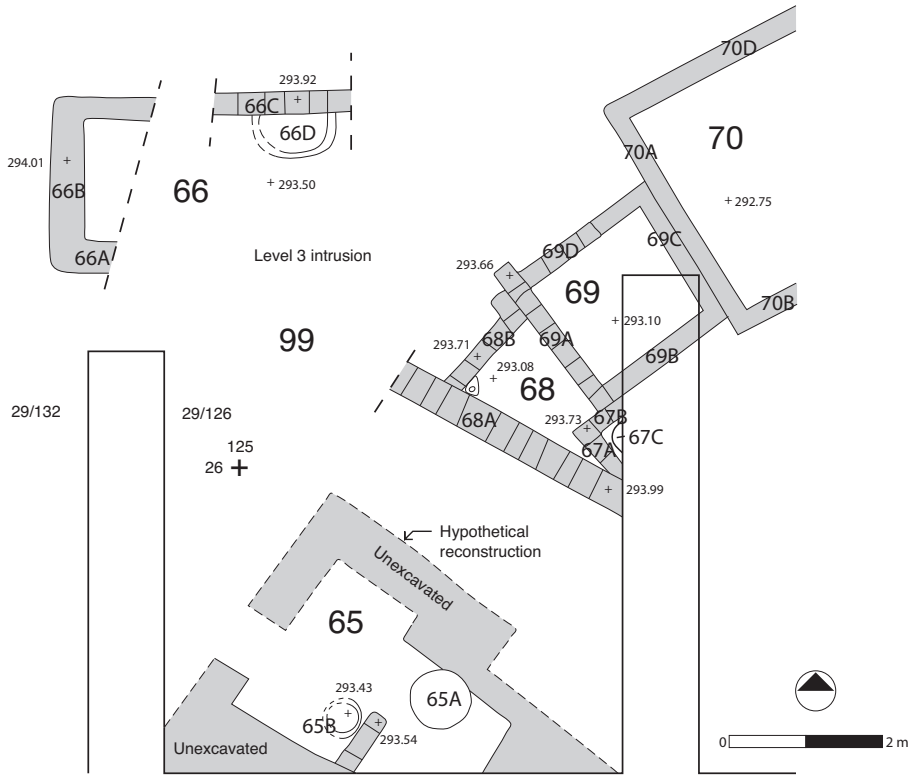


FIGURE 2.70. Level 4, northwest, areas 65–70. *Illustration prepared by Violaine Chauvet.*

in the center of the published section belong to early level 4, but the earlier phases of the two northernmost walls as well as the grill architecture in the lowest stratum are assigned to level 5 (Figures 2.9, 2.11–2.13).

The earliest level 4 occupation noted in the 36/120 deep sounding (Figure 2.71) consists of segments of several rooms with relatively thin walls that maintain the orientation of the architecture in the level 5 phases below. Room 112 contained the remains of three small circular clay ovens (112C–E). The parallel lines of stones in area 114 to the south are of uncertain significance, as is the mudbrick platform or thick wall (113B) against the east balk.

Objects: area 87 or 101—fragments from large, baked clay object.

Complete vessels/profiles: area 112 (debris above architecture)—Cooking Ware round-based, hole-mouth pot with knob lugs (Figure 4.24:6).

Phase b: Areas 50 and 60, east of the complex of silos and small rooms in the Western Area, were largely an open zone in middle to later level 4, with few vestiges of architecture preserved. In phase b, remains of a mudbrick mass in the southeast (60B) suggest a reinforcement or glacis against the outer wall of the Round

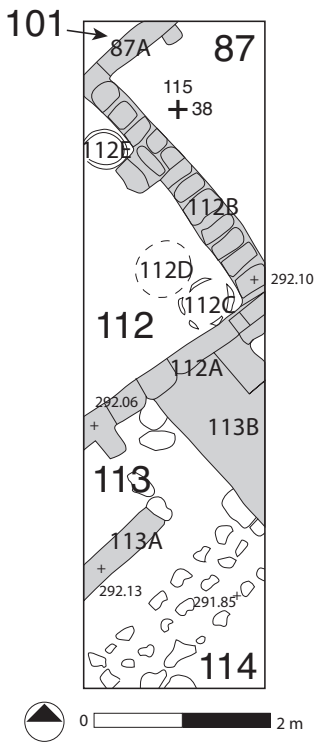


FIGURE 2.71. Level 4, west central area (36/120), phase a. *Illustration prepared by Violaine Chauvet.*

Building (see Figures 2.15, 2.65). Ashy debris in area 60 contained numerous sherds. For contemporaneous phases to the southwest, see areas 62/63.

Objects: area 60—two bronze fragments, bone awl, quartz bead.

Complete vessels/profiles: area 60—large Medium Simple Ware round-based jar with everted rim (Figure 4.19:23).

Phase c: In phase c, a northwest-southeast mud-plastered wall (61A) preserved to five courses was constructed in the southern part of the central zone, dividing areas 60 and 61 (see Figure 2.65). Area 50 was demarcated by mud-plastered walls preserved only to the height of one or two mudbrick courses, enclosing a room with an earthen floor. To the south of room 50 in area 60 was a mud-plastered wall stump (60A) two courses high with traces of a pebble surface ca. 30 × 30 centimeters to its east and a small, circular lime-plastered depression (60C) to its north. East of platform 58E is open area 100.

Objects: area 100—clay model wheel fragment, clay cylinder with flaring ends.

Southwest Area (Figure 2.72)

Area 62: Area 62 is a room built against the outer wall of the Round Building. The interior faces of the room walls and the floor surface were coated with green or yellow lime plaster, and lime-plastered mudbrick benches (62E–F) were positioned against the room walls in the northwest and southeast corners of the room. The southeast wall of the room (62B), which had 15 courses preserved, leaned markedly to the west, probably under pressure from the Round Building outer wall. A buttress comprised of upright bricks was part of the northeast wall (62C) (cf. also the buttresses comprised of upright bricks in level 3, area 2, phase c). Evidence of an apparent doorway blocked with mudbricks was noted in the northeast wall east of the buttress (where the label 62C is placed in Figure 2.72). The southwest wall (62A) was poorly preserved.

In the western part of the room were two circular clay ovens (62G–H), left unexcavated. The skeleton of an infant was found on the floor surface north of the buttress in the east wall 62B (Burial 37); no burial pit dug from above was recognized.

Complete vessels/profiles: Cooking Ware lid with handle (Figure 4.24:19).

Area 63: This area, whose southeast and southwest walls were relatively thick, was built against the Round Building outer wall. No floor surface was identified in the room.

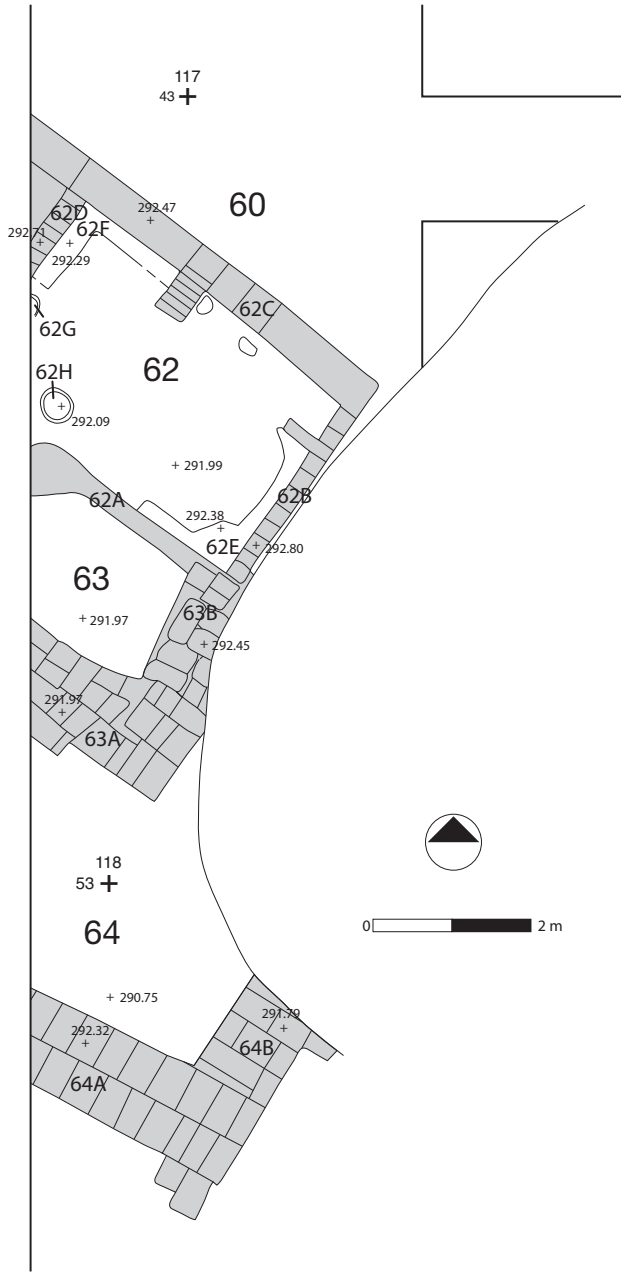


FIGURE 2.72. Level 4, southwest area. *Illustration prepared by Violaine Chauvet.*

Area 64: South of room 63, area 64 was immediately below the present-day tell surface and was much eroded by gullies. No floor surface was identified.

Objects: bronze fragment, gypsum (?) lid rim sherd, bone bead.

Northwest Area

Area 66 (Figure 2.70)**:** The fragment of a rectangular room in the northwest corner of the extant remains of level 4, area 66 was much destroyed by later foundation constructions for level 3, area 56. The room is oriented according to the cardinal directions, as is the case with the level 3 architecture built above it, and there is a possibility that it might be better assigned to early level 3 than to level 4.[17] An earthen floor was identified in the eastern portion of the room associated with a mud bin (66D) whose interior and exterior walls had a greenish-white, lime plaster coating.

Area 99: An open zone between area 66 and area 67–70.

Objects: clay animal figurine fragment, bone awl fragment, bone needle.

Areas 67–70: In the north area were two structures (areas 67–70 in the west and areas 77/78 in the east) that remained in use while various rooms and features were added and modified in adjacent areas.

Area 67 (Figure 2.70)**:** Abutting areas 68 and 69 to the southeast and thus apparently constructed later than those structures was the small corner of the incompletely excavated room 67, with a clay circular oven (67C) visible.

Area 68 (Figure 2.70)**:** Area 68 is a small space later modified by the addition of room 67 to the east. A door socket was found in the west corner of the space, but no door was identified or floor surface reached. The room gives the impression of having been truncated by the construction of wall 68A to the south, but excavations did not proceed deep enough to confirm that this wall was later than the others in its vicinity.

Area 69 (Figures 2.73–2.75): Area 69 is the square, smaller room of a possible two-room structure area 69/70. The room's interior wall faces had a coating of yellow lime plaster, and an upper floor at elevation 293.10 had a similar lime plaster coating. The room walls continued down below this floor, but a lower floor had not been reached when excavations terminated.

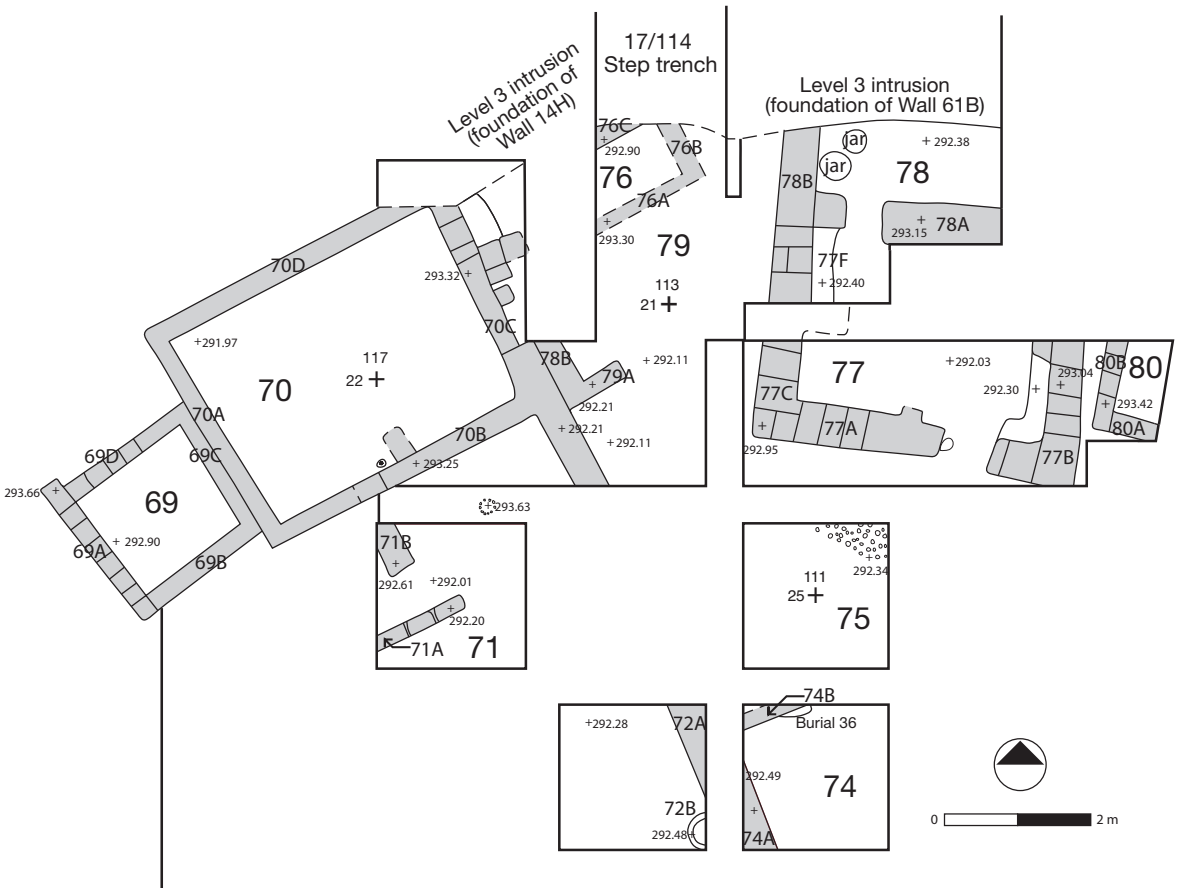


FIGURE 2.73. Level 4, north area, phase a. *Illustration prepared by Violaine Chauvet.*

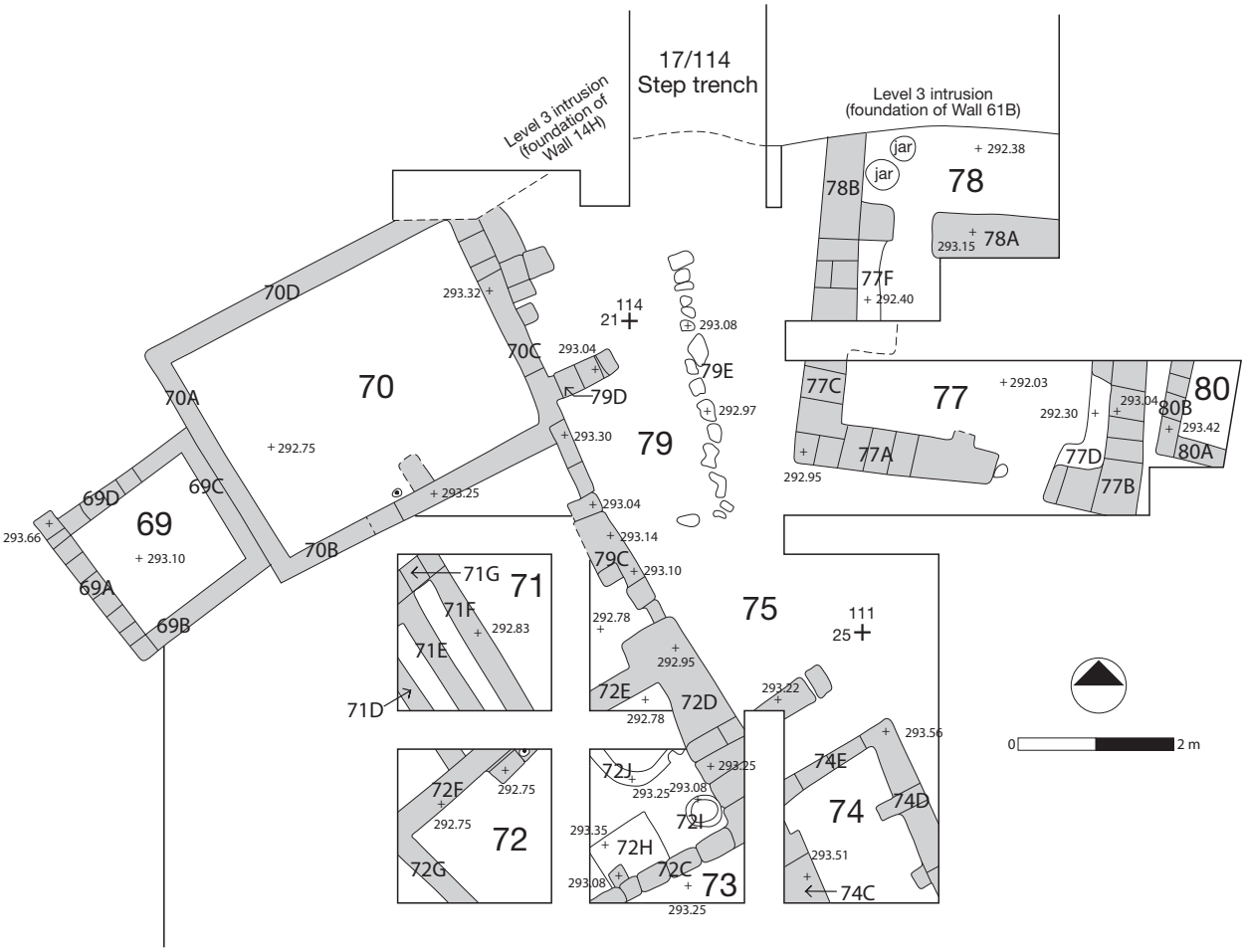


FIGURE 2.74. Level 4, north area, phase b. *Illustration prepared by Violaine Chauvet.*

Area 70 (Figures 2.73–2.75): Area 70 is the larger room of areas 69/70. Its walls were lime plastered, and an upper lime-plastered floor was reached at elevation 292.75. In this upper phase, fine ashy soil on the floor in the eastern part of the room yielded a number of clay tokens, sealings, and tablet-like fragments. The deposit of fine ash contained very little mudbrick debris and may have been the result of a conflagration. An earlier floor was identified at elevation 292.25, and the room walls continued below this floor, but their bottoms were not reached when excavation terminated. A blocked doorway in the southeast wall of area 70 (70B) was apparent next to a door socket.

Objects: 3 clay tablet-like fragments, 6 (possibly 7) clay tokens, 16 clay unimpressed sealing or sealing-like fragments, bronze fragment, bone awl fragment, two small clay wheels, clay bead, shell bead, carnelian bead.

Areas 77/78 (Figures 2.73–2.75): To the east of the areas 67–70 construction was the two-room structure areas 77/78, cut to the north by the foundations of the level 3 community enclosure wall (level 3 wall 61B). Although the building appears to have consisted of two rooms, it may have included more, given the incomplete state of excavation and disturbance to the north. The bottom of wall 78B was reached at elevation 291.67.

Both rooms had greenish-white lime-plastered interior wall faces and floors. The southern room, area 77, also had lime-plastered mudbrick benches against the east and west walls (77D, 77F). The floor plaster in area 77 overlapped that of bench 77D, whose plaster in turn overlapped that of wall 77B. The east and west walls of the room had interior buttresses, of which the western example (77E), while mainly unexcavated in the balk, was clearly vaulted.

In the north room (area 78), two large storage jars were sunk into an apparent rectangular brick or mud feature against wall 78B, adjacent to the area 78 floor.

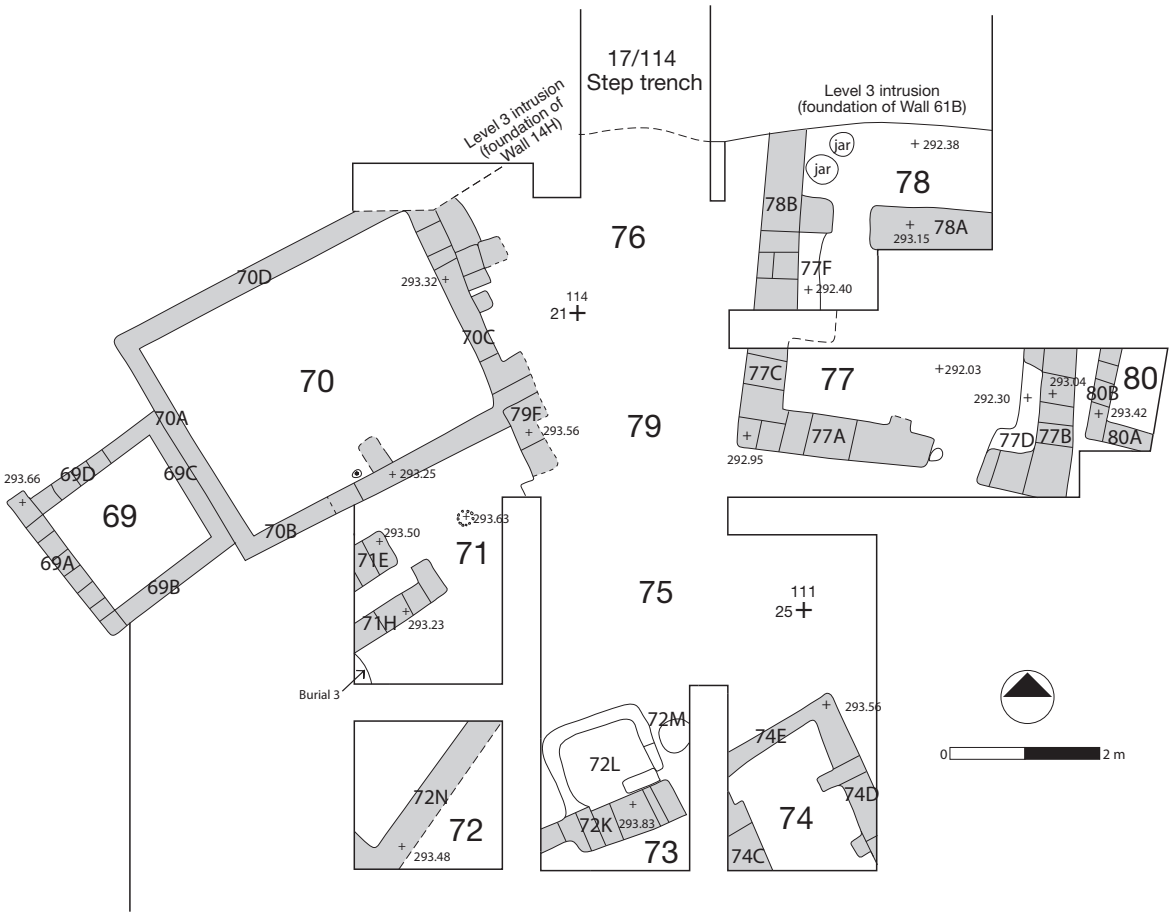


FIGURE 2.75. Level 4, north area, phase c. *Illustration prepared by Violaine Chauvet.*

This feature was not fully articulated when excavation terminated.

Since the building of areas 77/78 is thicker walled than most level 4 architecture outside the Round Building, it may have been a structure of some significance within the community, perhaps the house of a family of slightly greater status or wealth than others.

Just to the east of area 77 was the southwest corner of another structure, area 80, only minimally investigated, with no floor surface identified.

Objects: area 77—clay sherd disk fragment, white stone pendant.

Areas 71–76 and 79: An assortment of features and architecture built between and to the south of the areas 67–70 and 77/78 buildings in level 4, areas 71–76 can be divided into three phases.

Areas 71–76 and 79, phase a (Figure 2.73): Two wall fragments were noted in area 71 (71A, 71B) without clear associations to floors or other architecture. In Area 74 to the southeast was the perpendicular intersection of two walls (74A, 74B), with the top of a clay oven (72B) west of wall 74A; no floors were identified. The burial of a child (burial 36) was situated underneath wall 74B and thus belongs to an earlier phase. In area 75 was part of a pebble pavement.

The presence of several rooms or enclosures is indicated in areas 76 and 79. Reconstruction of the walls of the small square room of area 76 is very uncertain because of their poor preservation. The locations of walls 76A and 76C in the west balk of trench 29/114 are definite, however. In the area south and east of wall 79A was evidence of a greenish-white, lime-plastered surface (elevation 292.11).

Objects: area 76—white stone door socket/mortar; area 79—notched bone implement, basalt grinding stone type A.

Areas 71–76 and 79, phase b (Figure 2.74): A grill structure composed of parallel walls separated by narrow

intervals (71D, E, F) in area 71 was constructed north of a room with several features (area 72) (Grill Building 6 in Schwartz and Curvers 1993/1994:250). The material between the parallel grill walls was green soft soil. A door socket was found adjacent to wall 72F, which, if in situ, might indicate that access to the grill architecture was available from this location. Area 71 east of the grill structure had a white lime-plaster surface.

Use of the area 72 room can be understood as having three phases, each with a different pyrotechnic feature. First, the small clay oven 72I was employed, then the large clay and mudbrick bin 72J was installed, and finally, feature 72H was added, consisting of a small brick platform one course high with ash deposited atop its center.

South of area 72, a small segment of an additional room (area 73) was excavated with a white lime-plastered floor. East of areas 72 and 73 was a room with two interior buttresses on its east wall (area 74); no floor was clearly identified.

In the open area 79 between the 69/70 and 77/78 structures a line of stones (79E) may have functioned as the lowest course of a fence or boundary marker in the passageway.

A schematic diagram of this phase was published in the 1993/1994 report by Schwartz and Curvers (abb. 74; note that north is oriented toward the left). The small room with facing interior buttresses east of area 70 in that diagram is now interpreted as a mix of brickwork from different phases and contexts and should be disregarded.

Objects: area 79—bone pin fragment.

Areas 71–76 and 79, phase c (Figure 2.75): The latest level 4 phase in this area sees the disappearance of the grill installation and adjacent architecture in areas 71 and 72. Instead, disconnected wall fragments are evident in the west (71E, 71H, 72N), and a new large rectangular mud, bin-like feature (72L, appended to wall 72K) was installed in area 72, next to a small clay circular oven (72M). The area 74 room remained extant. In this phase, the passageway between the 67–70 and 77/78 structures had no features.

As in the upper phase of area 70, a collection of clay sealings, tokens, tablet-like objects, and other "administrative" objects were found in areas 71–76.

Objects: area 71—18 clay unimpressed sealings, 6 tokens, clay tablet-like object, small clay wheel fragment, gypsum (?) disk fragment, bone awl fragment, basalt grinding stone type A fragment, carnelian bead, quartz bead, 3 white stone beads; area 72—bone pin fragment, basalt grinding stone type A fragment, bone bead; area 74, phases b-c—clay human figurine fragment, 3 bronze fragments, stone mace or hammerhead fragment; area 75, phase c—clay token, clay spindle whorl, white stone door socket/mortar; area 75, phases b-c—4 clay tokens, 2 clay unimpressed sealing (?) fragments, clay andiron, tapered clay object, 6 clay animal figurine fragments, 2 bronze fragments, gypsum (?) lid rim sherd, gypsum (?) disk fragment, 2 bone pin fragments, bone awl fragment, clay spindle whorl, small clay wheel (whorl?), clay bead, faience bead, shell bead, white stone bead; area 76, phase c—clay spindle whorl; area 76, phases b-c—clay unimpressed sealing, clay token, clay spindle whorl, 2 bronze fragments.

Center North Area (Figure 2.76)

The level 4 remains in this area were partly destroyed by the foundation structure for the level 3, area 21 "temple."

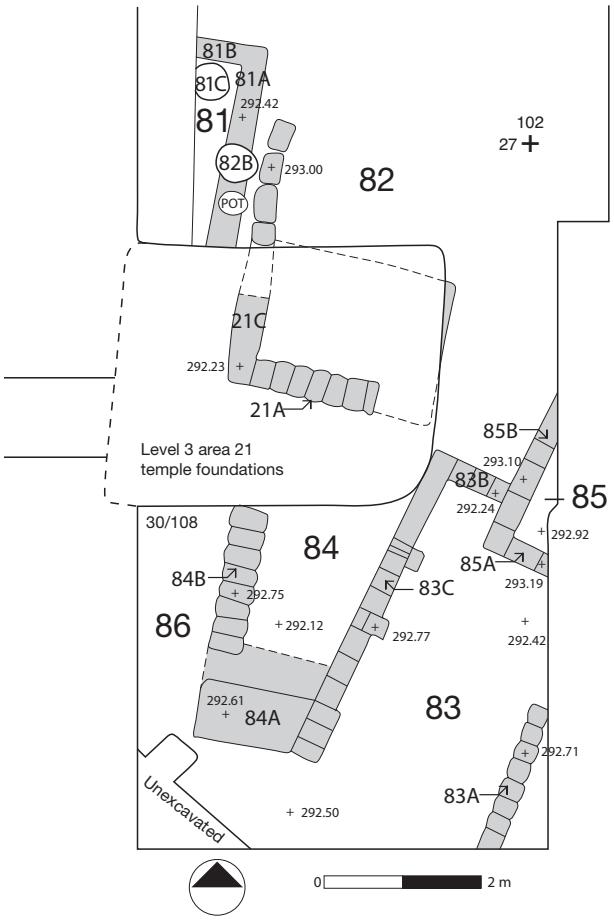


FIGURE 2.76. Level 4, center north area.
Illustration prepared by Violaine Chauvet.

Figure 2.77. Level 4, area 82–86, with part of foundation massif for level 3 temple visible. Looking west.

Areas 82–86, phase a: North of the level 3, area-21 foundation structure was the corner of a room (81) that was incompletely excavated and whose floor surface was not reached. The top of a circular clay oven (81C) was identified.

Incorporated into the brick fill of the level 3, area 21 foundation structure were two perpendicular walls (level 3, walls 21A and 21C) that are probably best assigned to this phase. The corner of a brick (21B) noted underneath the area 21 foundation structure and jutting out to its northeast appears to have been a corner of this level 4 room.

Level 4 architecture was also exposed south of the level 3, area 21 foundation structure in areas 83, 84, and 86 (walls 83A–C, 84A–B) (Figure 2.77). Floor surfaces associated with this architecture were not unequivocally identified, nor are their architectural plans easily comprehensible.

Objects: area 82—clay spindle whorl; area 83—clay animal figurine fragment; area 86—stone spindle whorl, quartz bead.

Areas 82–86, phase b: In this phase, room 85 was constructed to the east, with one corner extant in the excavation area; the room interior was only minimally excavated and a floor was not reached. In the debris between the level 3 temple foundation and area 85 was a concentration of pebbles ca. 65 × 100 centimeters and 7 centimeters thick.

To the north, a circular clay oven (82B), a partly preserved cooking pot in situ to its south, and an adjacent row of mudbricks two courses high dated to phase b.

Objects: area 82, phase b—clay square object with legs; area 82, phases a-b—clay animal figurine fragment, clay human figurine fragment, 2 quartz beads, 2 white stone beads, white stone disk; area 83, phases a-b—basalt pestle type F, 5 small bronze fragments.

South Area (Figure 2.78)

What appear to be a set of long narrow parallel rooms oriented northwest-southeast was exposed south of the Round Building in the southern portion

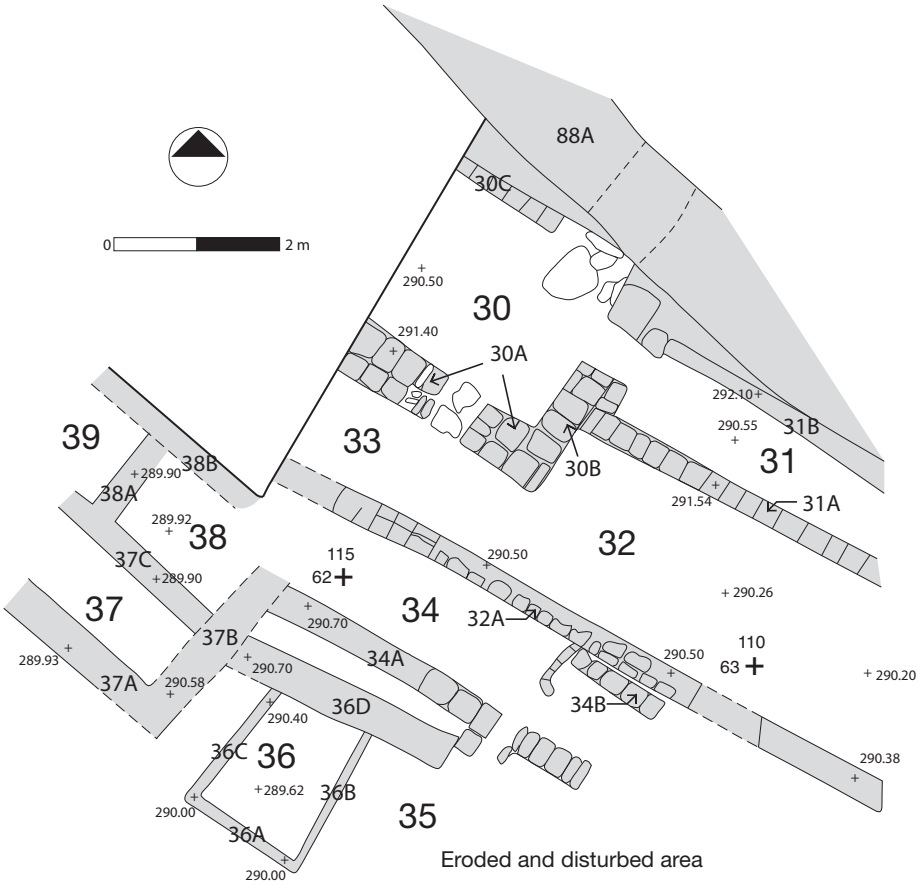


FIGURE 2.78. Level 4, south area. *Illustration prepared by Violaine Chauvet.*

of excavation units 42/114, step trench 42/116, and trench 60/120. Since this architecture was often found just under the present-day mound surface, it was frequently not well preserved or had been disturbed.

Area 30: Area 30 is a room built against the Round Building south of that structure's entryway, its walls 30A–C abutting those of the Round Building and area 31 to the east. Both the walls of area 30 and area 31 were built on top of the same gray soil layer. In the southwest wall of the room (30A) was a doorway with a threshold of stone slabs (largest slab 50 × 30 × 30 centimeters). Several stones were also inserted into the brickwork of wall 30A, including a flat stone (40 × 59 × 10) set vertically in the bricks west of the doorway. In the northeast corner of the room adjacent to the doorway into the Round Building was a set of stone slabs, some as large as 50 × 70 centimeters, extending out from the stone threshold in the doorway.

Patches of a green, clay floor surface were identified at the bottom of the room debris, connecting to traces of light green lime plaster found atop the stone threshold of the wall 30A doorway.

Objects: clay animal figurine fragment, white stone bead.

Area 31: East of area 30, area 31 was also a room built against the Round Building and on top of a gray soil layer. Its north wall (31B), abutting the outer wall (88A) of the Round Building, had a vaulted ceiling. It is possible that the south wall (31A) also had a vaulted ceiling, but it was preserved only as high as the elevation where the vault of 31B began to appear (see Figure 2.1), so it is uncertain whether the south wall was also vaulted.[18] A package of 3–4 sequential earthen floor surfaces were exposed below the room's accumulated debris.

Objects: clay andiron fragment, gypsum (?) lid rim sherd.

Complete vessels/profiles: Medium Simple Ware round-based, flaring neck jar (Figure 4.19:26).

Areas 32/33: These areas make up the long narrow space south of rooms 30 and 31, demarcated to the south by wall 32A (lowest elevation of 32A, 289.64). At the bottom was a gray earth surface with pebbles, above which were alternating deposits of gray soft ashy material and brownish-red harder bricky fill.

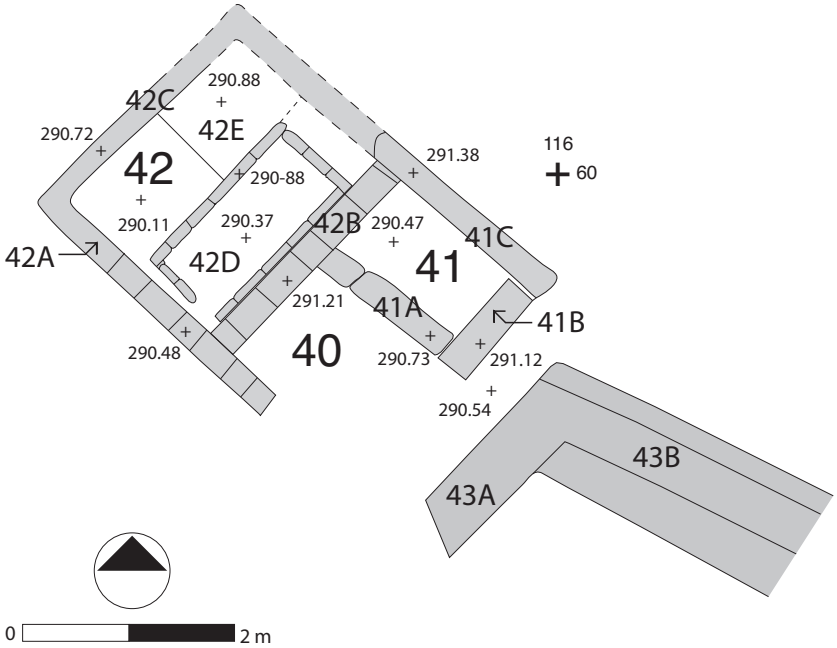


FIGURE 2.79. Level 4, south area, areas 37–43, phase b. *Illustration prepared by Violaine Chauvet.*

Objects: worked rectangular potsherd, triangular worked ulna fragment of large mammal.

Complete vessels/profiles: Medium Simple Ware flat-based, simple rim bowl (Figure 4.18:8).

Areas 34/35:

Area 34 is a long narrow space between northwest-southeast oriented walls 32A and 34A that included the remains of a brick bin-like feature (34B) against wall 32A. To the south and east, area 35 was heavily disturbed and eroded, its deposits located just below the present-day tell surface and mixed with modern debris like plastic bags and metal cans.[19]

Objects: area 34—clay animal figurine fragment; area 35—pestle type A.

Area 36: Consisting of a squarish bin or enclosure of upright mudbricks, area 36 has walls dug into earlier contexts (compare bin 42D in area 42, for which see below). A red/brown earth surface was identified at the bottom of the structure, and the fill above contained very loose ashy material with abundant sherds. The structure was found just below the present-day mound surface, and its dug-in character might allow for a date later than level 4.[20]

Objects: stone door socket/mortar fragment.

Complete vessels/profiles: Fine Simple Ware pointed-base, simple-rim corrugated goblet (Figure 4.20:8).

Areas 37–43: Two phases of small rooms whose remains were uncovered just below the present-day mound surface and were often poorly preserved due to intrusions, erosions, and wetness.

Areas 37–43, phase a: Fragments of three rooms were noted (areas 37–39) in this early phase; a light gray earth floor with pebbles was identified in the small area 38 room.

Areas 37–43, phase b (Figure 2.79): In phase b, a set of rooms (areas 40–42) were built on top of phase a rooms 37–39. The northwest space, area 42, had two phases of use. In its earlier phase, it had a green-yellow (lime?) plaster floor (elevation 290.11), and tannur fragments were found in the debris just above the floor. Subsequently, a rectangular bin constructed of upright mudbricks (42D, compare area 36) was installed in the southeast. Dug into earlier levels, feature 42D had destroyed the phase a remains in this area. A gray-black and white (lime plaster?) surface was noted at the bottom of the bin, whose contents included ash, brick, and tannur fragments. West of 42D was a mudbrick platform three courses high (42E, elevation 290.57–290.88). There was evidence of a possible door in the northeast wall of the room (41C) behind bin 42D.

Area 40 had evidence of a light gray surface at elevation 290.59. The small cubicle area 41 had a red-brown earthen floor inside. In a subsequent phase of use, a platform comprising a single preserved course of mudbricks (top elevation 291.38) was built above the area 41 enclosure, including its southwest wall 41A.

The mudbrick walls of area 43, southeast of areas 40–42, were found just below the modern tell surface and were only minimally preserved.

Objects: area 42, phases a-b—pestle type C.

Areas 97/98 (Figure 2.80)**:** In unit 65/108 to the southeast, above more coherent level 5 architecture (level 5, areas 13/14), fragments of architecture probably contemporaneous with level 4 were noted. Under the present-day mound surface, this area had suffered from bulldozer activity. Wall 98A (elevations ca. 290.00–290.90) was the first structure to be installed, followed by area 97, represented by the corner of a room whose interior walls faces and floor had a coating of yellow lime plaster.

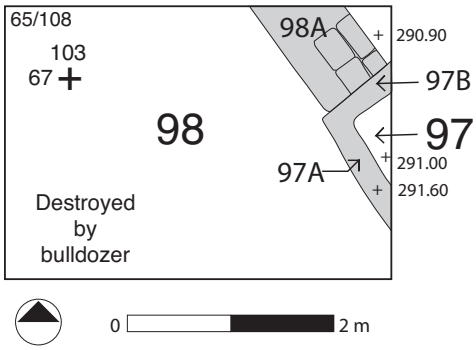


FIGURE 2.80. Level 4, southeast. *Illustration prepared by Violaine Chauvet.*

Areas 108–110:

Areas 108–110 were sounded immediately south of the Round Building, east of area 32. Area 108 is located south of "silo" 2, without architectural remains. Area 109, in trench 52/100, was south of area 3 in the Round Building and revealed portions of two rooms but was not significantly excavated.

Objects: area 108—clay animal figurine fragment, clay cylinder; area 109—clay rectangular token (?), clay animal figurine (?) fragment.

Area 104: A sounding outside the Round Building to the east was conducted in area 104; no architecture was noted.

Objects: clay animal figurine fragment.

LEVEL 3

Level 3 refers to deposits contemporaneous with the second and last major phase of the Round Building and with the "temple" (area 21) (for relevant section drawings, see Figures 2.81, 2.82, and 2.20). Covering an area of ca. 1,300 square meters (Figures 2.83, 2.84), the level 3 exposure is the largest attained at Raqa'i with a coherent architectural plan.[21] Although it is likely that the level 3 settlement extended farther to the south, given the eroded southern slope, elsewhere there are indications that the present-day mound approximated its ancient extent. In the north and northeast, for instance, the level 3 edge of the mound is clearly indicated by its retaining walls (14L, 56H, 61B, 67B, and 68A).

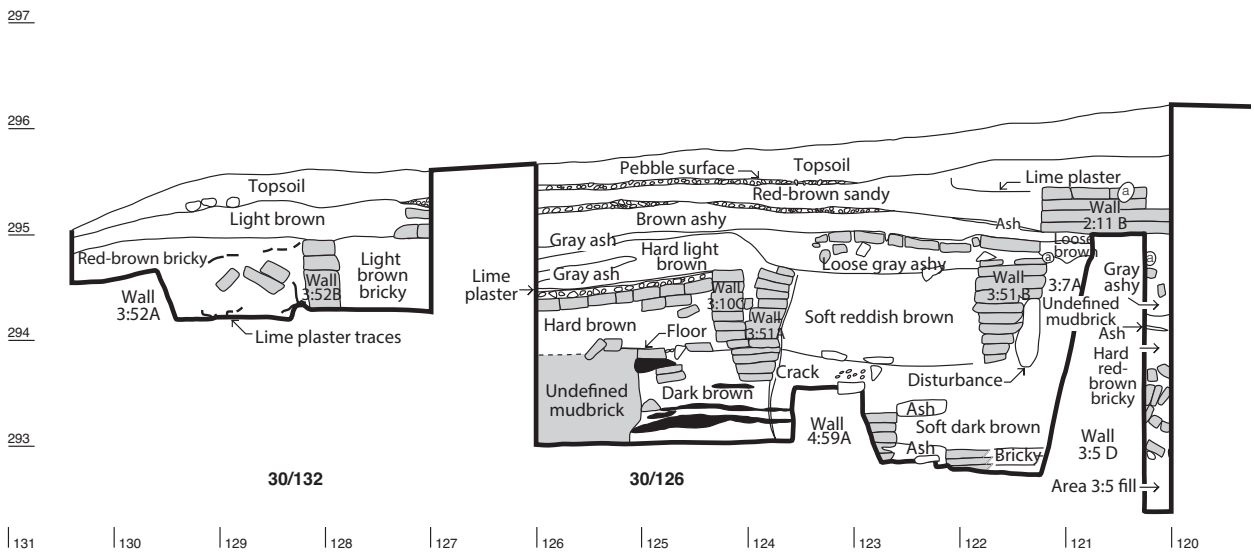


FIGURE 2.81. North balk section, 31 east-west grid line *(continued on following 2 pages)*. Black = ash; a = animal burrow. Walls and features indicated by level and feature number (e.g., Wall 3:5D = level 3 wall 5D). *Illustration prepared by Julie Perlmutter.*

Although an estimate of the total size of the community is tenuous, it is nonetheless likely that most of the area covered by the ancient level 3 community has been exposed. A very rough estimate of 0.21 ha is suggested, leaving room for the southern part of the Round Building and additional architecture to its west, south, and east (Figure 2.84).

Because the exposed sample is so sizeable, we may consider the organization and layout of the entire community in a way that is relatively unusual in the archaeology of early complex societies in the Near East (see Chapter 3). We may also consider the details of construction as utilized in structures and features over the (near-) complete settlement.

Considering the settlement in its entirety, we find that Raqa'i 3 consists of small-scale architectural units organized radially around the large Round Building. A similar arrangement existed at Tell Gubba, an early third-millennium site organized around a round building in the Hamrin region of Iraq (Fujii 1981: figure 8), and a radial organization is also observed for Melebiya in its mid-third-millennium occupation (Lebeau 1993:42). The Raqa'i 3 small-scale architecture is oriented diagonal to the cardinal directions, with the exception of the area 21 temple and the area 56 room to the northwest, both aligned north-south.

Separating the blocks of architecture in the Raqa'i 3 settlement was a set of streets or alleys. The relatively wide thoroughfare (2–3 meters) of area 38 provides a passage between the Round Building and smaller-scale architecture to the east and northeast. Narrowing in area 48, the passage turns to the northwest toward areas 60 and 58. Narrow alleys divide the segments of small-scale architecture, including the dog-leg passages of areas 73/84 and (apparently) 67/72 as well as areas 50, 57, and 82. These passages were often blocked and turned into dead ends, as in area 82 northeast, area 72 southwest, area 50 south, and area 57. In areas 72, 82, and possibly area 71, phase a, the blockings appear to have been associated with the installation of ovens.

A number of structures conformed to a type that we designate the "two-roomed house," which consists of two adjacent rectangular or sometimes square rooms, one of which is significantly larger (up to twice the size) than the other (e.g., areas 1/2, 20/83, 18/19, 52/53, 13/14, 15/16). The smaller room tends to be the more southerly of the two rooms. Pfälzner (2001) proposes that most two-room houses were originally one-room, with another room added later, but the two-room houses whose full sequences were excavated at Raqa'i (areas 1/2, 13/14, 15/16, 20/83[22]) appeared to have included two rooms from the beginning. In the eastern area of multi-room houses, however, the earliest phase excavated of areas 32/33/69 consisted of only one room.

On the northwest and northeastern slopes of the level 3 tell, retaining walls (14L, 56H, 61B, 67B) were sunk into level 4 remains to protect the level 3 domestic architecture adjacent to the south. These constructions are not interpreted to be part of a community enclosure or defensive wall because of their disjointed

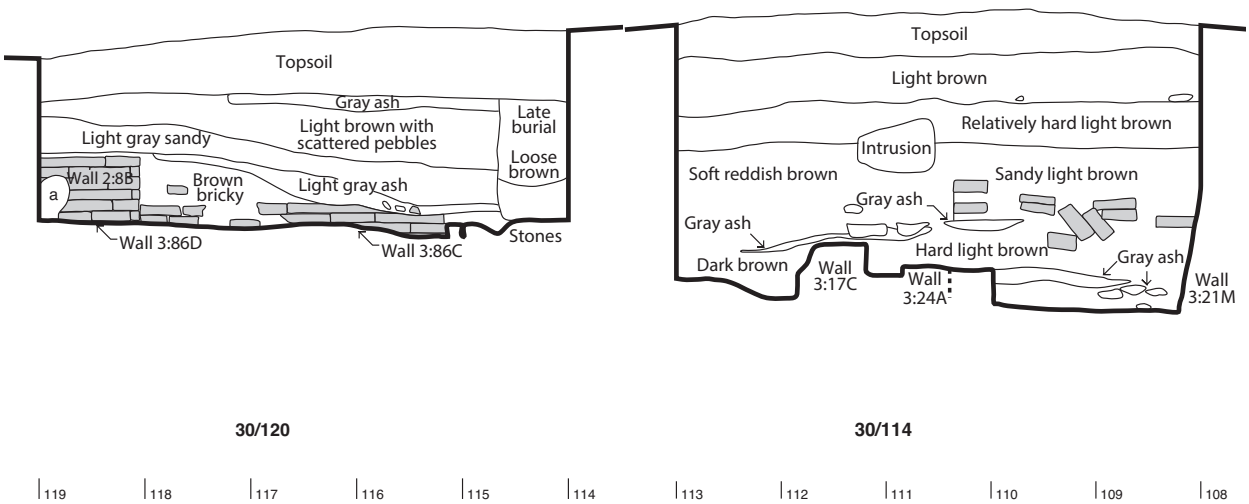


FIGURE 2.81 (*continued*). North balk section, 31 east- west grid line *(continued on following page)*. Black = ash; a = animal burrow.

character: there was clearly no continuation of this structure east of wall 14L, where collapsed level 4 mudbrick walls were exposed.

In general, the preservation of level 3 architecture was reasonably good. Although a few rooms had only one or two brick courses preserved above their earliest associated floors (e.g., areas 8, 12), room walls were usually preserved 40–100 centimeters above the earliest floors and sometimes higher. The temple of area 21 was preserved up to 1.7 meters above its floor, and the Round Building exterior walls were preserved as high as 1.9 meters. Constructed in level 4, the "silos" of areas 4–6 remained extant almost up to 3 meters.

CONSTRUCTION MATERIALS AND METHODS

The most common building material in Raqa'i 3 was sun-dried mudbrick, usually of a reddish-brown color, with mud mortar. A wide range of brick sizes was employed, but particularly common were 50 × 30, 45 × 30, 40 × 30, 34–36 × 24–26, and 30 × 30, all with a height of 8–10 centimeters.[23] A study of the bricks used in the area 15 walls and installations revealed that the bricks of lime-plastered installations had abundant sherd and bone fragments, while bricks in walls had far fewer inclusions. This pattern may indicate the on-site manufacture of the bricks used for installations, employing material from the tell itself, as opposed to an off-site source for the bricks intended for walls (Bachelot and Sauvage 1992:20).

The level 3 buildings were sometimes constructed without any foundational features (e.g., area 83), but several methods of providing substantial foundations or wall bases were often employed. In some cases, one or more courses of headers (or simply relatively wide bricks) constructed above floor level formed the base of a wall, and narrower bricks were used in the higher courses; in this arrangement, the projection of the wider courses at the wall base into the room interior was lime plastered and took the form of a mudbrick bench (cf. wall 9C/bench 9A; walls 70D, 70C; wall 52B).

Alternatively, a wall and its parallel adjacent and abutting mudbrick bench were built on top of a subfloor foundation row of brick headers whose width was equivalent to the combined widths of the bench and wall above (area 2; area 8, walls 8B–C, benches 8A, 8E; area 14, wall 14C/bench 14E; area 16, wall 16B/bench 16F). The unusually substantial foundations of area 56 deviate from the common patterns and consist of two-row foundation courses rather than one row of wide bricks or headers. Most elaborate of all were the foundations of the "temple," area 21 (see below).

Above the wall foundations, courses of headers or stretchers were common, but square bricks or odd-sized pieces were also often included. The walls of individual rooms tended to be bonded to one another but not to the walls of adjoining rooms. Thus, in the two-room houses and other multi-room structures, each room was constructed as a discrete unit.

Lines of stone cobbles or boulders were sometimes used to bolster the bases of mudbrick walls on their exteriors (e.g., walls 2C, 36A, 40B, 56A, 70B, phase a, 74C, 83D), probably as protection against erosion from rainwater (Aurenche 1981:38). In contrast, wall 83B

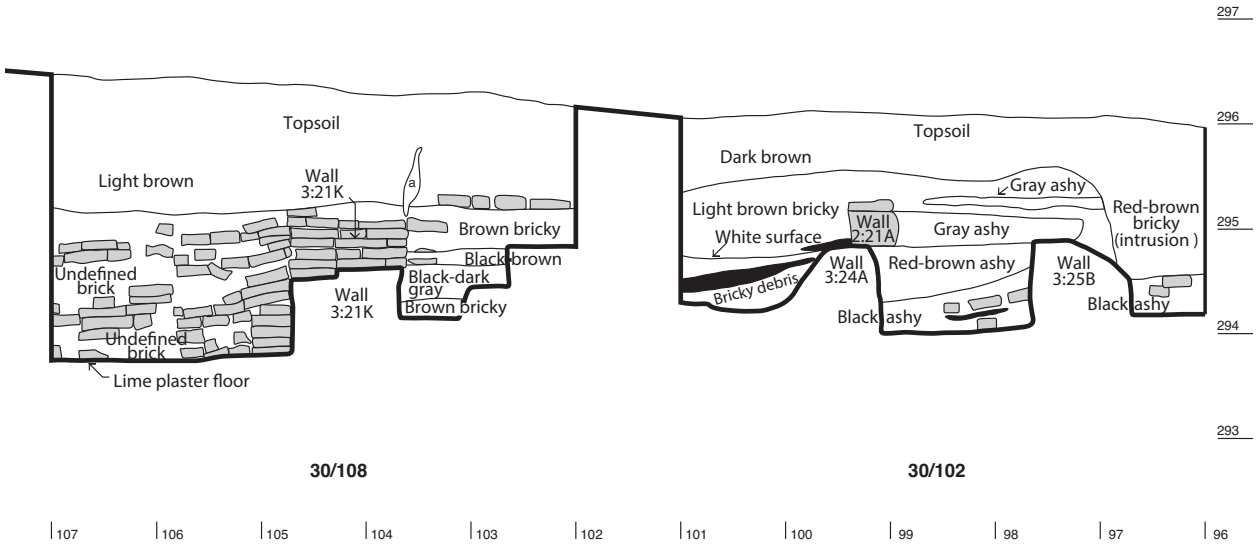


FIGURE 2.81 *(continued)*. North balk section, 31 east–west grid line. Black = ash; a = animal burrow.

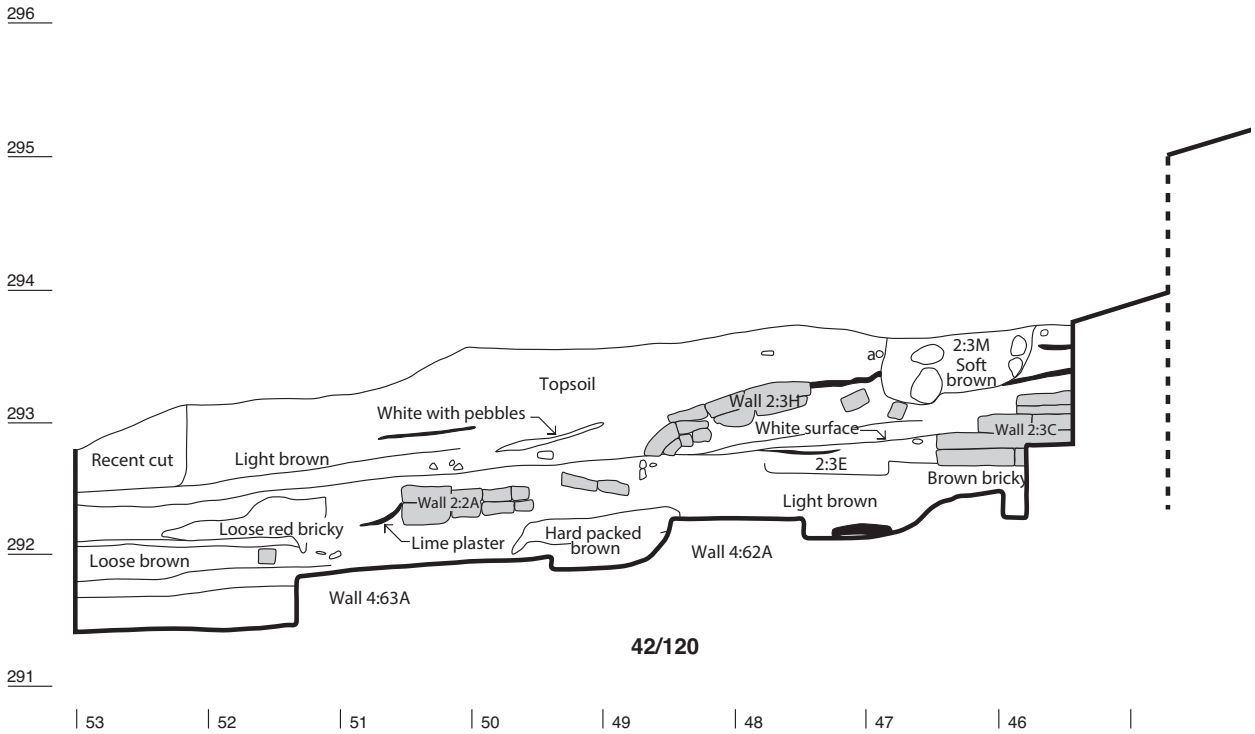


FIGURE 2.82. West balk section, 119 north-south grid line *(continued on following 3 pages)*. Black = ash; a = animal burrow. Walls and features indicated by level and feature number (e.g., Wall 2:2A = level 2 wall 2A). *Illustration prepared by Julie Perlmutter.*

had cobbles and sherds against its inner face. On occasion, mudbrick walls were built on top of stone foundations (walls 1D, 51A–B, 58A; cf. also 21K and 14H).

With the possible exception of area 47 in the Round Building, the level 3 structures all appear to have been single story. No stairways to an upper floor were identified, and walls were usually of a minimal width, ca. 25–50 centimeters, unlikely to function effectively as a second floor support (Kramer 1982:99). Generally, the walls were constructed of a single row of mudbricks, but exceptions are not uncommon and can consist of a row of 1-1/2 bricks (e.g., walls 8B–C, 22A, 59A), a row of two or more small bricks (e.g., walls 39A, 66C–D, 79A), or other configurations (e.g., walls 43B, 43C, 51B–D; for remarks on the Round Building, see below). While many structures had a combination of thicker and thinner walls, some had conspicuously wider walls (ca. 50 centimeters or more), particularly in the central and northwestern areas (areas 8, 13/14, 42, 47, 51, 52/53, 56, "silos" 5 and 6), while others had notably thin ones (ca. 24–30 centimeters) (areas 10, 17, 18/19).

The use of interior buttresses is very common in level 3 structures, both in smaller-scale buildings and in more substantial architecture like the northwest slope retaining walls and the Round Building, while occasional exterior buttresses were also encountered (e.g., wall 18D and the exterior wall of the Round Building). Arched interior buttresses were preserved in areas 6 (a level 4 structure still extant in level 3) and 25. Interior buttresses, both straight and arched, are typical of small-scale, third-millennium architecture in the Khabur area (Bielinski 1991:96; Bielinski 1992: figure 1; Fortin 1990a: figure 8b; Fortin and Cooper 1994: figures 4, 6, 7, 9, and 11; Klengel-Brandt and Martin 2005; Kolinski and Lawecka 1992:184), but they are absent from the larger, later communities at Melebiya and Bderi (Lebeau 1993; Pfälzner 1990). As noted above, Pfälzner (2001) proposes that pairs of facing interior buttresses were arched to support a flat roof, which is possible, but they may also have served to stabilize the walls, as suggested by rooms with only one interior buttress or rooms where the buttresses on opposite walls did not face each other (e.g., area 25). None of the level 3 interior buttresses showed evidence of vaulting.

In level 3, some rooms have two pairs of perpendicular facing interior buttresses (areas 2, 19, 25, 83)[24] or one pair plus an additional buttress on a third wall (areas 29, 34, 56); these are found in both the large and

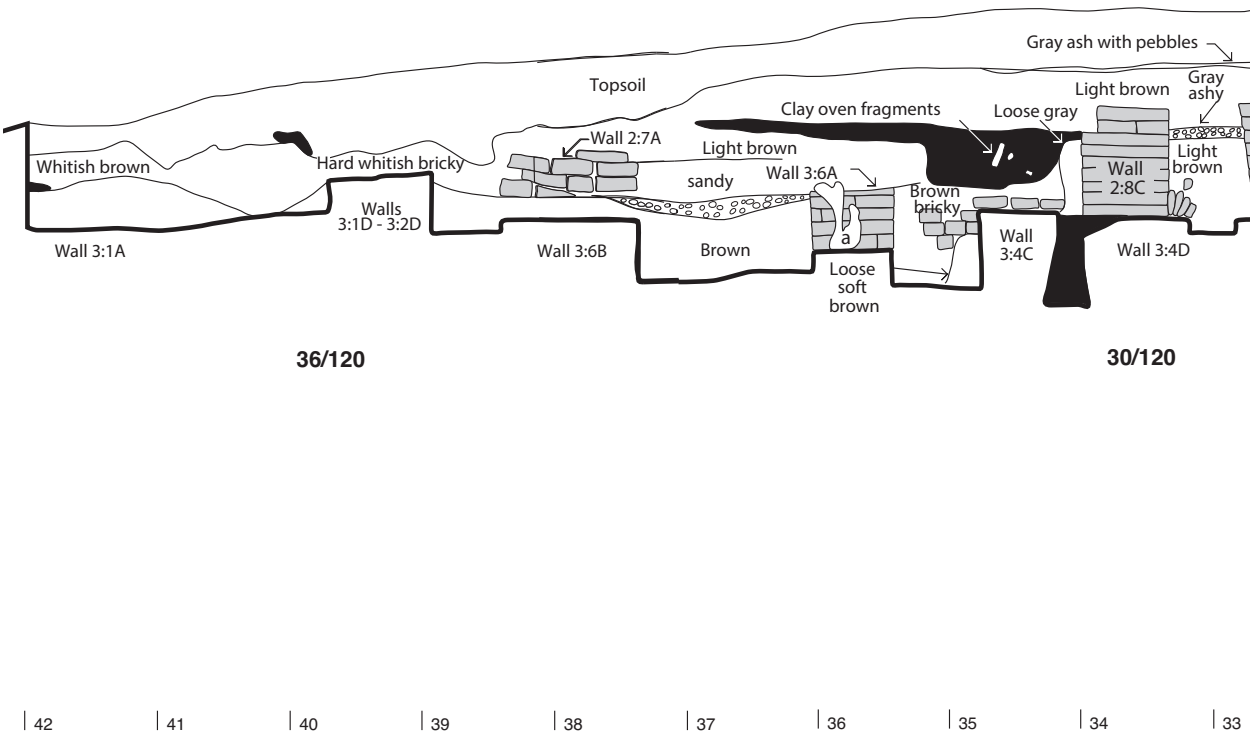


FIGURE 2.82 *(continued)*. West balk section, 119 north-south grid line *(continued on following 2 pages)*.

small rooms of the two-room houses on the west, in single-room structures, and in the multi-room expanse on the east. Silo 6 had two parallel pairs of facing buttresses. Rooms with only a single facing pair of interior buttresses are less common and are restricted to the west and temple area (areas 10, 15, and 16). Other spaces in both the eastern and western areas have only a single interior buttress preserved (areas 10, 12, 14, 18, phase a, 29, 31, 33, 51, 52, 53, 69), while area 17 had two perpendicular buttresses visible and area 20 had two on one wall. In Raqa'i level 3, structures that are recognizable as discrete units ("houses"; see Chapter 3) with their plan relatively complete include at least some interior buttresses, with the exception of the "temple."

It seems fairly easy to distinguish between roofed and unroofed space in level 3. Roofed areas would have been limited in size by the length of available roof-beam timber, and almost every unit of the expected dimensions has lime-plastered walls (inner faces only) and/or floors (exceptions are areas 40, 42, and 51) (Figure 2.85). Lime plastering is unattested in the putative outdoor contexts. A chemical analysis of the white plaster at Raqa'i concluded that it was made from lime and not gypsum (Rehhoff et al. 1990), contrary to the results obtained from Melebiya (Lebeau 1993:89, n. 2). In the absence of lime plaster, the inner faces of walls often had evidence of mud plastering. No lime plaster was detected for exterior wall faces, which were mud plastered only.

Floor surfaces of stone slabs, cobbles, or pebbles, sometimes installed above a course of mudbricks and/or coated with lime plaster, were not uncommon in roofed spaces.[25] In three instances, mudbrick (and, in two of the three cases, also cobble or pebble) floors were installed in small rooms that included ovens, two of which also included abundant cooking ware sherds or a cooking pot (area 10, with sherds; area 31 with a cooking pot; area 75, with a storage jar and cooking ware sherds). These rooms might be considered kitchens. Finally, floors in roofed spaces could also consist of beaten earth or mud plaster.

Outdoor areas sometimes had pavements of pebbles and/or cobbles (areas 7, phases a and e; areas 43/44, phase c; area 62, phases a and c), especially passageways between buildings (areas 54, 57, 58, 72, 82, 84, and the space between areas 20 and 18/19). Two outdoor passageways (7A and 73A) were paved with bricks, while large mudbrick platforms were constructed in two unroofed areas (44F, 88B).

It appears that the two-room houses and other architectural units usually had only one exterior doorway.

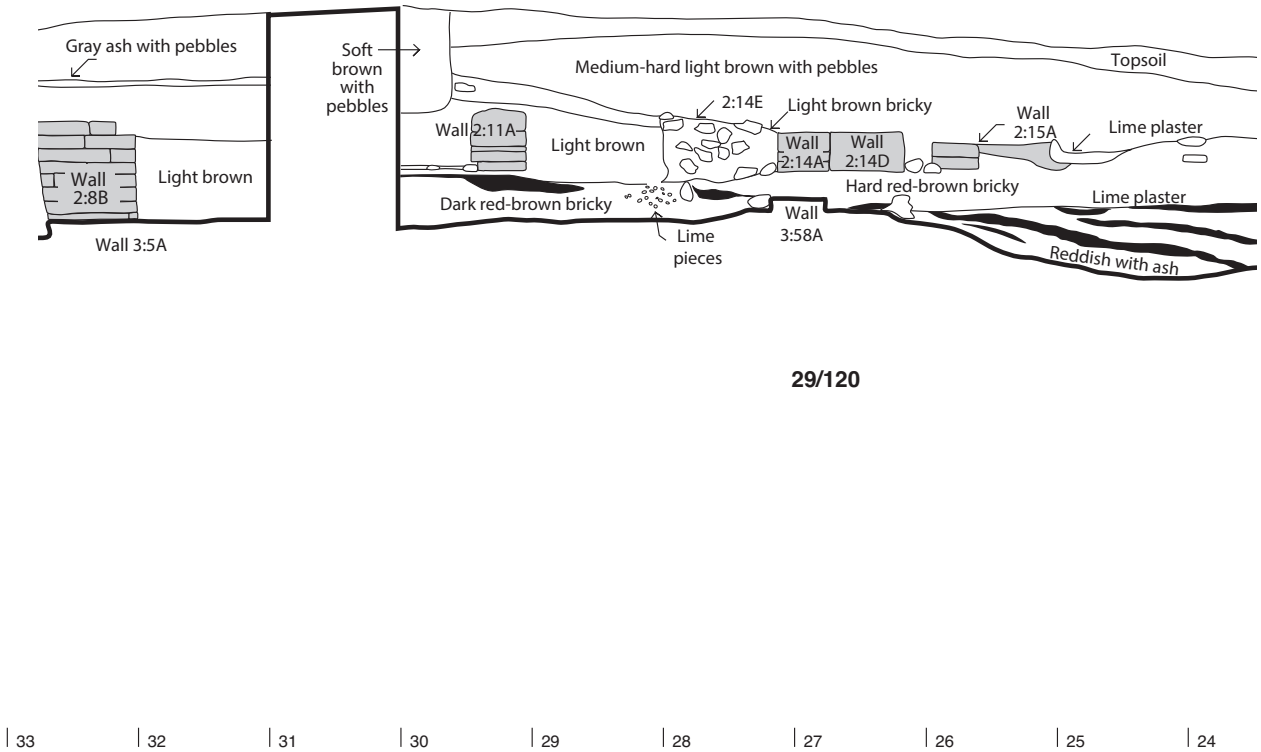


FIGURE 2.82 *(continued)*. West balk section, 119 north-south grid line *(continued on following page)*.

However, the doorways of a number of rooms were difficult to identify, for several possible reasons: (1) access was from above, (2) the doorway area was too eroded for recognition of a gap in the relevant wall, (3) the doorway was in an unexcavated balk, and (4) the relevant wall was only preserved as high as its foundation courses or a brick threshold indistinguishable from the rest of the wall. Doorway widths ranged from ca. 45 to 85 centimeters, with 62–66 centimeters particularly common, both in inner and outdoor doorways.

Door sockets were found in inner (areas 1/2, phase b; area 70, phase a) and outer doorways (areas 8; 15, phase a; 16, phase c; 18, phase a; 47; 51; 52, phase a; 79), with no preference for the left or right side. These results differ from the pattern observed at the contemporaneous occupation at Abu Hafur in which door sockets were associated with outer doorways and placed on the left (Kolinski and Lawecka 1992:182).

Thresholds of a single limestone slab (areas 40, 47, 51) or a collection of stones (area 16, phase c) were sometimes used for exterior doorways. Brick thresholds for inner or outer doorways were also used (areas 8, 34/35, 52/53) and, in two cases, brick steps (areas 8 and 18/19, phase b). The "temple" (area 21) had a particularly elaborate threshold of lime-plastered slabs set on top of mudbricks. In the cases where excavations were conducted down to a room's foundations, the foundation courses did not incorporate a gap for the intended doorway (e.g., areas 1/2, 8, 16, 56).

The blocking of doorways with mudbricks was a frequent practice (see Chapter 3).

FEATURES

Ovens: The great majority of Raqa'i 3 ovens are *tannurs* of baked clay, measuring 30–120 centimeters in width or diameter, with the majority within a 50–90-centimeter range, and usually with walls 2–3 centimeters thick. Examination of several level 3 *tannurs* revealed that they were built with concentric clay coils. Oven 60D, for example, was constructed of coils of clay 2 centimeters thick and ca. 1.5 centimeters high. Many examples were enclosed by a reinforcement of mud, pebbles, sherds, or mudbricks, probably for heat insulation.

Several ovens in level 3 were constructed of mudbricks alone, without any evidence of a clay *tannur*-type core (4H, 47A–E, 77D, 87A, 88A). These ovens were all larger than the *tannurs*, with diameter or width ranging from 111 to 230 centimeters.

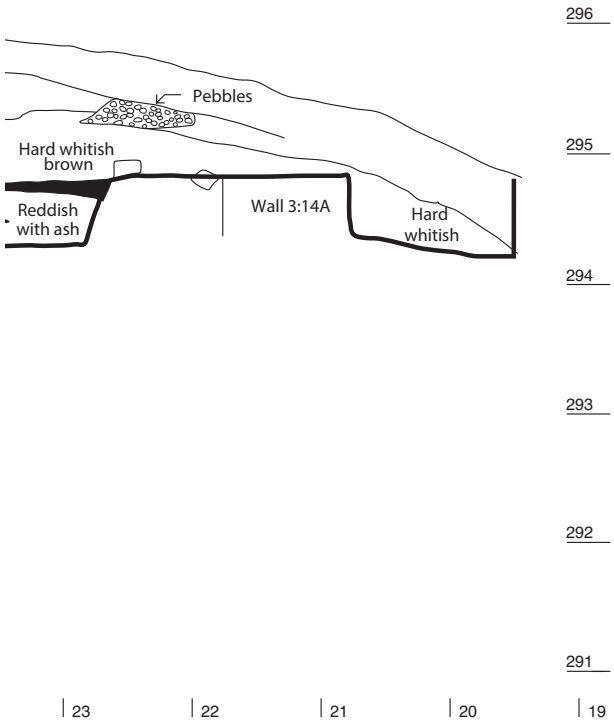


FIGURE 2.82 *(continued)*. West balk section, 119 north-south grid line.

Van der Steen's (1991) review of Levantine ethnographic data notes that ovens can be placed directly on a surface, on a mudbrick platform, dug in, or dug in next to a work pit that accommodates the feet of the user of the oven. At Raqa'i level 3, ovens are most commonly built directly on the associated surface, but there are occasional examples of ovens constructed atop brick platforms (16N, 60B).

The ovens are found in spaces that can be interpreted as both unroofed and roofed (Figure 2.85). Houses (see chapter 3 for definitions) are equally likely to have ovens inside or lack them, specimens of the latter category including areas 20/83, 18/19, 52/53, 15/16 (but note the three ovens outside this structure), 32/33/39/69–71, and 34/35/40. Whether this pattern has some importance or whether ovens in these units were hidden in unexcavated balks (or, in the case of area 34/35/40, disturbed by later intrusions) is uncertain in most cases. Households without ovens may have borrowed the use of other households' facilities, or one might also suggest that oven-less households produced bread in the fashion now associated with nomadic pastoralists, that is, on a convex metal pan (*saj*) placed over a fireplace (Sweet 1960:111, 132; Watson 1979:161).

Several instances of ovens installed inside small mudbrick enclosures may also be noted, perhaps to be identified as "bakehouses" (area 49, walls 49A–D; area 77) (Kramer 1982; van der Steen 1991). Such features can be interpreted as communal facilities for the use of several families or, in the case of ovens used for non-domestic purposes, loci of specialized activities. Thus, the inhabitants of oven-less areas 20/83 (as well as the residents of areas 1/2 in warm weather) may have used the ovens in the area 49 facility just to their south. Sometimes ovens were located in passageways that were simultaneously blocked off at one end (82A, 72C); presumably the installation of the ovens precluded the use of the space for passage and the blockage communicated that fact all the more effectively.

Van der Steen's study of ovens in the Iron Age southern Levant (1991) suggests that smaller ovens were used indoors in winter weather while larger ovens were used outdoors in the dry season (cf. also Kramer 1982:100 and Watson 1979:159). While the outdoor ovens often had a stone, sherd, or brick reinforcement for heat insulation, indoor ovens generally lacked such treatment in order to allow the oven to be used as a stove to heat the room in addition to its functions of baking and cooking. The interior ovens also tended not to be dug in, since this procedure would defeat their function as stoves; the highest heat, produced at the bottom of the oven near the heat source, would be lost if the feature were partly subterranean. Rather than employing indoor *tannurs* in winter weather, villagers near Shergat in northern Iraq observed by Crawford (1981) used communal roofed bakehouses. At Raqa'i level 3, we note that sherd, pebble, or mudbrick packing is attested in five baked clay ovens from unroofed space but only two from roofed, and the five large brick ovens are all from unroofed contexts or a "bakehouse." It may be, therefore, that van der Steen's observations partially apply here—although the frequency of mudbrick packing outdoor clay ovens may not be that significant, since outdoor clay ovens are far more common than indoor.

Fireplaces: Fireplaces are flat surfaces of burned clay, generally shiny as if from repeated rubbing (see Figure 2.88, upper right).. They are most often circular or oval in shape, ca. 50–100 centimeters in diameter, and ca. 2–4 centimeters thick. Some examples are smaller (34F) or rectangular in shape (34E, 79C). These surfaces are sometimes encircled by a border of pebbles and/or sherds or lime plaster; occasionally the clay surfaces were mounted on top of a layer of pebbles

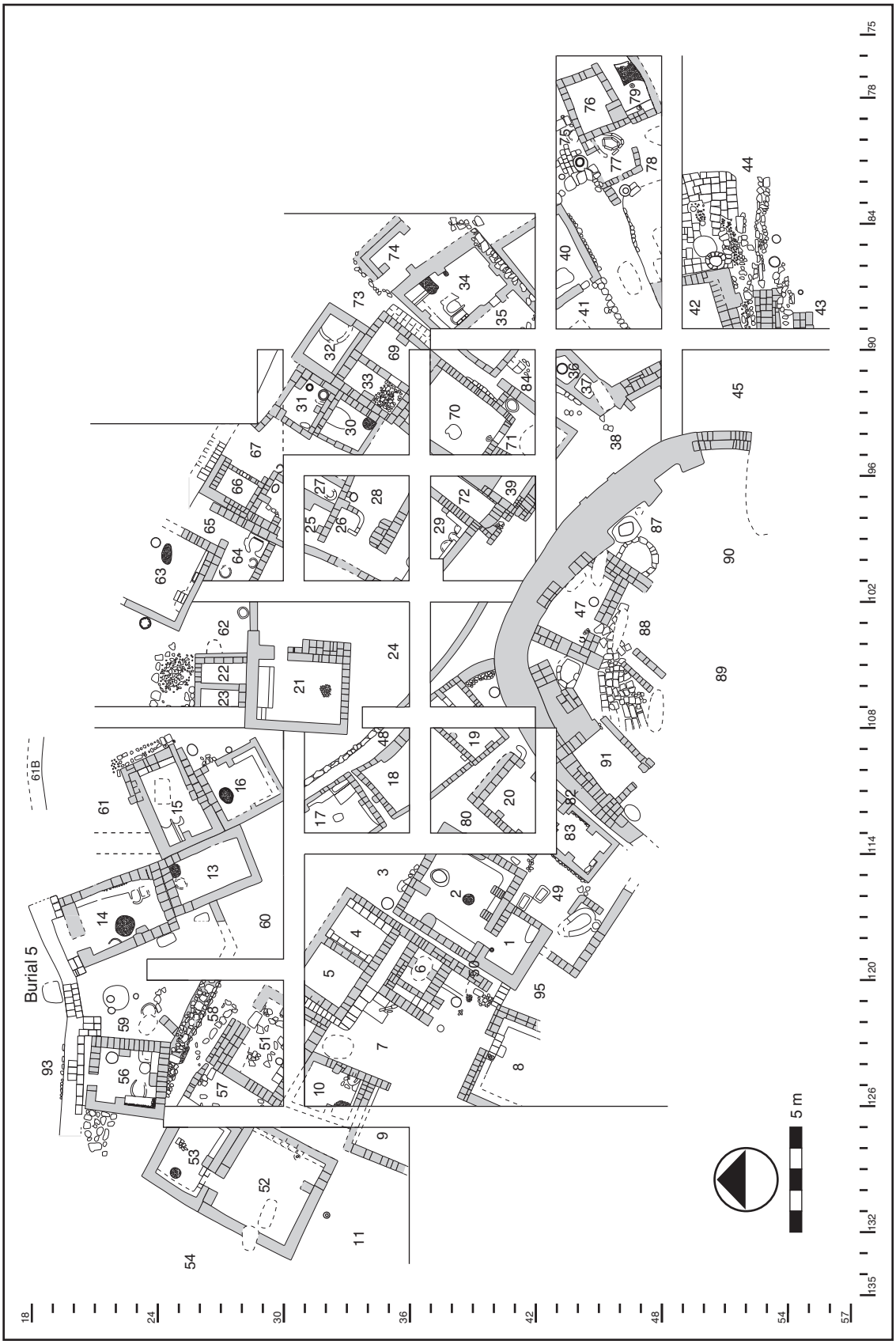


FIGURE 2.83. Level 3. *Illustration prepared by Julie Perlmutter.*

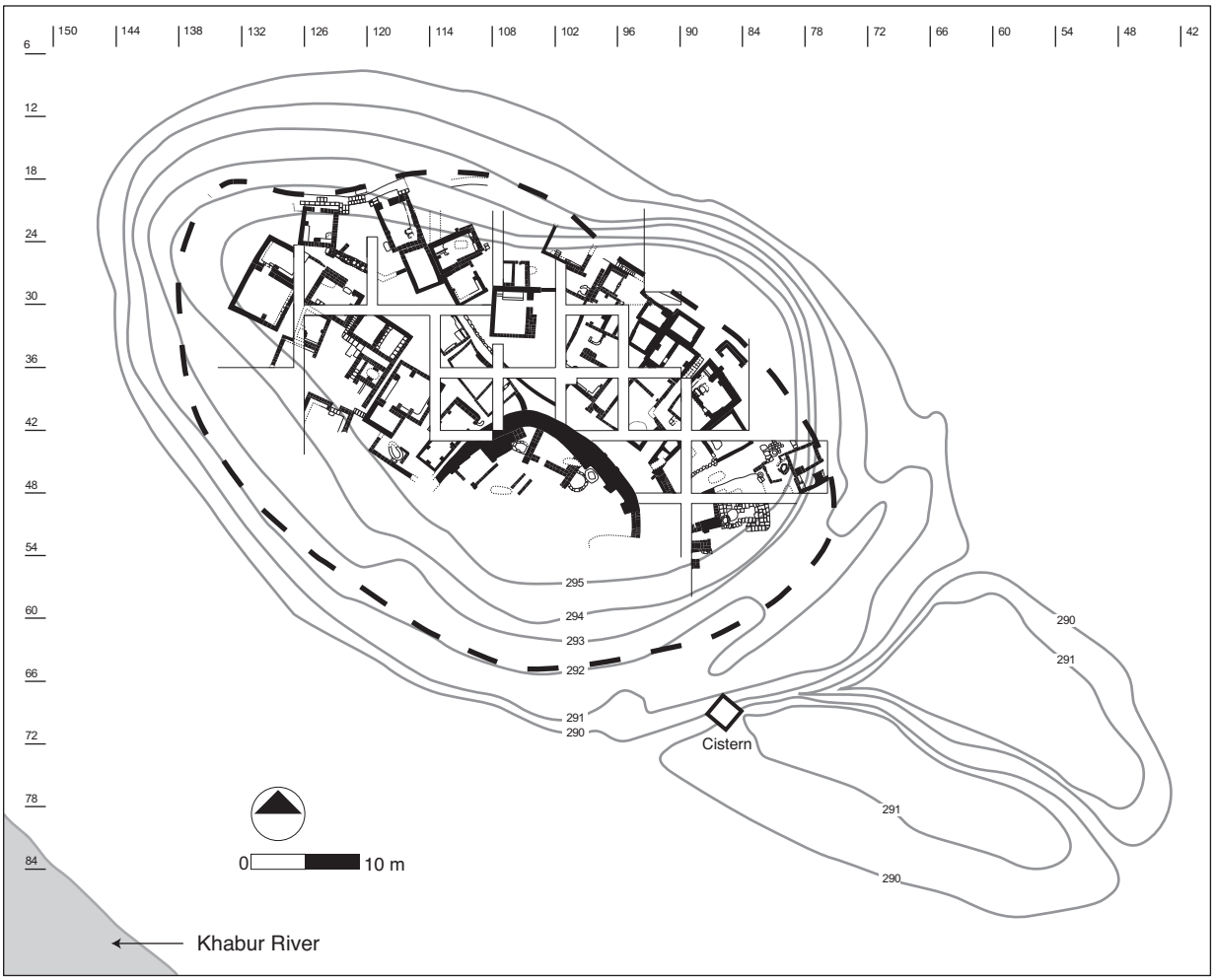


FIGURE 2.84. Level 3 excavated architecture with hypothesized extent of ancient village.
Illustration prepared by Harley King.

(e.g., 16J). In one case (2I), a surface was enclosed by a slightly raised ridge of earth.

These surfaces are most often found on the floors of lime-plastered rooms in the two-roomed houses or the small-scale architecture in the eastern part of the site (Figure 2.85). Only one example (72B) was located in an outdoor context, in the area 72 (blocked) passageway. Area 18/19 had no fireplaces, and the area 20/83 house is unique in having no fireplaces, ovens, or lime-plastered basins.

Occasional suggestions have been made that these surfaces served as platforms for kneading dough (Schwartz and Curvers 1992:403; van Loon 1979:103), but ethnographic studies of traditional Near Eastern villages indicate that dough is characteristically kneaded on a wooden board (Watson 1979:205). Kolinski (2000:37) also suggests that these features were used as working surfaces. While this may have been the case in some circumstances, at Raqa'i we suggest a function as fireplaces or hearths for heating and cooking within residential architecture (Schwartz and Klucas 1998). In such a case, the burnished appearance of the surfaces is likely to be a product of the repeated sweeping of ashes and debris from the surface to clean it. The ring of pebbles or sherds around a fireplace was probably intended for heat retention.

Features comparable to the Raqa'i fireplaces are attested in contemporaneous excavated communities such as Bderi in the middle Khabur (Pfälzner 2001) and Abu Hafur (Kolinski and Lawecka 1992:198) and Beydar (Milano and Rova:15) in the upper Khabur. At Raqa'i, no fireplaces were identified inside the Round Building or the "temple" of area 21, supporting the features' hypothesized function as domestic hearths.

Pits (Figure 2.86): Pits are divided into four categories.

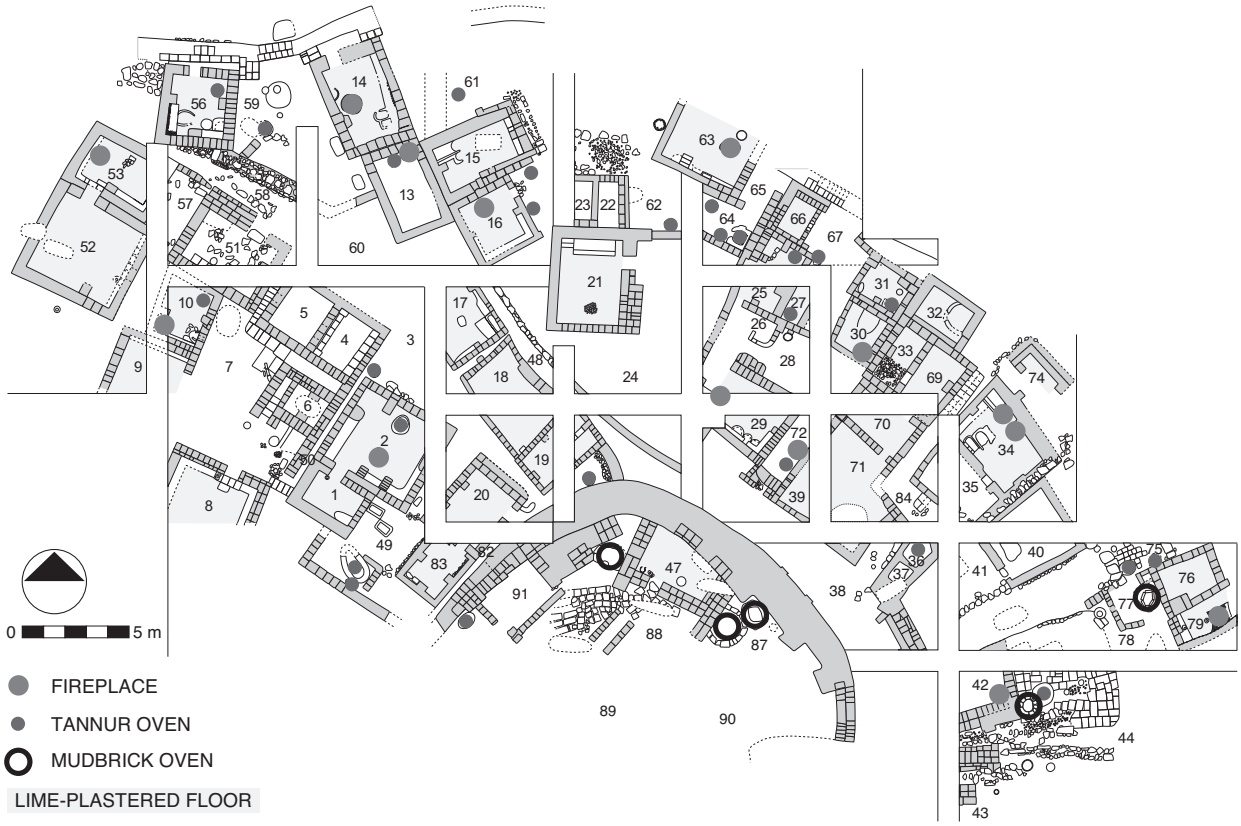


FIGURE 2.85. Level 3, spatial distribution of ovens, fireplaces, and lime-plastered floors.
Illustration prepared by Julie Perlmutter.

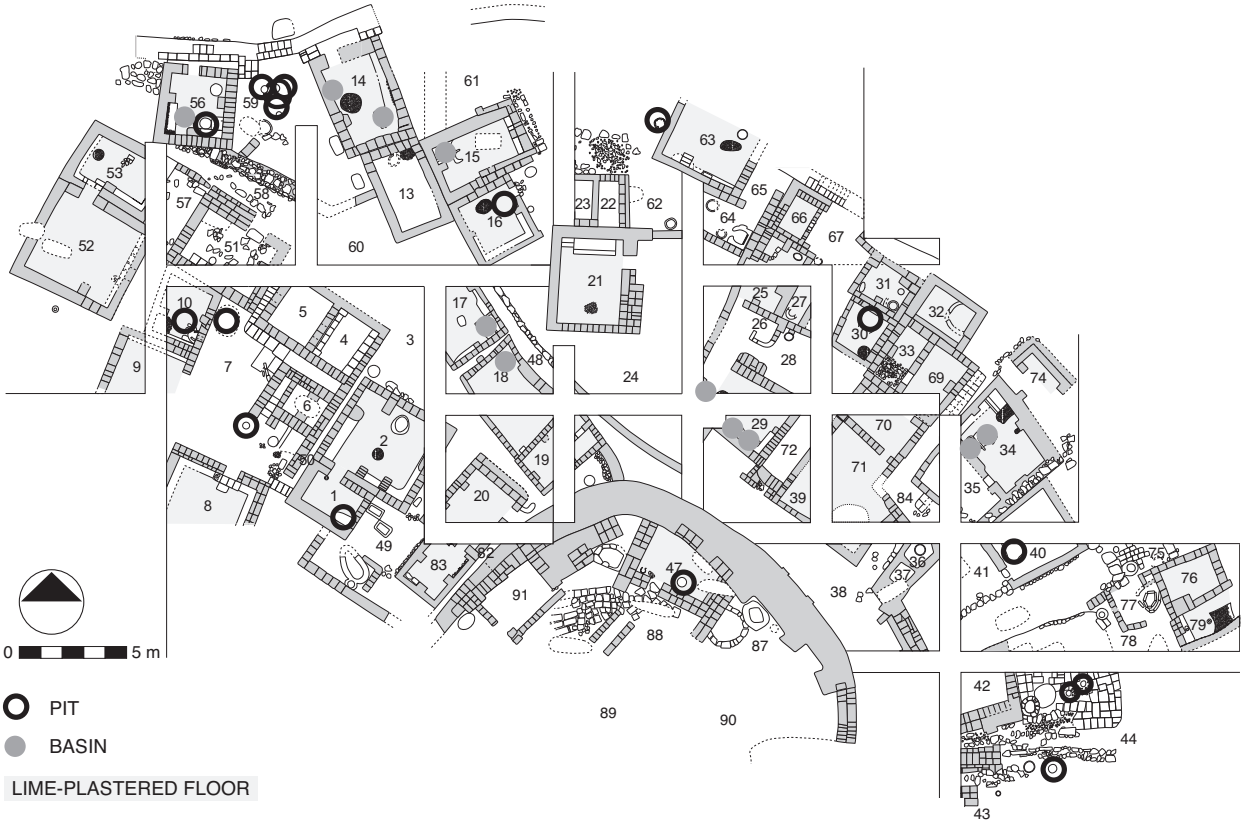


FIGURE 2.86. Level 3, spatial distribution of pits, lime-plastered basins, and lime-plastered floors.
Illustration prepared by Julie Perlmutter.

Large Pits: These pits are usually oval or rectangular in shape (from 86 × 48 centimeters to 115 × 160 centimeters in area, depth 30–104 centimeters) and are found in both unroofed and roofed spaces (1E, 7H, 7L, 30F, 40E, 58B, 59C). We suggest that these pits were used for storage of grain and other foodstuffs and, particularly in unroofed space, for trash as well. Contemporary Near Eastern villages often have pits used for storage of grain both in roofed and unroofed spaces (Kramer 1982:33, 105; Watson 1979:125, 157, 277); grain pits no longer in use for storage are sometimes re-used for trash.

Another possible interpretation of pits in unroofed contexts could be loci excavated for mudbrick building material, although these might be expected in the fringe areas of the tell or beyond it (Watson 1979: 37, 277). There was little evidence for trash pits or for dumps located on the slope of the tell in level 3, contrary to what one might expect for a mounded site (Kramer 1982:85; Watson 1979:37, 277). However, it should be noted that large-scale excavation on the mound slope was largely restricted to the south, where the level 2 terrace had destroyed level 3 remains and where the level 3 Round Building and associated contexts were seriously eroded.

Fire Pits: Fire pits are small and shallow (diameter or width 15–75 centimeters; maximum recorded depth 34 centimeters), usually circular but sometimes rectangular in shape, with a substantial fill of ash (7D, 7J, 10H, 47I, 49J). Their suggested function is of small fireplaces or hearths. Perhaps significantly, fire pits are only located in areas without fireplaces; they are located in both indoor and outdoor spaces. None were identified in the northern or eastern parts of the site.

Lined Pits: These pits tend to be small and circular (diameter 19–31 centimeters with two larger exceptions of 55–56 centimeters) with a lining of sherds or pebbles and sometimes lime plaster (16I, 44G–H, 56, 59C–E, 62E, 82C). All examples were found in unroofed contexts, with the exception of 16I and 56G. The smaller pits might be interpreted as postholes, particularly those found in outdoor contexts, or as depressions to hold ceramic vessels. The latter interpretation is more probable in the case of the two examples from indoor areas, particularly 56G, which contained sherds from what appeared to be a single vessel in its fill.

Four of the outdoor examples occurred with no counterparts in their vicinity, while three were grouped close together in area 59 and two were adjacent in areas 43/44, phase b, in the center of a mudbrick platform.

Burial Pits: See Chapter 6.

Bins/Basins (Figure 2.86)**:** Various lime-plastered mud and/or brick bin or basin-like features were noted inside level 3 small-scale structures, a typical feature of third-millennium middle Khabur sites (Bielinski 1992: 83; Fortin 1990a: figure 32; Fortin 1990b:546; Lebeau 1993; Monchambert 1987:52, Figure 5; Pfälzner 1986–1987, 2001). At Raqa'i, they are usually found in the room corners. The installations had no traces of burning, and their enclosure walls usually included a gap or a large opening which would have precluded retention of liquids (an exception is the eastern component of 17D). Citing analogies from traditional West African facilities, Pfälzner (1993, 2001) has suggested that similar installations at Bderi were used for grinding flour.[26] At Raqa'i, analogous installations might include 7E/F, 14I, 15F, 34G, and 56E/J, in which the grain could have been ground on the flat upper surface and the flour swept into the mouths of vessels placed in the hollow curved spaces adjacent.

Other lime-plastered bins/basins at Raqa'i are not as easily interpreted as "Mahltische,"[27] however, and additional suggestions for activities performed in the lime-plastered bins/basins of the middle Khabur sites have included the tanning of hides (Pfälzner 1986–1987), levigating clay (Fortin 1990a:256) and processing oil, wine (Lebeau 1993:103), or lime plaster (M. Fortin, personal communication, [1990]).

Benches: Lime-plastered mudbrick benches, usually only one course high above the room floor but often built into the room's sub-floor foundations, were found in roofed spaces in Raqa'i level 3, primarily in the western and northern parts of the site. In two cases, the space between the bench and the room wall was filled in with a line of pebbles and small stones (14E, 56J). As noted above, these benches could either be the projection into the room of a wide course of headers at the base of the room wall, or a separate row of bricks placed next to the room wall. Possible uses for these features could include a place for sitting, for working (Pfälzner 1986–1987:293), or for storage of vessels (Sweet 1960:119) or bedding (Watson 1979:172).

Shelves: Areas 32 and 33 (phase c) each had a set of three standing mudbricks against a wall (32H, 33B) that could be interpreted as the base for shelving (Pfälzner 2001:158). Feature 10E in area 10 may have served a similar purpose.

Drains: Stone drains leading out towards the tell edge were located outside area 15 to the north and in areas 43/44 to the southeast. These features consisted of

two parallel lines of stone cobbles and boulders flanking a channel paved with pebbles and sherds. A unique feature is the lime-plastered channel or drain 7E in the area 7 courtyard (phase c), associated with a jar imbedded into the courtyard surface and a lime-plastered surface.

Silos: The "silos" of areas 4–6 were rectangular or squarish brick single-room structures built in level 4 that had become semi-subterranean by level 3 times and were re-used by the level 3 inhabitants. Areas 4 and 5 were doorless but included a window-like passage between them, and a window was also located in the northwest wall of area 5, although it was apparently not used in level 3 times. Area 6 had a doorway and a set of steps leading down into the room, but the room surface was well below the lowest step, also indicating a storage function. These "silos" exhibited no trace of the vaulted ceilings attested in the level 4 Round Building silos (Schwartz and Curvers 1992). For further discussion of silos and their function, see above.

In addition to the silos in level 3 Raqa'i, grain could have been stored within the houses inside large pits (see above). Traditional Near Eastern village houses studied by ethnographers usually had facilities for the household storage of grain or other materials constructed of mud or mudbrick, often portable and constructed on little "feet" (Kramer 1982:33, 100; Watson 1979:157, 162; Sweet 1960:119). No evidence of such facilities was apparent in Raqa'i 3, with the possible exception of feature 32J.

Area Descriptions, Level 3

While many areas were excavated with their complete level 3 sequence (the Round Building, areas 1–8, 10, 12–16, 21–24, 29, 32–33, 50–59, 69, 85–86), others only had later level 3 occupation exposed, since excavations were not continued down to level 4 in those units (areas 17–20, 25–28, 30–31, 63–68). Some areas in the southeast only yielded early/middle level 3 occupation; here, later phases were apparently eroded, and level 4 was not definitively reached (areas 40–44, 75–79).

West Center

Areas 1/2: These areas comprise a two-roomed house for which a complete level 3 sequence was retrieved.

Areas 1/2, phase a (Figures 2.87, 2.88): In area 1, the smaller of the two rooms, were traces of a white lime-plastered floor surface and no other features. The northwest wall of the room (1D) was founded on top of a cluster of stone boulders and cobbles remaining from level 4. The northeast wall (1C) was erected atop a similarly oriented level 4 wall. When removed, the southeast wall (1B) proved to contain pebbles and limestone cobbles inserted between the mudbricks.

Area 2 is the larger of the two rooms. In phase a was a lime-plastered floor, a cluster of cobbles in the northwest corner, and a circular fireplace (2I) in the center of the room. The fireplace was encircled by a slightly raised lime-plastered earth ridge. The benches (2E–2H) consisted of one mudbrick course above the floor and were lime plastered. Numerous pebbles were distributed at the foot of benches 2E and 2F in the southeast corner of the room. Wall 2D and the other three walls of area 2 had two foundation courses of wide headers with the benches and upper wall courses constructed above them.

It would appear that the doorway into the area 1/2 house was in the eastern corner of area 2, left unexcavated in the east balk of excavation unit 36/120, either in the southeast wall of the room (as in area 20) or in the northeast wall.

Evidence of a temporary abandonment of area 1 after the phase a occupation is provided by burial 15, the jar burial of an infant in the southwest corner of area 1, dug into the fill of phase a prior to the installation of the phase b floor (for the jar, see Figure 4.27:10).

Areas 1/2, phase b (Figure 2.89) (= 36/120 Stratum 2, Curvers 1987): In this phase, a light green lime-plastered floor was installed in area 1, and lime plaster was also applied to the interior faces of the room walls. A stone door socket was located by the southwest corner of the door between areas 1 and 2. In the southeast corner of area 1, a pit (1E) was dug to a depth of 90 centimeters; its fill consisted of pebbles and cobbles.

Area 2 had a mudbrick bench (2L) along the northwest wall, and another (2J) between two stacks of bricks laid on their sides along the south wall, continuing around the southeast corner (2K) extending to a somewhat rounded buttress on the east wall. The benches, buttresses, brick stacks, interior wall faces, and floor of the room had white lime plaster applied, often in successive layers (Figure 2.90). A circular clay oven (2M, Figure 2.91) lined with packed mud was located by the north wall, and a fireplace with a border of pebbles and sherds was in the center of the room (2N).[28]

Area 3 phase a (Figure 2.92): To the northeast of the area 1/2 house, a mud surface ca. 2 centimeters thick (elevation 293.93) was installed in area 3 in the

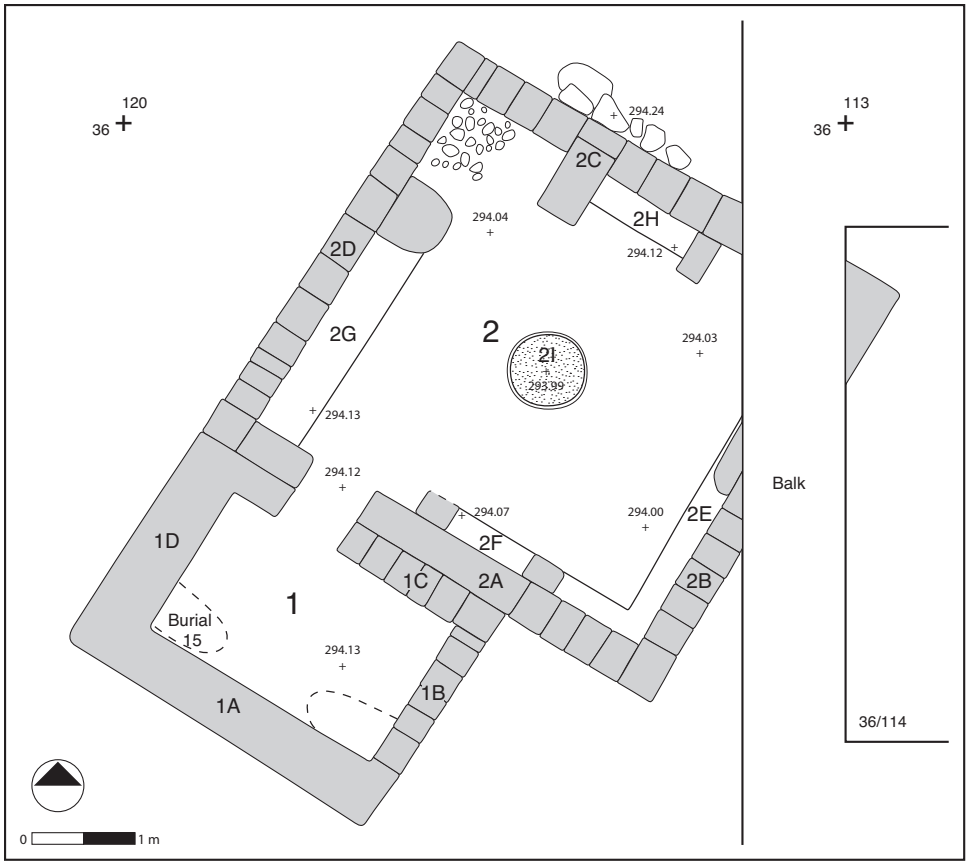


FIGURE 2.87. Level 3, areas 1/2, phase a. *Illustration prepared by Julie Perlmutter.*

FIGURE 2.88. Level 3, areas 1/2 (phase b, area 2). Looking northwest.

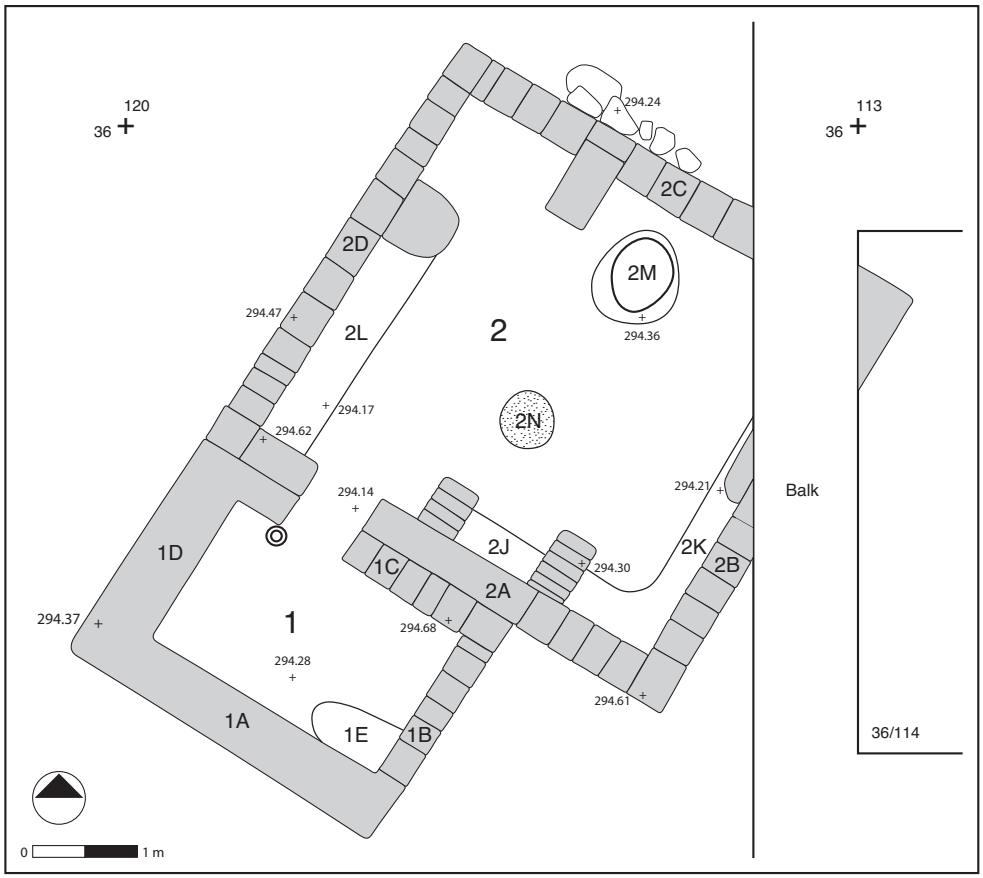


FIGURE 2.89. Level 3, areas 1/2, phase b. *Illustration prepared by Julie Perlmutter.*

earliest level 3 contexts. A line of limestone and basalt cobbles and boulders (3A) were placed on the floor against the north wall of area 2, presumably as a reinforcement.

Objects: pierced stone fragment type B, in line of cobbles and boulders 3A.

Area 3, phase b (Figure 2.92): The shallow vestiges of a small round clay oven (3B) were excavated in the fill above the phase a floor.

Area 49 (Figure 2.92): In the northern corner of open area 49, against the outer walls of area 1/2, were two infant graves (burials 12 and 13) inside small mudbrick enclosures, one of which (burial 13) had remnants of a vaulted brick covering. These two installations appear to have been constructed on an outside surface aboveground.

To the southwest were remains of two clay ovens, one large and oval, the other small and round (49E–F), inside a mudbrick enclosure (note the southeast extension of wall 49C indicated on 42/116 stratum 2, Curvers 1987: figure 7).

Objects: bone awl fragment, clay bull head figurine, 2 pierced shells.

Complete vessels/profiles: Fine Simple Ware incurving simple-rim, pointed-base goblet (Figure 4.29:11). (A large Medium Simple Ware flat-based simple rim bowl (Figure 4.26:15) was found below this area in contexts designated level 4/3).

Area 80 (Figure 2.92): Area 80, the space between the area 1/2 and area 20/83 houses, included a line of stone cobbles connecting the southwest and southeast corners of the larger rooms. North of the cobbles was a pit with an interred infant (burial 16).

Area 81 (Figure 2.92): This area is the narrow passageway between the 18/19 and 20/83 houses.

Objects: clay cylindrical andiron.

Area 82 (Figure 2.92): A passage northwest of the Round Building, area 82 was blocked off from the area 48 passage to the northeast by a mudbrick wall (82D). Remains of a pebble surface were discovered to the west of this blocking. Subsequent to the use of the surface, a circular baked clay oven (82A) was installed in the area

FIGURE 2.90. Level 3, area 2, phase b, south corner. Looking southeast.

FIGURE 2.91. Level 3, area 2, phase b, oven 2M. Looking northeast.

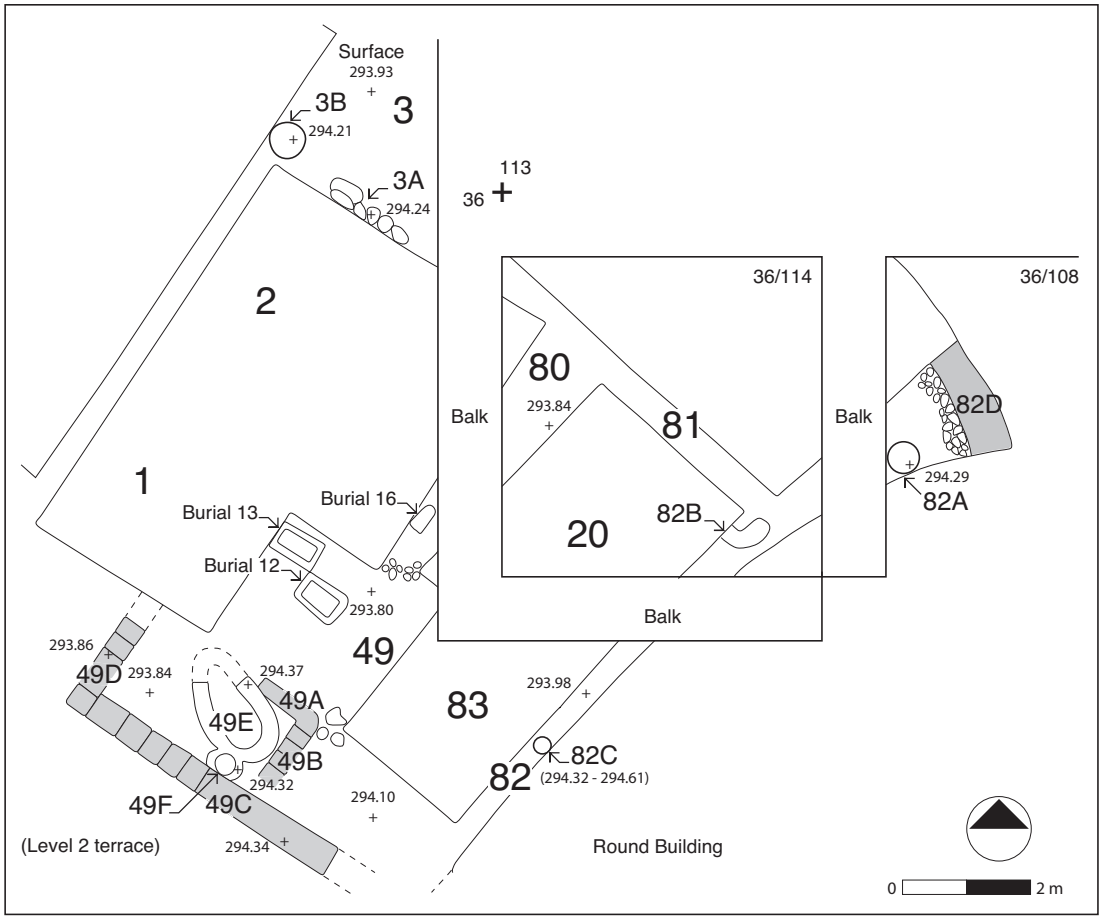


FIGURE 2.92. Level 3, areas 3, 49, 81–82. *Illustration prepared by Julie Perlmutter.*

next to the west balk of excavation unit 36/108. A semi-circular mud feature (82B) with a semi-circular flat stone (lid?) nearby was located by the east corner of area 20. To the southwest, remains of a cooking pot were discovered in the fill of the passage.

Sometime after the deposition of considerable fill in the passage, a small pit (82C, diameter = 30 centimeters) was dug, lined with pebbles, sherds, and lime plaster.

Areas 20/83 (Figure 2.93): This two-room structure, a mirror image of the area 1/2 building, was constructed somewhat later than the latter edifice, at the same time that the oven enclosure of area 49 was installed (see Figure 2.2).

Area 20, the larger northern room, had a green lime plaster floor. The doorway in the southeast wall 20B was later filled in with stones and mudbricks. A second row of brick courses (20E) was also added to the exterior of the northeast wall, placed atop an exterior surface that sealed against the lower bricks of the wall. Outside the room by the east corner in area 82 was a semi-circular clay feature (82B) preserved 8 centimeters high with a flat semi-circular stone found adjacent to it (= a clay bin and its stone lid?). In the passage between area 20 and areas 18/19 was a surface of limestone cobbles.

The smaller southern room, area 83 (cf. 42/116 stratum 2, Curvers 1987) had two lime-plastered floor surfaces, the lower, yellow, the upper, ca. 20 centimeters above, white. A packing of sherds and cobbles was located against the interior face of the southeast wall (83B) on the level of the upper floor. In addition, a mudbrick and stone cobble were fit into the western corner of the room, with a lining of sherds between them and wall 83A.

The southwest and northwest walls (83A, 83D) were mud plastered on their interior faces (plaster 2–6 centimeters thick). The outer face of the northwest wall (83D) had a packing of mud plaster, stone cobbles, and mudbrick fragments against it.

Sometime after the abandonment of the area 20/83 house, a white surface with traces of lime plaster was laid above the fill of area 83, with sherds lying flat

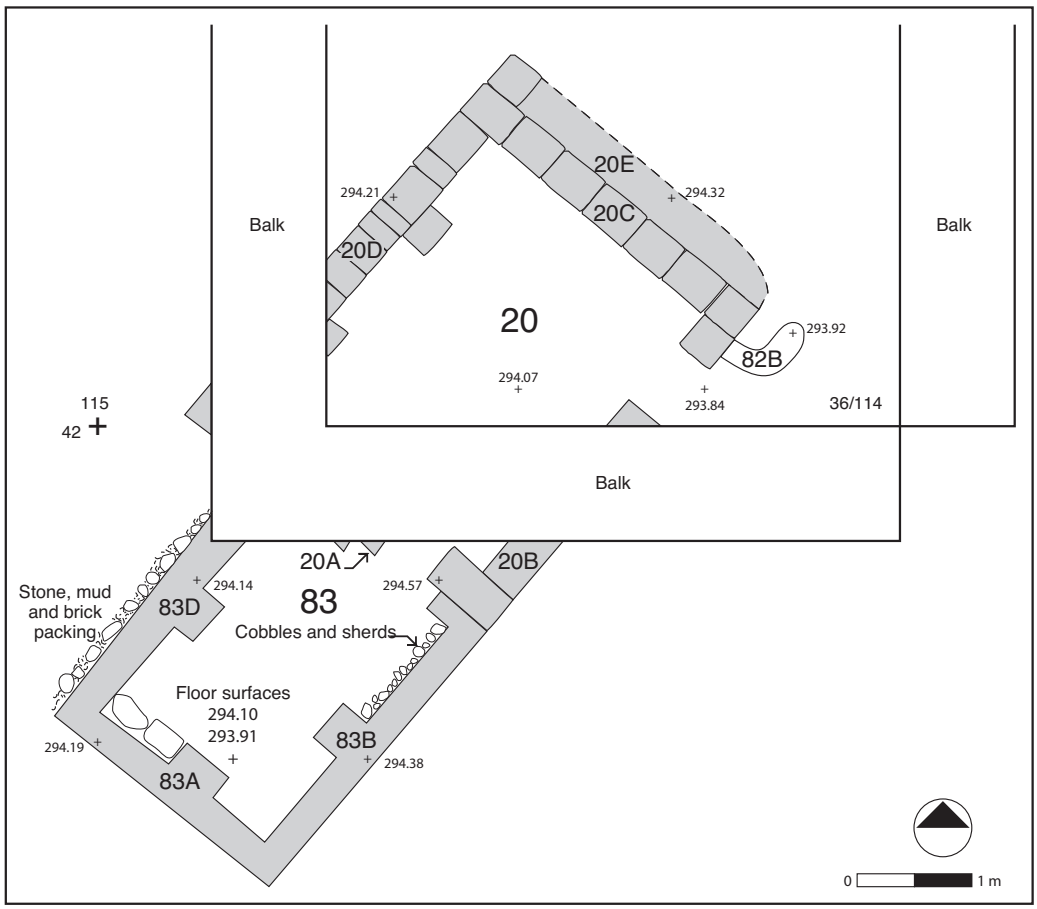


FIGURE 2.93. Level 3, areas 20, 83. *Illustration prepared by Julie Perlmutter.*

on the surface (=42/116 stratum 1; Curvers 1987). A small ash-filled pit (49J) (diameter = 15 centimeters, elevations ca. 294.45–294.60) was noted above the corner of the earlier walls 83A and 83D.

Areas 18/19: These areas constitute a two-room house with one rectangular room larger than the other. Two building phases were noted for area 18 in excavation unit 30/114, but the earlier phase was not reached in unit 36/114. It appears that the structure changed from an "L"-shaped building to a rectangular one in its later phase.[29]

Areas 18/19, phase a (Figure 2.94): In area 18, the interior wall faces were plastered with lime, the outer faces with mud. In the western corner of the room was a doorway with a stone door socket; a rectangular construction of mudbrick fragments and mudbricks on edge (18E) with traces of lime plaster was located in the room's north corner. Because this early phase was unexcavated in excavation unit 36/114 to the south, we have no information on area 19, but it seems likely that the phase a house had the "L"-shape characteristic of the other two-roomed houses of level 3, with area 18 forming the larger of the two rooms.

Areas 18/19, phase b (Figure 2.95): In phase b, area 18 was reduced in area and provided with a lime plaster floor (Figure 2.96). The western doorway was eliminated, and part of the northeast wall (18C) was widened. The area 19 room had white lime-plastered interior wall faces and a white lime-plastered floor surface laid atop a deposit of flat cobbles and pebbles. This surface was ca. 60 centimeters above the surface of area 18, and a mudbrick step two courses high was placed against the northwest wall (19D) to allow easier access. The step was presumably in front of a doorway not otherwise identifiable: the area 19 walls were not preserved significantly higher than the area 19 floor and evidently included a door sill. In the east corner of the room was a "box"-type feature (19E) with floor and inner wall faces lime plastered; the northwest wall of this feature (19F) was added to an interior buttress bonded to the northeast wall (19C) of the room. The floor of feature 19E was ca. 15 centimeters above the

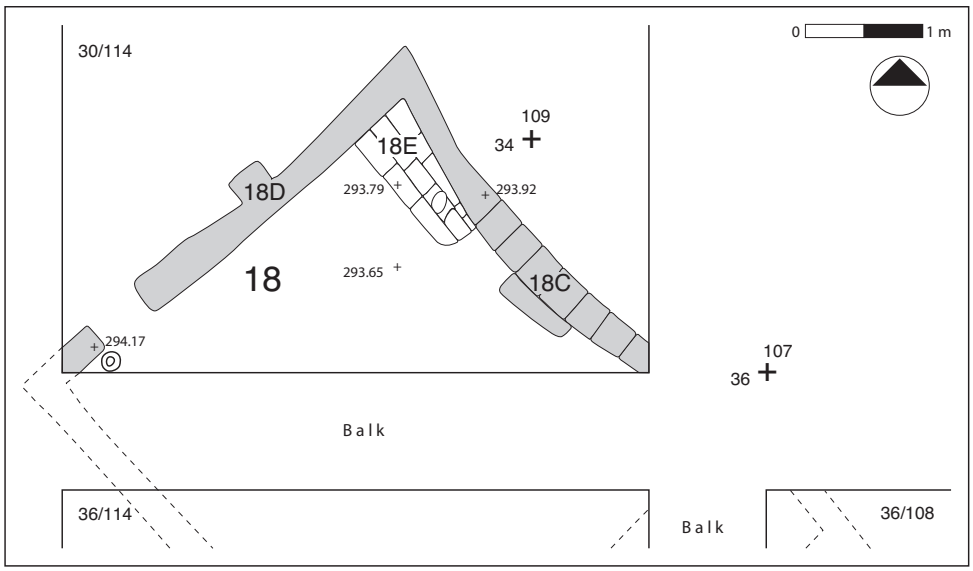


FIGURE 2.94. Level 3, area 18, phase a. *Illustration prepared by Julie Perlmutter.*

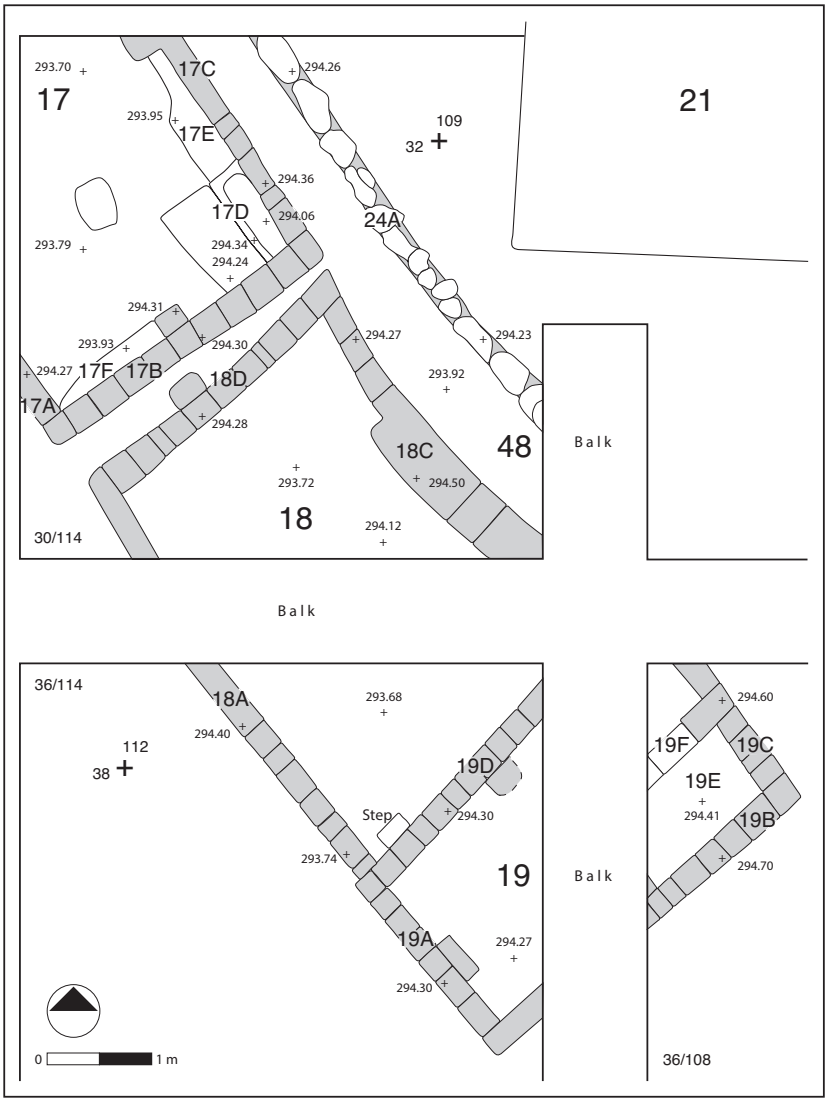


FIGURE 2.95. Level 3, area 17; areas 18/19, phase b. *Illustration prepared by Julie Perlmutter.*

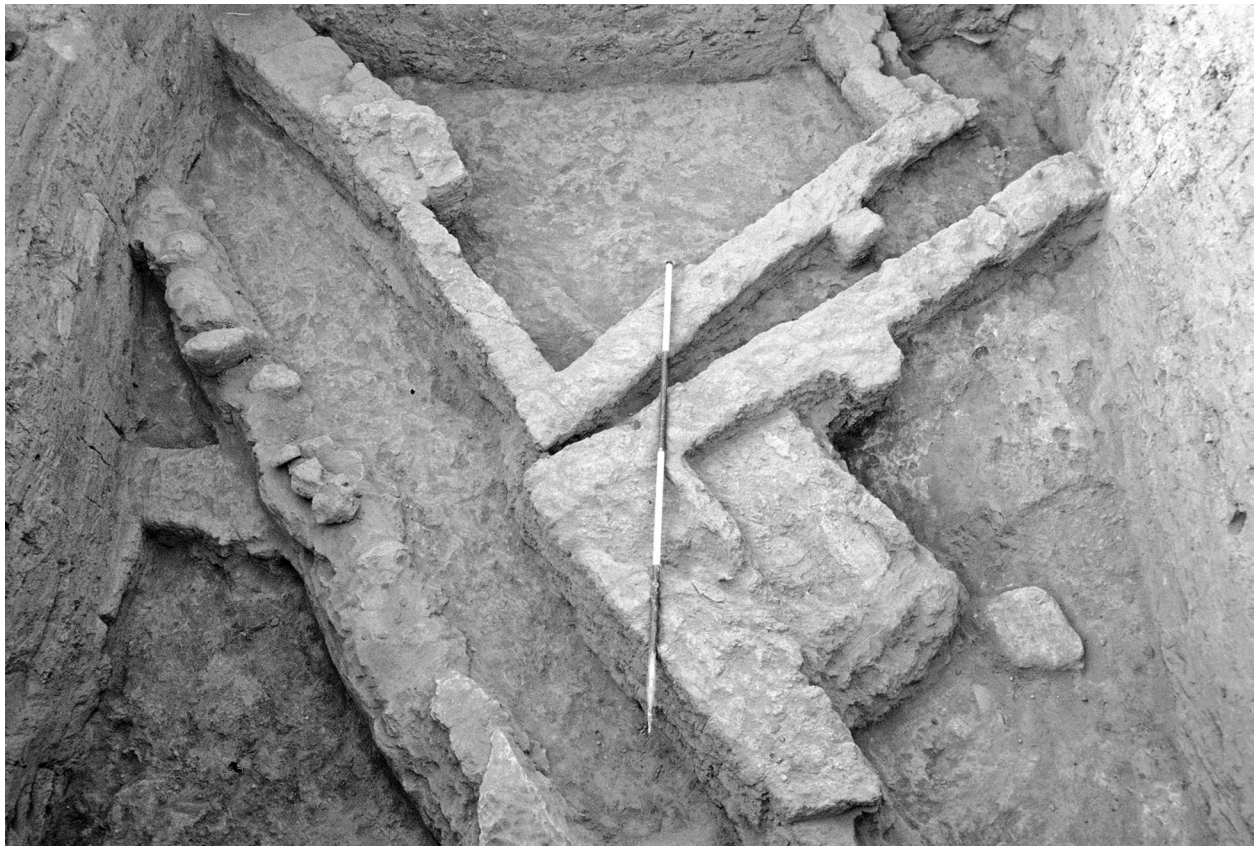


FIGURE 2.96. Level 3, area 17 (right foreground) and area 18 (background). Looking south.

room floor. On the exterior of the room, the southeast wall (19B) was faced with flat stones covered with white plaster. Lenses of black ashy fill were deposited within the area 19 room.

Objects: area 18, phases a-b—bone awl fragment, notched bone, fragment of basalt type A mortar.

Area 17 (Figures 2.95, 2.96)**:** The floor, interior wall faces, and mudbrick benches against the walls of this room were all white lime plastered, while the wall exteriors were mud plastered (with as much as 7 centimeters of mud plaster evident on the exterior face of the northeast wall 17C). A flat round stone lined with lime plaster around its edges was found lying on the floor in the room center, with a concentration of sherds and pebbles around it, perhaps a working surface or a support for a column.

A completely lime-plastered, bin-like mudbrick feature (grinding table?) (17D, Figure 2.97) was constructed in the eastern corner of the room, built in two segments. The earlier segment was the relatively thin component in the corner of the northeast (17C) and southeast (17B) walls of the room; the lime plaster of the southwest wall of this feature extended down to meet the lime plaster of the room floor. Subsequently, a wider platform with a slightly convex (southeast to northwest) top was constructed above the lime-plastered floor of the room. Both the vertical and horizontal surfaces of this feature were lime plastered, denoting its complete preservation, except for the thin wall dividing the two segments of the structure. Also built atop the lime-plastered room floor was the 12-centimeter-high bench (17E) against the northeast wall.

The existence of a southwest wall (17A) is confirmed by the corner next to the west balk of excavation unit 30/114, but there is no evidence of a northwest wall for the room in excavation unit 30/120, where a heap of boulders and cobbles associated with the area 86 intrusion was exposed (Figure 2.120). Although the evidence indicates that the northwest part of the room was destroyed by the area 86 intrusion, it is possible that the room was a three-walled structure open to the street to the north. In this case, the flat plaster-lined stone in the center of the room could be

FIGURE 2.97. Level 3, area 17, feature 17D. Looking south.

construed as the base of a (wooden?) column supporting the roof of such an open, three-walled structure.

The room walls were preserved to a height of three to four courses. Area 94, the narrow space between areas 17 and 18, was filled in with a packing of mud and cobbles at its northeast end.

Objects: area 94—fragment of basalt grinding stone type A, reused.

Area 48 (Figure 2.83) **(see also areas 38/45):** Area 48 is part of a narrow passageway to the north and west of the Round Building with alternating lenses of ashy debris and bricky fill. Traces of mudbrick paving were noted in excavation area 36/108. In general, the passage was excavated to an elevation of ca. 294.00.

Northwest

Areas 4–6 (Figures 2.98, 2.99)**:** These three (semi-) subterranean rooms, without lime plastering and exterior doorways, are construed as silos. They were constructed in level 4 but remained in use in level 3. The dating of the activities within the structures to levels 4 or 3 is uncertain, and the pottery found inside had diagnostics characteristic of both levels (see Chapter 4). However, one may note that pottery from the lowest context in Area 4 included an incised design (type 626) more likely to be characteristic of level 4, while pottery from phases b and d included panel designs (type 606), more common in level 3.

Area 4 (Figure 2.98)**:** A "silo" retained from level 4 (level 4, area 58), area 4 is a squarish brick enclosure with mud-plastered walls preserved at almost 3 meters in height. Because part of this structure remained above ground and was re-used in level 3, the contemporaneity of constructions within the silo and outside of it in levels 4 and 3 is open to question.

At the bottom of the silo was a red-brown earth surface, assigned to phase a in the sequence of area 4 construction and deposition. A large near-complete incised cup was found in fill above this surface (Chapter 4, Figure 4.46:7) and is assigned to area 4, phases a–b.

At some point subsequent to construction of the silo, in phase b, two mudbrick "ledges" one mudbrick wide were added against the southeast and northwest walls of the structure (Figures 2.98 and 2.99). The southeast ledge (4E) was preserved to a height of 14 courses (1.28 m); occasional traces of mud plaster were visible on the brick faces. The northwest ledge (4F),

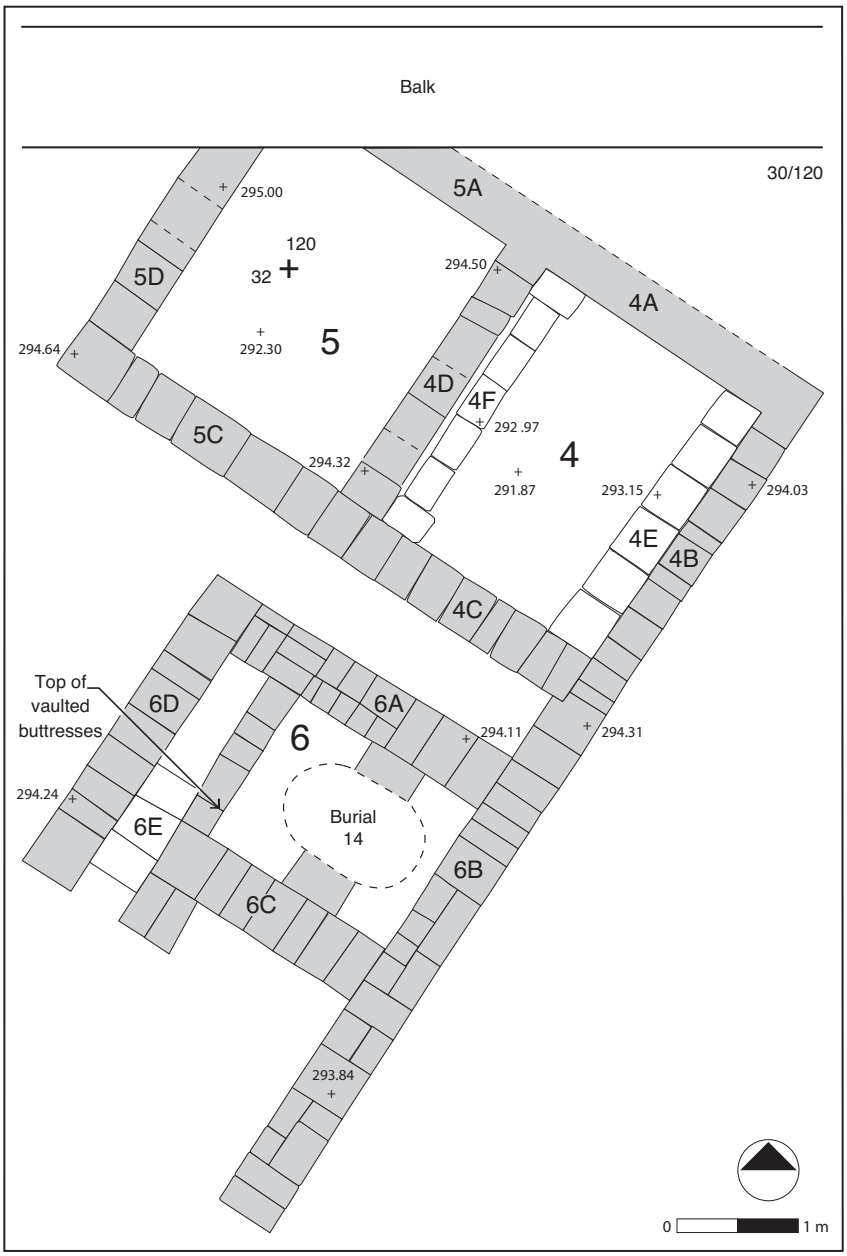


FIGURE 2.98. Level 3, areas 4–6 (area 4, phases a–b). *Illustration prepared by Julie Perlmutter.*

preserved 12 courses high (1.10 m), consisted of headers forming buttresses in both corners and stretchers in between. The face of this ledge was often irregular, with mudbrick courses set several centimeters farther out or in from those above or below.

In phase c, a mudbrick platform (4G) was installed (Figure 2.100), comprising one course 9 centimeters high of irregularly arranged mudbricks (e.g., 22 × 20 × 9 and 38 × 22 × 9 centimeters) with 1.5–2.0 centimeters of light gray mud plaster on top. Located ca. 20–40 centimeters above the extant tops of the two phase b ledges, platform 4G was 1.9 meters above the silo bottom. This platform, as preserved, covered only the western portion of the enclosure; perhaps only the area closest to the passage into area 5 required reinforcement. Two steps led down to the platform from a rectangular opening in the northwest wall leading to the area 5 silo. The step closest to the northwest wall consisted of three courses of single mudbrick stretchers, and the lower step next to it comprised two courses of single mudbrick stretchers; individual bricks measured 43 × 22 × 9 centimeters. The entry to the area 5 silo was eventually blocked with mudbricks.

It is worth noting that the "twin" silo 5 did not have a platform corresponding to the one in area 4, leading one to wonder how the doorway between the two units

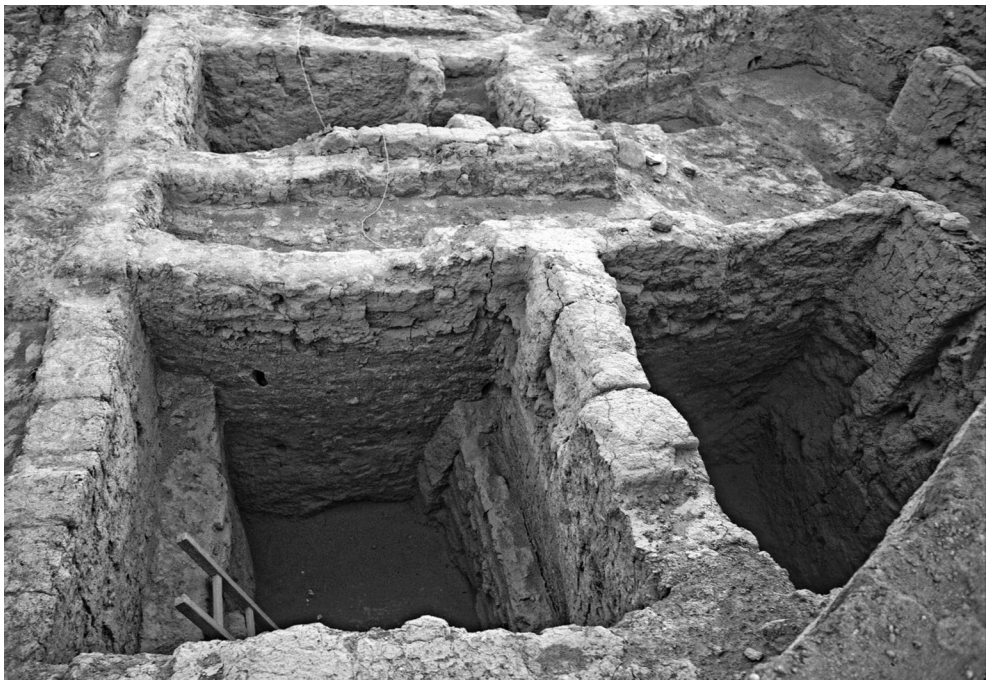


FIGURE 2.99. Level 3, silos 4 (foreground, left), 5 (right), and 6 (background). Looking southwest.

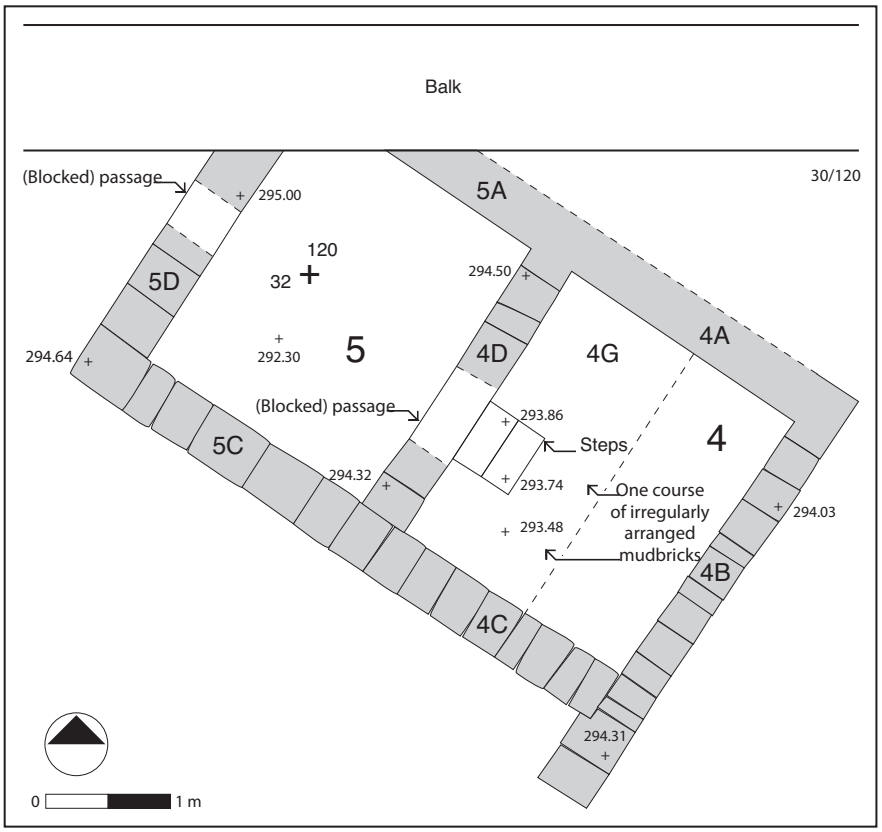


FIGURE 2.100. Level 3, areas 4–5 (area 4, phase c). *Illustration prepared by Julie Perlmutter.*

was used. Perhaps the platform and steps in area 4 were used to fill and retrieve the contents of silo 5 when area 4 was no longer used for storage. Similarly, a mudbrick platform built against the southeast wall (4B) of area 4 in late level 4 may have been used to fill the contents of area 4 in that phase.

Sometime subsequent to use of the platform and accumulation of ca. 50 centimeters fill above it, a circular mudbrick oven (4H) preserved to a height of 45 centimeters was installed inside the silo in phase d (Figure 2.120; Figure 2.101, lower right). The mudbrick platform of area 86 was probably contemporary, and its function may be connected to that of the oven 4H. It is possible that a level 2 date would be preferable for this phase.

The southwest and southeast walls of area 4 (4B–C) abutted the extension of the southeast wall to the southwest (6B).

Objects: clay human figurine fragment, clay animal figurine fragment, basalt grinding stone type A fragment, bone awl fragment.

Complete vessels/profiles: Fine Simple Ware goblet with pointed base and incised Ninevite 5 decoration (Figure 4.46:7).

Area 5 (Figure 2.98): Like area 4, this square mudbrick enclosure was retained from level 4 (see area 57, level 4), and was preserved almost as high as 3 meters. Fill included ashy debris, mudbrick fragments, some clay oven fragments, and several pieces of burned bone; if the structure was a grain storage emplacement, as hypothesized, little or no evidence of its original contents was preserved—as was the case for areas 4 and 6.

The interior wall faces were mud plastered; the preserved upper portion of the southwest wall (5C) sloped inward. An opening in the shape of an arched window was located just below the extant top of the northwest wall (5D) of the structure; this aperture was apparently no longer in use in level 3, since the passage between wall 5D and wall 51B was blocked in this period. The opening found at the extant top of the southeast wall (4D) was rectangular without any indication of an arch, but its top was no longer preserved. This passage was also later filled in with mudbricks (see above, area 4). The construction of a mudbrick platform and steps leading to the window/door between silos 5 and 4 (in later level 3?) may indicate the use of area 4 as a "loading zone" for silo 5 in this phase.

FIGURE 2.101. Level 3, areas 4 (lower right), 6 (right), and 1/2 (upper left), with oven 4H. Looking south.

The space between areas 5 and 51 was filled in with mudbricks (7A, cf. area 7, phase a and subsequent phases).

Objects: clay andiron fragment, clay cylindrical object fragment.

Area 6 (Figure 2.98): "Silo" 6 is a small semi-subterranean mud-plastered room with two pairs of facing arched buttresses, originally constructed in level 4 (see level 4, area 56). The western pair of arched buttresses was preserved relatively high and included one course of bricks spanning the arch (top elevation 294.53). A mudbrick stairway of three steps (6E) led down partway into the room, which had no floor apart from the earth surface at the bottom (elevation ca. 292.30). Damaging the two eastern buttresses of the room was the pit of burial 14, dating to later level 3.

Objects: clay animal figurine fragment.

Complete vessels/profiles: large Medium Simple Ware, round-base, evert-rim jar (Figure 4.46:1).

Area 7, phase a (Figure 2.102): Area 7 is the courtyard surrounded by areas 6, 5, 8–10, and 51. The earliest level 3 contexts included remains of a pebble surface sloping up to the east identified near the southwest corner of area 6. In this and subsequent phases the space between area 5 and area 51 was filled in with successive mudbrick courses (7A) laid on top of one course of stone slabs, which also underlay walls 51A and 51B.

Objects: fragments of white plaster circular lid.

Area 7, phase b: In this phase, a small brick platform feature (7B) one course high was appended to the northwest wall of area 6; the phase b courtyard surface sloped down to the north.

Area 7, phase c (Figure 2.103): A line of three limestone slabs was set vertically into the courtyard surface to the northwest of area 6, just north of the spot where brick platform 7B of phase b had been located. Further, a two-stepped brick feature (7C) was constructed against the northwest wall of area 6 and the southwest and northwest walls of area 5, perhaps to provide access to those two "silos."

Contemporary with this phase were diverse remains between areas 8 and 6 (Figure 2.104). Northeast of area 8 was a cluster of stones set in the courtyard surface. This

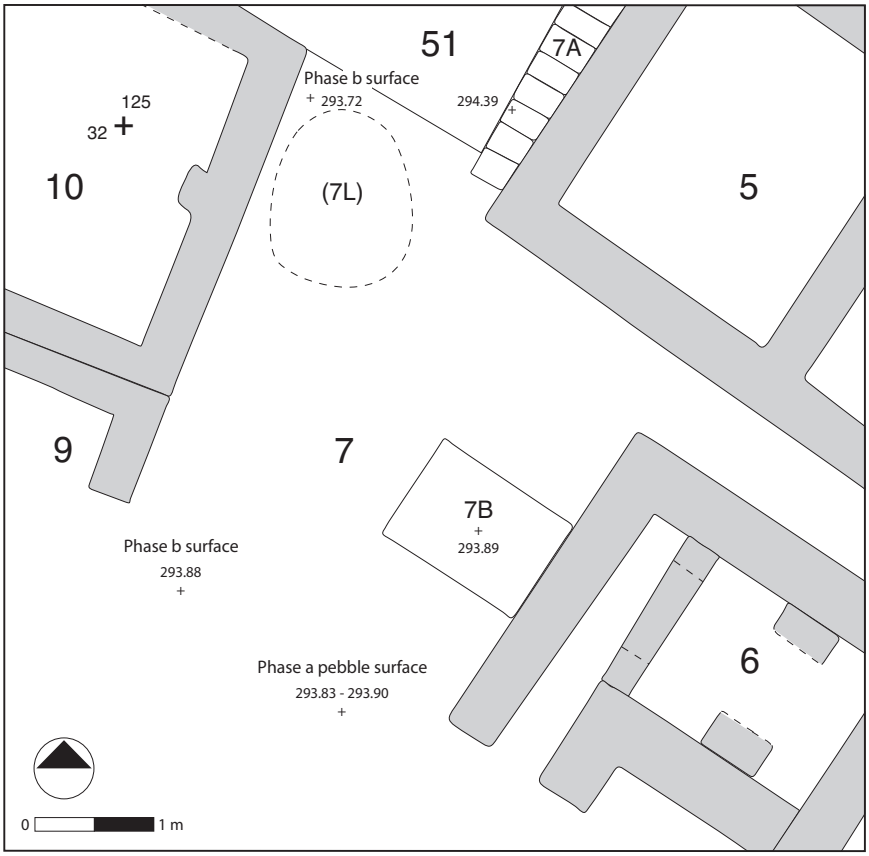


FIGURE 2.102. Level 3, area 7, phases a–b. *Illustration prepared by Julie Perlmutter.*

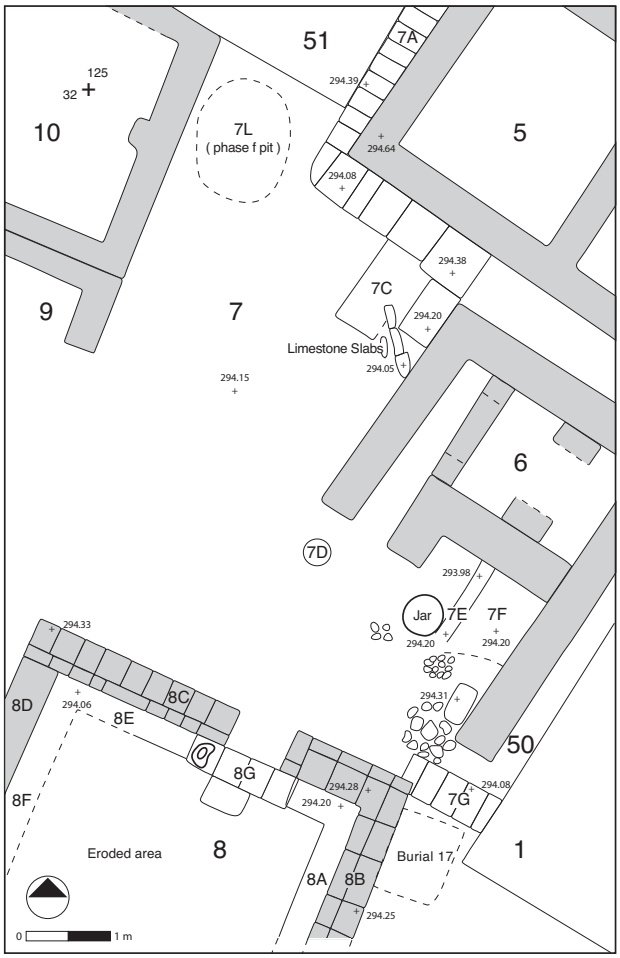


FIGURE 2.103. Level 3, area 7, phase c.
Illustration prepared by Julie Perlmutter.

area also included a small pit filled with ash and pebbles (7D) and a channel or drain lined with lime plaster (7E) sloping down to the northeast. At the drain's southwest end was a large jar embedded in the courtyard surface and a cluster of pebbles. The drain was adjacent to a lime-plaster surface (7F) to the east. Perhaps this can be understood as a surface for grinding grain adjacent to a channel and a jar for catching the flour (Pfälzner 2001). A mudbrick wall (7G) connected the northeast corner of the area 8 room with the southwest corner of the area 1 room, blocking off the area 50 passageway.

A succession of gray and red lenses accumulated in the open courtyard area subsequent to the surface associated with the jar, drain 7E, the cluster of stones, and pit 7D.

Area 7, phase d (Figure 2.105): In this phase, the courtyard had a surface with sherds lying flat on it. The southeast wall of area 9 (9B) was extended to the south at this point, with the extension built atop the sherd-covered surface. An oval pit (7H) was dug adjacent to areas 9 and 10 underneath the phase e features 7I and 7J, measuring 150 × 70 centimeters in area, 30–75 centimeters deep.

Objects: clay animal figurine torso, in pit 7H; clay jar stopper.

Area 7, phase e: This phase had a gray surface paved with flat stones and pebbles (Figures 2.105–2.107) in the west part of the courtyard which had occasional traces of white lime plaster to the south; the surface sloped down from south to north and east to west. A short wall (?) (7K) was located south of area 5 atop this surface, with a stone door socket, presumably out of context, found directly to its west. Further, a small squarish platform (7I) of 13 mudbrick courses was constructed against the southeast wall of area 9, atop the stone slabs of the pavement. An ashy pit (7J) was located just to the north of this platform.

Area 7, phase f: A pit (7L) in the northwest corner of area 7 intruded into phases e and d (Figure 2.105); it would thus date to a late level 3 or perhaps a level 2 context. Furthermore, sometime after the phase e occupation, the northern part of area 7 as well as area 51 were covered with a deposit of 20–30 centimeters of black ash.

Area 8 (Figures 2.103 and 2.104): Located directly below the present-day mound surface on the southwest slope of the tell, the remains of the area 8 room were only partially preserved. In the interior of the room, whose interior wall faces were lime plastered, were white lime-plastered mudbrick benches (8A, 8E–F) abutting the room walls. Traces of a lime-plastered floor were discovered in the room's northeastern corner ca. 15–20 centimeters below the top of bench 8A. The doorway in the room's north wall had a mudbrick door sill two courses high (see the four articulated bricks of 8G, Figure 2.103) with an accompanying stone door socket; the sill was level with the mudbrick benches but left unplastered. A step consisting of one mudbrick, one course lower than the top of the door sill, led down into the room.

The extant walls of the room were preserved as high as four courses. Both the walls and benches of this room were built atop rather deep mudbrick foundations (elevations 293.10–293.91) sunk into level 4 deposits.

Burial 17 was located just east of area 8 in area 95 and included a mudbrick enclosure with the skull of a young child. Since the grave construction included a segment of level 4 architecture, this grave may either be

FIGURE 2.104. Level 3, area 7, phase c (lower right) and area 8 (upper right). Looking southwest.

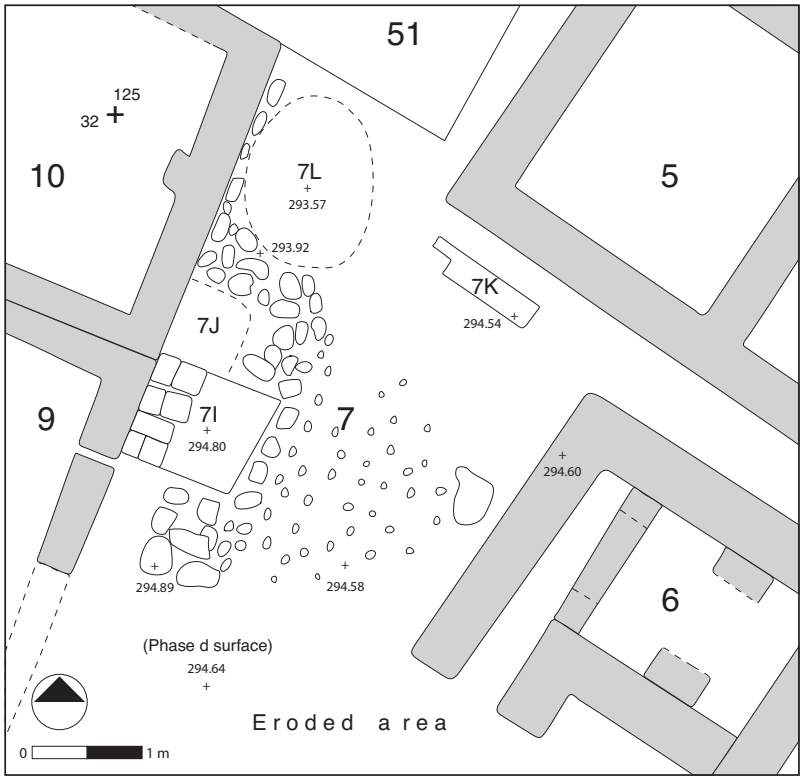


FIGURE 2.105. Level 3, area 7, phases d–f. *Illustration prepared by Julie Perlmutter.*

FIGURE 2.106. Level 3, area 7, phase e. Looking north.

FIGURE 2.107. Level 3, area 7, phase e (left) and areas 9/10, phase b (right). Looking south.

dated to late level 4 or early level 3, when this architecture was still in view (see Figure 2.65).

Area 9, phase a (Figure 2.108): Eroded to the south, area 9 may have been part of a two-room structure together with area 10 to its north. Phase a is contemporaneous with area 7, phases a–c. The room was better preserved to the east in 30/126 than in 30/132; in 30/126, a white to green lime-plastered floor was exposed. The bottom five courses of the northeast wall 9C consisted of wider bricks than those of the upper course, with the wider bricks' projection to the southwest forming bench 9A, which had two coats of lime plaster evident. The later intrusive oven 9E (see below) as well as a late burial destroyed much of the northern wall of the room in 30/132.

Area 9, phase b (Figures 2.107, 2.109, 2.110): The southeast wall of Area 9 (9B) was extended to the south in this phase, perhaps serving to block a hypothesized doorway of phase a. Phase b is contemporaneous with area 7, phases d–e. At some point in this phase, platform 7I of area 7, phase e was added against the room exterior to the northeast. In a later period, probably in later level 3 after abandonment of the room, a circular clay oven (9E, diameter = 46 centimeters) was installed in the corner made by walls 9D and 9C, partly damaging those walls.

Area 10, phase a (Figure 2.108): As noted above, area 10 might be part of a two-room structure together with area 9, but this is not certain. Associated with the earliest phase of this room was a burned green plaster surface. Against the east wall was a semi-circular feature (10E) composed of a course of mudbrick fragments atop a foundation of stone cobbles and slabs, with two upright mudbricks placed on top of the mudbrick course (compare similar features in areas 32 and 33). Cobbles were also found around the exterior of the installation. This feature was situated next to a lime-plastered circular (ventilation?) hole ca. 10–15

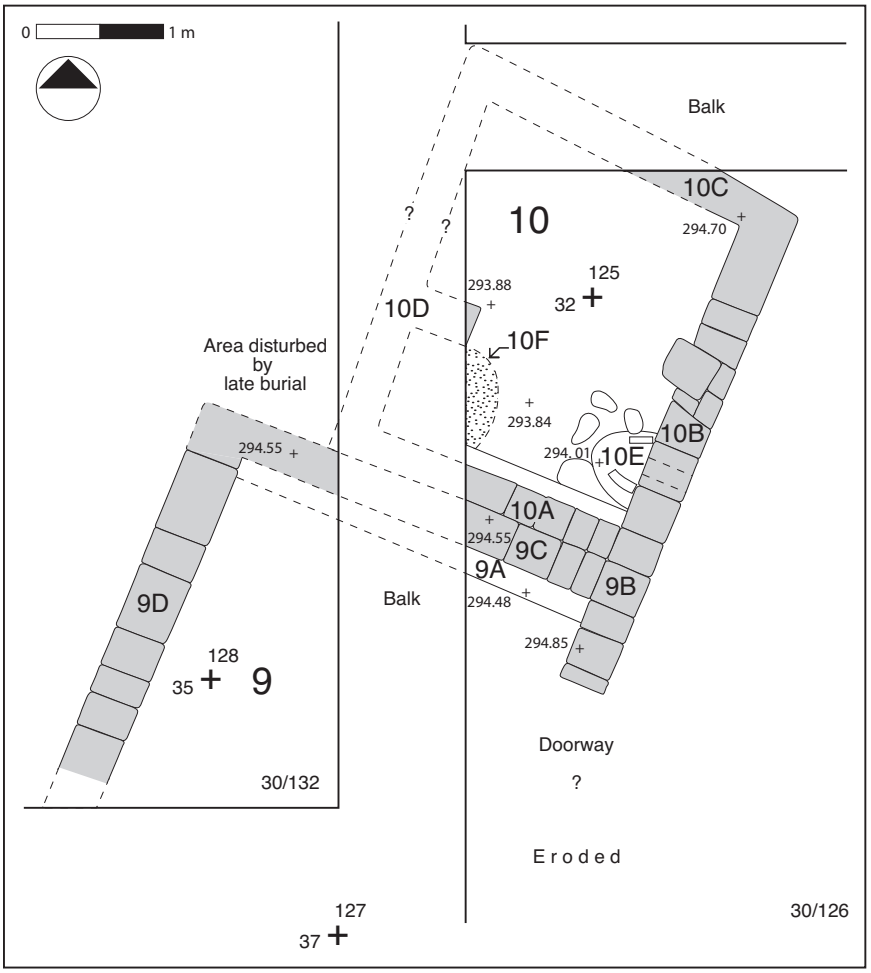


FIGURE 2.108. Level 3, areas 9/10, phase a. *Illustration prepared by Julie Perlmutter.*

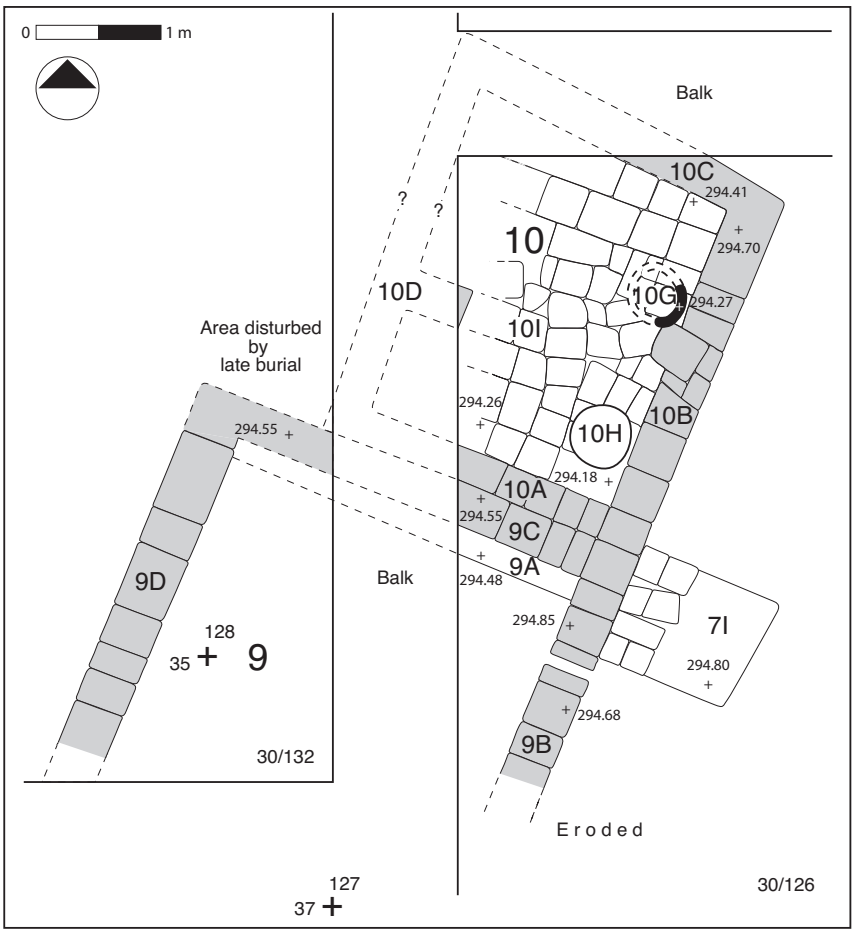


FIGURE 2.109. Level 3, areas 9/10, phase b. *Illustration prepared by Julie Perlmutter.*

centimeters in diameter penetrating the southeastern wall (10B) of the room. A fireplace (10F) was located to the southwest by the west balk of 30/126, and clay oven fragments were also noted. The interior faces of the room walls were lime plastered.

This phase should be approximately contemporary with area 9, phase a, since both are the original occupations of two adjacent rooms founded on the same elevation.

Area 10, phase b (Figure 2.109): Attributed to this phase is a sequence of surfaces, the lowermost of which was a burned green plaster floor. Directly above this, a floor of one course of mudbricks (10I) was installed (Figure 2.110), which itself was covered with flat stone cobbles (Figure 2.107). Traces of white lime plaster were observed above the cobbles against the southwest wall (10A) of the room. A large number of cooking ware sherds were recovered above the cobble surface.

In the northeast corner of the room was a small fragmentary circular clay oven (10G), while a shallow

FIGURE 2.110. Level 3, areas 9/10, phase b. Looking north.

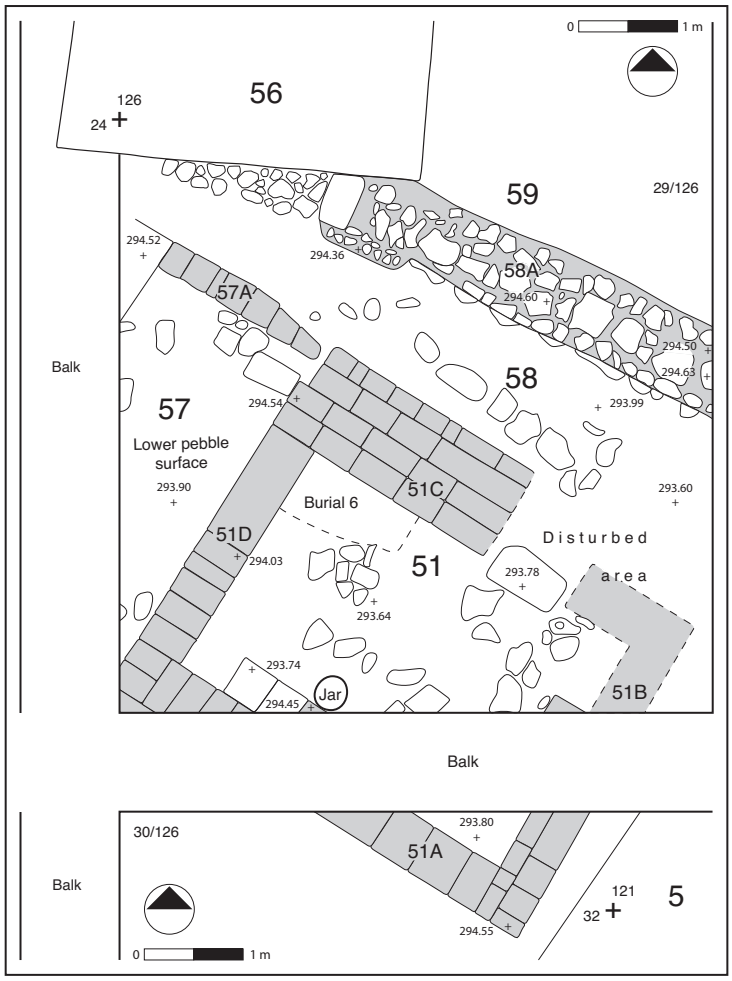


FIGURE 2.111. Level 3, areas 51, 57–58. *Illustration prepared by Julie Perlmutter.*

pit (10H) was dug in the southeast corner, filled in with ash. The interior wall faces of the room were lime plastered.

Objects: clay andiron fragment found near small oven 10G, two brown stone beads.

Area 51 (Figures 2.111, 2.112): North of area 10, area 51 is a room with a stone paving contemporary with that of the area 58 alley. A jar was installed at the base of a buttress against the southwest wall 51A, and two bricks were placed against this buttress to its northwest. A late grave destroyed a large segment of the northeast wall in the vicinity of its doorway, which is nevertheless indicated by the large stone of the threshold and the door socket adjacent to the southeast.

Both the southwest (51A) and southeast (51B) walls were constructed on a foundation of flat stone slabs as large as 50 × 70 centimeters. Two extra rows of mudbricks were added to the north face of the northeast wall (51C) subsequent to its initial construction.

After some fill had accumulated above the stone paving, and presumably when the room was abandoned, the grave of an infant (burial 6) including a mudbrick and stone enclosure was dug in the northwest corner of the room, utilizing the northwest and northeast walls (51C–D) as part of the grave construction.

A deposit of 20–30 centimeters of black ash was found above the extant architectural

FIGURE 2.112. Level 3, area 51 (left) and street 58 (right). Looking west.

remains of area 51; above this, the level 2 architecture was constructed.

Objects: white stone bead.

Area 57 (Figure 2.111): In this area were two surfaces deposited in succession comprised of pebbles in a matrix of gray-green material with lime inclusions. The north wall 57A was badly disturbed by a later burial; it may have functioned primarily as a blocking of the passage between areas 53 and 51.

Objects: pierced potsherd.

Area 58 (Figure 2.111): The area 58 "street" ran to the northeast of area 51. The wall bordering the street to its north (58A) had a foundation of one course of stone cobbles (elevation ca. 293.80–294.02) surmounted by a mudbrick construction. In a later level 3 phase contemporary with construction of the area 12 edifice (see below), the wall was rebuilt with a foundation of one to two courses of stones consisting of boulders flanked on either side by smaller cobbles; one course of one mudbrick row was preserved above the stone foundation (see Figure 2.120). An individual stack of mudbricks was found at the northwest end of the wall, adjacent to area 56 (see Figure 2.114).

The street had a surface paved with occasional flat stones, contemporary with the paved surface of area 51. Above this were alternating layers of black ash, reddish bricky material, yellow gravel, and light brown material, often well-stamped down.

Objects: one half of a pierced potsherd disk, irregular circular gypsum (?) perforated disk, bone animal figurine.

Areas 52/53 (Figure 2.113): These areas constitute a two-room house adjacent to rooms 9 and 10 to the southeast, with two occupation phases. The room walls generally showed evidence of lime plastering on the interior.

Areas 52/53, phase a: The phase a occupation in area 52, the larger room, included an earth floor surface (elevation ca. 293.70–293.90) and a door socket against the lowest course of the southeast wall (52B). The latter

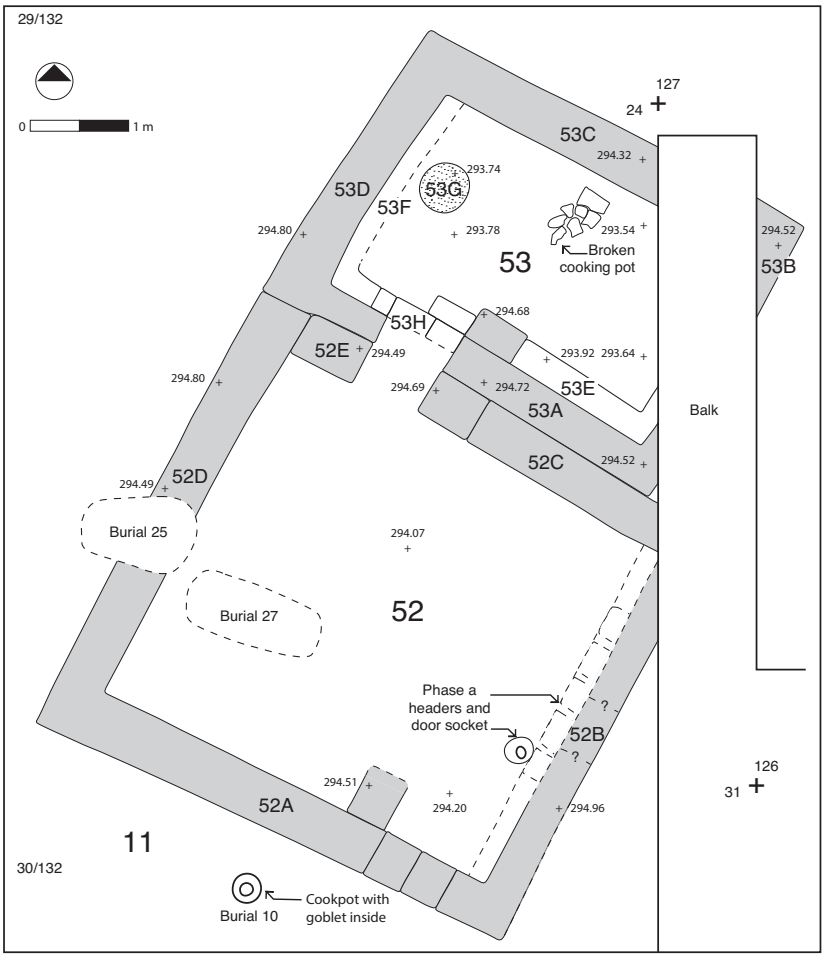


FIGURE 2.113. Level 3, areas 52/53. *Illustration prepared by Julie Perlmutter.*

find indicates the existence of a doorway, but its precise plan is not available since only the lowest foundation course of wall 52B was preserved in this area.

A sounding in the eastern part of area 52 revealed that this room was partly dug into earlier (level 4?) remains. Although much of the southeast wall (52B) had been destroyed, its lowest course survived and consisted of headers, which would have ostensibly formed a wider row than the courses above it according to the pattern observed for other two-room houses.

In area 53, the smaller of the two rooms, were mudbrick benches against all but the northeast wall. The phase a floor surface sloped up to the north (elevation ca. 293.50–293.64).

(*Complete vessels/profiles:* in test trench below floor of area 52, two complete vessels—round-based, evert neck Medium Simple Ware jar (Figure 4.26:11), and flat-based, simple-rim Coarse Simple Ware bowl (Figure 4.26:13). (Each is given level 4/3 designation since it is not clear whether the context it derived from should be understood as level 3 or 4.)

Areas 52/53, phase b: Area 52, phase b, had a gray earth floor surface and no distinguishable features or installations. The door jamb (52E) in the northwest corner of the room was preserved to a lower elevation than the adjacent northwest wall (52D) and resembled a mudbrick platform when first excavated.

In area 53 was a greenish-white lime-plastered floor with occasional traces of burning. Broken remains of a large cooking pot were found on the floor, and a fireplace (53G) was located in the northwest part of the room. Mudbrick benches (53E–F) one course high with light green plaster were appended to the northwest, southeast, and southwest walls. On the floor in the doorway leading to area 52 several mudbricks lay flat (53H), perhaps serving as a step into the latter room, which had a slightly higher floor surface than area 53.

South of area 52 was the eroded area 11. Here were the remains of a poorly preserved burial of a child (burial 10) in association with a fragmentary large cooking ware vessel containing a pointed-base goblet, as well as a small jar west of the head.

Objects: area 11—small bronze fragment, white stone bead.

Complete vessels/profiles: area 52—Fine Simple Ware round-base, everted-rim goblet (Figure 4.29:26).

Area 54: This area is an open zone on the edge of the tell west of areas 52/53 (see Figure 2.83).

Complete vessels/profiles: Fine Simple Ware round-base, bead-rim bowl (Figure 4.29:1)

Area 56: Area 56 (Figure 2.114) is a square room oriented north-south, in contrast to all other architecture of level 3 except the area 21 temple, which is also square in shape. Only one floor surface was noted in the room, but there is the possibility of an earlier phase of use, because the semi-circular feature (56E) in the southwest corner of the room was built above a circular clay oven (56K) (see Figures 2.115, 2.116). Other possible interpretations follow: (1) oven 56K represents the subterranean segment of an oven used during an earlier phase of occupation associated with the room's lime plaster floor, or (2) the oven is to be dated to later level 4.

Associated with the lime-plastered floor were a number of features. The bottom of what appears to be a clay oven (56F), though without traces of burning, was found in the northeast corner of the room; in the southeast area were traces of a burned surface (fireplace?) north of the vestiges of a lime-plastered mud bin (56H), itself next to a mudbrick bench (56I) along the south wall. Northwest of this bench was a circular lime-plastered pit (56G) filled with sherds, dug from the room floor, perhaps to hold a vessel sunk into the floor. The poorly preserved, oval lime-plastered mud feature 56E, perhaps intended to contain a storage jar (Pfälzner 2001:160), was located in the southwest part of the room, against a white lime-plastered bench (56J). The lime-plastered floor of the feature appeared to be a continuation of the plastered room floor. Stone cobbles and pebbles filled the space between bench 56J and wall 56D.

The room was constructed with elaborate foundations sunk into earlier architecture, ca. 60 centimeters below the lime-plastered room floor. It appears that the level 4 building below was already in ruins when the level 3 foundations were laid, since these foundations were sometimes sunk into brick collapse from the level 4 walls. The lowest two or three courses of the foundations consisted of walls constructed of often irregular shaped-bricks in irregular patterns; only the lowest courses of the north wall (56C) were constructed regularly (Figure 2.117). The southeast segment of the wall 56A foundation underlay the exterior cobble feature noted below. Above these lower courses were foundations of the upper walls 56A–D (Figures 2.115, 2.116).

In addition to the elaborate foundations, the building was supported with extra constructions on all four sides. Set against the exterior of the south wall (56A) was a course of cobbles with some brick packing beneath (Figure 2.114), and a pavement or support of

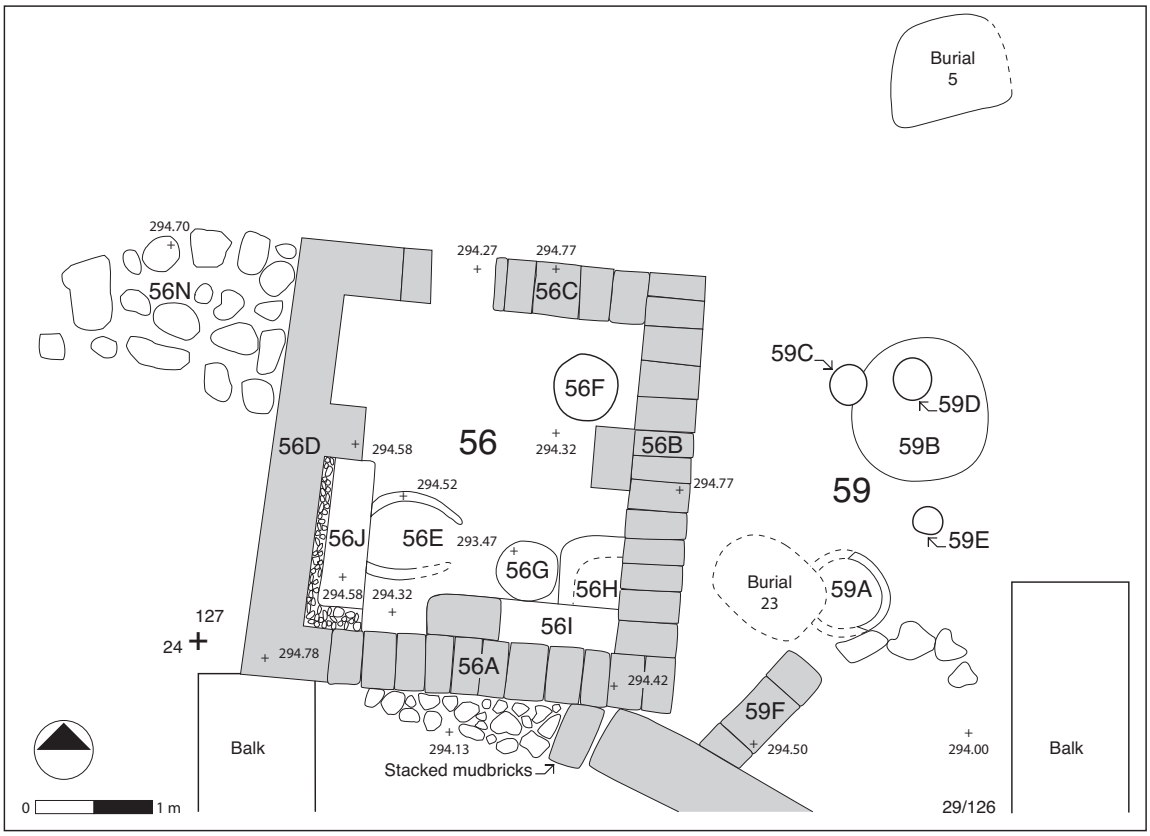


FIGURE 2.114. Level 3, areas 56 and 59. *Illustration prepared by Julie Perlmutter.*

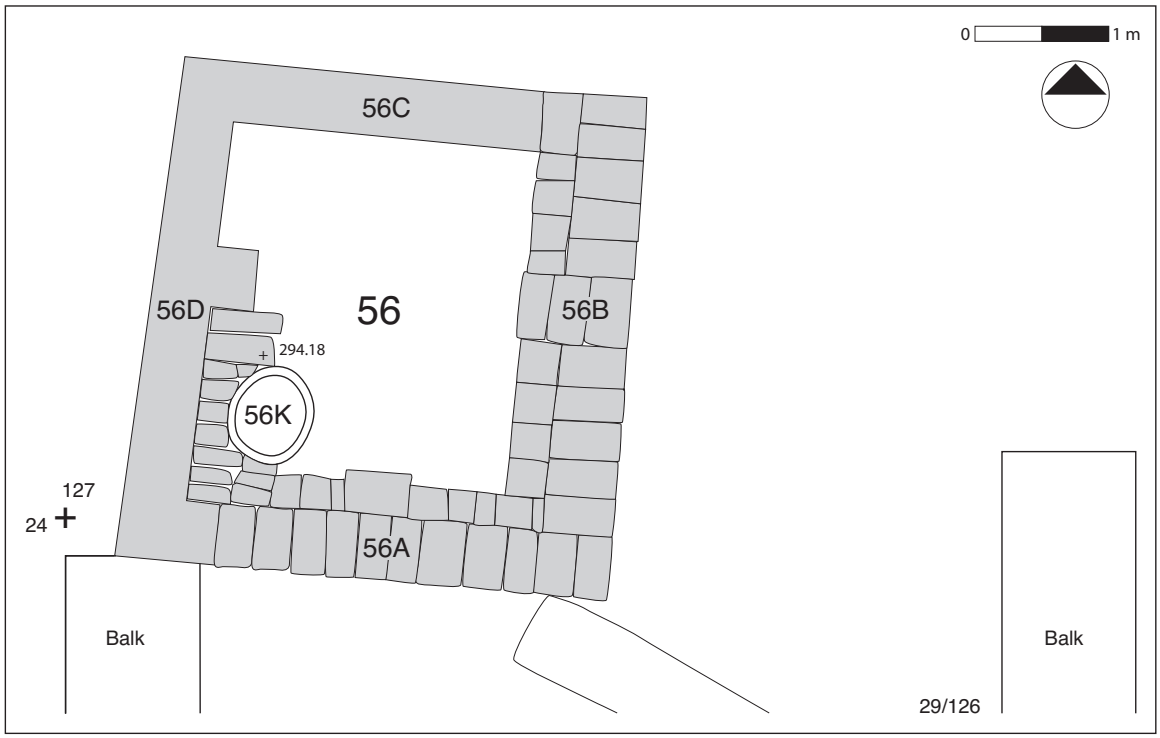


FIGURE 2.115. Level 3, area 56, foundations (upper). *Illustration prepared by Julie Perlmutter.*

Figure 2.116. Level 3, area 56, foundations (upper). Looking northwest. *Illustration prepared by Julie Perlmutter.*

stone cobbles was also installed against the outside of the northern stretch of the west wall (56N). Against the east wall of area 56 was an unplastered set of bricks two rows wide and 12 courses high (56M, ca. 1 meter high preserved, Figures 2.116, 2.117), added against the retaining wall for further support. Like the retaining wall 56L (see below), this feature intruded into level 4 contexts, but not as deeply.

The retaining wall 56L was constructed on the north slope of the tell against the north wall of area 56 (56C), extending deep into level 4 contexts (Figures 2.117, 2.118). Two large interior buttresses were positioned at the northeast and northwest corners of area 56 (see also area 14); the western face of the western buttress was not excavated. It would appear, therefore, that the doorway in the northern wall of area 56 was blocked by the retaining wall, unless the retaining wall did not extend that high. Certainly, the preserved top of the retaining wall was below the area 56 floor level.

Objects: clay bird (?) figurine fragment, bronze rod fragment, rim sherd from white plaster lid (from under floor next to wall foundations), red stone bead (from under floor next to wall foundations), faience bead.

Complete vessels/profiles: Medium Simple Ware flat-based, bead-rim bowl, found in upper fill of foundation below room floor (Figure 4.27:5). (Flat-based carinated Fine Simple Ware bead-rim bowl found in lower debris next to the eastern foundation wall of area 56 was given a level 4/3 designation; see Figure 4.26:1.)

Areas 59/60: The open area 59 (Figure 2.114) included remains of a circular clay oven (59A) partly destroyed by the level 2 burial 23. Several grinding stone fragments and a bone needle were found in the fill east of the oven. To the north of the oven was a large pit (59B) and, in a subsequent phase, three small pebble-lined pits (post holes?) (59C–E). The pit grave of an adult (burial 5) was located outside the retaining wall 56L/14H at the northern edge of the mound (see Figure 2.83, 2.114).

To the east in area 60, west of 13/14 (Figure 2.119), were two child graves (burials 3 and 4) situated just outside rooms 13 and 14, consisting of pits containing mudbrick enclosures. Farther south were three circular clay ovens (60B–D) associated with the late level 3 construction of area 12 (Figure 2.120). Oven 60B had a packing of stones and sherds around

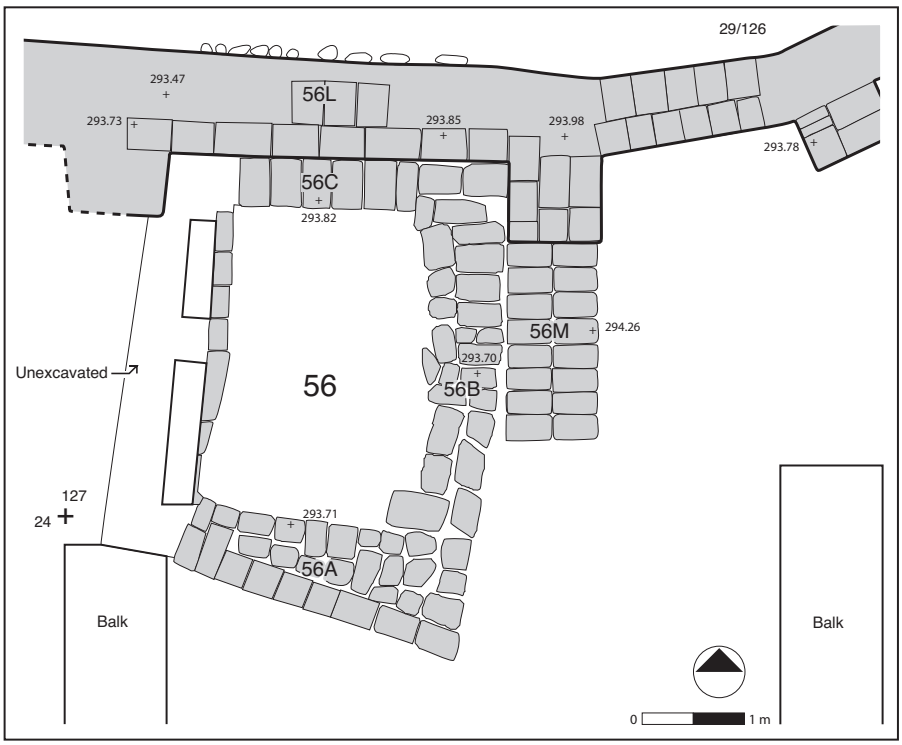


Figure 2.117. Level 3, area 56, foundations (lower). *Illustration prepared by Julie Perlmutter.*

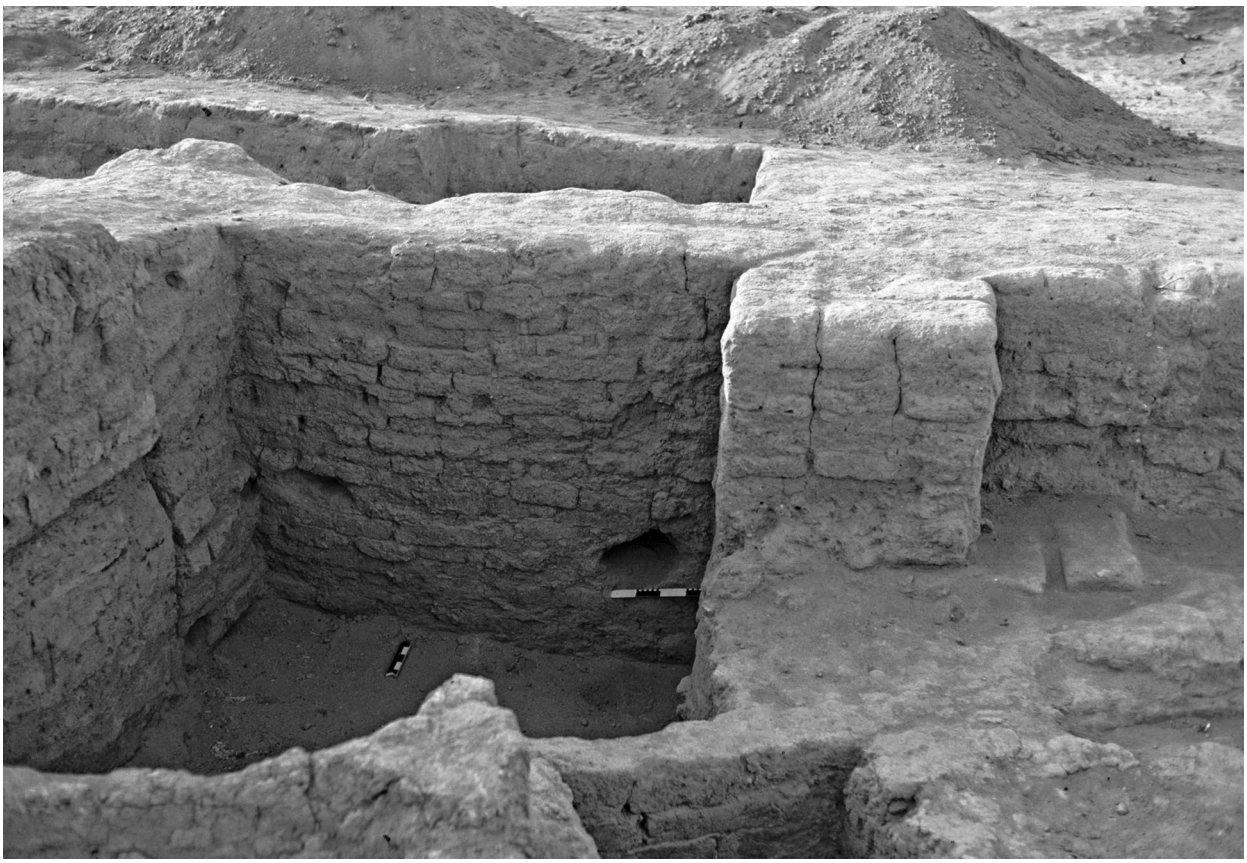


Figure 2.118. Level 3, retaining wall 56L on northern edge of site. Looking northeast.

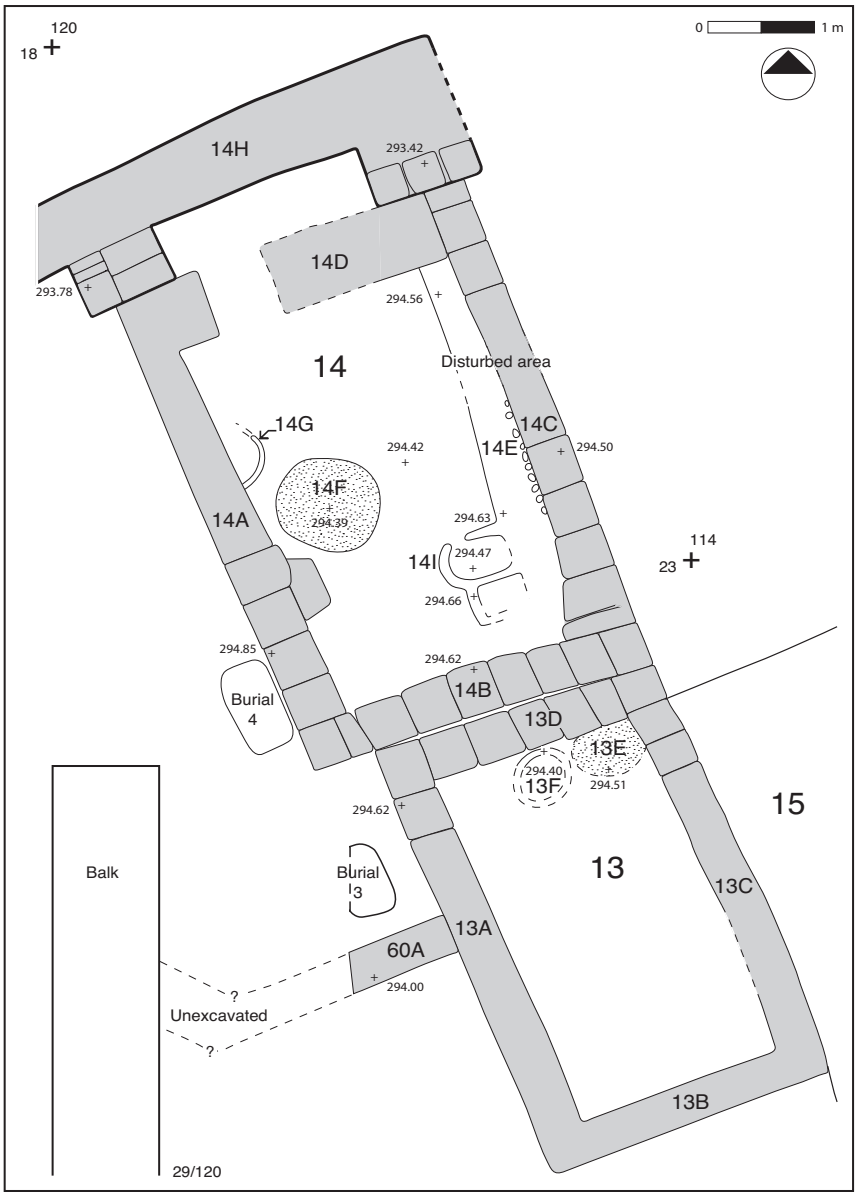


Figure 2.119. Level 3, areas 13/14. *Illustration prepared by Julie Perlmutter.*

it and rested on a mudbrick platform 10 centimeters high. This oven (and the other two?) was associated with a green floor surface (elevation 294.52). Fill in this area included abundant ashy material and cooking ware sherds.

Objects: area 59—2 animal figurine fragments, clay andiron fragment, bone awl fragment found in oven 59A, bone awl fragment found inside wall, bone pin fragment, 3 grinding stone fragments type A, fragment of stone door socket, small clay wheel, pierced potsherd disk; area 60—2 clay tokens, clay unimpressed sealing, quartz bead.

Areas 13/14 (Figure 2.119): These areas comprise a two-room house without apparent access between the two rooms. The south central part of area 13 was largely destroyed later in its history when the area 12 structure was installed, but the lowest brick course(s) of its walls in the disturbed areas were still extant.[30]

Area 13: Although a floor surface was not identified in the room, two features apparently associated with area 13 floor(s) were delineated. Near the northeast corner of the room was a fireplace (13E) with sherds of a horizontal-lugged cooking pot resting on it, and fragments of a sherd-lined baked clay oven (13F) were found to the west of this surface. The fact that the oven fragments were found at a somewhat lower elevation than the fireplace might be interpreted to indicate that the fireplace was on a raised platform or that two floor surfaces were present in the room (see also area 79). The walls of the area 13 room were constructed

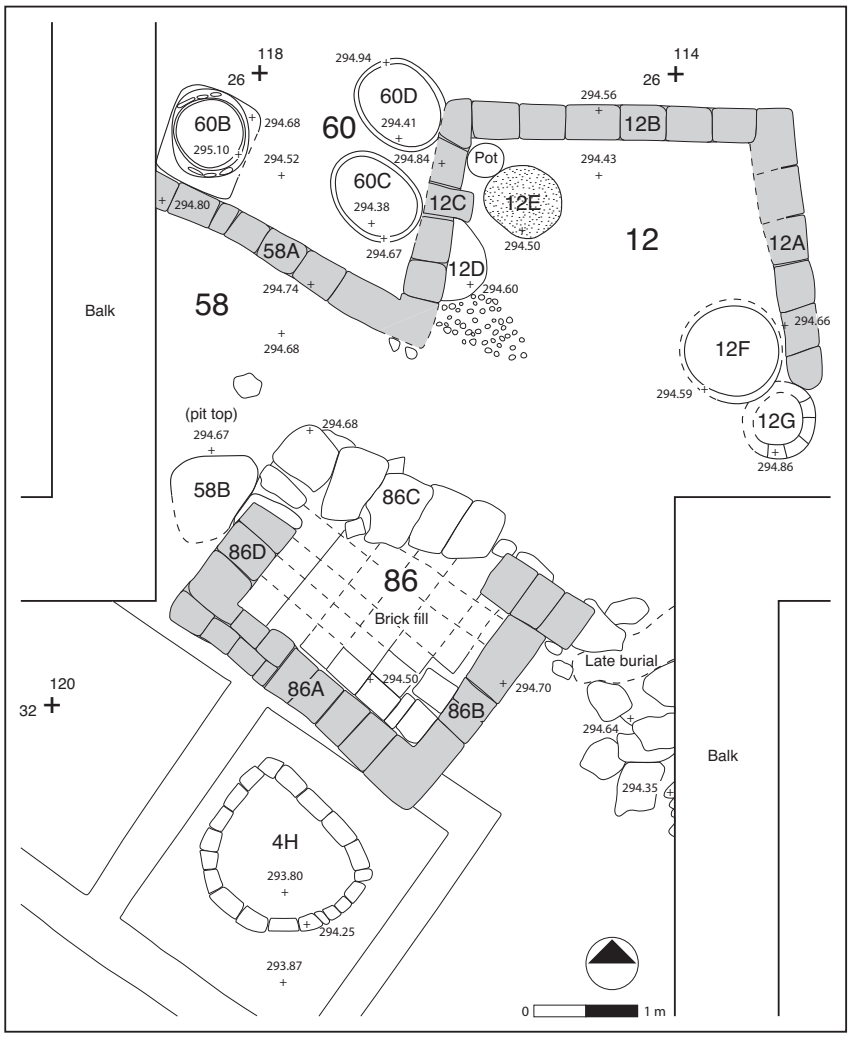


FIGURE 2.120. Level 3, areas 12 ("shop"), 60, and 86. *Illustration prepared by Julie Perlmutter.*

above one or two wide courses of headers; the headers of wall 13C measured ca. 50 × 20 centimeters.

Objects: bone pin fragment, small white stone hexahedron of uncertain function, white stone partly pierced irregularly shaped object, two white stone beads, bone bead, quartz bead.

Area 14: This room included greenish-white lime-plastered interior wall faces, mudbrick bench (14E), and floor. In the southeast part of the room was a fragmentary lime-plastered feature (14I) consisting of two receptacles, one of which had a clear gap in its enclosure wall (cf. Kolinski and Lawecka 1992: figure 4, feature F3, room 20, layer 3). Perhaps flour was ground on the adjacent bench 14E and then swept into the receptacles of 14I or into vessels placed inside them. The southwest wall of 14I was preserved to its full height (24 centimeters), apparent from the preservation of lime plaster on its top. The association of the room floor and feature 14I was corroborated by the floor's lime plaster curving up the sides of the feature; the lime-plastered floor of the feature was at the same elevation as the room floor. The feature was appended against bench 14E; a line of pebbles and small cobbles marked the border between the bench and wall 14C (compare area 56, bench 56J).

Near the southwest wall (14A) was a round fireplace (14F) with a border of pebbles, sherds, and white plaster. Just to its northwest were the poorly preserved remains of a lime-plastered circular feature (14G).

The northeast wall 14C was only preserved to the height of one brick course above the room floor, indeed lower than the adjacent bench 14E; the more northerly stretches of wall 14C and bench 14E were poorly preserved, located just below the present-day mound surface and also much disturbed by animal burrows and plant roots. However, excavations below the floor revealed that the bench and wall were built above a foundation row of mudbrick headers whose width was

equivalent to the combined width of the bench and wall built above. The northwest wall of the room (14D), similarly disturbed and eroded, is partially reconstructed; the doorway in this wall is evident from its lime-plastered southwest door jamb. The doorway would have been blocked by the retaining wall 14H to the north, unless that wall did not extend that high; its preserved top was certainly well below the floor level of area 14.

Objects: 1 (or 2?) unimpressed clay sealings, 2 bronze rod fragments.

Area 93: As noted above, a retaining wall (14H) was constructed on the north slope of the tell north of areas 56, 59, and 14, sunk deep into level 4 deposits; the bottom of wall 14H in its western extent was at an elevation of 291.36. Wall 14H, which extended west to wall 56L, constructed north of area 56, included two large interior buttresses at the northwest and northeast corners of area 14. Construction of the eastern buttress entailed excavation of a pit intruding into and destroying level 4 architecture, installation of a course of stone cobbles and boulders as a foundation, and construction of the mudbrick buttress above it. An apparent eastern continuation of this retaining wall was observed north of area 61 (see wall 61B, below). Area 93 is the designation for the region north of wall 14H.

Objects: clay unimpressed sealing.

Area 12 (the "shop") (Figure 2.120): In late level 3 or early level 2, the southeast wall and the southern portions of the northeast and southwest walls of area 13 were removed in order to build new architecture. Before construction began, however, a small circular clay oven (13G, diameter = 60 centimeters, elevations 294.10–294.34) was sunk into the southwest wall 13A of level 3, area 13, in the area below the northwest corner of area 12 and the pot in that corner.

After the oven's use was terminated, the area 12 room was built above its remains and the leveled tops of the level 3, area 13 room walls. This structure had only three walls and was apparently open to the passageway or street to its south. The outer face of the west wall (12C) was much disturbed by the construction of the southeast wall of level 2, area 14, particularly at its north end.

The floor surface of area 12 was of yellow plaster, found only in occasional traces, particularly near the northern wall (12B). The west wall (12C) of the room, lime plastered on its interior face, had an interior buttress, south of which was a raised (height = 15–20 centimeters) feature (12D) consisting of a concave white lime plaster surface laid atop a layer of pebbles and mudbrick fragments. A basalt grinding stone fragment was found on the floor near this feature. In the northwest corner of the room was a circular fireplace (12E) ringed by pebbles and white plaster; a pot dug into the floor was inserted in back of this.

By the south end of the east wall (12A) of area 12 were two round clay ovens (12F–G). Wall 58A, marking the north edge of the street of area 58, was rebuilt in this phase, with a foundation of one or two courses of stone cobbles and slabs (cf. area 58).

Because of the absence of a fourth wall in the area 12 room and its location next to an alley, the space was informally referred to during excavation as the "shop." However, the features found in it are characteristic of the domestic architecture elsewhere in Raqa'i levels 2 and 3 and imply no specialized function for the space. In contrast, ethnographic studies in traditional Near Eastern villages have noted that shops tend to have niches for goods (Sweet 1960:122) and lack other domestic features such as ovens, bins, and hearths (Kramer 1982:113).

Since the area 12 structure is situated in a stratigraphically intermediate position between contexts associated with more coherent distributions of architecture assignable to either level 2 or level 3, it is possible that the structure should be dated to early level 2 rather than late level 3. Indeed, a review of the pottery from this structure (Chapter 4) supports that hypothesis.

Objects: 2 clay disk tokens, plaster sealing, grinding stone fragment type A, pestle type B, white stone bead, shell pendant.

Area 86 (Figure 2.120): Southwest of area 12, a rectangular platform of some five to six brick and stone courses was sunk into earlier level 3 contexts, damaging the northeastern walls of level 3, silos 4 and 5. This structure consisted of four walls enclosing a space filled in with mudbricks. The walls were primarily mudbrick, with the exception of the northeast wall and part of the northwest wall, which were constructed of stone boulders. In the eastern corner of the structure, a course of mudbricks was added on top of the stone courses.

It is possible that this platform was used in conjunction with the circular mudbrick oven (4H) built above the fill of level 3, silo 4. Adjacent to the platform on the northwest was an incompletely excavated pit with ashy fill (58B).

Given the ceramic results noted for area 12, it may be that the area 86 platform is more appropriately assigned to early level 2 than late level 3, but the evidence is not conclusive.

"Temple" Area

Areas 15/16: These areas comprise a two-room house with lime-plastered interior wall faces and floors, situated back-to-back against the area 13/14 house. A complete sequence of level 3 occupation was excavated in areas 15/16.

Areas 15/16, phase a: The phase a architectural plan of area 15 was duplicated in phase b (Figure 2.121). Included in the room were a floor with seven lime-plaster layers (elevation ca. 294.00) and a fireplace (15E, diameter = 80–90 centimeters, elevation 294.02) in the north central part of the area (see Figure 2.121, the area between burial 20 and feature 15F).

Excavations down to the lowest courses of the area 15 architecture revealed that, contrary to many other level 3 two-room houses, the walls of this room were not built above a wider row of headers. Instead, the lowest courses consisted of stretchers and half-bricks. However, the lowest courses of the walls of area 16, the smaller room to the south, did consist of headers wider than the courses above (for wall 16B, brick size = 48 × 26 × ?). Little more can be said about area 16 in phase a, since no clear floor surface or associated features were identified.

Objects: area 15—bone awl (complete), pointed bone tool fragment, clay spindle whorl; area 16—stone disk-shaped token (?), small bronze fragment in wall 16D/15B, bone pin in wall, quartz bead.

Areas 15/16, phase b (Figure 2.121): In area 15, phase b, the floor, interior wall faces, and mudbrick bench (15G) had greenish-white lime plaster applied. In the northwest part of the room was a two-part, lime-plastered mud and mudbrick feature (grinding table?) (15F) with a thin incompletely preserved lime-plastered wall bisecting its two segments. The east edge of the feature was formed two semi-circles, perhaps to accommodate two vessels to receive flour ground atop the feature (Pfälzner 2001:139–141).

Area 16 also had a greenish-white plaster floor, with lime-plastered mudbrick benches (16E–G) against

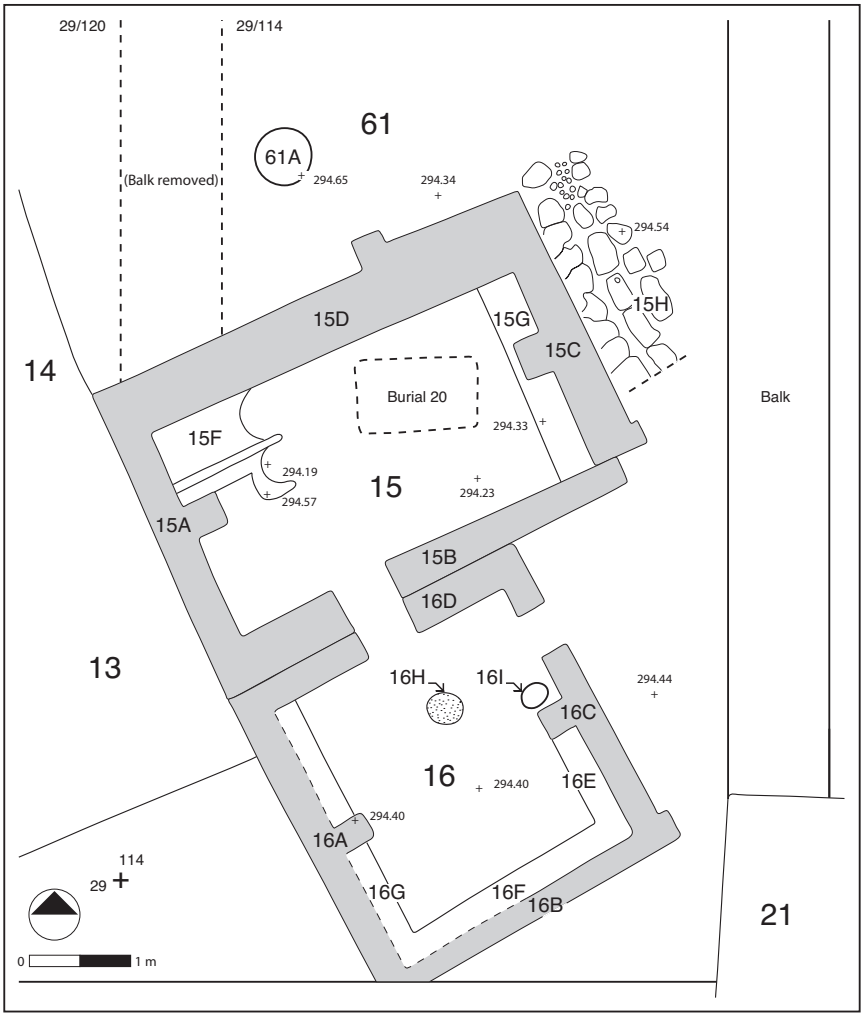


FIGURE 2.121. Level 3, areas 15/16, phase b. *Illustration prepared by Julie Perlmutter.*

three walls, one small fireplace (16H), and a pit (16I) filled with hard red material, encircled by pebbles and sherds. Later intrusions associated with the construction of the area 12 room damaged the southwest wall and bench, making the inner face of the southwest wall difficult to define.

A drain (15H) running parallel to the northeast wall (15C) of area 15 may date to this phase or to its successor. This construction consisted of two parallel lines of stone cobbles and boulders with an occasional re-used door socket or grinding stone, with a channel lined with pebbles and sherds between them. The drain may have been used to protect the building from damage due to standing water.

Area 61, north of area 15, had two consecutive outside surfaces (elevations at 294.34 and 294.54) and a circular baked clay oven (61A) whose bottom was not reached, excavated from 294.27 to 294.65.

Objects: area 15—black stone pendant; area 16—grinding stone fragment type A, limestone mortar (?) type A.

Areas 15/16, phase c (Figure 2.122): In this phase, the doorway between areas 15 and 16 was blocked with mudbricks. Area 15 included a greenish-white lime-plastered floor. Outside was drain 15H (shown at a slightly higher elevation than in Figure 2.121). Area 61, north of area 15, included an outer surface with ashy spots and a post hole.

Area 16 had a gray-white plaster floor, a round fireplace (16J) to the north ringed by pebbles, and lime-plastered mudbrick benches (16K-M) against three walls. East of the doorway in the northeast wall 16C, which had a threshold of stones with a door socket, area 92 included a circular clay oven (16N) to the north of the doorway and a circular oven atop the remains of a plastered mudbrick platform (16O) to the south. As noted for phase b, the southwest wall (16A) and bench (16M) of area 16, phase c were considerably disturbed by the later activities associated with the construction of the area 12 architecture.

Well to the north of Area 61, the south face of what appears to be the continuation of the north slope retaining wall (as in 14H to the west) was identified,

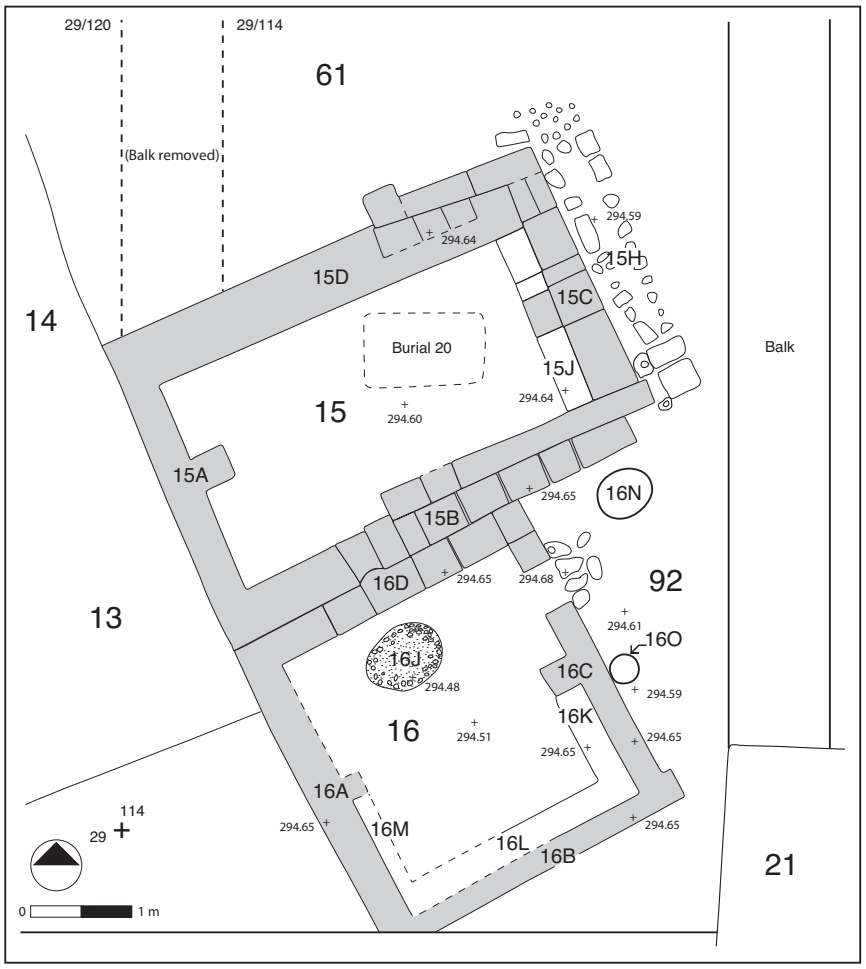


FIGURE 2.122. Level 3, areas 15/16, phase c. *Illustration prepared by Julie Perlmutter.*

intruding into level 4 contexts. The wall, designated 61B, had its preserved top at elevation 293.30 and extended down to 292.03 (Figure 2.83).

Objects: area 15, phase c—two bronze rod fragments, stone pestle type D, clay model wheel; area 15, phases a-c—bone awl fragment, pierced potsherd disk; area 16, phases a-c—pierced potsherd disk; area 61 (contemporary with areas 15/16, phases a-c)—stone cylindrical token (?), clay animal figurine head, clay jar stopper (?), bronze fragment, nine grinding stone fragments, one complete grinding stone (all type A), fragment of type a grinding stone with type B piercing, and one pestle type B reused as part of drain 15H, two fragments of pierced stone type B, pestle type F, pestle type G, fragment of mace head or hammer head, fragment of small stone ring ornament, basalt biconical object of uncertain function, alabaster (?) pierced cylinder of uncertain function, two clay spindle whorls, clay model wheel (complete), fragment of clay model wheel, clay disk, one half pierced potsherd disk, complete potsherd disk, gypsum (?) circular pierced disk, white stone pendant; area 92—2 basalt grinding stone type A fragments.

Area 21 (Temple): This area, the temple or shrine, consists of a one-room structure built atop a relatively elaborate dug-in foundation (see Schwartz 2000 for additional discussion of this edifice). The creation of this foundation appeared to have commenced with the excavation of a pit ca. 4 × 3.5 meters in area and 2 meters deep. Inside the pit, a brick construction was then erected of mudbricks and mudbrick debris.

Area 21, Brick Foundation Structure (Figure 2.123; Figure 2.77, right): Careful examination of excavation results and records has led us to the conclusion that the temple's foundation structure consisted of a solid block of mudbricks some 10 courses high with occasional pockets of brick debris. We now reject consideration of the structure as a four-walled edifice filled in with mudbricks (Schwartz 2000; Schwartz and Curvers 1992:404–405), because no clear interior wall faces were ever identified and because the interior "buttresses" (21D–E) discussed in previous reports now appear, on closer examination, to have been stacks of bricks included in the fill of the building.

The structure consisted primarily of mudbricks and mudbrick fragments arranged in rows or in irregular patterns interspersed with areas of softer bricky debris. The bricks were clearly re-used segments taken from preexisting architecture, because they often had lime plaster-coated edges arranged haphazardly.

At the bottom of the structure and integrated into it were the minimal remains (12–16 centimeters high)

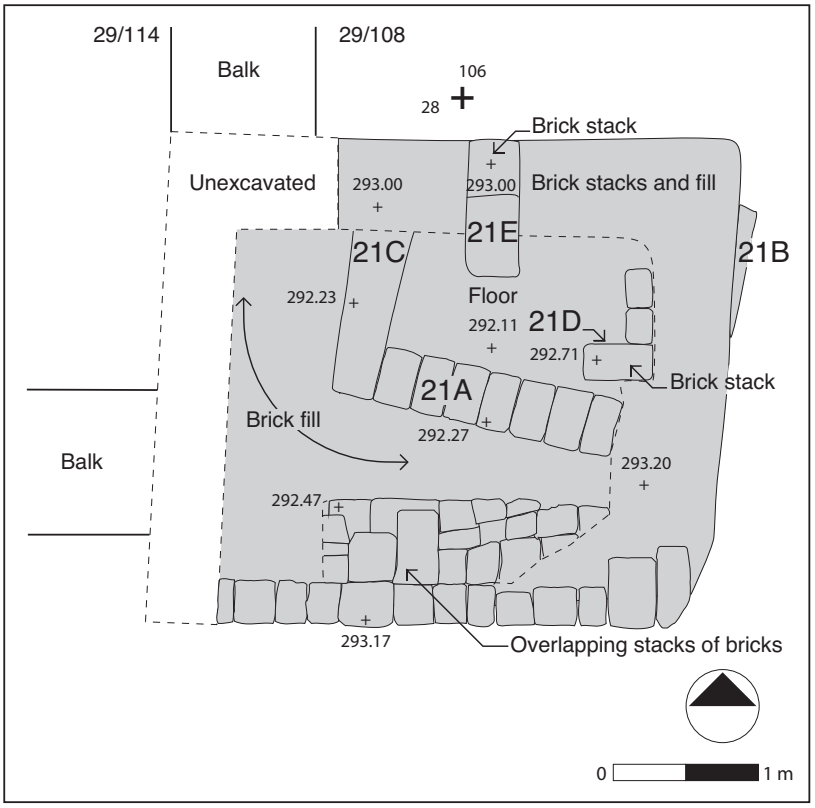


FIGURE 2.123. Level 3, area 21 (temple), foundations (lower). *Illustration prepared by Julie Perlmutter.*

of two perpendicular walls (21A, 21C) associated with a gray earth floor. It appears that walls 21A and 21C and their associated surface are remains from a level 4 room cut by the level 3 intrusion and incorporated into the area 21 foundation structure.

Although no obvious foundation trenches were observed in the sections, traces of the edge of such a foundation trench were observed horizontally during excavation, ca. 10–20 centimeters in front of the north and east edges of the area 21 foundation structure. The intrusive nature of this construction is also corroborated by the recovery of level 3 type Ninevite 5 excised sherds in the associated fill (see Chapter 4).

Area 21, Platform (Figure 2.124): Constructed above this architecture was a platform (21F) of one to three courses of mudbrick, ca. 5 × 5.5 meters in area. The north and east edges of the platform were oriented atop the north and east edges of the foundation structure underneath, but the platform was extended to cover a substantially larger area to the south. The platform included many re-used bricks, evident from their haphazardly arranged lime-plastered edges, as had been the case with the brick fill of the structure below and was to be the case for the brick fill in the level 3 temple.

In the eastern part of the platform was a discrete block of bricks which extended down into the fill of the structure below, consisting of five brick courses (21G). The top two courses of the north and west faces of this block were coated with greenish-white lime plaster, as was the top of the uppermost southern brick. This block could be interpreted either as an intentional feature within the platform or a coincidental stacking of re-used bricks included in the platform.

Area 21, Temple (Figures 2.125, 2.126): The one-room temple (ca. 4.5 × 5 meters in area) was constructed atop mudbrick platform 21F. Two white lime-plastered stepped mudbrick "altars" (21H–I), one large and one small, were located next to one another against the north wall (21L). The plastering extant on the vertical and horizontal faces indicates the features' complete preservation. The interior wall faces of the room had coatings of white lime plaster, and the floor of the building was lime plastered at least three times; the walls' exterior faces were mud plastered. A burned area (diameter = ca. 50 centimeters) was noted on the south

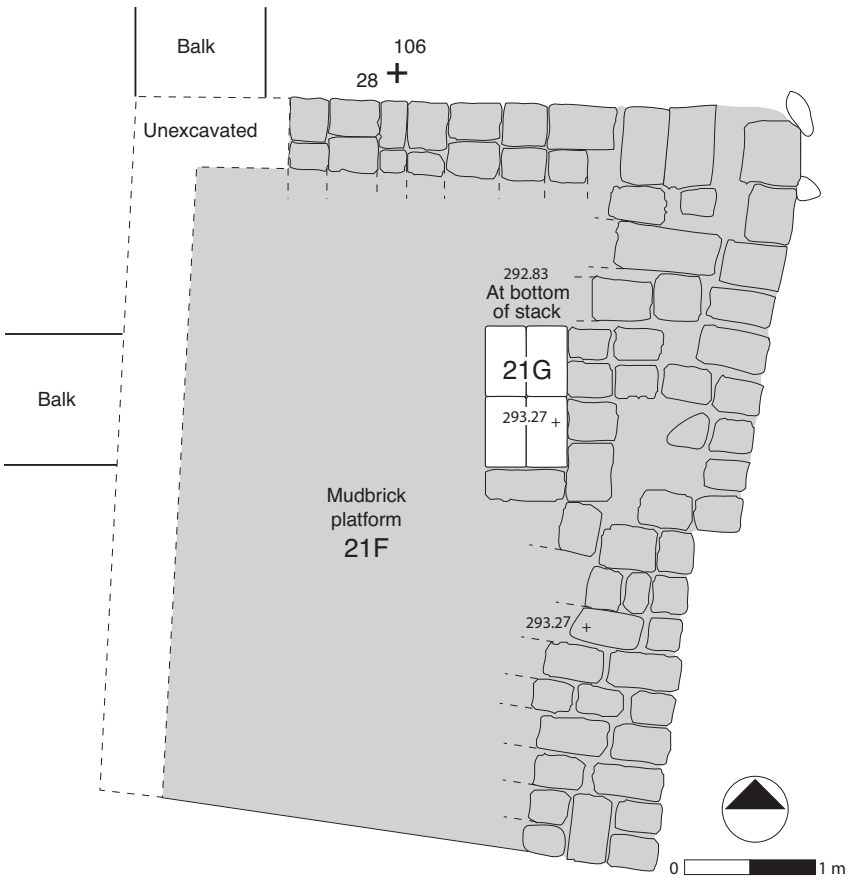


FIGURE 2.124. Level 3, area 21 (temple), foundations (upper). *Illustration prepared by Julie Perlmutter.*

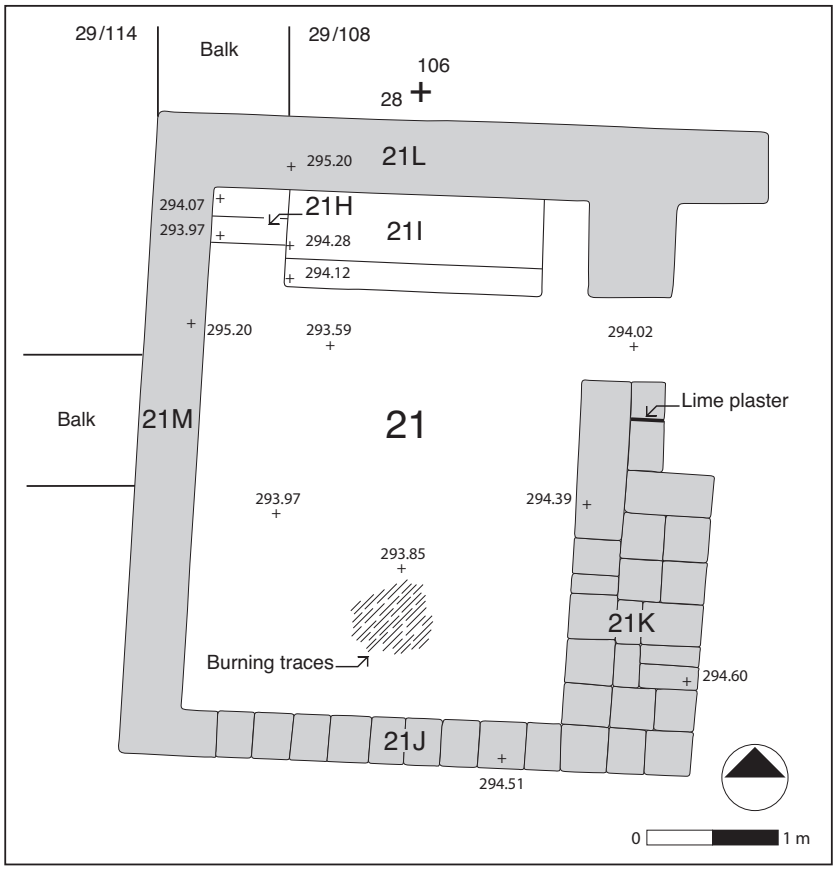


FIGURE 2.125. Level 3, area 21 (temple). *Illustration prepared by Julie Perlmutter.*

FIGURE 2.126. Level 3, "temple" (area 21). Looking north.

central area of the floor. The entire room was completely filled with mudbricks subsequent to its level 3 use (see Figure 2.81, grid points 105–107), presumably as the foundation for a later construction not erected or preserved—or possibly as part of a ritual filling-in of the structure before its abandonment (cf. Oates, Oates, and McDonald 2001).

South of the doorway, the east wall (21K) consisted of two components, an inner row of yellow mudbricks bonded to wall 21J, and a segment of gray-brown bricks added to the east. The two segments combined to form the recessed entry of the building. These segments were preserved up to 16 courses. The southern part of the recessed entry was originally a double recess, apparently, because a stack of single mudbricks was added against the north face of the eastern wall segment, adjacent to the east face of the western segment, above a green lime plaster surface in the doorway. The bricks of the east segment that this stack was set against had traces of green lime plaster on their north faces. There was no evidence of a similar double recess on the north side of the entry.

The two segments of wall 21K were constructed atop a foundation of one brick course surmounted by a course of stone boulders and cobbles (e.g., sizes 21 × 37, 24 × 27, 18 × 20, 26 × 35, 20 × 26 centimeters). Wall 21J had three courses of headers below the level of the green plaster floor of the room.

The wide, lower step of "altar" 21I consisted of five courses of bricks, while the upper step consisted of seven. The lower step entailed alternating courses of two rows of 11 headers with one row of 11 headers flanked by two rows of five stretchers. The top two courses comprising the upper step of the altar consisted of alternating rows of five stretchers and 11 headers; the top course had the stretchers to the north. Smaller "altar" 21H had four courses, of which the upper two had one row of two stretchers and one row of headers.

The entryway into the structure consisted of a lime plaster surface ca. 30 centimeters higher (elevation 294.02) than the lime plaster floor of the interior of the structure. This surface was laid on top of a number of flat stone slabs, which were in turn placed above a layer of mudbricks that extended east to cover the area of the recess.

Among the characteristics of this building that support its identification as a shrine or small temple are elaborate foundations (Dunham 1980); recessed entry; north-south orientation, otherwise unattested in level 3 except for area 56; stepped altars (Tunca 1988); isolation of the building behind an enclosure wall, characteristic of Early Dynastic period Mesopotamian temples; provision of large open spaces adjacent to the building, in contrast to the other architecture of level 3 (Otto 2013); and its subsequent filling-in with bricks.[31] Also indicative of its unusual status in the settlement is the unusually high preservation of the structure's walls (up to 1.7 meters)—perhaps the consequence of its infilling with bricks, and the lack of interior buttresses, otherwise common in level 3 architecture. The plan is familiar from Early Dynastic Diyala temples (Delougaz and Lloyd 1942; Schwartz 2000). Although the Raqa'i example's door is unusually close to the altars, one may compare shrine 52 within the Khafajah Nintu temple VI (Early Dynastic II) with a doorway similarly close to its altar. Close parallels may also be cited from structures also identified as religious in character in the Early Jezirah 1–2 upper Khabur at Brak and Kashkashok III (Matthews 2002, 2003; Suleiman 2002: figure 3). At Brak, the temple in HS4 level 5 had been filled with mudbricks, like the Raqa'i example, prior to the construction of the level 4 temple above. In the middle Euphrates region, we may also cite the one-room temple at Qara Quzaq level V with its elaborate foundations and ancillary rooms (Olávarri and Valdés Pereiro 2001).

An anomalous feature of the temple's construction is the small size of the foundation pit and brick fill in comparison to the platform (21F) and temple proper on top. It may be that a decision was made to enlarge the size of the temple after the foundation pit had already been dug and filled in.

No religious paraphernalia were recovered from the area 21 temple, the floor being clean except for a small number of sherds.

Objects: copper curved rod fragment, small clay wheel.

Areas 22/23/62, phase a (Figure 2.127): In its earliest level 3 use, there was an open zone between the area 21 temple to the south and wall 62A to the north. The north face of wall 62A was not identified. A scattering of basalt cobbles was exposed southeast of wall 62A in this phase, located around the very fragmentary remains of a circular clay oven (62B) with a mudbrick lining.

Objects: area 62—pierced potsherd disk, pierced potsherd (irregular square shape).

Areas 22/23/62, phase b: Wall 62C was built parallel to the north wall of the area 21 temple, with a possible corner in the west balk of excavation area 29/108. No

more than three courses of this wall were preserved. Against wall 62A to the north a rectangular brick box-like feature (62D) of uncertain function two to five courses high was added. Inside, ashy fill was deposited.

Objects: area 22, phases a-b—clay human figurine (complete).

Areas 22/23/62, phase c (Figure 2.128): Two small rooms were now built against the northern wall of the area 21 temple, both including two sets of earth floors, but no evident entrances, perhaps indicating a storage function. To the north and northeast in area 62 was a surface of pebbles, cobbles, and boulders. A circular clay oven (62H) was located east of area 22 and north of the newly built wall 24B (see area 24). West of area 63 was a small pit or posthole (62E) lined with pebbles, sherds, and lime plaster.

Objects: area 22—grinding stone type A, complete; area 62—clay human figurine (?), grinding stone fragment type a, fragment of hammer stone or mace head.

Complete vessels/profiles: area 62—Fine Simple Ware pointed-base, bead-rim goblet (Figure 4.29:14); Fine Simple Ware flat-based, simple-rim bowl (Figure 4.29:24).

Areas 22/23/62, phase d (Figure 2.129): In this phase, the walls of areas 22 and 23 were no longer extant; above them was an open space with clusters of stone boulders and smaller stones and ashy fill.

Areas 22/23/62, phase e (Figure 2.129): This phase includes a white plastered surface north of area 21 and vestigial remains of two clay ovens (62F–G) to the west, one (62G) with a packing of sherds around it.

Two burials may belong to this or previous phases. The easternmost (burial 8, Figure 2.127), partly under the east balk of 29/108, consisted of a pit lined with mudbricks. This grave would instead be dated to area 22/23, phase b if the sealing of the burial by a phase b surface observable in the 29/108 east section is to be accepted. The westernmost burial (burial 9) was clearly later than phase c at least, since its pit disturbed the area 22 room and tunneled through its east wall.

Area 24: Area 24 is located outside the temple to the east and south in the area demarcated by the temple's enclosure wall. At a point contemporaneous with areas 22/23/62, phase c, wall 24B was added, isolating the temple from the area to the north (Figure 2.128).

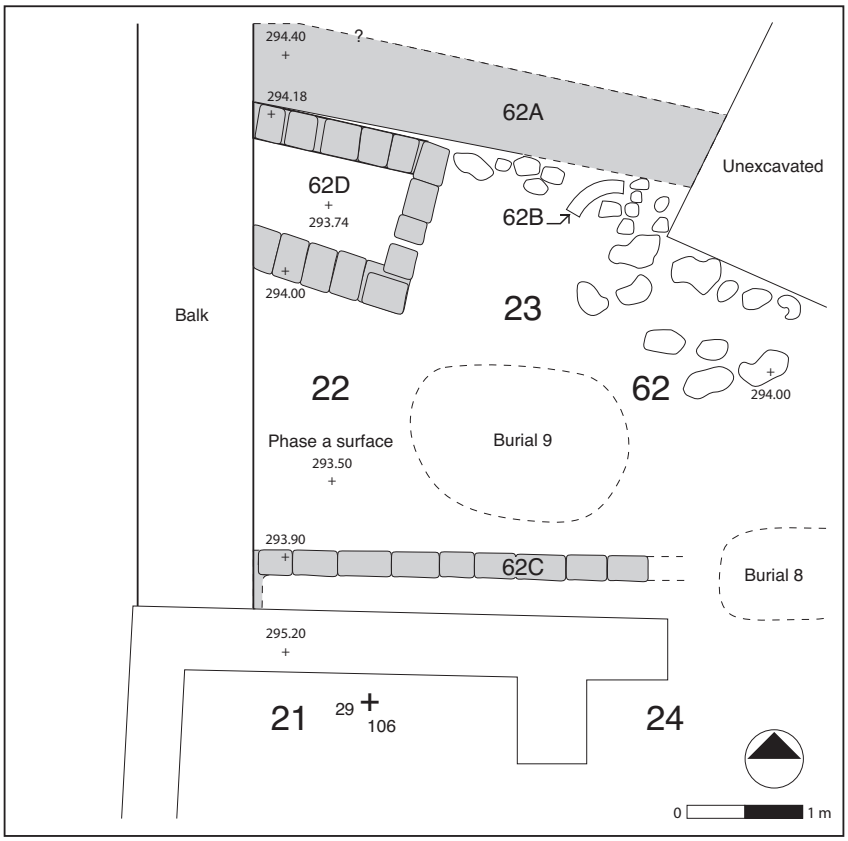


FIGURE 2.127. Level 3, areas 22/23 and 62, phases a–b. *Illustration prepared by Julie Perlmutter.*

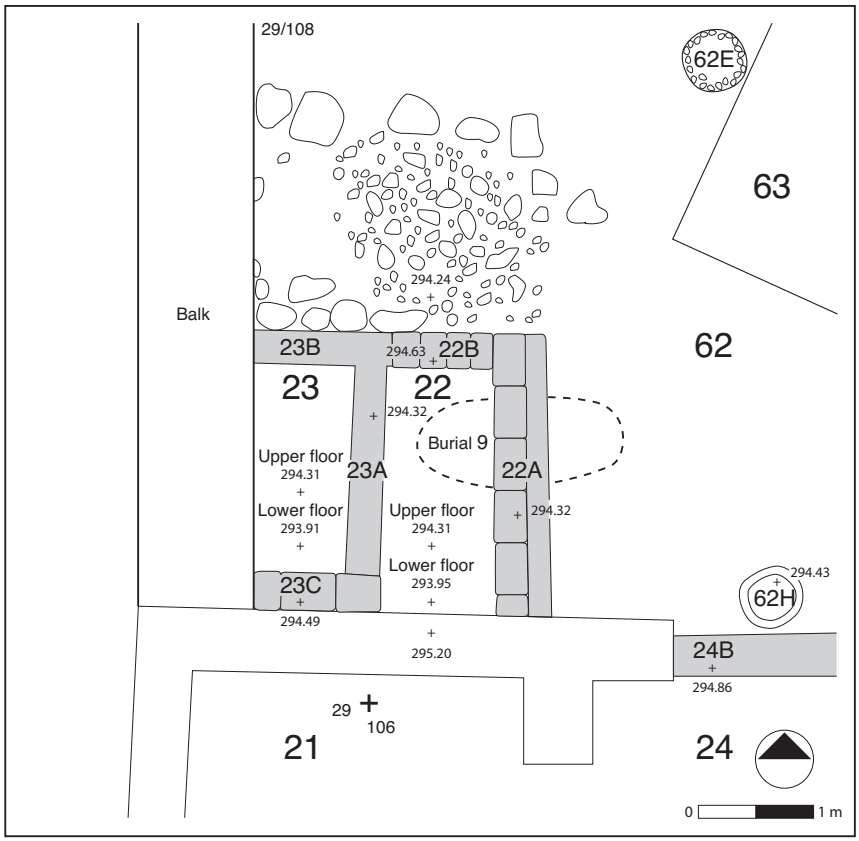


FIGURE 2.128. Level 3, areas 22/23 and 62, phase c. *Illustration prepared by Julie Perlmutter.*

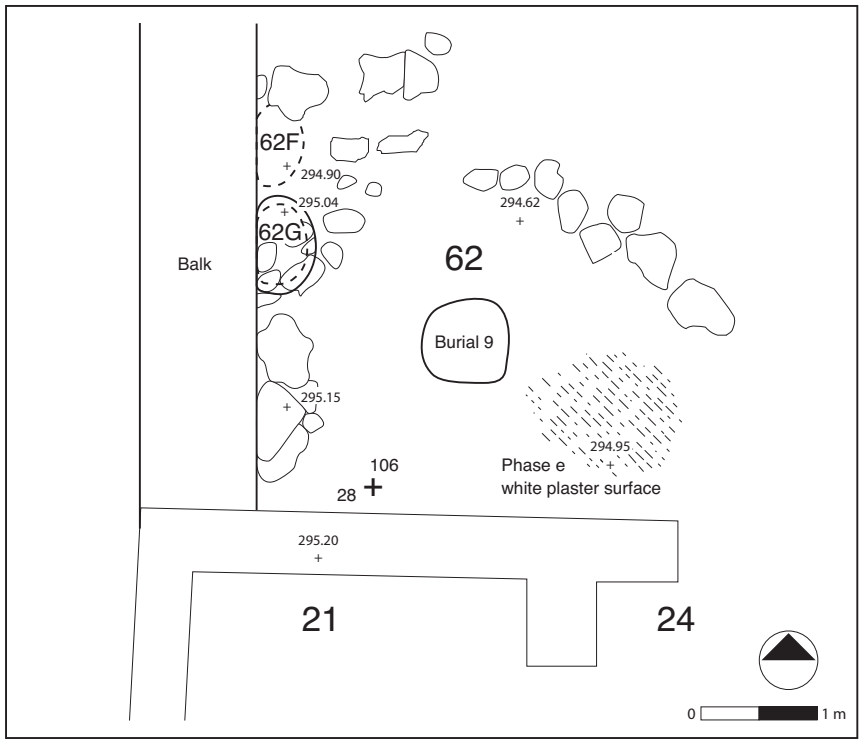


FIGURE 2.129. Level 3, areas 22/23 and 62, phases d–e. *Illustration prepared by Julie Perlmutter.*

The enclosure wall surrounding area 24 (24A, Figure 2.83) was composed of mudbricks with occasional stretches of interspersed courses of stone boulders and cobbles. It would appear that this wall made a jog to the southeast in the unexcavated area of the balk between 30/108 and 30/102 and between 36/108 and 36/102. Alternatively, this may have been an area of access, although an entrance from the street (areas 48 and 38, in the balk between 36/108 and 36/102) might be more likely.

Objects: flat circular pierced stone, shell pendant.

Area 63 (Figure 2.130): This area consists of a room east of area 62 whose eroded wall remains disappeared to the north at the edge of the tell. The room floor and interior wall faces were coated with light green to white lime plaster. In 1993, a 1-meter wide, north-south deep sounding excavated east of the 29/102 west balk and extending north revealed two distinct lime plaster floors in area 63, the upper with seven re-plasterings, the lower (ca. 12 centimeters below) with six re-plasterings. A light green lime-plastered mudbrick bench (63D) located against the southwest wall of the room had an unplastered rectangular hole or bin near its western edge measuring 40 × 18 × 15 centimeters. Farther to the west was a badly preserved mudbrick feature (63E) of three steps leading up to the southwest wall with lime plaster on its horizontal and vertical surfaces.

The floor sloped down to the northeast, where a fireplace (63F) was located. In the eroded debris near the tell edge was a large jar sunk below the area 63 floor (elevation 293.64–294.08).

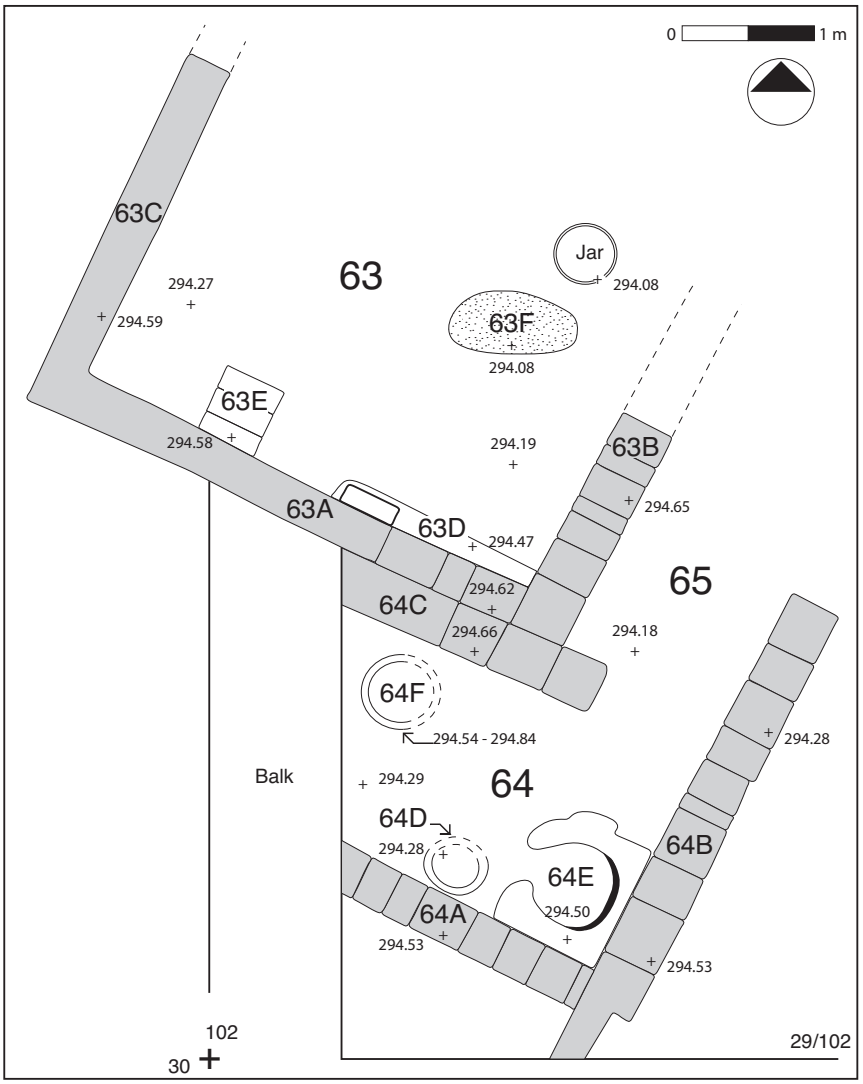


FIGURE 2.130. Level 3, areas 63–65. *Illustration prepared by Julie Perlmutter.*

Objects: white plaster fragments of lid for large jar sunk into floor.

Complete vessels/profiles: Fine Simple Ware, incurving simple-rim, pointed-base goblet (Figure 4.29: 8).

Area 64 (Figure 2.130): Area 64, whose primary excavated phase is contemporaneous with area 22/23/62, phase c, had a light gray to whitish earth floor, wall faces coated with mud plaster, and two poorly preserved clay ovens (64D–E) in the southeast corner. Oven 64E had a mudbrick enclosure around the clay core of the oven. Excavations below the floor against walls 64A and 64B revealed that the walls extended down at least 30 centimeters below the floor (wall 64A, elevations 293.97–294.53), but no prior surface was identified.

Apparently, area 64 had no northwest wall, or such a wall was hidden in the balk between units 29/108 and 29/102. Therefore, wall 24B northeast of the area 21 "temple" must have met wall 64A or a corner formed by 64A and a northwest wall of area 64.

Belonging to a late level 3 phase of occupation in area 64 was a circular clay oven (64F) adjacent to the west balk of excavation unit 29/102, apparently installed in the ruins of the area 64 architecture. Partly damaged by level 2 building activity, this oven was associated with a gray ashy layer ca. 30 centimeters thick that had level 2 architecture built on top of it.

Objects: rim sherd from gypsum plaster lid, found in oven 64E.

Area 65 (Figure 2.130): The space between areas 63 and 66, area 65, had a light green lime-plaster surface in an area ca. 1 meter wide northeast of wall 64C.

Northeast

Area 29 (Figure 2.131): Area 29 is a room with mudbrick benches (29D–E) installed against the southeast (29B) and southwest (29A) walls, with poorly preserved basin-like, lime-plastered mud features (29F–H) against and between the benches. The walls, floor, benches, and basins were all lime plastered. A 1-meter-wide test trench against the south balk of unit 30/102 revealed that the bottom of wall 29C consisted of three courses of headers 15 centimeters wider than the courses above. Thirteen coats of lime plaster were noted on the exterior of these headers.

A human skull was found atop bench 29D (= burial 11); it is uncertain whether this skull was in situ or derived from an intrusive burial otherwise unnoticed.

In the western part of the room, adjacent to an apparent buttress (29I), was a lime-plastered mud basin (29J) probably rectangular in shape, with a border preserved some 30 centimeters high. The northern segment of a fireplace (29K) was exposed east of the basin.

Objects: basalt pierced stone fragment, pierced potsherd disk.

Area 72 (Figure 2.131): Area 72 is the passage between areas 29 and 39, whose fill included a number of stone cobbles. At a later point in its use, an ashy gray surface with pebbles and sherds on it could be identified, associated with a widening of the northwest wall

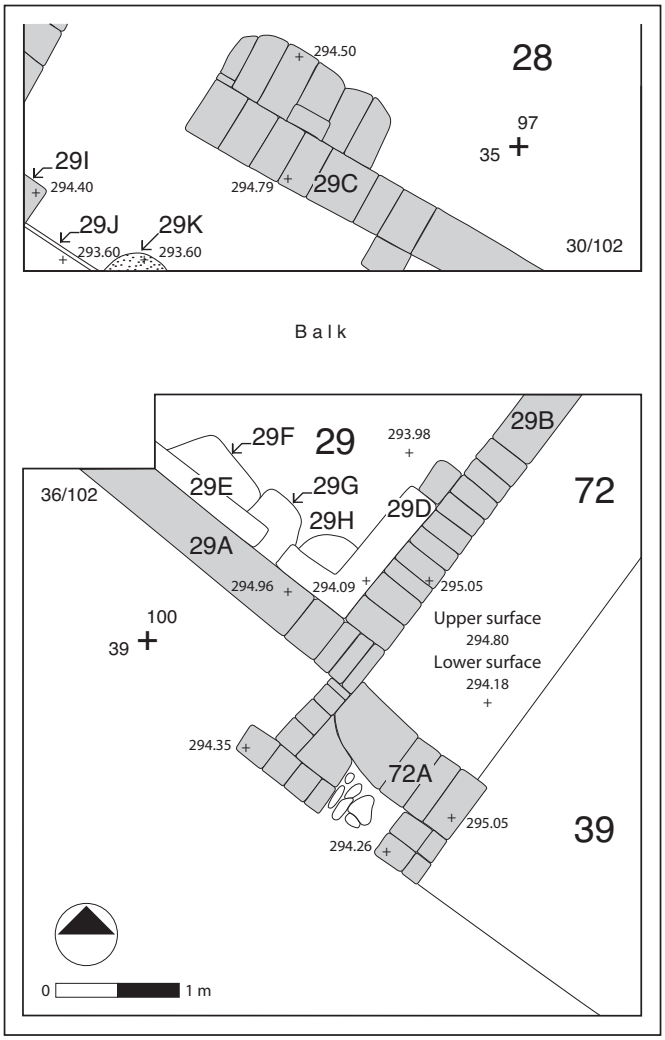


FIGURE 2.131. Level 3, areas 29 and 72.
Illustration prepared by Julie Perlmutter.

of area 39 (areas 70/39/71, phase a). Against this wall were some fragments of a fireplace (72B) and of a clay oven (72C, elevation 294.43). The blocking of the passageway with a crude wall of mudbricks (72A) is also datable to this phase.

Objects: clay conical andiron fragment, bone awl fragment, small clay wheel.

Complete vessels/profiles: carinated bead rim, flat/concave base, Fine Simple Ware bowl (Figure 4.29: 15); 2 incurving, simple-rim Fine Simple Ware pointed-base goblets (Figure 4.29:10, 12).

Area 25 (Figure 2.132): A room built against the temple enclosure wall 24A, area 25 had light green or white lime-plastered interior wall faces. The space contained four interior buttresses, of which two, the northwestern and northeastern, were arched. No floor surface was reached, but the top of a circular clay oven (25E) was exposed in the northeast corner of the room and probably indicates that the floor was just below the limit of excavation.

In the northwest corner was the grave of an adult in a brick enclosure (burial 2). The grave was fit into the northwest corner of the room between two buttresses, with a line of mudbricks connecting the buttresses to enclose the burial, indicating that the grave was arranged when the architecture was in full view. Therefore, a later level 3 date for the grave is probable.

Reddish-brown to black soft ashy fill with numerous sherds, baked clay oven fragments, boulders, and lime flecks accumulated in the area 25 room.

Areas 26/28 (Figure 2.132): In this area between rooms 25, 27, and 29, a mud-plastered wall or feature (26A) preserved only one course high represents a later addition to area 26, creating a small cubicle with a green lime-plaster floor, but the earlier phases were not excavated. In area 28 was an ashy surface associated with the remains of a large vessel installed against a buttress of wall 25A to the north.

Objects: area 28—bone awl (complete).

Area 27, phase a (Figure 2.132): Phase a is an incompletely excavated (limit of excavation, elevation 294.18) early phase of a small room with a (semi-)circular mudbrick feature plastered with mud inside and out (27A) in the southwest corner. Room fill was ashy debris.

Area 27, phase b: Phase b is a later phase of this small room, with a green lime-plaster floor (elevation 294.56).

Area 66 (Figures 2.132, 2.133): This room north of area 25 had an unusually deep as well as elaborate floor surface comprised of white lime plaster applied above a layer of sherds and pebbles, itself laid above a course of mudbricks. The interior wall faces of the room were largely plastered with white lime.

There appear to have been two architectural phases in this room. In the later phase, the room was enlarged slightly, with the northeast wall (66C) moved slightly to the northeast. However, no associated upper floor surface was identified. The room walls were lime plastered in both phases.

The upper courses of the middle of the southeast wall of the room (66B) had been damaged by the pit of burial 1, but below the pit an opening was located in the wall, apparently a window or perhaps a doorway. This feature, as preserved, had the shape of the bottom of a semi-circle or oval, on top of which several stone cobbles had been placed. The presence of these cobbles might support an interpretation of this aperture as a doorway, if they are to be regarded as a sill; in such a case, the room would have been partly subterranean, with the floor far below the door sill. Alternatively, one might suggest that the cobbles were part of a blocking of the opening.

Burial 1, which consisted of a mudbrick enclosure sunk into the fill of the room and cut into wall 66B, is dated to later level 3.

Objects: complete pierced basalt stone type B.

Complete vessels/profiles: Fine Simple Ware incurving simple-rim, pointed-base goblet (4.28, 15).

Area 67 (Figures 2.132, 2.133): Area 67 northeast of area 25 had traces of a light green lime-plaster surface, and very fragmentary remains of a circular clay oven (67A) were noted outside the northeast corner of area 25. A cut some 1.5 meters in width extended east from excavation unit 29/102 and exposed the tops of two perpendicular walls (67C-D).

North of areas 67 and 66 on the tell edge were the remains of a mudbrick wall or platform (67B). This feature is aligned with a similar wall (68A) exposed in area 68 and appears to form part of the set of retaining walls (56L, 14H) built on the northern edge of the tell in level 3.

Objects: stone spherical token (?), small clay wheel.

Area 30 (Figure 2.139): A small room with a green lime-plaster floor, a fireplace (30E) in the southeast corner, and a pit (30F) dug from floor level to the north. Since this phase of the room is the latest preserved and has similar floor elevations to area 32/33 late phases d and e, we assume an approximate contemporaneity of these contexts. Excavations did not continue down to the earlier phases of the structure.

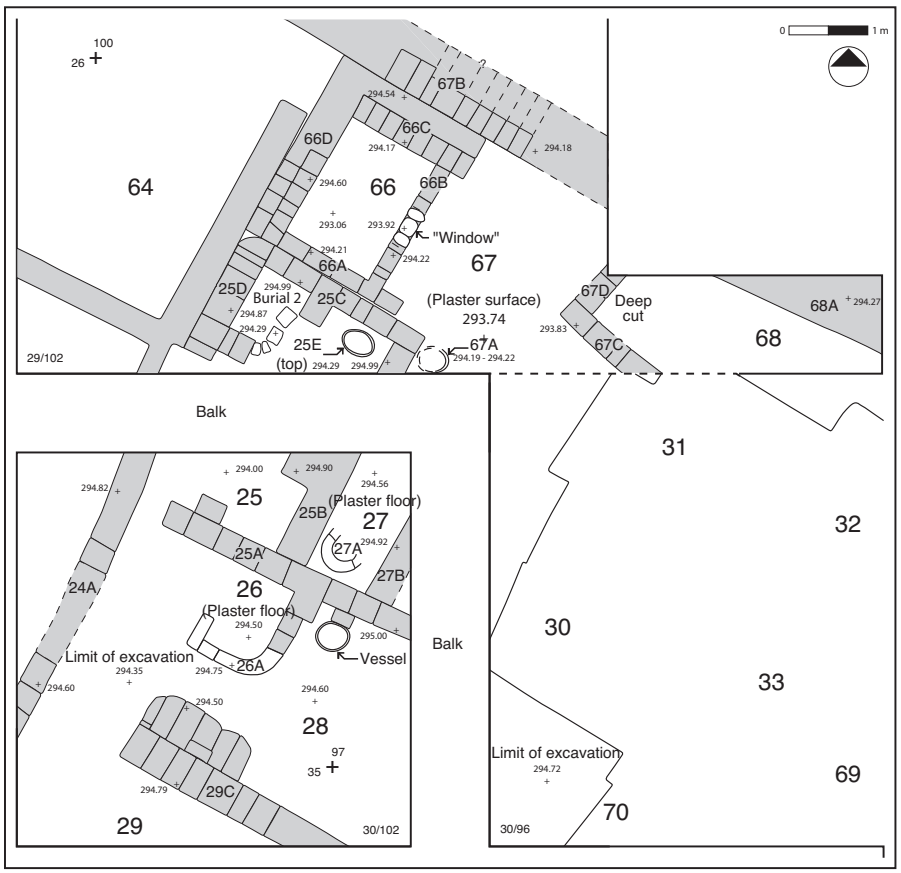


FIGURE 2.132. Level 3, areas 25–28 and 66/67. *Illustration prepared by Julie Perlmutter.*

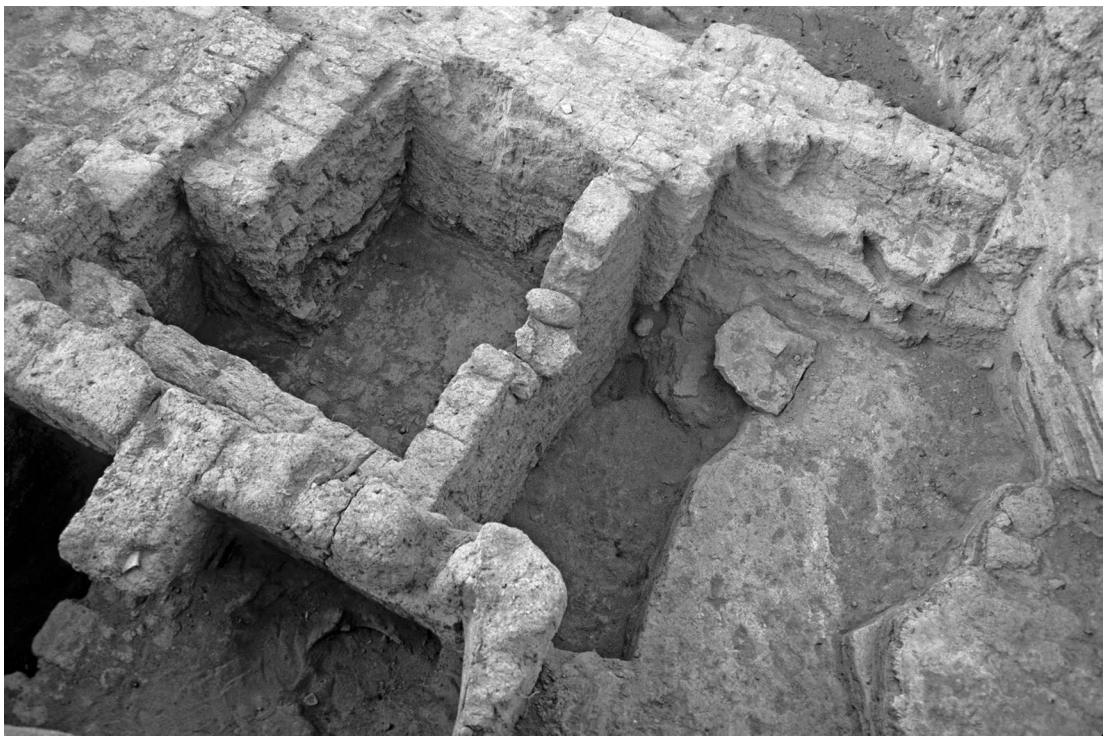


FIGURE 2.133. Level 3, areas 25 (below left), 66 (top middle), and 67 (right). Looking north.

Area 31 (Figure 2.139): This small room had a floor consisting of one course of mudbricks below a thin ash layer, atop of which was a pebble surface ca. 7–10 centimeters thick (elevation 294.90). Associated with this surface were minimal remains of a circular clay oven (31E) in the southern corner of the room, with the remnants of a mud enclosure extending from wall 31A, and the partial remains of a hole-mouth cooking pot installed in the eastern corner of the room. The interior face of the southeast wall (31B) had traces of white lime plaster. The northeast and northwest walls of the structure had been built on top of a surface of stone slabs and boulders that extended to the west and north.

This phase of area 31 is probably contemporary with the excavated phase in area 30 and area 32/33 later phases (e.g., d and e; see area 30 above); excavations did not continue down to earlier phases of the structure.

In the western corner of area 31 was the burial of a child (burial 7). It is uncertain whether the mudbrick floor in this part of the room was disturbed or simply not well-preserved, but the location of the burial in a room corner may indicate a later level 3 date subsequent to use of the room.[32]

Areas 32/33/69: The architecture of areas 32 and 33 was excavated to a lower level than the structures of adjacent areas, providing a more extensive sequence of level 3 architectural history than was obtained in areas 63–67 or 30–31. Since the earliest excavated structures here are considerably deeper than other early level 3 buildings, it may be that the earliest excavated phase or phases properly belong to level 4; if so, this sequence demonstrates an unusually smooth architectural continuity between levels 4 and 3.[33] Data from the adjacent area 69 complement the results from areas 32/33 in later phases.

Areas 32/33/69, phase a (Figure 2.134): In its earliest excavated phase, areas 32/33 consisted of a rectangular room whose interior walls had light green lime plaster, a practice maintained in succeeding phases of use. The northeast wall (32C) was comprised of square bricks (29 × 29 × 8 centimeters); possible evidence of a mudbrick bench with lime plaster on top (32E) was located against its inner face in a small test trench.

In the deepest excavated context, a test trench in the south corner of area 32/33, a gray earth floor was identified. In a thin ashy layer deposited directly on this surface were a number of large sherds lying flat. A thick build-up of ashy surfaces accumulated above this, on one of which were the remains of a circular clay oven (32F) with an exterior mud coating.

A door or window in use in phase b in the southwest wall (32A) may also have been utilized in this period. This feature had mud-plastered sides and the beginnings of an arched (corbelled) top, and it measured 68 centimeters across at its widest point and 100 centimeters high. Its lowermost elevation at 293.73 suggests that if it was a door it could only have been employed (without a ladder of some sort) in the later part of phase a. If it was a window, it could have been used throughout phase a. Similar considerations apply to a door or window in the southeast wall (32B) in use by at least phase c, the bottom of which was at an elevation of 293.81. In this case, the feature may be more likely to be a door, since it had straight sides for its entire extant height of 85 centimeters.

Areas 32/33/69, phase b (Figure 2.134): In phase b, a new circular clay oven (32G) with an exterior mud coating was installed in the southwest part of the room. The door or window in the southwest wall (32A) was now clearly utilized.

Objects: area 32/22, phases a–b—Bone awl fragment, bone spindle whorl found atop lentil-shaped stone with protrusion fit into hole in bottom of spindle whorl.

Areas 32/33/69, phase c (Figures 2.135, 2.136): At this juncture, the area 32/33 structure was divided into two rooms by the construction of a new wall (33A). Given the absence of a door between the two rooms, the relative contemporaneity of their phases of use can only be tentatively suggested, so the reader should consider the phasing suggested here with appropriate caution.

The north room, area 32, had an earth floor surface associated with a feature of three standing mudbricks (32H) against the northwest wall of the room, partly sunk below the floor. These may have been the base for shelves used for storage (Pfälzner 2001:158). The doorway in the southeast wall 32B was now clearly in use. Room fill included baked clay oven fragments.[34]

In the south room, area 33, the window or doorway in the southwest wall (32A) was blocked with mudbricks. The earliest surface in the room was of light brown/whitish earth, on which soft ashy fill with mudbrick debris was deposited.

A brown ashy surface on top of this fill was associated with an installation (33B) consisting of three standing mudbricks set against the northwest wall (Figure 2.137); the southernmost of the three bricks

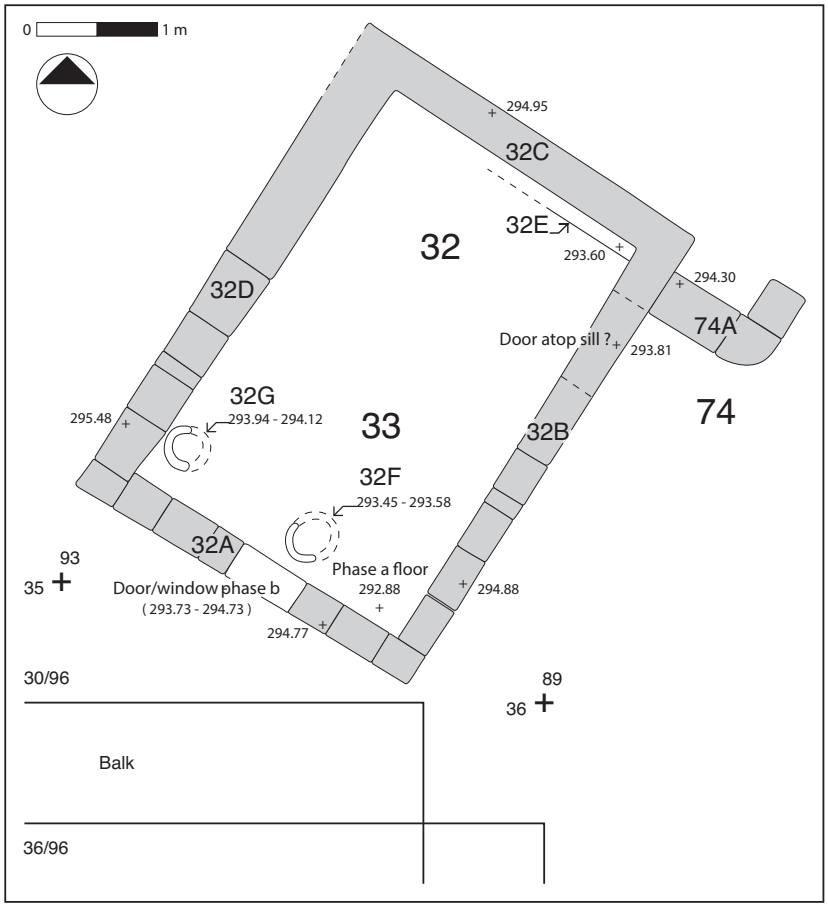


FIGURE 2.134. Level 3, areas 32/33, phases a–b. *Illustration prepared by Julie Perlmutter.*

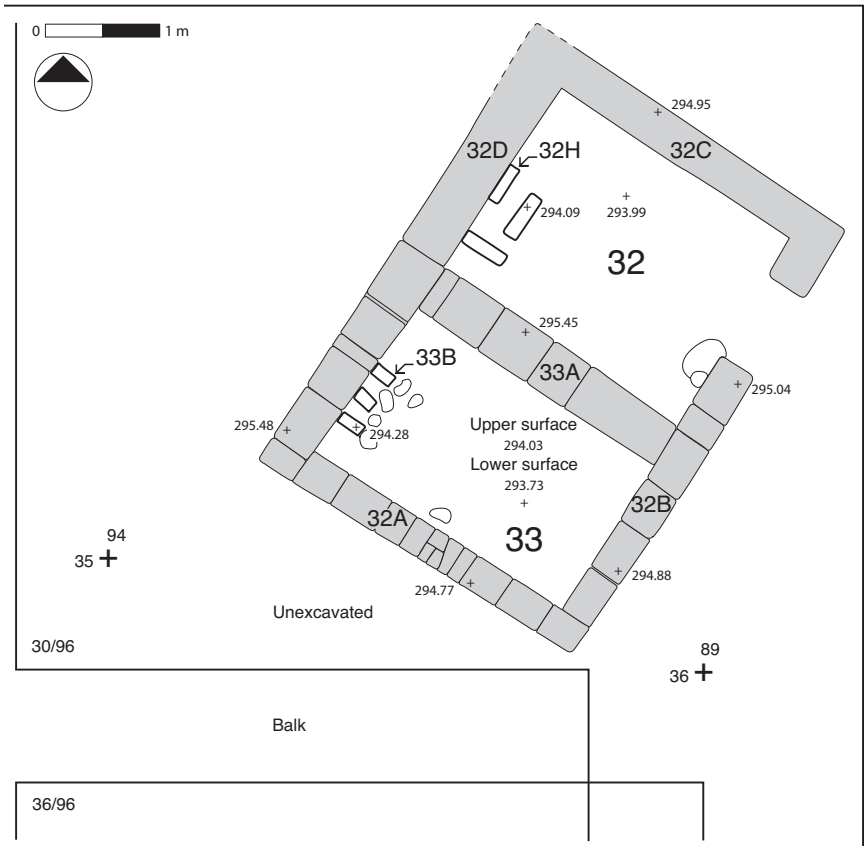


FIGURE 2.135. Level 3, areas 32/33, phase c. *Illustration prepared by Julie Perlmutter.*

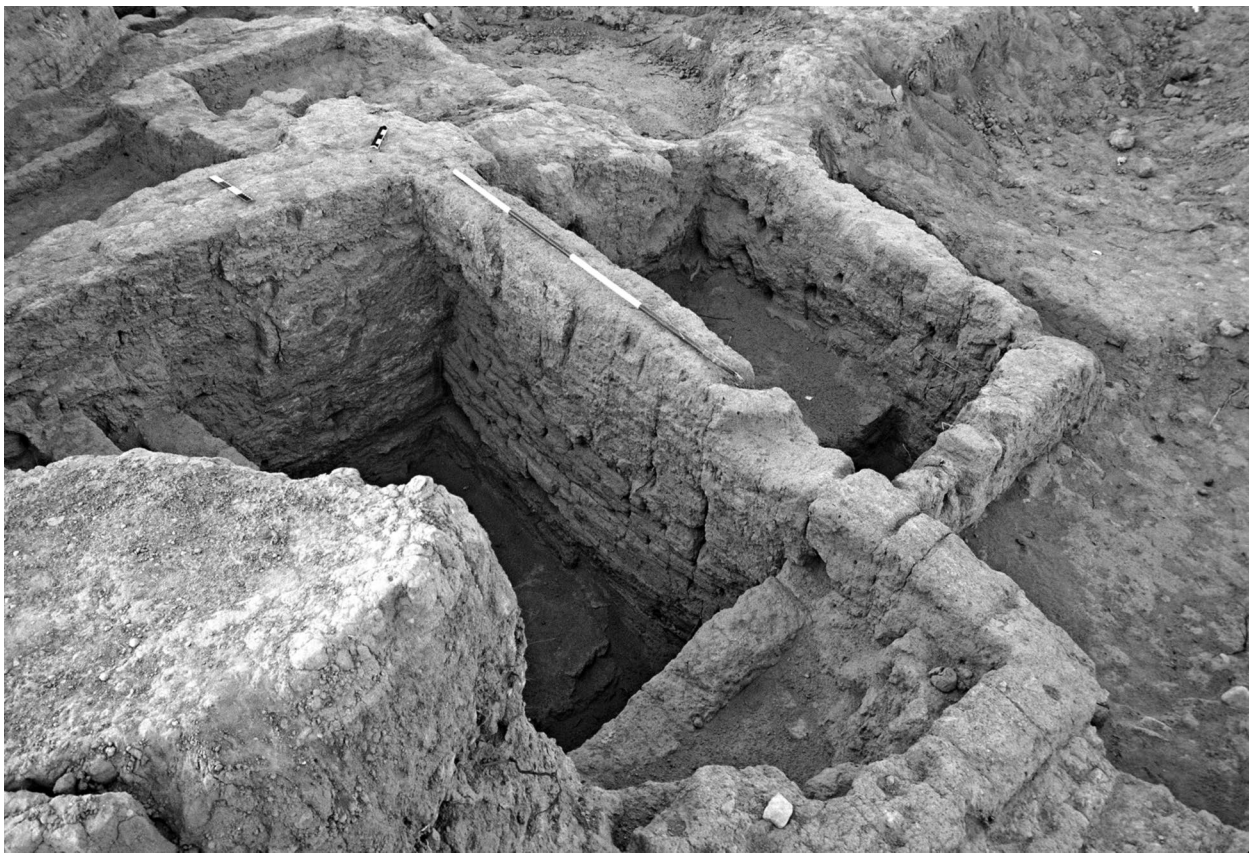


FIGURE 2.136. Level 3, areas 32/33, phase c, with parts of walls from upper phases still extant. Looking northwest.

was set directly on top of oven 32G from phase b. Like feature 32H, feature 33B may have served as base for shelving. Stone cobbles and boulders were found on the room floor in front of the standing mudbricks. There was no obvious access to the room in this phase, which might suggest a storage function with access from above. Room fill included ashy soil with baked clay oven fragments.

Objects: area 32—bone awl fragment, worked (?) equid tooth found on floor; area 33—clay unimpressed sealing, potsherd disk, quartz bead, clay animal figurine fragment.

Complete vessels/profiles: area 32—Medium Simple Ware, small round-based, bi-mouth vessel (Figure 4.27: 14); area 33—Fine Simple Ware, squat evert rim, round-base miniature vessel (Figure 4.29:33).

Areas 32/33/69, phase d (Figure 2.138): In area 32, the doorway in the southeast wall was blocked with mudbricks, the northeast stretch of the southeast wall was levelled, and a new wall (32I) was built on top of the blocked doorway and levelled earlier wall. A pebble surface and a large mudbrick bin-like feature of a roughly rectangular shape (32J) were installed. At some subsequent point, a new southwest wall (32K) was added against the wall (33A) dividing areas 32 and 33. These developments could have been contemporary with alterations in area 33, phase d or e.

After the phase c occupation, the area 33 room was reduced in size by the construction of a new wall (33C). At the same time, the southwest wall 32A was discontinued and the room extended further to the south. A rather thick mass of mudbricks (33D) appears to have served as the southwest wall of the room at this point. In addition, an interior buttress was added to the northwest wall of the room in this phase. No surfaces were ascertained, and there was no obvious entry into the room in this phase, perhaps suggesting its use as a storage area with access from above.

East of the newly compressed area 33 room was a larger room, area 69. The inner face of the southeast wall (69B) of the room had light green lime plaster. No floors were recognized; fill of the space included a number of clay oven fragments and much ash. Excavations in area 69 proceeded no lower than the tops of the area 33, phase c, walls, so it is unclear if an earlier (and narrower?) version of area 69 had existed. One

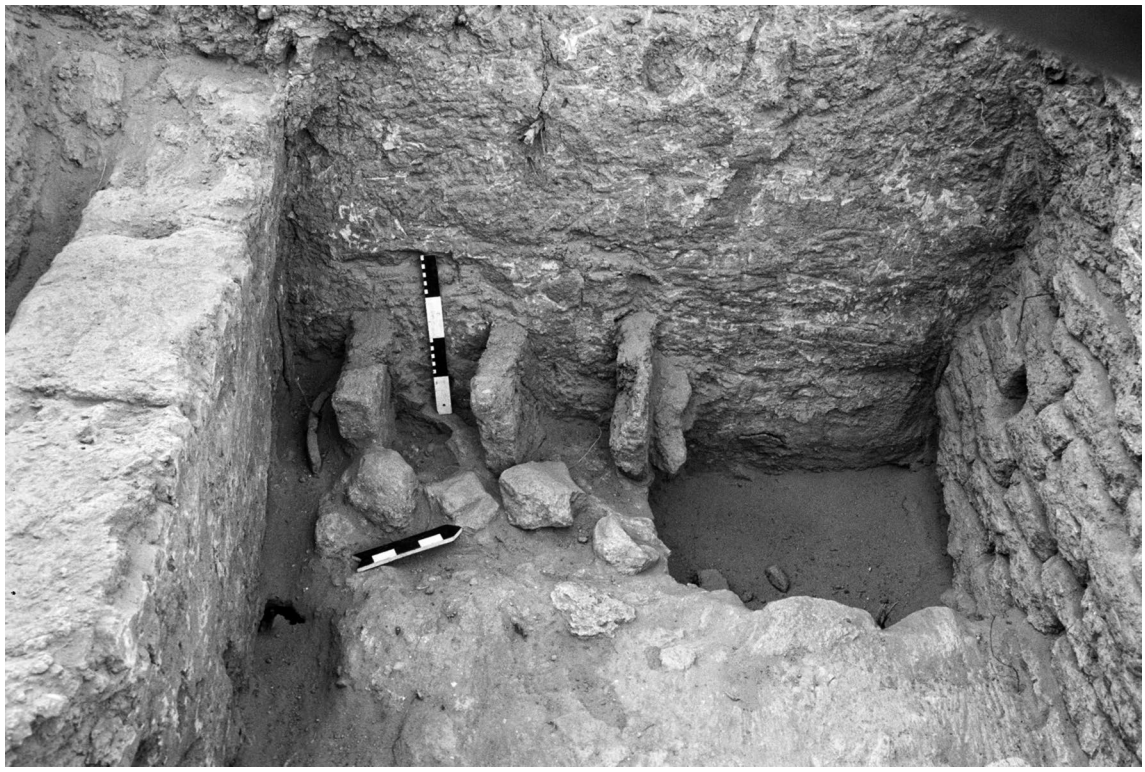


FIGURE 2.137. Level 3, area 33, phase c, with feature 33B. Looking northwest.

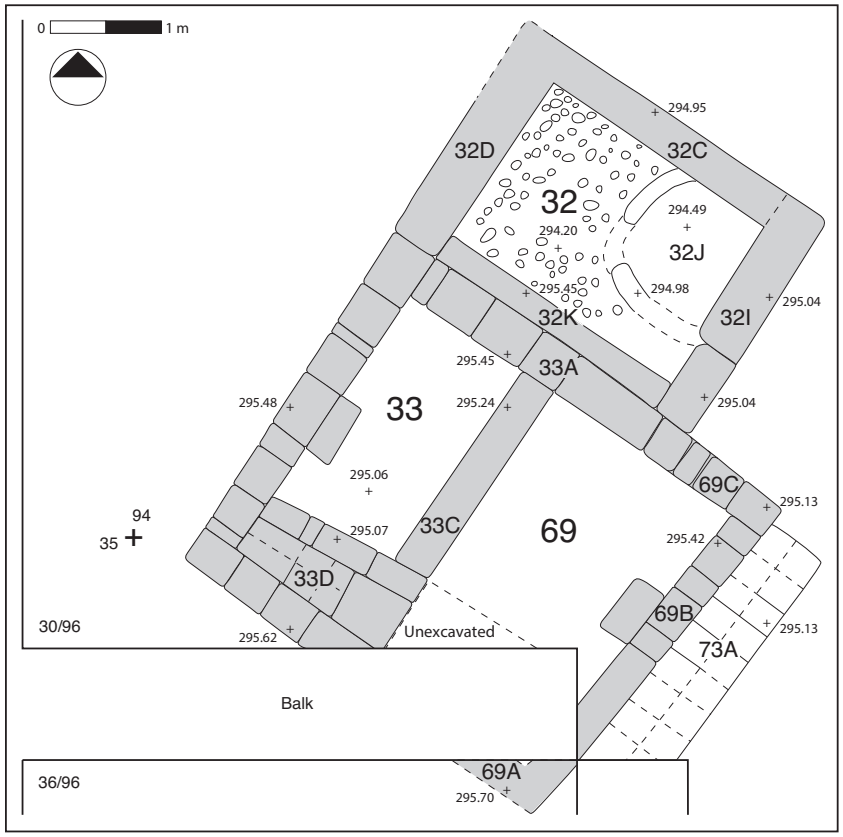


FIGURE 2.138. Level 3, areas 32/33 and 69, phase d. *Illustration prepared by Julie Perlmutter.*

might postulate a phase c existence for such a room (cf. Schwartz and Curvers 1992:403, figure 8), since the northeast wall of area 69 (69C) can be seen as an extension of the phase c, wall 33A dividing areas 32 and 33, but there is no direct evidence to support such an assertion.

Objects: area 33—bronze pin fragment, in wall; area 69—complete pierced stone type B.

Complete vessels/profiles: area 69—Fine Simple Ware, miniature flat-base restricted vessel (Figure 4.29: 30).

Areas 32/33/69, phase e (Figure 2.139): In phase e, the thick southwest wall (33D) of area 33 was reduced to a single row of bricks, resulting in a long narrow room. A doorway was now in use in the lime-plastered southeastern wall 33C, later to be blocked with bricks oriented vertically. In the southwestern half of the room was a surface of pebbles and cobbles that sloped down to meet a white lime plaster floor in its northeastern half. Contemporary with these surfaces was a white lime-plastered floor in area 69 to the east.

Objects: pierced stone type C (complete).

Area 73 (Figure 2.138): Between areas 32/33, 69, and 74 and farther to the southwest was a passage that accumulated fill of alternate lenses of brown bricky and gray ashy deposits, capped with a course (73A) of square mudbricks (30 × 30 centimeters) east of area 69, which is probably to be associated with area 32/33/69, phase e.

Objects: bone awl fragment.

Areas 70/39/71: These areas entail two rooms with two distinct phases.

Areas 70/39/71, phase a (Figure 2.140): Area 70 is a large rectangular room southwest of areas 32/33, 69, and 73, with a doorway in the southwest wall. The southeast wall (70B) had a row of bricks with some boulders and cobbles appended to its lowest course on the building exterior, perhaps to strengthen it against damage from rainwater (cf. also similar treatments of walls in areas 2, 20, 40, 56, and 83). The room walls had some traces of lime plastering.

A stone door socket was located just northwest of the doorway in the southwest wall 70A in association

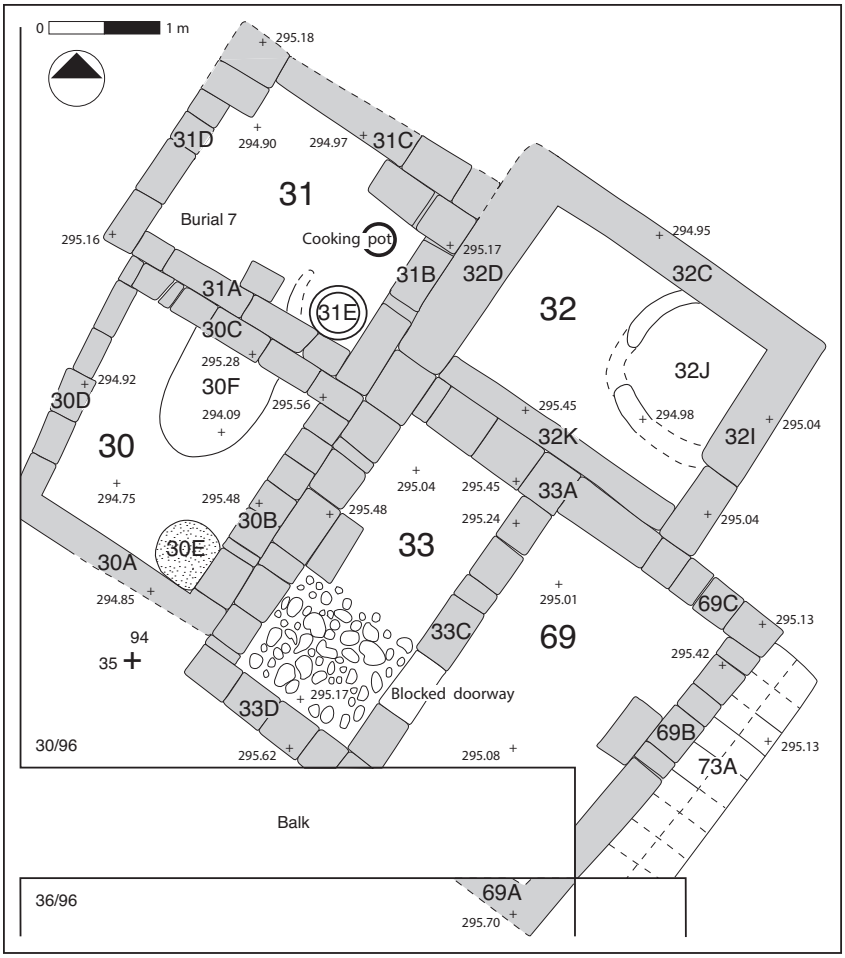


FIGURE 2.139. Level 3, areas 30–33 and 69, phase e. *Illustration prepared by Julie Perlmutter.*

with a white lime plaster floor; a fireplace (70E) was located in the center of the room. A 1-meter wide cut made against the south balk of excavation unit 30/96 in 1993 elucidated three superimposed lime plaster surfaces associated with this phase in the northwest corner of the room, observable in the south balk section. This cut also revealed two and three courses of headers at the bottom of walls 70D and 70C, respectively, with courses of narrower bricks set above them.

Areas 39/71 comprise a room fronting the passage around the Round Building. The southwest (39A, 71A) and southeast (71B) walls of the room were built atop the same gray ash layer as the outer wall of the level 3 Round Building (see below). In area 39, a stamped clay and pebble floor was recognized. The southwest wall (39A) was bolstered by a substantial brick addition against its outer face. The northwest wall (39C), whose interior face had white lime plaster, was slightly widened in a later phase of use by the addition of a row of narrow bricks (see area 72). Fill with clay oven fragments and a large segment of a lime-plastered collapsed wall accumulated in the room.

To the east, area 71 was much disturbed by a later intrusive pit, but traces of a lime plaster floor were identified. Apparently, the space between walls 70B and 71B was originally left open as an entrance to the room, and then blocked with mudbricks (71C), next to which a circular clay oven (71D) was installed.

Objects: area 70—limestone (?) cylinder of unclear function.

Complete vessels/profiles: area 70—Medium Simple Ware, flat-based, evert rim jar (Figure 4.27:8).

Areas 70/39/71, phase b (Figure 2.141): In phase b, area 70 was reduced in size and area 39/71 enlarged. A light green lime-plaster floor was traced in area 70; the 1-meter wide cut against the south balk of 30/96 conducted in 1993 revealed eight superimposed plasterings associated with the phase b floor visible in the south balk section; these eight lime-plaster surfaces were surmounted by a final surface of lime plaster and pebbles. A door jamb of one brick's extent (70G) was added to the southeast wall of the room by the doorway, with sherds and mud used to fill the space between the door jamb and the wall.

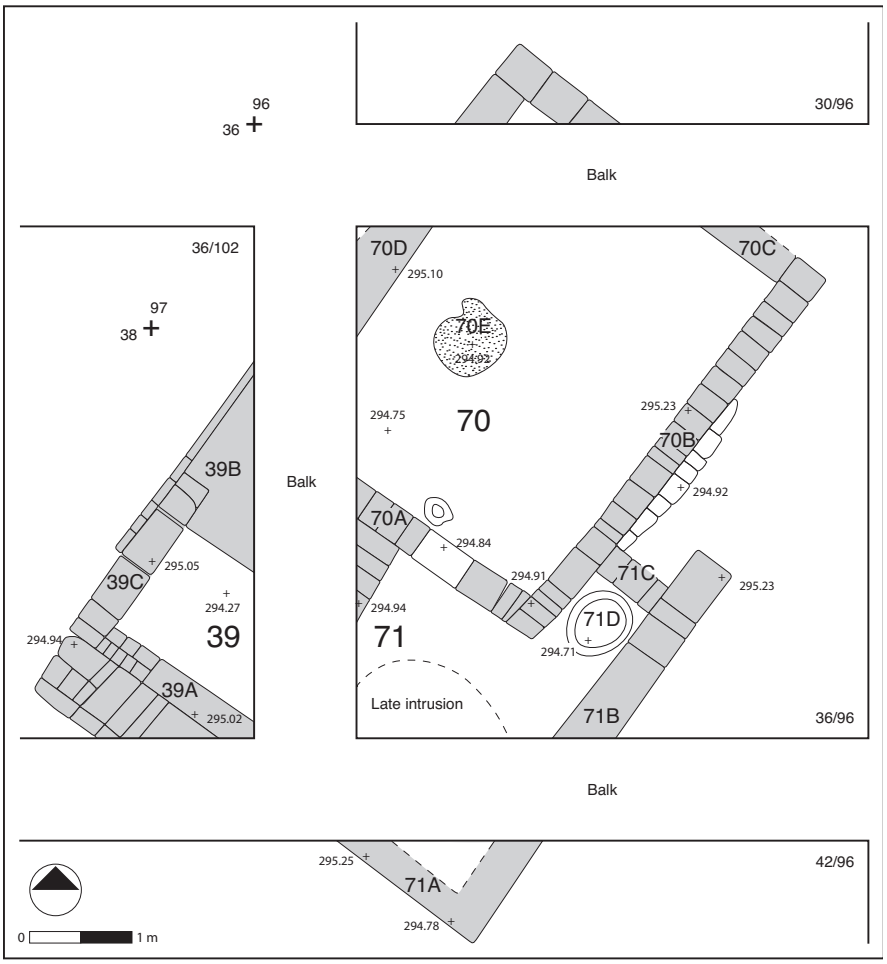


FIGURE 2.140. Level 3, areas 39 and 70/71, phase a. *Illustration prepared by Julie Perlmutter.*

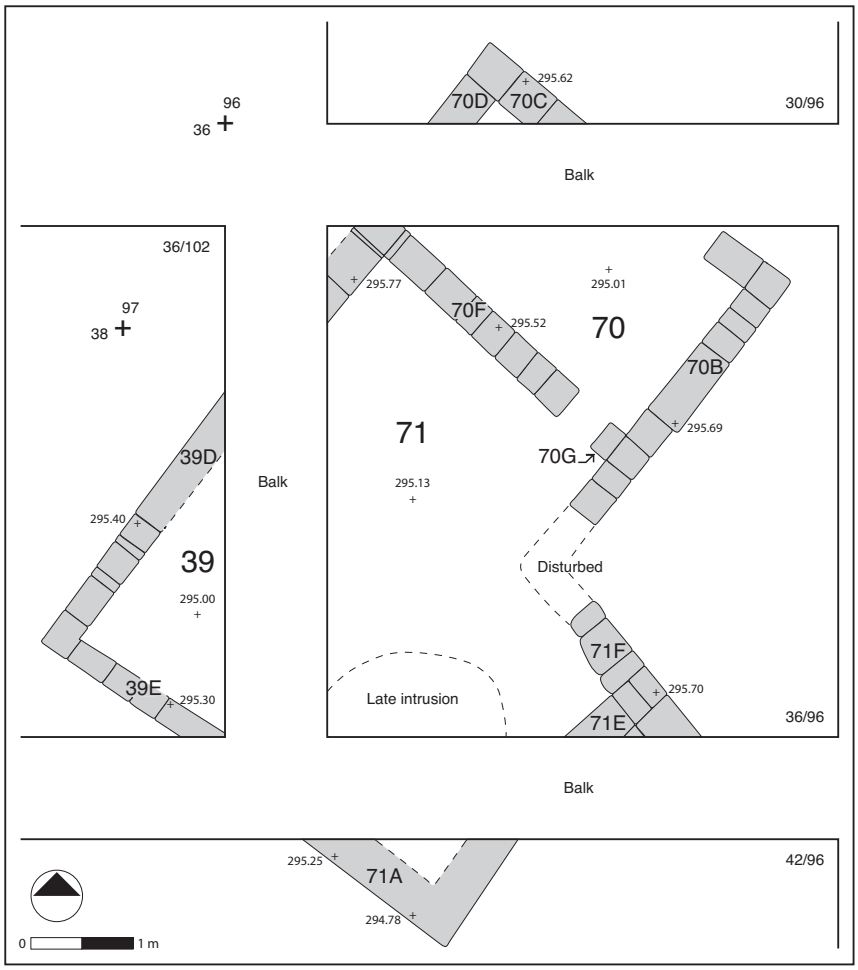


FIGURE 2.141. Level 3, areas 39 and 70/71, phase b. *Illustration prepared by Julie Perlmutter.*

The enlarged area 39/71 had white lime-plastered walls and a floor with two layers of white lime plaster.

Objects: area 71—clay human figurine torso, clay spindle whorl, circular clay disk fragment.

Southeast

Areas 34/35 (Figure 2.142): This area had a greenish-white lime plaster floor (elevations 294.46 in west to 294.70 in east) with two fireplaces to the north (34E-F), the remains of one of which (34F) were quite small, and a mud and mudbrick two-part feature (grinding table?) (34G) lime plastered inside and out (Figures 2.143, 2.144). Each segment was a two-part affair with an upper and lower portion, the floor of the lower portion being continuous with the room floor. Judging from the lime plaster traces on its upper surfaces, the feature was preserved to its full height.

A stepped mudbrick feature (34H) with traces of greenish-white lime plaster on its vertical surfaces was located in the north corner of the room against a lime-plastered mudbrick bench (34I). Greenish-white lime plaster had also been applied to the interior wall faces of the room. The remains of the southeast wall of the room (34B) included one or two courses of mudbrick below two courses of limestone boulders, the latter presumably the foundation for architecture of a later phase that otherwise is undetectable. The doorway leading to area 35 had a mudbrick threshold.

Most of area 35 suffered from later intrusions and extensive erosion, such that no floor was identified contemporaneous with the lime plaster floor in area 34. Traces of an upper lime plaster floor (elevation 295.25) were noted in the undisturbed western corner of the area in excavation unit 36/96, which may have belonged to a later phase not preserved to the east in excavation unit 36/90. The interior wall faces (walls 35A, 35C) associated with the floor were lime plastered. Since excavations were not conducted any deeper in this western corner of area 35, it is unknown if re-

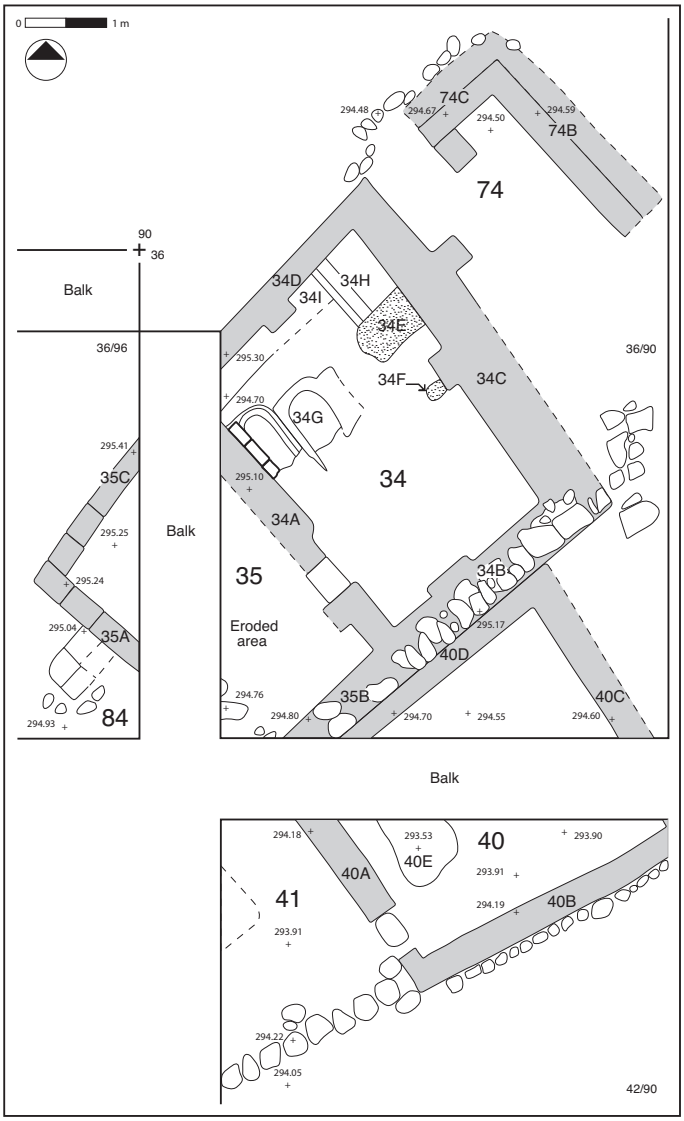


FIGURE 2.142. Level 3, areas 34/35, 40, and 74. *Illustration prepared by Julie Perlmutter.*

FIGURE 2.143. Level 3, area 34. Looking northwest.

mains of an earlier surface contemporaneous with the area 34 floor were extant in this area. The absence of any continuation of wall 35A in the southwest corner of excavation unit 36/90 may indicate either the presence of a door or damage from erosion and later intrusion.

The remains in areas 34/35 are probably contemporaneous with areas 70/39/71, phase a. If later level 3 occupation existed in area 34 (apart from the stone wall foundation mentioned above) or in the eastern part of area 35, it has been removed by erosion and subsequent intrusive activity.

Objects: area 34—pierced stone type A.

Area 74: A wall appended to the northeast corner of area 32/33 making a right angle (74A, Figure 2.134) appears to belong to an early level 3 phase. The remains of this wall were covered by an ashy surface. To the east, the corner of a mudbrick structure was partially exposed below topsoil (walls 74B–C, Figure 2.142). The northwest wall or segment (74C) of this structure was constructed above the ashy surface covering wall 74A (elevation ca. 294.50), and its outer face was lined with stones at its base. A line of five stones was also found in the passage between areas 74 and 34.

Area 40 (Figures 2.142, 2.145): Only the top of the extant remains of this room was excavated in unit 36/90, but a complete phase was exposed in unit 42/90. The tops of the extant mudbrick walls in 42/90 (40A–B), preserved only a few courses high, were 40–50 centimeters lower than those in 36/90 (40C–D), apparently due to erosion as the mound sloped to the southeast.

The earth floor surface of the room was difficult to trace but was substantiated in the north balk section of unit 42/90. A pit with gray ashy fill (40E) was dug from this surface. In the room doorway was a stone boulder serving as a threshold, and a lining of stone cobbles was in place at the base of the exterior face of the southeast wall (40B). This line was continued in a course of stone boulders leading southwest in area 41.

FIGURE 2.144. Level 3, area 34, feature 34G. Looking northwest.

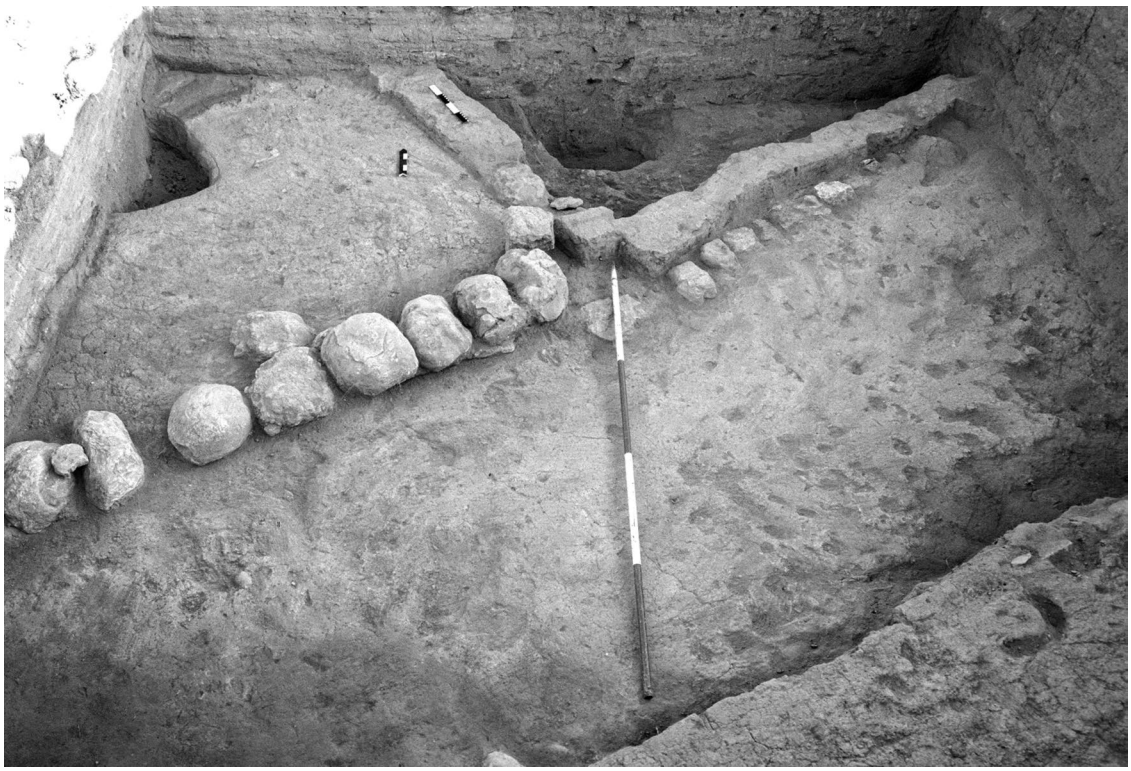


FIGURE 2.145. Level 3, areas 41 (left) and 40 (right). Looking north.

The area 40 floor is probably of an earlier phase than that in area 34, given the divergent elevations, unless the architecture was terraced; if there was a floor contemporaneous with that of area 34 it must have been eroded.

Area 41 (Figure 2.146): Area 41 is west of area 40. Marking its southeastern border was a single course of stone boulders (41A) extending from the south corner of area 40. Traces of a greenish-white lime surface was found in area 41 in both excavation units 42/90 and 42/96. To the southwest, wall 41B, perpendicular to areas 36/37, was composed of irregularly shaped mudbricks and had no trace of plaster.

Areas 36/37, phase a (Figure 2.146): Areas 36 and 37 include an anomalous mudbrick construction (36A), apparently a wide wall or platform appended to area 35, with two rectangular intrusions dug into it in phase b. Occasional stone cobbles were included in this structure among the bricks. At the limit of excavation in the area 84 passage to the northwest, which had an outdoor earth and pebble surface, the exterior face of construction 36A was reinforced with a line of cobbles. The southeast face was excavated down to the area 41 lime-plastered surface.

Areas 36/37, phase b (Figure 2.146): Two rectangular spaces were dug into the phase a mudbrick construction. Area 36 contained a circular oven of clay (36B), while area 37 contained clay oven fragments but no oven installation in situ.

Objects: area 37—clay animal figurine fragment, bone awl fragment.

Area 84 (Figure 2.146): This area comprises the passage between area 36/37 and area 71 to the northwest, with a surface of brown-gray earth and pebbles. At its north end were mudbricks and boulders lying flat. A row of cobbles was found against the northwest edge of the mudbrick feature 36A of area 36/37.

Objects: pierced potsherd disk, irregular shaped perforated gypsum (?) disk.

Complete vessels/profiles: Fine Simple Ware miniature bowl (Figure 4.29:34).

Area 42 (Figure 2.147)

Area 42, phase a: In phase a, area 42 consists of a small room with an earth floor that became covered with ash. The western edge of this room, presumably in excavation unit 48/96, was destroyed by later intrusive activity, and the south wall (42A) was also considerably disturbed, particularly in its southern and southeastern segments. The recovery of a fragment of copper casting splatter on the floor of the room may indicate the presence of metallurgical activities in the "industrial" zone of areas 42–44/75–79 (see Chapter 8).

Objects: copper casting splatter, on floor.

Complete vessels/profiles: Cooking Ware, round-base, hole-mouth pot with horizontal lugs (Figure 4.31: 14).

Area 42, phase b: A gray earth surface was associated with phase b, which also involved the rebuilding of

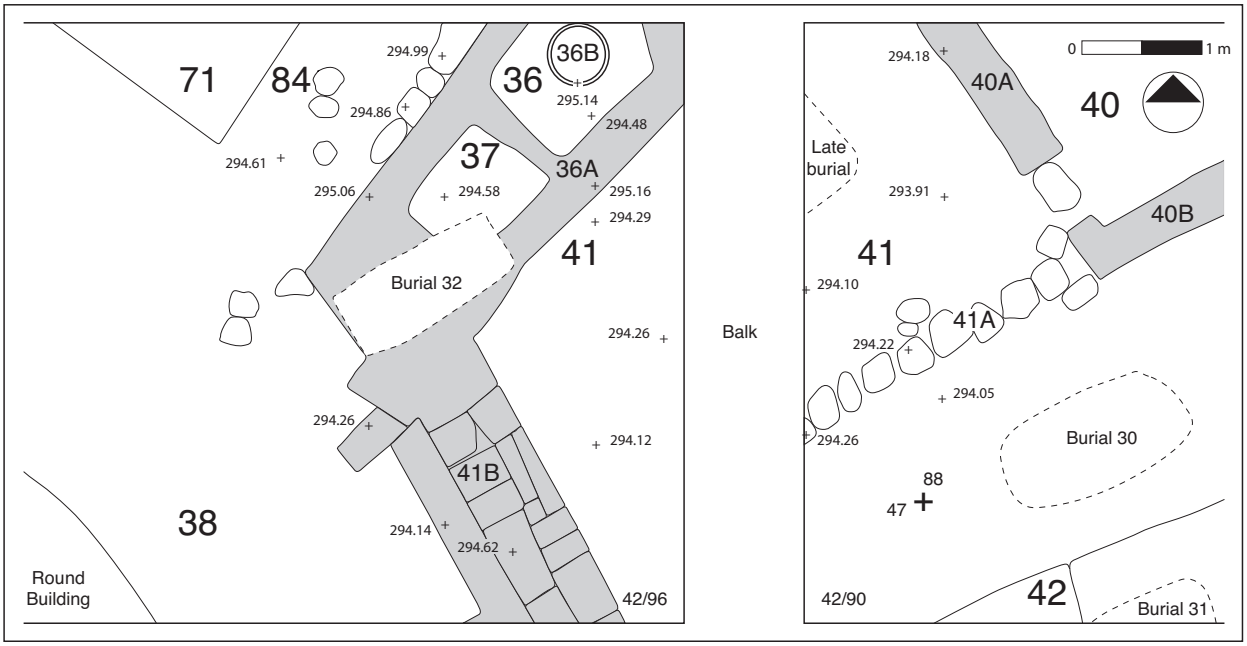


FIGURE 2.146. Level 3, areas 36/37 and 41. *Illustration prepared by Julie Perlmutter.*

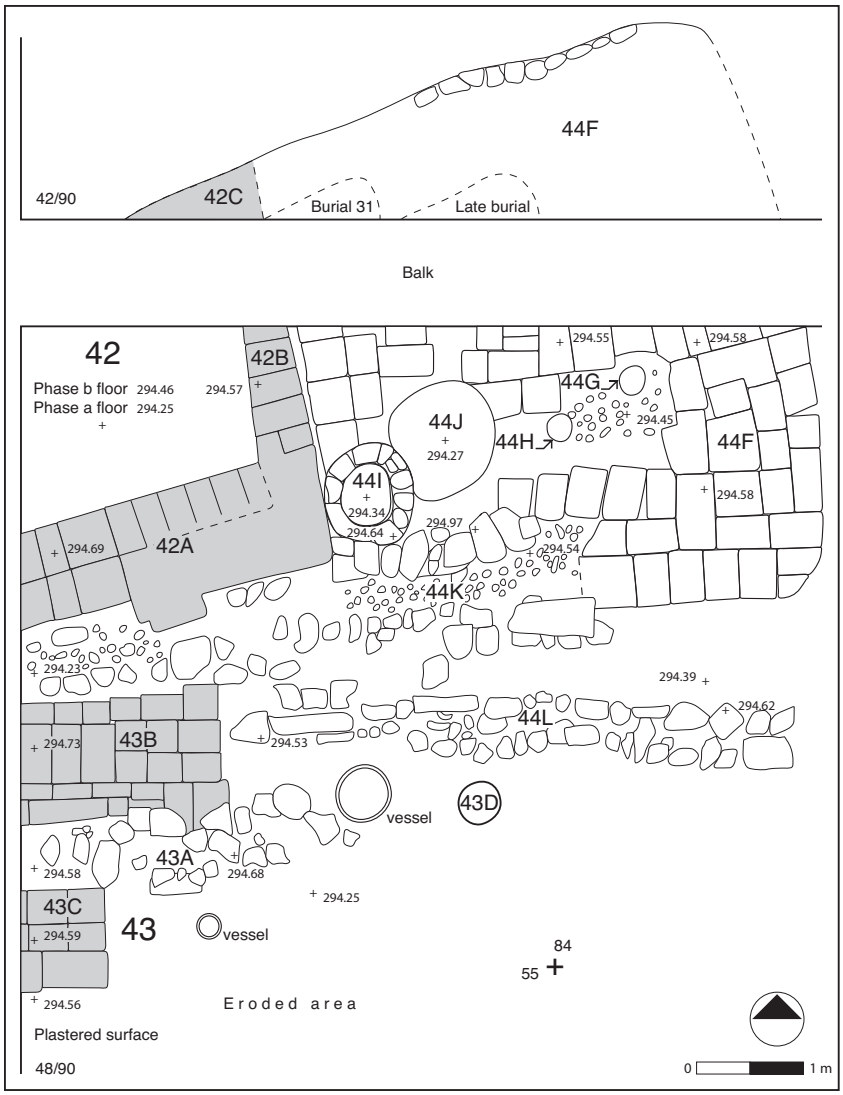


FIGURE 2.147. Level 3, area 42, and areas 43/44, phase b. *Illustration prepared by Julie Perlmutter.*

the south wall of the room (42A) above the phase a wall. (Figure 2.147 shows the top of the phase a wall; the elevation of the top of the phase b wall was 295.18.) In the southeast corner of the room were remains of a cooking ware pot resting on segments of a fireplace (42D).

Areas 43/44, phase a (Figure 2.148):

A small sounding was made in the northeastern part of area 44 in excavation unit 48/90, uncovering fragments of two parallel walls (44A–B) running northwest-southeast with a gray earth surface between them. To their west was another gray-brown earth surface, a mudbrick floor or platform (44C, apparently a predecessor to the phase b platform 44F, for which see below), and an adjacent cluster of cobbles, pebbles, and boulders (44D).

These constructions appear to pre-date the area 77 oven enclosure and the excavated phase of area 76/79, but may have been contemporary with an earlier (unexcavated) phase of area 76/79.

Sometime late in phase a, a small circular pit (44E) was dug west of wall 44A, partly cutting into that wall.

Areas 43/44, phase b (Figures 2.147, 2.149): In phase b, a mudbrick platform (44F) was constructed east of area 42, consisting of some three brick courses. This feature included an open area in its center containing two small shallow pits lined with sherds (44H) or sherds, pebbles, and lime plaster (44G). The lowest course of the platform was exposed in unit 42/90, where the north edge of the structure was faced with cobbles.

In the platform's western segment were the vestigial remains of two circular ovens. The western oven (44I, height = 30 centimeters) had a lining of mudbricks; the eastern (44J), whose clay core was only ob-

servable in collapsed fragments, had a height of 37 centimeters. It cannot be stated definitively whether these ovens were in use in phase b at the same time as the platform or were sunk into the platform area from phase c.

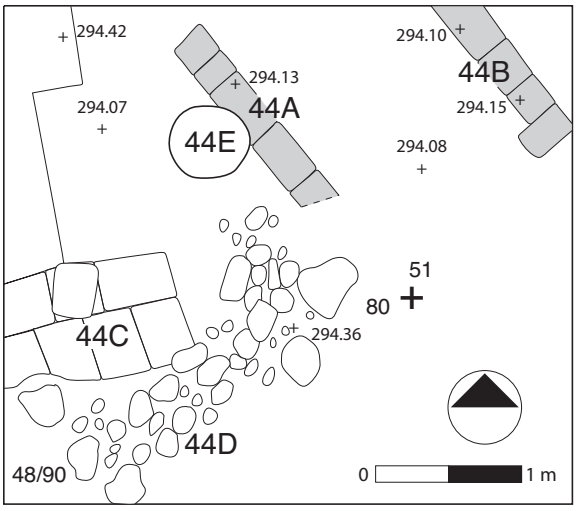


FIGURE 2.148. Level 3, area 44, phase a. *Illustration prepared by Julie Perlmutter.*

To the south were three stone drains (44 K-L, 43A) that extended to the edge of the mound, comprised of parallel lines of boulders, slabs, and cobbles. The northernmost drain (44K) was preserved to the height of two courses of boulders, and its channel contained numerous sherds and pebbles. If we consider that this feature led out to the mudbrick platform 44F and the improbability of the intentional conducting of liquid onto a brick surface, it may be more appropriate to date drain 44K to a phase subsequent to the use of platform 44F, e.g., phase c. The drain to its south (44L) consisted of one to two courses of boulders and cobbles. The southernmost drain (43A) was not as well preserved as the other two and disappeared with the slope of the mound to the southeast.

South of the area 42 room was a construction of mudbricks (43B) preserved to a height of four courses. Farther to the south was another brick segment (43C), incompletely excavated, with a white lime plaster surface to its south on the tell slope. In the eroded area to the east and northeast of 43C were the remains of two sunken vessels and a pit (43D).

The mudbrick platform 44F of phase b was installed at a point subsequent to the construction of

FIGURE 2.149. Level 3, areas 42–44. Looking northeast.

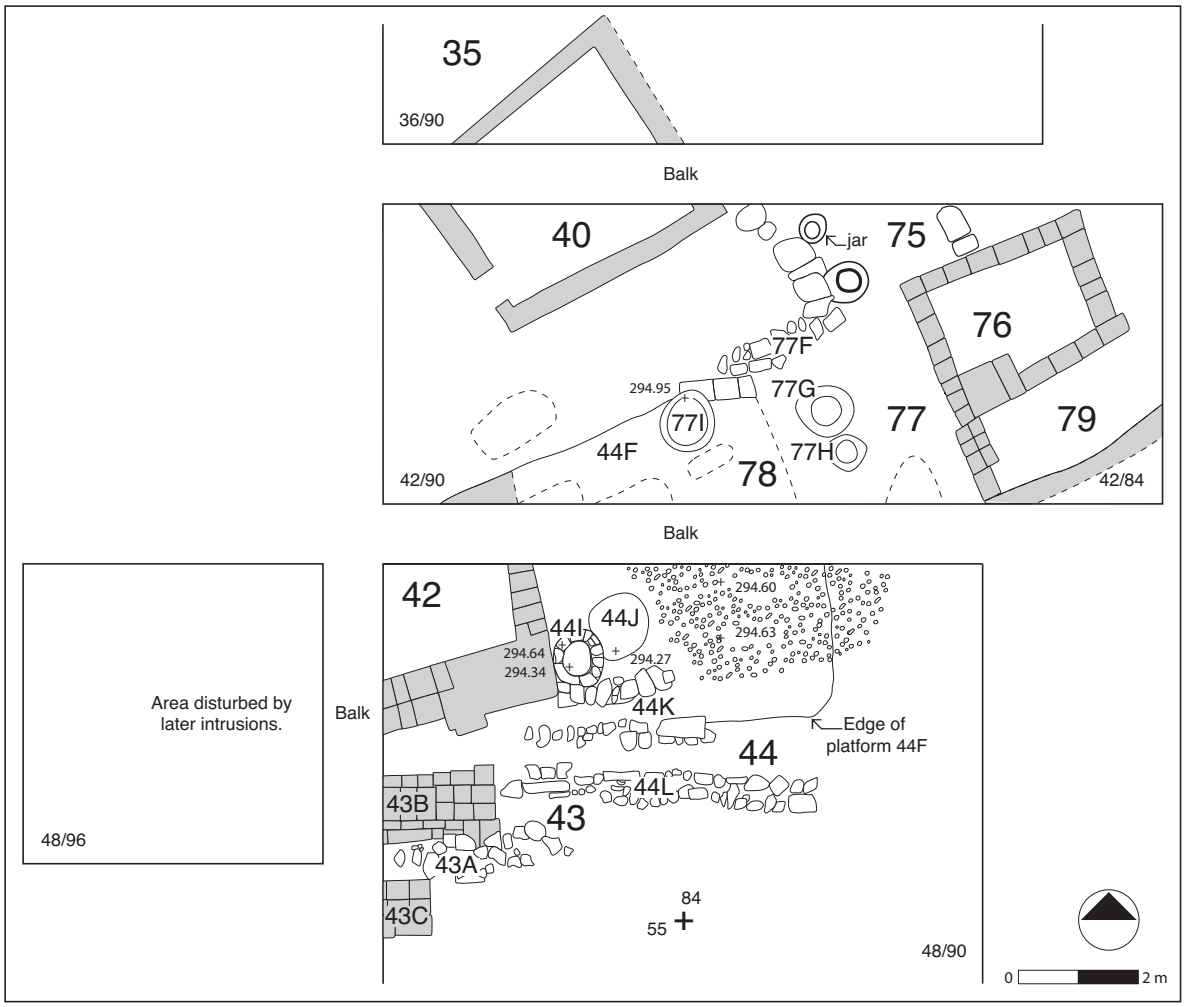


FIGURE 2.150. Level 3, areas 43/44, phase c, areas 77/78, phase b. *Illustration prepared by Julie Perlmutter.*

areas 76/79 and the oven enclosure of area 77, roughly contemporaneous with area 77/78, phase b.

Whatever segments of the features described above extended west into excavation unit 48/96 were destroyed by later intrusions.

Objects: area 44—bone awl fragment.

Areas 43/44, phase c (see Figure 2.150): A pebble surface was installed just above the phase b mudbrick platform, with which drain 44K (with 44L and 43A?) may be associated (see above, phase b). The two round clay ovens (44I-J) sunk into the phase b platform located southeast of area 42 may have been constructed either in this phase or in phase b (see above).

Areas 43/44 phases a–c appear to be contemporary with area 40/41 and area 42. Although the possibility exists that area 43/44 phase a should be assigned to level 4, in the absence of stratigraphic connections to other level 4 contexts this issue cannot be resolved.

Objects: area 44—half of pierced potsherd disk.

Area 75 (Figures 2.150, 2.151, 2.152): Area 75 is a space demarcated by two parallel walls of limestone boulders (75A–B) oriented northwest-southeast, contemporary with area 76/79. One course of wall 75A and three courses of wall 75B were preserved. The area was paved with a course of mudbricks (75C), into which a storage jar and a circular clay oven (75D) with a mud packing were partially sunk. In the southeastern corner of the room, where the mudbrick floor was not extant, were the remains of a second clay oven (75E) with mud packing, apparently the top of an oven belonging to an earlier and unexcavated phase. Area 75 yielded a large number of cooking ware sherds (see Chapter 4).

Figure 2.151. Level 3, areas 75 (foreground) and 77 (phase a). Looking south.

Objects: clay cylinder with flaring ends between oven 75D and feature 77C.

Complete vessels/profiles: large Medium Simple Ware, round-base, evert rim jar (Figure 4.27:15).

Areas 76/79 (Figure 2.150, 2.152): Areas 76/79 make up a structure of at least two rooms whose southeastern segment was eroded. Evidence indicates that the two rooms began as a single-room prior to the phase excavated, when a partition wall was added dividing the structure into two segments.

In area 76, the interior faces of walls 76B–C were coated with yellow to white lime plaster. Because the lime plaster on the interior of wall 76C could be followed in an unbroken line from area 76 to area 79, it is clear that wall 76B separating the two rooms was a later addition added to a wide buttress (76E) against wall 76A. The earliest floor excavated in area 76 had yellow to light green lime plaster occasionally covered with ashy spots. A shallow deposit of fill was surmounted by an upper floor of gray to white lime plaster.

Area 79 had a gray-yellow lime plaster floor. In the eastern corner of the room was a mud feature (79C) raised above the floor, with a burned clay surface and a mud border to the east. A lime-plastered mudbrick bench (79D) raised only c. 8 centimeters higher than the floor was located against the room's southwest wall (79A); the northwest part of this bench was burned and lustrous in a manner similar to the fireplaces found elsewhere in level 3. The stone door socket on top of feature 79D, considered together with the thinning of wall 79A at its intersection with wall 79B, suggests a blocked doorway (without a door jamb) in this corner (cf. also area 40, south corner). Wall 79B was difficult to define, due to erosion on the mound slope, and a northeastern wall evidently did not survive for the same reason.

This two-room structure was occupied contemporaneously with areas 77/78, phase a; it may have persisted longer, but the eroded nature of the area removed any evidence of later occupations. Phases prior to the addition of the partition wall were not excavated.

Objects: area 76—bone awl fragment; bone needle from inside wall; area 79—bone awl fragment, type B pierced basalt fragment (door socket?) made from grinding stone type A, found on bench 79D, type B pierced basalt stone from debris inside room.

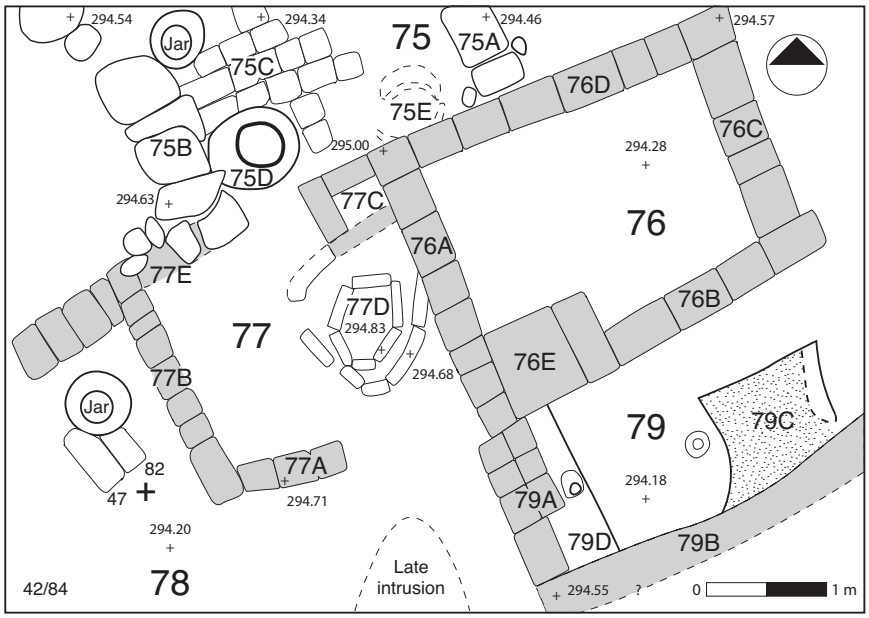


FIGURE 2.152. Level 3, areas 77/78, phase a; areas 75/76 and 79. *Illustration prepared by Julie Perlmutter.*

Complete vessels/profiles: area 79—Coarse Simple Ware round-based, hole-mouth jar (Figure 4.27:7).

Areas 77/78, phase a (Figure 2.152): Area 77 contained a squarish mudbrick and stone structure enclosing an oven (77D), with the southwest wall of area 76 (76A) forming the east edge of the feature. The north wall 77E consisted of a mudbrick structure of two to three courses, with courses of stone boulders above the bricks presumably deriving from a later rebuild.

Area 77's oven (77D) consisted of a hexagonal core made of six mudbricks standing on their sides, encircled by an outer ring of mudbricks on their sides. The tops of the bricks in the hexagonal core were ca. 15 centimeters higher than the tops of the bricks of the outer ring. An ashy fill was deposited inside the feature.

Outside wall 77B, to the west, a large storage jar was installed atop two (or more) mudbricks lying flat.

Phase a is contemporaneous with the two-roomed structure of area 76/79 and precedes the installation of the mudbrick platform 44F of areas 43/44, phase b. This phase was not excavated to the west in excavation unit 42/90.

Complete vessels/profiles: area 77—large Medium Simple Ware round-base, evert rim jar (Figure 4.27:16) found above two flat mudbricks.

Areas 77/78, phase b (Figure 2.150): The enclosure surrounding the phase a oven 77D was discontinued in phase b, although the top of the oven was probably still visible, and two new ovens (77G-H) were built over the walls of the enclosure. Both ovens were circular with clay cores surrounded by mud casings.

Sometime subsequent to the construction of these ovens and to the use of the mudbrick platform 44F, a third circular clay oven (77I) was constructed to the west, adjacent to an irregular wall (77F) of mudbricks and stone boulders. A brown earth surface was associated with this phase, which also was characterized by a large number of cooking ware sherds.

Areas 77/78, phase b is contemporary with areas 43/44, phases b–c.

Objects: shell bead (unio valve), black stone bead.

Areas 38/45 (Figure 2.83) (cf. also area 48): An alley to the east and north of the Round Building with alternating lenses of ashy debris and bricky fill.

Objects: bone awl, bone awl fragment.

Round Building

The level 3 Round Building was only traceable in its northern segments, the southern portions having been eroded or destroyed by later intrusive activities (see below). The preservation of level 3 architecture inside the Round Building diminished in quality from north to south; therefore, some poorly preserved mudbrick remains in excavation unit 48/102 or the southern part of 42/114 may have belonged to level 3, but they are excluded from this discussion because of their incoher-

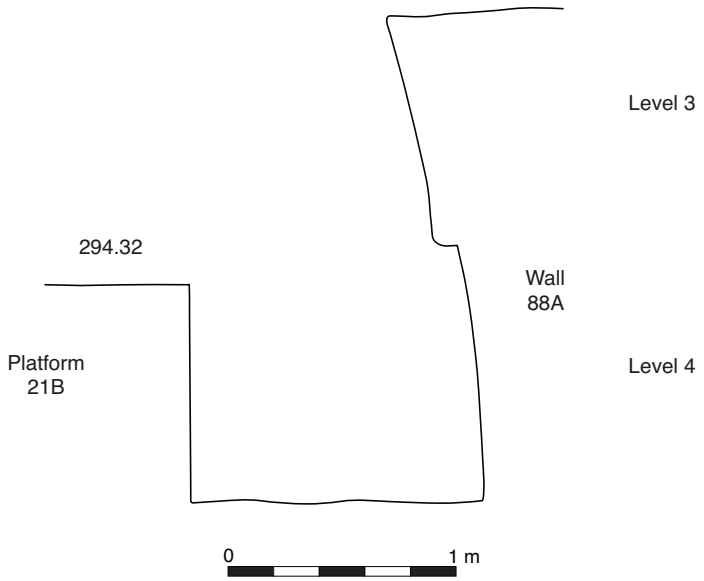


FIGURE 2.153. Section indicating level 4 and level 3 phases of outer wall of Round Building. Level 3, area 87, level 4, northwest area 29, between level 4 platform 21B and outer wall of Round Building. *Illustration prepared by Julie Perlmutter.*

ent quality and the likelihood that they represented collapsed mudbrick.

Although it is conceivable that the level 3 inhabitants re-used segments of level 4 Round Building architecture still extant in the south, much as they re-used level 4 silos in the northwest part of the site (areas 4–6), there is no evidence to support this hypothesis. For example, no ceramics of clear level 3 type were found in the level 4 rooms.

The outer wall of the level 3 Round Building as preserved in its northern segment was largely a reconstruction of the later level 4 outer wall and also incorporated parts of that wall left extant, such as the substantial interior buttresses. However, since the level 3 outer wall was primarily left extant by the excavations, the precise nature of its divergences from and relationship to the level 4 wall is not completely certain. It is clear, in any case, that the level 3 wall was wider than its level 4 counterpart in some areas (Figure 2.20 [level 4 wall in balk 42–43], Figure 2.153). It appears that the outer wall, like its level 4 predecessor, was largely comprised of discrete, abutting rectangular segments of 80–200 centimeters in width. The constituent bricks of the structural segments were often irregular in shape and sometimes appeared to be arranged in courses sloping down to the exterior, particularly in excavation unit 36/108. The interior face of the outer wall tended to be mud plastered, but evidence for exterior plastering was rare except for a glacis-like sloping mud packing noted in excavation unit 36/108. Two small exterior buttresses were identified in the northeast.

The inner face of the outer wall often took on the character of a vaulted structure, with one course projecting out slightly from the one beneath it in a corbelled effect. This feature was most evident in areas to the north and northeast but not in excavation unit 42/114, where the inner face seemed rather straight. In stretches of the wall where the vaulted effect was noted, the resultant overhang between the inner faces of the highest preserved course and the lowest could measure as much as 10 centimeters.

It would appear that much of the interior of the Round Building, as preserved, consisted of unroofed space, with roofed zones being confined to areas 47 and 91 in phase b (Figure 2.156). As with the level 4 Round Building, it is unlikely that the outer (partly vaulted?) enclosure wall of the edifice was associated with a roof of its own, given the dimensions of the building and the nature of the architecture inside.

Since the phase b area 47 room was constructed of walls with two rows of bricks against the outer wall of the Round Building (Figure 2.155), one might suggest that the unusual thickness of the walls was intended to support a second story. However, there is no obvious mode of access to a second floor.

Buildings of similar shape and scale have been noted in the Hamrin region and elsewhere (see above for the discussion of the Raqa'i 4 Round Building), indicating a central/northern Mesopotamian tradition of large-scale circular architecture, but there are no exact parallels between the Raqa'i 3 Round Building and structures found elsewhere. Perhaps the closest

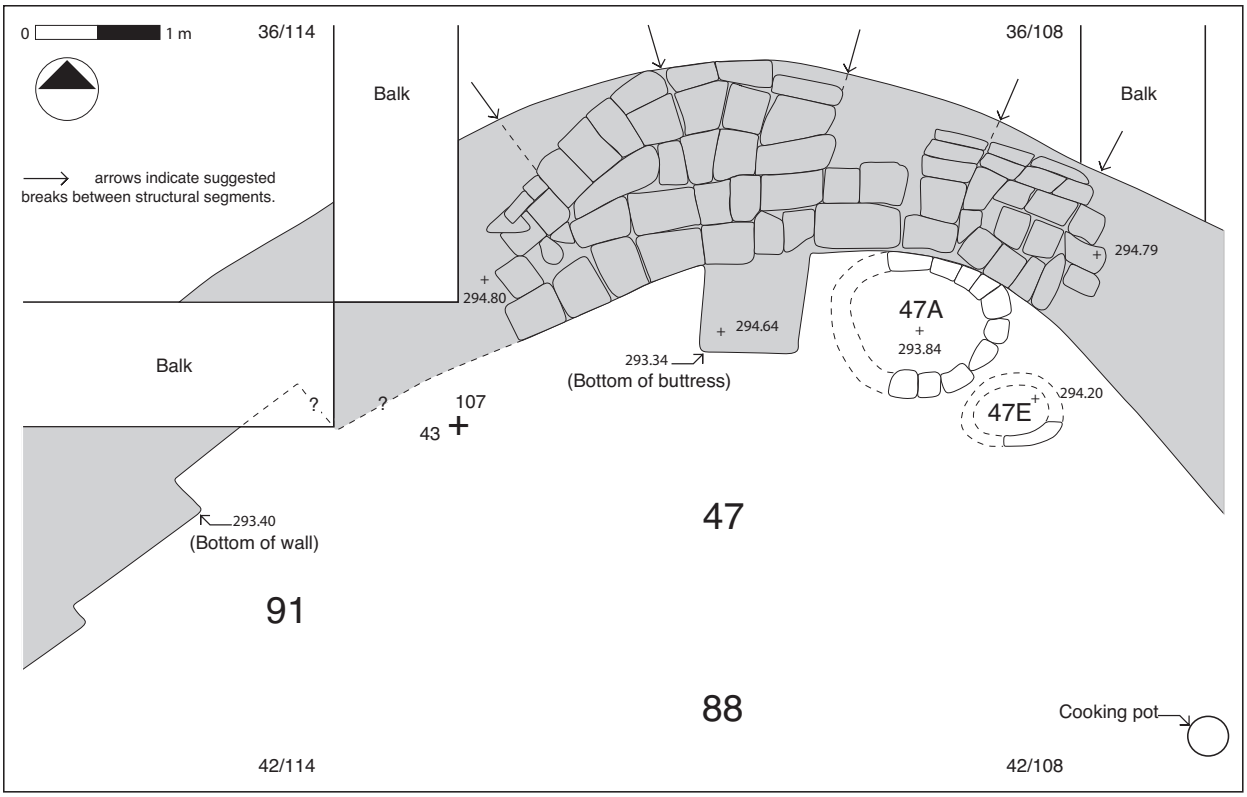


FIGURE 2.154. Level 3 Round Building, phase a. *Illustration prepared by Julie Perlmutter.*

comparison is to the round building at Tell Madhhur in the Hamrin (Roaf 1982).

Phase a (Figure 2.154): The level 3 reconstruction of the rounded outer wall was erected above a thin gray ashy layer deposited above the remains of the level 4 outer wall, particularly visible in 42/114 and 42/96. The earliest deposits inside the level 3 building consisted of reddish bricky material ca. 25 centimeters thick, perhaps debris from the re-construction project. Above this layer were alternating lenses of orange-red wash and gray organic material in a deposit ca. 25–40 centimeters thick that also included mudbrick debris, particularly substantial in areas 47 and 88. The layers sloped down from east to west and constituted a thicker deposit in the west. These alternate layers may represent seasonal deposition in which periods of processing activities that included burning alternated with periods of inactivity marked by rain-washed deposition of bricky eroded material (for an alternate interpretation, cf. Wright et al. 1989).

Somewhat later, a sequence of as many as five circular mudbrick ovens (47A–E; Figure 2.154 shows the earliest, 47A, and latest, 47E) was installed against the interior face of the rounded wall in area 47, associated with a large quantity of dark gray ash. Otherwise, the north central area of the Round Building accumulated lenses of dark gray to black ashy fill with frequent animal bone fragments, sloping down to the west. Fragments of a large cooking pot were recovered from this ashy fill in the eastern part of area 88.[35]

Phase b (Figures 2.155–2.157): Phase b entails a proliferation of construction activity in the northern part of the Round Building.

First, the niche-like feature in the outer wall of the building in area 91 was filled in with bricks, and a massive buttress-like brick feature (91C) was added against the wall. Perhaps this construction was deemed necessary to better support the vaulted wall face. The brick courses of this feature sloped down to the south as if in response to considerable pressure.

Sometime after this project, two walls (91A–B) were added to its west, forming a room in area 91. These two walls were poorly preserved, and the northeastern segment of wall 91B, of which two to three courses were extant, appeared to have been disturbed. The reason for leaving a narrow open space between

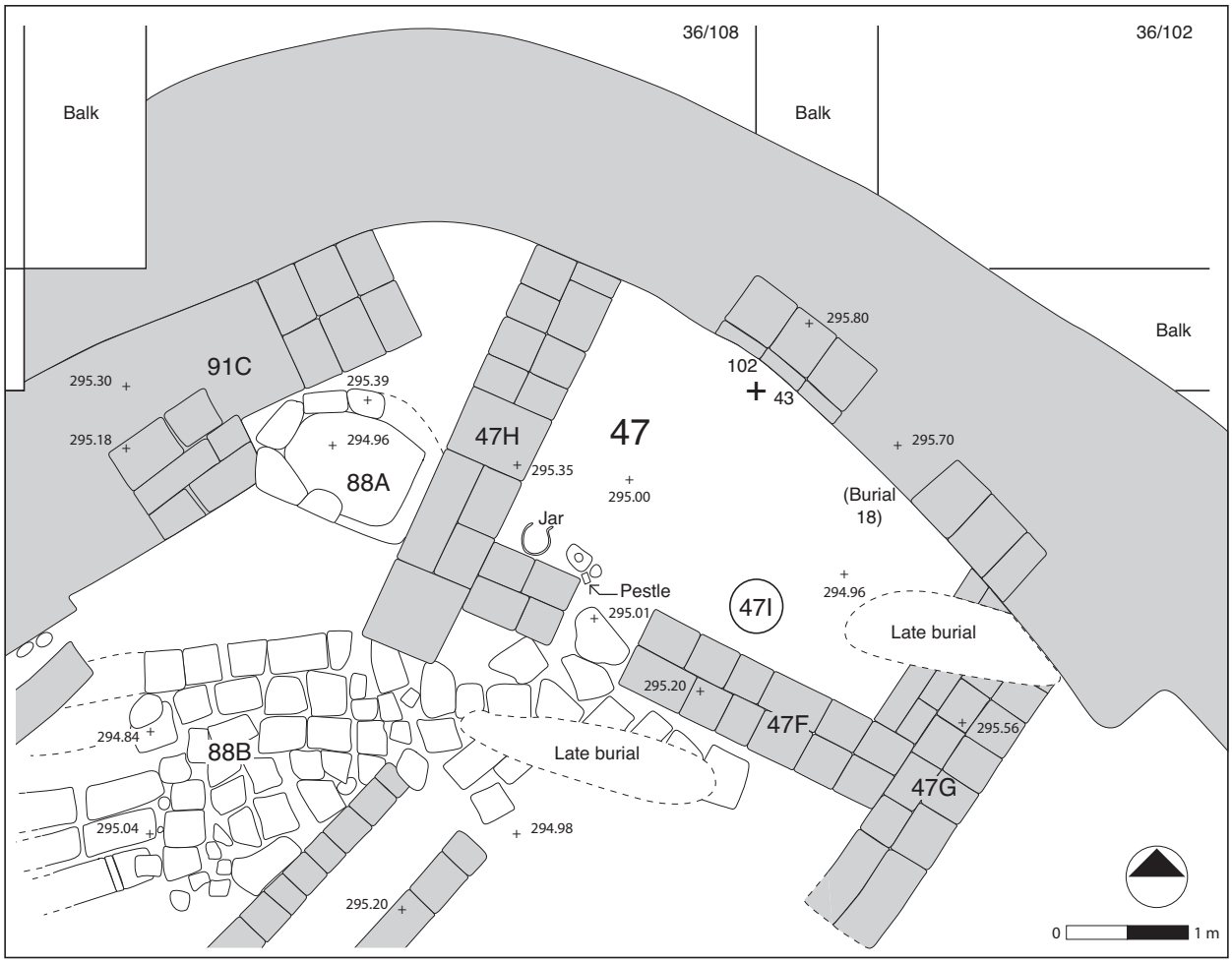


FIGURE 2.155. Level 3 Round Building, area 47, phase b. *Illustration prepared by Julie Perlmutter.*

wall 91B and feature 91C, against whose face two basalt grinding stones were found, is unclear.

In the open area south of the area 91 room, gray-brown soft and often ashy fill accumulated, subsequent to which a gray ashy surface was in use which had a collection of large sherds from broken jars distributed flat across it. A circular clay oven (91D) was located against the Round Building outer wall.

To the east, three walls (47F-H) in area 47, preserved to a height of 9–11 courses, were constructed against the outer wall of the building, forming another room; the large phase a interior buttress in this area was now deleted. The area 47 room had a flooring of limestone boulders, sherds and pebbles, with a white to yellow lime plaster surface laid directly above it; traces of yellow plaster were also noted on the interior face of the west wall 47H. A large limestone slab served as a threshold, and the lowest course of the wall 47H at its southwestern end also consisted of stone slabs. On the plaster floor was a broken jar situated in the southwest corner of the room, and a basalt door socket and broken stone pestle were found against the northwest corner of the doorway. Shallow ashy pit 47I was located to the east.

To the north, next to the outer wall of the building, were the skeletal remains of an adult individual (burial 18) and associated grave goods. No burial pit had been recognized during excavation, nor were there traces of one visible in section, but we assume that such a pit had been dug through the fill above the area 47 floor.

South and west of the area 47 room were two free-standing parallel walls (88C-D) the width of one mud-brick.[36] A basalt door socket was found in fill against the east face of wall 88C. Walls 88C and 88D recall the grill architecture of levels 5 and 4 and the constructions

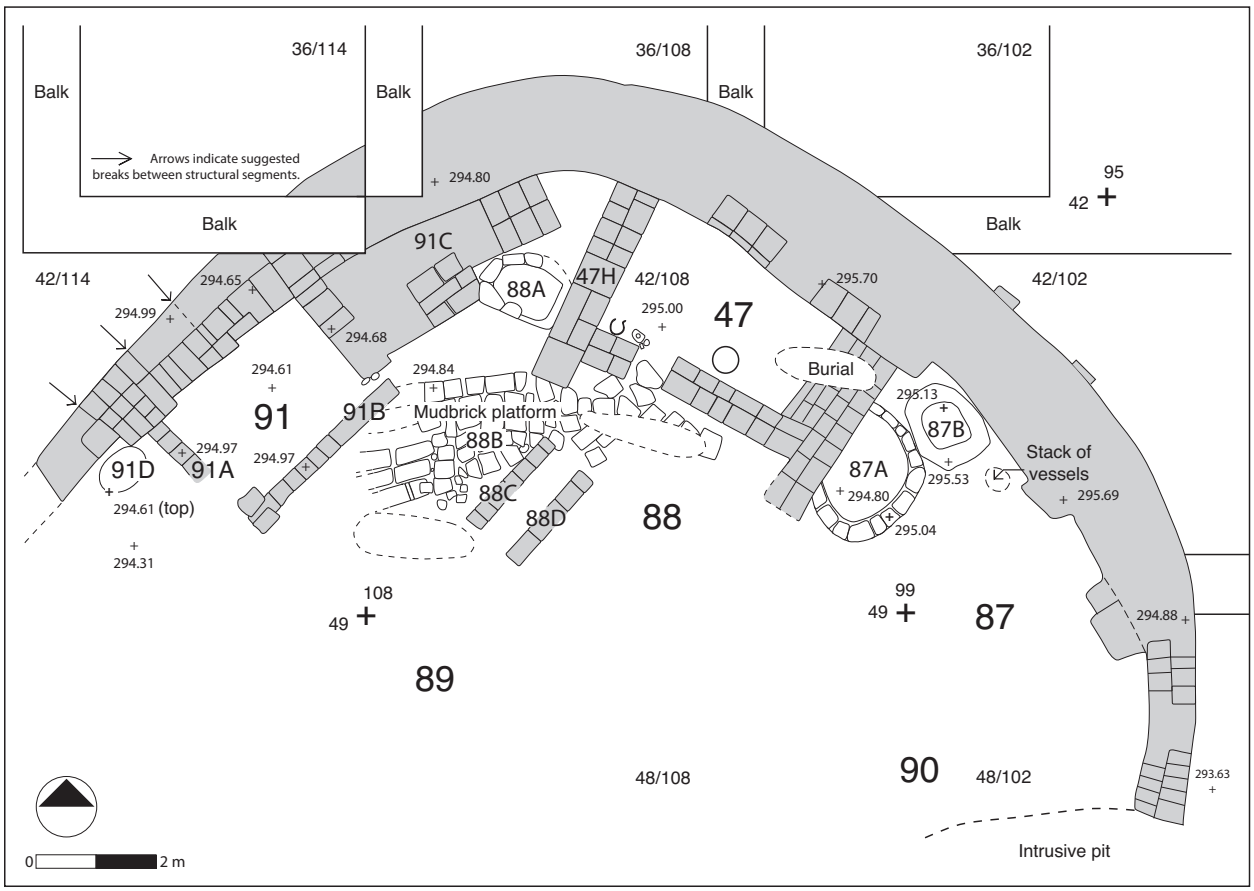


Figure 2.156. Level 3 Round Building, phase b. *Illustration prepared by Julie Perlmutter.*

associated with grain storage and drying known from contemporaneous sites in Mesopotamia and elsewhere in the Near East (Schwartz 1987:95; Wilhelm and Zaccagnini 1993: plate VII).

A pavement of often irregularly shaped mudbricks (88B) was installed to the north and west of walls 88C-D, sometime after the initial construction of the area 91 room. North of the pavement, a mudbrick oven (88A) preserved to a height of seven courses had been installed between feature 91C and the northwest wall (47H) of area 47, at about the same time that both constructions had been erected.

After the brick pavement 88B fell out of use and became covered with ashy fill, a large concentration of sherds from broken storage jars was distributed over the northwestern part of area 88, perhaps as a pavement, although the sherds did not present an especially flat surface. This sherd concentration (elevations noted from 295.22–295.37) was located directly south of feature 91C, oven 88A and the southwest part of the area 47 room, in a distribution ca. 80–140 centimeters wide from north to south and some 4 meters from northwest to southeast. While the upper courses of feature 91C, oven 88A, and the walls of area 47 were still extant at this point, one might consider the possibility that these sherds represent level 2 activity (see below, level 2 Round Building).

In area 87, a semi-circular mudbrick oven (87A, Figure 2.158) without an evident clay *tannur*-like core was constructed against the outer face of wall 47G, associated with a light gray-white surface. Contemporary with this oven was a cluster of sherds from several large vessels located to its northeast against the inner face of the Round Building's outer wall. The use of oven 87A was discontinued, and a new mudbrick oven (87B) elliptical in shape was built against the inner face of the outer, associated with later ashy surfaces in area 87. Several animal bone fragments and one piece of copper/bronze were found in the fill of this oven. In the

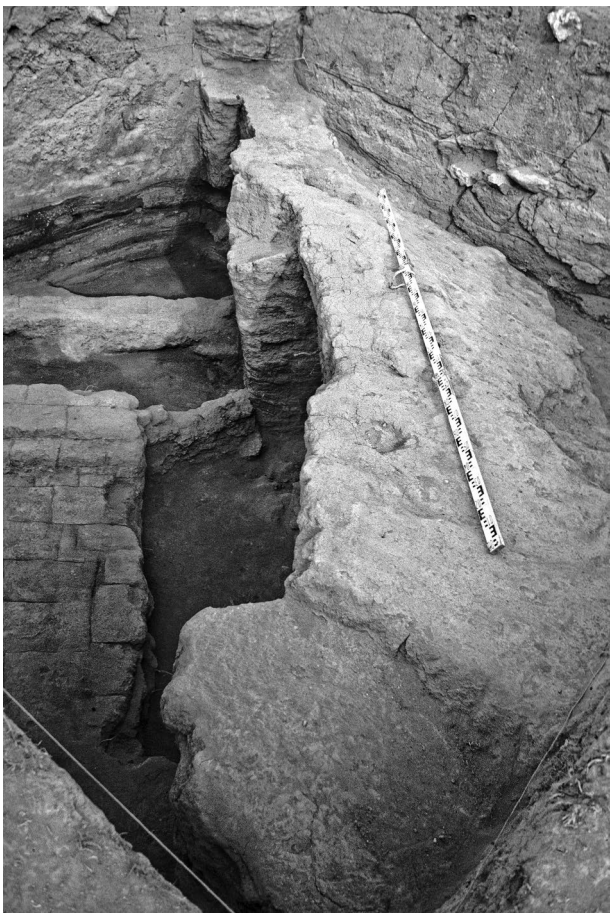


FIGURE 2.157. Level 3 Round Building, area 87. Looking northwest (with level 4, area 21B platform visible to left).

corner southeast of the feature was a stack of several smashed incomplete vessels lying atop one another.

Burial 19, dug into the fill of the level 4 Round Building area 6 and responsible for much damage to the upper architecture of the room, is assigned to level 3 on the admittedly equivocal stylistic evidence of the associated toggle pins (cf. Chapter 5).

Objects: area 47—clay human figurine (complete), 5 bronze pin fragments, complete grinding stone type A, pierced basalt stone (door socket?) type B next to pestle type C against northwest corner of doorway, 8 quartz beads, 1 carnelian bead; area 87—bronze fragment from oven 87B, complete basalt mortar type A, small clay wheel; area 88—clay andiron fragment, 2 grinding stone fragments of type A, pierced stone type B; area 89—complete basalt mortar type A; area 91—basalt pierced stone type B.

Complete vessels/profiles: area 47—Medium Simple Ware round-base, evert rim jar (Figure 4.27:9); area 91—Cooking Ware hole-mouth pot with horizontal lugs missing its base (Figure 4.31:6).

FIGURE 2.158. Level 3 Round Building, area 87 (oven 87A next to wall 47G on right). Looking south.

LEVEL 2 (FIGURE 2.159)

Level 2 is the latest third-millennium occupation at Raqa'i. Contexts are assigned to this level if they yielded third-millennium material culture and were stratified above level 3 remains, that is, deposited later than strata contemporary with the use of the level 3 Round Building (see Figures 2.81 and 2.82 for relevant section drawings). The preserved remains were generally fragmentary, with many open spaces without evidence of architecture, in contrast to the densely distributed architecture of preceding levels. It must also be acknowledged that the level 2 remains were also frequently damaged by later burial pits and by erosion. In addition to the scattered architectural remains, level 2 is notable for the numerous mudbrick tombs of children located on the outer edges of the mound.

In level 2, walls were preserved 10–70 centimeters in height, with a few exceptions surviving as high as 1.4 meters. Occasional evidence of the use of interior buttresses, so common in previous levels, is observable (e.g., areas 8, 11, 17).

Given the numerous child burials and the fragmentary character of the preserved level 2 occupation, one might suggest that the tell was only minimally (perhaps seasonally) occupied, with the burials belonging to mobile groups who mainly resided elsewhere. However, the restriction of the burials to the edges of the mound suggests that those interring the children were avoiding more substantial features in the central parts of the site. In that case, it may be prudent to infer that the level 2 architecture was originally more profuse and coherent than its extant vestiges suggest, and that it suffered considerable damage from erosion, intrusion, and other factors.

FEATURES

Ovens: The level 2 ovens were all of the circular clay *tannur* type, with a range of 25- to 99-centimeter diameter or width. Some of them seem to have been partly subterranean (8D–E, probably 18C–F). The ovens are located in both roofed and unroofed spaces. As in level 3, there is evidence for ovens installed inside a "bakehouse" mudbrick enclosure (ovens 18C–F). Ovens with packings of sherds, pebbles, or mudbricks are found only in exterior contexts or in the "bakehouse," again supporting van der Steen's suggestions of functional and spatial variability in the use of oven insulation.

Pits: Pits are divided into three categories:

Large pits: Interpreted as receptacles for grain/foodstuffs or trash, these pits were only represented by one level 2 example (1F). As in level 3, there was little evidence for garbage pits situated on the mound slope, although the outer edge of the level 3 tell was often used for burial pits by the level 2 inhabitants, particularly in the northwest and southeast.

Fire pits: One circular fire pit was identified, a very small example (10E) on the floor of the area 10 room.

Lined pits: The majority of the level 2 pits fall into this category (3D, 8G, 9A, 16A–B, 22A, 26B–C). As in level 3, these small round pits (diameter 20–56 centimeters; maximum recorded depth 64 centimeters) with sherd, pebble, or plaster linings are found in both unroofed and roofed contexts. All examples occurred in apparent isolation, with the exception of the two adjacent pits in area 26.

Examples of lime-plastered basins or bins include 23G–H, 7E–F, and 18L. Note also the lime-plastered surface with circular depression 3E and the lime-plastered small bin with sunken vessel 1D. None of these had the multi-segment features found in the level 3 examples. No clear case of a fireplace like those of level 3 was noted (but cf. area 15).

AREA DESCRIPTIONS, LEVEL 2

Areas 1–6, Terrace: On the southwest slope of the mound, the inhabitants of level 2 dug into and removed earlier third-millennium remains and constructed architecture on the newly created terrace.[37] Because the excavations below this architecture revealed level 4 remains, we infer that level 3 contexts in this area had been completely destroyed by the level 2 terrace builders.

The terrace area was much eroded toward the south, and a deep gulley ran down the slope of the mound at this point. This area was also considerably damaged by modern intrusive activity. Because of this disturbance, an understanding of the southern extent of the terrace is difficult, but there is reason to hypothesize a second step of the terrace to the south of the architecture reported below. Evidence in favor of this reconstruction includes indications from the stratigraphic sections (cf. level 2, wall 2A, Figure 2.82 [grid point 50]) and wall fragments to the south that did not cohere with level 4 architecture in the area.

Area 1 (Figure 2.160) (cf. **areas 2/3/4, phase b):**

Area 1 consists of the northern portion of a room eroded to the south, in which two white lime plaster

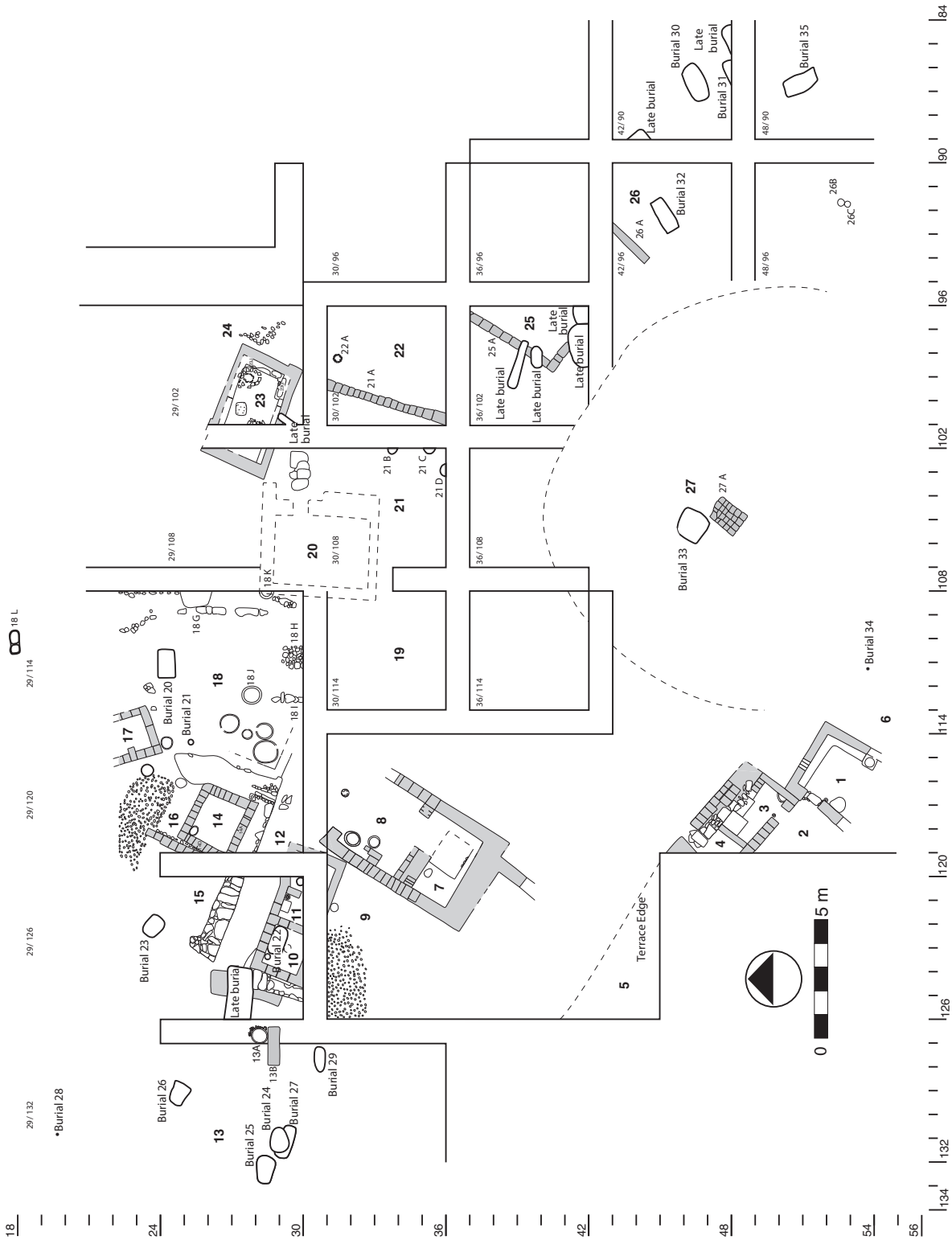


FIGURE 2.159. Level 2. *Illustration prepared by Julie Perlmutter.*

floor surfaces were identified. Associated with the earliest surface (293.35) was a small squarish mud feature with a lime-plastered depression (1D); in the depression was an incompletely preserved ceramic vessel kept upright with stones and mudbrick fragments (Curvers 1987). The vessel contained some charcoal and lime plaster pieces and a few animal bone fragments.

Prior to the installation of the second lime plaster surface (293.57), the doorway in wall 1B was blocked and mudbrick bench 1E was constructed against walls 1B and 1A. The blocking of the doorway consisted of three vertically placed mudbricks, under which a copper/bronze toggle pin with a bent spherical head (M-003) was found. When wall 1B was removed, a copper/bronze spiral (M-010) was found between two bricks in the lowest course of the wall.

The northwest wall (1C) of area 1 was only preserved to the height of one mudbrick course. The doorway in this wall was associated with a stone door socket and with a door sill consisting of a boulder with traces of lime plaster on top. Pit 1F just east of wall 1C contained dark gray to black ash and abundant sherds.

In a later phase preserved just below the present-day surface of the mound slope was an earth floor. The soft sandy and ashy fill above the surface included a scattering of basalt cobbles to the northeast, with smaller basalt fragments to the northwest (cf. area 6, basalt cobbles).

Objects: bronze toggle pin in blocked doorway, bronze spiral ring in wall.

Areas 2/3/4, phase a (Figure 2.161): The earliest phase of the level 2 terrace in areas 2–3 entailed a room with a gray to white lime plaster floor. A circular sherd-lined depression (3D) was dug from the floor and was located next to a mud installation (3E) with its own

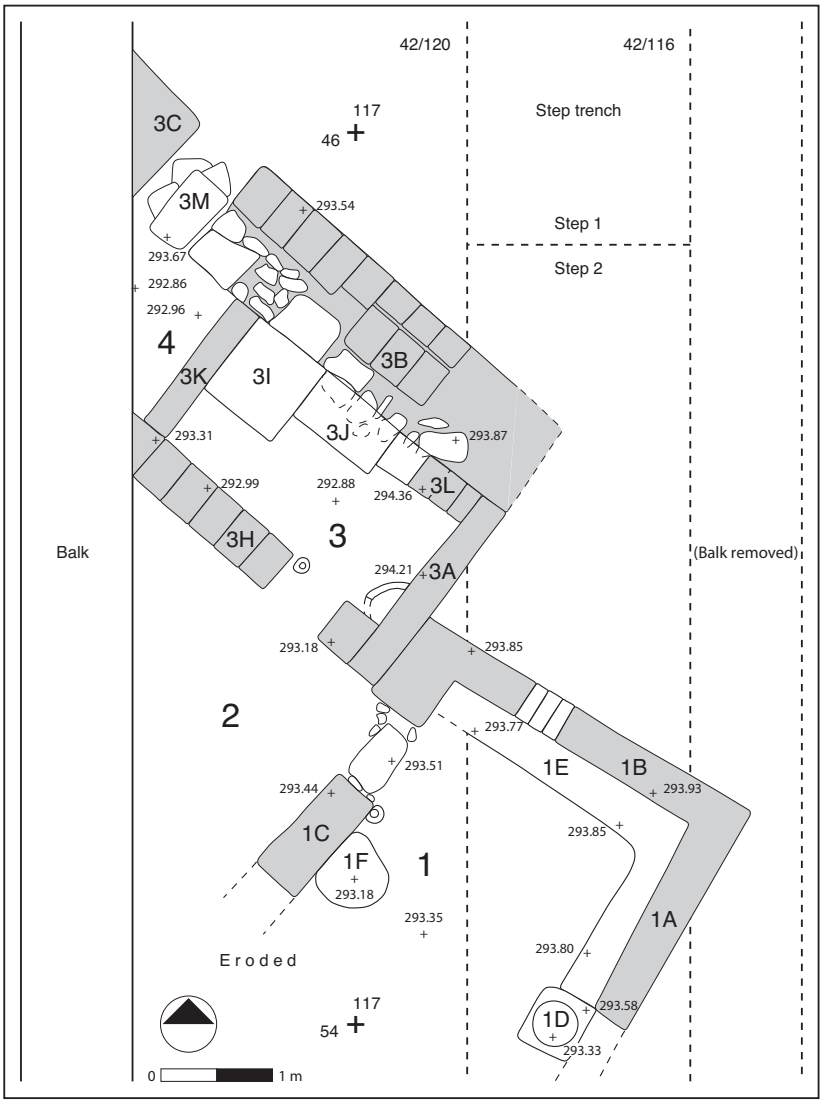


FIGURE 2.160. Level 2, area 1, and areas 2–4, phases b–c. *Illustration prepared by Julie Perlmutter.*

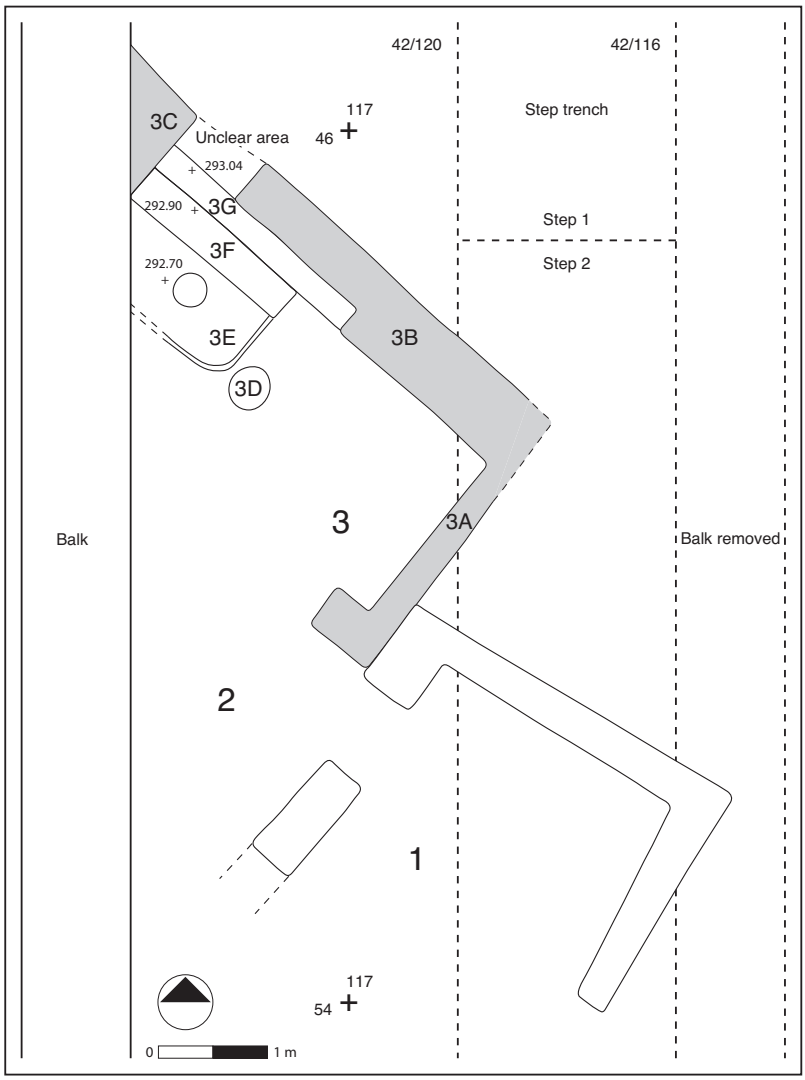


FIGURE 2.161. Level 2, areas 2–4, phase a. *Illustration prepared by Julie Perlmutter.*

circular shallow depression 30 centimeters in diameter and 12 centimeters deep (Figure 2.162).[38] This installation was constructed atop a surface of pebbles and was enclosed by a 5-centimeter high border of clay, lime, and pebbles. The feature was coated with gray-white lime plaster showing traces of burning. This plaster ran up to the higher plastered mudbrick feature next to it (3F), two courses in height. Another, still higher, lime-plastered feature also consisting of one row of mudbricks (3G) was adjacent to the north of 3F; between 3F and 3G was a thin coat of green lime plaster. The overall effect of these features is of a step-like arrangement. Northeast of feature 3G, wall 3B had traces of white lime plaster.

Objects: fragment of stone hammer head (?).

Areas 2/3/4, phase b (Figure 2.160): In phase b, a southwest wall (3H) was added, associated with a new white lime-plastered floor in area 3. The northeast wall 3B had a doorway apparently leading to a narrow passage at the north edge of the terrace. Against this wall inside the area 3 room were two white lime-plastered low mud platforms (3I-J). By the doorway in wall 3H was a small stone door socket, while a segment of a large jar with pieces of lime plaster inside was found in the southeast corner of the room, seemingly inserted into the brickwork of the adjacent eastern wall.

Minimal traces of a white lime-plastered surface in area 2 probably belonged to this phase.

Areas 2/3/4, phase c (Figure 2.160): Two new architectural elements were added on top of the phase b plaster floor. These are wall 3K, added to the northwest of area 3, and a wall segment (3L) three bricks long, preserved to a height of 11 courses, added in the northeast corner of the room. Inside the room was gray, relatively hard bricky fill with mudbrick fragments, but no floor surface was identified.

FIGURE 2.162. Level 2, area 3, phase a, features 3D–3G. Looking northwest.

Area 4 is a room west of area 3 in phase c, with only a small segment excavated.

Complete vessels/profiles: flat-based, Fine Simple Ware bowl with pinched rim (Figure 4.37:6) derived from area 3.

Areas 2/3/4, phase d (Figure 2.160): Sometime subsequent to phase c, a wall (3M) of stone boulders and cobbles (limestone and basalt) was constructed north of area 3 and to the west. This wall was built on top of the remains of wall 3B, whose doorway was filled in with stone boulders. No obvious contemporaneous architecture to the south was identified, perhaps because of erosion. It is unlikely that the wall belongs to level 1, since the doorway of wall 3B (phases a–c) was filled in as part of the construction of wall 3M, and it is improbable that this doorway would have remained free of dirt until the period of level 1.[39]

Area 5 (Figure 2.159): Level 2 remains in area 5, west of areas 1–4, consisted of three layers: these included, from bottom to top, traces of a lime-plastered greenish-white surface, a gray earth surface, and a cluster of basalt cobbles and boulders (5A) extending northwest-southeast in a band ca. 1 to 1.5 meters wide along the north edge of the level 2 terrace.

North of the cluster of basalt cobbles and pebbles a few storage jar sherds typical of level 2 were found mixed with level 4 contexts. These ceramics, including one collared rim jar sherd, apparently derived from a level 2 pit or intrusion otherwise undetected.

Area 6 (Figure 2.159): Southeast of area 1 was a small fragment of a white lime-plastered floor and a segment of a rectangular lime-plastered, bin-like feature ca. 25 × 10 × 25 centimeters (grid points 55.4–55.7/113.2–113.45). These features appear to have been cut into the brickwork of the level 4 Round Building and are therefore best assigned to the level 2 terrace.

Areas 7/8 (Figure 2.163): The architecture of areas 7/8, situated below topsoil, was largely fragmentary and poorly preserved, particularly to the south and east. In area 8, traces of a floor surface were extremely difficult to detect during excavation, but the evidence of the west balk section of 30/120 (Figure 2.82) indicates the presence of two floors at elevations of ca. 294.70 and 295.25, with room walls evident as high as 295.44. A floor surface associated with the earlier of the two phases was more clearly discerned in area 7, where it consisted of lime plaster and pebbles and sloped up slightly from south to north.

The southwest and northwest walls (7A, 7D) of area 7 were built on top of and largely replicated the southwest and northwest walls of level 3 "silo" 6. The southeast wall of area 7/8 (7B/8A) was built on top of the northwest wall of level 3, area 2, the larger room of the level 3, areas 1/2, two-room house.

Areas 7/8, phase a (Figures 2.163, 2.164): Two circular clay ovens (8D–E) with packed mud coatings in the northwest corner of area 8 belong to the earlier

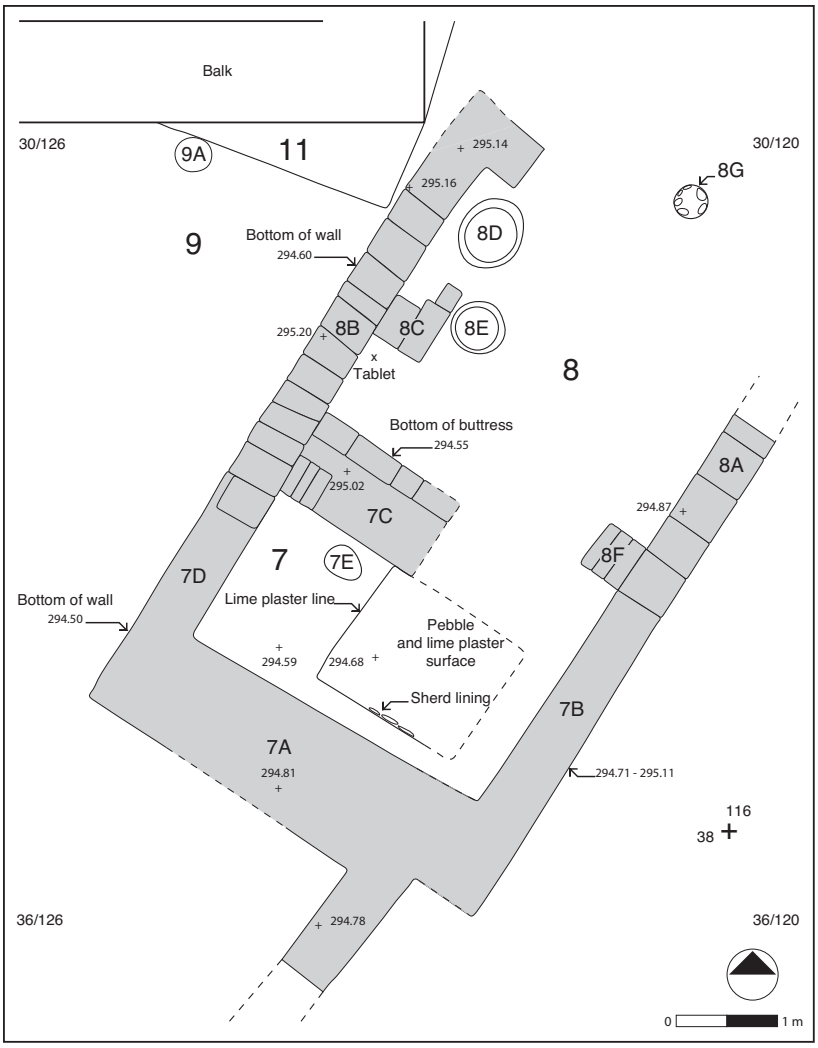


FIGURE 2.163. Level 2, areas 7/8. *Illustration prepared by Julie Perlmutter.*

FIGURE 2.164. Level 2, area 8 (prior to west balk removal). Looking northwest.

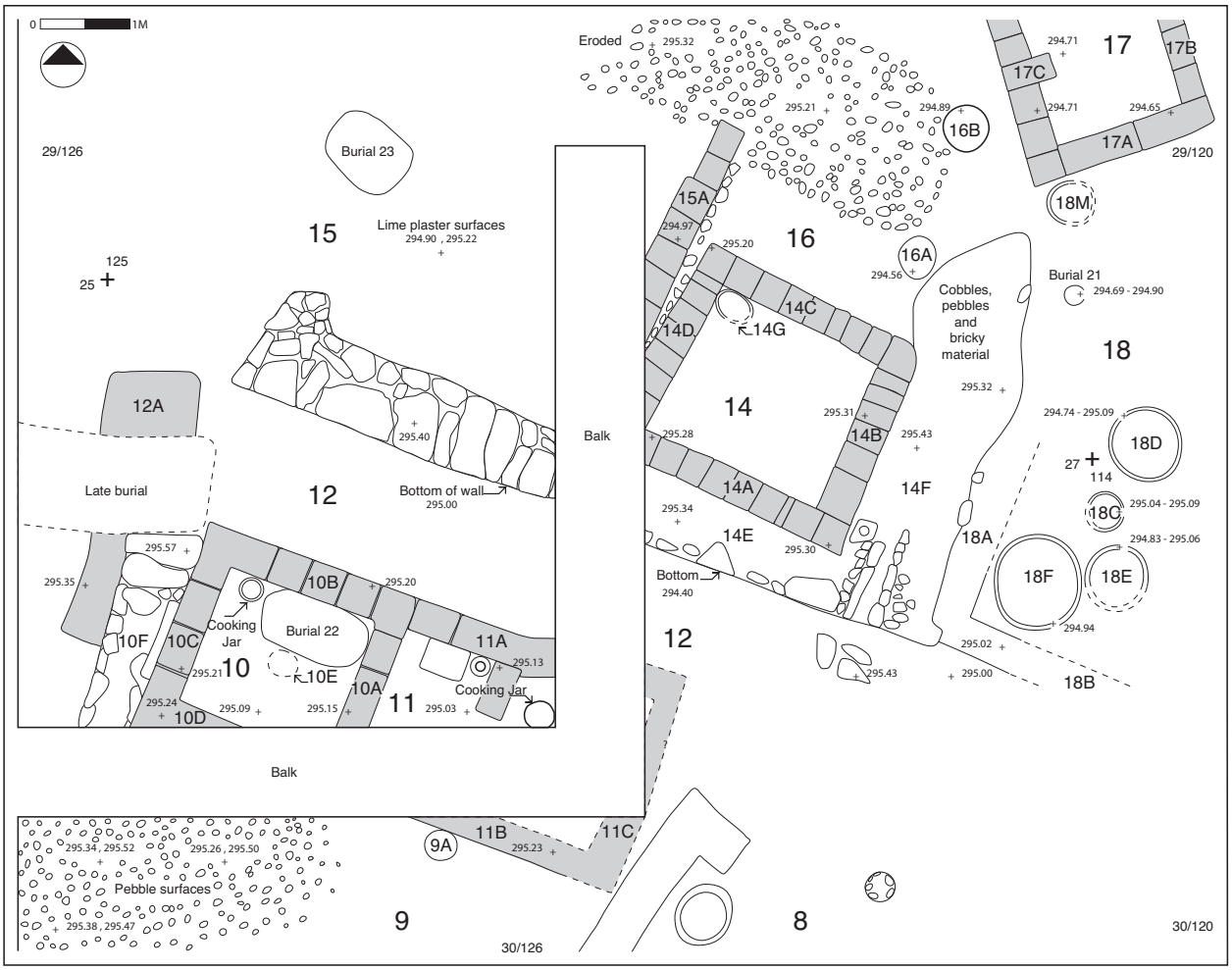


FIGURE 2.165. Level 2, northwest. *Illustration prepared by Julie Perlmutter.*

phase of the structure and were probably sunk below its floor surface, since their bottoms were at different heights (elevations were not recorded, however). A large area of ashy fill was located in the area between the ovens and buttress 8F of the southeast wall.

Southwest of ovens 8D–E were two buttress-like protuberances (8C, 7C) against wall 8B/7D. Feature 7C (elevations 294.55–295.02), clearly abutted wall 7D/8B and was constructed in two phases. The northernmost brick row was built first, in association with the pebble and white lime-plastered surface to the south. Afterwards, the feature was widened to the southwest, with brick courses laid above the northern part of the pebble and lime surface. To the north, the area between buttresses 7C and 8C was filled with numerous mudbrick fragments and large segments of collapsed mudbrick walls. In this fill, a small unbaked clay tablet with apparent numerical notations was recovered.

No northeast wall of area 8 was identified, although a doorway seemed to be indicated near the northern corner of the room. While a late intrusive burial was located in the northeast corner of 30/120 and might be responsible for the destruction of the northeast corner of area 8, there is little reason to suggest that it destroyed an entire northeastern wall. Further, the small pit (8G) lined with sherds and pebbles to the northeast indicates that at least this area was not disturbed.

Objects: area 8—clay numerical tablet, basalt type B pestle, bone awl fragment, andiron found in wall.

Areas 7/8, phase b: Two excavated features can be assigned to phase b, whose surfaces (elevation ca. 295.25) were identified in the 30/120 west balk section but were undetected during excavation. In the space between buttresses 7C and 8C, the bottom of a rectangular lime-plastered basin (7F) without an apparent associated surface was noted just below topsoil. Simi-

larly, the bottom of a small oval, lime-plastered basin (7E) was found below topsoil south of buttress 7C, above the bricky fill of phase a.

Area 9 (Figures 2.163, 2.165): Area 9 consists of the open zone west of the area 7/8 structure. Two pebble surfaces ca. 5 centimeters thick each were located south of area 10 sloping up slightly to the northwest. A lime plaster-lined small circular pit (9A) 30 centimeters deep filled with ash and pebbles adjoined the southwest wall of area 11; this pit, sunk from an elevation of ca. 295.00, cut the northwest wall of level 3 silo 4 as well as the ash deposit covering the latest level 3 features in level 3, area 51 and the north part of level 3, area 7.

Areas 10/11 (Figure 2.165):

Areas 10/11 comprise a two-room mudbrick structure with white lime-plastered interior wall faces. The bottoms of the walls and of drain 10F to the west were at an elevation of ca. 295.00.

Area 10:

Area 10 is the western room of the structure. Its white lime plaster floor had a shallow ash-filled depression (10E) in its center, and a cooking ware jar with triangular lugs was sunk halfway into the northwest corner of the floor. Outside the room, against the west wall 10C, was a drain (10F, Figure 2.166) consisting of a channel flanked by two rows of stone boulders and cobbles and covered by stone slabs (Figure 2.165 shows two of the covering slabs at the north end of the drain). Adjacent to the drain on its western side was a mudbrick wall (12A) running north-south.

Sometime after the use of the area 10 room, a pit with a brick-enclosed child grave (burial 22) was dug through the lime plaster floor.

Complete vessels/profiles: large, round-based Cooking Ware jar with triangular lugs at rim (Figure 4.40:4) sunk into room floor.

Area 11: Area 11, the east room of the two-room structure, included an earth floor with a door socket against the northeast wall 11A. Since only one or two brick courses were preserved of this architecture, the location of this door socket suggests the presence of a door sill (including the brick to the west of the door socket) in the northwest corner of the room. To the southeast was a cooking ware jar with horizontal lugs in an area of soft soil. A large ashy spot was located on the room floor adjacent to the northwest wall (10A) of the room.[40]

Complete vessels/profiles: large, hole-mouth Cooking Ware jar with horizontal lugs but missing its base (Figure 4.40:6), located in the northwest corner.

Area 12 (Figure 2.165): Area 12 is a passage between the area 10/11 and area 14/15 structures. Here, stratified ashy fill accumulated above an outdoor surface (surface elevation ca. 294.90–295.00).

Area 13 (Figure 2.159): In the northwest corner of the mound in area 13, six level 2 child burials had been dug into the remains of level 3 architecture. Each of these graves, burials 24–29, consisted of a rectangular pit with a mudbrick structure. Burial 24, found just below the present-day mound surface, was dug into and therefore later than burial 27.

Associated with level 2 were the remains of a circular clay oven (13A) with traces of an outer ring of pebbles on its eastern side. This feature was exposed in the partial excavation of the east balk of 29/132. Next to the oven was a fragment of an eroded wall (13B) 22 centimeters high excavated in 29/132 next to the east balk.

Objects: clay vessel-shaped token (?), gypsum lid-rim sherd, gypsum (?) disk, clay animal figurine

Figure 2.166. Level 2, drain 10F. Looking north.

fragment, grinding stone type A (one complete, one fragmentary) grinding stone type B fragment.

Area 14 (Figure 2.165): Area 14 consisted of a square mudbrick enclosure with a thick packing of stone boulders, cobbles, pebbles, and bricky material installed against the southwest and southeast walls. The stone packing (14E–F, ca. 40–50 centimeters high) included, in addition to unworked stones, 18 basalt grinding stone fragments. In the southeast corner of the stone packing were slabs set on their sides in two parallel rows in a pattern suggesting a drain, with a door socket to the northwest.

A white lime plaster surface in area 14 was encountered at approximately the same elevation as the extant wall tops. In the fill below this surface were the remains of four ovens. The southwestern example (level 3, 60A) was associated with a late level 3, area 60 outdoor surface, and the two eastern ovens (level 3, 60B–C), of a similar low elevation below the area 14 walls (cf. Figure 2.120), appear to belong to a similar context. The northwest oven (14G), a poorly preserved specimen 15 centimeters high, was at a higher elevation than the other three and was positioned against the corner of walls 14C and 14D. We therefore assign this oven to an early phase of the room's use, for which no floor surface was discerned.

An alternate interpretation might be as follows: oven 14G was associated with a level 3, area 60 outdoor surface deposited later than that of ovens 60A-C, and the area 14 lime plaster surface was installed at an elevation above oven 14G and 2–3 courses of brick foundations sunk into earlier fill. However, there is no indication of a foundation trench in the west balk section of 29/120, and the stone packing 14E is clearly associated with an area 12 outdoor surface running up against its base at an elevation of ca. 294.90.[41]

Objects: bronze rod fragment. In packing of stones and bricky material 14E-F: 11 basalt grinding stone type A fragments, basalt grinding stone type B fragment, pierced white stone cube type A, 2 pierced type B basalt grinding stone type A fragments, pierced type B basalt circular (?) stone, pierced type B basalt object, pestle type H.

Complete vessels/profiles: Fine Simple Ware, flat-based goblet with bead rim (Figure 4.37:4) recovered from inside area 14 room.

Area 15 (Figure 2.165): This area had been subject to much disturbance and is difficult to interpret but may have originally formed a room, given the traces of two white lime-plastered floors (elevations 295.08–295.22 and 294.90–295.00) in association with the mudbrick wall 15A to the east. The area was demarcated on the south by the continuation of the stone construction 14E. There were fragments from a fireplace and from a baked clay oven recovered from the center of the space, but no features in situ.

The grave of an infant was dug down into level 3 architecture from area 15 (burial 23) and consisted of an oval pit with a rectangular mudbrick structure.

Objects: bronze toggle pin fragment, basalt pestle type F.

Complete vessels/profiles: large, Coarse Simple Ware globular jar with everted rim but missing its base (Figure 4.36:17), found in area 15.

Area 16 (Figure 2.165): Area 16 is the open area to the north of area 14, which included two small lime-plastered pits (16A and 16B, the latter with a small hole at the bottom). To the west was a pebble surface 8–20 centimeters thick.

Objects: pierced type B limestone object.

Area 17 (Figure 2.165): Fragmentary architectural remains were excavated northeast of area 15, including part of a room with a lime-plastered floor. The floor was laid above a pavement consisting of one mudbrick course partly sunk into level 3 contexts, at a bottom elevation of ca. 294.50. This architecture was at a lower elevation than that of area 14 to the southwest, which indicates that the level 2 inhabitants built down the slope of the mound in a terrace-like fashion comparable to the architecture on the southwest slope of the mound (areas 1–6).

Far to the northeast, a lime-plastered, two-part mud basin (18L, Figure 2.159) that intruded into retaining wall 61B of level 3 on the slope of the mound may also belong to a level 2 terracing into the tell slope. There were indications that a lower lime-plastered segment existed to the north of the feature as shown on Figure 2.159 but had largely eroded away.

An infant buried in a ceramic vessel (burial 21) was located south of area 17.

Area 18 (Figures 2.159, 2.165): East of area 14 were remains of two uncertain and indistinct walls (18A–B) enclosing four circular clay ovens (18C–F), perhaps an enclosure for a "bakehouse." The bottom of the central oven (18C) was at the highest elevation, that of the northeast oven (18D) the lowest, with a difference of ca. 30 centimeters. Although the ovens could have been sunk below the same surface (no longer extant) and used concurrently, it is not unlikely that at least some were used in sequence. Ovens 18C-E each

had traces of mudbrick fragments, pebbles, and mud packed against the outside of the clay core.

In excavation unit 29/114 was a line of stones extending from north to south (18G) and two stone clusters (18H–I) to the southeast (Figure 2.159). A circular clay oven (18J) was located to the west, and another circular clay oven (18K) was partially excavated adjacent near the east balk of 29/114. The latter feature was insulated with three concentric linings which consisted, from interior to exterior, of sherds, pebbles, and mud. Burial 20, a child's grave located in this area, consisted of a pit with a mudbrick enclosure at the bottom.

Objects: clay ovoid token, pestle type C found in oven, basalt grinding stone type A, clay model wheel, clay lid (?).

Complete vessels/profiles: small Metallic Ware bowl in upper debris, area 18 (Figure 4.37:18). (Since it is a type found in level 2 burials, the bowl may have derived from one of nearby child burials.)

Area 19 (Figure 2.159): Area 19 is east of area 7/8. No coherent architecture was observed here.

Area 20 (Figure 2.159, 2.167): There may be reason to suspect that a version of the Raqa'i "temple" existed in level 2, although almost all physical evidence of it has disappeared. The filling-in of the level 3 temple with mudbricks implies an intention to construct a new structure on top of the solid foundation, and several large stone slabs in a step-like arrangement (20A) found above the fill deposited east of the entry into the level 3 temple might have been part of the approach to the building in such a later phase of use (Figure 2.167). A pavement of mudbricks seems to have existed to the north and south of the stones, to judge from the east section of 29/108 (elevations 294.98–295.06 bottom to 295.06–295.12 top, from south to north) and the north section of 30/108 (elevations 295.18–295.30).

Area 21 (Figure 2.159): East of the temple area is a long, narrow wall (21A) built above the level 3 temple enclosure wall. Two courses were preserved that were apparently set in a foundation trench visible to the east. The remainder of this wall was not clear in excavation, but a line of bricks observed in the north section of excavation unit 36/108 might indicate a westward continuation of the wall.

Three small pits were located west of wall 21A. Pit 21B to the north had a hard white layer at its bottom,

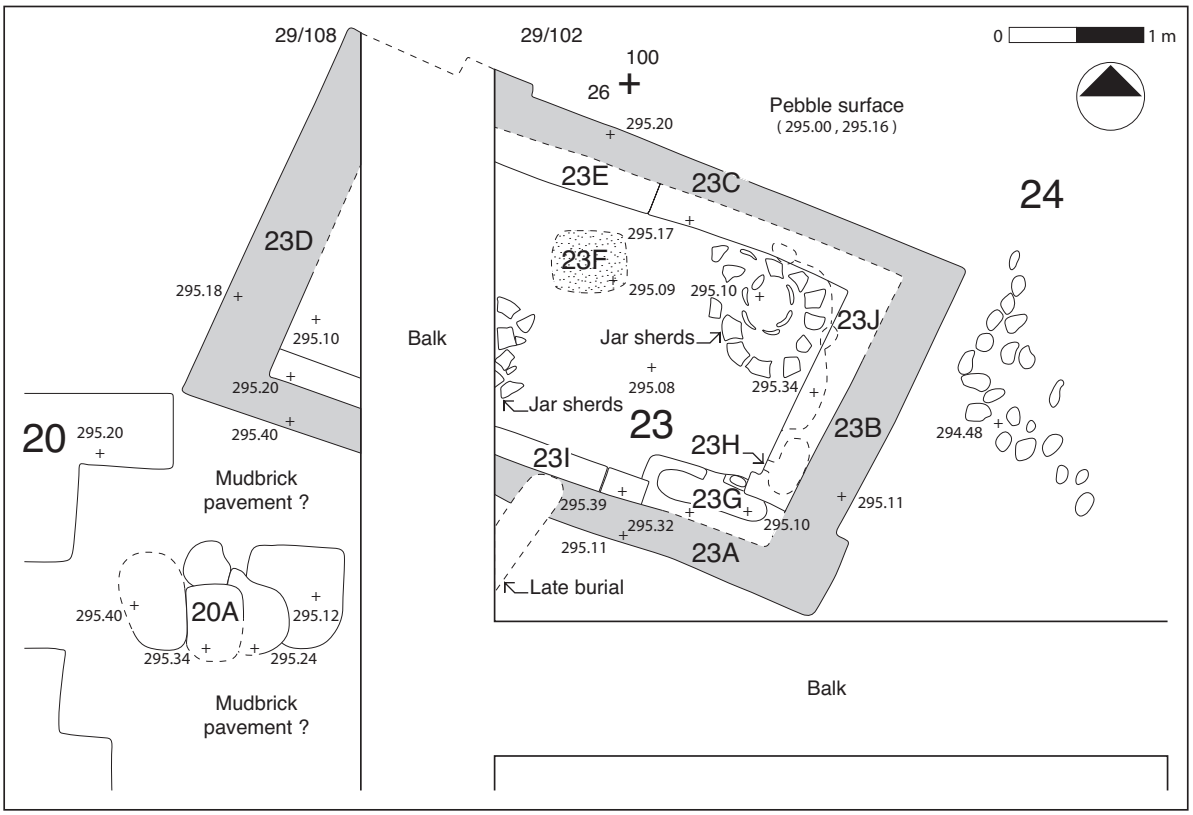


FIGURE 2.167. Level 2, area 23, phases a–b. *Illustration prepared by Julie Perlmutter.*

pit 21C to its south had a fill of mudbrick fragments, and pit 21D to the southwest was a conical-shaped feature with a fill including pebbles and sherds that may have derived from a pit lining.

Objects: clay wheeled-vehicle model fragment.

Area 22 (Figure 2.159): East of area 21, area 22 included a gray surface with abundant sherds and pebbles near wall 21A, one course of four or five bricks observed in the east balk section of 30/102 but not traced in excavation, and an ash-filled oven with a mudbrick lining and pebble floor to the northeast, only noted in the west balk of excavation unit 30/96. To the east of wall 21A in the western part of 30/102 was a small pebble-lined pit or post hole (22A).

Object: small cylindrical clay object (sling pellet?)

Area 23, phase a (Figure 2.167): Area 23, phase a, is the earlier phase of a one-room structure in the northeast part of the site that is an approximate rebuild of the level 3, area 64 room (Figure 2.130). The walls of area 23 were coated with white lime plaster on the inside and mud plaster on the exterior, except for the southeast wall (23B), which was lime plastered inside and out. The room floor was also white lime-plastered (elevation 294.98 in west, 294.94 in east).

A lime-plastered mudbrick bench one course high (23I) was appended to the southwest wall of the room; another bench (23J) was located against the southeast wall, although its outlines were somewhat unclear, and a third (23E) was placed against the northeast wall. Bench 23E had a small, round lime-plastered hole near its eastern end, and a similar feature was noted near the northern end of bench 23J (the two plastered holes, the edge of the phase a benches 23J and 23E, and phase a feature 23H are indicated in dashed lines on Figure 2.167).

In the southeast corner of the room were two partially preserved mud bins or basins, white lime plastered inside and out (23G–H); the southwest wall of 23G was almost completely destroyed. The bottom of each basin was raised about 10–15 centimeters above the room floor (basin 23H, 295.05, basin 23G, 295.10); both basins had an opening in their enclosure walls facing the room floor.

Traces of a lime-plastered room floor ca. 6 centimeters below the floor mentioned above were visible in the 29/102 west balk section (but not in the 29/108 east balk section), associated with the lowest course of wall 23A. Remains of the early floor were not visible horizontally during excavation but presumably were associated with basins 23G H.

Area 23, phase b (Figures 2.167, 2.168): A white to yellow lime-plastered surface (ca. 295.08–295.10) was installed on top of ca. 10–15 centimeters of phase a fill, and lime-plastered benches 23E, I, and J were reconstructed. The reconstruction of bench 23J covered the phase a basin 23H, but basin 23G remained extant. Both benches 23I and 23J were preserved to a greater height than the walls they were adjacent to.

In the center of the room was a poorly demarcated area of burning on the lime-plastered floor (23F) that differed from the well-defined fireplaces of level 3. Remains of two broken storage jars were found in the northeast corner and in the south central part of the room.

Area 24 (Figure 2.159): Outside area 23 to the north were the remains of a pebble surface. To the east were vestiges of two cobble surfaces.

Area 25 (Figure 2.159): Area 25 consists of the remains of the corner of a room much disturbed by late burials. Fill inside the room contained a large amount of ashy material. No floor surface was noted.

Area 26 (Figure 2.159): Four child burials in the southeastern part of the mound that are sunk into level 3 architecture are to be dated to level 2 or late level 3 at the earliest. To the southeast of area 26, burial 32 consisted of a pit with a brick enclosure covered by mudbricks on edge. To the east, burial 30 had an elliptical pit with a partial cover of bricks on edge; burial 31 consisted of a pit grave, part of which was left unexcavated in the south balk of excavation unit 42/90.

Also of likely level 2 date, late level 3 at the earliest, was a small rectangular brick platform preserved only one course high in excavation unit 48/90 that had beads, worked shell, two miniature limestone animal figurines, and three small vessels in its center. Although no human bones were recovered, the similarity of the feature to burial 33 inside the Round Building and the similarity of the finds to burial 30 recommend its identification as burial 35.

Probably of level 2 date is the fragment of a wall (26A) northeast of burial 32 with three courses extant. Patches of a yellow lime plaster floor were noted as well, but the area was seriously disturbed by late burials. Also perhaps of this period were two small, circular pebble-lined pits (26B–C) west of burial 35.

Objects: bone awl fragment, two small clay wheels (spindle whorls?).

Complete vessels/profiles: large, flat-based holemouth Vegetal-Tempered Ware pot with vertical

Figure 2.168. Level 2, area 23. Looking north.

pierced lugs (Figure 4.39:4), found in debris below topsoil near burial 25.

Area 27 (Figure 2.159): There is no evidence of a reconstruction of the Round Building in level 2, although it might be possible that such remains were completely destroyed by erosion, construction of the level 1 limestone building (see below), or post-level 1 intrusive burial activity. It seems more likely that the ruins of the upper courses of at least the northern part of the level 3 Round Building outer wall were still partially visible in level 2 times: while the east section of 36/108 indicates that ashy lenses sealed the top of the wall prior to level 2, no such sealing is evident in the west section.

Also relevant are data from inside the Round Building. In the uppermost fill of the building were two square mudbrick enclosures. The northwestern example (burial 33), preserved to the height of one brick course, contained the very scant skeletal remains of a small child and two small ceramic vessels. The other enclosure (27A) was preserved at least four courses high as noted in the balk but had no discernible contents.

Given the similarity of these two mudbrick enclosures to level 2 burials elsewhere on the mound, we suggest that the structures were either of level 2 date dug into the level 3 Round Building or were constructed inside the abandoned level 3 Round Building in level 2 times. There was no evidence of a pit for either enclosure, making the latter interpretation more likely. Nevertheless, one still cannot completely rule out the possibility that these contexts are of late level 3 date (as in Curvers and Schwartz 1990:13). Perhaps also contemporaneous was the concentration of sherds from broken storage jars found just to the north of burial 33 (see above).

To the south, the area east of area 6 consisted of an expanse of eroded brickwork just under the contemporary surface of the mound slope, apparently part of the outer wall of the later level 4 Round Building. Two miniature jars belonging to a level 2 time frame were found in interstices of this brickwork, close to some human skeletal fragments and teeth; we assume that the vessels and skeletal material belong to a level 2 burial not otherwise preserved (burial 34). Further, a scattering of occasional basalt cobbles across the eroded brickwork southwest of level 4 areas 9 and 10 may be associated with the level 2 terrace. Finally, the area northwest of level 4 area 5 and southwest of level 4 areas 9 and 10 included a scattering of occasional basalt cobbles across the eroded brickwork which might also be associated with level 2 terracing.

LEVEL 1 (FIGURE 2.169)

With the exception of the stone foundations of a large rectangular structure in the south central part of the mound, the remains of level 1 were minimal. Contexts are assigned to this level if they clearly post-date third-millennium contexts and are not to be associated with the recent use of the tell as a cemetery. Our suggested date for the level 1 architecture is Hellenistic, given the recovery of some Hellenistic small finds and sherds from the general region of area 1, but the date is not conclusive.

The major feature of area 1 is a large rectangular structure with walls extant up to 1 meter constructed of limestone boulders (some larger examples measure 75 × 78 × 25, 95 × 60 × 40, and 65 × 90 × 14 centimeters) with smaller limestone and basalt cobbles inserted into the interstices (Figures 2.170, 2.171). A door socket was re-used, upside down, as part of the wall construction in excavation unit 42/102. Mud mortar

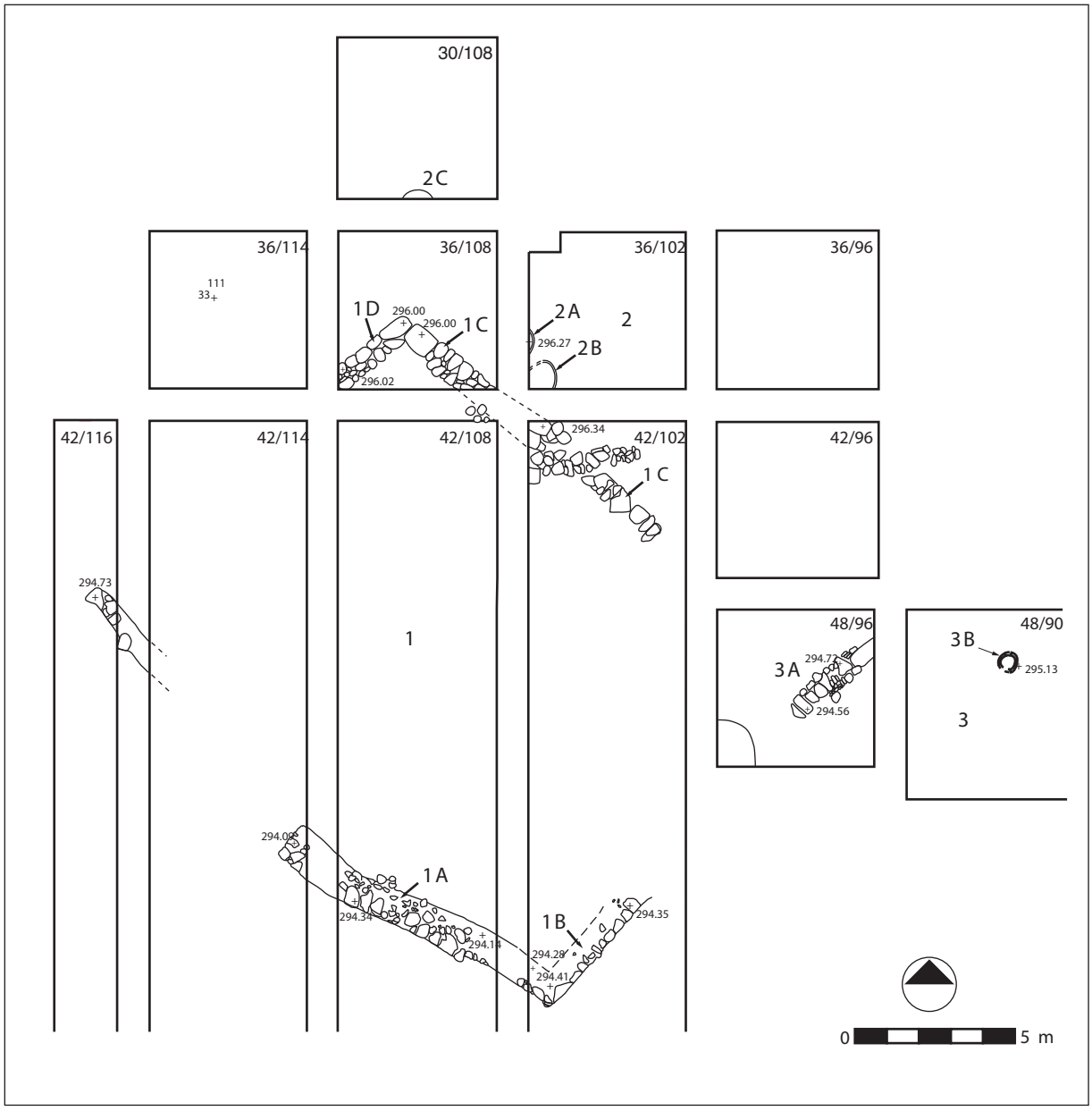


FIGURE 2.169. Level 1. *Illustration prepared by Julie Perlmutter.*

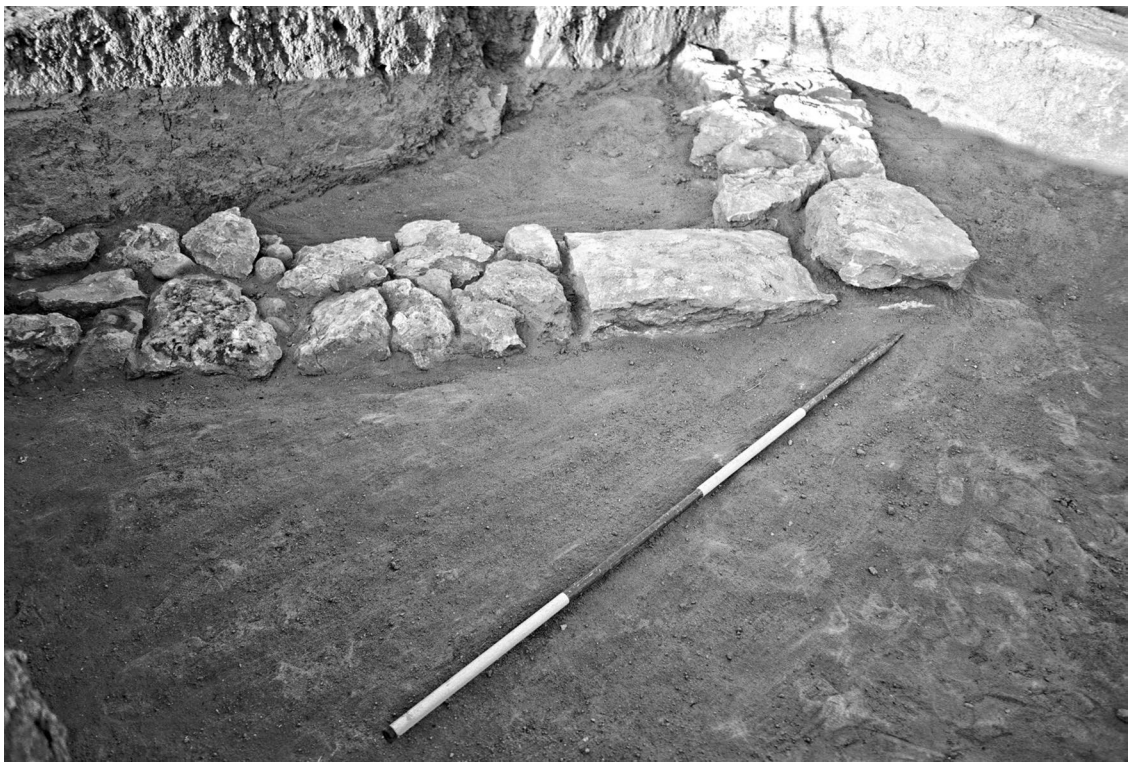


Figure 2.170. Level 1, area 1 building, north corner. Looking southwest.

Figure 2.171. Level 1, area 1 building, south corner, atop outer wall of level 4 Round Building. Looking north.

was employed in the construction, and the lowest course of stones in the southeast corner had an exterior coating of white plaster.

This architecture was constructed atop and sunk into the remains of the third millennium Round Building (levels 3 and 4), apparently utilizing the massive outer wall of that building as a solid foundation. The stone masonry was sunk into level 3 or 4 architecture to a depth of as much as 1 meter. No floor surfaces were identified inside the structure, and it is likely that the stone walls were foundations for an edifice (of mudbrick?) no longer preserved.

In area 3 was a stone-lined drain (3A) sloping down from northeast to southwest in excavation unit 42/96. This feature was composed of at least three courses of stone boulders and cobbles forming a channel covered over with flat slabs (elevations 294.34, southwest end—294.76, northeast end).

A round clay oven (3B) east of the drain cut into the brick installation of level 2 burial 35. The oven had a packing of large sherds as a reinforcement and was associated with an ash-covered surface.

In area 2 are two circular clay ovens from a context deposited subsequent to the level 2 architecture of area 13. The southernmost oven (2B), much damaged by a late burial, had a mud packing around it. The possibility exists that these ovens date from late level 2, since they are at roughly the same elevation as the extant remains of the level 1, area 1, stone construction to the west, which is cut into the level 3 Round Building and appears to consist of sub-floor foundations.

Another circular clay oven (2C) was exposed north of ovens 2A–B. Although stratigraphic links are difficult to establish, the feature's high elevation may best place it in level 1.

APPENDIX: RADIOCARBON DATA[42]

Two radiocarbon samples from Tell al-Raqa'i were processed, both from carbonized seeds:

Level 3. UTC-822, Raqa'i 1987, 36/114-026. 4020 ± 70 BP uncalibrated. Calibrated ranges (Figure 2.172) suggest a date in the second quarter of the third millennium (Bronk Ramsey 2013; Reimer et al. 2009).

Context: room debris, area 20.[43]

Comments: conforms to expected time range.

Level 4. UTC-823, Raqa'i 1988, 42/116-073. 4020 ± 90 BP uncalibrated. Calibrated ranges (Figure 2.173) suggest a date in the second quarter of the third millennium (Bronk Ramsey 2013; Reimer at al. 2009).

Context: debris in area 35 outside of mudbrick bin 36.

Comments: Should be earlier than UTC-822; however, the length of calibrated range may allow for such a relationship.

In a previous publication (Curvers and Schwartz 1990:18, n. 37), the date of UTC-823 was assigned to level 6, given the initial understanding of the stratigraphy of the 42/116 step trench excavated in 1987. Information from expanded excavations in the area led to a reassessment of the stratigraphy and a reassignment of the context of this sample to level 4.

Similar dates (4100 ± 70 and 4130 ± 70 BP) were obtained from the approximately contemporaneous grain storage facility at Tell Kerma, 2 kilometers up-

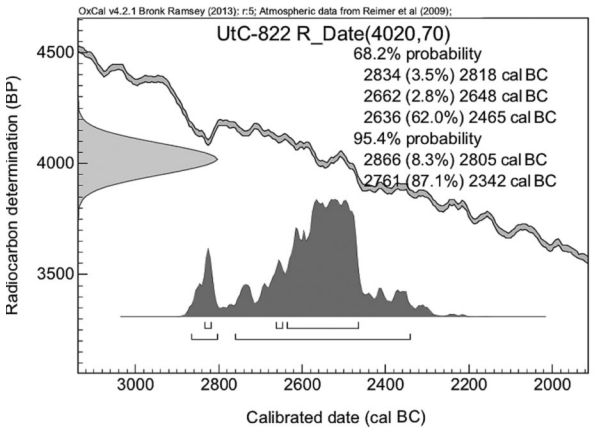


FIGURE 2.172. Radiocarbon date from level 3. *Illustration prepared by Felix Höflmayer.*

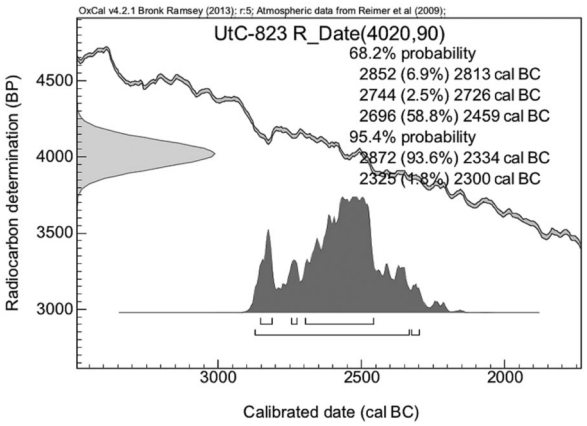


FIGURE 2.173. Radiocarbon date from level 4. *Illustration prepared by Felix Höflmayer.*

stream from Raqa'i (Saghieh 1991:174). Raqa'i level 3 is contemporaneous with the Early Jezirah 2 period, which centers around 2600 BCE according to Ristvet's analysis of Jezirah radiocarbon dates (Ristvet 2011b). Raqa'i 4 is datable to Early Jezirah 1/early Early Jezirah 2, for which Ristvet's analysis suggests a range of ca. 29/2800–2625 BCE (Ristvet 2011b). The two dates from Raqa'i fall more or less in the second quarter of the third millennium and thus agree with dates from contemporaneous contexts elsewhere in the Jezirah.

In northern Iraq, the six published dates from Karrana 3, level 3c, were reported to have a calibrated weighted average of 3290–2925 BCE (Wilhelm and Zaccagnini 1993:19); this occupation dates to a transitional phase between Late Uruk and Early Jezirah 1, earlier than the founding of Raqa'i. Two dates from Telul eth-Thalathat Tell V, a middle-Ninevite 5 phase probably equivalent to Raqa'i 4 or somewhat earlier, are reported to have an early to middle third-millennium calibrated range (4200 ± 90 BP; 4020 ± 70 BP; Fukai et al. 1974:60).

Notes

[1] The author is greatly indebted to Hans Curvers for extensive discussions and consultations on the data presented in this chapter and their interpretation.

[2] Of course, the latter examples may not necessarily indicate a general site abandonment but only desertion of specific areas within the site.

[3] In the following discussion, "boulders" are the largest stones (≥30 centimeters diameter), "cobbles" are medium-sized (ca. 5–30 centimeters diameter), and "pebbles" are the smallest (<5 centimeters diameter). Mudbricks "on edge" or "standing" are bricks set vertically on their short sides as opposed to lying flat. The architectural plans published here include evidence from several sources: a plan produced with a computer program written in BASIC and PASCAL by Dr. Jan Hartmann, prepared by taking points with an analog theodolite along the lines of the excavated architecture; the plans made by the site supervisors, drawn with reference to surveyed grid points and including details on mudbrick articulation, small features, significant artifacts in situ, and so on; and notes taken by the site supervisors or excavation directors. On occasion, the combination of these different sources did not provide a harmonious picture, in which case we opted for the interpretation that best fit the different varieties of evidence.

Occasional differences may be noted between these plans and those published in preliminary reports. Several of these discrepancies are due to reinterpretations of the stratigraphy or architecture, while others were simply errors in the preliminary reports. The northwest corner of excavation unit 36/102, for example, was shown in preliminary reports as an excavated area, but our benchmark was located in this corner and therefore a small area was left unexcavated. The elevations provided on the architectural plans do not necessarily designate the highest preserved elevations of the architecture represented—at times, upper courses of walls were removed due to excavation error or in order to articulate the bricks more easily. Often, the extant wall tops were preserved in balk sections, and this information was utilized when reporting preserved architectural dimensions. Similarly, the illustrated balk sections (Figures 2.1, 2.2, 2.20, 2.81, 2.82) were sometimes recorded prior to subsequent excavation in those areas; as a result, balks or horizontal deposits that were later removed are represented as unexcavated in the section drawings.

[4] In preliminary publications, we assigned numerical designations to the architectural units of levels 2–4, providing numbers in sequence from unit to adjacent unit. In the report on seasons 1987 and 1988, for example (Curvers and Schwartz 1990), 50 numbers were assigned to level 3 architectural units. When new level 3 architecture was exposed adjacent to previously excavated areas, we were constrained to give those units numbers higher than 50; thus, the rooms around a courtyard in the northwest excavated in 1987 and 1988 were given numbers 4–11, but the adjacent rooms to the north excavated in the 1989 and 1990 seasons were given the numbers 51–60, since numbers 12 and above had already been assigned to previously excavated units. For this report, I retain these numerical designations for the sake of consistency, despite the sometimes disjointed assignment of numbers to the architectural units. In order to facilitate easier reference to the excavated areas, I discuss the numbered architectural units by intra-site "zone." Walls and features are designated by the number of the area to which they belong, together with a letter designation (e.g., wall 57A refers to a wall in area 57).

[5] Pfälzner 2011. See also contemporaneous examples from other middle Khabur sites such as 'Atij (Fortin 1990a) and Knedig XIII (Klengel-Brandt and Martin 2005).

[6] For further discussion of interior buttresses, see below for levels 4 and 3.

[7] Note that in the illustrations of grill buildings and other architecture in abb. 66–69 and 74 in Schwartz and Curvers 1993–1994, north is oriented toward the left.

[8] At some depths, the actual dimensions of the trench reached as much as 2.2 × 7.6 meters.

[9] Wall 22B and feature 22E are shown in dashed lines on Figure 2.14 because the excavation records include sketches with measurements of these features but no architectural plans.

[10] Note also that the long narrow spaces demarcated by parallel walls southwest of the Raqa'i 4 Round Building (areas 30–35) recall the parallel concentric walls outside the Gubba Round Building (Fujii 1981: figure 5).

[11] Reference to the two-room house plan in the north area was made in Schwartz and Curvers 1993/1994, and perhaps areas 69/70 could be so interpreted, but a current assessment of the architecture from this area reveals no clear cases of this type.

[12] Examples outside the Round Building stem from area 55; area 60, phase c (likely to be unroofed); area 75, phase a (likely to be unroofed); areas 32/33; and area 38, phase a.

[13] In preliminary publications, this structure was referred to as the "Rounded" Building, since it was a rectangular structure with rounded corners rather than a circle.

[14] Compare the brick packing against the bottom of the walls inside "silo" 51.

[15] There were problems of documentation for the west part of area 23, which had been contained within a north-south balk retained until the end of the 1990 excavation season. Only sketches of wall 23C, buttress 23D, and the limestone threshold are now extant, so those features are represented with dashed lines on Figure 2.54. Because of documentation problems, wall 23C was not included in published preliminary reports.

[16] The phase c pile of cobbles was clearly not a foundation for platform 13J, since the pile was a sloping affair and did not cover the entire area below the platform. Note that platform 13J was originally assigned to level 3 in Curvers and Schwartz 1990:12.

[17] The absolute elevations of this room are not substantially deeper than some level 3 elevations elsewhere in the area, so an early level 3 assignment is possible. The nine diagnostic sherds from this room have traits found with frequency in both levels 3 and 4 and do not allow for a definitive statement.

[18] It is also possible that area 30 had a vaulted ceiling, but its walls were not preserved as high as those of area 31.

[19] A carbon-14 date was retrieved from area 35 near the area 36 bin, excavated in the 1987 step trench 42/116 (see Chapter 1). In a previous publication, this date was assigned to level 6, but it is now reassigned to level 4 given the more extensive excavations of the level 4 Round Building, with its stratigraphic connections to architecture to the south made clearer (Curvers and Schwartz 1990:18, n. 37).

[20] See note 19.

[21] The figure of 1,300 square meters approximates the area of excavated trenches with level 3 remains, excluding balks.

[22] Although the entire sequence of room 20 in unit 36/114 was not excavated, room 83 and small sections of room 20 were completely removed and revealed no evidence of an original single-room structure.

[23] Compare similar sizes in the approximately contemporaneous levels 3–4 at Abu Hafur north of Hasseke (Kolinski and Lewecka 1992:196). At Knedig, common brick sizes also included 50 × 30 × 10 as well as 50 × 50 × 10 (Klengel-Brandt and Martin 2005).

[24] While area 19 and 83 only had three buttresses exposed, it is likely that a fourth existed in the unexcavated balks.

[25] Areas 10, phase b, installed above a mudbrick floor, lime plastered; 19, lime plastered; 31, installed above mudbrick floor; 32, phase d; 33, phase e; 39/71, phase a; 47, lime plastered; 51; 66, installed above a mudbrick floor, lime plastered; 70, phase b, lime plastered. For a similar "composite" floor at Rad Shaqrah consisting of layers of stones, bricks, and plaster, cf. Bielinski 1993:126.

[26] Similar milling facilities that were gypsum plastered are also known from second-millennium BCE Egypt (Kemp 1986:3).

[27] For example, feature 17D has an enclosed basin next to a low platform; grain could have been ground on the low platform, but there is no obvious function for the narrow basin next to it concerned with grinding of flour.

[28] The wall and doorway attributed to a late phase of level 3, area 2 in Curvers 1987:9, 10 ("stratum 1") are now recognized to be part of the southeast wall of level 2, area 11.

[29] The level 3 plan published in Curvers and Schwartz 1990 and Schwartz and Curvers 1992 combines these two phases erroneously and adds an interior buttress to wall 18A.

[30] Level 3 plans included in preliminary reports show a space between the south wall of area 14 and the north wall of 13, which is incorrect. Another correction to the preliminary level 3 plan is the reclassification of the wall fragment shown east of the east wall of area 14 to level 2.

[31] Pfälzner (2001:309) considers the area 21 building to be a house with a domestic altar, but this interpretation is contradicted by the evidence cited here, as well as the absence of domestic features in the structure.

[32] Schwartz and Curvers 1992: figure 8 shows phase c architecture from 32/33 adjacent to areas 30 and 31, but later phases for areas 32/33/69 are more likely to have been contemporary with the excavated phases of 30 and 31. The same plan also shows a hypothesized early phase of area 69 contemporary with area 32/33, phase c, but, as noted below, there is no firm evidence to support such an early phase for the area 69 room. Note also that the fragment of two perpendicular walls extending to the northwest of area 31 in Schwartz and Curvers 1992: figure 8 date to an earlier period than the area 31 room (cf. walls 67C-D above).

[33] The available diagnostic sherd sample from these contexts was too minimal to provide additional evidence for determining whether they are best assigned to level 3 or level 4.

[34] For comparative material relevant to features 32H and 33B, cf. Chuera (Moortgat 1962:36, figure 28) and Khafajah Sin level VI, room 12, a set of four standing bricks against the south wall identified as a "kitchen range." Cf. also the Khafajah Sin VII courtyard, with a possible kitchen range containing "one or several open troughlike compartments" (Delougaz and Lloyd 1942:43, 46).

[35] The stepped mudbrick platform in the southwest part of the Round Building previously associated with level 3 (Curvers and Schwartz 1990:12) is now assigned to later level 4 (13J, Figure 2.53).

[36] Walls 88C-D are contemporary with pavement 88B, contra Schwartz and Curvers 1993/1994:252.

[37] Construction on terraces dug into earlier deposits seems to have been particularly popular in the Early Jezirah 3 period, judging from the results at Melebiya (Lebeau 1993:43), Brak (Oates, Oates, and McDonald 2001: 39–40), Gawra VI (Rothman 1988:149–150, 436–437), and Tepe Chenchi (Algaze 1989).

[38] Cf. the "ablution place" in the Khafajah Nintu Temple IV for a similar feature (Delougaz and Lloyd 1942: figures 91, 92).

[39] A previously published architectural plan indicates rooms north of area 1 that we now understand to be level 4 architecture cut by the level 2 terrace (Curvers 1987: stratum 4 plan).

[40] Curvers and Schwartz 1990:7 erroneously reported this room to include a platform.

[41] Curvers and Schwartz 1990:7 stated that the ovens below the lime plaster floor in area 14 were associated with three separate floor surfaces inside the structure, an interpretation no longer tenable.

[42] I am very grateful to Felix Höflmayer for his help in calibrating these dates.

[43] This context was erroneously listed as area 18 in Curvers and Schwartz 1990:18, n. 37.

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Chapter 3

Spatial and Social Organization of Level 3[1]

Eric E. Klucas and Glenn M. Schwartz

Because of Tell al-Raqa'i's small size and the nature of our research design, we obtained an unusually large sample from level 3, the latest coherent third-millennium occupation. The retrieval of such a large sample provides us with the unusual opportunity of considering the majority of an ancient community. Raqa'i 3 was very obviously a small community, regardless of the population estimator one employs. Given 100–200 persons per hectare of settlement and a figure of 0.21 hectare for Raqa'i 3 (see Chapter 2, Figure 2.84), Raqa'i level 3 would have had a population of 21–42. An area of some 400 square meters of residential roofed space in Raqa'i 3 (see Table 3.1; 273 square meters, plus estimated space for rooms eroded on the mound slope) would have housed 40 inhabitants, if we use the figure of 10 square meters of residential space per person (Naroll 1962), or 67 inhabitants using a lower figure of 6 square meters per person (Kolb 1985; Marfoe 1980; Postgate 1994).

Considering Raqa'i 3 in its entirety, one can observe a distinct pattern of spatial differentiation (Figure 3.1). Segments of the community that can be recognized include the western area, with two-room houses and "silos"; the temple inside its enclosure wall 24A, along with houses 9 (areas 15/16) and 10 (areas 63/64/65); the Round Building to the south; an agglomeration of small rooms in the northeast; and an "industrial" area in the southeast with ovens, drains, a brick platform, and possible evidence of metallurgical activity (see Chapter 8). This pattern is reminiscent, albeit at a vastly reduced scale, of the spatial differentiation noted by Elizabeth Stone (1997) in her consideration of southern Mesopotamian cities, where neighborhoods were demarcated by canals or walls and defined by kinship, clientage, occupation, or even ethnicity (Smith 2010). Implications of this division of the community into different "neighborhoods" will be explored below.

Households

Archaeologists frequently attempt to associate architectural components with households (residential units of individuals involved in economic and social cooperation) or families (kinship units) (Allison 1999; Blanton 1994; Hendon 2010; Kramer 1982b; Parker and Foster 2012; Yanagisako 1979). Although a one-to-one correspondence of these social or economic groups with architectural entities is not always tenable (Horne 1982), the attempted inference of such groups from architectural remains can provide useful insights. As defined here, the household is a social group characterized by propinquity of residence and shared participation in a number of specific activities. These activities include, but are not limited to: the production, preparation, and consumption of food; the storage of materials both for household consumption and extra-household exchange; and the rearing of children. Thus, houses would be expected to contain similar sets of features reflecting this shared collection of activities.

A total of 14 structures identified as houses were assigned to level 3 (cf. Table 3.1, Figure 3.2).[2] The criteria employed to define the houses include patterns of circulation (i.e., rooms with interconnected access that were not accessible from any adjacent rooms) and wall bonding sequences. The houses of the west and "temple" precincts are relatively simple to distinguish, particularly the two-room type that is clearly a discrete unit. Houses of the eastern area were more difficult to

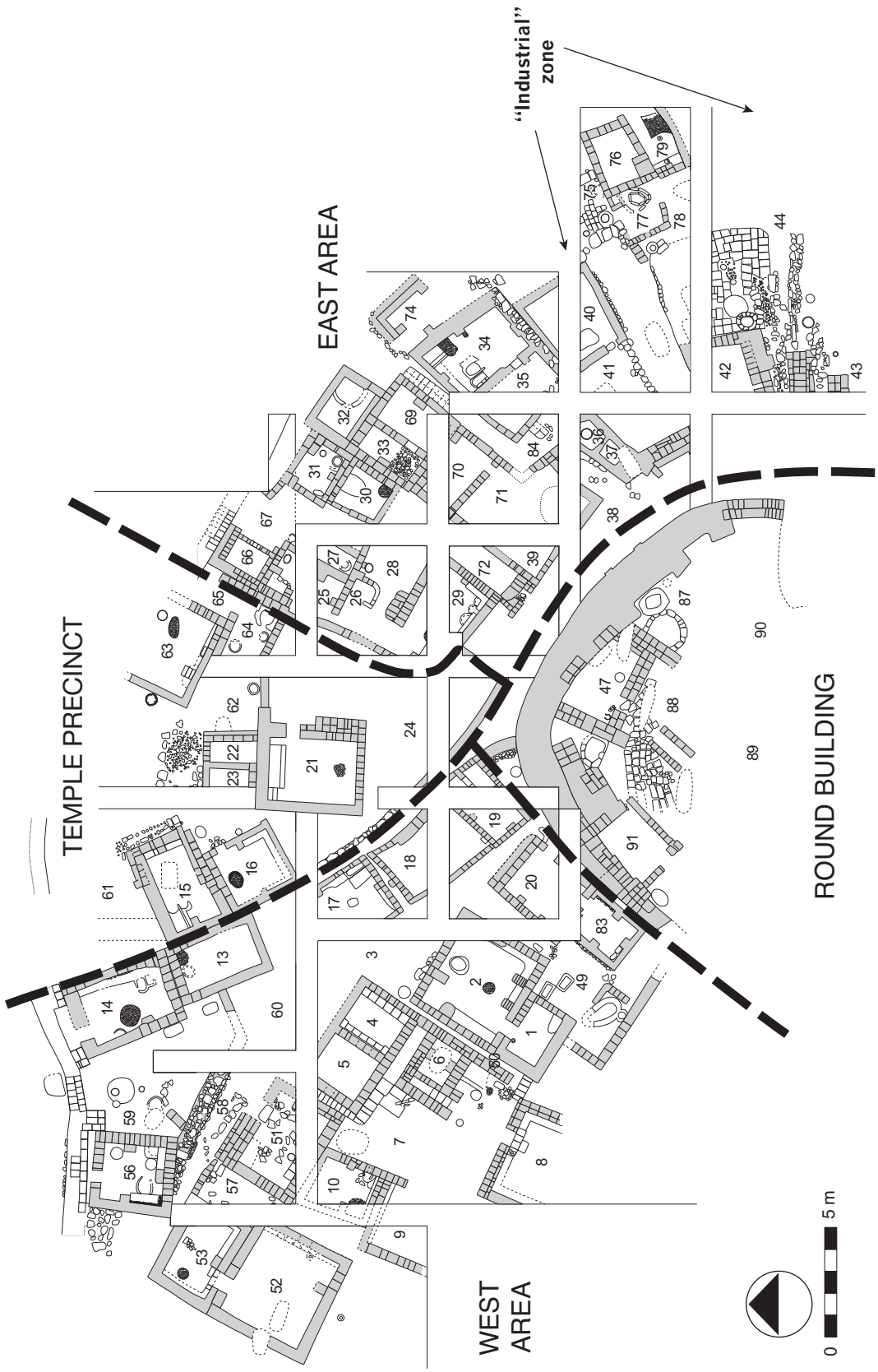

Figure 3.1. Level 3 zones or neighborhoods. *Illustration prepared by Julie Perlmutter.*

TABLE 3.1. Roofed Space, Level 3.

House	Areas (roofed space in m² in parentheses)	Number of rooms	Area (in m²) of roofed space
1	1 (4.1)	2	18.9
	2 (14.8)		
2	20 (7.4)	2	11.7
	83 (4.3)		
3	18 (10.4)	2	16.4
	19 (6.0)		
4	8 (8.7)	Unknown	8.7*
5	9 (5.3)	Unknown	10.7*
	10 (5.4)		
6	52 (16.9)	2	24.9
	53 (8.0)		
7	56 (6.7)	1	6.7
8	13 (6.9)	2	16.0
	14 (9.1)		
9	15 (7.3)	2	14.1
	16 (6.8)		
10	63 (9.6)	Unknown	17.7*
	64 (4.4)		
	65 (3.7)		
11	34 (9.8)	3	26.7
	35 (7.1)		
	40 (9.8)		
12	25 (5.9)	2	16.5
	29 (10.6)		
13	27 (1.6)	4	10.2
	30 (3.5)		
	31 (3.1)		
	66 (2.0)		
14	32 (3.8)	5	32.1 (latest phase)
	33 (3.3)		
	69 (5.0)		
	70 (11.6)		
	71 (8.4)		
–	17 (10.1)	–	10.1 *
–	40 (9.8)	–	9.8
–	42 (4.9)	–	4.9 *
–	51 (9.2)	–	9.2
–	76 (3.9)	–	3.9
–	79 (4.0)	–	4.0
–	TOTAL	–	273.2

* Minimum estimate

recognize and their definition is more speculative; house 12 (areas 25/26/28/29) was distinguished from house 13 (areas 27/30/31/66/67) partly because it was assumed that access was not possible between area 67 and passage 72 (unclear due to the east balk of unit 30/102) and to allow each house to have its own *tannur* (25E, 31E). However, one might reasonably reconstruct a larger house with two *tannurs* comprising areas 25–31 and 66–67.[3]

The breakdown of houses by precinct is as follows: eight in the west, two in the temple precinct, and four in the northeastern precinct. No houses were observed within the Round Building. Of the 14 houses, complete floor plans were obtained for 11. For partially excavated houses, a number of variables such as size and number of rooms could not be determined with confidence. In addition, portions of some walls were only preserved to the height of a single mudbrick course, precluding identification of doorways, and several balks left in place may have concealed significant information. The absence of apparent doorways in some cases might also be attributable to the use of rooftop access (Özbal 2012:330).

Level 3 houses are generally small, consisting of one to five rooms. Individual walls were generally only a single row of mudbricks wide, suggesting the absence of a second story (Kramer 1982:132; Özbal 2012:328). House areas, including walls, ranged from 13.3 to 54.7 square meters (see Table 3.2), with an average of 30.8 square meters.

A number of distinctions can be made concerning the layout of the houses in the various architectural precincts. In general, the houses located in the western and temple precincts share enough similarities to be considered a single type, the two-roomed house. In cases where exterior doorways can be identified with confidence, they can be located in either the larger or smaller room. House 4 (area 8), attested by a single room, was only partially excavated and may have included additional rooms. Only house 7 (area 56) clearly consisted of a single room throughout its use.

The four houses located in the northeastern area of the village differ by varying degrees from those located in the western and temple precincts. Two of the houses, 11 (areas 34/35/40) and 14 (areas 32–33/69–71), follow the general two-room pattern with the addition of supplemental rooms, one in the case of house 11 and three in the case of house 14. In the remaining houses in the northeast, 12 (areas 25/26/28/29) and 13 (areas 27/30/31/66/67), the rooms

Figure 3.2. Level 3 suggested houses. *Illustration prepared by Harley King.*

TABLE 3.2. Estimated House Areas (Including Walls), Level 3.

House	Area (square meters)
1	30.1
2	20.0
3	23.3
4	12.6*
5	17.2*
6	39.3
7	13.3
8	29.4
9	25.7
10	24.6
11	41.9
12	35.0
13	32.3
14	54.7 (latest phase)
TOTAL	399.4

* Minimum estimate

are arranged differently and in such a way as to create a central "courtyard" of unroofed space.

In terms of circulation patterns, the houses are quite simple, with access to any given room controlled by no more than a single interior space. In the case of many of the multi-room houses in the northeast (houses 12–14), internal circulation patterns are unknown, due to the absence of evidence of internal doorways. Given these circumstances, the rooms of most structures are differentiated only as "front" and "back," with front rooms providing direct access to the outside.

In areas where a sequence of level 3 phases was excavated, one receives the impression of consistency in room function through time. For example, rooms with lime-plastered floors and walls tend to remain lime-plastered through their different phases of use, while rooms with unplastered floors remain unplastered. An exception is area 33, phase e, where a lime-plastered floor was installed in an area where all previous surfaces had been earth floors or pebble surfaces; this may indicate a shift in the use of this room from a storage or kitchen function to a living room (see below). Similarly, areas 71/39 replace the mud/pebble surface of phase a with a lime-plastered surface in phase b.

Other architectural adjustments and modifications deserve comment. These include the removal of

old walls and/or the erection of new ones within a preexisting structure, a process resulting in the modification of room size or the creation of new rooms. While the reduction of area 18 and elimination of its northwest doorway is an example of such a phenomenon from the western part of the site (see also the demolition of area 13 and construction of the area 12 structure), the majority of such modifications were noted in the east, particularly in house 14 (areas 32–33/69–71). In areas 32/33/69, we see a sequence of architectural adjustments and changes. The structure begins as one rectangular room (phases a-b); the room is divided into the two small rooms 32 and 33 without access between them, and area 33's outer door is blocked (phase c); area 32's outer door is blocked, while area 33 is expanded and divided into two rooms, areas 33 and 69, both without apparent doorways (phase d); and finally, area 33 is lengthened, and a doorway created between 33 and 69 is subsequently blocked (phase e). In areas 70/71/39, the northern room area 70 is reduced in size from phase a to b and areas 39/71 are enlarged.

Although double rows of mudbricks in interior walls (i.e., walls constructed back to back) appear to have been the dominant pattern,[4] some interior walls were constructed of a single row of mudbricks (19D, 33A, 33C, 34A, 70A, 70F, and 76B). In keeping with the dominant pattern, however, these interior walls were not bonded to the other walls of the structure. Among these, two patterns are apparent. In house 3 (areas 18/19), the construction of area 18 simply involved the addition of three walls to the north wall of area 19. With houses 11 (areas 34/35/40) and 14 (areas 32–33/69–71), an existing interior space was divided into two discrete units.

Thus, in terms of the way that houses change through time, two patterns can be observed. In the first pattern, rooms are added to existing structures, presumably as the size of the household increases. Often, this addition leads to an increase in the level of functional specialization, since the additional room appears to have been used for storage. In the second pattern, interior space was subdivided, reducing the size of the original room. As with the dominant pattern, this physical division of space appears to have allowed for an increase in the level of functional specialization of interior space.

Another architectural modification that can be identified in Raqa'i 3 is the blocking of room doorways. In the case of the two-room structures of areas 15/16, phase c and areas 76/79, access between the two rooms was impeded at a point subsequent to their initial use, and area 79's western outer doorway may also have been blocked. In these examples, the blockage prevented any obvious access to rooms without an exterior doorway, that is, areas 15 and 76. A similar problem exists for areas 13/14, where there is no evident access between areas 13 and 14, and area 13 appears to have no exterior doorways. It is not unlikely, however, that a doorway into area 13 existed in the nearly destroyed southern part of the room, where a brick threshold would have been indistinguishable from the rest of the minimal wall remains. A different situation appears in areas 20/83, where the outer door of the two-room house was blocked.

At first, one might interpret the sealing of one room from another as a function of the division of property among heirs: later Mesopotamian texts reveal frequent partition and purchase of individual house rooms (Stone 1981, 1987; Yoffee 1988; see also Horne 1982, 1994 for examples from a modern Iranian village). However, the door blockings at Raqa'i usually render one room totally inaccessible, at least as far as doorways were concerned. Therefore, a more credible interpretation may be the blockage of rooms for storage. In her study of a rural Iranian community, Kramer noted that villagers sometimes sealed the doors of storerooms once the rooms were filled up and unblocked them when the stored goods were required (Kramer 1982:106).[5] The blockage of the outer door of the house (areas 20/83, house 2) may reflect the temporary abandonment of the dwelling, ethnographically attested for groups who travel with their herds for part of the year. However, in such a case one might expect to find objects to be used upon the group's return inside the house, which is not the situation with house 2.

Doorways or passageways were also blocked in non-residential spaces, such as silos 4/5 and at the ends of alleys (area 82 northeast; area 72 southwest; area 50 south; area 57). The blockage of alleys was often associated with the installation of ovens. At Knedig level XIII, a similar pattern of blockage was recognized and interpreted as the consequence of deliberate site abandonment with the intention to return (Klengel-Brandt, Kulemann-Ossen, and Martin 2005).

Features (Table 3.3, Figures 2.85, 2.86)

While the small-scale domestic architecture generally includes some combination of ovens, fireplaces and/or

TABLE 3.3. Level 3 Features per Architectural Unit.

House/ Phase	Rooms	Number of rooms	Ovens	Fireplaces	Bins/ basins	Benches	Pits
1 a	1 and 2	2		1		x	
	1						
	2			1		x	
b	1 and 2	2	1	1		x	Large pit
	1						Large pit
	2		1	1		x	
2	20 and 83	2					
3 a	18 and 19	2?			1		
	18				1		
	19 unexcavated						
b	18 and 19	2			1		
	18						
	19				1		
4	8	1				x	
5 a	9 and 10	2		1	Stone/brick feature	x	
	9					x	
	10			1	Stone/brick feature		
b	9 and 10	2	1			x	Fire pit
	9					x	
	10		1				Fire pit
6 a	52 and 53	2				x	
	52 (part excavated)						
	53					x	
b	52 and 53	2		1		x	
	52						
	53			1		x	
7	56	1	1?		2	x	Lined pit
8	13 and 14	2	1	2	2	x	
	13		1	1			
	14			1	2	x	
9 a	15 and 16	2		1		x	
	15			1		x	
	16					x	
b	15 and 16	2		1	1	x	Lined pit
	15				1	x	
	16			1		x	Lined pit
c	15 and 16	2 (blocked)		1		x	
	15					x	
	16			1		x	
10	63 and 64	2?	2	1		x	
	63			1		x	
	64		2				

TABLE 3.3, *continued*.

House/ Phase	Rooms	Number of rooms	Ovens	Fireplaces	Bins/ basins	Benches	Pits
11	34, 35, 40	3		2	2	x	
	34			2	2	x	
	35						
	40						Large pit
12	25, 26, 29	3	1	1	4	x	
	25		1				
	26						
	29			1	4	x	
13	30, 31, 66	3	1	1			Large pit
	30			1			Large pit
	31		1				
	66						
14	32,33,39,69,70,71	5					
a	32/33	?	1				
b	32/33	?	1				
c	32 and 33	?			3 standing bricks		
	32				3 standing bricks		
	33				3 standing bricks		
d-e	32/33/69	3			Mud bin		
	32				Mud bin		
	33						
	69						
70/39/71a-b = 32/33/39/ 69 d-e?	70/39/71	2	1	1			
a	70			1			
	39/71		1				
b	70						
	39/71						
	12		2	1	1		
	17				1	x	
	41						
a	42						
b	42			1			
	47						Fire pit
	51						
	76						
	79				Burned mud feature	x	
	91						

basins, these are distributed in what seems to be a rather haphazard pattern. For example, house 3 (areas 18/19) had basins but no ovens or fireplaces, house 6 (areas 52/53) had a fireplace but no basins or ovens, and house 2 (areas 20/83) had no features of any sort.[6]

If we consider the spatial distribution of ovens, we find that large mudbrick ovens are located inside the Round Building, in the "industrial" area in the southeast, and inside the former "silo" 4, but never in domestic spaces. In contrast, the baked clay *tannur* ovens are

found primarily in domestic spaces, both roofed and unroofed, and are missing from the Round Building. In several instances, ovens are installed inside small mud-brick enclosures (e.g., area 49), perhaps serving as communal facilities for the use of several households.

Interior *tannurs* were most often installed outside the main traffic areas, frequently in room corners. Of those houses with *tannurs* where entryways could be identified, all were located in the front rooms. Most of the houses containing *tannurs* held only a single example, the exception being area 64 with two *tannurs*. Although both of these *tannurs* are assigned to the same phase, it is possible that they were used consecutively rather than simultaneously.

Fireplaces were located indoors, with only one exception (72B). In the seven houses where definitive doorways were observed, five of the fireplaces were located in the "front" room (i.e., the room with the exterior doorway). As was the case with the interior *tannurs*, only one house contained more than one of these features (house 11, area 35), while four contained none at all. The fireplaces are frequently centrally located, suggesting that in addition to their presumed food preparation function, they provided heat for the living areas of the house. This relationship may simply reflect practical considerations, if the feature functioned as a source of heat for both cooking and maintaining a comfortable temperature within the house. The fact that the other domestic thermal feature, the *tannur*, was observed in both interior and exterior loci suggests that food preparation was not limited to a single kind of space.

While some pits and installed jars probably served as facilities for storage, it is unlikely that these features represent the complete inventory of storage strategies employed by the villagers at Tell al-Raqa'i. Moreover, the possibility that one or more of the rooms in multi-room houses served as a place of storage suggests far greater storage capacities than are directly attested by the features recovered. With respect to the identification of the stored materials, pits have been observed ethnographically serving for the storage of loose agricultural products such as grain or animal fodder. Jars may have served for the storage of either liquid or dry materials.

The actual number of features recovered from this class is surprisingly low. No house possessed more than two discrete storage features, and five possessed none at all. All of the houses lacking formal storage features are multi-room. It is likely, therefore, that one or more of the additional rooms served as a storage facility. Moreover, grain may have been stored in such perishable containers as fiber sacks that would not survive in the archaeological record. On the other hand, it is possible that the households at Raqa'i received foodstuffs from storage facilities in the Round Building or in silos 4–6 (Schwartz and Klucas 1998:204; Pfälzner 2002). Given the relatively small sample of formal storage features among the houses, patterns and regularities concerning their distribution are difficult to discern. Pits inside houses were found in back rooms, although in the case of house 11 (areas 34/35/40) a doorway in the western wall of area 40 provides direct access to the room.

The distribution of built features suggests the existence of relatively few invariable rules concerning the use of space, both at the level of the individual structures and the village as a whole. Most features were found in a variety of settings, indicating a relatively wide range for the settings of the associated activities. Exceptions occur in the case of the Round Building, with a limited array of features, and the southeastern "industrial" area, which contained the highest concentration of thermal features. The large number of features in the latter area found in exterior loci, indicating minimal restriction on access, suggests a more "communal" role for this part of the village.

The lack of strong associations between storage features, thermal features, and particular locations within the house suggests rather weak cultural conventions concerning the spatial segregation of activities within the house. The position of storage features within the house appears to be governed by practical concerns, reflected in their construction away from presumed high traffic areas.

Household Economic Independence

The distribution of interior *tannurs* and fireplaces suggests that each household was responsible for its own food preparation and, presumably, food consumption. This interpretation is reinforced by the distribution of *tannurs* in exterior locations, which, with the exception of a cluster of ovens immediately outside areas 76/79 in the southeastern "industrial" area, are not located in areas that would have provided easy access for more than two individual households.

The positioning of entryways emphasizes the independence of the individual houses. With the exception of houses 4 (area 8) and 5 (areas 9/10), which both

open onto the area 7 courtyard, entryways tend to face away from neighboring structures. This is perhaps most readily apparent in the case of house 2, whose entryway opens onto an extremely narrow alleyway between it and the Round Building. Houses on the periphery of the village generally have their entryways facing away from the settlement. In this way, control of access to the interiors of many of the houses begins before the entryway, emphasizing the "private" nature of house interiors.

Feature distributions directly attest to a relatively small number of activities, beyond co-residency, that were carried out at the communal level. The distribution of *tannurs*, fireplaces, and storage facilities again suggests that for many of the more mundane domestic activities each household managed its own affairs with little or no inter-household cooperation. The shared open spaces that do exist appear to have served in part as loci for large-scale grain processing and/or storage activities reflected in the presence of silos, platforms, and large mudbrick ovens.

It has been argued by Flannery that regardless of the existence of centralized stores, the presence of individual household storage facilities implies a degree of economic independence for the households (Flannery 1972:39). In spite of the minimal number of such obvious storage facilities as bins and installed jars, the possibility of the use of perishable containers, which may have been kept in the back rooms of the houses, suggests that the households at Tell al-Raqa'i were economically independent. This interpretation is consistent with the apparent separateness of the houses as reflected in the control of access to the individual structures.[7]

Following the proposition that a significant function of the built environment is to provide cues for the selection of "contextually specific" behaviors, it is possible to explore which kinds of activities were viewed as "private," that is, carried out in the context of the individual households; "communal," or those activities carried out freely by the community at large; and "managed," that is, those activities that, although requiring the participation of several representatives of the community, were coordinated and/or controlled by managers representing, perhaps, an extra-community elite.

There is remarkably little space within the confines of the village that can be said to be communal. This is reflected in the restrictions on movement through the village created by the placement of the structures. This apparent lack of communal space within the village, however, does not preclude the possibility that such spaces existed beyond the limits of excavation. Still, the emphasis on privacy expressed in restrictions of movement, location of entryways, and lack of shared exterior space strongly suggests the relative independence of the households at Tell al-Raqa'i in much of their day-to-day domestic activities.

The minimal evidence for communal activities leads one to consider what integrative mechanisms might have served to hold the community together. The temple and associated ritual activities may be the most likely candidate. If authorities based locally or elsewhere exercised socioeconomic control over village activities, as suggested by the "export" hypotheses (see Chapter 11), the temple may also have served to legitimize such control, a position supported both by the temple's central location in the village and the apparent restrictions on direct access to the building (Schwartz 2000). The Round Building is likely to be relevant to integrative functions as well, depending on how one interprets the activities conducted within it.

Exterior Space

Although providing a convenient analytical unit, the spaces defined by the individual house structures represent only a fraction of the total space utilized by the households defined above. A significant number of household activities can be expected to take place in exterior settings, including spaces controlled by the household and those used communally by several households.

Identification of the exterior space associated with the houses is difficult, since lack of identifiable entryways for a number of houses preclude direct association of specific houses with exterior spaces. In two cases where doorways were identified, they faced away from the more conspicuous open areas within the village (houses 7 [area 56], and 8 [areas 13/14]). This pattern suggests that these houses were most directly accessible from beyond the confines of the village. As such, they could be entered without passing through space shared with other households.

Movement between the various parts of the village was accomplished via a system of narrow alleyways and streets that, due to their irregular nature, appear to have developed informally during the construction of the village. The main east–west artery 38/48 forms the border separating the temple and eastern area from the

western precinct and the Round Building. This street leads northwest to the area 58 street and the northwest edge of the tell. North–south movement is somewhat more restricted, limited to several extremely narrow gaps between buildings.

Based primarily on circulation patterns within the village, including the location of the entryways of individual structures, it is possible to assess the degree to which particular open spaces were "controlled" and, with somewhat less confidence, to identify the households that may have controlled them.

Six discrete open areas can be identified: areas 3, 7, 49, and 59/60 in the west, areas 24 and 62 in the temple precinct, and areas 41, 43, and 44 in the southeast. Perhaps the clearest case of control of exterior space by a specific set of structures, besides the Round Building and the temple, is courtyard area 7. Access to this area appears to have been controlled by two domestic structures, houses 4 (area 8) and 5 (areas 9/10), whose entryways open directly onto the courtyard. Thus, the residents of these structures would have been able to control access to at least one of the grain silos located in the western precinct, area 6. Access to silos 4 and 5 may have also been possible from the street to the north.

The open area comprising area 49 lies immediately south of houses 1 (areas 1/2) and 2 (areas 20/83), which appear to be the most likely structures associated with this space. The only clearly identifiable entryway, however, is located in the eastern wall of the northern room of house 2, which opens onto a narrow alleyway between the house and the Round Building. In spite of the fact that there is no direct evidence for the control of area 49 by any of the excavated houses, other data suggest that this was not a "public" area. The location of a pair of mudbrick burial chambers resting on the surface, each containing the body of a child, appears to suggest that this area may have been "claimed" by specific members of the community. Areas 59 and 60, located at the northeastern limit of the site, are most closely associated with houses 7 (area 56) and 8 (areas 13/14), although neither structure's entryway opens directly onto this area. The courtyard surrounding the temple appears to have been the most restricted exterior space in the village. It should be noted, however, that the function of the wall demarcating the temple precinct may have been more symbolic than an impediment to movement, although the latter result also occurred.

Given the available sample, the exterior areas in the southeastern part of the village appear to be the most "public" in nature. Of the architecture adjacent to the area, house 11 (areas 34/35/40) and areas 76/79, only the southern room of house 11 possesses an entryway opening into the open area. Access to the area from the rest of the village is made possible by the main east–west street 38/45/48. The area appears to have been open to the south as well, although it is possible that a means of controlling access such as a wall or additional structure has completely eroded from the tell slope.

Nuclear Families

The small size, circulation patterns, and feature distributions of the Raqa'i houses suggest that they were inhabited by at most a nuclear family. The two-roomed houses, in particular, are quite diminutive, with a range of 20 to 39 square meters (including walls) and 12 to 25 square meters of roofed space (Tables 3.1, 3.2). Using Naroll's cross-cultural figure of 10 square meters of roofed space per person (Naroll 1962), we would arrive at the curiously low figure of 1.2 to 2.5 people per two-roomed house (Table 3.1); figures such as 6 square meters per person have also been recommended (Kolb 1985; Marfoe 1980; Stone 1981) and would entail two to four people per house, just barely enough for a nuclear family.

Assuming an average family size of between four and five (Watson 1978:132), the 14 excavated level 3 households would have contained between 56 and 70 people; if a smaller estimate of between three and four persons per household is used, the resulting range is 42 to 56 persons. If five or six additional houses were located on the west and southwest (see Figure 2.84), the total population of the community could have numbered from 57 to 100 people. This estimate is higher than the figures cited above derived from 6 to 10 square meters residential space per person (40–67 persons) or 100 to 200 persons per hectare of settlement (21–42 persons).

Citing data from ethnographic studies of traditional Near Eastern villages, Kramer (1982a:119) cautiously suggested that the resident nuclear families in a house compound sometimes can be estimated from the number of hearths. In such cases, each family sleeps and receives guests in its living room, heated by a hearth, while kitchens contained ovens used for food preparation and for heating the room (Kramer 1982a: 104, 123; Watson 1979:122). Bearing such possibilities in mind, Pfälzner (2001:150), focusing on the results

from third-millennium Tell Bderi, suggested that a room with a hearth and benches was a "Kernraum," serving as a living room in mid–third-millennium villages, with adjacent rooms with pits or ovens employed for storage and cooking.

If we apply Pfälzner's interpretation to Raqa'i, either the larger or the smaller rooms of the two-room houses could have been living rooms (e.g., areas 2, 14, 16, 29, 53, 63). However, the pattern fails to apply comfortably in many cases: rooms with fireplaces and benches can also have ovens, pits, and grinding installations; both rooms of house 9 (areas 15/16) have benches; house 3 (areas 18/19) has no benches or fireplaces; and house 2 (areas 20/83) and room 51 have no benches or installations at all. Further, some fireplaces were found in association with or near cooking vessels (12E, 13E, 42D, 53G), which suggests a use additional to that of heating a living room. In short, there is considerable evidence for multi-functional use of space in the Raqa'i domestic architecture (Allison 1999).

Nonetheless, if benches are deleted from the definition of a living room, there is reason to hypothesize an association of fireplaces with living rooms and hence with nuclear families. Houses 1 (areas 1/2), 6 (areas 52/53), 9 (areas 15/16), and 10 (areas 63/64) each have one room with one fireplace in any given phase. Although houses 2 (areas 20/83) and 3 (areas 18/19) have no fireplaces, they were incompletely excavated units that may have contained fireplaces in the unexcavated balks that traverse the structures.

If the normative household consisted of a single nuclear family, what can be said of the socioeconomic environment in which it existed? According to Pasternak, Ember, and Ember (1976), small nuclear family households are more likely to exist in situations with little or no activity "incompatibility"—that is, where labor demands for a given activity interfere with the performance of others. This pattern, they suggest, is reflected in a correlation between more complex extended families and agricultural economies, which are often characterized by broad seasonal fluctuations in labor demands.

Change in family size and/or composition is but one way to address a problem of activity incompatibility. Otherwise independent households can pool resources in an ad hoc fashion to deal with short-term labor deficits. This may be especially true, for example, in cases where the projects benefit the community at large, such as in the construction or maintenance of irrigation systems and fortifications.

If, as suspected, the economy of Tell al-Raqa'i was agriculturally-based, the presence of the nuclear family as the dominant household type runs counter to the conclusions of Pasternak, Ember, and Ember. This discrepancy may be explained either by the villagers periodically pooling their efforts in those instances where labor demands exceeded the capabilities of the individual households, or by the absence of the kinds of activity incompatibility that would favor extended family households.

The absence of evidence for the division of property consistent with a system of partible inheritance may also be relevant to our understanding of Raqa'i's socioeconomic environment. If Raqa'i was indeed established for the purpose of processing and transporting an agricultural surplus for an externally based elite, as posited by the export hypotheses, that elite may have maintained control of the settlement itself and there may not have been any "household" property to divide.

Spatial, Social, and Economic Differentiation

According to scholars who have discussed the "reflexive" quality of architecture and the partitioning of space (Bourdieu 1977; Donley-Reid 1990; Giddens 1979), the built environment is both "the medium and the outcome of social practices" and partly functions to define and maintain power relations. In general terms, highly differentiated and stratified societies with more formalized sets of power relationships would then be expected to partition space in a similarly differentiated and stratified manner, an assumption demonstrated ethnographically (Kent 1990).

Applying this interpretive framework to the Raqa'i 3 houses, we can observe that few formal rules appear to have existed concerning the use of space, particularly in the case of the single-room houses, where all interior activities would be carried out in the same room. Even in the case of multiple-room houses where a more formal separation of interior activities is possible, regularities were more apparent within individual structures than between them. While *tannurs*, fireplaces, and storage bins were often found together in the same room, the location of this room within the house in terms of access from the exterior was quite variable.

At the level of the village, however, a more formalized division of space is evident, manifested particularly in the restricted access to the temple precinct and

the Round Building. Moreover, the architectural variability evident between the western and eastern areas of the village may also reflect differences in associated activities. The "embedded separateness" of the temple and the Round Building may have served to simultaneously represent the community as well as reinforce and legitimize status differences between managers and managed.

An analysis of richness and evenness of the latest deposits from Raqa'i 3 conducted by Klucas (1996; Schwartz and Klucas 1998) indicated that two areas clearly served as the loci of specialized activities.[8] These include the temple precinct and the southeastern "industrial" area. In the case of the temple, the relatively high percentage of areas with low richness and evenness values may be attributable both to a limited number of activities carried out in the precinct and the greater care given to maintaining the area. The relatively low number of areas within the Round Building with diversity values below the expected range was unexpected; the apparently specialized nature of the building is only weakly reflected in the artifact assemblages associated with it, perhaps because the building had lost much of its specialized function in the period of its latest deposits.

Architectural differentiation is evident between the eastern and western segments of the site, distinctly separated by the Round Building and the temple area. Two-roomed houses are restricted to the western and temple areas and are not evident in the east, which is characterized by multi-room constructions. Further, architectural modifications involving the addition, removal or repositioning of walls are more common in the eastern area, while the western two-room houses largely remained static in their shape. This pattern holds even though we obtained a larger sample of complete level 3 sequences from the western area. Klucas's analyses of artifactual distributions show a marked differentiation between the eastern and western neighborhoods (Klucas 1996; Schwartz and Klucas 1998), with the western area exhibiting a larger number and variety of activities taking place. The ceramic distribution shows the presence of more fine ware and Metallic Ware sherds in the west and in the temple enclosure (Chapter 4); the few bronze fragments retrieved from level 3 were largely restricted to the western and temple areas (Chapter 5). Although these materials almost exclusively derived from secondary contexts, their differential distribution in east, west, or temple areas is probably significant given the improbability that the trash of one side of the mound was dumped on the other side.

Despite these differences, evidence of status distinctions between houses is relatively minimal. Similarities in architectural elements and techniques, such as construction, floor, and wall treatment, suggest socioeconomic similarities among the residents of the main residential precincts of the site. Given the technical requirements for the production of lime and gypsum plaster (Blackman 1982; Gourdin and Kingery 1975; Kingery et al. 1988), it has been suggested that its distribution within a community may be used as an indicator of wealth and status differences, with wealthier households better able to meet the costs associated with its production and application (Garfinkel 1987). At Raqa'i 3, both the western and northeastern precincts contained the full range of observed floor treatments and both are characterized by roughly the same percentage of rooms with evidence of lime plaster.

The two-roomed houses of level 3, restricted to the western and temple precincts, diverge conspicuously from the multi-room houses common elsewhere in third-millennium Syria and Mesopotamia[9] and from the houses excavated in pre-state villages such as Tepe Gawra (Tobler 1950). However, there are some cases of small one- or two-room houses in the urban centers of late third/early second millennium southern Mesopotamia. At Larsa period Ur, linear houses of one or two rooms exist, ca. 6 × 2 meters (Woolley and Mallowan 1976); and at Old Babylonian period Nippur, similar houses with a mean area of 23 square meters existed in area TA (e.g., houses G and H), interpreted as nuclear family dwellings (Stone 1983; but cf. Van de Mieroop 1992).

Given their peculiarity and unusually small size, one might suggest that the two-room houses did not house "families" per se, but rather individuals engaged in specialized activities being carried out at the site. In such a scenario, the site may have been only seasonally occupied and the houses serving as temporary shelter for people who maintained permanent residences at other locations. One could hypothesize that the two-room houses were occupied by managers or upper-level workers in the Raqa'i Round Building facility, while the cramped eastern quarters were inhabited by lower-level workers at the facility. Alternatively, one might also suggest that the two-roomed houses served as initial cores for nuclear family dwellings that would be enlarged for extended family use, as suggested for Bderi (Pfälzner 2001), but there are few obvious open

areas in the western part of Raqa'i that would have allowed for house expansion.

While a seasonal occupation of Raqa'i 3 may be suggested by the relatively small number of sherds and faunal material recovered, the minimal quantity of such material could be a product of the small size of the caretaker population of the Raqa'i facility (Schwartz and Curvers 1992:417). Moreover, the burial population includes males, females, children, and infants (see Chapter 6), suggesting a resident population or, minimally, the seasonal movement of entire families to and from the village. The presence of both indoor (winter) and outdoor (summer) ovens also implies year-round occupation.[10]

NOTES

[1] We are grateful to Elizabeth Stone for her comments on some of the issues discussed here.

[2] In his discussion of Raqa'i 3, Pfälzner (2001) proposed 15 houses, some of which correspond to the house assignments here (e.g., our houses 1–3 and 7–10), but others, especially in the eastern area, differed from our reconstruction. Given the uncertainties with respect to exterior doorways, the delineation of houses in the eastern area is particularly difficult. Further, Pfälzner interpreted the "temple" as a house.

[3] The dense distribution of rooms in the east is comparable to the contemporaneous domestic architecture at Tell Knedig level XIII farther downstream (Klengel-Brandt and Martin 2005).

[4] Such construction is interpreted by Pfälzner (2001) in the case of the two-room houses to indicate that an original house consisted of only one room, with an additional room added later. However, excavations of complete sequences of two-room houses at Raqa'i (e.g., areas 1–2, 13–14, 15–16) revealed no evidence of an original single-room structure. Further, one can observe that the back-to-back walls 32K and 33A separating rooms 32 and 33 in areas 32/33/69, phase d were not the result of the addition of a new room, since both rooms 32 and 33 had existed before in phase c.

[5] One might also suggest that doorways were blocked in preparation for the construction of new architecture above, a process that would require the deposition of artificial fill in a room. However, there is little evidence to support such an interpretation, and a number of the door blockings were observed in late level 3 structures that were not situated below subsequent architecture.

[6] When considering the distribution of non-portable installations in level 3, one must bear in mind that some installations may be hidden in unexcavated balks.

[7] Pfälzner (2002) proposes that the Raqa'i 3 households stored their foodstuffs communally in the Round Building (see below, Chapter 12).

[8] Richness and evenness are parameters of diversity; richness refers to the number of artifact types in an assemblage, while evenness refers to the relative proportions of each artifact category represented. An area with low richness values, indicating a limited number of activities being conducted, is likely to be associated with specialized behaviors. An area with low evenness values and a small number of artifact types represented is also likely to have seen specialized activities.

[9] Pfälzner 2001. Cf., for example, Melebiya level 2, contemporary with Raqa'i 2 or slightly later (Lebeau 1993); Chuera (Moortgat-Correns 1988a:plan III); Bderi (Pfälzner 2001); and the Diyala sites (Delougaz, Hill, and Lloyd 1967).

[10] The 'Atij evidence indicates all-year occupation (Fortin and Cooper 1994:44).

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Chapter 4

Ceramics

Glenn M. Schwartz and Peter Chomowicz[1]

The most common artifactual material recovered from the excavations at Tell al-Raqa'i, as in other Bronze Age Near Eastern sites, was pottery. In analyzing the ceramics excavated, we aimed to construct a ware, shape, and surface treatment typology in order to ascertain intra-site patterns of chronological and spatial distribution, make inter-site comparisons, and establish a relative chronology.

The pottery was collected according to its associated stratigraphic feature; when a trench supervisor observed a discrete stratigraphic or architectural unit, a separate "archon" or locus number was given to this unit, and the associated pottery and other finds were labeled with the archon number (see Chapter 2). All level 3–5 contexts were dry-screened (1-cm mesh), with the exception of walls and other architectural features, areas disturbed by recent intrusions, and area 86, level 3 in the 1992 excavation season. Since the architectural remains in levels 1–2 were fragmentary and/or close to the present-day surface, the materials from those contexts were not screened.

After the sherds were washed by locally hired workers, the excavation supervisors sorted the sherds from their units into diagnostics (rims, bases, body sherds with decoration, handles, or significant features) and body sherds. Hans Curvers established a ware typology for the body sherds, and those sherds were counted, weighed, and recorded by ware in the sherd yard by Curvers, Nel Loosbroek, and Marga Schoenmaker.

With assistance from Olivier Nieuwenhuyse, whose master's thesis (1991) provided a first step toward the establishment of a typology, Curvers subsequently developed a more extensive typology for the study of the diagnostics, in which he also modified the ware typology. Curvers recorded the diagnostics according to this typology. Glenn Schwartz coded an additional 174 sherds and complete vessels, analyzed the chronological and spatial patterns exhibited by the sherds as presented below, and drew the pottery. As part of the analysis, Schwartz "lumped" some of the rim and base types that had very few attestations, merging them with similar types. Peter Chomowicz assisted Schwartz in producing the tables of sherd counts and relative frequencies.[2]

Nature and Description of the Sample

The focus of this report is on the diagnostic sherds coded from the third-millennium levels 2–5. Contexts assigned to level 1 included a mix of third-millennium sherds with a small minority of Hellenistic pottery and will be discussed in a subsequent publication.

In the analysis presented here, sherds from contexts not clearly assignable to one level or another are not included, nor are sherds from questionable stratigraphic contexts. Further, sherds from contexts primarily composed of mudbrick components like walls, platforms, or mudbrick features are excluded, since they are particularly likely to derive from materials deposited prior to the period of the stratum in question. Therefore, the sample reported on here is substantially smaller than the sum of all sherds recorded.

The problem of residuality is relevant to all sites, especially in the Near East, where mudbricks are often produced from soil extracted from earlier deposits on a site. As a result, bricks frequently contain fragments of artifactual materials from earlier levels, which can

be redeposited in a later level when the brick breaks into fragments. Even sherds on a living floor can derive from such residual contexts, since a brick from a collapsing wall can easily land on the floor after a room is abandoned, break into pieces, and deposit its ceramic fragments. One solution to this problem is to focus only on complete vessels from primary contexts, which are least likely to derive from earlier levels. But this strategy is only reasonable if the site contains a large sample of primary contexts and complete vessels, which is decidedly not the case for Raqa'i. As a result, we must be cognizant of the possibility that some, and possibly many, sherds examined in this study may derive from residual contexts.

Some of the sherds illustrated in this chapter—but not included in the quantitative analysis—are designated as deriving from either levels 5 or 4, 4 or 3, or 3 or 2 (Figures 4.17:31, 4.26, 4.33) rather than allocated to a single discrete level. These sherds derive from excavated contexts that could not be assigned to either one or the other level due to stratigraphic uncertainties or because they came from excavated units that "mixed" contexts from two levels.

Ceramics from the "silos" of level 3, areas 4–6/level 4, areas 56–58 in the northwest part of the site were not included in the analysis of the discrete levels, since it was not clear if the silos' contents derived from level 3 or 4. Likewise, the ceramics from area 12 (assigned to level 3 in Chapter 2) were not included, since there is a similar uncertainty as to whether they derived from level 3 or 2. However, the ceramics from both sets of contexts are considered below and compared to the sherds analyzed from well-defined contexts (see section titled Quantitative Analysis—Chronological Patterns, this chapter).

Pottery from the small-scale experimental excavations conducted by Hans Curvers in 1991, 1991–1992 and 1993 are not included in the present analysis, because sherd retrieval methods differed from those of other seasons, and it was judged preferable to analyze them separately in a publication to be presented at a later date.

After ceramics from unreliable contexts were removed from analysis, a total of 42,799 body sherds and 4451 diagnostic sherds (including 110 complete vessels or complete profiles, most of which derived from burials) remained (Table 4.1).

It should be noted that some of the sherds published in preliminary reports have been reassigned to different levels in the present study. This occurred because results from excavations subsequent to the sherds' preliminary publication broadened and revised our understanding of stratigraphic relationships. In particular, many sherds assigned to levels 5–7 in the preliminary reports have been reassigned to level 4 (Curvers and Schwartz 1990: figure 24), since our understanding of levels 5–7 (now designated level 5) originally derived from a narrow step trench whose contexts required reassessment given broader extension of excavation and exposure of the level 4 Round Building.

TABLE 4.1. Levels 2–5, Sherds Analyzed from Reliable Contexts.

Level	Diagnostic sherds	Body sherds
2	536	5,276
3	1,697	18,316
4	1,976	16,440
5	242	2,767
Total	4,451	42,799

A salient characteristic of the sherds found in Raqa'i third-millennium contexts is their small numbers. Compared to excavated samples from other third-millennium Syrian sites that have been published in quantified fashion (Lebeau 1993; Schwartz 1988; van Loon 1988), the number of sherds at Raqa'i is decidedly modest, despite the large sample excavated. A possible comparison to the small number at Raqa'i may be provided by results from another small site, Tell Hazna in the upper Khabur, where 83,000 body sherds and 9,000 diagnostics were recovered from a large excavated sample (Munchaev, Merpert, and Amirov 2004:481). Whether the small number of sherds from village sites indicates a smaller scale of pottery use at such sites compared to larger centers or is related to seasonal and thus a reduced level of occupation at these communities remains to be clarified.

At Raqa'i, diagnostic sherds retrieved from the earliest occupation phase, level 5, are especially few in number. This might be interpreted in several possible ways: (1) the inhabitants, newly settled, possessed relatively few pottery vessels; (2) the inhabitants of level 5 discarded their broken pottery at some distance from the settlement proper; or (3) the earliest occupational deposits at the site had no chance to accumulate "residual" sherds from earlier phases. The latter conclusion would imply that a large percentage of the sherds recovered from later phases originally derived from earlier contexts.[3]

It is unclear how much of the pottery employed at Raqa'i was manufactured on-site. One might expect that hand-made cooking ware vessels were made in domestic or small-scale contexts, while finer vessels finished on the wheel were more likely to be produced by specialists, but data to evaluate such a hypothesis are not very substantial. A rim sherd of green vitrified ceramic slag identified from level 3 (area 7, phase e) as well as numerous over-fired body sherds recorded from diverse levels (see below, Tables 4.8–4.9) imply the production of some pottery at the site, but no kilns or ceramic workshops were identified during excavation.

WARE AND INCLUSIONS

The third-millennium pottery diagnostics at Tell al-Raqa'i were recorded in the following ware categories.

Simple Ware, consisting of light-colored ("buff") pottery, usually mineral-tempered, is the most common. The colors most often represented were light yellow, light green, and light brown. Gray fine sherds appeared occasionally but were rare. Finer, thinner-walled (ca. 3–5 mm) and smaller examples were commonly made on the fast wheel; larger jar rims could presumably be finished on the wheel. The size of the inclusions and the thickness of the sherds allowed for their division into three subtypes:

Ware 1: *Coarse Simple Ware*—larger inclusions, thicker vessel walls (most commonly ca. 10–14 mm)

Ware 2: *Medium Simple Ware*—medium-size inclusions, medium-thick vessel walls (most commonly ca. 6–10 mm)

Ware 3: *Fine Simple Ware*—smaller inclusions, thin vessel walls (most commonly ca. 3–5 mm)

All three Simple Wares together constituted 67% of the sample of sherds coded for ware (Table 4.2).[4]

Ware 4: *Metallic Ware*—considered to be one of the main diagnostic wares of the mid-late third millennium BCE (Kühne 1976; Kühne and Schneider 1988).

While the term "stoneware" has also been applied to this pottery, its use is not strictly correct, since proper stoneware is characterized by a low porosity due to extremely high temperatures in the kiln (Rice 1987), a characteristic not necessarily applicable to the third-millennium Syrian examples (Miller 2007:107; Oates, Oates, and McDonald 2001:152; Schneider 1989). Raqa'i Metallic Ware examples were found in a range of bowl and goblet types.

At Raqa'i, Metallic Ware varied from orange through brown and gray to black, occasionally with a bichrome appearance; the surface sometimes had an opaque sheen (Figure 4.45). The profiles were thin (most commonly ca. 3–5 mm), inclusions were either absent or only present in an extremely fine consistency, and the sherds were high-fired with a dense, hard fabric. When sherds of this ware were knocked together, the result was a "metallic" sound. Technical analysis of this ware has shown that the chemical contents can be subdivided into several classes (Daszkiewicz and Schneider 1996; Daszkiewicz and Smogorzewska 1999; Kühne and Schneider 1988, 1989; Schneider and Daszkiewicz 2001). Since such analysis has not been conducted with the Raqa'i examples, we cannot be certain which groups are represented here.

Some vessels resemble Metallic Ware in their color and bichrome or horizontally streaked appearance but do not have the high-fired and hard character that is expected. This kind of "imitation" or "near" Metallic Ware (Oates, Oates, and McDonald 2001:159) is sometimes difficult to distinguish from "true" Metallic Ware, and it is not unlikely that some sherds coded as Metallic Ware might be better designated as "imitation," and vice versa.

Metallic Ware examples constituted only 0.9% of the analyzed diagnostic sherd sample (38 out of 4,182 sherds recorded for ware).

TABLE 4.2. Simple Ware Categories.

Ware Category	Percentage out of all diagnostics coded for ware	Raw count of ware type/total of all diagnostics coded for ware
Coarse Simple Ware	30	1,238 / 4,182
Medium Simple Ware	14	600 / 4,182
Fine Simple Ware	23	946 / 4,182

Ware 5: *Vegetal-Tempered Ware*, recognized from the profusion of voids in the shape of chopped straw or chaff burned during firing.

Inclusion of vegetal materials contributes to the heat resistance of fired vessels (Akkermans 1988). While occasional evidence of plant inclusions was found in the Simple Ware categories listed above, this ware type is characterized by much more abundant evidence of vegetal temper. These sherds were very rare at Raqa'i and are likely to have been imports, perhaps from the upper Khabur, where vegetal temper can be common in the early-middle third-millennium assemblages (e.g., Buccellati and Kelly-Buccellati 2000; Matthews 2003; Schwartz 1988). At Raqa'i, vegetal-tempered sherds constituted 0.8% of the analyzed sherd sample (37 out of 4182 sherds recorded for ware).

Ware 6: *Cooking Ware*, characteristic red-brown or gray-brown, and the surface of the pottery either burnished or very coarse, with faint or sharp striations in several directions.

Typically the Cooking Ware sherds were incompletely oxidized, with a dark core. These vessels were largely limited to hole-mouth pots and open simple bowl shapes with simple rims and were ostensibly manufactured by hand. Ethnographic studies indicate that the hole-mouth shape is very common cross-culturally in ceramics used for the preparation of food (Henrickson and McDonald 1983:631; Rice 1987).

The addition of calcite (white carbonate sand) or, as in the case of the majority of the Tell al-Raqa'i Cooking Ware examples, other grits to the clay can produce a vessel resistant to thermal shock (Rice 1987: 228–230; Rye 1981:35). The continuous heating and cooling of cooking vessels during the preparation of food would have required such a precaution. The black grits observed in the Cooking Ware of Tell al-Raqa'i are presumed to be basalt, outcrops of which, if derived from the volcano Kawkab, would have been available as close as Tell Kerma, 2 km distant; note, however, that the source of basalt grinding stones from Tell 'Atij and Tell Gudeda south of Raqa'i was determined to be the Ard esh-Sheikh plateau northwest of the middle Khabur sites (Lease et al. 2001). Medium or coarse mineral inclusions are common in the third-millennium cooking ware from the middle Khabur (Kolinski and Lawecka 1992:223–224; Lebeau 1993; Pfälzner 1988:264–273), while medium to coarse vegetal inclusions were used at Tell Leilan in the upper Khabur plains (Schwartz 1988:36–37).

Cooking Ware sherds constituted 32% of the analyzed diagnostic sherd sample (1,323 out of 4,182 sherds recorded for ware), making Cooking Ware the most abundantly attested individual ware category. If the three Simple Ware categories were merged, however, then Simple Ware would form the vast majority of the coded sherds.

During the description of the diagnostic sherds, all types of inclusions were registered individually, but for purposes of recognizing general patterns in this analysis all combinations of inclusions were grouped into four general temper classes. Sherds described with white opaque "gritty" inclusions were classified as "calcite" (1). Whenever vegetal inclusions were observed and registered in profusion, regardless of other inclusions present, the sherds were grouped into the vegetal temper class (2). Two other classes were defined on the basis of the registered occurrence of either (3) "lime" or (4) "grit or sand" as the most numerous inclusion.

Out of the 4,451 diagnostic sherds from reliable contexts in the database produced by Curvers, Loosbroek, and Schoenmaker, 269 examples had no ware assignments, and these data must unfortunately be considered lost.

BODY SHERD WARE CATEGORIES

Five of the body sherd ware categories were the same as those used for diagnostic sherds: Coarse Simple, Medium Simple, Fine Simple, Metallic, and Cooking Ware. However, the category of Vegetal-Tempered Ware was not used, so the relevant body sherds were grouped with other ware categories such as Coarse or Medium Simple Ware.

In addition, the body sherd analysis employed six ware categories not used with the diagnostics: Cooking Ware with evidence of burnish, Coarse, Medium, and Fine Simple Ware with evidence of overfiring, sherds with evidence of bitumen coating, and sherds with incised motifs. Sherds in the latter category should have been reclassified as diagnostics and studied with the diagnostic corpus, but occasional examples were unfortunately overlooked by the body sherd recorders and were coded without reclassification.

RIMS AND VESSEL SHAPES (FIGURES 4.1–4.9)

The set of types based on vessel form and rim shape utilizes a combination of variables and is composed of four main categories, each with a set of subtypes.

Bowls consist of vessels with open (unrestricted) or slightly incurving profiles, usually with rim diame-

ter greater than 12 cm, and, if enough of the profile is preserved, with vessel height significantly less than rim diameter (h = <0.75 d); both thin- and thick-walled vessels were included.

Goblets are relatively small (rim diameter usually ca. 7–12 cm) and thin-walled (ca. 3–7 mm), with relatively fine inclusions, and, if enough of the profile is preserved, with vessel height similar to rim diameter, producing a squarish shape (0.75 d < h < 1.5 d).

Pots are closed (restricted) vessels of a relatively large size (rim diameter generally greater than 12 cm) without a pronounced neck.

Jars are closed vessels with pronounced necks and rim diameters generally greater than 12 cm.

Additional categories represented by smaller numbers of examples include *miniature vessels*, with a rim diameter less than 7 cm; *bi-mouth vessels*; *lids,* consisting of flat disks, sometimes with handles; and *miscellaneous shapes* (stands, conical "funnel").

Because of the uncertainties of vessel height with small, thin-walled sherds, there is likely to be some inconsistency as to whether the sherd coders assigned such sherds to either bowls or goblets. It is therefore probable that there is overlap between some bowl and goblet types. Creating workable typologies for sherd fragments is an imperfect process, and the distinctions between the types should be understood as guides to our understanding rather than representatives of a precisely defined set of distinctions.

The rim sherd sample discussed here, which comprises the great majority of excavated diagnostics (88%, 3,896 of 4,451 sherds), includes complete vessels and lids. The rims have been divided into six classes of forms: bowls, goblets, restricted vessels (pots and jars), bi-mouth vessels, lids, and miniature vessels. After the initial coding of the sherds, a number of types that were only represented by a small number of sherds were "lumped" with a more abundant type of a similar shape. As a result, some types embraced a multitude of different varieties (e.g., 3211) that were merged into a single category (Figures 4.1–4.9).

In the entire level 2–5 sample of 3,896 coded rim sherds (Table 4.3), the most abundant shape class is jars, constituting 47% (2,435 examples). Bowls are next, with 21% (783 examples), followed by pots with 16% (613 examples) and goblets with 14% (546 examples). Much rarer are lids (2%, 77 examples), miniature vessels (1%, 39 examples), bi-mouth vessels (0.3%, 13 examples), and miscellaneous (0.08%, 3 examples).

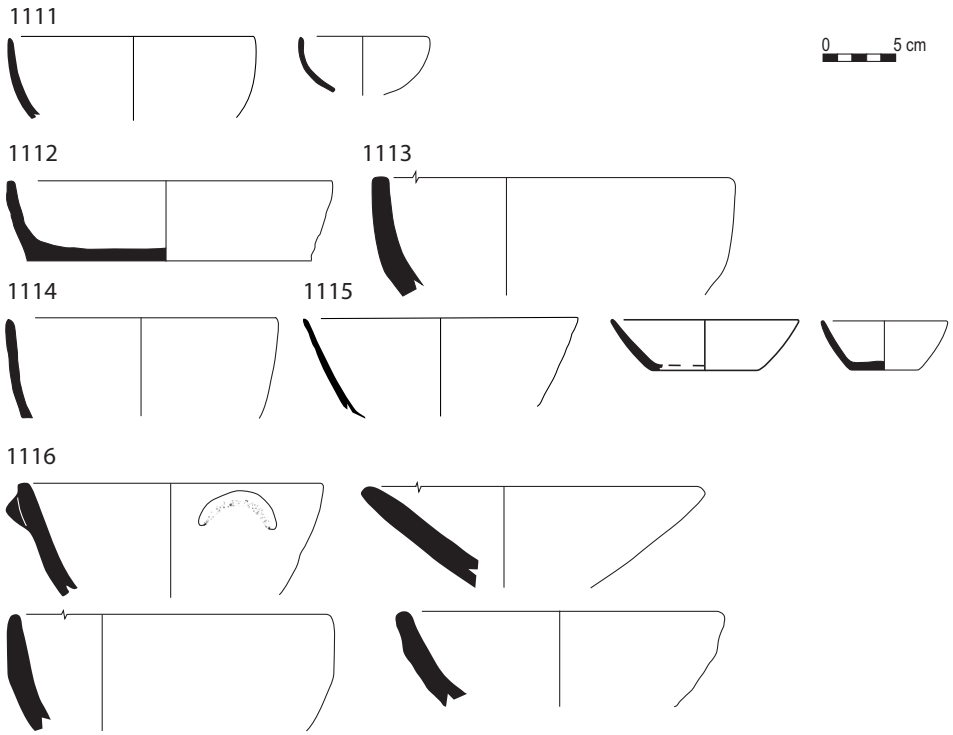

FIGURE 4.1. Rim shapes 1111–1116.

All drawings (Figures 4.1–4.24, 4.26–4.33, 4.36–4.40, 4.46) prepared by Christian Baum, Christopher Brinker, Violaine Chauvet, Macie Hall, and Harley King.

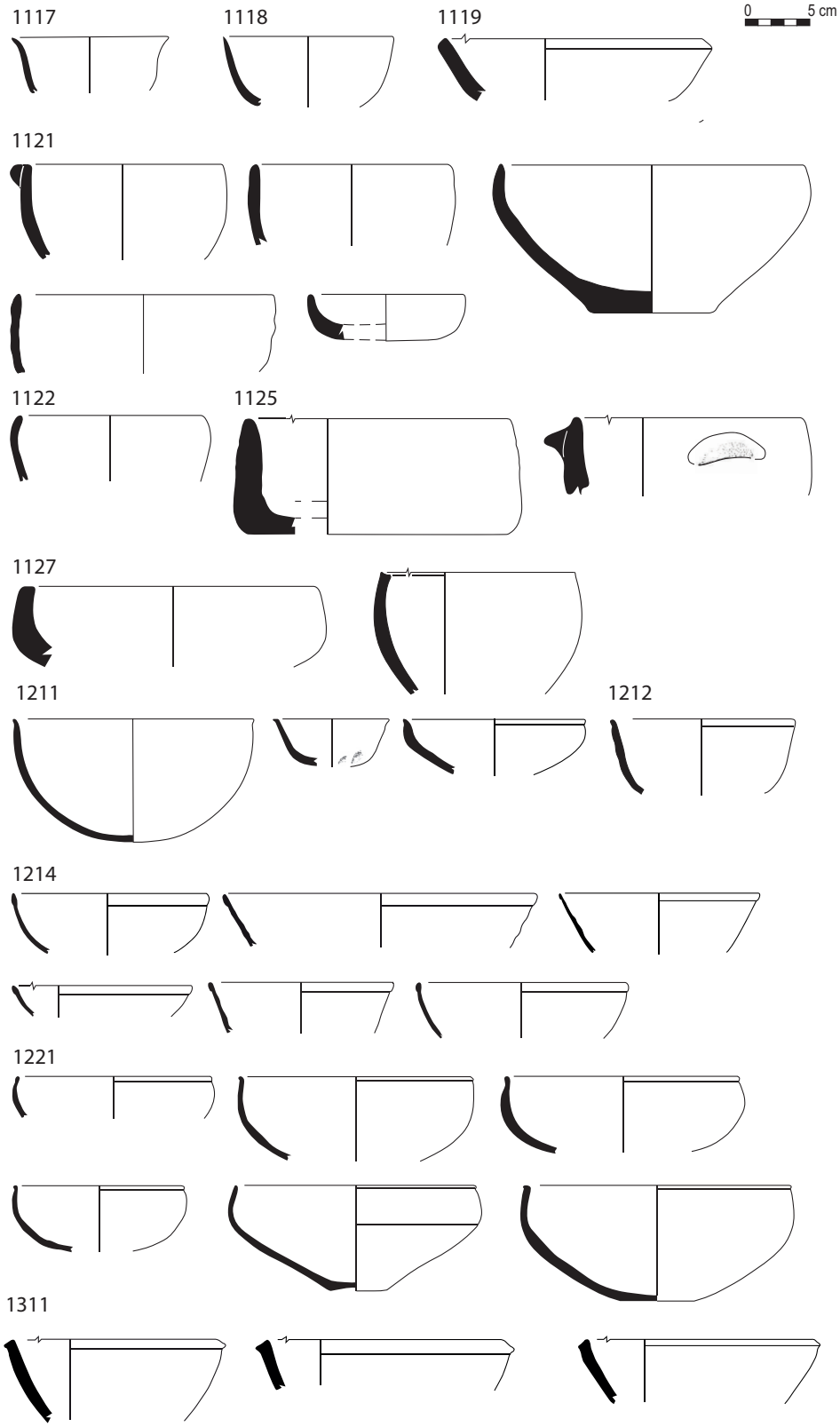

FIGURE 4.2. Rim shapes 1117–1311.

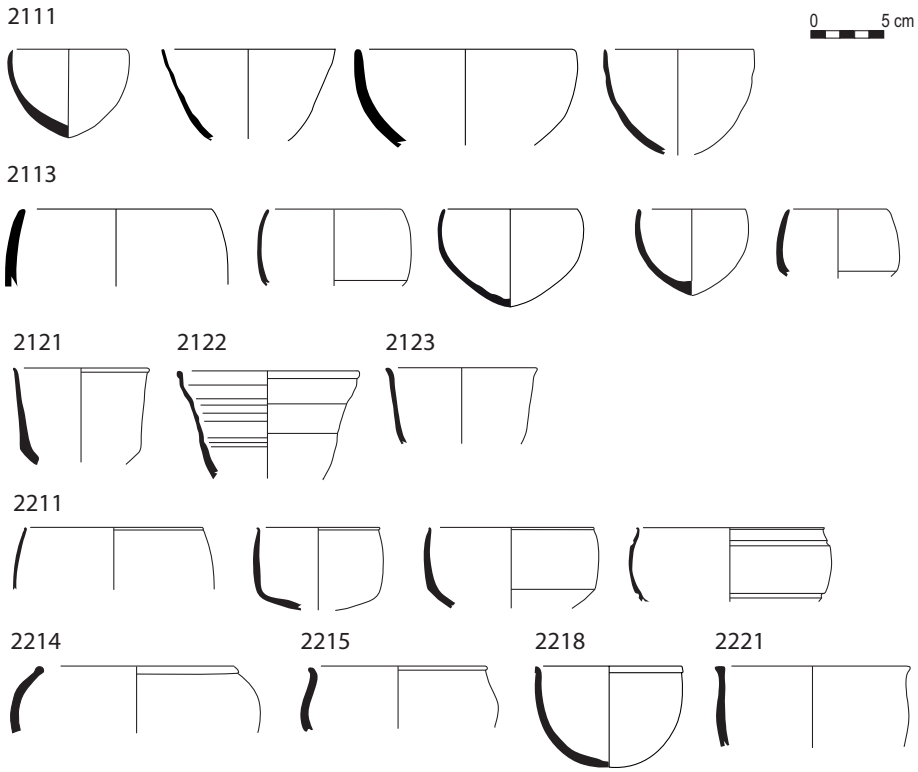

FIGURE 4.3. Rim shapes 2111–2221.

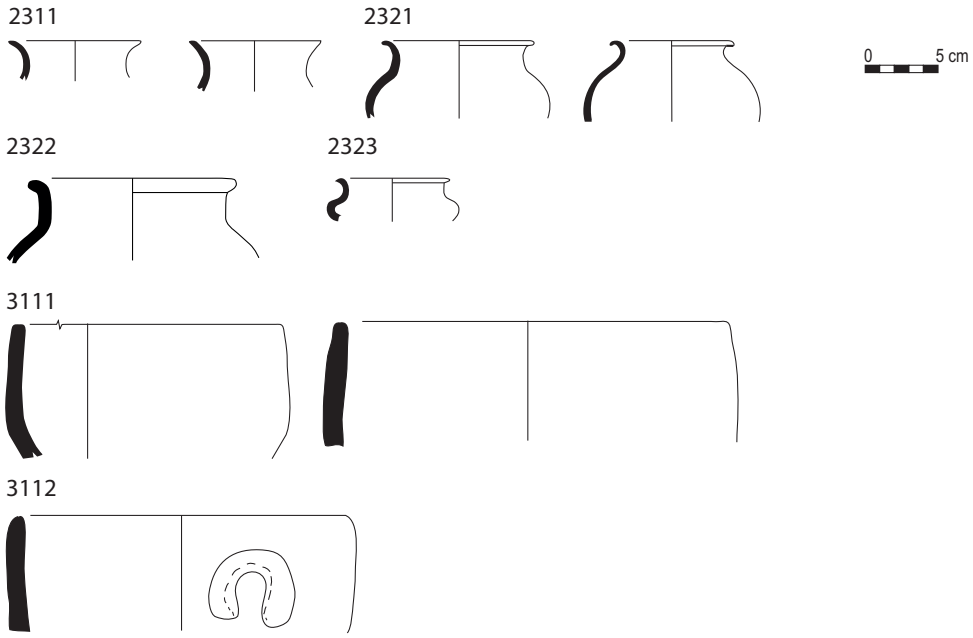

FIGURE 4.4. Rim shapes 2311–3112.

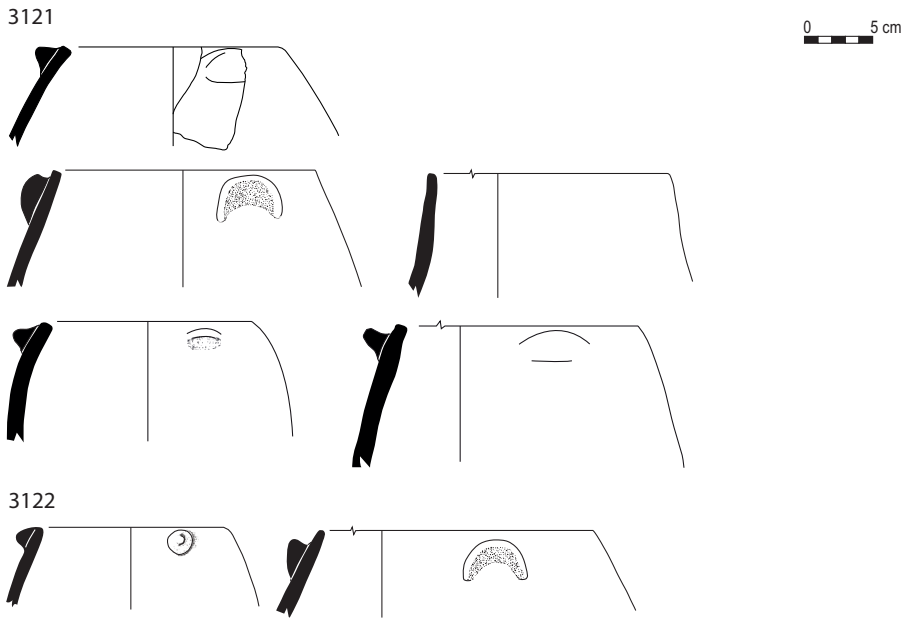

FIGURE 4.5. Rim shapes 3121–3122.

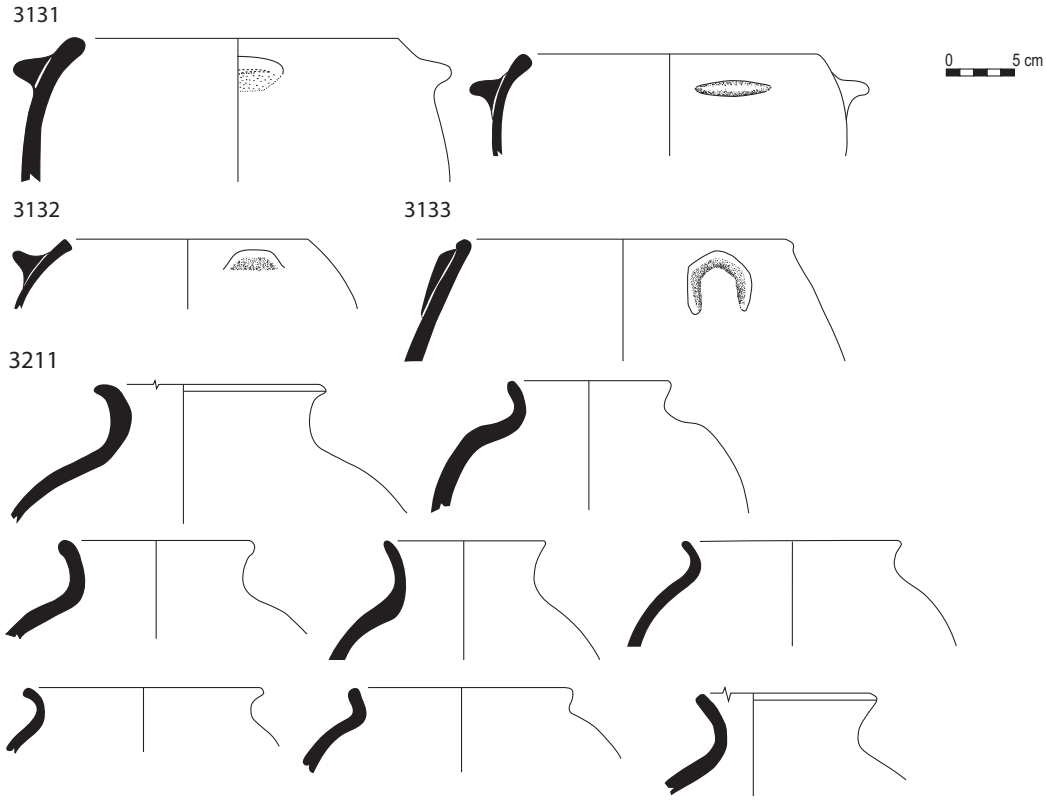

FIGURE 4.6. Rim shapes 3131–3211.

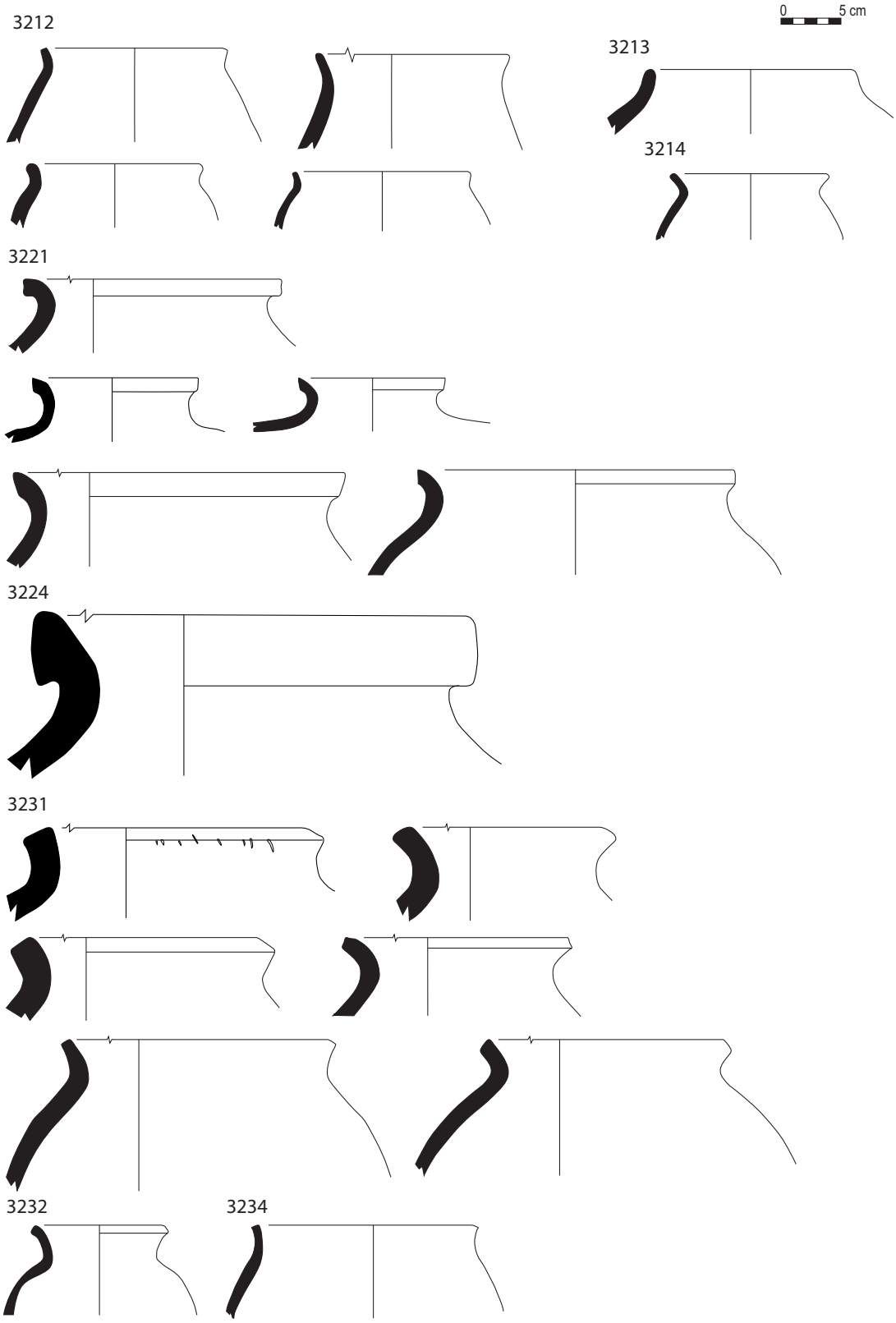

FIGURE 4.7. Rim shapes 3212–3234.

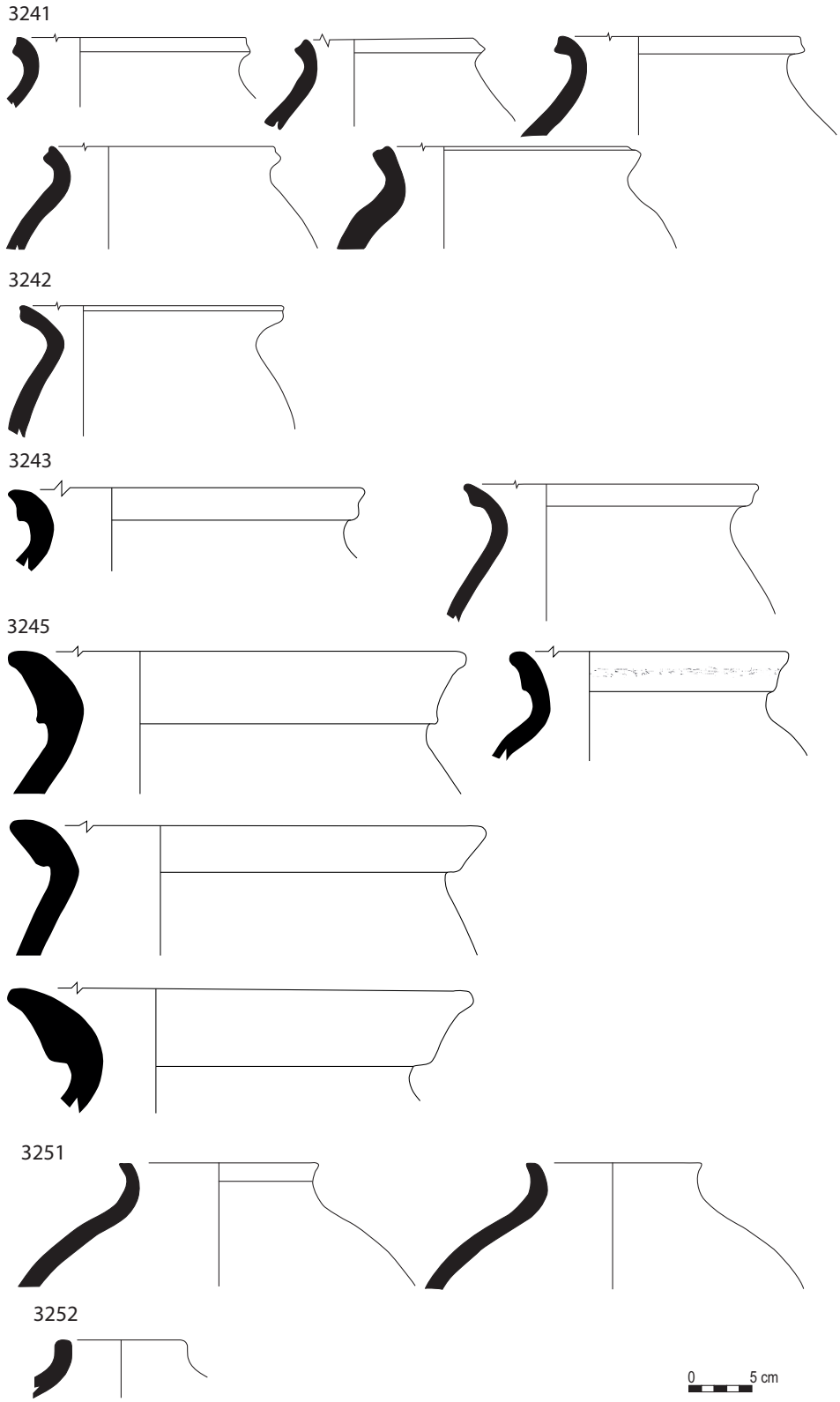

FIGURE 4.8. Rim shapes 3241–3252.

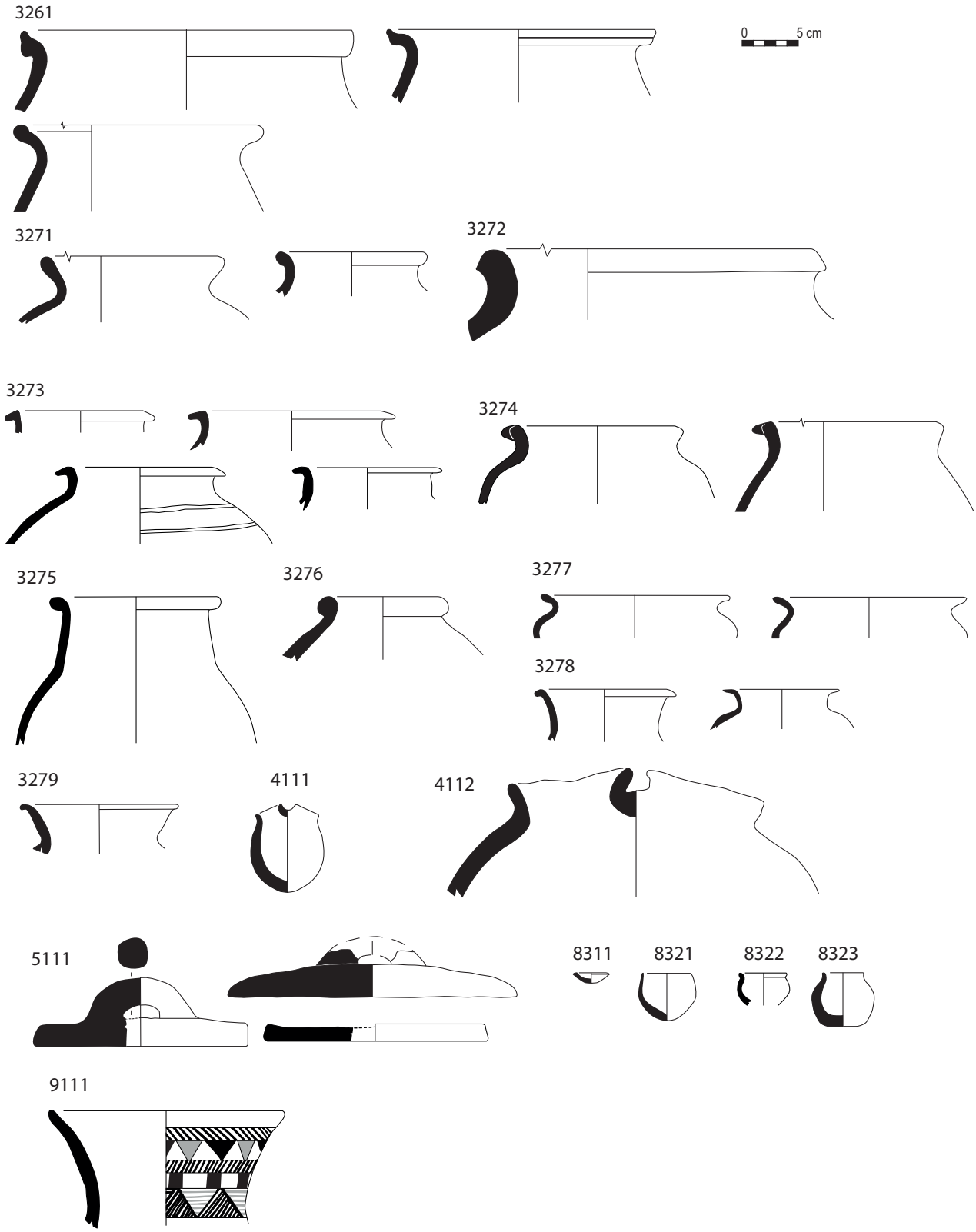

FIGURE 4.9. Rim shapes 3261–9111.

TABLE 4.3. Rim Types by Level: Raw Counts and Percentages of Types (%) Out of All Rim Sherds in Level.

Rim	2	%	3	%	4	%	5	%	Total
1111	19	4	39	3	34	2	4	2	96
1112			1	0	1	0			2
1113	1	0							1
1114	7	2	8	1	3	0			18
1115	1	0	2	0	3	0			6
1116	9	2	33	2	144	8	21	10	207
1117			1	0	2	0	1	1	4
1118	6	1	6	0	4	0			16
1119	1	0			2	0			3
1121	27	6	79	5	94	5	7	3	207
1122			1	0	2	0	1	1	4
1125			3	0	1	0			4
1127	2	0	1	0	4	0	1	1	8
1211	5	1	6	0					11
1212	1	0	1	0					2
1213			1	0					1
1214	5	1	8	1	3	0	2	1	18
1221	17	4	92	6	44	3	3	1	156
1311	1	0	1	0	15	1	2	1	19
2111	38	8	71	5	15	1	1	1	125
2113	12	3	50	3	42	2	3	1	107
2121	4	1	6	0	6	0			16
2122			4	0	1	0			5
2123			2	0	4	0			6
2211	12	3	75	5	35	2	3	1	125
2214			3	0	1	0			4
2215	3	1			6	0			9
2218	3	1							3
2221			2	0	2	0			4
2311	10	2	37	3	36	2	3	1	86
2321	5	1	18	1	9	1			32
2322	3	1	6	0	9	1	1	1	19
2323	2	0	3	0					5
3111			6	0	17	1			23
3112	1	0	12	1	24	1	5	2	42
3121	5	1	27	2	56	3	7	3	95
3122	16	4	168	12	220	13	19	9	423
3131	3	1	2	0	2	0			7
3132	2	0	8	1	1	0			11

TABLE 4.3, *continued.*

Rim	2	%	3	%	4	%	5	%	Total
3133			1	0	10	1	1	1	12
3211	55	12	250	17	439	25	57	27	801
3212	2	0	9	1	63	4	17	8	91
3213			1	0	16	1	6	3	23
3214	2	0	1	0	1	0			4
3221	39	8	112	8	24	1	7	3	182
3224	5	1	2	0	3	0			10
3231	11	2	103	7	145	8	19	9	278
3232	1	0	1	0	7	0	1	1	10
3234	2	0	12	1	22	1	2	1	38
3241	10	2	44	3	43	2	2	1	99
3242	19	4	35	2	4	0			58
3243	14	3	18	1	4	0			36
3245	12	3					1	1	13
3251	1	0	4	0	19	1	3	1	27
3252			1	0	1	0			2
3261	6	1	4	0	1	0			11
3271	13	3	11	1	34	2	5	2	63
3272	1	0	7	1	6	0	4	2	18
3273	1	0	1	0	2	0	2	1	6
3274	11	2	4	0	3	0			18
3275	3	1			1	0			4
3276	1	0	2	0					3
3277	1	0	2	0					3
3278	12	3	3	0	5	0	1	1	21
3279			2	0	1	0			3
4111	1	0	3	0	3	0			7
4112			6	0					6
5111	5	1	27	2	45	3			77
8311	1	0	6	0					7
8321	1	0	2	0	7	0			10
8322	2	0	2	0	3	0			7
8323	2	0	1	0	3	0			6
8331	7	2	2	0					9
9111	1	0	1	0			1	1	3
Total	**463**		**1,463**		**1,757**		**213**		**3,896**

BOWLS

Bowls have been divided into three main groups: a group with plain rims (rounded or flattened, without thickening or other modification), a group with thickened rims (e.g., bead rims), and a very small group with beveled rims.

Plain Rim, Open Profile

Type 1111—hemispherical shape
Type 1112—thick-walled, straight profile
Type 1113—flat-top rim
Type 1114—open, relatively vertical profile
Type 1115—thin-walled, straight profile
Type 1116—thick-walled
Type 1117—sinuous profile
Type 1118—thin-walled, curving profile
Type 1119—thick-walled, beveled rim

Plain Rim, Incurving Profile

Type 1121—slightly inverted rim, curving profile
Type 1122—1121 variant, curve begins closer to rim
Type 1125—thick-walled
Type 1127—thick-walled, flat-top rim

Manipulated/Thickened Rim, Open Profile

Type 1211—pinched rim
Type 1212—rim with small bead
Type 1213—beveled/thickened rim
Type 1214—beaded/thickened rim

Manipulated/Thickened Rim, Incurving Profile

Type 1221—beaded rim

Beveled Rim

Type 1311—beveled rim, open profile

GOBLETS

The goblets have been divided into three main groups: a group with plain rims, a group with thickened or manipulated rims, and a group with necks.

Plain Rim

Type 2111—straight slightly thickened profile, U-shaped body, straight rim
Type 2113—incurving rim, U-shaped body
Type 2121—flaring profile
Type 2122—flaring and slightly sinuous profile
Type 2123—angular rim

Thickened Rim

Type 2211—bead rim, slightly incurving profile
Type 2214—bead rim, incurving globular profile
Type 2215—bead rim, sinuous profile
Type 2218—bead rim, U-shaped profile
Type 2221—flat-top rim

With Necks

Type 2311—plain everted rim, globular body
Type 2321—thickened rim, globular body, S-shaped neck
Type 2322—bead rim, globular body, tall neck
Type 2323—horizontal ledge rim, globular body, tall neck

RESTRICTED VESSELS

The restricted vessels (jars and pots) have been divided into two main groups: a group with a hole-mouth shape ("pots") and a group with pronounced necks ("jars").

Hole-Mouth Pot, Plain Rim

Type 3111—flat-top rim, straight profile, nearly vertical
Type 3112—rounded (i.e., plain) rim, straight profile, nearly vertical
Type 3121—incurving profile, straight cut rim
Type 3122—incurving profile, rounded lip

Hole-Mouth Pot, Incurving Profile, Thickened Rim

Type 3131—rounded rim
Type 3132—straight cut rim
Type 3133—bead rim

Plain Rim Jar

Type 3211—everted neck, sinuous profile
Type 3212—short neck, slightly flaring
Type 3213—short vertical neck
Type 3214—tall, flaring everted neck

Thickened Rim Jar

Type 3221—everted neck, vertical face
Type 3224—vertical face, thick wall

Miscellaneous Jars

Type 3231—beveled rim, obliquely cut
Type 3232—beveled rim, obliquely cut, tall flaring neck
Type 3234—rim obliquely cut, tall vertical neck

Type 3241—grooved rim, lower ridge curving out, short neck
Type 3242—grooved rim, ridges equal, short neck
Type 3243—grooved rim, lower ridge curving in, short neck
Type 3245—collared rim
Type 3251—rim with flat top, short neck
Type 3252—rim with flat top, short vertical neck
Type 3261—plain everted rim with inside groove
Type 3271—thickened rim, tall neck
Type 3272—thickened rim, thick-walled neck
Type 3273—sloping ledge rim, tall neck
Type 3274—thickened rim, slightly flaring neck
Type 3275—bead rim, tall neck
Type 3276—bead rim, low neck
Type 3277—thickened everted rim, flaring neck
Type 3278—horizontal ledge rim, tall neck
Type 3279—bead rim, flaring neck

BI-MOUTH VESSELS

The bi-mouth vessels, only attested in Simple Ware, have been divided into two groups: a group with plain rim and small diameter and a group with plain rim and large diameter. The former group could also be called miniature bi-mouth vessels.

Type 4111—small
Type 4112[5]—large

LIDS

Type 5111—flat lid

MINIATURE VESSELS

The miniature vessels have a rim diameter smaller than 7 cm.

Type 8311—open, plain rim
Type 8321—plain rim, incurving profile
Type 8322—plain rim, low everted neck
Type 8323—plain rim, low vertical neck
Type 8331—plain rim, taller everted neck

MISCELLANEOUS

Type 9111—biconical stand, or conical "funnel" (Figure 4.17:30).

BASES (TABLE 4.4, FIGURE 4.10)

The number of bases analyzed (364) is far fewer than the number of rims (3,896), constituting 8% of the total sherds analyzed. This must be due partly to the fact that rims tend to occupy a larger area around the circumference of the vessel than bases, with rim sherds correspondingly likely to be greater in number. But the disparity is so extreme that other factors are also probably involved, particularly the difficulty in distinguishing a small sherd that derives from a rounded or flat base from a body sherd. It should be taken into consideration, however, that the sherd coders paid special attention to the body sherds in order to retrieve as many round-based fragments as possible.

The following base types were recognized:

Type 730—round
Type 731—flat
Type 732—concave
Type 735—tripod
Type 736—round, perforated
Type 737—pedestal
Type 738—disk
Type 739—ring
Type 741—footed (hollow)
Type 743—flat, "sagging" (slightly rounded)
Type 745—pointed

The most common base type in the entire corpus was flat (731, 51%), with round (730, 32%) slightly less abundant, and pointed bases (745, 10%) a distant third. Pedestal bases (737) and ring bases (739) trailed far behind, each represented by only 6 sherds and constituting less than 2% of the base corpus, and the other types were represented by one to three sherds each.

LUGS AND HANDLES (FIGURES 4.11–4.12)

Sherds with lugs and/or handles totaled 307, constituting 7% of the analyzed diagnostic sample. The great majority of these examples had lugs, while handles were quite rare (14 sherds). The typology follows:

Type 701—handle, circular in section
Type 703—handle, oval/flattened in section
Type 709—handle with double wide groove
Type 713—triangular lug
Type 714—horizontal ledge/lug below rim
Type 715—pierced lug
Type 719—knob lug/handle
Type 720—crescent/horseshoe lug
Type 721—concave ledge handle/lug
Type 722—horizontal ledge/lug at rim
Type 723—crescent/horseshoe lug inside rim
Type 724—loop handle with knob on end
Type 725—ledge handle/lug inside rim
Type 726—rectangular loop handle

TABLE 4.4. Base Types by Level: Raw Counts and Percentages of Types (%) Out of All Base Sherds in Level.

Base	2	%	3	%	4	%	5	%	Total
730	39	49	46	30	33	27			118
731	30	38	75	48	75	61	5	83	185
732			1	1					1
735					1	1			1
736	2	3			1	1			3
737	4	5	1	1	1	1			6
738	1	1	1	1			1	17	3
739			4	3	2	2			6
741	1	1	1	1	1	1			3
743	1	1			1	1			2
745	1	1	26	17	9	7			36
Total	**79**		**155**		**124**		**6**		**364**

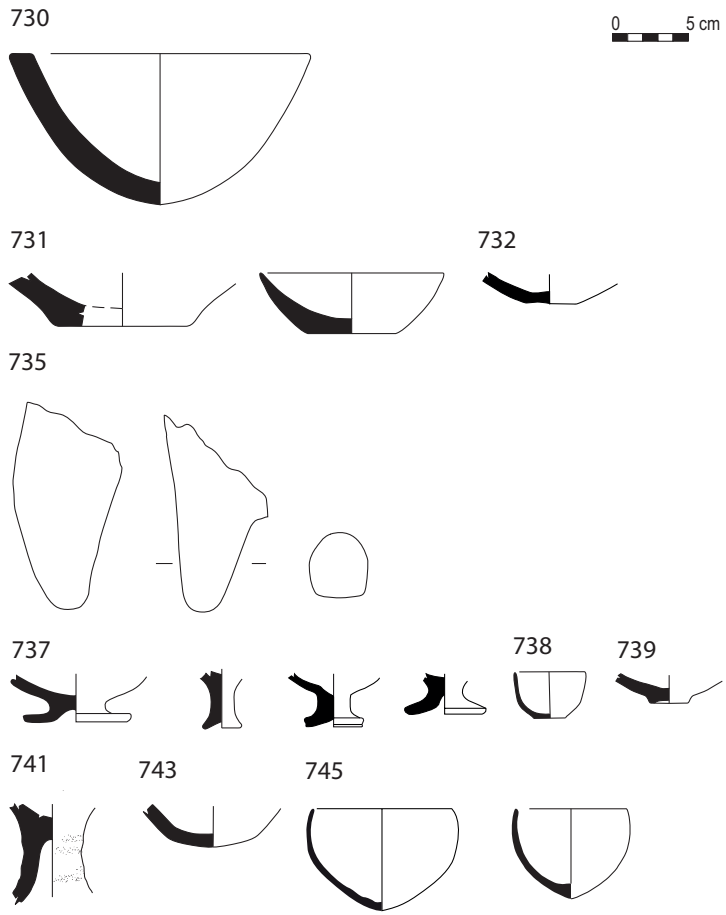

FIGURE 4.10. Base shapes 730–745.

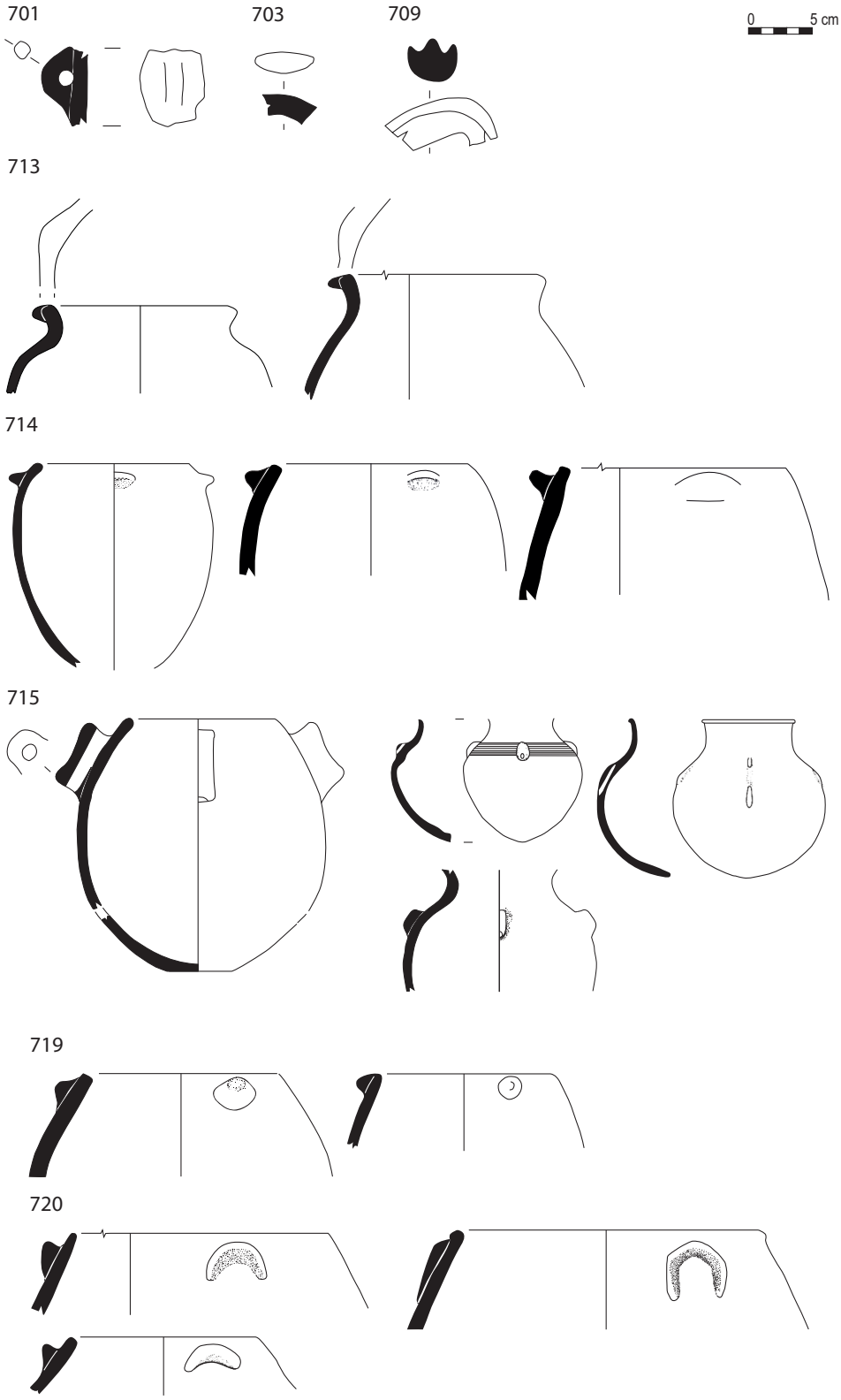

FIGURE 4.11. Lugs and handles 701–720.

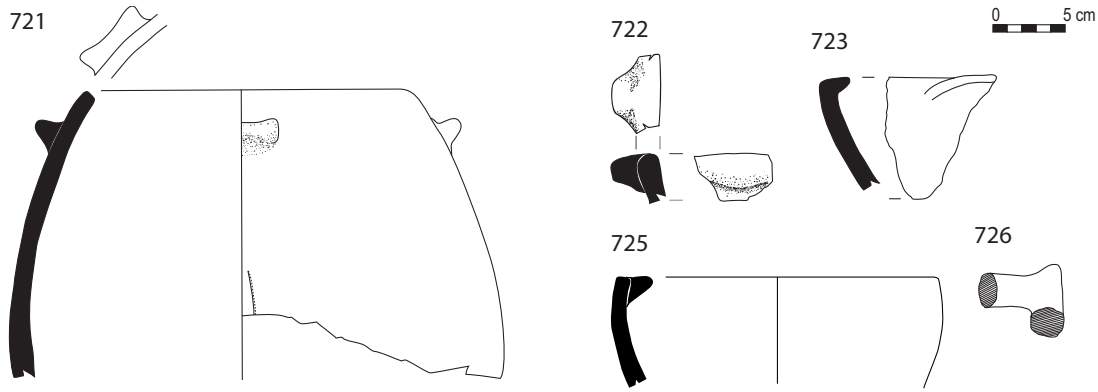

FIGURE 4.12. Lugs and handles 721–726.

SURFACE TREATMENT

Surface treatment was registered on the basis of macroscopic observation of the outer and inner surfaces of the preserved ceramic fragments. The following types were distinguished (cf. Rye 1981; Shepard 1963):

Slip was registered in cases where a thin clay layer was applied onto the surface of a sherd, making the inclusions in the body of the sherd invisible (Rice 1987: 482; Rye 1981:54). This treatment differs from wet slip or wash, which is the result of finishing the surface of a vessel with a wet hand or other device. Wash is a very thin and watery layer that leaves inclusions visible from the outer surface. We did not register wet slip because this treatment is highly associated with the manufacture of pottery in general (Rye 1981:75). The direction of the faint striations left by wiping or smoothing the vessels was registered. Faint striations are considered the result of finishing the vessel by a wet hand or any other device used for smoothing that leaves parallel striations. Sharp striations usually occur when the potter wants to make the vessel wall thinner and more even; the vessel wall is scraped with a piece of flint, wood, or metal.

Smoothing, burnishing, and polishing were other features observed on the surfaces (Rye 1981:89–90). The results of smoothing were registered as striations (sharp or faint) in parallel bands or in several directions. Burnishing or polishing was recognized as a lustrous vessel surface obtained by rubbing the leather-hard vessel with an implement, thus closing the surface pores of the clay and creating a tight coating. The occurrences of burnishing or polishing were registered according to the possible patterning in which the burnishing was applied to the surface.

Incision (Figures 4.13–4.15)

A minority of the Tell al-Raqa'i level 2–5 ceramics was decorated with incision or an applied ridge. The following typology of motifs was employed:

Type 601—dotted circles and horizontal grooves
Type 602—horizontal hatched bands (herringbone or other)
Type 603—hatched chevrons (excised)
Type 604—hatched "step"/zigzag pattern (excised)
Type 605—hatched vertical grooves (excised)
Type 606—panels (excised)
Type 607—band of oblique parallel lines
Type 608—alternating chevrons and groups of vertical lines
Type 609—hatched triangles
Type 610—impressed circles
Type 611—plant
Type 612—bird or quadruped
Type 613—undulating groove with incised dots inside
Type 614—punctate triangle
Type 615—dotted triangles
Type 617—arrows
Type 620—horizontal hatched bands with grooves
Type 622—undulating parallel lines
Type 626—oblique groups of parallel lines
Type 627—vertical parallel lines
Type 628—pendant triangles
Type 637—crosshatched triangles
Type 638—concentric triangles
Type 645—horizontal "ladder"
Type 650—applied band or ridge
Type 651—applied rope pattern
Type 653—combed band

Type 654—impressed rope
Type 656—horizontal ridges
Type 657—rocker
Type 663—horizontal groove and wavy line
Type 665—horizontal corrugation
Type 666—"pot mark"
Type 667—horizontal groove
Type 669—horizontal applied ridge and wavy line
Type 671—square impressions in a line
Type 675—604 and 605 together
Type 676—606 and 607 together
Type 677—607 and 609 together
Type 678—609 and 627 together
Type 679—610 and 611 together
Type 680—complex design (miscellaneous)
Type 681—horizontal band with chevrons below, panel motif above
Type 682—625 and 627 together
Type 683—627 and 665 together
Type 684—628 and 665 together
Type 690—605 and 665 together
Type 691—610 and 666 together
Type 701—vertical grooves with other incised motifs
Type 702—wavy line with dotted design

Painted motifs were recorded as follows:

Painting (Figure 4.16)
Type 629—pendant solid triangles
Type 631—pendant crosshatched triangles
Type 632—simple band
Type 633—horizontal ladder
Type 634—crosshatching
Type 649—Ninevite 5 crosshatch
Type 668—paint traces
Type 685—pendant solid triangle with ladders
Type 686—629 and 631 together
Type 687—pendant solid triangles, with an additional inverted "v" design
Type 688—631 and 624 together
Type 700—complex design (miscellaneous)
Type 709—hatched triangles, hatched bands, solid squares

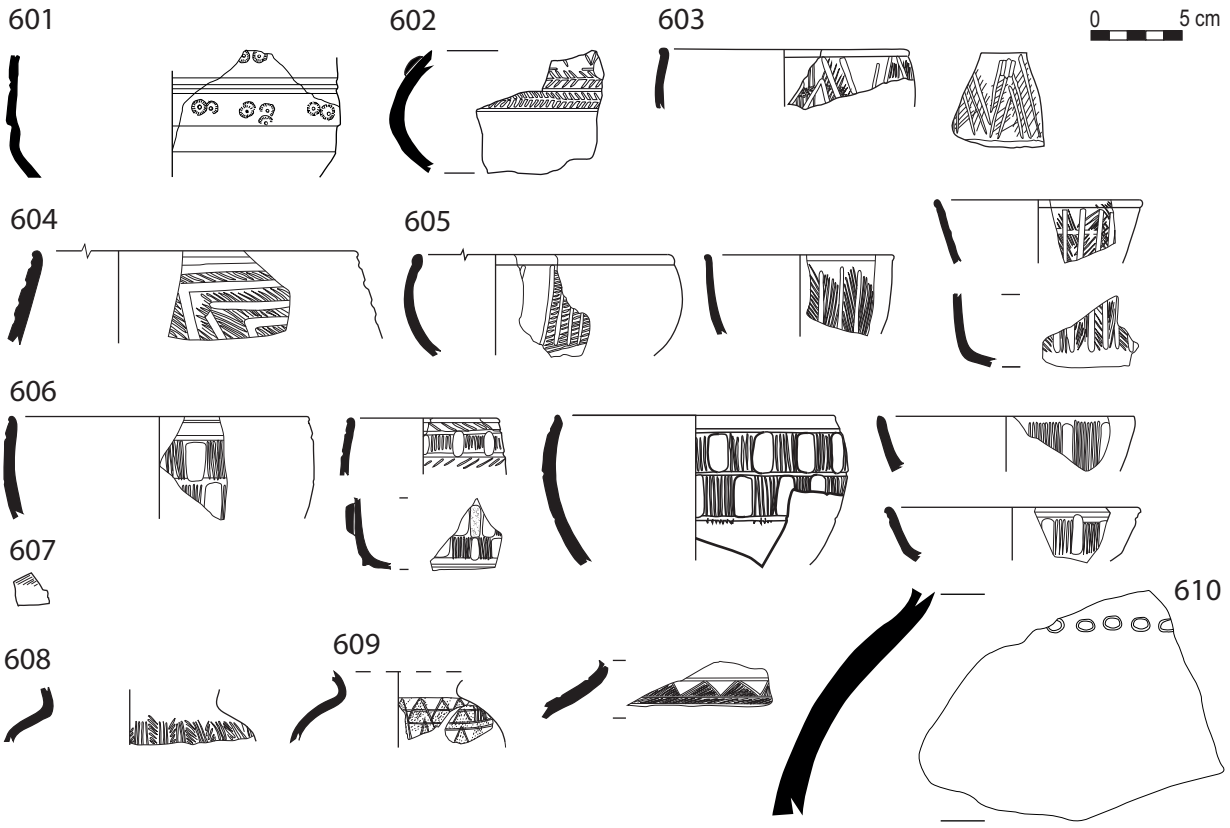

FIGURE 4.13. Incised motifs 601–610.

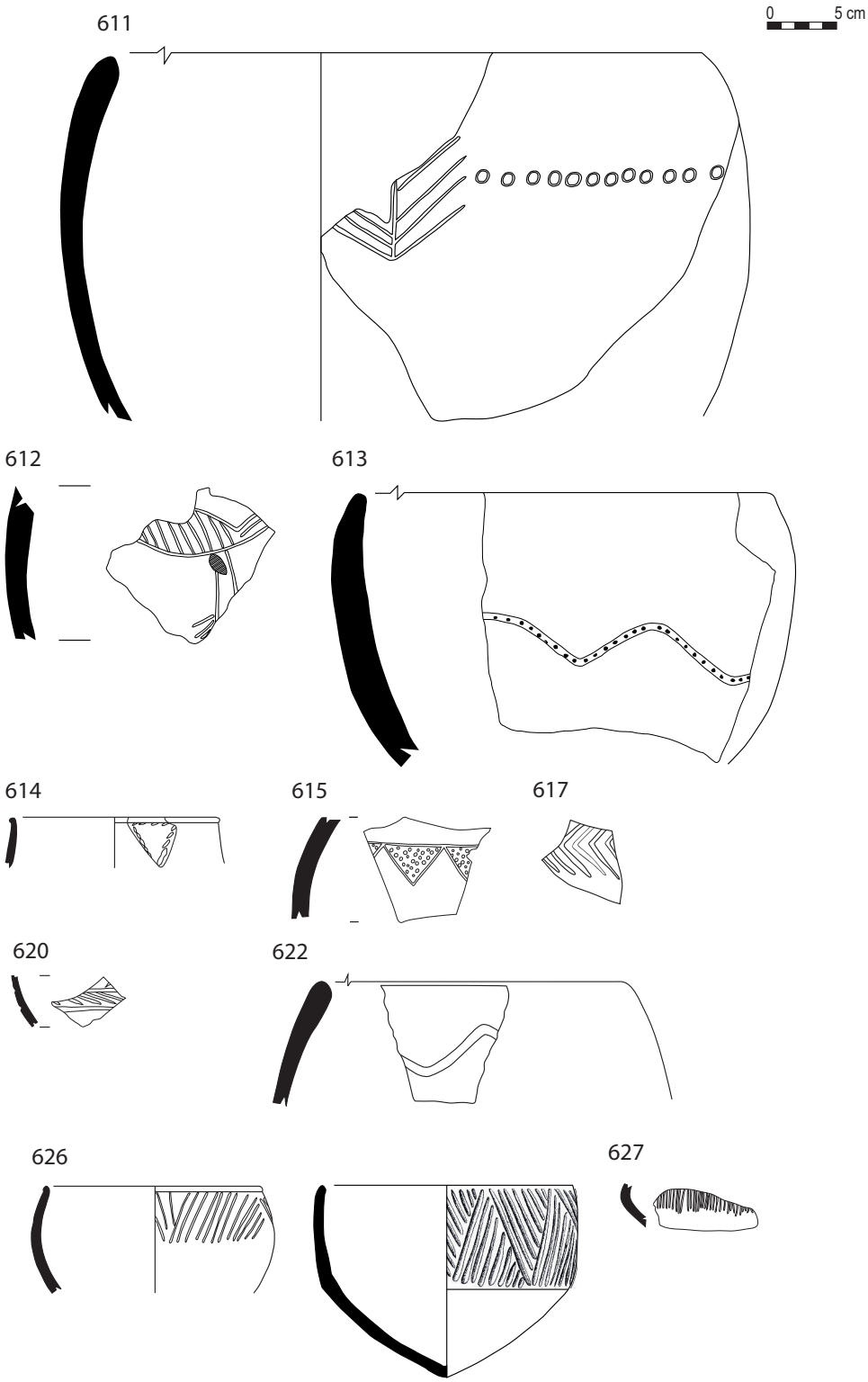

FIGURE 4.14. Incised motifs 611–627.

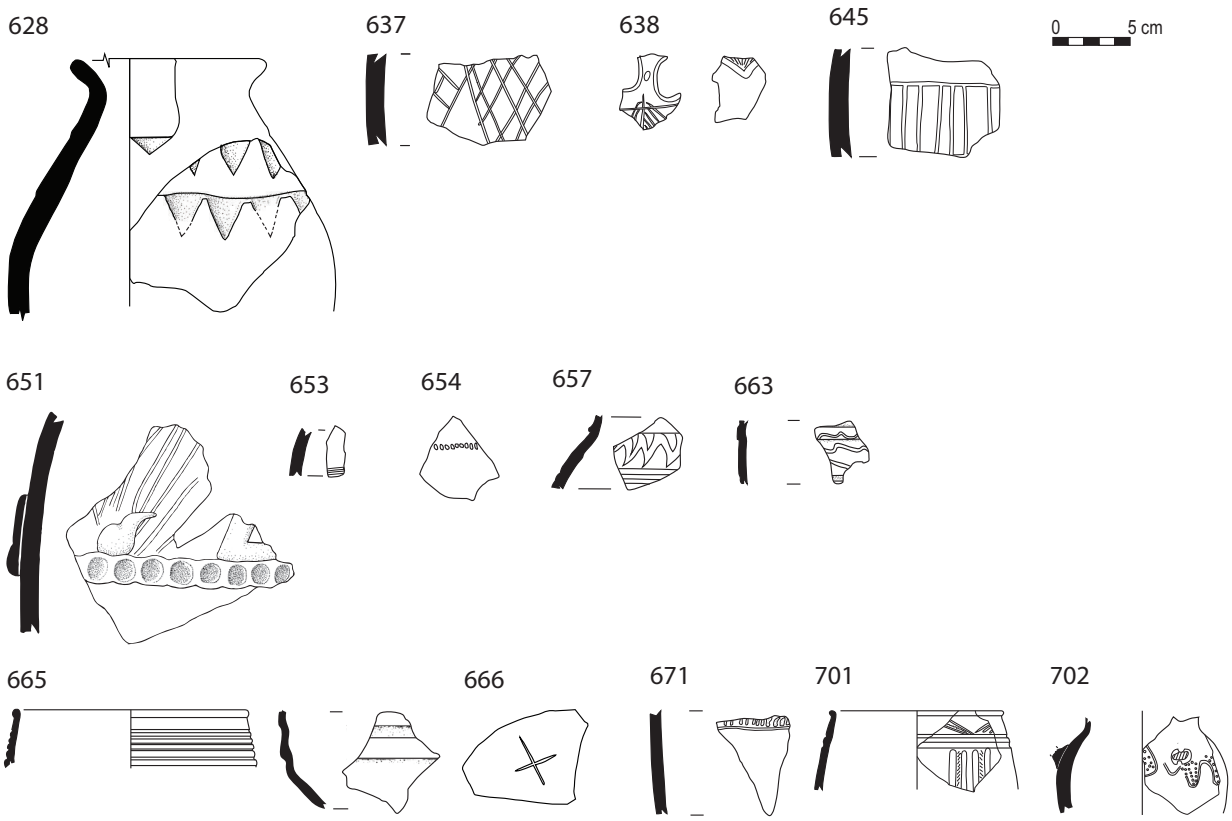

FIGURE 4.15. Incised motifs 628–702.

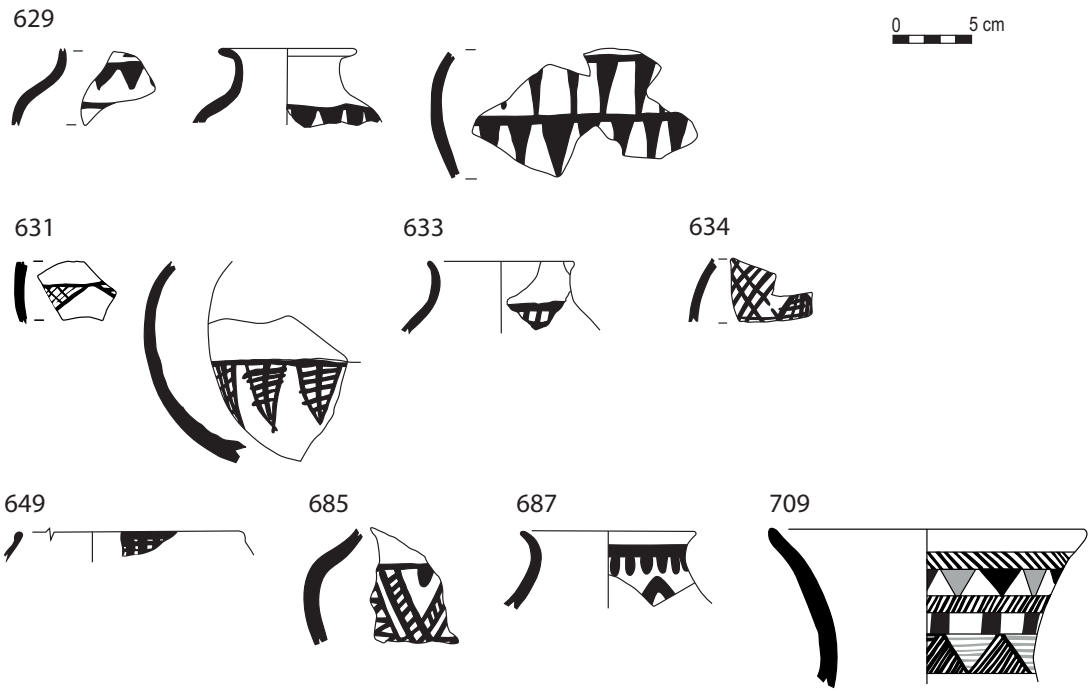

FIGURE 4.16. Painted motifs 629–709.

QUANTITATIVE ANALYSIS—CHRONOLOGICAL PATTERNS

WARE

In the diagnostic sherd corpus, the wares show significant changes in abundance through the third-millennium sequence except for Medium Simple Ware, which constitutes a consistent 14–15% of the assemblage (Table 4.5). Fine Simple Ware steadily grows in popularity from level 5 (8%) to level 2 (35%). In contrast, Cooking Ware steadily declines from its level 5 peak (52%) to a level 2 nadir (16%). Indeed, levels 4–5 are particularly characterized by their abundant Cooking Ware jars and other vessels, while the level 3 and 2 assemblages are more typified by Fine Simple Ware cups, bowls, and jars. Coarse Simple Ware, well represented throughout the sequence (26–33%) is particularly common in level 3, representing 32.9% of the level 3 coded diagnostics. Metallic Ware first appears in two examples (0.1%) in level 4, increases (1%) in level 3 and reaches its peak (4%) in level 2. Vegetal-Tempered Ware is very unusual in all levels but is most common in level 2.

Considering the shapes represented in the different wares, the following patterns are observable (Table 4.6; see also Table 4.7). In all levels, Coarse Simple Ware is predominantly made up of jars (81–93% of all Coarse Simple Ware rims), with bowls a distinct second (7–15%). Medium Simple Ware is also predominantly constituted of jars (58–68%), but with a larger percentage of bowls than Coarse Simple Ware (13– 26%) and is also found in goblets (9–13%). In all levels, Fine Simple Ware is primarily attested in goblets (54–69%), followed at a distance by bowls (24–33%) and a minority of jars (3–8%) or miniature vessels (0–8%).

Metallic Ware, generally rare but primarily attested in levels 2 and 3, is evenly distributed among bowls, goblets, and jars in level 2 but contains more bowls than goblets or jars in level 3. Vegetal-Tempered Ware, absent in level 5 and rare in other levels, is dominated by jars (60–100%).

Cooking Ware displays substantial differences in the general shape categories through time. In level 5, the ware is relatively evenly divided among jars, pots, and bowls (41%, 30%, 28%, respectively); in level 4, pots predominate (40%), but jars and bowls are also very frequent (32%, 21%, respectively). In level 3, pots assume the great majority of Cooking Ware rims (69%), but in level 2 jars and pots once again are equally common. Cooking Ware is used for lids consistently in levels 2–4.

Different ceramic characteristics may each contribute to a possible understanding of associated activities. Cooking Ware, for example, is indicative of food preparation, and pottery with elaborate decoration or finer fabrics may denote more delicate uses or higher-tier social contexts. Vessel shape may also communicate vessel function (Duistermaat 2008: 423ff.; Henrickson and McDonald 1983; Lesure 1998), with bowls and goblets used for serving and consuming food, hole-mouth pots for cooking, and medium to large jars employed for storing food and other materials. Distinctions between liquid and dry storage, and short-term and long-term storage may also be inferred from jar data, given a large enough sample of complete vessels (Duistermaat 2008). Unfortunately, such a sample is not available from the Raqa'i assemblage.

Considering the concurrences of ware and vessel shape noted above, we might conclude that Coarse and Medium Simple Ware, primarily associated with jars, were most often used for storage. On the other hand, Fine Simple Ware, primarily attested in goblet and, to a lesser extent, bowl shapes, was commonly associated with serving and consumption. Pots are, as expected, a very common shape for Cooking Ware vessels, but

TABLE 4.5. Ware Types by Level: Raw Counts and Percentages of Types (%) Out of All Sherds Coded for Ware in Level.

Ware	2	%	3	%	4	%	5	%	Total
1	139	29	542	33	503	27	54	26	1,238
2	65	14	223	14	284	15	28	14	600
3	166	35	522	32	242	13	16	8	946
4	18	4	18	1	2	0			38
5	15	3	6	0	16	1			37
6	77	16	335	20	803	43	108	52	1,323
Total	**480**		**1,646**		**1,850**		**206**		**4,182**

TABLE 4.6. General Shape Categories by Ware and Level (Percentages of Shape Categories Out of All Rim Sherds in Ware).

	Coarse (1)	Medium (2)	Fine (3)	Metallic (4)	Vegetal-Tempered (5)	Cooking (6)
Level 2						
Bowls	14	18	30	33	23	12
Goblets	1	11	54	33	—	
Pots	2	4	1	—	—	33
Jars	83	65	7	33	77	49
Lids	—	—	—	—	—	6
Miniatures	—	4	8	—	—	—
Misc.	1	—	—	—	—	—
Level 3						
Bowls	13	20	30	64	—	14
Goblets	<1	9	61	27	—	1
Pots	2.0	2	<1	—	—	69
Jars	83	68	5	—	100	8
Lids	1	—	<1	—	—	7
Miniatures	<1	—	2	9	—	<1
Misc.	<1	—	—	—	—	—
Level 4						
Bowls	15	26	24	—	20	21
Goblets	<1	11	69	50	7	1
Pots	3	3	1	—	—	40
Jars	81	58	3	50	60	32
Lids	<1	—	—	—	13	6
Miniatures	<1	2	3	—	—	<1
Misc.	—	—	—	—	—	—
Level 5						
Bowls	7	13	33	—	—	29
Goblets	—	13	58	—	—	1
Pots	—	4	—	—	—	30
Jars	93	67	8	—	—	41
Lids	—	—	—	—	—	—
Miniatures	—	—	—	—	—	—
Misc.	—	4	—	—	—	—

TABLE 4.7. General Shape Categories by Ware, Levels 2–5 Combined (Percentages of Shape Categories Out of All Rim Sherds in Ware).

	Coarse (1)	Medium (2)	Fine (3)	Metallic (4)	Vegetal-Tempered (5)	Cooking (6)
Bowls	14	22	29	42	18	19
Goblets	<1	10	62	32	3	1
Pots	2	3	1	—	—	46
Jars	83	63	5	23	73	28
Lids	1	—	<1	—	6	6
Miniatures	<1	1	4	3	—	<1
Misc.	<1	<1	—	—	—	—

other shapes such as jars and bowls are not infrequent, indicating either a diversity of related tasks or a diversity of shapes used for cooking. Small Metallic Ware jars, bowls, and goblets were ostensibly used for serving, consumption and, perhaps—in the case of jars—storage of precious liquids.

TABLE 4.8. Body Sherds, Ware by Level, Raw Counts and Percentages of Ware Types (%) Out of All Body Sherds in Level.

	Coarse Simple	Medium Simple	Fine Simple	Cooking	Cooking, Burnished	Metallic	Coarse Over-fired	Medium Over-fired	Fine Over-fired	Bitumen Coated	Incised	Total
2	3,353 (64)	765 (15)	238 (5)	538 (10)	283 (5)	39 (1)	45 (1)	8 (<1)	1 (<1)	1 (<1)	5 (<1)	5,276
3	11,865 (65)	2,758 (15)	679 (4)	2,308 (13)	507 (3)	37 (<1)	92 (1)	41 (<1)	3 (<1)	5 (<1)	21 (<1)	18,316
4	9,132 (56)	1,809 (11)	270 (2)	4,507 (27)	567 (3)	14 (1)	100 (1)	35 (<1)	0	1 (<1)	5 (<1)	16,440
5	1,394 (50)	167 (6)	8 (<1)	1,135 (41)	44 (2)	0	11 (<1)	6 (<1)	0	0	2 (<1)	2,767
Total	**25,744**	**5,499**	**1,195**	**8,488**	**1,401**	**90**	**248**	**90**	**4**	**7**	**33**	**42,799**

TABLE 4.9. Body Sherds, Ware by Level, Weights in Grams of Ware Type and Percentages of Ware Types (%) Out of All Weighed Body Sherds in Level.

	Coarse Simple	Medium Simple	Fine Simple	Cooking	Cooking, Burnished	Metallic	Coarse Over-fired	Medium Over-fired	Fine Over-fired	Bitumen coated	Incised	Total
2	115,425 (79)	8578 (6)	865 (1)	13,176 (9)	5,415 (4)	305 (<1)	1,886 (1)	45 (<1)	8 (<1)	14 (<1)	134 (<1)	145,851
3	382,374 (77)	27,604 (6)	2,618 (1)	69,278 (14)	8,766 (2)	302 (<1)	1,995 (<1)	424 (<1)	8 (<1)	127 (<1)	141 (<1)	493,637
4	504,245 (68)	22,882 (3)	1,233 (<1)	185,964 (25)	25,545 (3)	160 (<1)	3,192 (<1)	627 (<1)	0	26 (<1)	102 (<1)	743,976
5	68,362 (60)	2,476 (2)	195 (<1)	40,439 (36)	1,565 (1)	0	200 (<1)	53 (<1)	0	0	74 (<1)	113,364
Total	**1,070,406**	**61,450**	**4,911**	**308,857**	**41,291**	**767**	**7,273**	**1,149**	**16**	**167**	**451**	**1,496,828**

The recorded body sherd corpus (Table 4.8) yielded both similarities and differences with respect to patterns observed from the diagnostics. As with the diagnostics, there was a steady decline in the relative frequency of Cooking Ware sherds from level 5 to level 2, and a corresponding steady increase in Fine Simple Ware (and Metallic Ware) through time. Medium Simple Ware and Coarse Simple Ware also increased steadily through time among the body sherds, but this is not mirrored precisely in the diagnostics. The most prominent difference between the body sherd and diagnostic results is in the predominance of Coarse Simple Ware in every level in the body sherd corpus, while sherds of that ware predominate only in level 3 among the diagnostics. The reasons for this difference cannot be certain, but it may be that large, coarse vessels yielded far more body sherds, relative to other wares, than they did diagnostics.

The results of the weighed body sherds (Table 4.9) are consistent with those of the counted sherds in terms of diachronic patterns in changing ware abundances. The main difference from the counted sherds is that the percentages of Cooking Ware and Coarse Simple Ware are generally higher per level than among the counted sherds. Thus Cooking Ware and Coarse Simple Ware sherds weigh more on average than those of other wares and overshadow other wares in the relative frequencies of weights per level.

RIM/VESSEL SHAPE

The patterns observable in rim and vessel shape relative frequencies, in types with significant numbers of examples, usually consist of steady rise, steady decline, or equilibrium, rather than abrupt changes in one direction or another. As such, they largely conform to battleship curve configurations, where pottery styles change gradually over time (see Table 4.3).

Among the bowl forms, open simple-rim thin-walled bowls (1111, 1114, 1118), usually in Fine Simple Ware (see Tables 4.10–4.14), rise steadily through time.

TABLE 4.10. Rim Types by Ware, Level 2: Raw Counts and Percentages (%) Out of All Sherds in Ware Type (C) and Out of All Sherds Coded for Rim Type (R).

Rim	1	C %	R %	2	C %	R %	3	C %	R %	4	C %	R %	5	C %	R %	6	C %	R %	Total
1111	6	5	43	4	7	29	2	1	14				1	8	7	1	2	7	14
1114							6	4	100										6
1116	1	1	14													6	9	86	7
1118							5	4	100										5
1119	1	1	100																1
1121	8	7	32	1	2	4	12	9	48	1	6	4	2	15	8	1	2	4	25
1127	1	1	100																1
1211							5	4	100										5
1212				1	2	100													1
1214							2	1	40	3	17	60							5
1221				3	5	19	11	8	69	2	11	13							16
1311				1	2	100													1
2111							36	26	97	1	6	3							37
2113	1	1	8				11	8	92										12
2121							2	1	50	2	11	50							4
2211							10	7	100										10
2215							3	2	100										3
2218							3	2	100										3
2311				4	7	40	6	4	60										10
2321				1	2	20	3	2	60	1	6	20							5
2322				1	2	33	2	1	67										3
2323										2	11	100							2
3112				1	2	100													1
3121				1	2	20	1	1	20							3	5	60	5
3122	1	1	6													15	22	94	16
3131	1	1	33													2	3	67	3
3132																2	3	100	2
3211	22	18	44	8	14	16							2	15	4	18	27	36	50
3212																2	3	100	2
3221	22	18	63	13	23	37													35
3224	2	2	50	2	4	50													4
3231	9	7	82	1	2	9							1	8	9				11
3232							1	1	100										1
3234	1	1	100																1
3241	8	7	80	1	2	10							1	8	10				10
3242	17	14	94	1	2	6													18
3243	5	4	56	4	7	44													9
3245	4	3	50	2	4	25							2	15	25				8
3251													1	8	100				1
3261	5	4	83										1	8	17				6
3271	3	3	27	4	7	36							2	15	18	2	3	18	11
3272	1	1	100																1
3273										1	6	100							1
3274																11	16	100	11

Continued on following page

TABLE 4.10. Rim Types by Ware, Level 2 (*continued*).

Rim	1	C %	R %	2	C %	R %	3	C %	R %	4	C %	R %	5	C %	R %	6	C %	R %	Total
3275							1	1	100										1
3276	1	1	100																1
3277							1	1	100										1
3278							7	5	58	5	28	42							12
4111				1	2	100													1
5111																4	6	100	4
8311							1	1	100										1
8321							1	1	100										1
8322							2	1	100										2
8323				1	2	50	1	1	50										2
8331				1	2	14	6	4	86										7
9111	1	1	100																1
Total	**121**			**57**			**141**			**18**			**13**			**67**			**417**

Note: C = column; R = row.

TABLE 4.11. Rim Types by Ware, Level 3: Raw Counts and Percentages (%) Out of All Sherds in Ware Type (C) and Out of All Sherds Coded for Rim Type (R).

Rim	1	C %	R %	2	C %	R %	3	C %	R %	4	C %	R %	5	C %	R %	6	C %	R %	Total
1111	18	4	49	11	6	30	5	1	14							3	1	8	37
1112																1	0	100	1
1114	2	0	29				5	1	71										7
1115							2	1	100										2
1116	2	0	6	1	1	3										30	10	91	33
1117	1	0	100																1
1118							6	2	100										6
1121	41	8	53	18	9	23	14	3	18							5	2	6	78
1122				1	1	100													1
1125	1	0	33													2	1	67	3
1127																1	0	100	1
1211				3	2	50	3	1	50										6
1212							1	0	100										1
1213							1	0	100										1
1214	1	0	13				3	1	38	3	27	38				1	0	13	8
1221				5	3	5	83	20	90	4	36	4							92
1311	1	0	100																1
2111				3	2	4	67	17	96										70
2113				2	1	4	47	12	94							1	0	2	50
2121							4	1	67	1	9	17				1	0	17	6
2122							3	1	75	1	9	25							4
2123							2	1	100										2
2211				3	2	4	70	17	96										73
2214							3	1	100										3
2221	1	0	50				1	0	50										2

TABLE 4.11, *continued.*

Rim	1	C %	R %	2	C %	R %	3	C %	R %	4	C %	R %	5	C %	R %	6	C %	R %	Total
2311				8	4	22	27	7	75	1	9	3							36
2321							18	4	100										18
2322				1	1	17	5	1	83										6
2323							3	1	100										3
3111	2	0	33													4	1	67	6
3112	1	0	8													11	4	92	12
3121	2	0	8													24	8	92	26
3122	5	1	3	4	2	2	1	0	1							158	53	94	168
3131																2	1	100	2
3132							1	0	13							7	2	88	8
3133																1	0	100	1
3211	173	34	70	58	30	24	7	2	3				1	17	0	7	2	3	246
3212				1	1	11										8	3	89	9
3213																1	0	100	1
3221	75	15	71	25	13	24	1	0	1				3	50	3	1	0	1	105
3224	2	0	100																2
3231	76	15	81	14	7	15	2	1	2							2	1	2	94
3232	1	0	100																1
3234	10	2	83	1	1	8	1	0	8										12
3241	31	6	74	9	5	21	1	0	2				1	17	2				42
3242	20	4	63	9	5	28	2	1	6				1	17	3				32
3243	11	2	61	7	4	39													18
3251	4	1	100																4
3252																1	0	100	1
3261	2	0	67	1	1	33													3
3271	6	1	55	2	1	18	2	1	18							1	0	9	11
3272	5	1	100																5
3273	1	0	100																1
3274																4	1	100	4
3276	2	0	100																2
3277				1	1	50	1	0	50										2
3278				1	1	33	2	1	67										3
3279	1	0	100																1
4111				2	1	67	1	0	33										3
4112	5	1	83				1	0	17										6
5111	4	1	15				1	0	4							22	7	82	27
8311	2	0	33				2	1	33	1	9	17				1	0	17	6
8321							2	1	100										2
8322							2	1	100										2
8323							1	0	100										1
8331							2	1	100										2
9111	1	0	100																1
Total	**510**			**191**			**406**			**11**			**6**			**300**			**1,424**

Note: C = column; R = row.

TABLE 4.12. Rim Types by Ware, Level 4: Raw Counts and Percentages (%) Out of All Sherds in Ware Type (C) and Out of All Sherds Coded for Rim Type (R).

Rim	1	C %	R %	2	C %	R %	3	C %	R %	4	C %	R %	5	C %	R %	6	C %	R %	Total
1111	18	4	58	10	4	32	1	1	3							2	0	7	31
1112				1	0	100													1
1114				1	0	50	1	1	50										2
1115				1	0	33	2	1	67										3
1116	5	1	4	6	3	4										130	17	92	141
1117							1	1	100										1
1118				2	1	50	2	1	50										4
1119	1	0	50													1	0	50	2
1121	35	8	40	28	12	32	6	3	7				2	13	2	17	2	19	88
1122				1	0	100													1
1125																1	0	100	1
1127	1	0	25													3	0	75	4
1214				1	0	50	1	1	50										2
1221	2	0	5	6	3	15	32	17	78							1	0	2	41
1311	7	2	58	4	2	33							1	7	8				12
2111	1	0	7	1	0	7	11	6	79							1	0	7	14
2113				5	2	12	34	18	81	1	50	2				2	0	5	42
2121							6	3	100										6
2122							1	1	100										1
2123							4	2	100										4
2211				1	0	3	34	18	97										35
2214							1	1	100										1
2215				3	1	50	2	1	33							1	0	17	6
2221				1	0	50	1	1	50										2
2311				11	5	31	22	12	61				1	7	3	2	0	6	36
2321				1	0	13	7	4	88										8
2322				2	1	25	6	3	75										8
3111	1	0	6													16	2	94	17
3112	2	0	9	1	0	5										19	3	86	22
3121	1	0	2	1	0	2										53	7	96	55
3122	8	2	4	6	3	3	1	1	1							202	27	93	217
3131																2	0	100	2
3132																1	0	100	1
3133	1	0	10													9	1	90	10
3211	180	39	44	78	33	19	1	1	0				4	27	1	145	19	36	408
3212	3	1	5	1	0	2										54	7	93	58
3213	2	0	13	1	0	6										13	2	81	16
3214																1	0	100	1
3221	14	3	64	4	2	18	1	1	5				3	20	14				22
3224	1	0	50													1	0	50	2
3231	87	19	73	18	8	15	1	1	1							13	2	11	119
3232	2	0	67	1	0	33													3
3234	17	4	77	5	2	23													22
3241	31	7	86	4	2	11										1	0	3	36
3242	3	1	75	1	0	25													4
3243	1	0	25	2	1	50							1	7	25				4
3251	8	2	42	2	1	11										9	1	47	19
3252																1	0	100	1
3261	1	0	100																1
3271	16	4	49	15	6	46							1	7	3	1	0	3	33
3272	4	1	80	1	0	20													5

TABLE 4.12, *continued.*

Rim	1	C %	R %	2	C %	R %	3	C %	R %	4	C %	R %	5	C %	R %	6	C %	R %	Total
3273				2	1	100													2
3274																3	0	100	3
3275																1	0	100	1
3278							2	1	67	1	50	33							3
3279	1	0	100																1
4111				2	1	100													2
5111	2	0	4										2	13	4	41	6	91	45
8321	1	0	14	3	1	43	3	2	43										7
8322							3	2	100										3
8323				2	1	67										1	0	33	3
Total	**457**			**236**			**187**			**2**			**15**			**748**			**1,645**

Note: C = column; R = row.

TABLE 4.13. Rim Types by Ware, Level 5: Raw Counts and Percentages (%) Out of All Sherds in Ware Type (C) and Out of All Sherds Coded for Rim Type (R).

Rim	1	C %	R %	2	C %	R %	3	C %	R %	6	C %	R %	Total
1111				1	4	33				2	2	67	3
1116										19	19	100	19
1117							1	8	100				1
1121							1	8	14	6	6	86	7
1122	1	2	100										1
1127										1	1	100	1
1214				1	4	50				1	1	50	2
1221	1	2	33				2	17	67				3
1311	1	2	50	1	4	50							2
2111							1	8	100				1
2113				1	4	33	1	8	33	1	1	33	3
2211							3	25	100				3
2311				2	8	67	1	8	33				3
2322							1	8	100				1
3112										5	5	100	5
3121										7	7	100	7
3122				1	4	6				17	17	94	18
3133										1	1	100	1
3211	13	29	30	11	46	26				19	19	44	43
3212	2	4	15							11	11	85	13
3213										5	5	100	5
3221	2	4	33	4	17	67							6
3231	13	29	77							4	4	24	17
3234	2	4	100										2
3241	1	2	100										1
3245	1	2	100										1
3251										3	3	100	3
3271	4	9	100										4
3272	4	9	100										4
3273							1	8	100				1
3278				1	4	100							1
9111				1	4	100							1
Total	**45**			**24**			**12**			**102**			**183**

Note: C = column; R = row.

TABLE 4.14. Rim Types by Ware, Levels 2–5: Raw Counts and Percentages (%) Out of All Sherds in Ware Type (C) and Out of All Sherds Coded for Rim Type (R).

Rim	1	C %	R %	2	C %	R %	3	C %	R %	4	C %	R %	5	C %	R %	6	C %	R	Total
1111	42	4	49	26	5	31	8	1	9				1	3	1	8	1	9	85
1112				1	0	50										1	0	50	2
1114	2	0	13	1	0	7	12	2	80										15
1115				1	0	20	4	1	80										5
1116	8	1	4	7	1	4										185	15	93	200
1117	1	0	33				2	0	67										3
1118				2	0	13	13	2	87										15
1119	2	0	67													1	0	33	3
1121	84	7	42	47	9	24	33	4	17	1	3	1	4	12	2	29	2	15	198
1122	1	0	33	2	0	67													3
1125	1	0	25													3	0	75	4
1127	2	0	29													5	0	71	7
1211				3	1	27	8	1	73										11
1212				1	0	50	1	0	50										2
1213							1	0	100										1
1214	1	0	6	2	0	12	6	1	35	6	19	35				2	0	12	17
1221	3	0	2	14	3	9	128	17	84	6	19	4				1	0	1	152
1311	9	1	56	6	1	38							1	3	6				16
2111	1	0	1	4	1	3	115	15	94	1	3	1				1	0	1	122
2113	1	0	1	8	2	8	93	13	87	1	3	1				4	0	4	107
2121							12	2	75	3	10	19				1	0	6	16
2122							4	1	80	1	3	20							5
2123							6	1	100										6
2211				4	1	3	117	16	97										121
2214							4	1	100										4
2215				3	1	33	5	1	56							1	0	11	9
2218							3	0	100										3
2221	1	0	25	1	0	25	2	0	50										4
2311				25	5	29	56	8	66	1	3	1	1	3	1	2	0	2	85
2321				2	0	7	28	4	90	1	3	3							31
2322				4	1	22	14	2	78										18
2323							3	0	60	2	7	40							5
3111	3	0	13													20	2	87	23
3112	3	0	8	2	0	5										35	3	88	40
3121	3	0	3	2	0	2	1	0	1							87	7	94	93
3122	14	1	3	11	2	3	2	0	1							392	32	94	419
3131	1	0	14													6	1	86	7
3132							1	0	9							10	1	91	11
3133	1	0	8													11	1	92	12
3211	388	34	52	155	31	21	8	1	1				7	21	1	189	16	25	747
3212	5	0	6	2	0	2										75	6	92	82
3213	2	0	9	1	0	5										19	2	86	22
3214																1	0	100	1
3221	113	10	67	46	9	27	2	0	1				6	18	4	1	0	1	168
3224	5	0	63	2	0	25										1	0	13	8
3231	185	16	77	33	7	14	3	0	1				1	3	0	19	2	8	241
3232	3	0	60	1	0	20	1	0	20										5

TABLE 4.14, *continued.*

Rim	1	C %	R %	2	C %	R %	3	C %	R %	4	C %	R %	5	C %	R %	6	C %	R	Total
3234	30	3	81	6	1	16	1	0	3										37
3241	71	6	80	14	3	16	1	0	1				2	6	2	1	0	1	89
3242	40	4	74	11	2	20	2	0	4				1	3	2				54
3243	17	2	55	13	3	42							1	3	3				31
3245	5	0	56	2	0	22							2	6	22				9
3251	12	1	44	2	0	7							1	3	4	12	1	44	27
3252																2	0	100	2
3261	8	1	80	1	0	10							1	3	10				10
3271	29	3	49	21	4	36	2	0	3				3	9	5	4	0	7	59
3272	14	1	93	1	0	7													15
3273	1	0	20	2	0	40	1	0	20	1	3	20							5
3274																18	2	100	18
3275							1	0	50							1	0	50	2
3276	3	0	100																3
3277				1	0	33	2	0	67										3
3278				2	0	11	11	2	58	6	19	32							19
3279	2	0	100																2
4111				5	1	83	1	0	17										6
4112	5	0	83				1	0	17										6
5111	6	1	8				1	0	1				2	6	3	67	6	88	76
8311	2	0	29				3	0	43	1	3	14				1	0	14	7
8321	1	0	10	3	1	30	6	1	60										10
8322							7	1	100										7
8323				3	1	50	2	0	33							1	0	17	6
8331				1	0	11	8	1	89										9
9111	2	0	67	1	0	33													3
Total	**1,133**			**508**			**746**			**31**			**34**			**1,217**			**3,669**

Note: C = column; R = row.

Thin-walled bowls with slightly incurving simple rims (1121), attested in a variety of wares, rise from a 3% relative frequency in level 5 to 5–6% in levels 2–4. In contrast, thick-walled simple-rim bowls (1116), usually in Cooking Ware, decline significantly after a period of popularity in levels 4–5. The latter trend is associated with the decline of thick-walled cooking vessels through the sequence. Likewise, Coarse and Medium Simple Ware beveled rims (1311) decline from levels 4–5 to levels 3–2. The thin-walled bowl with slightly incurving bead rim (1221), usually in Fine Simple Ware, diverges from the usual pattern of steady rise or fall, rising steadily from level 5 to 3 and then falling in level 2.

In general, goblets, usually in Fine Simple Ware, increase in popularity through the sequence. Rising steadily in popularity are the open simple-rim goblet (2111), and the simple-rim goblet with flaring profile (2121).

Jars with everted necks are found primarily in Coarse Simple and, to a lesser extent, Medium Simple Wares (an exception being the low-necked flat rim jar 3251, in Coarse Simple and Cooking Wares). Jars with everted necks and squared-off or grooved rims increase in popularity through the sequence (types 3221, 3242, 3243). In contrast, the low-necked everted flat rim jar (3251), found primarily in Coarse Simple and Cooking Wares, declines consistently from level 5 to 2, and the low-necked, everted beveled-rim jar (3231) declines steadily from levels 5–3 and drops significantly in level 2. Jars with low everted necks and straight-cut rims (3212) and jars with a low vertical neck and rounded lip (3213), primarily attested in Cooking Ware, also decline steadily.

The collared-rim jar (3245) is almost exclusively a level 2 type. Similarly, the low-necked jar with a simple rim thickened at the top (3274), found exclusively in Cooking Ware, rises slightly from levels 4 to 3 but is much more common in level 2.

The vast majority of hole-mouth pots are found in Cooking Ware. Examples with plain rims and vertical profiles (3111, 3112) display a general pattern of decline through the sequence, along with hole-mouth pots with incurving profiles and squared-off rims (3121). In a slight variation, hole-mouth pots with incurving profiles and rounded lips (3122) increase in popularity from levels 5 to 4 and then decline thereafter. Also exhibiting a steady decrease in popularity are jars with tall everted necks (3211), the most common jar type in the sequence, and attested in a variety of wares. Lids (5111), usually in Cooking Ware, are most common by far in levels 4 and 3; no examples were attested in level 5.

Rim sherds are the most common diagnostic type in all levels (Table 4.15). Although it would be useful to consider the patterns of chronological change exhibited by complete vessels, since the entire vessel shape is represented, the small sample of complete vessels or complete profiles (n = 110), most of which derive from graves (see below), makes conclusions on trends through time unreliable.

Considering the general vessel shape categories (Table 4.16), we can observe that the percentage of bowls remains more or less constant throughout the sequence (19–22%), but there is a steady increase in the frequency of goblets, from 5% to 20%. Pots reach a maximum of 19% in level 4, then decline to 6% in level 2. Jars are the most frequent shape type in all levels, but the small level 5 sample has a significantly larger percentage than that of the other levels.

TABLE 4.15. Rim Sherds per Level.

Level	Percentage out of all coded sherds	Rim sherds/total coded sherds
2	86	463/536
3	86	1,463/1,697
4	89	1,757/1,976
5	88	213/242

BASES

The two most common base types are round and flat, found in all wares with the exception of Vegetal-Tempered Ware, which yielded only one base sherd, in the flat category (Tables 4.4, 4.17–4.20). The two types have inverse trends of popularity (Table 4.4). Flat bases (731) are most common in level 5 and decline steadily until level 2, while round bases (730) are absent from level 5 and then slowly build in popularity to a peak in level 2. Pointed bases (745), particularly associated with Fine Simple Ware cups and jars, are almost exclusively restricted to levels 4 (7%) and 3 (17%). Pedestal bases (737) and footed (hollow) bases (741) are quite rare, as are ring bases (six examples only), which are restricted to levels 3–4. The small sample (six examples) of bases from level 5 is remarkable but consistent with the small number of sherds from that level.

In general, the number of Cooking Ware bases is smaller than expected, given the relative frequencies of Cooking Ware. In level 4, for example, 46% of the rim sherds were Cooking Ware (747/1638), while only 15% of the base sherds were Cooking Ware (17/117). This pattern may be due to the difficulty in differentiating small sherds from round bases of Cooking Ware vessels from Cooking Ware body sherds. On the other hand, Cooking Ware, especially common in level 4, is most often represented by flat bases in that level.

TABLE 4.16. General Shape Categories, Levels 2–5: Proportion of Total Rim Sherds in Level, Raw Counts/Total Rims per Level.

Shape	Level 2	Level 3	Level 4	Level 5
Bowls	22% (102/463)	19% (283/1463)	20% (356/1757)	20% (42/213)
Goblets	20% (92/463)	19% (277/1463)	9% (166/1757)	5% (11/213)
Pots	6% (27/463)	15% (224/1463)	19% (330/1757)	15% (32/213)
Jars	48% (222/463)	43% (629/1463)	48% (844/1757)	60% (127/213)
Bi-mouth	0.2% (1/463)	0.6% (9/1463)	0.1% (3/1757)	0
Lids	1% (5/463)	2% (27/1463)	3% (45/1757)	0
Miniatures	3% (13/463)	0.9% (13/1463)	1% (13/1757)	0
Misc.	0.2% (1/463)	.007% (1/1463)	0	0.5% (1/213)

The amount of base sherds per level relative to the entire analyzed sherd sample per level is presented on Table 4.21. Considering the numbers on that table, we observe a steadily increasing frequency of base sherds from the earliest to the latest levels. This is a curious trend, since the percentage of round bases increases from levels 5 to 2 as well, and one would expect round bases to be under-represented in the sample, given the difficulty of distinguishing a small round-based sherd from a body sherd. It is likely that the steady increase of bases is related to the profusion of burials in levels 3 and (especially) 2, containing complete vessels with intact bases. This suggestion is supported by the predominance of Fine Simple Ware bases in levels 2 and 3.

TABLE 4.17. Base Types by Ware, Level 2: Raw Counts and Percentages (%) Out of All Sherds in Ware Type (C) and Out of All Sherds Coded for Base Type (R).

Base	1	C %	R %	2	C %	R %	3	C %	R %	4	C %	R %	5	C %	R %	6	C %	R %	Total
730				9	69	24	23	44	61	5	83	13				1	50	3	38
731				3	23	11	23	44	82	1	17	4	1	100	4				28
736	1	50	50													1	50	50	2
737							4	8	100										4
738							1	2	100										1
741	1	50	100																1
743				1	8	100													1
745							1	2	100										1
Total	**2**			**13**			**52**			**6**			**1**			**2**			**76**

Note: C = column; R = row.

TABLE 4.18. Base Types by Ware, Level 3: Raw Counts and Percentages (%) Out of All Sherds in Ware Type (C) and Out of All Sherds Coded for Base Type (R).

Base	1	C %	R %	2	C %	R %	3	C %	R %	4	C %	R %	6	C %	R %	Total
730	4	31	9	9	30	20	28	27	62	4	67	9				45
731	8	62	11	18	60	24	45	44	60	2	33	3	2	100	3	75
732							1	1	100							1
737							1	1	100							1
738							1	1	100							1
739	1	8	25				3	3	75							4
741							1	1	100							1
745				3	10	12	23	22	89							26
Total	**13**			**30**			**103**			**6**			**2**			**154**

Note: C = column; R = row.

TABLE 4.19. Base Types by Ware, Level 4: Raw Counts and Percentages (%) Out of All Sherds in Ware Type (C) and Out of All Sherds Coded for Base Type (R).

Base	1	C %	R %	2	C %	R %	3	C %	R %	6	C %	R %	Total
730	8	31	25	12	32	38	9	24	28	3	18	9	32
731	15	58	22	23	62	33	19	51	28	12	71	17	69
735	1	4	100										1
736							1	3	100				1
737	1	4	100										1
739				1	3	50				1	6	50	2
741	1	4	100										1
743										1	6	100	1
745				1	3	11	8	22	89				9
Total	**26**			**37**			**37**			**17**			**117**

Note: C = column; R = row.

TABLE 4.20. Base Types by Ware, Level 5: Raw Counts and Percentages (%) Out of All Sherds in Ware Type (C) and Out of All Sherds Coded for Base Type (R).

Base	1	C %	R %	2	C %	R %	Total
731	3	75	75	1	100	25	4
738	1	25	100				1
Total	**4**			**1**			**5**

Note: C = column; R = row.

TABLE 4.21. Base Sherds per Level.

Level	Percentage out of all coded sherds	Base sherds/ total coded sherds
2	15	79/536
3	9	155/1,697
4	6	124/1,976
5	2	6/242

INCISION

The percentage of sherds with incised decoration is small (3–5%) in all levels (Tables 4.22–4.24), but one observes a slight rise in levels 3 and 2. Within our sherd sample, level 3 is clearly the high point for Ninevite 5 incised sherds, which constitute 4% of all coded diagnostic sherds from the level, as opposed to 1% in the other three levels (Table 4.23). While level 2 has a larger percentage of incised sherds than levels 4 or 5, most of the coded incised examples display non-Ninevite 5 types such as plant motifs (611), animal motifs (612), combed designs (653), and pot marks (666). The seven Ninevite 5 incised sherds present in level 2 are mainly small specimens that could have been derived from mudbrick debris and might be understood as "residual" from earlier levels, although it is possible that the tradition of Ninevite 5 incising still persisted in level 2.

In general, "excised" motifs (603, 604, 605, 606, 675, 676, 690), with deep grooving and light incising between the grooves, are mainly found in level 3, although some examples derive from preceding and succeeding levels. Levels 4 and 5 are more likely to have Ninevite 5 simple incised (i.e., non-excised) motifs.

PAINTING

Painted decoration on pottery is considerably rarer in the Raqa'i assemblage than incised decoration but is most common in levels 5 and 4 (Tables 4.25–4.26). Triangle- and ladder-painted pottery (Boileau 2005; Rova 2000:234) (types 629, 631, 685–688) is only found in levels 4–5, and most of the painted sherds from those two levels are examples of that variety, characterized by sand temper with red, brown, or reddish-brown paint. Although rim sherds are rarely preserved, they tend to derive from everted neck jars or goblets with simple rims (Figure 4.17:8, and Figure 4.22:2).

Boileau's technical analysis of examples of this group revealed that the paste was not local to the Tell 'Atij region and that the vessels must have been imported from elsewhere (Boileau 2005). Since 'Atij is only 2 km south of Raqa'i, the same is likely to apply to the Raqa'i sherds. Nevertheless, this pottery type is likely to have been produced somewhere in the Khabur area, given its site distribution in the middle Khabur and in the vicinity of the wadis Aweij and Khanzir in the upper Khabur.

Although some similarities to Karababa Painted Ware in southeastern Anatolia have been observed, particularly to what is identified as its earlier manifestations (Marro and Helwing 1995; Rova 2000; Schwartz 1985:60, n. 43), the two wares are by no means identical (Schwartz 2001:263; *contra* Klengel-Brandt, Kulemann, and Martin 2005:101). For example, solid triangles in Triangle- and ladder-painted vessels are pendant, pointing down, while those in Karababa painted ware generally point upwards.

One or two sherds can be identified as Ninevite 5 painted, one (Figure 4.17:4) from level 5 and one from level 4 (Figure 4.22:9). Jezirah bichrome decoration, well-known from Chuera, Bderi, Brak, and Mozan (Rova 2000), is present on a stand from level 2 (Figure 4.38:1). Other painted examples are from small sherd fragments.

TABLE 4.22. Incised Sherds per Level.

Level	Percentage out of all coded diagnostics	Incised sherds/ total coded sherds
2	5	28/536
3	5	91/1,697
4	3	57/1,976
5	4	9/242

TABLE 4.23. Ninevite 5 Incised Sherds per Level.

Level	Percentage out of all coded diagnostics	Incised sherds/ total coded sherds
2	1	7/536
3	4	71/1,697
4	1	26/1,976
5	1	3/242

TABLE 4.24. Incised Types by Level: Raw Counts and Percentages (%) Out of All Incised Sherds in Level (C) and Out of All Sherds Coded for Incised Type (R).

Incision	2	C %	R %	3	C %	R %	4	C %	R %	5	C %	R %	Total
601							3	5	100				3
602				2	2	67	1	2	33				3
603				1	1	100							1
604	3	11	11	22	24	79	2	4	7	1	11	4	28
605	2	7	25	6	7	75							8
606	1	4	5	15	17	79	3	5	16				19
607				2	2	67	1	2	33				3
608	1	4	33	2	2	67							3
609				1	1	100							1
610				1	1	100							1
611	2	7	100										2
612	2	7	67				1	2	33				3
613	1	4	100										1
614							1	2	100				1
615										2	22	100	2
620							1	2	100				1
622	1	4	100										1
626	1	4	20	3	3	60	1	2	20				5
627				6	7	75	2	4	25				8
628				1	1	50	1	2	50				2
637	1	4	17	1	1	17	3	5	50	1	11	17	6
638				2	2	100							2
645	1	4	50	1	1	50							2
650							3	5	100				3
651							2	4	100				2
653	3	11	60				2	4	40				5
654	1	4	25				3	5	75				4
656										1	11	100	1
657				1	1	100							1
663							1	2	100				1
665	2	7	13	6	7	38	5	9	31	3	33	19	16
666	4	14	22	7	8	39	6	11	33	1	11	6	18
667				1	1	100							1
669							1	2	100				1
671							2	4	100				2
675				1	1	100							1
676				2	2	67	1	2	33				3
677				3	3	75	1	2	25				4
678				1	1	100							1
679	1	4	100										1
680							2	4	100				2
681							2	4	100				2
682				1	1	100							1
683				1	1	100							1
684							1	2	100				1
690				1	1	50	1	2	50				2
691	1	4	100										1
701							2	4	100				2
702							2	4	100				2
Total	**28**			**91**			**57**			**9**			**185**

Note: C = column; R = row.

TABLE 4.25. Percentage of Painted Sherds per Level.

Level	Percentage out of all coded sherds	Painted sherds/ total coded sherds
2	0.6	3/536
3	0.2	3/1,697
4	0.9	16/1,976
5	2	5/242

TABLE 4.26. Painted Types by Level: Raw Counts and Percentages (%) Out of All Painted Sherds in Level (C) and Out of All Sherds Coded for Painted Type (R).

Painting	2	C %	R %	3	C %	R %	4	C %	R %	5	C %	R %	Total
629							5	31	83	1	20	17	6
631										1	20	100	1
632				1	33	50	1	6	50				2
633	1	33	50	1	33	50							2
634							1	6	50	1	20	50	2
640				1	33	50	1	6	50				2
649										1	20	100	1
668							1	6	100				1
685							3	19	100				3
686							1	6	100				1
687										1	20	100	1
688							1	6	100				1
700	1	33	33				2	13	67				3
709	1	33	100										1
Total	**3**			**3**			**16**			**5**			**27**

Note: C = column; R = row.

HANDLES AND LUGS

Handles are rare, with type 701 (circular in section) the most common and type 703 (oval/flattened in section) restricted to level 3 (Tables 4.27–4.28); most examples are on Cooking Ware. Lugs are also most frequently attested on Cooking Ware vessels, where they are located just below the rim or, in the case of triangular lugs, at the rim. Horizontal lugs (714, 722) are consistently popular throughout the sequence, while crescent lugs (720) are common in levels 5–3, peaking in level 3. Triangular lugs (713) are not unknown in earlier levels but are much more common in level 2.

BURNISH

Tables 4.29–4.32 reveal that the vast majority of burnished sherds in all levels belonged to the Cooking Ware category (100% in level 5, 94% in level 4, 92% level 3, and 91% in level 2).

Of the sherds in the analyzed corpus, 9% were burnished in level 5, 10% in level 4, 5% in level 3, and 8% in level 2. The rim sherds show a more obvious decline in burnishing through time, with burnished rims making up 10% of the total rim sherds in levels 5 and 4, 6% in level 3, and 7% in level 2. This pattern is correlated to the predominance of Cooking Ware vessels in levels 5 and 4.

TABLE 4.27. Percentage of Sherds with Lugs and Handles per Level.

Level	%
2	4 (24 out of 536)
3	9 (146 out of 1697)
4	6 (128 out of 1976)
5	4 (9 out of 242)

TABLE 4.28. Handle/Lug Types by Level: Raw Counts and Percentages (%) Out of All Sherds with Handles or Lugs in Level.

Handle/lug	2	%	3	%	4	%	5	%	Total
701	1		2	1	4	3			7
703			4	3					4
709					1	1			1
713	9	39	2	1	3	2	1	11	15
714	9	39	56	38	49	38	5	56	119
715	2	9	3	2	10	8			15
719			2	1	10	8			12
720	3	13	75	51	45	35	3	33	126
721					1	1			1
722			1	1	2	2			3
723					1	1			1
724					1	1			1
725					1	1			1
726			1	1					1
Total	**24**		**146**		**128**		**9**		**307**

TABLE 4.29. Burnished and Unburnished Sherds by Ware Type, Level 2: Raw Counts and Percentages (%).

Ware	Burnished	%	Unburnished	%	Total
1			139	100	139
2			65	100	65
3	3	2	163	98	166
4	2	11	16	89	18
5			15	100	15
6	32	42	45	58	77
Total	**37**	**8**	**443**	**92**	**480**

TABLE 4.30. Burnished and Unburnished Sherds by Ware Type, Level 3: Raw Counts and Percentages (%).

Ware	Burnished	%	Unburnished	%	Total
1			542	100	542
2	3	1	220	99	223
3	4	1	518	99	522
4			18	100	18
5			6	100	6
6	80	24	255	76	335
Total	**87**	**5**	**1,559**	**95**	**1,646**

TABLE 4.31. Burnished and Unburnished Sherds by Ware Type, Level 4: Raw Counts and Percentages (%).

Ware	Burnished	%	Unburnished	%	Total
1	2	0	501	100	503
2	5	2	279	98	284
3	3	1	239	99	242
4			2	100	2
5	1	6	15	94	16
6	180	22	623	78	803
Total	**191**	**10**	**1,659**	**90**	**1,850**

TABLE 4.32. Burnished and Unburnished Sherds by Ware Type, Level 5: Raw Counts and Percentages (%).

Ware	Burnished	%	Unburnished	%	Total
1			54	100	54
2			28	100	28
3			16	100	16
6	19	18	89	82	108
Total	**19**	**9**	**187**	**91**	**206**

TABLE 4.33. Burnished and Unburnished Sherds by Rim Type, Level 2: Raw Counts and Percentages (%).

Rim	Burnished	%	Unburnished	%	Total
1111	1	5	18	95	19
1113			1	100	1
1114			7	100	7
1115			1	100	1
1116	3	33	6	67	9
1118			6	100	6
1119			1	100	1
1121			27	100	27
1127			2	100	2
1211			5	100	5
1212			1	100	1
1214			5	100	5
1221			17	100	17
1311			1	100	1
2111	1	3	37	97	38
2113			12	100	12
2121			4	100	4
2211			12	100	12
2215			3	100	3
2218			3	100	3
2311			10	100	10
2321	2	40	3	60	5
2322			3	100	3
2323			2	100	2
3112			1	100	1
3121	1	20	4	80	5
3122	7	44	9	56	16
3131	1	33	2	67	3
3132	2	100			2
3211	9	16	46	84	55
3212	1	50	1	50	2
3214			2	100	2
3221			39	100	39
3224			5	100	5
3231			11	100	11
3232			1	100	1
3234			2	100	2
3241			10	100	10
3242			19	100	19
3243			14	100	14
3245			12	100	12
3251			1	100	1
3261			6	100	6
3271	2	15	11	85	13
3272			1	100	1
3273			1	100	1
3274	2	18	9	82	11
3275			3	100	3
3276			1	100	1
3277			1	100	1
3278	1	8	11	92	12
4111			1	100	1
5111			5	100	5
8311			1	100	1
8321			1	100	1
8322			2	100	2
8323	1	50	1	50	2
8331			7	100	7
9111			1	100	1
Total	**34**	**7**	**429**	**93**	**463**

As Tables 4.33–4.36 show, burnished surfaces occurred predominantly on vessels with restricted shapes (jars and hole-mouth pots). Burnish is particularly common on hole-mouth vessels, especially types 3121

TABLE 4.34. Burnished and Unburnished Sherds by Rim Type, Level 3: Raw Counts and Percentages (%).

Rim	Burnished	%	Unburnished	%	Total
1111	1	3	38	97	39
1112			1	100	1
1114			8	100	8
1115			2	100	2
1116	9	27	24	73	33
1117			1	100	1
1118			6	100	6
1121	2	3	77	98	79
1122			1	100	1
1125			3	100	3
1127	1	100			1
1211			6	100	6
1212			1	100	1
1213			1	100	1
1214	1	13	7	88	8
1221	1	1	91	99	92
1311			1	100	1
2111	1	1	70	99	71
2113			50	100	50
2121			6	100	6
2122			4	100	4
2123			2	100	2
2211	2	3	73	97	75
2214			3	100	3
2221			2	100	2
2311			37	100	37
2321			18	100	18
2322			6	100	6
2323			3	100	3
3111	1	17	5	83	6
3112	1	8	11	92	12
3121	9	33	18	67	27
3122	39	23	129	77	168
3131			2	100	2
3132	4	50	4	50	8
3133			1	100	1
3211	3	1	247	99	250
3212	1	11	8	89	9
3213			1	100	1
3214			1	100	1
3221			112	100	112
3224			2	100	2
3231			103	100	103
3232			1	100	1
3234			12	100	12
3241			44	100	44
3242			35	100	35
3243			18	100	18
3251			4	100	4
3252	1	100			1
3261			4	100	4
3271			11	100	11
3272			7	100	7
3273			1	100	1
3274	2	50	2	50	4
3276			2	100	2
3277			2	100	2
3278			3	100	3
3279			2	100	2
4111			3	100	3
4112			6	100	6
5111	4	15	23	85	27
8311			6	100	6
8321			2	100	2
8322			2	100	2
8323			1	100	1
8331			2	100	2
9111			1	100	1
Total	**83**	**6**	**1,380**	**94**	**1,463**

and 3122, although the percentages recorded never exceed half of the analyzed sherds. While the popularity of the hole-mouth vessels decreases through time, the tendency to apply burnish on them continues. Jars with tall necks and everted rims (especially types 3211 and 3212) are also sometimes burnished but not as often as the hole-mouth vessels.

Bowls form the second largest group of shapes provided with a burnished surface. Most commonly burnished are thick-walled bowls with simple rims (type 1116). Type 1116 rims with evidence of burnish constitute 19% of all type 1116 rims in level 5, 31% in level 4, 27% in level 3, and 33% in level 2; as with hole-mouth vessels, type 1116 bowls decreased in popularity from level 5 to level 2, along with the reduction in Cooking Ware, but the tendency to apply burnish on the bowls persisted. Very few vessels with burnishing belong to the goblet class.

In levels 4 and 3, lids are sometimes burnished (11% of lids in level 4, 16% in level 3).

TABLE 4.35. Burnished and Unburnished Sherds by Rim Type, Level 4: Raw Counts and Percentages (%).

Rim	Burnished	%	Unburnished	%	Total
1111			34	100	34
1112			1	100	1
1114			3	100	3
1115			3	100	3
1116	45	31	99	69	144
1117			2	100	2
1118			4	100	4
1119			2	100	2
1121	3	3	91	97	94
1122			2	100	2
1125			1	100	1
1127			4	100	4
1214			3	100	3
1221			44	100	44
1311			15	100	15
2111			15	100	15
2113	1	2	41	98	42
2121			6	100	6
2122			1	100	1
2123			4	100	4
2211	2	6	33	94	35
2214			1	100	1
2215			6	100	6
2221			2	100	2
2311	1	3	35	97	36
2321			9	100	9
2322	1	11	8	89	9
3111	3	18	14	82	17
3112	2	8	22	92	24
3121	18	32	38	68	56
3122	44	20	176	80	220
3131			2	100	2
3132			1	100	1
3133	2	20	8	80	10
3211	34	8	405	92	439
3212	8	13	55	87	63
3213	3	19	13	81	16
3214			1	100	1
3221			24	100	24
3224	1	33	2	67	3
3231	5	3	140	97	145
3232			7	100	7
3234	1	5	21	96	22
3241			43	100	43
3242			4	100	4
3243			4	100	4
3251	3	16	16	84	19
3252			1	100	1
3261			1	100	1
3271	1	3	33	97	34
3272			6	100	6
3273			2	100	2
3274	1	33	2	67	3
3275			1	100	1
3278			5	100	5
3279			1	100	1
4111			3	100	3
5111	4	9	41	91	45
8321			7	100	7
8322			3	100	3
8323			3	100	3
Total	**183**	**10**	**1,574**	**90**	**1,757**

TABLE 4.36. Burnished and Unburnished Sherds by Rim Type, Level 5: Raw Counts and Percentages (%).

Rim	Burnished	%	Unburnished	%	Total
1111	1	25	3	75	4
1116	4	19	17	81	21
1117			1	100	1
1121	1	14	6	86	7
1122			1	100	1
1127			1	100	1
1214	1	50	1	50	2
1221			3	100	3
1311			2	100	2
2111			1	100	1
2113	1	33	2	67	3
2211			3	100	3
2311			3	100	3
2322			1	100	1
3112			5	100	5
3121	3	43	4	57	7
3122	1	5	18	95	19
3133			1	100	1
3211	4	7	53	93	57
3212	3	18	14	82	17
3213	3	50	3	50	6
3221			7	100	7

TABLE 4.36, *continued.*

Rim	Burnished	%	Unburnished	%	Total
3231			19	100	19
3232			1	100	1
3234			2	100	2
3241			2	100	2
3245			1	100	1
3251			3	100	3
3271			5	100	5
3272			4	100	4
3273			2	100	2
3278			1	100	1
9111			1	100	1
Total	**22**	**10**	**191**	**90**	**213**

GENERAL PATTERNS PER LEVEL

Level 5 (Figure 4.17)[6]

In the small corpus of excavated ceramics from level 5, Cooking Ware was predominant. Sherds of this ware were often of a friable fabric and crude appearance. Well-attested Cooking Ware types included open, thick-walled, simple-rim bowls (type 1116),[7] hole-mouth pots (type 3122)[8] that could be provided with horizontal or crescent lugs, and everted-rim jars (types 3211–3212).[9]

Coarse Simple Ware everted-rim jars are also attested with some frequency (types 3211, 3231),[10] as are Medium Simple Ware everted-rim jars (types 3211, 3221).[11] Fine Simple Ware, which is only minimally attested, is represented by a variety of incurved rim bowls and goblets and one open sinuous-profile bowl (type 1117).[12]

Incised sherds are attested in level 5 (Figure 4.17: 5–6), with motifs more or less comparable to those of Ninevite 5, including corrugation, hatching, dotted triangles, and an excised step pattern (type 604), which ordinarily would not be expected until later levels.[13]

Five painted sherds from level 5 were identified (Figure 4.17:4, 7–9), of which at least three are comparable to the Triangle- and Ladder-painted group attested in the middle and upper Khabur regions (cf. Figure 4.17:7–8) (Boileau 2005). One sherd belongs to the Ninevite 5 painted tradition (Figure 4.17:4).

Only six base sherds derive from level 5, five of which are flat, in coarse and Medium Simple Ware. One disc base is attested in Coarse Simple Ware.

Level 4 (Figures 4.18–4.24)

The level 4 ceramic sample, far larger than that of level 5, was also dominated by Cooking Ware vessels. As in level 5, the Cooking Ware was often crude and friable (Figure 4.25). In contrast to later levels, Cooking Ware took on a variety of shapes in level 4. These included thick-walled open simple bowls (type 1116),[14] hole-mouth vessels, often with a horizontal or crescent lug below the rim (types 3121–3122),[15] and jars with everted simple and cut (beveled) rims (types 3211–3213, 3231).[16] The latter included a bulbous near-carinated vessel with a low neck and everted beveled rim (type 3212) (Figure 4.23:16–17). Often the everted-rim jars had flaring or angular necks (Figures 4.23:12, 18–20; 4.24:1–4). Cooking Ware lids, sometimes with handles preserved, were also typical of level 4 (type 5111, Figure 4.24:19–21).

Medium and Coarse Simple Wares (Figures 4.18–4.19) shared many types that were common in the assemblage, including bowls with simple incurving rims (type 1121)[17] and bowls with open beveled rims (type 1311).[18] Many common jar types were also found in both wares, especially varieties of everted rims including simple, cut (out-beveled), grooved and thickened (types 3211, 3231, 3241, 3271).[19] Level 4 jars often had pronounced or carinated shoulders (Figures 4.19:19, 21, 22; 4.20:17).

In level 4, Fine Simple Ware (Figure 4.20) was not as common as in levels 3 and 2 but was present in bowls and goblets with incurving simple and bead rims (types 1221, 2113, 2211)[20] as well as restricted goblets with everted rims (type 2311).[21] When enough of the profile is preserved, the vessel is often carinated (Figure 4.20:1, 5–6, 9, 12). Also attested are four-lugged jars (Figures 4.20:18; 4.21:13, 15). Bowls and goblets were sometimes provided with pointed bases. While Fine Simple Ware in level 4 is usually light yellow in color, there are also examples in light to dark gray.

Incised Fine Simple Ware (Figure 4.21) featured motifs comparable to those of Ninevite 5, mainly of the simpler pre-excised variety, but a few excised sherds also derived from level 4. All but one of the latter were

found in the area directly underneath the level 3 temple.[22] Given the intrusive character of the temple construction, it may be that some sherds associated with the level 3 temple found their way into contexts otherwise understood to be level 4. Alternatively, it is possible that excised decoration began a moderate appearance in level 4.

A small group of sherds from level 4 had painted designs (Figure 4.22), most of which are assignable to the Triangle- and Ladder-painted group found in the middle and upper Khabur regions (see also Figure 4.26:7–8, for examples from levels 3/4) (Boileau 2005; Rova 2000).

Flat bases predominate in level 4, but round bases also appear, with both shapes manifested in coarse, medium, fine, and Cooking Wares. Pointed bases are sometimes used in Fine Simple Ware vessels.

Level 3 (Figures 4.27–4.31; see Figures 4.32–4.33 for additional data)

In level 3, Fine Simple Ware vessels are abundant and particularly attested in incurving bead-rim bowls and goblets (types 1221 and 2211),[23] as well as simple-rim bowls and goblets (e.g., types 1121, 2111, 2113).[24] Fine Simple Ware goblets are often provided with pointed bases. Unlike those of level 4, level 3 Fine Simple Ware goblets and bowls rarely have evidence of carination. Incised Fine Simple Ware is most common in this level, appearing particularly on goblets with incurving bead rims and on bowls with straight profiles and bead rims (type 1214, Figure 4.30:12). The incised motifs are usually Ninevite 5 in character, and particularly common are examples of the so-called excised variety (Figure 4.30:1–14, 16, and Figure 4.34). Also found are the "simplified" motifs that include designs found in excised pottery but without the hatching separating the designs (Figure 4.30:15, and Figure 4.35) (Calderone and Weiss 2003). Although Fine Simple Ware is most often light yellow in color, numerous examples are light to dark gray. Metallic Ware (Figure 4.31:1–5), while rare, appears on such forms as open, straight-walled, bead-rim bowls (type 1214) and incurving bead-rim bowls (type 1221).[25]

Level 3 Medium and Coarse Simple Ware (Figures 4.27–4.28) both have numerous simple-rim bowls with open or incurving profiles (e.g., type 1121),[26] and jars with everted rims of rounded, cut, or grooved types (types 3211, 3221, 3231, 3241).[27]

Cooking Ware (Figure 4.31:6–25) is most commonly represented by hole-mouth incurving vessels with rounded lips (types 3121, 3122),[28] often provided with crescent lugs below the rim or, less frequently, horizontal lugs. Other important Cooking Ware types include open simple thick-walled bowls (type 1116)[29] and lids (type 5111).[30]

Both round and flat bases are commonly used in Coarse Simple, Medium Simple, Fine Simple, and Metallic Wares in level 3. Pointed bases are almost exclusively associated with Fine Simple Ware vessels. Unfortunately, Cooking Ware bases were too infrequently identified to comment on related shapes.

Vessels or complete profiles retrieved from burials in level 3 (see Chapter 6) included simple-rim, Fine Simple Ware goblets with pointed bases, everted-rim, Medium Simple Ware jars with pointed or flat bases, large everted-rim, Medium Simple Ware jars with round bases, bead or simple incurving-rim Fine Simple Ware bowls, small squat ledge-rim jars with flat bases, and various other types. Only one incised vessel was represented, with "simplified" excised decoration, and no Cooking, Metallic, Vegetal-Tempered, or Coarse Simple Ware was present.

Level 2 (Figures 4.36–4.40)

The level 2 assemblage differs from preceding levels in its shift away from a Ninevite 5–related corpus. Traits that lose popularity in level 2 include hole-mouth cooking pots with crescent-shaped lugs, Fine Simple Ware incurving goblets with bead rims, Fine Simple Ware goblets with pointed bases, Cooking Ware lids, and incised Ninevite 5 Fine Simple Ware vessels. Bead rims on Fine Simple Ware are also less abundant in level 2 than in level 3. New trends in the level 2 assemblage include an increased popularity of round bases (but flat bases are still common), a greater abundance of thin-walled open simple-rim bowls and goblets as opposed to examples with incurving rims (e.g., Figure 4.37:1–3, 8), cooking vessels with triangular lugs at the rim (Figure 4.40:2–4), and a growing popularity of Metallic Ware (Figure 4.37:18–22). For photographs of typical vessels found in the level 2 burials, see Figures 4.41–4.45.

Among its most common or recognizable Fine Simple Ware types, the level 2 assemblage includes incurving bowls with simple or bead rims (types 1121, 1221),[31] open simple-rim goblets (type 2111),[32] and incurving simple-rim goblets (2113).[33] Coarse and Medium Simple Ware types include everted simple-rim jars (type 3211)[34] and varieties of everted-rim jars with straight or cut rims (type 3221)[35] or grooved

rims (types 3241, 3242, 3243).[36] Nearly unique to level 2 is the collared rim jar (type 3245, in Coarse and Medium Simple Ware and Vegetal-Tempered Ware).[37]

Cooking Ware is most often attested in everted simple-rim jars (type 3211)[38] but is also manifest in hole-mouth round-lip pots (type 3122),[39] often with a horizontal lug below the rim, a thickened-rim jar with a triangular lug at the rim (type 3274),[40] and thick-walled, crude, open simple-rim bowls (type 1116).

Fine, thin-walled jars, including Metallic Ware examples, tend to have a tall neck and ledge rim (Figure 4.37:17, 21, 22). In addition to this jar type, Metallic Ware vessels also appear on bowls and goblets, such as straight-walled, open bead-rim bowls (1214).[41] A sinuous-shaped, small, fine gray jar type (shape 3277) with fine white-sand inclusions is attested in level 2 and in levels 2/3 (Figures 4.33:1; 4.37:15).

Among the most common types from complete vessels or complete profiles derived from burials in level 2 (see Chapter 6) were miniature Fine Simple Ware globular jars with low everted necks, flat-based, Fine Simple Ware small bowls (cups) with simple or thickened rims, and globular round-based Fine and Medium Simple Ware jars with tall necks and thickened rims. Miniature solid-footed, bead-rim goblets and other miniature vessels were also found, in addition to less abundantly represented types. No Cooking Ware, Coarse Simple Ware, or Vegetal-Tempered Ware vessels were represented, and only one incised vessel was documented, a miniature goblet with a plant motif.

RELATIVE CHRONOLOGY[42]

RAQA'I 5

The assemblage from Raqa'i level 5 can be assigned to the Early Jezirah 1 phase (Lebeau et al. 2000; Pfälzner 1998; Quenet 2011; Ristvet 2011; Rova 2011), presumably in the early/middle part of that period ca. 2800 BCE, and is comparable to other contexts with sinuous-profile bowls, Ninevite 5 painted vessels, and Triangle- and ladder-painted vessels (Table 4.37). Such contexts also typically have hole-mouth cooking pots with crescent lugs, as in level 5, but this type is not restricted to the Early Jezirah 1 period. Likewise, Cooking Ware disc-shaped lids and jars with everted rounded or straight-cut rims are common in this phase but continue subsequently.

Triangle- and ladder-painted pottery is found in Early Jezirah 1 contexts at sites in the middle and western upper Khabur (Rova 2000), such as Knedig level XIII (Klengel-Brandt, Kulemann, and Martin 2005: tafel 82 a), 'Atij and Gudeda (Boileau 2005), Chagar Bazar 5–4 (Mallowan 1936: figure 19:5–8), Hazna (Munchaev, Merpert, and Amirov 2004:273, figures 8:275, 9:1–2, 277, and figure 10), and Kashkashok III (Suleiman 2002: 49, figure 10). The small number of sherds found at Raqa'i is matched by the modest number found at 'Atij (Boileau 2005). It is noteworthy that no examples have been detected thus far at Tell Brak, which otherwise has a wide range of available ceramic types in each period, nor are examples reported from Tell Leilan.

The suggested Ninevite 5 painted sherd from level 5 (Figure 4.17:4) may be compared to an example from Leilan IIIc (Schwartz 1988: figure 36:1). The extreme rarity of painted Ninevite 5 sherds at Raqa'i is matched by the results from nearby 'Atij, where the total number identified is only two (Boileau 2005).

The open sinuous bowl (Figure 4.17:1) compares to examples from the Balikh and other points west (Curvers 1988; Jamieson 1993) found in early third-millennium contexts. The pot with a funnel-shaped upper body (Figures 4.17:12; 4.23:6) compares with an example from Leilan IIIa (Schwartz 1988:124, figure 51:3).

In her technical analysis of the pottery from Tell 'Atij and Tell Gudeda, Boileau (2005) recognizes two groups of Cooking Ware, one poorly manufactured and locally made with diverse inclusions, and another carefully produced, locally made, and characterized by crushed basalt inclusions. Since we did not perform technical analysis on Raqa'i Cooking Ware sherds, it is not certain if these two types existed at Raqa'i. However, it can be noted that the local group is associated with hole-mouth shapes and crescent lugs and with disc-shaped lids that are characteristic of earlier levels at Raqa'i (5–3), while the imported group is represented by jars with triangular lugs and other types characteristic of Raqa'i 2 (Boileau 2005 notes this chronological pattern as well), so the distinction may well have applied at Raqa'i also.

TABLE 4.37. Contexts with Ceramics Comparable to Raqa'i 5.

Upper Khabur:	*Middle Khabur:*
Leilan IIIa	Melebiya 4
Brak period J; HS2	'Atij XIII–X (see Boileau 2005)
	Knedig XV–XIII (early)

RAQA'I 4

The Raqa'i 4 assemblage is similar to that of Raqa'i 5 but includes more incised sherds, particularly of the Ninevite 5 type. In the recent ARCANE Jezirah publication, Raqa'i 4 is assigned to the earlier Early Jezirah 2 period (Quenet 2011; Ristvet 2011; Rova 2011). However, level 4 was designated as Early Jezirah 1 in the original formulation of the Early Jezirah periodization (Pfälzner 1988), and a number of ceramic types identified as diagnostic of Early Jezirah 1 by Rova (2011) are indeed present in Raqa'i 4. These include carinated fine goblets with pointed bases (Rova type 16) (see Figure 4.20:1, 5, 6, 9, 12; Figure 4.21:3), small jars with pointed bases and suspension lugs (Rova type 22) (see Figure 4.20, 18; Figure 4.21:13, 15), Triangle- and ladder-painted vessels (Rova type 24, which "may persist into the early EJZ 2 period" [Rova 2011:68]), and corrugated vessels (Rova type 29) (see Figure 4.20:8).[43] A date early in the Early Jezirah 2 period may have been suggested due to the presence of an incised sherd comparable to examples from Leilan IIIb–c (Figure 4.21:1, see below) and several "excised" sherds with panel motifs.[44] Given the above data, we propose an Early Jezirah 1/early Early Jezirah 2 date for Raqa'i 4, perhaps ca. 2700 BCE.

The level 4 corpus can be compared to other assemblages with carinated fine goblets with pointed bases, bowls with sinuous profiles, Ninevite 5 painted vessels, Triangle- and ladder-painted vessels, hole-mouth cooking pots with crescent lugs, Cooking Ware disc-shaped lids, and jars with everted rounded or straight-cut rims (Table 4.38).

The Triangle- and ladder-painted ware is discussed above. A level 4 example of this ware (Figure 4.22:7) compares well to an example from Gudeda (Fortin, Routledge, and Routledge 1994:63, figure 16) and perhaps Chagar Bazar (Mallowan 1936: figure 19:7). The suggested Ninevite 5 painted sherd from level 4 (Figure 4.22:9) might be comparable to a sherd from Leilan IIIa (Schwartz 1988: figure 49:9).

TABLE 4.38. Contexts with Ceramics Comparable to Raqa'i 4.

Upper Khabur:	*Middle Khabur:*
Leilan IIIb–c	Melebiya 4
Brak period J; HS 4 levels 9–4; HL1 levels 4–1	'Atij XIII–X
Chagar Bazar 5	Knedig XV–XIII (early)

The Ninevite 5 incised sherds from level 4 belong to the period before excision becomes common (see Numoto 1993 for a suggested chronology), although a few excised examples were found. The sherd with vertical grooves and dotted triangles (Figure 4.21:1) compares to examples from Leilan IIIb–IIIc (Schwartz 1988: figures 32:1; 39:2, 5–8; and 43:2) and numerous sherds from Brak (Matthews 2003). Sherds with circular dotted impressions (Figure 4.21:3, 7) resemble a Leilan IIIa example (Schwartz 1988: figure 47:2).

Sherds with nose-lug and crosshatch designs (Figure 4.21:16–19) resemble southern Mesopotamian Uruk and Early Dynastic pottery and present a rare example of ceramics with Mesopotamian affinities in the Early Jezirah 1–2 period Khabur region. Comparable examples have been reported at Brak HS 4 levels 9–6 (Matthews 2003:126, 147, figure 5.60:16; 149, figure 5.61:12) and Leilan IIIa (Mayo and Weiss 2003: figure 3:10).

In contrast to Brak and Leilan, there are no examples of fingernail-impressed cooking ware vessels. Examples of the bulbous Cooking Ware vessel with short vertical neck (Figure 4.23:16–17) are reported from Hazna (Munchaev, Merpert, and Amirov 2004: plates 34:3; 35:1–2).

As in level 5, the open sinuous bowl (Figure 4.20: 2) resembles early third-millennium specimens from the Balikh and other sites to the west (Curvers 1988; Jamieson 1993). For the carinated Fine Simple Ware goblet with slightly flaring upper body and bead rim (Figure 4.20:1), see Leilan IIIa and IIId (Calderone and Weiss 2003: figure 5:7, with incised decoration; Schwartz 1988: figure 50:7). The incurving bead-rim bowls with low carination (Figure 4.20:12) parallel an example from Brak HS4, level 10 (Matthews 2003: figure 5.59: 21).

One theriomorphic vessel derives from level 4 (Figure 4.18:13). Cholidis (1989) notes that the earliest representation of such vessels, which she interprets as ritual implements, is on the late fourth-millennium "Uruk Vase." However, the oldest attestations of theriomorphic vessels from archaeological contexts as cited by Cholidis are Early Dynastic III in date, later than the Raqa'i 4 example.

RAQA'I 3

The Raqa'i 3 ceramic assemblage belongs to the (later) Early Jezirah 2 phase, ca. 2600 BCE (Quenet 2011; Ristvet 2011; Rova 2011).[45] Important diagnos-

TABLE 4.39. Contexts with Ceramics Comparable to Raqa'i 3.

Upper Khabur:	*Middle Khabur*:
Leilan IIId	Melebiya 3
Brak HS4 levels 4–3; Brak K	'Atij IX–IV
Abu Hafur 3–4	Mashnaqa niveau 2, chantier A
Chagar Bazar 4	Bderi levels 25–21 (Early Jezirah 2)
	Knedig XIII (later)–XI

tics include uncarinated fine goblets with pointed bases (Figure 4.29:9–12, 14) and fine vessels with Ninevite 5 excised decoration (Figure 4.30). The decorative pattern of deep and wide incised parallel zigzag lines with shallower hatching (e.g., types 604, 642) is particularly characteristic at Raqa'i and other Khabur sites but is rare in northern Iraq (Numoto 1993). Similar motifs without hatching, designated "simplified" (Calderone and Weiss 2003), are also diagnostic. As in Early Jezirah 1 and early 2, late Early Jezirah 2 assemblages include hole-mouth cooking pots with crescent lugs (Figure 4.31:7–8, 10, 12), Cooking Ware disc-shaped lids (Figure 4.31:23–25), and jars with everted rounded or straight-cut rims (Figure 4.28) (Table 4.39).

The flat-based, carinated bead-rim small goblet/cup shape from burial 8 (see Figure 4.35 and Chapter 6, Figure 6.9) compares to Rova's type 35 (Rova 2011: 69) and to examples from Brak (Oates 1986: figure 5:85, 86, "ED") and Leilan IIa (Early Jezirah 3a) (Calderone and Weiss 2003: figure 9:4–5, 12–13; Ristvet 2007: figure 11:1), while the small squat, round-based jar with extended ledge rim from burials 3 and 10 (see Figures 6.4, 6.12) is comparable to examples from Leilan IIId (Calderone and Weiss 2003: figure 7:1, 3), Mohammed Diyab (Faivre 1992: figure 5:11), Chagar Bazar (Mallowan 1947: plate 82:2), Brak (Oates, Oates, and McDonald 2001:559, figure 471:1778–1779) and Billa 6 (Speiser 1933: plate 53:6). For the flat-based large bowl with incurving beaded rim (Figure 4.29:15), see Mohammed Diyab (Faivre 1992: figure 6:10).

RAQA'I 2

Raqa'i 2 belongs to the Early Jezirah 3a horizon (ca. 2500 BCE) (Ristvet 2011; Rova 2011) and is synchronous with contexts yielding assemblages with collared rim jars (Figures 4.36:1–4, 6–7; and 4.39:5; e.g., Schwartz 1988:83, figure 30:9; Oates, Oates, and McDonald 2001:535, figure 459:1546, 537, figure 460: 1564, 1568–1569), Jezirah Bichrome painted pot stands (Figure 4.38:1) (Rova 2000; cf., e.g., Oates, Oates, and McDonald 2001:559, figure 471:1790), cooking vessels with triangular lugs (Figure 4.40:2–4), Metallic Ware (Figure 4.37:18–22), and an absence or paucity of the Raqa'i 3 period diagnostics cited above (Table 4.40). Also common in Early Jezirah 3a contexts are tall-necked, thin-walled, round-based jars with ledge or everted rims, sometimes in Metallic Ware or imitation Metallic Ware, as attested in the level 2 burials (cf. Oates, Oates, and McDonald 2001:413, figure 398: 180–181, 184–185, 187–188).

For Jezirah Bichrome ware (Rova 2000), see, for example, Brak HF1 level 3 (Matthews 2003:171, figure 5.72:23, 173, figure 5.73:9). The round-based, bead-rim hemispherical goblet (Figure 4.37:4) compares to examples from Brak HS3/4 level 7 (Matthews 2003: 231, figure 6.53:20) and Leilan II (Schwartz 1988:81, figure 29:3), while rims with an interior indentation to accommodate a lid (Figure 4.36:18, 19, 21) are found at Mohammed Diyab (Faivre 1992: figure 2:10, 13) and Abu Hujeira (Suleiman and Quenet 2006: figure 16: 183–184) as well as the middle Euphrates (e.g., Porter 2007: plate 3:10). An example from Raqa'i 3 is also attested (Figure 4.28:10). Miniature vessel comparisons include the round-based, spouted goblets from burial 34 (Figure 6.44), similar to examples from Leilan IIb (Weiss 1990:abb. 15:5, 7), and numerous examples with parallels to the graves on the secondary tell at 'Atij, including the pedestal-based cups from burials 25, 30, and 32 (Figures 6.27, 6.36, 6.40) (Fortin 1990:560, figure 26), the two-lugged jar from burial 30 (Figure 6.36) (Fortin 1990:559, figure 25), and the globular cup with incised plant motif from burial 25 (Figure 6.27) (Fortin 1990:558, figure 24:ATJ88.NN17A4.C1121). The large open form with an incurving simple rim decorated with small impressed circles and an incised plant motif (Figure 4.38:7) is similar to examples from Leilan II (Schwartz 1988: figure 30:1) and Melebiya 2 (Lebeau 1993: plate 184:13).

TABLE 4.40. Contexts with Ceramics Comparable to Raqa'i 2.

Upper Khabur:	*Middle Khabur:*
Leilan IIa	Melebiya level 2
Brak L	Bderi levels 20–14
Abu Hafur 1–2	'Atij secondary tell graves
Abu Hujeira child graves	Knedig X–VIII

QUANTITATIVE ANALYSIS—SPATIAL DISTRIBUTION

In general, we assume that the ceramics analyzed in this study derived from secondary contexts, since very few instances of vessels in situ were detected, apart from burials. In particular, it is expected that the majority of the ceramic material belongs to trash deposited inside ruined, abandoned architecture or discarded or dropped in outdoor contexts. Therefore, we do not presume a direct relationship between the pottery and the activities performed in the areas where the ceramics were found. However, it is likely that the transport of trash rarely took place beyond the first available open area or ruin inside the settlement, apart from the occasional dumping of refuse over the side of the tell or outside the settlement. If this is the case, then the distribution of recovered sherds might be expected to bear some general association with the activities in their given region.

As noted above, ceramic ware, shape, and decoration may help to elucidate activities associated with pottery vessels and, occasionally, social context. For an examination of the spatial patterns of sherd distribution, we consider the data from levels 4 and 3; level 5 is not included because its sample was small and largely restricted to one area of the tell, and level 2 is not included because its architectural remains were too fragmentary.

To recognize patterns of spatial distribution, we subdivided levels 4 and 3 into areas or "neighborhoods" and reviewed the ceramic types found within each area (Tables 4.42–4.64).

LEVEL 4 (TABLE 4.41)

Two distinct zones of ware distributions can be recognized in the excavated area of level 4 (Table 4.42). One is the Round Building and the area south/southwest of the Round Building, with a marked preponderance of Cooking Ware (53, 48%) and relatively little Fine Simple Ware. The high percentages of Cooking Ware are particularly striking when compared to the other areas. The other zone is composed of the North and West areas, in which Coarse Simple Ware is the most common ware type (39, 35%) and Medium Simple Ware is relatively rare (10–11%). Within this zone, the North area has more Fine Simple Ware and the West area significantly more Cooking Ware.

The Round Building and South/Southwest areas also have similar relative frequencies of rim types, with less popularity accorded fine bowls and goblets (e.g., types 1221, 2113) than in the North and West areas (Tables 4.43–4.44). Fine vessel shapes were somewhat more common in the North than in the West, as the ware distributions would imply. In all zones except the area east of the Round Building, the most common rim type was the jar with tall everted neck (3211), and the second in popularity was the hole-mouth pot with rounded lip (3122). Thick-walled bowls (1116) and low-necked, beveled-rim jars (3231) were also common, as were jars with low everted necks and straight-cut rims (3212) in the Round Building and South/Southwest.

Flat bases were the most common base type in all level 4 areas, with round bases second in popularity (Tables 4.45–4.46). Pointed bases were best attested in the North zone, as befits the greater preponderance of fine vessels in that area. There is a curious heterogeneity in the abundance of base sherds per neighborhood, with the North having the largest percentage. Perhaps Fine Simple Ware pointed bases, typical of the North area, are more likely to be observed than the round or flat bases of the coarser wares more common in other neighborhoods.

Incised sherds were found in equivalent percentages in each neighborhood, with the exception of the area east of the Round Building, which had no incised sherds in its very small diagnostic sherd sample (11 sherds) (Tables 4.47–4.48).

Painted sherds were primarily found in the Round Building and the South area, once again underscoring the ceramic similarities between the two zones (Tables 4.49–4.50). The distribution of handle and lug types

TABLE 4.41. Neighborhoods with Their Area Designations, Level 4.

Round Building (1012 diagnostic sherds)	1–29, 88–90, 92, 103, 105–107
South and Southwest of Round Building (206 diagnostic sherds)	30–39, 41–43, 98, 108–109, 111
West (440 diagnostic sherds)	46–55, 59–65, 87, 99, 100–102, 112–114
North (307 diagnostic sherds)	66–70, 76–79, 81–86
East of Round Building (11 diagnostic sherds)	104

appears to be without obvious significant spatial patterns, with fluctuating popularities of horizontal as opposed to crescent lugs (Table 4.51).

To summarize the above trends, we find that the Round Building and the South/Southwest areas are distinguished by the abundance of Cooking Ware and rarity of Fine Simple Ware, as well as being the locus for almost all of the painted sherds from level 4. The North and West areas have more Fine Simple Ware, especially evident in bowls and goblets. These distinctions are likely to indicate the different character of the two zones, with the Round Building and South/Southwest areas devoted to large-scale (grain?) processing and storage, while the North and West contained domestic structures associated with the lives and activities of individual households, including the presentation and consumption of food and drink implied by the larger amounts of Fine Simple Ware sherds.

TABLE 4.42. Distribution of Ware by Neighborhood, Level 4: Raw Counts and Percentages (%) Out of All Sherds Coded for Ware in Neighborhood.

Ware	Round Building	%	S/SW of RB	%	W	%	N	%	E of RB	%	Total
1	220	22	53	26	110	35	119	39	1	9	503
2	176	17	41	20	36	11	30	10	1	9	284
3	74	7	14	7	64	20	87	28	3	9	242
4	1	0			1	0				27	2
5	8	1			1	0	2	1	5	46	16
6	531	53	98	48	105	33	68	22	1	9	803
Total	**1,010**		**206**		**317**		**306**		**11**		**1,850**

Notes: RB = Round Building, S/SW of RB = South/Southwest of RB, W = West, N = North, E of RB = East of Round Building).

TABLE 4.43. Percentage of Rim Sherds per Neighborhood, Level 4.

Round Building	91% (917 out of 1012 sherds)
S/SW of Round Building	85% (176 out of 206 sherds)
West	88% (387 out of 440 sherds)
North	85% (261 out of 307 sherds)
East of Round Building	91% (10 out of 11 sherds)

TABLE 4.44. Distribution of Rim Types by Neighborhood, Level 4: Raw Counts and Percentages (%) Out of All Rim Sherds in Neighborhood.

Rim	RB	%	S/SW of RB	%	W	%	N	%	E of RB	%	Total
1111	19	2	2	1	5	1	8	3			34
1112	1	0									1
1114	1	0	1	1	1	0					3
1115	1	0	1	1			1	0			3
1116	88	10	21	12	20	5	15	6			144
1117			1	1	1	0					2
1118			1	1	2	1	1	0			4
1119	1	0					1	0			2
1121	45	5	10	6	25	6	13	5	1	10	94
1122					2	1					2
1125					1	0					1
1127	2	0			2	1					4
1214			1	1	2	1					3
1221	11	1	1	1	13	3	19	7			44
1311	9	1	2	1	3	1	1	0			15

Continued on following page

TABLE 4.44. Distribution of Rim Types by Neighborhood, Level 4 (*continued*).

Rim	RB	%	S/SW of RB	%	W	%	N	%	E of RB	%	Total
2111	4	0	1	1	4	1	5	2	1	10	15
2113	7	1	2	1	10	3	22	8	1	10	42
2121	5	1			1	0					6
2122							1	0			1
2123	3	0							1	10	4
2211	8	1			14	4	13	5			35
2214							1	0			1
2215	4	0					2	1			6
2221	2	0									2
2311	23	3	4	2	6	2	3	1			36
2321	4	0	1	1	1	0	3	1			9
2322	4	0	1	1	1	0	3	1			9
3111	10	1	2	1	3	1	2	1			17
3112	11	1	4	2	6	2	3	1			24
3121	41	5	5	3	7	2	3	1			56
3122	103	11	29	17	57	15	31	12			220
3131	1	0	1	1							2
3132			1	1							1
3133	6	1	2	1	2	1					10
3211	254	28	38	22	95	25	51	19	1	10	439
3212	48	5	9	5	5	1	1	0			63
3213	10	1	5	3			1	0			16
3214					1	0					1
3221	6	1			7	2	8	3	3	30	24
3224	3	0									3
3231	61	7	10	6	43	11	30	11	1	10	145
3232	1	0			6	2					7
3234	9	1	3	2	3	1	7	3			22
3241	24	3	3	2	12	3	4	2			43
3242					2	1	2	1			4
3243	2	0	1	1			1	0			4
3251	9	1	4	2	5	1	1	0			19
3252	1	0									1
3261	1	0									1
3271	20	2	4	2	7	2	2	1	1	10	34
3272	3	0	1	1	1	0	1	0			6
3273	1	0			1	0					2
3274	3	0									3
3275	1	0									1
3278	3	0			2	1					5
3279	1	0									1
4111	1	0			2	1					3
5111	33	4	4	2	6	2	2	1			45
8321	4	0			1	0	2	1			7
8322	1	0					2	1			3
8323	3	0									3
Total	**917**		**176**		**388**		**266**		**10**		**1,757**

Notes: RB = Round Building, S/SW of RB = South/Southwest of RB, W = West, N = North, E of RB = East of Round Building.

TABLE 4.45. Percentage of Base Sherds per Neighborhood, Level 4.

Round Building	5% (47 out of 1012 sherds)
S/SW of Round Building	4% (8 out of 206 sherds)
West	8% (36 out of 440 sherds)
North	11% (33 out of 307 sherds)
East of Round Building	0% (0 out of 11 sherds)

TABLE 4.46. Distribution of Base Types by Neighborhood, Level 4: Raw Counts and Percentages (%) Out of All Base Sherds in Neighborhood.

Base	RB	%	S/SW of RB	%	W	%	N	%	Total
730	15	32	3	38	7	19	8	24	33
731	25	53	4	50	27	75	19	58	75
735					1	3			1
736	1	2							1
737	1	2							1
739	2	4							2
741			1	13					1
743	1	2							1
745	2	4			1	3	6	18	9
Total	**47**		**8**		**36**		**33**		**124**

Note: There are no examples from east of Round Building. RB = Round Building, S/SW of RB = South/Southwest of RB, W = West, N = North.

TABLE 4.47. Percentage of Incised Sherds per Neighborhood, Level 4.

Round Building	3% (26 out of 1012 sherds)
S/SW of Round Building	3% (6 out of 206 sherds)
West	3% (15 out of 440 sherds)
North	3% (10 out of 307 sherds)
East of Round Building	0% (0 out of 11 sherds)

TABLE 4.48. Distribution of Incised Sherds by Neighborhood, Level 4: Raw Counts and Percentages (%) Out of All Incised Sherds in Neighborhood (C) and Out of Sherds from All Neighborhoods Coded for Incised Type (R).

Incision	RB	C %	R %	S/SW of RB	C %	R %	W	C %	R %	N	C %	R %	Total
601	2	8	67				1	7	33				3
602										1	10	100	1
604										2	20	100	2
606										3	30	100	3
607	1	4	100										1
612							1	7	100				1
614	1	4	100										1
620							1	7	100				1
626							1	7	100				1
627										2	20	100	2
628	1	4	100										1
637	3	12	100										3
650	3	12	100										3
651	2	8	100										2
653	2	8	100										2

Continued on following page

TABLE 4.48. Distribution of Incised Sherds by Neighborhood, Level 4 (*continued*).

Incision	RB	C %	R %	S/SW of RB	C %	R %	W	C %	R %	N	C %	R %	Total
654	1	4	33	1	17		1	7	33				3
663	1	4	100										1
665	3	12	60	1	17		1	7	20				5
666	2	8	33	1	17		2	13	33	1	10	17	6
669							1	7	100				1
671	2	8	100										2
676										1	10	100	1
677							1	7	100				1
680	1	4	50	1	17								2
681							2	13	100				2
684							1	7	100				1
690	1	4	100										1
701							2	13	100				2
702				2	33								2
Total	**26**			**6**			**15**			**10**			**57**

Notes: C = column; R = row. There are no examples from east of Round Building.
RB = Round Building, S/SW of RB = South/Southwest of RB, W = West, N = North.

TABLE 4.49. Percentage of Painted Sherds per Neighborhood, Level 4.

Round Building	1% (11 out of 1012 sherds)
S/SW of Round Building	2% (4 out of 206 sherds)
West	0.2% (1 out of 440 sherds)
North	0% (0 out of 307 sherds)
East of Round Building	0% (0 out of 11 sherds)

TABLE 4.50. Distribution of Painted Sherds by Neighborhood, Level 4: Raw Counts and Percentages (%) Out of All Painted Sherds in Neighborhood (C) and Out of Sherds from All Neighborhoods Coded for Painted Type (R).

Painting	RB	C %	R %	S/SW of RB	C %	R %	W	C %	R %	Total
629	3	27	60	2	50	40				5
632				1	25	100				1
634	1	9	100							1
640				1	25	100				1
668							1	100	100	1
685	3	27	100							3
686	1	9	100							1
688	1	9	100							1
700	2	18	100							2
Total	**11**			**4**			**1**			**16**

Notes: C = column; R = row. There are no examples from east of Round Building or North area.
RB = Round Building, S/SW of RB = South/Southwest of RB, W = West.

TABLE 4.51. Distribution of Handle/Lug Types by Neighborhood, Level 4: Raw Counts and Percentages (%) Out of All Sherds with Handles or Lugs in Neighborhood.

Handle/lug	RB	%	S/SW of RB	%	W	%	N	%	E of RB	%	Total
701	4	6									4
709			1	6							1
713	2	3	1	6							3
714	29	40	3	19	10	44	6	38	1	100	49
715	6	8	2	13	2	9					10
719	8	11			2	9					10
720	18	25	9	56	8	35	10	63			45
721	1	1									1
722	1	1			1	4					2
723	1	1									1
724	1	1									1
725	1	1									1
Total	**72**		**16**		**23**		**16**		**1**		**128**

Notes: RB = Round Building, S/SW of RB = South/Southwest of RB, W = West, N = North, E of RB = East of Round Building.

The sample of complete vessels or complete profiles from non-burial contexts is distributed as follows:

Round Building

Area 28—Medium Simple Ware four-lugged, round-based jar (Figure 4.21:15). Fine Simple Ware four-lugged, pointed-base jar, missing rim (Figure 4.20:18).

Area 6—Medium Simple Ware round-based, carinated evert neck jar (Figure 4.19:27).

Area 9, phase b—Fine Simple Ware miniature round-based jar with everted rim (Figure 4.20:19).

Area 11, phases a–b—Cooking Ware round-based flat rim bowl (Figure 4.24:13).

Area 12, phase b—Medium Simple Ware flat-based incurving simple-rim bowl (Figure 4.18:9).

(Areas 13/17, phase d—in debris above architecture, assigned a level 4/3 designation: Medium Simple Ware round-based everted-rim jar (Figure 4.26:10); flat-based, vertical-walled Cooking Ware bowl (Figure 4.26:14)

Western Area

(Above area 52—miniature Fine Simple Ware round-based, hole-mouth goblet/pot [Figure 4.20:16].)

Area 56 (= level 3 area 6)—large Medium Simple Ware round-based, everted-rim jar (Figure 4.46:1).

Area 58, phases a–b (= level 3 area 4)—Fine Simple Ware goblet with pointed base and incised Ninevite 5 decoration (Figure 4.46:7).

West Central Area

Area 112 (debris above architecture), phase a—Cooking Ware round-based, hole-mouth pot with knob lugs (Figure 4.24:6).

Area 60, phase b—large Medium Simple Ware round-based jar with everted rim (Figure 4.19:23).

Southwest Area

Area 62—Cooking Ware lid with handle (Figure 4.24:19).

South Area

Area 31—Medium Simple Ware round-based flaring neck jar (Figure 4.19:26).

Area 32—Medium Simple Ware flat-based simple-rim bowl (Figure 4.18:8).

Area 36—Fine Simple Ware pointed-base simple-rim corrugated goblet (Figure 4.20:8).

Turning to the recorded body sherd corpus (Tables 4.52–4.53), we find that, like the diagnostics, the body sherds indicate two zones of ware distribution, one concentrated in the Round Building and South/Southwest area, the other in the North and West. As with the diagnostics, Cooking Ware is much more abundant in the Round Building-South/Southwest zone, while Fine Ware is more abundant in the North and West zones.

TABLE 4.52. Body Sherds, Level 4, Ware by Neighborhood (raw count followed by figure in parentheses representing percentage of the ware category out of all recorded body sherds in that neighborhood).

	Coarse Simple	Medium Simple	Fine Simple	Cooking	Cooking, Burnished	Metallic	Coarse Overfired	Medium Overfired	Fine Overfired	Bitumen Coated	Incised	Total
Round Building	4,470 (50)	783 (9)	70 (1)	3,142 (35)	447 (5)	7 (1)	68 (1)	2 (<1)	0	0	2 (<1)	8,991
South/ Southwest	899 (52)	215 (13)	20 (1)	529 (31)	52 (3)	1 (1)	1 (<1)	0	0	0	0	1,717
West	2,541 (66)	551 (14)	93 (2)	572 (15)	66 (2)	4 (<1)	12 (<1)	24 (<1)	0	1 (<1)	2 (<1)	3,866
North	1,219 (64)	256 (13)	86 (4)	307 (16)	22 (1)	2 (<1)	18 (1)	9 (<1)	0	0	0	1,919
East of Round Building	103 (74)	25 (18)	0	12 (9)	0	0	0	0	0	0	0	140

TABLE 4.53. Body Sherds, Level 4, Ware by Neighborhood (weight in grams followed by figure in parentheses representing percentage of the ware category out of all weighed body sherds in that neighborhood).

	Coarse Simple	Medium Simple	Fine Simple	Cooking	Cooking, Burnished	Metallic	Coarse Overfired	Medium Overfired	Fine Overfired	Bitumen Coated	Incised	Total
Round Building	308,579 (64)	11,349 (2)	332 (<1)	139,829 (29)	21,006 (4)	68 (<1)	2,047 (<1)	40 (<1)	0	0	12 (<1)	483,262
South/ Southwest	35,995 (64)	2,646 (5)	35 (<1)	15,945 (28)	1,929 (3)	12 (<1)	108 (<1)	0	0	0	0	56,670
West	118,132 (79)	6,313 (4)	461 (<1)	21,576 (14)	2,024 (1)	42 (<1)	678 (<1)	426 (<1)	0	26 (<1)	8 (<1)	149,686
North	48,610 (76)	2,682 (4)	403 (1)	10,404 (16)	904 (1)	38 (<1)	358 (1)	161 (<1)	0	0	0	63,560
East of Round Building	1,629 (85)	74 (4)	0	206 (11)	0	0	0	0	0	0	0	1,909

Considering the sherd counts, the popularity of wares among the body sherds has a similar hierarchy of proportions in all areas except for the East of the Round Building (for which, see below). Coarse Simple Ware is most abundant (but more so in the North/West zone than in the Round Building/South), Cooking Ware is the second most common ware (but twice as profuse in the Round Building/South than in the North/West), Medium Simple Ware is third in popularity (least attested in the Round Building) and Fine Ware is a distant fourth (and more than twice as abundant in the North/West as in the Round Building/South).

The patterns observed above are repeated in the sherd weight data. The major difference between the two bodies of data are the lower relative frequencies of Fine Ware and Medium Simple Ware weights as compared with the sherd counts, since examples of those wares weigh less on average than Coarse or Cooking Ware sherds.

As with the diagnostics, the spatial patterns observed imply different activities taking place in the two major zones, with the North and West more devoted to domestic contexts (and hence with more Fine Ware), while the Round Building and South/Southwest areas involve a particular focus on activities involving Cooking Ware.

The number of sherds from the area East of the Round Building is probably too small to place much weight on the observed patterns, but Cooking Ware has a much lower frequency here than elsewhere, and Fine Simple Ware is completely absent.

LEVEL 3 (TABLE 4.54)

In level 3, Fine Simple Ware enjoys the largest popularity in the Temple and West areas, and the same zones have the most Metallic Ware, although in very small numbers (Table 4.55). The West area has a larger per-

centage of Fine Simple Ware than the East and a smaller percentage of Coarse Simple Ware. With respect to Cooking Ware, we find that its relative frequencies are lowest for the Temple area and highest in the southeast. The number of sherds from the Round Building, much fewer than the other areas, may not be large enough for significant patterns to be observed, but one might note that the Round Building has a high relative frequency of Cooking Ware and the lowest for Fine Simple Ware.

With respect to rim and vessel shapes (Tables 4.56–4.57), the East and West areas have a similar hierarchy of proportions of the most common types—jars, then cooking pots, then Fine Simple Ware bowls and goblets. The everted-rim jar 3211 is always the most common type except in the Southeast, where the hole-mouth cooking pot rim 3122 predominates. The Temple area has a greater popularity of the finer bowls and goblets and fewer hole-mouth cooking pots than the other localities. Although the Round Building has a very small sample, one may observe a relative paucity of finer bowls and goblets.

Rim sherds formed the great majority of the diagnostics in each neighborhood, but the Temple and West areas had smaller percentages than the other areas, presumably due to the higher number of decorated body sherds in those two zones.

Both the East and West areas have a preponderance of flat, round, and pointed bases, in that order (Tables 4.58–4.59). In the Temple area, flat bases are also most the common type, but there are an equal number of round and pointed bases. Compared to the East and West areas, the Temple area has the largest percentage of pointed bases and the smallest percentage of round bases, probably resulting from the predominance of Fine Simple Ware vessels and the relative rarity of storage vessels in the Temple zone. The number of base sherds for the Round Building is too small (n = 5) to discern significant patterns. When compared to the total sample of sherds from each area, the neighborhoods all had similar relative frequencies of base sherds (see Table 4.58).

Considering the frequency of incised sherds, we find that the Temple area has by far the largest proportion (Tables 4.60–4.61). The West area has a slight edge over the remaining areas in its abundance of incised pottery but lags far behind the Temple area. Within the Temple area itself, the incised sherds derive from the temple proper and neighboring open areas, not the 15/16 or 63–65 houses.[46]

TABLE 4.54. Neighborhoods with Their Area Designations, Level 3.

West (618 diagnostic sherds)	Areas 1–3, 7–11, 13–14, 17–20, 48–60, 80–83, 93–94
Temple (323 diagnostic sherds)	Areas 15–16, 21–24, 61–65, 92
Round Building (56 diagnostic sherds)	Areas 47, 87–91
East (700 diagnostic sherds)	Areas 25–46, 66–79, 84
[Southeast "industrial" zone	Areas 40–45, 75–79, with 94 diagnostic sherds, a subarea of the East Area, is also represented as a separate unit in Tables 4.54, 4.56, 4.58, and 4.60 in order to investigate whether significant differences were evident, given the frequency of ovens, mudbrick platforms, drains, and other distinctive features in this area.]

TABLE 4.55. Distribution of Ware by Neighborhood, Level 3: Raw Counts and Percentages (%) Out of All Sherds Coded for Ware in Neighborhood.

Ware	W	%	Temple	%	RB	%	E	%	SE	%	Total
1	165	29	118	37	13	23	246	35	30	32	542
2	75	13	45	14	18	32	85	12	9	10	223
3	199	35	108	33	7	13	208	30	26	28	522
4	6	1	8	3	1	2	3	0			18
5	4	1	2	1							6
6	118	21	42	13	17	30	158	23	29	31	335
Total	**567**		**323**		**56**		**700**		**94**		**1,646**

Notes: W = West, RB = Round Building, E = East, SE = Southeast; Southeast = southeast "industrial" zone (areas 40–45, 75–79) a subarea of the East area, represented as a separate unit in Tables 4.55, 4.57, 4.59, and 4.61, with figures in gray, in order to investigate whether significant differences were evident, given the frequency of ovens, mudbrick platforms, drains, and other distinctive features in this area.

TABLE 4.56. Percentage of Rim Sherds per Neighborhood, Level 3.

West	84% (523 out of 618 sherds)
Temple	82% (266 out of 323 sherds)
Round Building	91% (51 out of 56 sherds)
East	89% (623 out of 700 sherds)
[Southeast	90% (85 out of 94 sherds)]

TABLE 4.57. Distribution of Rim Types by Neighborhood, Level 3: Raw Counts and Percentages (%) Out of All Rim Sherds in Neighborhood.

Rim	W	%	Temple	%	RB	%	E	%	SE	%	Total
1111	10	2	6	2	3	6	20	3			39
1112	1	0									1
1114	4	1	4	2							8
1115	1	0	1	0							2
1116	13	3	3	1	5	10	12	2	3	4	33
1117			1	0							1
1118	5	1					1	0			6
1121	21	4	23	9	2	4	33	5	4	5	79
1122					1	2					1
1125	1	0	2	1							3
1127					1	2					1
1211	5	1					1	0			6
1212	1	0									1
1213			1	0							1
1214	3	1	1	0	2	4	2	0			8
1221	36	7	22	8	1	2	33	5	1	1	92
1311	1	0									1
2111	37	7	10	4	1	2	23	4	3	4	71
2113	10	2	16	6	2	4	22	4	3	4	50
2121	2	0	3	1			1	0	1	1	6
2122	2	0	2	1							4
2123							2	0			2
2211	23	4	12	5			40	6	9	11	75
2214							3	1			3
2221	1	0			1	2					2
2311	14	3	7	3			16	3	1	1	37
2321	6	1	3	1			9	1	2	2	18
2322	2	0	2	1			2	0	1	1	6
2323	2	0					1	0			3
3111	3	1	1	0			2	0			6
3112	6	1	1	0			5	1			12
3121	10	2	8	3	2	4	7	1			27
3122	63	12	14	5	5	10	86	14	19	22	168
3131			1	0	1	2					2
3132	2	0					6	1	1	1	8
3133							1	0			1
3211	76	15	63	24	8	16	103	17	15	18	250
3212	1	0	1	0	1	2	6	1			9
3213							1	0			1
3214	1	0									1
3221	52	10	24	9	3	6	33	5	7	8	112

Table 4.57, *continued*

Rim	W	%	Temple	%	RB	%	E	%	SE	%	Total
3224	1	0					1	0			2
3231	37	7	2	1	6	12	58	9	5	6	103
3232	1	0									1
3234	1	0	2	1	2	4	7	1	1	1	12
3241	12	2	5	2	2	4	25	4	2	2	44
3242	19	4	7	3			9	1			35
3243	8	2	3	1			7	1			18
3251	1	0	2	1			1	0			4
3252	1	0									1
3261	2	0			1	2	1	0	1	1	4
3271	3	1	2	1			6	1	1	1	11
3272	3	1	2	1			2	0			7
3273	1	0									1
3274	2	0	2	1							4
3276							2	0			2
3277			2	1							2
3278			1	0			2	0			3
3279	1	0					1	0	1	1	2
4111	1	0					2	0			3
4112	2	0	1	0			3	1	1	1	6
5111	8	2	2	1	1	2	16	3	3	4	27
8311	1	0					5	1			6
8321	1	0					1	0			2
8322							2	0			2
8323							1	0			1
8331	1	0	1	0							2
9111	1	0									1
Total	**523**		**266**		**51**		**623**		**85**		**1,463**

Notes: W = West, RB = Round Building, E = East, SE = Southeast; Southeast = southeast "industrial" zone (areas 40–45, 75–79) a subarea of the East area, represented as a separate unit in Tables 4.55, 4.57, 4.59, and 4.61, with figures in gray, in order to investigate whether significant differences were evident, given the frequency of ovens, mudbrick platforms, drains, and other distinctive features in this area.

TABLE 4.58. Percentage of Base Sherds per Neighborhood, Level 3.

West	9% (55 out of 618 sherds)	East	9% (63 out of 700 sherds)
Temple	10% (32 out of 323 sherds)	[Southeast	7% (7 out of 94 sherds)]
Round Building	9% (5 out of 56 sherds)		

TABLE 4.59. Distribution of Base Types by Neighborhood, Level 3: Raw Counts and Proportions (%) of All Base Sherds in Neighborhood.

Base	W	%	Temple	%	RB	%	E	%	SE	%	Total
730	17	31	7	22	1	20	21	33	5	71.40	46
731	27	49	17	53	2	40	29	46	2	28.60	75
732							1	2			1
737					1	20					1
738	1	2									1
739	1	2	1	3	1	20	1	2			4
741	1	2									1
745	8	15	7	22			11	18			26
Total	**55**		**32**		**5**		**63**		**7**		**155**

Notes: W = West, RB = Round Building, E = East, SE = Southeast; Southeast = southeast "industrial" zone (areas 40–45, 75–79).

TABLE 4.60. Percentage of Incised Sherds per Neighborhood, Level 3.

West	5% (32 out of 618 sherds)
Temple	11% (36 out of 323 sherds)
Round Building	2% (1 out of 56 sherds)
East	3% (22 out of 700 sherds)
[Southeast	4% (4 out of 94 sherds)]

TABLE 4.61. Distribution of Incised Sherds by Neighborhood, Level 3: Raw Counts and Percentages (%) Out of All Incised Sherds in Neighborhood (C) and Out of Sherds from All Neighborhoods Coded for Incised Type (R).

Incision	W	C %	R %	Temple	C %	R %	RB	C %	R %	E	C %	R %	SE	C %	Total
602				1	3	50	1	100	50						2
603				1	3	100									1
604	7	22	32	7	19	32				8	36	36	1	25	22
605	2	6	33	4	11	67									6
606	3	9	20	6	17	40				6	27	40	3	75	15
607				2	6	100									2
608				2	6	100									2
609	1	3	100												1
610	1	3	100												1
626				2	6	67				1	5	33			3
627				6	17	100									6
628				1	3	100									1
637	1	3	100												1
638	2	6	100												2
645	1	3	100												1
657	1	3	100												1
665	5	16	83							1	5	17			6
666	4	13	57							3	14	43			7
667	1	3	100												1
675	1	3	100												1
676										2	9	100			2
677	2	6	67	1	3	33									3
678				1	3	100									1
682				1	3	100									1
683										1	5	100			1
690				1	3	100									1
Total	**32**			**36**			**1**			**22**			**4**		**91**

Note: C = column; R = row. W = West, RB = Round Building, E = East, SE = Southeast; Southeast = southeast "industrial" zone (areas 40–45, 75–79)

The West and Temple areas both show a predominance of horizontal lugs over crescent lugs, while the East area displays a pronounced preeminence of crescent lugs (**Table 4.62**). The Round Building sample is too small (n = 4) for significant observations.

Summarizing the above trends, we may suggest that the predominance of finer wares in the Temple and the West may indicate higher-ranking social contexts, specialized contexts (i.e., cultic, in the case of the Temple), and/or a greater degree of serving and consumption of food than in other zones. The predominance of fine ware bowls and goblets in the Temple area, as well as the large proportion of incised pottery, underscore the special nature of this zone and the likely use of more elaborate vessels in cultic contexts or by associated individuals. The activities hypothesized for

TABLE 4.62. Distribution of Handle/Lug Types by Neighborhood, Level 3: Raw Counts and Percentages (%) Out of All Sherds with Handles or Lugs in Neighborhood.

Handle/lug	W	%	Temple	%	RB	%	E	%	SE	%	Total
701			2	8							2
703	1	2					3	5	1	10	4
713	1	2	1	4							2
714	29	53	11	46	2	50	14	22	5	50	56
715			3	13							3
719			1	4			1	2			2
720	23	42	6	25	2	50	44	70	4	40	75
722							1	2			1
726	1	2									1
Total	**55**		**24**		**4**		**63**		**10**		**146**

the Southeast in light of the ovens, drains and mud-brick platforms found there are supported by the large proportion of Cooking Ware sherds. The Round Building, albeit with a small sherd sample, also has a large Cooking Ware presence and relatively few Fine Simple Ware sherds, presumably indicative of its specialized function.

The sample of complete vessels or complete profiles from non-burial contexts is distributed as follows:

West Center

Area 49—Fine Simple Ware incurving simple-rim pointed-base goblet (Figure 4.29:11).

(Large Medium Simple Ware flat-based simple-rim bowl (Figure 4.26:15) was found below this area in contexts designated level 4/3.)

Northwest

Area 4, phases a–b (= level 4, area 58)—Fine Simple Ware goblet with pointed base and incised Ninevite 5 decoration (Figure 4.46:7).

Area 6 (=level 4 area 56)—large Medium Simple Ware round-based everted-rim jar (Figure 4.38:1).

Area 52—(A test trench below the floor of area 52 yielded two complete vessels—a round-based evert neck Medium Simple Ware jar (Figure 4.26:11) and a flat-based, simple-rim Coarse Simple Ware bowl (Figure 4.26:13). Both are given a level 4/3 designation since it is not clear if the context it derived from should be understood as level 3 or 4.)

Area 52, phase b—Fine Simple Ware round-based, everted-rim goblet (Figure 4.29:26).

Area 54—Fine Simple Ware round-based, bead-rim bowl (Figure 4.29:1).

Area 56—Medium Simple Ware flat-based, bead-rim bowl, found in upper fill of foundation below room floor (Figure 4.27:5). (A flat-based carinated Fine Simple Ware bead-rim bowl was found in lower debris next to the eastern foundation wall of area 56 and given a level 4/3 designation, Figure 4.26:1.)

Temple Area

Area 62, phase c—Fine Simple Ware pointed-base bead-rim goblet (Figure 4.29:14), Fine Simple Ware flat-based simple-rim bowl (Figure 4.29:24).

Area 63—Fine Simple Ware incurving simple-rim pointed-base goblet (Figure 4.29:8).

Northeast

Area 72—carinated bead-rim flat/concave base Fine Simple Ware bowl (Figure 4.29:15), 2 incurving simple-rim Fine Simple Ware pointed-base goblets (Figure 4.29:10, 12).

Area 66—Fine Simple Ware incurving simple-rim pointed base goblet (Figure 4.29:9).

Area 32, phase c—Medium Simple Ware small, round-based bi-mouth vessel (Figure 4.27:14).

Area 33, phase c—Fine Simple Ware squat, everted-rim, round-based restricted vessel (Figure 4.29:33).

Area 69, phase d—Fine Simple Ware flat-based restricted miniature vessel (Figure 4.29:30).

Area 70, phase a—Medium Simple Ware flat-based everted-rim jar (Figure 4.27:8).

Southeast

Area 84—Fine Simple Ware miniature bowl (Figure 4.29:34).

Area 42, phase a—Cooking Ware round-based, hole-mouth pot with horizontal lugs (Figure 4.31:14).

Area 75—large Medium Simple Ware round-based everted-rim jar (Figure 4.27:15).

Area 79—Coarse Simple Ware round-based hole-mouth jar (Figure 4.27:7).

Area 77, phase a—large Medium Simple Ware round-based everted-rim jar (Figure 4.27:16) found above two flat mudbricks.

Round Building

Area 47, phase b—Medium Simple Ware round-based everted-rim jar (Figure 4.27:9).

Area 91, phase b—Cooking Ware hole-mouth pot with horizontal lugs, missing base (Figure 4.31:6).

Although the sample of complete vessels is quite small, one pattern that might be of significance is the distribution of Fine Simple Ware vessels, found in every area except the Round Building and the southeastern zone. These vessels, ostensibly used for presentation and consumption of food and drink, may be particularly associated with domestic and cultic areas and thus not as common in non-residential locations such as the Round Building and the southeastern zone.

The corpus of recorded body sherds revealed fewer differences between neighborhoods than the diagnostics discussed above, presenting a picture of relative homogeneity (Tables 4.63–4.64). The pattern observed diachronically of the predominance of Coarse Simple Ware body sherds applies synchronically in the level 3 areas as well, and the Temple, East, and Round Building had a remarkable consistency in the relative frequencies of the number of Coarse Simple Ware sherds (66%). After Coarse Simple Ware, Cooking Ware was the most abundant type in each area, followed by Medium Simple Ware and, at a considerable remove, Fine Simple Ware. As with the diachronic pattern for levels 5–2, the Cooking Ware sherds individually outweigh the Medium Ware examples.

Although the numbers are small, the Temple area has the largest amount and weight of Metallic Ware sherds; while the differences are even less remarkable, the Temple area also has the greatest abundance of Fine Ware. The Temple has the smallest percentage of Cooking Ware, while that ware category is particularly

TABLE 4.63. Body Sherds, Level 3, Ware by Neighborhood (raw count followed by figure in parentheses representing percentage of the ware category out of all recorded body sherds in that neighborhood).

	Coarse Simple	Medium Simple	Fine Simple	Cooking	Cooking, Burnished	Metallic	Coarse Overfired	Medium Overfired	Fine Overfired	Bitumen Coated	Incised	Total
West	3,946	950	217	783	155	13	23	14	1	3	5	6,310
	(63)	(15)	(3)	(16)	(2)	(<1)	(<1)	(<1)	(<1)	(<1)	(<1)	
Temple	2,073	483	128	279	105	13	44	7	0	1	10	3,143
	(66)	(15)	(4)	(9)	(3)	(<1)	(1)	(<1)		(<1)	(<1)	
East	5,397	1,251	310	926	239	11	22	19	2	1	4	8,182
	(66)	(15)	(4)	(11)	(3)	(<1)	(<1)	(<1)	(<1)	(<1)	(<1)	
Round Building	448	73	24	120	8	0	3	1	0	0	2	679
	(66)	(11)	(4)	(18)	(1)		(<1)	(<1)			(<1)	

TABLE 4.64. Body Sherds, Level 3, Ware by Neighborhood (weight in grams followed by figure in parentheses representing percentage of the ware category out of all weighed body sherds in that neighborhood).

	Coarse Simple	Medium Simple	Fine Simple	Cooking	Cooking, Burnished	Metallic	Coarse Overfired	Medium Overfired	Fine Overfired	Bitumen Coated	Incised	Total
West	116,403	8,968	895	28,493	2,185	57	294	118	2	98	22	157,535
	(74)	(6)	(1)	(18)	(1)	(<1)	(<1)	(<1)	(<1)	(<1)	(<1)	
Temple	58,603	4,283	610	6,322	1,332	196	765	80	0	9	64	72,264
	(81)	(6)	(1)	(9)	(2)	(<1)	(1)	(<1)		(<1)	(<1)	
East	173,253	13,071	996	29,084	5,101	49	440	218	6	20	31	222,269
	(78)	(6)	(<1)	(13)	(2)	(<1)	(<1)	(<1)	(<1)	(<1)	(<1)	
Round Building	34,055	1,280	117	5,379	148	0	496	8	0	0	24	41,507
	(82)	(3)	(<1)	(13)	(<1)		(1)	(<1)			(<1)	

high in the West and Round Building (but note the lesser relative frequencies for Cooking Ware weights in the Round Building compared to the sherd counts).

NORTHWEST SILOS, LEVELS 3–4 (LEVEL 3 AREAS 4–6 = LEVEL 4 AREAS 56–58) (FIGURE 4.46:1–10)

Since the northwest "silos" were present in both levels 4 (Areas 56–58) and 3 (Areas 4–6), and it was not clear to which level the associated sherds belonged, the diagnostics from those features were not included in the level 2–5 study presented above. The number of diagnostic sherds found in two of the silos (level 3, areas 5–6 = level 4, areas 56–57) was decidedly minimal, but level 3 area 4 (level 4, area 58) had more examples.

As Tables 4.65–4.72 indicate, the patterns exhibited by the northwest silo diagnostics have characteristics common in both levels 4 and 3. These include Ninevite 5 type incised fine sherds, hole-mouth cooking pot rims with horizontal or crescent lugs (lug types 714, 720), pointed bases (base type 745), and thinner-walled vessels with incurving beaded rims (rim type 1221). Although level 3, area 4 (level 4, area 58) has four recognized phases of deposits and construction within the structure,[47] the sherd patterns do not easily

TABLE 4.65. Ware Frequencies of Diagnostic Sherds, Area 4, Level 3 (=Area 58, Level 4) by Phase: Sherd Counts and Percentages (%) Out of All Sherds in Phase.

Phase	Coarse Simple	Medium Simple	Fine Simple	Metallic	Vegetal-Tempered	Cooking	Total
a/b	3 (30)	1 (10)	4 (40)	0	0	2 (20)	10
b	3 (21)	2 (14)	4 (29)	0	0	5 (36)	14
c	16 (44)	3 (8)	5 (14)	0	0	12 (33)	36
d	4 (36)	0	4 (36)	0	0	3 (27)	11
Total	**26 (37)**	**6 (8)**	**17 (24)**	**0**	**0**	**22 (31)**	**71**

TABLE 4.66. Ware Frequencies of Diagnostic Sherds, Northwest Silos: Sherd Counts and Percentages (%) Out of All Sherds in Phase.

Area	Coarse Simple	Medium Simple	Fine Simple	Metallic	Vegetal-Tempered	Cooking	Total
4	26 (37)	6 (8)	17 (24)	0	0	22 (31)	71
5	1 (20)	0	1 (20)	0	0	3 (60)	5
6	0	2 (67)	0	0	0	1 (33)	3
Total	**27 (34)**	**8 (10)**	**18 (23)**	**0**	**0**	**26 (33)**	**79**

TABLE 4.67. Rim Type Distribution, Area 4 (Level 3) = Area 58 (Level 4) Phases: Sherd Counts.

Rim type	Phase a/b	Phase b	Phase c	Phase d	Total
1111	1	0	2	1	4
1116	0	2	2	0	4
1121	0	0	2	0	2
1221	0	1	1	2	4
2111	0	0	1	1	2
2113	1	0	1	0	2
2211	0	0	0	1	1
2311	3	1	0	0	4
3122	0	0	8	1	9
3211	2	2	6	1	11
3221	0	0	1	0	1
3231	0	0	3	0	3
3232	0	0	0	1	1
3241	0	0	2	0	2
3242	0	1	0	1	2
5111	1	4	0	0	5
Total	**8**	**11**	**29**	**9**	**57**

TABLE 4.68. Rim Type Distribution by Area, Northwest Silos: Sherd Counts.

Rim type	4	5	6	Total
1111	4	0	0	4
1116	4	0	0	4
1121	2	0	0	2
1221	4	1	0	5
2111	2	0	0	2
2113	2	0	0	2
2211	1	0	0	1
2311	4	0	0	4
3122	9	0	1	10
3211	11	0	1	12
3221	1	0	0	1
3231	3	1	1	5
3232	1	0	0	1
3241	2	0	0	2
3242	2	0	0	2
5111	5	2	0	7
Total	**57**	**4**	**3**	**64**

TABLE 4.69. Base Type Distribution by Area, Northwest Silos: Sherd Counts.

Base type	4	5	6	Total
730	0	0	1	1
731	2	0	0	2
745	2	0	0	2
Total	**4**	**0**	**1**	**5**

TABLE 4.70. Handle/Lug Type Distribution by Area, Northwest Silos: Sherd Counts.

Handle/lug type	4	5	6	Total
701	1	0	0	1
714	4	0	0	4
717	2	0	0	2
720	2	0	0	2
Total	**9**	**0**	**0**	**9**

TABLE 4.71. Incised Type Frequencies, Level 3 Area 4 = Level 4 Area 58 Phases: Sherd Counts.

Phase	602	602 and 606	606	607 and 627	617	626	654	Total
a/b	0	0	0	0	0	1	0	1
b	0	1	0	1	1	0	0	3
c	0	0	0	0	0	0	0	0
d	1	0	2	0	0	0	1	4
Total	**1**	**1**	**2**	**1**	**1**	**1**	**1**	**8**

TABLE 4.72. Incised Type Distribution by Area, Northwest Silos: Sherd Counts.

Incised type	4	5	6	Total
602	1	0	0	1
602 and 606	1	0	0	1
606	2	0	0	2
607 and 627	1	0	0	1
617	1	0	0	1
626	1	0	0	1
654	1	0	0	1
698	0	1	0	1
Total	**8**	**1**	**0**	**9**

lend themselves to a discernment of level 4 as opposed to level 3 contexts. The only hint of such differences is provided by incised sherds. In phases b and d, incised panel motifs (type 606) are found, a type far more common in level 3 than level 4 (Table 4.71), which might imply that the debris of those phases derived from level 3. The earlier phases a/b include incised design 626 on a complete pointed-based goblet, a motif more characteristic of Early Jezirah 1/early 2 contexts elsewhere and thus possibly deriving from level 4. However, the diagnostic sherd sample from these areas is too small and too ambiguous to date the contents of the silos to either level 3 or 4.

The silos contain an unusually large number of Cooking Ware lid sherds (type 5111, 11% of all area 4–6 rims) compared to either level 3 (1%) or level 4 (2%).

LEVEL 3, AREAS 12, 58, 60, 86 (THE "SHOP") (FIGURE 4.46:11–14)

The architecture from the structure designated in Chapter 2 as level 3, area 12, together with contemporaneous contexts in areas 58, 60, 86, derived from a phase that could be assigned to either late level 3 or early level 2 on the basis of stratigraphy. This area was referred to informally as the "shop," due to area 12's U-shaped form, open to the nearby thoroughfare, although its identification as a shop is questionable (see Chapter 2). In Chapter 2, a late level 3 date was suggested, but since the level assignment of the associated sherds was not clear, the pottery from the "shop" was not included in the analysis presented above. Data from these sherds are supplied in Tables 4.73–4.74. The number of sherds from the "shop" is probably too small to draw significant conclusions, but one may note the large percentage of Metallic Ware, which is more characteristic of level 2 than level 3.

Although 65 rim sherds were found (Table 4.74), only two base sherds were identified, both of the round variety (type 730). Two Cooking Ware sherds with triangular lugs (type 713) and five with horizontal lugs (type 714) were recorded. Only one incised/decorated sherd was noted, bearing horizontal grooves (type 665).

While the data are meager, the ceramic evidence from the "shop" area suggests a level 2 horizon. Such level 3 characteristics as crescent lugs, pointed bases, incised Ninevite 5, and Cooking Ware lids are missing, while types more common in level 2 are present, including triangular lugs, a relative abundance of Metallic Ware, Cooking Ware thick slightly flaring rims (type 3274) with triangular lugs (type 713), and jar rims with an interior notch to accommodate a lid (type 3261). Note also the similarity of the cooking pot with hori-

TABLE 4.73. Ware Frequencies of Diagnostic Sherds, "Shop"

Coarse Simple	Medium Simple	Fine Simple	Metallic	Vegetal-Tempered	Cooking	Total
29 (35)	8 (10)	27 (33)	5 (6)	0	14 (17)	83

TABLE 4.74. Rim Type Distribution, "Shop."

Rim type	Quantity
1111	2
1114	3
1118	1
1121	5
1211	3
1221	2
2111	4
2113	2
2121	2
2211	1
2311	2
2321	2
2322	1
2323	1
3112	1
3121	2
3122	7
3131	2
3211	5
3221	4
3231	1
3241	2
3243	2
3245	1
3261	2
3272	1
3274	2
3278	2
Total	**65**

zontal lug illustrated in Figure 4.46:11 to that of the near-complete example from level 2, area 11 (Figure 4.40:6).

CONCLUSIONS

The sherd sample from Raqa'i provides a well-documented early third-millennium BCE sequence of ceramic types, and it is notable that the chronological patterns observed in the quantitative analysis generally correspond to "battleship curve" expectations of types growing steadily, reaching a peak, and then declining. In addition to ascertaining diagnostics of different periods, we may also recognize diachronic patterns associated with changes in on-site activities or social organization. For example, pots and Cooking Ware are most common in earlier levels and then decline, while goblets and Fine Simple Ware steadily grow in popularity. Likewise, if we "lump" the categories in Table 4.16 to consumption vessels (bowls/goblets) versus storage/cooking vessels (jars/pots), there is a steady increase of bowls and goblets and a decline of storage and cooking vessels from levels 5 to 2.[48]

These results might be interpreted in several ways. On the one hand, the decline of pots and Cooking Ware, or of storage/cooking vessels, could signal a reduction in the grain storage and processing activities inferred for the earlier levels, while the proliferation of goblets and Fine Simple Ware, or of consumption vessels, could imply an increase in domestic activities, social differentiation (if one understands fine ware as a high-status object), and commensal behaviors involving drinking. But on the other hand a different explanation could be advanced based on the nature of the excavated samples: the exposed segment of the level 4 occupation was dominated by the Round Building, where Cooking Ware predominates, while the level 3 excavated exposure consisted primarily of domestic architecture, where drinking vessels would be expected. In such an interpretation, the patterns in levels 5 and 2 would still have to be accounted for.

Despite the changes enumerated above, the most common shape type for all levels is that of the jar. This observation suggests that storage remained consistently important throughout the third-millennium occupation of Raqa'i, regardless of possible changes in habits of consumption or of social differentiation.

In addition to diachronic changes, we might also consider synchronic spatial patterning of pottery as a proxy for on-site activities and social organization—bearing in mind the caveat noted above that the sherds derive from secondary contexts. In both levels 4 and 3, ceramic distribution patterns imply different activities associated with specific parts of the site. In level 4, the Round Building and the South/Southwest area have higher numbers of Cooking Ware and painted sherds

and relatively few fine ware bowls and goblets, attesting to a function distinct from food/drink consumption and perhaps connected to (grain) storage and processing. In the North and West areas, fine bowls and goblets are much more common, suggestive of domestic activities and the consumption of food and drink.

In level 3, the Round Building is once again associated with Cooking Ware and a paucity of fine ware sherds, although the excavated sherd sample is much smaller than in level 4. The predominance of Cooking Ware in the southeast is associated with non-domestic architecture, ovens, and mudbrick platforms, likewise corresponding to the suggested specialized character of activities transpiring there. Elsewhere in level 3, the Temple and West areas have the largest proportions of fine wares and, especially for the Temple area, incised pottery, which may suggest higher-ranking social contexts and/or specialized (cultic) activities.[49]

CATALOGUE

Figure 4.17. Level 5 Ceramics (and Levels 4/5, No. 31)

1. Raq 90. Level 5. 42/114-278. Fine Simple Ware, light yellow, no visible inclusions, smooth exterior with burnish traces. Rim/shape type 1117.
2. Raq 88. Level 5, area 3. 60/120-038. Fine Simple Ware, light yellow, no visible inclusions. Rim/shape type 1121.
3. Raq 88. Level 5, area 3. 60/120-038. Fine Simple Ware, pink core/interior, light yellow exterior (slip?), fine sand. Rim/shape type 3273.
4. Raq 90. Level 5, area 2. Fine Simple Ware, light green, some fine sand and vegetal inclusions, dark brown paint. Rim/shape type 1221.
5. Raq 92. Level 5, area 13. 65/108-016. Fine Simple Ware, light gray, no visible inclusions, corrugated. Rim/shape type 2211.
6. Raq 90. Level 5, area 19, phase d. 36/120-215 and 219. Coarse Simple Ware, exterior light yellow slip, interior/core light brown, fine sand, incised, and punctated with a stick (not hollow).
7. Raq 90. Level 5, area 20, phase b. 36/120-244. Medium Simple Ware, exterior light yellow-green (slip), light yellowish-gray interior/core, brown paint.
8. Raq 90. Level 5, area 19, phase b. 36/120-249. Medium Simple Ware, light brown, fine sand and lime, brown paint. Rim/shape type 2311.
9. Raq 90. Level 5, area 20, phase b. 36/120-244. Fine Simple Ware, exterior/interior whitish slip, pink core, fine white sand, dark brown paint.
10. Raq 88. Level 5, area 3. 60/120-038. Cooking Ware, light brown exterior/interior, black core, fine and medium sand, applied lug (broken). Rim/shape type 3122.
11. Raq 90. Level 5, area 2. 42/114-262. Cooking Ware, light brown, medium sand. Rim/shape type 3231.
12. Raq 90. Level 5, area 19, phase d. 36/120-205. Cooking Ware, light brown exterior/interior, black core (in center), interior with burnish traces. Rim/shape type 3121.
13. Raq 90. Level 5, area 19, phase b. 36/120-245. Cooking Ware, light brown exterior/interior with darkening on exterior, black core, medium and coarse sand. Rim/shape type 3212.
14. Raq 90. Level 5, area 21, phase c. 36/120-227. Cooking Ware, exterior/interior brown to reddish-brown, black core, fine and medium sand, crude, finger impressions. Rim/shape type 1116.
15. Raq 90. Level 5, area 2. 42/114-262. Cooking Ware, exterior/interior dark brown, black core, fine and medium sand. Rim/shape type 1116.
16. Raq 90. Level 5, area 2. 42/114-276. Cooking Ware, light brown, medium sand. Rim/shape type 1116.
17. Raq 90. Level 5, area 2. 42/114-272. Cooking Ware, exterior/interior light brown, black core, fine sand. Rim/shape type 1116.
18. Raq 90. Level 5, area 20. 36/120-233. Cooking Ware, exterior light yellow, black core, fine/medium/coarse sand. Rim/shape type 1116.
19. Raq 90. Level 5, area 19, phase c. 36/120-219. Cooking Ware, exterior/interior pinkish-brown, black core, medium sand. Rim/shape type 3212.
20. Raq 90. Level 5, area 19, phase d. 36/120-215. Coarse Simple Ware, exterior/interior light yellow (slip), light reddish-brown core, fine and medium sand. Rim/shape type 3231.
21. Raq 90. Level 5, area 2. 42/114-279. Coarse Simple Ware, black, crude. Rim/shape type 3231.
22. Raq 90. Level 5, area 19, phase b. 36/120-249. Coarse Simple Ware, exterior light yellow slip with red-brown discoloration, pinkish-brown core/interior, fine sand. Rim/shape type 3231.
23. Raq 90. Level 5, area 2. 42/114-268. Coarse Simple Ware, exterior/interior light brownish-yellow, light brown core, fine white sand. Rim/shape type 3231.
24. Raq 90. Level 5, area 19, phase c. 36/120-218. Medium Simple Ware, light brown, fine white sand. Rim/shape type 3232.
25. Raq 90. Level 5, area 19, phase b. Medium Simple Ware, exterior yellowish-brown, interior gray-

brown, brown core, medium vegetal temper, fine sand. Rim/shape type 3221.

26. Raq 90. Level 5, area 20, phase b. 36/120-233. Medium Simple Ware, light yellowish-brown, fine sand. Rim/shape type 3211.
27. Raq 90. Level 5, area 19, phase c. 36/120-219. Medium Simple Ware, exterior/interior light yellow, light brown core, fine sand. Rim/shape type 3211.
28. Raq 90. Level 5, area 2. 42/114-259. Medium Simple Ware, exterior/interior light yellow, light brown core, fine sand. Rim/shape type 1311.
29. Raq 90. Level 5, area 20, phase b. 36/120-233. Medium Simple Ware, light (greenish-) yellow, fine sand. Rim/shape type 3122.
30. Raq 92. Level 5, area 22, phase b. 17/114-022. Medium Simple Ware, exterior light yellow (slip), pinkish-brown interior/core, fine sand. Rim/shape type 9111.
31. Raq 92. Level 4 or 5, above Level 5, area 18. 42/114N-026. Fine Simple Ware, exterior/interior light brown, fine white sand and lime, light red paint. Rim/shape type 2311.

Figure 4.18. Level 4 Coarse and Medium Simple Ware Bowls and Miscellaneous Shapes

1. Raq 90. Level 4. Area 11, phases b–c. 42/108-80. Medium Simple Ware, exterior/interior light yellow (slip), core light brown, fine sand. Rim/shape type 1116.
2. Raq 88. Level 4, area 42, phases a–b. 60/120-042. Medium Simple Ware, exterior/interior light gray to yellow, gray core, fine and medium sand, crude. Rim/shape type 1116.
3. Raq 92. Level 4. Area 5. 42/114E- 41. Medium Simple Ware, exterior/interior whitish slip with darkening on interior, core light brown, fine sand. Rim/shape type 1221.
4. Raq 89. Level 4, area 19. 42/108-055. Medium Simple Ware, light yellow exterior, fine sand. Rim/shape type 2221.
5. Raq 88. Level 4, area 9, phase b. 42/114-077. Medium Simple Ware, light yellow, fine sand, some medium vegetal inclusions. Rim/shape type 1221.
6. Raq 89. Level 4, area 9, phase b. 42/114-137. Coarse Simple Ware, light pink/yellow, fine white sand. Rim/shape type 1221.
7. Raq 89. Level 4, area 60, phase b. 36/120-132. Medium Simple Ware, exterior light yellow (slip?), core/interior light brownish-yellow, fine sand. Rim/shape type 1122.
8. Raq 90. Level 4, Area 32. 42/114-237. Medium Simple Ware, light brown, fine/medium white sand. Rim/shape type 1115.
9. Raq 90. Level 4, area 12, phase b. 48/108-72. Medium Simple Ware, exterior/interior light brown, pink core, fine sand. Rim/shape type 1121.
10. Raq 88. Level 4, area 29. 42/102-042. Coarse Simple Ware, light yellow to brown, fine sand. Rim/shape type 1311.
11. Raq 90. Level 4, area 13, phase a. 42/114-112. Medium Simple Ware, light yellow/gray, no visible inclusions. Rim/shape type 1311.
12. Raq 88. Level 4, area 29. 42/102-042. Coarse Simple Ware, light brown/gray, fine sand. Rim/shape type 1311.
13. Raq 89. Level 4, area 22. 42/108-058. Coarse Simple Ware, pink-brown, coarse and medium sand, with applied "tail."
14. Raq 89. Level 4, above Area 52, phase b. 30/126-063. Coarse Simple Ware, exterior/interior pink/brown, black core, vegetal inclusions.
15. Raq 89. Level 4, area 17, phase b. 42/114-110. Medium Simple Ware, light pink/brown exterior, fine sand.
16. Raq 90. Level 4, area 33. 42/114-263. Coarse Simple Ware, exterior/interior light yellow, light brown core, fine multi-colored sand.
17. Raq 89. Level 4, area 18, phase a. 42/108-069. Coarse Simple Ware, exterior/interior brown, black core, fine sand.

Figure 4.19. Level 4 Coarse and Medium Simple Ware Jars

1. Raq 90. Level 4, area 99. 29/126-148. Coarse Simple Ware, exterior/upper interior light yellow, core and lower interior pink-brown, fine sand. Rim/shape type 3231.
2. Raq 88. Level 4, area 42, phase b. 60/120-031. Coarse Simple Ware, light yellow exterior, pink core, fine sand. Rim/shape type 3211.
3. Raq 87. Level 4, area 36. 42/116-070. Medium Simple Ware, brownish-red to light yellow, fine sand/lime. Rim/shape type 3211.
4. Raq 90. Level 4, area 1. Coarse Simple Ware, Light yellow, fine sand. Rim/shape type 3211.
5. Raq 89. Level 4, area 23. 48/108-041. Medium Simple Ware, exterior/interior light brownish-yellow, light gray core, fine sand. Rim/shape type 3211.
6. Raq 89. Level 4, area 9, phase b. 42/114-138. Medium Simple Ware, exterior light yellow, pink core, fine white sand. Rim/shape type 3271.

7. Raq 89. Level 4, area 9, phase a. 42/114-139. Coarse Simple Ware, exterior light yellow, interior/core pink/brown, fine sand and lime. Rim/shape type 3211.
8. Raq 89. Level 4, area 23. 48/108-041. Medium Simple Ware, light yellow, fine sand. Rim/shape type 3211.
9. Raq 88. Level 4, area 42, phase b. 60/120-025. Medium Simple Ware, exterior/interior light yellow, light pink core, medium and fine white sand. Rim/shape type 3231.
10. Raq 90. Level 4, area 7. 42/114-209. Coarse Simple Ware, light green, multi-colored coarse sand, friable rim. Rim/shape type 3272.
11. Raq 89. Level 4, area 9, phase b. 42/114-137. Coarse Simple Ware, exterior light yellow (slip), interior light pink, core light pink with gray in center, fine sand, diagonal incised notches along rim. Rim/shape type 3231.
12. Raq 87. Level 4, area 34. 42/116-071. Coarse Simple Ware, reddish-brown, fine sand. Rim/shape type 3231.
13. Raq 90. Level 4, area 3. 48/108-131. Medium Simple Ware, light yellow, fine sand, some vegetal temper. Rim/shape type 3221.
14. Raq 90. Level 4, area 83, phase a. 30/108-85. Coarse Simple Ware, light yellow-brown exterior and interior (slip), brown-pink core, fine sand. Rim/shape type 3231.
15. Raq 90. Level 4, area 2. 42/102-147. Coarse Simple Ware, light yellow, fine sand. Rim/shape type 3241.
16. Raq 89. Level 4, area 60, phase b. 36/120-134. Medium Simple Ware, exterior light yellow, pink core, fine sand and lime. Rim/shape type 3232.
17. Raq 89. Level 4, area 18. 42/108-058. Coarse Simple Ware, light brown, darkened rim, coarse sand, warped. Rim/shape type 3241.
18. Raq 89. Level 4, above Area 1. 49/108-016. Medium Simple Ware, exterior/interior light yellow to light pink/brown, pink/brown core, fine lime and sand, crude. Rim/shape type 2311.
19. Raq 90. Level 4, area 99. 29/126-151. Coarse Simple Ware, exterior light yellow (slip?), interior and core pinkish-brown. Rim/shape type 3231.
20. Raq 89. Level 4, area 61, phase c. 36/120-126. Coarse Simple Ware, light yellow, fine vegetal temper and sand. Rim/shape type 3211.
21. Raq 89. Level 4, area 18. 42/108-058. Medium Simple Ware, exterior/interior light brownish-yellow with light pink areas, pink/brown core, fine white sand. Rim/shape type 3211.
22. Raq 90. Level 4, area 27. 48/108-125. Medium Simple Ware, light yellowish-green, fine sand.
23. Raq 89. Level 4, area 60, phase b. 36/120-131. Medium Simple Ware, exterior light yellow exterior, gray core, fine sand, scraping along interior. Rim/shape type 3211.
24. Raq 90. Level 4, area 29. 42/102-142. Medium Simple Ware, light yellow, fine sand. Rim/shape type 3231.
25. Raq 90. Level 4, area 7. 42/114-198. Medium Simple Ware, light yellow, fine sand, exterior lightly smoothed. Rim/shape type 3232.
26. Raq 90. Level 4, area 31. 42/114-227. Medium Simple Ware, exterior and rim interior with light whitish-yellow slip, pink and light brown elsewhere, fine sand. Rim/shape type 3211.
27. Raq 90. Level 4, Area 6. 42/114-226. Medium Simple Ware, light yellow, fine sand. Rim/shape type 3211.
28. Raq 89. Level 4, area 19. 42/108-061. Medium Simple Ware, light reddish-brown, medium sand. Rim/shape type 3212.
29. Raq 88. Level 4, area 42, phases a–b. 60/120-042. Medium Simple Ware, exterior light yellow/brown, medium to large sand, applied lug. Rim/shape type 1116.

Figure 4.20. Level 4 Fine Simple Ware

1. Raq 90. Level 4, area 12, phase b. 48/108-072. Fine Simple Ware, light yellow, no visible inclusions. Rim/shape type 2121.
2. Raq 88. Level 4, area 9, phase b. 42/114-077. Fine Simple Ware, light yellow to light green, no visible inclusions. Rim/shape type 2121.
3. Raq 90. Level 4, area 12, phase b. 48/108-108. Fine Simple Ware, light blue greenish-gray, no visible inclusions, horizontal ribbing. Rim/shape type 2211.
4. Raq 89. Level 4, area 9, phase b. 42/114-138. Fine Simple Ware, light yellow, fine vegetal and sand inclusions. Rim/shape type 2211.
5. Raq 89. Level 4, area 14. 42/114-167. Fine Simple Ware, dark gray, fine lime and sand. Rim/shape type 2211. Rim/shape type 2113.
6. Raq 89. Level 4, area 15, phase c. 42/114-169. Fine Simple Ware, gray, fine sand. Rim/shape type 2113.
7. Raq 90. Level 4, area 2. 42/102-147. Fine Simple Ware, exterior light greenish-gray (slip?), interior/core light gray, exterior smoothed. Rim/shape type 2113.
8. Raq 87. Level 4, area 36. 42/116-070. Fine Simple Ware, light gray, no visible inclusions, corrugated. Rim/shape type 2211.

9. Raq 89. Level 4, area 9, phase b. 42/114-137. Fine Simple Ware, light gray, no visible inclusions. Rim/shape type 2211.
10. Raq 90. Level 4, area 12, phase b. 48/108-108. Fine Simple Ware, light gray, no visible inclusions. Rim/shape type 2211.
11. Raq 89. Level 4, area 9, phase b. 42/114-138. Fine Simple Ware, light gray/green, no visible inclusions, horizontal grooves. Rim/shape type 2211.
12. Raq 89. Level 4, area 16, phases b–c. 42/114-102. Fine Simple Ware, light yellow/green exterior, fine and medium lime and vegetal inclusions. Rim/shape type 1221.
13. Raq 89. Level 4, area 18, phase a. 42/108-069. Fine Simple Ware, exterior/interior light yellow, light brown core, fine sand and lime. Rim/shape type 2322.
14. Raq 88. Level 4, area 42, phase b. 60/120-021. Fine Simple Ware, light gray, fine sand. Rim/shape type 2311.
15. Raq 89. Level 4, area 18, phase b. 42/108-075. Fine Simple Ware, pink-brown, fine white sand. Rim/shape type 2311.
16. Raq 89. Level 4, above Area 52, phase b. 30/126-063. Fine Simple Ware, light yellow, no visible inclusions. Rim/shape type 8321.
17. Raq 89. Level 4, area 60, phase b. 36/120-132. Fine Simple Ware, exterior/interior light yellow, pink core, fine white sand, coarse lime. Rim/shape type 3211.
18. Raq 90. Level 4, area 28. 48/108-126. Fine Simple Ware, light gray, fine and medium lime, 4 pierced lugs, horizontal ribbing, broken rim.
19. Raq 89. Level 4, area 9, phase b. 42/114-138. Fine Simple Ware, light yellow, fine sand. Rim/shape type 8322.

Figure 4.21. Level 4 Fine Simple Ware and Medium/Coarse Simple Ware Incised

1. Raq 89. Level 4, area 60, phase b. 36/120-132. Fine Simple Ware, light gray, no visible inclusions, grooved and incised. Rim/shape type 2211.
2. Raq 89. Level 4, area 60, phase b. 36/120-132. Fine Simple Ware, light yellow, no visible inclusions, incised. Rim/shape type 2211.
3. Raq 89. Level 4, area 15, phase c. 42/114-166. Fine Simple Ware, light blue-gray, fine lime, incised and impressed.
4. Raq 90. Level 4, area 6. 42/114-223. Medium Simple Ware, light yellow, fine sand, incised. Rim/shape type 2211.
5. Raq 90. Level 4, area 4. 48/108-093. Fine Simple Ware, light gray, fine sand and vegetal inclusions, horizontal ribbing.
6. Raq 92. Level 4, area 89. 42/114N-011. Fine Simple Ware, exterior/interior light yellow, light gray/green core, no visible inclusions, herringbone incision. Rim/shape type 2211.
7. Raq 88. Level 4, area 13, phase d. 42/114-069. Fine Simple Ware, light gray-green, fine sand, horizontal grooves, impressed circle with central hole and ring of punctate lines.
8. Raq 89. Level 4, area 100. 30/120-046. Fine Simple Ware, exterior whitish-pink slip, interior/core pink-brown exterior, no visible inclusions, incised.
9. Raq 90. Level 4, area 99. 29/126-158. Fine Simple Ware, light green, fine sand, incised.
10. Raq 89. Level 4, area 100. 30/120-046. Fine Simple Ware, light yellow, no visible inclusions, incised.
11. Raq 88. Level 4, area 13, phase d. 42/114-069. Medium Simple Ware, exterior light yellow (slip?), interior/core gray to yellow, fine sand, medium lime, incised/impressed.
12. Raq 90. Level 4, area 109. 52/100-009. Fine Simple Ware, exterior light yellow (slip), interior/core light brown, fine/medium white sand/lime, incised, punctate designs (not hollow), pierced lug.
13. Raq 89. Level 4, area 51, phase a. 30/126-073. Medium Simple Ware, exterior/interior light yellow, pink core, medium lime, two applied pierced vertical lugs preserved (of four).
14. Raq 89. Level 4, area 10, phase b. 42/114-136. Medium Simple Ware, light yellow, fine lime/sand, base incised.
15. Raq 90. Level 4, area 28. 48/108-126. Medium Simple Ware, light gray-green, fine lime/sand, 4 pierced lugs. Rim/shape type 3275.
16. Raq 90. Level 4, area 7. 42/114-209. Medium Simple Ware, exterior/interior light yellow, light yellow/brown core, fine white sand and mica, applied pierced nose lug, raised applied bands with impressed finger impressions.
17. Raq 88. Level 4, area 13, phase d. 42/114-073. Coarse Simple Ware, exterior/interior light yellow, pink core, fine to medium sand, incised.
18. Raq 92. Level 4, area 11, phase a. Coarse Simple Ware, exterior/interior light yellow (slip), light pink core, coarse sand, incised.
19. Raq 92. Level 4, area 31. 42/114E-004. Coarse Simple Ware, exterior/interior light yellow, light gray

core, fine black sand, light gray core, applied nose lug, incised, pitted with small holes.

Figure 4.22. Level 4 Painted

1. Raq 90. Level 4, area 29. 42/102-125. Medium Simple Ware, exterior light brownish-yellow (slip), light brown core, fine sand, red-brown paint.
2. Raq 92. Level 4, area 31. 42/114E-023. Fine Simple Ware, light brown, fine and medium lime, red-brown paint. Rim/shape type 2322.
3. Raq 88. Level 4, area 29. 42/102-042. Fine Simple Ware, exterior light pink slip, interior light gray to light brown, core gray to light brown, with black center, fine sand, red paint.
4. Raq 89. Level 4, area 29. 42/102-052. Medium Simple Ware, light yellow exterior slip, interior/core light brownish-yellow, fine white sand, red-brown paint.
5. Raq 89. Level 4, area 18, phase a. 42/108-069. Fine Simple Ware, exterior/interior light yellow/brownish-gray, pink core, fine white sand, brownish-red paint.
6. Raq 90. Level 4, area 9, phase a. 42/114-208. Medium Simple Ware, light brown to dark yellowish-gray, fine sand and vegetal inclusions, red-brown paint. Rim/shape type 2215.
7. Raq 89. Level 4, area 9, phase b. 42/114-137. Medium Simple Ware, exterior light yellow/white slip, interior light pink-brown, pink core with gray center, lime and fine white sand, red paint.
8. Raq 92. Level 4, area 31. 42/114E-007. Fine Simple Ware, exterior/interior light brownish-pink, light gray core, fine mica/sand, brownish-red paint.
9. Raq 88. Level 4, area 9, phase b. 42/114-077. Fine Simple Ware, exterior light yellow slip, interior/core light gray-brown, no visible inclusions, reddish-brown paint.
10. Raq 90. Level 4, area 2. 42/102-147. Fine Simple Ware, light yellow, fine sand, brown paint.

Figure 4.23. Level 4 Cooking Ware

1. Raq 87. Level 4, area 36. 42/116-070. Cooking Ware, brownish-pink, medium to coarse sand, rough surface, crescent lug. Rim/shape type 3133.
2. Raq 88. Level 4, area 36. 60/120-015. Cooking Ware, exterior/interior light brown, black core (center), fine and medium sand, burnished interior. Rim/shape type 3122.
3. Raq 88. Level 4, area 42, phases a–b. 60/120-049. Cooking Ware, exterior/interior light brown, black core, burnished exterior, medium sand. Rim/shape type 3213.
4. Raq 88. Level 4, area 42, phase b. 60/120-024. Cooking Ware, dark to light brown, medium sand, exterior smoothed. Rim/shape type 3252.
5. Raq 89. Level 4, area 19. 42/108-055. Cooking Ware, brown, medium and coarse sand, burnish traces on exterior. Rim/shape type 3212.
6. Raq 88. Level 4, area 41, phase b. 60/120-028. Cooking Ware, exterior/interior light brown, black core, fine and medium sand/ lime, crude/irregular exterior. Rim/shape type 3121.
7. Raq 89. Level 4, area 60, phase b. 36/120-132. Cooking Ware, brown exterior, black core, medium vegetal inclusions, crescent lug. Rim/shape type 3122.
8. Raq 90. Level 4, area 24, phase b. 48/108-067. Cooking Ware, brown exterior, black central core, medium black sand, projecting lug. Rim/shape type 3122.
9. Raq 90. Level 4, area 11, phase a–b. Cooking Ware, exterior/interior light brown/pink, gray core, fine/medium sand, crescent lug. Rim/shape type 3121.
10. Raq 88. Level 4, area 13, phase d. 42/114-073. Cooking Ware, exterior/interior brown, light gray core, coarse white sand, applied horizontal lug broken, friable. Rim/shape type 3121.
11. Raq 88. Level 4, area 41, phase b. 60/120-022. Cooking Ware, light brown, medium/coarse sand, applied crescent lug, rim irregular. Rim/shape type 3121.
12. Raq 90. Level 4, area 9, phase a. 42/114-208. Cooking Ware, exterior light brown, interior/core light gray, fine sand, exterior with dark black areas, burnished exterior. Rim/shape type 3211.
13. Raq 90. Level 4, area 1. 42/102-094. Cooking Ware, exterior and interior rim with whitish slip, light brown to reddish-brown, medium and fine lime. Rim/shape type 3213.
14. Raq 89. Level 4, area 17, phase b. 42/114-110. Cooking Ware, exterior/interior brown, black core, vegetal temper, crude. Rim/shape type 3213.
15. Raq 90. Level 4, area 1. 42/102-143. Cooking Ware, light brown, fine, medium and coarse sand, interior with burnish traces, smudged/darkened exterior as well as top and interior of rim, crude. Rim/shape type 3212.
16. Raq 87. Level 4, area 36. 42/116-070. Cooking Ware, brown to pinkish-brown, medium to coarse black and white sand, exterior rough surfaced. Rim/shape type 3212.

17. Raq 87. Level 4, area 36. 42/116-070. Cooking Ware, exterior/interior light pinkish-brown, dark core, fine sand/lime, lower body darkened. Rim/shape type 3212.
18. Raq 89. Level 4, area 16, phases b–c. 42/114-102. Cooking Ware, exterior/interior brown, black core, fine sand and vegetal inclusions, crude/friable. Rim/shape type 3212.
19. Raq 90. Level 4, area 11, phases b–c. 48/108-094. Cooking Ware, exterior/interior light brown, black central core, medium and coarse sand, burnished interior. Rim/shape type 3212.
20. Raq 88. Level 4, area 42, phase b. 60/120-024. Cooking Ware, exterior/interior brown, gray core, medium white sand, friable. Rim/shape type 3234.

Figure 4.24. Level 4 Cooking Ware (continued)

1. Raq 88. Level 4, area 41, phase b. 60/120-022. Cooking Ware, gray-black, medium/large black sand, burnished exterior, friable. Rim/shape type 3212.
2. Raq 88. Level 4, area 42, phase b. 60/120-024. Cooking Ware, light brown to black, fine/medium/coarse sand. Rim/shape type 3212.
3. Raq 89. Level 4, area 17, phase a. 42/114-114. Cooking Ware, light brown, medium sand. Rim/shape type 3211.
4. Raq 89. Level 4, area 15, phase b. 42/114-174. Cooking Ware, exterior/interior light red-brown, black core, fine to coarse sand, burnish traces on exterior. Rim/shape type 3211.
5. Raq 89. Level 4, area 9, phase b. 42/114-137. Cooking Ware, light brown, fine and medium sand, knob below rim. Rim/shape type 3122.
6. Raq 90. Level 4, above Area 112, phase a. 36/120-175. Cooking Ware, exterior/interior light reddish-brown, black central core, fine/medium/ coarse sand, applied knob (1 of 2?). Rim/shape type 3121.
7. Raq 90. Level 4, area 7. 42/114-198. Cooking Ware, pinkish-brown, fine/medium sand, "excised" triangles. Rim/shape type 3212.
8. Raq 89. Level 4, area 19. 42/108-055. Cooking Ware, exterior/interior brown, black core, medium and coarse sand, crescent lug applied, crude. Rim/shape type 1116.
9. Raq 90. Level 4, area 31. 42/114-232. Cooking Ware, exterior/interior brown, dark brown/black core, fine and medium sand, crescent lug. Rim/shape type 1125.
10. Raq 90. Level 4, area 1. 42/102-151. Cooking Ware, light brown, lower exterior dark brown, medium sand, burnished exterior, interior lug. Rim/shape type 1116.
11. Raq 88. Level 4, area 42, phase b. 60/120-031. Cooking Ware, exterior/interior light brown, black core, fine sand, crude. Rim/shape type 1116.
12. Raq 89. Level 4, area 17, phase b. 42/114-104. Cooking Ware, exterior/interior brown to pink, black core, medium sand, crescent lug and applied band, crude. Rim/shape type 1116.
13. Raq 90. Level 4, area 11, phases a–b. 48/108-094. Cooking Ware, exterior/interior light brown, black core, fine, medium and coarse sand. Rim/shape type 1116.
14. Raq 89. Level 4, area 19. 42/108-055. Cooking Ware, exterior/interior light red/brown, black core, coarse sand. Rim/shape type 1116.
15. Raq 88. Level 4, area 42, phases a–b. 60/120-049. Cooking Ware, light pink/light brown, fine sand. Rim/shape type 1116.
16. Raq 90. Level 4, area 31. 42/114-227. Cooking Ware, light pink-brown exterior, black core, fine sand. Rim/shape type 1116.
17. Raq 89. Level 4, area 9, phase b. 42/114-137. Cooking Ware, light red/brown with darkened areas, medium sand, spout with lower half broken, crude. Rim/shape type 3231.
18. Raq 89. Level 4, area 19. 42/108-055. Cooking Ware, light brown, medium and coarse sand, spout. Rim/shape type 3212.
19. Raq 90. Level 4, area 62. 42/120-059. Cooking Ware, light exterior/interior reddish-brown, central black core, medium and coarse sand, disc lid with handle, handle with indentations from grasping it. Rim/shape type 5111.
20. Raq 90. Level 4, area 7. 42/114-198. Cooking Ware, exterior/interior pink-brown, black core, coarse vegetal inclusions. Rim/shape type 5111
21. Raq 89. Level 4, area 19. 42/108-061. Cooking Ware, exterior/interior light brown except upper half exterior black, black core, coarse sand, burnish traces. Rim/shape type 5111.
22. Raq 90. Level 4, area 20. 42/102-202. Cooking Ware, exterior/interior black to dark brown, brown/black/brown "sandwich" core, medium sand, ridged. Rim/shape type 5111.
23. Raq 89. Level 4, area 13, phase a. 42/114-112. Cooking Ware, exterior/interior light reddish-brown, darkened interior, black core, vegetal inclusions, crude.

24. Raq 90. Level 4, area 30. Cooking Ware, exterior/interior light brown, black core, vegetal inclusions, medium sand, lid (?) handle.

Figure 4.26. Level 3 or 4 Pottery

1. Raq 90. Level 3 or 4, below Level 3, Area 56. 29/126-180. Fine Simple Ware, orange-brown, fine lime. Rim/shape type 1221.
2. Raq 90. Level 3 or 4, above Level 4, Area 82. 30/108-094. Fine Simple Ware, light yellow, fine sand. Rim/shape type 8323.
3. Raq 89. Level 3 or 4, Level 3 Area 88. 42/108-049. Fine Simple Ware, light yellow/light brown, fine lime. Rim/shape type 8322.
4. Raq 89. Level 3 or 4, Level 3, Area 88. 42/108-054. Fine Simple Ware, light gray, no visible inclusions, bubbling on interior surface. Rim/shape type 8321.
5. Raq 90. Level 3 or 4, below Level 3, area 59. 29/126-136. Fine Simple Ware, light yellow exterior and exterior core, light pink interior and interior core, fine lime and sand. Rim/shape type 2211.
6. Raq 89. Level 3 or 4, Level 3, Area 88. 42/108-054. Fine Simple Ware, light yellow exterior, darker yellow interior/core, fine sand, corrugated. Rim/shape type 1221.
7. Raq 89. Level 3 or 4, Level 3, Area 88. 42/109-049. Medium Simple Ware, light yellow/brown, red paint, fine white sand and lime.
8. Raq 89. Level 3 or 4, Level 3, area 88. 42/108-049. Medium Simple Ware, light pink-brown, pink-brown slip (?) exterior, red/brown paint, fine sand, some vegetal temper.
9. Raq 89. Level 3 or 4, Level 3, Area 88. 42/108-049. Vegetal-tempered Ware, black/dark gray, dense vegetal temper, crude appearing, herringbone incision, pierced lug.
10. Raq 89. Level 3 or 4, above Level 4, area 17. 48/108-027. Medium Simple Ware, exterior/interior light yellow, pink core, fine white sand and lime. Rim/shape type 3221.
11. Raq 90. Level 3 or 4, below Area 52, Level 3. 29/132-048. Medium Simple Ware, exterior/interior light yellow (slip), pink/brown core, fine sand, medium lime, vegetal inclusions. Rim/shape type 3211.
12. Raq 87. Level 3 or 4, or Level 2 terrace, Level 3, Area 49. 42/120-025. Medium Simple Ware, light pink to yellow, fine white sand, appliqué and incision.
13. Raq 90. Level 3 or 4, below Level 3, Area 52. 29/132-048. Coarse Simple Ware, light yellow exterior and interior, light pink/red core, fine/medium/coarse sand and lime, some vegetal temper. Rim/shape type 1116.
14. Raq 88. Level 3 or 4, above Level 4, Area 17. 48/108-023. Cooking Ware, light brown to red, fine to medium grit and irregular. Rim/shape type 1121.
15. Raq 89. Level 3 or 4, below Area 49. 36/120-066. Medium Simple Ware, whitish exterior and interior (slip?), pink core, fine/medium lime/sand, slow wheel used (?). Rim/shape type 1116.
16. Raq 89. Level 3 or 4, Level 3, Area 88. 42/108-054. Coarse Simple Ware, light pink to light yellow, fine white sand and lime. Rim/shape type 1127.

Figure 4.27. Level 3 Coarse Simple Ware and Medium Simple Ware

1. Raq 88. Level 3, Area 84. 36/96-020. Coarse Simple Ware, light yellow to light brown, find sand/lime. Rim/shape type 1121.
2. Raq 89. Level 3, area 69, phase d. 30/96-068. Coarse Simple Ware, brown, fine sand. Rim/shape type 1116.
3. Raq 89. Level 3, area 70, phase a. 36/96-035. Medium Simple Ware, light brown to light yellow, fine and coarse sand. Rim/shape type 1121.
4. Raq 87. Level 3, area 22 or 23, phase c. 29/108-22. Coarse Simple Ware, light brown and black exterior, black core, large black grit. Rim/shape type 1125.
5. Raq 90. Level 3, area 56. 29/126-100. Medium Simple Ware, light yellow, fine sand. Rim/shape type 1221.
6. Raq 87. Level 3, area 62, phase d. 29/108-021. Coarse Simple Ware, light yellow (slip?) with pink core, vegetal and lime inclusions, medium white sand. Rim/shape type 3111.
7. Raq 89. Level 3, area 79. 42/84-027. Coarse Simple Ware, light yellow, vegetal temper. Rim/shape type 3121.
8. Raq 89. Level 3, area 70, phase a. 36/96-035. Medium Simple Ware, light yellow/green, medium lime inclusions, base incised, very friable. Rim/shape type 3211.
9. Raq 88. Level 3, area 47, phase b. 42/108-036. Medium Simple Ware, light pink to brown, fine sand, rim finished on wheel. Rim/shape type 3231.

10. Raq 89. Level 3, area 1, phases a–b. 36/120-062 (burial 15). Medium Simple Ware, light yellow exterior, pink core and interior, fine and medium sand rim. Rim/shape type 3221.
11. Raq 87. Level 3, area 62, phase c. 29/108-017. Medium Simple Ware, light brown/pink, fine and medium sand.
12. Raq 89. Level 3, area 58. 29/126-052. Medium Simple Ware, light greenish-yellow, vegetal inclusions.
13. Raq 88. Level 3, area 44, phase c. 48/90-011. Medium Simple Ware, light brown, fine sand and lime inclusions.
14. Raq 89. Level 3, area 32, phase c. 30/96-095. Medium Simple Ware, light pink, crude, fine white sand. Rim/shape type 4111.
15. Raq 89. Level 3, area 75. 42/084-023. Medium Simple Ware, light yellow, fine sand/lime, misshapen rim (oval in plan). Rim/shape type 3211.
16. Raq 89. Level 3, area 77, phase a. 42/84-020. Medium Simple Ware, light yellow, fine/medium sand. Rim/shape type 3221.

Figure 4.28. Level 3, Coarse Simple Ware, Medium Simple Ware and Vegetal-Tempered Ware

1. Raq 87. Level 3, area 41. 42/090-012. Coarse Simple Ware, light yellow to light pink exterior (slip?), pink core and interior, lime inclusions and fine white sand rim. Rim/shape type 3231.
2. Raq 88. Level 3, area 11. 30/132-027. Vegetal-tempered Ware, light yellow, pink core, fine sand and lime inclusions, some medium vegetal temper. Rim/shape type 3241.
3. Raq 87. Level 3, area 10, phase b. 30/126-014. Coarse Simple Ware, light yellow exterior/interior, light pink core, fine and medium sand, rim finished on wheel, rim warped. Rim/shape type 3231.
4. Raq 88. Level 3, area 38. 36/102-045. Coarse Simple Ware, light brown to pink, fine sand/lime inclusions, darkening at rim. Rim/shape type 3231.
5. Raq 87. Level 3, area 38. 42/096-018. Medium Simple Ware, light yellow, fine sand/lime. Rim/shape type 3211.
6. Raq 88. Level 3, area 14. 29/120-050. Medium Simple Ware, light yellow, medium vegetal temper, fine sand. Rim/shape type 3211.
7. Raq 87. Level 3, area 17. 30/114-043. Coarse Simple Ware, light yellow exterior/interior, light gray core, medium vegetal temper, fine sand, rim finished on wheel. Rim/shape type 3243.
8. Raq 87. Level 3, area 7, phase d. 30/126-026. Coarse Simple Ware, light pink to light yellow, fine sand and lime. Rim/shape type 3241.
9. Raq 88. Level 3, area 15, phase c. 29/114-049. Coarse Simple Ware, light yellow interior/exterior, pink core, coarse vegetal inclusions. Rim/shape type 3272.
10. Raq 90. Level 3, area 56. 29/126-096. Coarse Simple Ware. Light yellow, coarse vegetal inclusions. Rim/shape type 3261.
11. Raq 87. Level 3, area 18, phase a. 30/114-039. Medium Simple Ware, light yellow exterior/interior, pink core, medium sand inclusions. Rim/shape type 3221.
12. Raq 87. Level 3, area 24. 30/108-023. Vegetal-tempered Ware, light pink/brown, medium vegetal inclusions. Rim/shape type 3211.
13. Raq 87. Level 3, area 48. 30/114-040. Coarse Simple Ware, light yellow exterior/interior, pink core, fine sand and lime inclusions rim and neck. Rim/shape type 3241.
14. Raq 89. Level 3, area 33, phase d. 30/96-069. Coarse Simple Ware, orange exterior/interior, gray core, medium vegetal temper. Rim/shape type 3251.
15. Raq 87. Level 3, area 10, phase b. 30/126-014. Coarse Simple Ware, light yellow exterior, brown interior, orange core, medium vegetal temper. Rim/shape type 3251.
16. Raq 87. Level 3, area 83. 42/114-060. Coarse Simple Ware, orange, coarse vegetal inclusions. Rim/shape type 3221.

Figure 4.29. Level 3 Fine Simple Ware

1. Raq 90. Level 3, area 54. 29/132-047. Fine Simple Ware, light yellow interior and upper exterior, light pink lower exterior, no visible inclusions. Rim/shape type 1211.
2. Raq 87. Level 3, area 18. 30/114-034. Fine Simple Ware, light yellow, fine sand. Rim/shape type 1114.
3. Raq 89. Level 3, area 58. 29/126-052. Fine Simple Ware, brown/red, gray inner core, no visible inclusions. Rim/shape type 1214.
4. Raq 89. Level 3, area 33, phase d. 30/96-069. Fine Simple Ware, light yellow/green, high-fired. Rim/shape type 1214.
5. Raq 89. Level 3, area 2, phase a. 36/120-060. Fine Simple Ware, pink interior/exterior, brown core, fine sand inclusions. Rim/shape type 1212.

6. Raq 89. Level 3, area 33, phase c. 30/96-074. Fine Simple Ware, light yellow, fine lime inclusions. Rim/shape type 1111.
7. Raq 89. Level 3, area 56. 29/126-050. Fine Simple Ware, light yellow, no visible inclusions. Rim/shape type 2111.
8. Raq 89. Level 3, area 63. 29/102-070. Fine Simple Ware, light orange/brownish-pink, no visible inclusions. Rim/shape type 2113.
9. Raq 89. Level 3, area 66. 29/102-049. Fine Simple Ware, light yellow, fine sand. Rim/shape type 2113.
10. Raq 88. Level 3, area 72. 36/102-043 and 045. Fine Simple Ware, light yellow, no visible inclusions. Rim/shape type 2113.
11. Raq 87. Level 3, area 49. 42/120-003. Fine Simple Ware, light yellow, fine sand. Rim/shape type 2111.
12. Raq 88. Level 3, area 72. 36/102-043. Fine Simple Ware, light yellow to whitish, no visible inclusions. Rim/shape type 2113.
13. Raq 88. Level 3, area 14. 29/120-050. Fine Simple Ware, light yellow, fine sand. Rim/shape type 1221.
14. Raq 87. Level 3, area 62, phase c. 29/108-017. Fine Simple Ware, light green, fine sand and lime inclusions. Rim diameter 14 cm. Rim/shape type 2211.
15. Raq 88. Level 3, area 72. 36/102-039. Fine Simple Ware, light yellow, no visible inclusions. Rim/shape type 1221.
16. Raq 87. Level 3, area 7, phase e. 30/126-013. Fine Simple Ware, light pink to yellow, fine sand. Rim/shape type 1221.
17. Raq 87. Level 3, area 24. 30/108-023. Fine Simple Ware, light yellow, fine sand. Rim/shape type 1221.
18. Raq 87. Level 3, area 48. 36/108-008. Fine Simple Ware, light yellow, fine and medium lime inclusions. Rim/shape type 2211.
19. Raq 88. Level 3, area 72. 36/102-039. Fine Simple Ware, light yellow to light pink, fine sand. Rim/shape type 2211.
20. Raq 89. Level 3, area 78. 42/084-005. Fine Simple Ware, black burnished exterior/interior, fine white sand. Rim/shape type 2211.
21. Raq 89. Level 3, area 32, phase c. 30/96-095. Fine Simple Ware, orange, fine sand. Rim/shape type 2214.
22. Raq 89. Level 3, area 32, phase c. 30/96-079. Fine Simple Ware, light yellow interior/exterior, pink core, fine vegetal inclusions. Rim/shape type 1121.
23. Raq 90. Level 3, area 54. 29/132-038. Fine Simple Ware, light green, no visible inclusions. Rim/shape type 1115.
24. Raq 90. Level 3, area 62, phase c. 30/108-053. Fine Simple Ware, light yellow to light pink, no visible inclusions. Rim/shape type 1115.
25. Raq 87. Level 3, area 7, phase d. 30/126-026. Fine Simple Ware, light brown, fine lime inclusions, crude, finger impressions on lower exterior. Rim/shape type 1211.
26. Raq 90. Level 3, area 52, phase b. 29/132-076. Fine Simple Ware, light yellow exterior (slip), pink core and interior, fine sand. Rim/shape type 2321.
27. Raq 90. Level 3, area 56. 29/126-100. Fine Simple Ware, light yellow exterior (slip), light gray interior/core, no visible inclusions. Rim/shape type 2321.
28. Raq 88. Level 3, area 14. 29/120-050. Fine Simple Ware, light pink exterior/interior, light gray core, brown wash smeared horizontally on exterior below neck, fine sand. Rim/shape type 2322.
29. Raq 88. Level 3, area 33, phase e. 30/96-031. Fine Simple Ware, light pink, fine lime. Rim/shape type 3278.
30. Raq 89. Level 3, area 69, phase d. 30/96-068. Fine Simple Ware, light yellow to light brown, fine sand. Rim/shape type 8323.
31. Raq 87. Level 3, area 42, phase a. 48/90-015. Fine Simple Ware, light yellow/white, fine lime. Rim/shape type 2321.
32. Raq 88. Level 3, area 88, phase b. 42/108-038. Fine Simple Ware, light yellow, spiral pattern on bottom of base, no visible inclusions.
33. Raq 89. Level 3, area 33, phase c. 30/96-086. Fine Simple Ware, light yellow, vegetal inclusions. Rim/shape type 8322.
34. Raq 88. Level 3, area 84. 36/96-020. Fine Simple Ware, light pink/brown, no visible inclusions. Rim/shape type 8311.

Figure 4.30. Level 3 Incised

1. Raq 88. Level 3, area 49. 36/120-035. Fine Simple Ware, light yellow to light pink/brown, fine sand, deep grooves and incised lines. Rim/shape type 2113.
2. Raq 88. Level 3, area 72. 36/102-039. Fine Simple Ware, light yellow, no visible inclusions, deep grooves and incised lines. Rim/shape type 2211.
3. Raq 89. Level 3, area 21. 30/108-030. Fine Simple Ware, light brown, deep grooves and incised lines, no visible inclusions. Rim/shape type 1114.
4. Raq 89. Level 3, area 3. 30/120-033. Fine Simple Ware, light yellow, no visible inclusions, deep grooves and incised lines, pierced lug.

5. Raq 90. Level 3, area 62, phase a. 30/108-063. Fine Simple Ware, light yellow-green, fine sand, deep grooves and incised lines. Rim/shape type 1214.
6. Raq 89. Level 3, area 49. 36/120-054. Fine Simple Ware, light yellow, no visible inclusions, incised. Rim/shape type 1221.
7. Raq 90. Level 3, area 24. 30/108-040. Fine Simple Ware, light yellow exterior slip, light green core/interior, deep grooves and thin incisions, no visible inclusions. Rim/shape type 1221.
8. Raq 87. Level 3, area 24. 30/108-023. Fine Simple Ware, light yellow, fine sand/lime, grooved and incised.
9. Raq 87. Level 3, area 24. 30/108-023. Fine Simple Ware, light yellow/green, fine sand, grooved and incised, interior darkened.
10. Raq 87. Level 3, above Area 38. 48/96-013. Fine Simple Ware, light yellow, no visible inclusions, grooved and incised.
11. Raq 88. Level 3, area 71, phase b. 36/96-007. Fine Simple Ware, light yellow (exterior slip?), thick grooves and thin incisions, no visible inclusions. Rim/shape type 2211.
12. Raq 88. Level 3, area 59. 29/126-051. Fine Simple Ware, light yellow, no visible inclusions, grooves and incised lines. Rim/shape type 1214.
13. Raq 88. Level 3, area 59. 29/120-047. Fine Simple Ware, light yellow, no visible inclusions, grooves and incised lines. Rim/shape type 2221.
14. Raq 87. Level 3, area 24. 30/108-023. Fine Simple Ware, light gray, no visible inclusions, grooves, and incised lines.
15. Raq 88. Level 3, area 61, phase c. 29/114-059. Fine Simple Ware, light yellow, fine sand, thin lightly incised grooves. Rim/shape type 1221.
16. Raq 88. Level 3, area 71, phase b. 36/96-007. Fine Simple Ware, light yellow, incised with thick grooves and thin lines, no visible inclusions. Rim/shape type 2211.
17. Raq 90. Level 3, area 62, phase b. 30/108-067. Fine Simple Ware, dark brown exterior/interior, brown core, lightly burnished, fine sand, lightly incised with thin horizontal lines. Rim/shape type 1121.
18. Raq 90. Level 3, area 22, before phase a. 30/108-079. Fine Simple Ware, light green, fine sand and lime, incised.
19. Raq 87. Level 3, area 21. 30/108-028. Fine Simple Ware, light yellow, lime inclusions, parallel vertical incisions.
20. Raq 87. Level 3, area 21. 30/108-026. Fine Simple Ware, light yellow, fine sand, incised.
21. Raq 87. Level 3, area 62, phase d. 29/108-021. Fine Simple Ware, light green, fine lime, broken rim.
22. Raq 92. Level 3, area 93. 29/120-567. Fine Simple Ware, pink/light red, fine white sand, pierced neck, incised. Rim/shape type 4111.

Figure 4.31. Level 3 Metallic Ware (1–5) and Cooking Ware (6–25)

1. Raq 87. Level 3, area 42, phase a. 48/90-015. Metallic Ware, red and dark brown/black in horizontal zones, high-fired, no visible inclusions. Rim/shape type 1214.
2. Raq 88. Level 3, area 61, phase c. 29/114-059. Metallic Ware, black and orange horizontal streaks, black core, no visible inclusions. Rim/shape type 1214.
3. Raq 89. Level 3, area 3. 30/120-033. Metallic Ware, brownish-red exterior/interior with dark gray horizontal streaks, light gray core, high-fired, no visible inclusions, horizontal ridges. Rim/shape type 1214.
4. Raq 88. Level 3, area 16, phases b–c. 29/114-028. Metallic Ware, dark brown to black and orange exterior/interior, black inner core and orange outer core, no visible inclusions. Rim/shape type 1221.
5. Raq 88. Level 3, area 24. 30/102-031. Metallic Ware, dark gray and light brown in alternating striations on exterior, dark brown interior, top broken and smoothed (broken base reused as cup?), no visible inclusions.
6. Raq 87. Level 3, area 91, phase b. 42/114-022. Cooking Ware, pinkish-brown exterior/interior with darkened areas, gray core, medium black sand, horizontal lug. Rim/shape type 3121.
7. Raq 88. Level 3, area 28. 30/102-040. Cooking Ware, light brown, medium black sand, crescent lug. Rim/shape type 3121.
8. Raq 88. Level 3, area 72. 36/102-039. Cooking Ware, brown exterior/interior with darkened areas, black core, medium sand, one crescent lug preserved. Rim/shape type 3122.
9. Raq 88. Level 3, area 87, phase b. 42/102-028. Cooking Ware, light reddish-brown, fine and medium sand, applied horizontal lug, smoothed exterior. Rim/shape type 3121.
10. Raq 88. Level 3, area 25. 30/102-038. Cooking Ware, brown, medium black sand, applied crescent lug. Rim/shape type 3122.
11. Raq 87. Level 3, area 62, phase d. 29/108-021. Cooking Ware, light brown, fine to medium dark sand, horizontal lug (tip broken). Rim/shape type 3121.

12. Raq 87. Level 3, area 44, phase b. 48/90-025. Cooking Ware, light brown, medium dark sand, crescent lug. Rim/shape type 3122.
13. Raq 89. Level 3, area 76. 42/084-008. Cooking Ware, light brown, medium black sand, horizontal lug. Rim/shape type 3121.
14. Raq 87. Level 3, area 42, phase a. 48/90-015. Cooking Ware, brown exterior with dark areas, traces of exterior burnish, brown interior, black core, medium white sand, 2 horizontal lugs, very rough below carination on exterior. Rim/shape type 3122.
15. Raq 88. Level 3, area 32, phase e. 30/96-010. Cooking Ware, brown, medium black sand, crescent lug. Rim/shape type 3112.
16. Raq 87. Level 3, area 7. 30/126-004. Cooking Ware, exterior/interior brown, black core, white sand, exterior burnish. Rim/shape type 1116.
17. Raq 89. Level 3, area 32, phase c. 30/96-079. Cooking Ware, brown burnished exterior, orange interior and black core, coarse black sand. Rim/shape type 1111.
18. Raq 87. Level 3, area 7, phase e. 30/126-013. Cooking Ware, light brown, black core, medium to coarse black sand. Rim/shape type 1116.
19. Raq 89. Level 3, area 33, phase c. 30/96-083. Cooking Ware, brown exterior/interior, brown-black core, burnished inside rim and on exterior, medium black sand. Rim/shape type 3111.
20. Raq 89. Level 3, area 2, phase a. 36/120-076. Cooking Ware, brown, coarse black sand. Rim/shape type 1112.
21. Raq 88. Level 3, above Area 30. 30/96-009. Cooking Ware, light brown exterior/interior, gray core, medium black sand, crude. Rim/shape type 1127.
22. Raq 87. Level 3, area 38. 42/096-018. Cooking Ware, light to dark brown exterior/interior, black core, interior burnished below rim, some burnish traces on exterior, medium to coarse black sand, vegetal temper, applied lug. Rim/shape type 1121.
23. Raq 89. Level 3, area 69, phase d. 30/96-068. Cooking Ware, brown, coarse sand, perforated. Rim/shape type 5111.
24. Raq 87. Level 3, area 91, phase b. 42/114-009. Cooking Ware, brown exterior/interior, black core, medium and coarse black sand, disc lid fragment. Rim/shape type 5111.
25. Raq 87. Level 3, area 62, phase c. 29/108-017. Cooking Ware, light brown exterior/interior, brown/black core, fine sand and medium to coarse black sand, disc lid fragment, handle broken off. Rim/shape type 5111.

Figure 4.32. Above Level 3 Architecture, Below Present-Day Mound Surface (originally published as level 3, Curvers and Schwartz 1990: figure 21)

1. Raq 88. Above Level 3, Area 30. 30/96-002. Fine Simple Ware, light yellow, no visible inclusions. Rim/shape type 1221.
2. Raq 88. Above Level 3, Area 30. 30/96-002. Fine Simple Ware, light yellow, no visible inclusions. Rim/shape type 1221.
3. Raq 88. Above Level 3, Area 30. 30/96-002. Fine Simple Ware, light green, no visible inclusions.
4. Raq 88. Above Level 3, Area 70. 36/96-003. Fine Simple Ware, light green, fine sand. Rim/shape type 1121.
5. Raq 88. Above Level 3, Area 30. 30/96-002. Fine Simple Ware, light green, no visible inclusions. Rim/shape type 2121.
6. Raq 88. Above Level 3, Area 30. 30/96-002. Fine Simple Ware, light yellow, fine to medium sand. Incised figure.

Figure 4.33. Level 2 or 3 Pottery

1. Raq 89. Level 2 or 3, above Level 3, area 58. 29/126-040. Fine Simple Ware, dark gray, fine white sand. Rim/shape type 3277.
2. Raq 89. Level 2 or 3, above Level 3, area 64. 29/102-024. Fine Simple Ware, exterior light yellow/white slip, pink interior/core, fine white sand, incised. Rim/shape type 1221.
3. Raq 89. Level 2 or 3, above Level 3, area 58. 29/126-040. (Imitation?) Metallic Ware, light pink-brown, well-fired, no visible inclusions, dark red/brown slip on exterior. Rim/shape type 3273.
4. Raq 89. Level 2 or 3, above Level 3, area 58. 29/126-040. Imitation Metallic Ware, exterior and rim dark red-brown with brownish-pink horizontal bands/ streaks, interior brownish-pink, brownish-pink core, no visible inclusions. Rim/shape type 3273.
5. Raq 89. Level 2 or 3, above Level 3, area 58. 29/126-040. Metallic Ware, exterior/interior dark gray, core pink, no visible inclusions, high-fired. Rim/shape type 1214.
6. Raq 89. Level 2 or 3, above Level 3, area 63. 29/102-040. Metallic Ware, alternating black and orange-red horizontal bands, high-fired, no visible inclusions. Rim/shape type 2122.
7. Raq 89. Level 2 or 3, above Level 3, area 58. 29/126-040. Fine Simple Ware, light pink/light reddish-brown, fine sand, imitation Metallic ware (?). Rim/shape type 2321.

8. Raq 88. Level 2 or 3, above Level 3, area 38. 36/102-021. Fine Simple Ware, exterior yellow-whitish (slip?), interior/core light pink, some lime inclusions. Rim/shape type 2322.
9. Raq 87. Level 2 or 3, above Level 3, area 7. 30/126-004. Cooking Ware, brown, fine sand, burnished exterior, horizontal lug. Rim/shape type 3132.
10. Raq 88. Level 2 or 3, Above Level 3, area 38. 36/102-026. Medium Simple Ware, light yellow, fine sand.
11. Raq 88. Level 2 or 3, below Level 2, area 14. 29/120-018. Coarse Simple Ware, light yellow, darkening on exterior, medium vegetal inclusions and fine sand. Rim/shape type 3221.
12. Raq 88. Level 2 or 3, below Level 2, area 14. 29/120-018. Medium Simple Ware, light yellow, fine sand. Rim/shape type 3221.
13. Raq 88. Level 2 or 3, above Level 3, area 16. 29/114-023. Medium Simple Ware, light yellow, fine sand. Rim/shape type 3243.
14. Raq 88. Level 2, above Level 3, area 60. 29/120-039. Medium Simple Ware, exterior/interior light yellow, pink core, fine sand. Rim/shape type 3231.

Figure 4.36. Level 2 Coarse and Medium Simple Ware

1. Raq 90. Level 2, area 2, phase a. 42/120-042. Medium Simple Ware, exterior/interior light yellow (slip), light pink core, fine white sand, some vegetal inclusions. Rim/shape type 3245.
2. Raq 89. Level 2, area 5. 36/126-021. Coarse Simple Ware, light red/pink, black core, dense vegetal inclusions. Rim/shape type 3245.
3. Raq 88. Level 2, area 18. 29/120-014. Medium Simple Ware, exterior/interior light yellow, darkening at rim, pink core, medium vegetal inclusions and fine sand. Rim/shape type 3245.
4. Raq 89. Level 2, area 5. 36/126-040. Coarse Simple Ware, exterior/interior light yellow, pink core, vegetal temper and fine sand. Rim/shape type 3245.
5. Raq 89. Level 2, area 5. 36/120-111. Medium Simple Ware, pinkish-brown, fine sand, worn. Rim/shape type 3243.
6. Raq 88. Level 2, area 18. 29/120-071. Coarse Simple Ware, exterior/interior light yellow (slip?), pink core, fine sand/lime. Rim/shape type 3245.
7. Raq 88. Level 2, area 18. 29/120-027. Coarse Simple Ware, exterior/interior light yellow (slip?), light pink-brown core, medium vegetal inclusions, fine sand. Rim/shape type 3245.
8. Raq 89. Level 2, area 3, phase c. 36/120-122. Medium Simple Ware, exterior light yellow (slip), red-brown interior/core, fine sand. Rim/shape type 3243.
9. Raq 88. Level 2, area 15. 29/126-026. Coarse Simple Ware, light green, fine to medium sand. Rim/shape type 3221.
10. Raq 88. Level 2, area 12. 29/120-017. Coarse Simple Ware, light yellow , lime inclusions, medium vegetal temper and fine sand. Rim/shape type 3241.
11. Raq 87. Level 2, area 14. 29/120-005. Coarse Simple Ware, exterior light yellow, interior pink, core yellow to pink, fine sand rim. Rim/shape type 3243.
12. Raq 89. Level 2, area 5. 36/126-040. Coarse Simple Ware, light yellow, vegetal inclusions. Rim/shape type 3243.
13. Raq 88. Level 2, area 15. 29/126-018. Coarse Simple Ware, light yellow, medium vegetal temper and fine sand. Rim/shape type 3221.
14. Raq 88. Level 2, area 12. 29/126-013. Coarse Simple Ware, light yellow, medium sand. Rim/shape type 3271.
15. Raq 88. Level 2, area 16. 29/120-024. Coarse Simple Ware, exterior/interior light yellow (slip?), light brown core, occasional lime inclusions, fine sand and medium vegetal temper. Rim/shape type 3211.
16. Raq 88. Level 2, area 15. 29/126-018. Coarse Simple Ware, exterior/interior light pink to brown, black core, medium vegetal temper and fine sand, one vertical lug preserved slightly askew. Rim/shape type 3211.
17. Raq 88. Level 2, area 15. 29/126-018. Coarse Simple Ware, light yellow , pink core, fine and medium white sand. Rim/shape type 3221.
18. Raq 87. Level 2, area 14. 29/120-005. Coarse Simple Ware, light yellow, vegetal temper, lime inclusions, highly corroded. Rim/shape type 3261.
19. Raq 90. Level 2, area 13. 29/132-023. Coarse Simple Ware, exterior light yellow (slip?), interior/core light greenish gray, fine sand. Rim/shape type 3261.
20. Raq 88. Level 2, area 16. 29/120-024. Coarse Simple Ware, light red/brown, medium sand. Rim/shape type 3276.
21. Raq 88. Level 2, area 16. 29/120-024. Coarse Simple Ware, Light pink/brown, medium vegetal inclusions and fine sand. Rim/shape type 3261.
22. Raq 87. Level 2, area 18. 29/120-010. Coarse Simple Ware, light yellow, vegetal inclusions and fine sand. Rim/shape type 3242.

Figure 4.37. Level 2 Fine Simple Ware (1–17) and Metallic Ware (18–22)

1. Raq 90. Level 2, area 2, phase a. 42/120-044. Fine Simple Ware, light yellow, fine sand. Rim/shape type 2111.

2. Raq 89. Level 2, area 5. 36/120-111. Fine Simple Ware, exterior/interior light yellow to light pink/brown, pink/brown core, fine sand. Rim/ shape type 1115.
3. Raq 88. Level 2, area 18. 29/120-027. Fine Simple Ware, light green/light yellow, no visible inclusions. Rim/shape type 1118.
4. Raq 87. Level 2, area 14. 29/120-005. Fine Simple Ware, light green, no visible inclusions. Rim/shape type 2218.
5. Raq 88. Level 2, area 16. 29/120-025. Fine Simple Ware, light yellow, no visible inclusions. Rim/shape type 8322.
6. Raq 89. Level 2, area 3, phase c. 36/120-122. Fine Simple Ware, light yellow, fine sand. Rim/shape type 1211.
7. Raq 87. Level 2, area 19. 30/120-015. Fine Simple Ware, light yellow, no visible inclusions. Rim/shape type 1211.
8. Raq 88. Level 2, area 12. 29/126-013. Fine Simple Ware, exterior light yellow, interior/core brown, fine sand. Rim/shape type 1111.
9. Raq 88. Level 2, area 15. 29/126-020. Fine Simple Ware, exterior light yellow (slip?), interior/core pink, no visible inclusions. Rim/shape type 1211.
10. Raq 89. Level 2, area 5. 36/126-040. Fine Simple Ware, pink, fine white sand. Rim/shape type 2113.
11. Raq 88. Level 2, area 12. 29/120-017. Fine Simple Ware, light yellow, no visible inclusions. Rim/shape type 2211.
12. Raq 89. Level 2, area 5. 36/126-040. Fine Simple Ware, light yellow, no visible inclusions. Rim/shape type 2111.
13. Raq 89. Level 2, area 5. 36/126-040. Fine Simple Ware, light yellow, no visible inclusions. Rim/shape type 1121.
14. Raq 89. Level 2, area 5. 36/126-040. Fine Simple Ware, light yellow, no visible inclusions. Rim/shape type 2322.
15. Raq 88. Level 2, area 16. 29/120-024. Fine Simple Ware, dark gray, fine white sand, exterior lightly burnished. Rim/shape type 3277.
16. Raq 88. Level 2, area 15. 29/126-018. Fine Simple Ware, light green to yellow, fine sand. Rim/shape type 2321.
17. Raq 89. Level 2, area 5. 36/120-111. Fine Simple Ware, light yellow/light brown, fine sand. Rim/shape type 3275.
18. Raq 87. Level 2, above Area 18. 30/114-032. Metallic Ware, upper exterior red, lower exterior dark brown/black, interior with alternating bands of red and brown/black, high-fired, fine white sand, high-fired. Rim/shape type 1214.
19. Raq 88. Level 2, area 18. 29/120-027. Metallic Ware, dark brown to reddish horizontal bands, no visible inclusions. Rim/shape type 2111.
20. Raq 88. Level 2, area 15. 29/126-026. Metallic Ware, reddish-pink, dark brown wash/paint traces on exterior from rim to 2 cm below, no visible inclusions. Rim/shape type 1214.
21. Raq 87. Level 2, area 4. 42/120-026. Metallic Ware, exterior with alternating black and orange horizontal bands, interior orange, high-fired, no visible inclusions. Rim/shape type 3278.
22. Raq 88. Level 2, area 12. 29/120-017. Metallic Ware, dark brown/red and pink, no visible inclusions. Rim/shape type 3273.

Figure 4.38. Level 2 Decorated Pottery

1. Raq 89. Level 2, area 5. 36/126-040. Coarse Simple Ware, light red or light brown to yellow exterior, light red interior, black core, vegetal temper and fine/medium lime, black and red (lighter solid triangles in upper register, horizontal lines in lower register) paint. Rim/shape type 9111.
2. Raq 89. Level 2, area 24. 29/102-015. Fine Simple Ware, light yellow, no visible inclusions, grooves and incised lines. Rim/shape type 2218.
3. Raq 87. Level 2, area 26. 42/096-007. Fine Simple Ware, light green, lime inclusions, fine sand, grooved and incised. Rim/shape type 1214.
4. Raq 89. Level 2, area 5. 36/126-040. Medium Simple Ware, light yellow exterior, fine sand, incised crudely. Rim/shape type 1121.
5. Raq 90. Level 2, area 3, phase b. 42/120-035 and 36/120-138. Medium Simple Ware, exterior light yellow (slip), interior/core light pinkish-brown, fine and medium vegetal inclusions, undulating groove with punctated holes. Rim/shape type 1121.
6. Raq 89. Level 2, area 5. 36/120-111. Coarse Simple Ware, light yellow, vegetal temper, incised.
7. Raq 89. Level 2, area 5. 36/120-111. Medium Simple Ware, exterior light yellow (slip?), core/interior light brown, fine sand, impressed circles, incised. Rim/shape type 1121.
8. Raq 89. Level 2, area 2. 36/120-150. Medium Simple Ware, light green, fine sand and some vegetal inclusions.
9. Raq 89. Level 2, area 2. 36/120-150. Coarse Simple Ware, light green, fine sand, impressed circles.

Figure 4.39. Level 2 Vegetal-Tempered Ware

1. Raq 88. Level 2, area 18. 29/120-036. Vegetal-tempered Ware, light yellow, medium vegetal inclusions, fine and medium white sand, fine lime. Rim/shape type 3241.
2. Raq 88. Level 2, area 12. 29/120-017. Vegetal-tempered Ware, light yellow, fine and medium vegetal temper. Rim/shape type 3271.
3. Raq 87. Level 2, area 8, phase a. 30/120-007. Vegetal-tempered Ware, light yellow, vegetal inclusions rim. Rim/shape type 3231.
4. Raq 87. Level 2, area 26 (below topsoil). 48/90-006. Vegetal-tempered Ware, exterior/interior brownish-pink, black core, vegetal inclusions, some coarse white sand, burnished exterior, 3 vertical handles. Rim/shape type 3122.
5. Raq 89. Level 2, area 3, phase c. 36/120-122. Vegetal-tempered Ware, exterior/interior light red, black core, vegetal inclusions. Rim/shape type 3245.
6. Raq 89. Level 2, area 3, phase c. 36/120-122. Vegetal-tempered Ware, light yellow, fine sand, vegetal inclusions. Rim/shape type 3224.
7. Raq 87. Level 2, area 5. 36/120-111. Vegetal-tempered Ware, exterior/interior light yellow, pink core, vegetal inclusions. Rim/shape type 3245.

Figure 4.40. Level 2 Cooking Ware

1. Raq 88. Level 2, area 16. 29/120-024. Cooking Ware, brown, exterior burnished, fine medium and coarse sand. Rim/shape type 3211.
2. Raq 87. Level 2, area 14. 29/120-005. Cooking Ware, brown, medium and coarse black sand, burnish traces on exterior, triangular lug at rim. Rim/shape type 3274.
3. Raq 87. Level 2, area 18. 29/120-010. Cooking Ware, light brown with darker areas, dark brown on interior below neck, fine sand, triangular lug at rim. Rim/shape type 3274.
4. Raq 88. Level 2, area 10. 29/126-015. Cooking Ware, light brown, medium and coarse black sand, two triangular lugs. Rim/shape type 3211.
5. Raq 87. Level 2, area 8, phase a. 30/120-008. Cooking Ware, exterior/interior brown, black core, small to coarse black sand, horizontal lug. Rim/shape type 3122.
6. Raq 88. Level 2, area 11. 29-126-012. Cooking Ware, exterior/interior light brown with areas of black and red/brown, black core, medium and coarse black sand, 4 horizontal lugs (3 preserved). Rim/shape type 3131.

Figure 4.46. Northwest Silos (Levels 3/4, with level 3 area designations) (nos. 1–10) and "Shop" (Level 3 or 2) (nos. 11–14)

1. Raq 88. Levels 3/4, area 6. 30/120-045. Medium Simple Ware, exterior/interior light yellow, core pink/brown, fine sand/lime. Rim/shape type 3231.
2. Raq 87. Levels 3/4, area 4, phase d. 30/120-021. Coarse Simple Ware, exterior light yellow, interior/core light pink, lime and vegetal inclusions, dark paint (?) traces on tip of rim. Rim/shape type 3211.
3. Raq 87. Levels 3/4, area 5. 30/126-024. Coarse Simple Ware, exterior/interior light yellow, pink core, darkening on rim, fine sand/lime. Rim/shape type 3231.
4. Raq 87. Levels 3/4, area 4, phase d. 30/120-028. Cooking Ware, brown with dark areas, horizontal lug, fine white and medium dark sand, smoothed exterior. Rim/shape type 3122.
5. Raq 87. Levels 3/4, area 4, phase d. 30/120-028. Coarse Simple Ware, exterior/interior light brownish-red, gray core, fine sand and vegetal inclusions. Rim/shape type 3242.
6. Raq 87. Levels 3/4, area 4, phase d. 30/120-028. Coarse Simple Ware, exterior/interior light yellow to light brown, pink core, fine white sand/lime rim. Rim/shape type 3232.
7. Raq 89. Levels 3/4, area 4, phases a–b. 30/120-044. Fine Simple Ware, light yellow, no visible inclusions, grooved and incised. Rim/shape type 2113.
8. Raq 89. Levels 3/4, area 4, phase d. 30/120-036. Fine Simple Ware, light yellow, no visible inclusions, grooved, and incised. Rim/shape type 2211.
9. Raq 89. Levels 3/4, area 4, phase b. 30/120-040. Medium Simple Ware, light yellow, deep incised groves, fine sand (profile not drawn).
10. Raq 87. Levels 3/4, area 4, phase d. 30/120-026. Fine Simple Ware, light yellow, fine lime inclusions. Rim/shape type 2111.
11. Raq 88. Level 3 "shop," area 12. 29/120-049. Cooking Ware, light brown, exterior darkened at lug and below, medium and fine sand, one horizontal lug preserved. Rim/shape type 3131.
12. Raq 88. Level 3 "shop," area 58. 29/120-064. Fine Simple Ware, light green, no visible inclusions. Rim/shape type 1118.
13. Raq 88. Level 3 "shop," area 12. 29/120-074. Fine Simple Ware, light yellow, no visible inclusions. Rim/shape type 2323.
14. Raq 88. Level 3 "shop," area 60. 29/120-063. Fine Simple Ware, light yellow, no visible inclusions. Rim/shape type 3278.

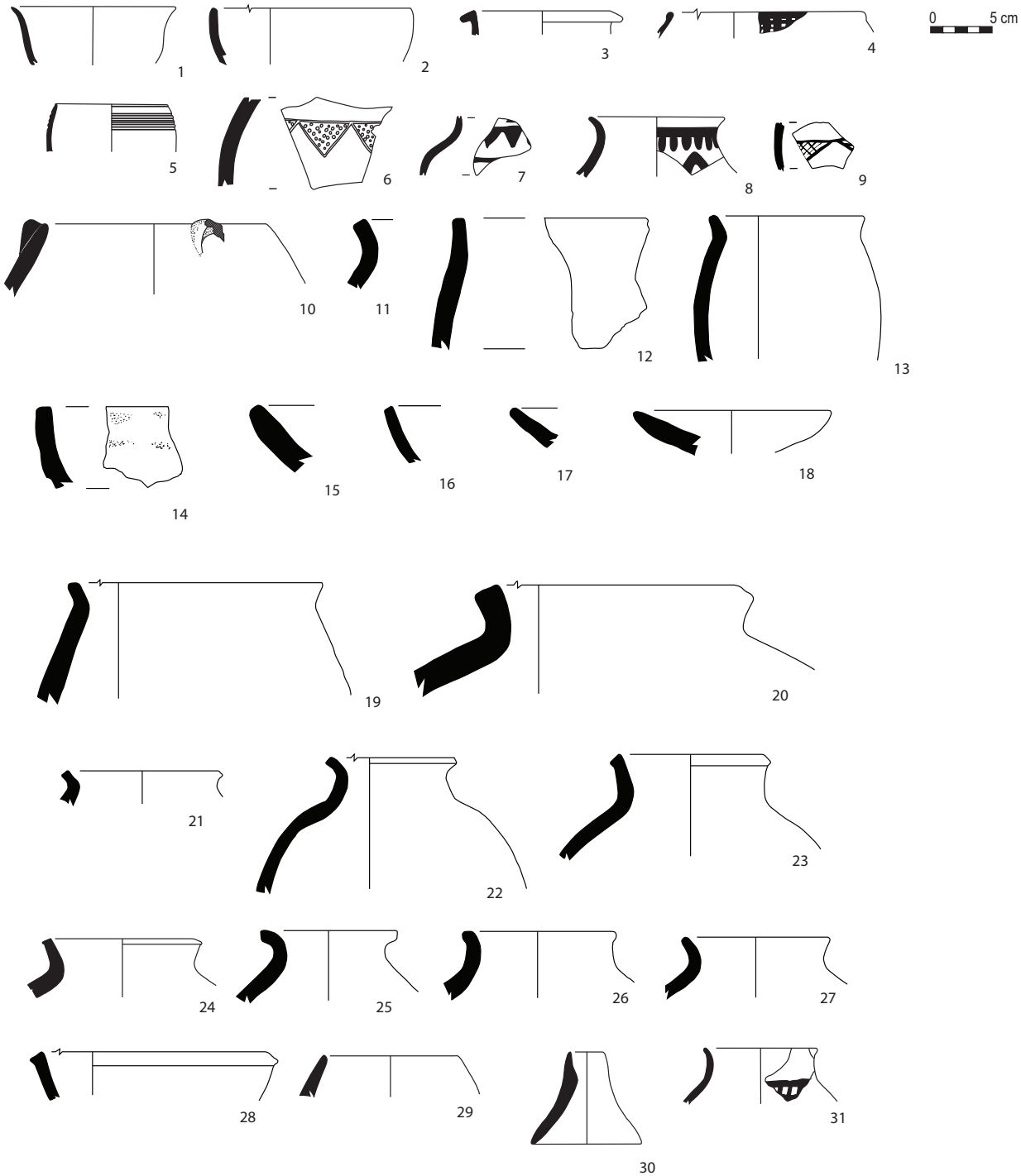

FIGURE 4.17. Level 5 ceramics (and levels 4/5, no. 31).

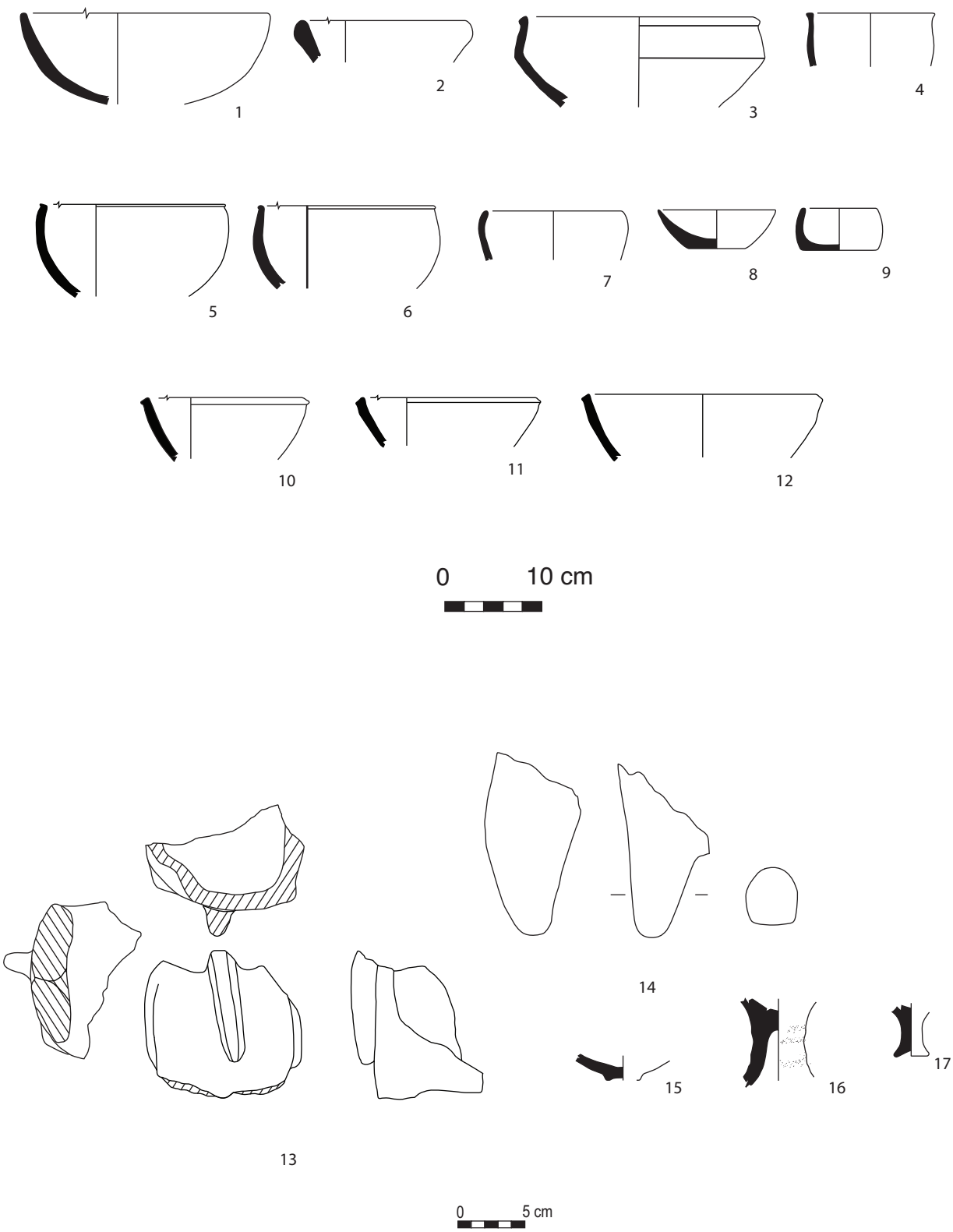

FIGURE 4.18. Level 4 Coarse and Medium Simple Ware bowls and miscellaneous shapes.

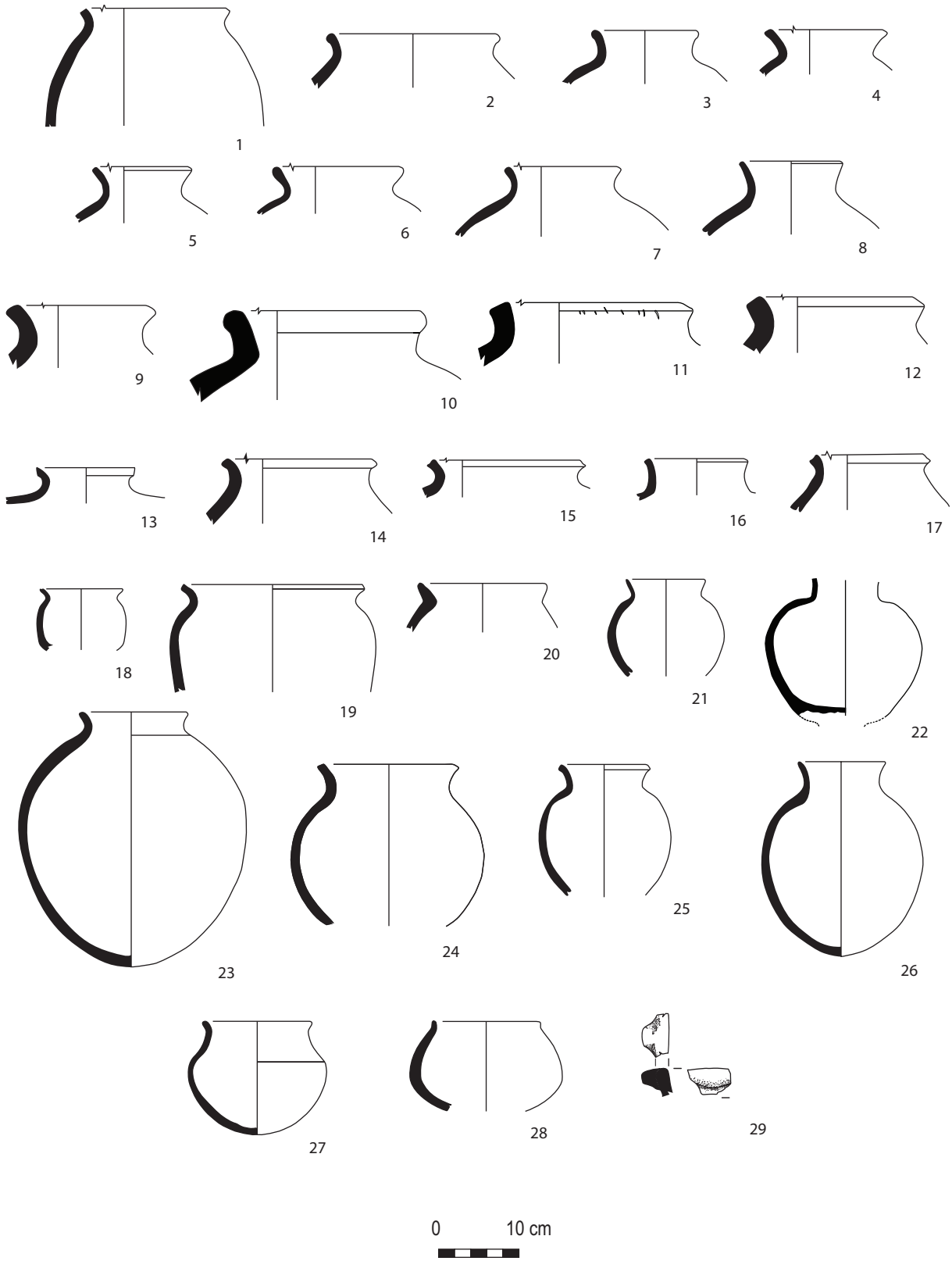

FIGURE 4.19. Level 4 Coarse and Medium Simple Ware jars.

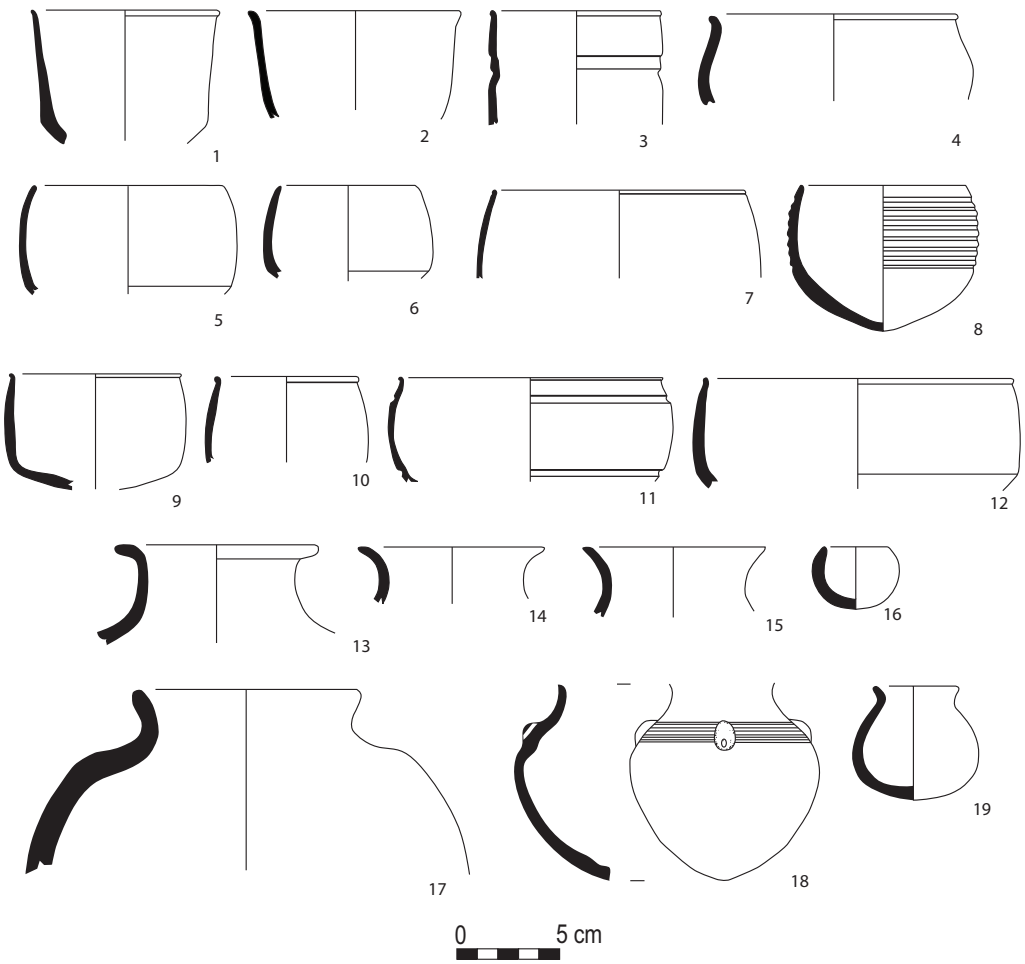

FIGURE 4.20. Level 4 Fine Simple Ware.

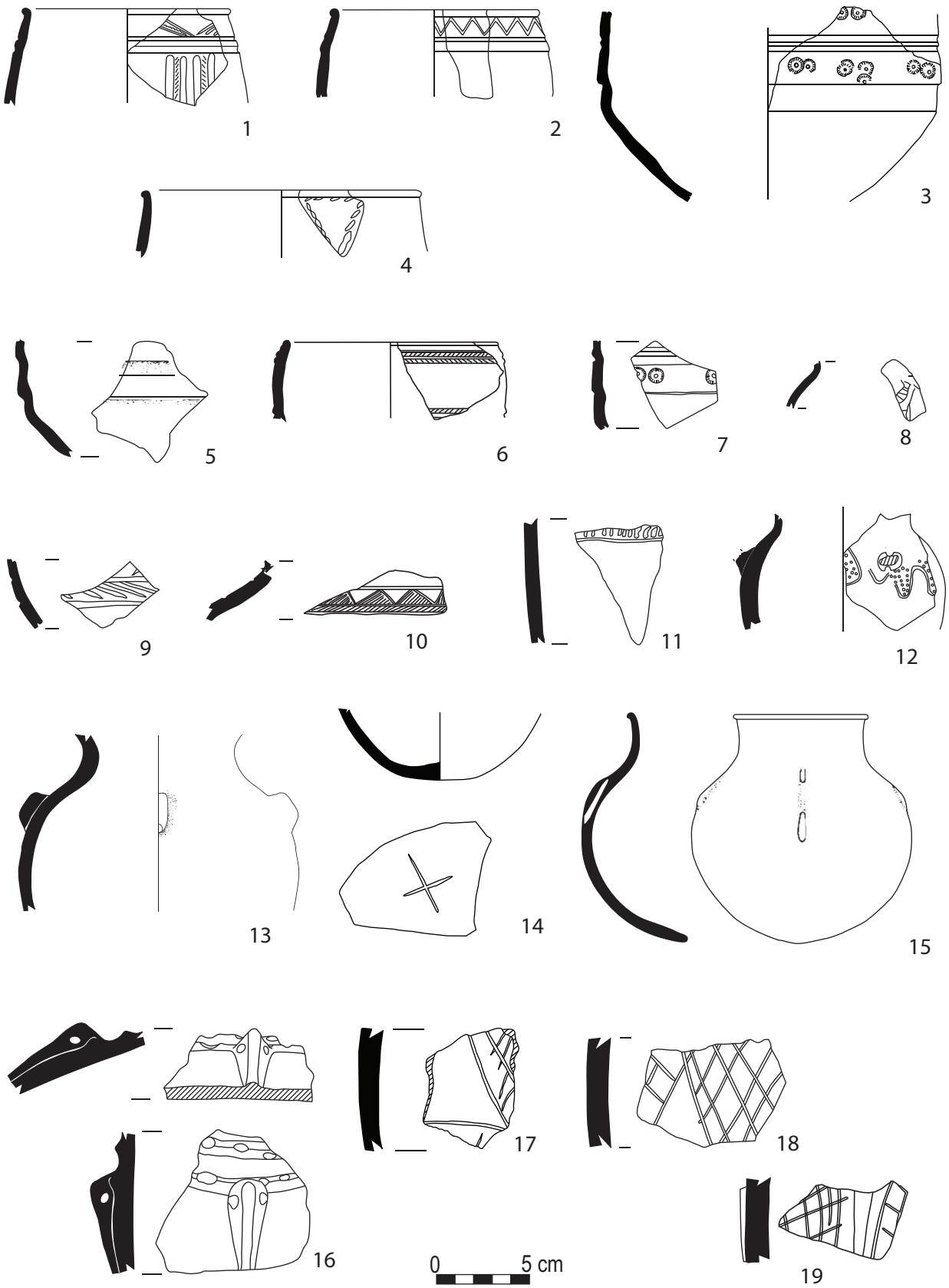

FIGURE 4.21. Level 4 Fine Simple Ware and Medium/Coarse Simple Ware incised.

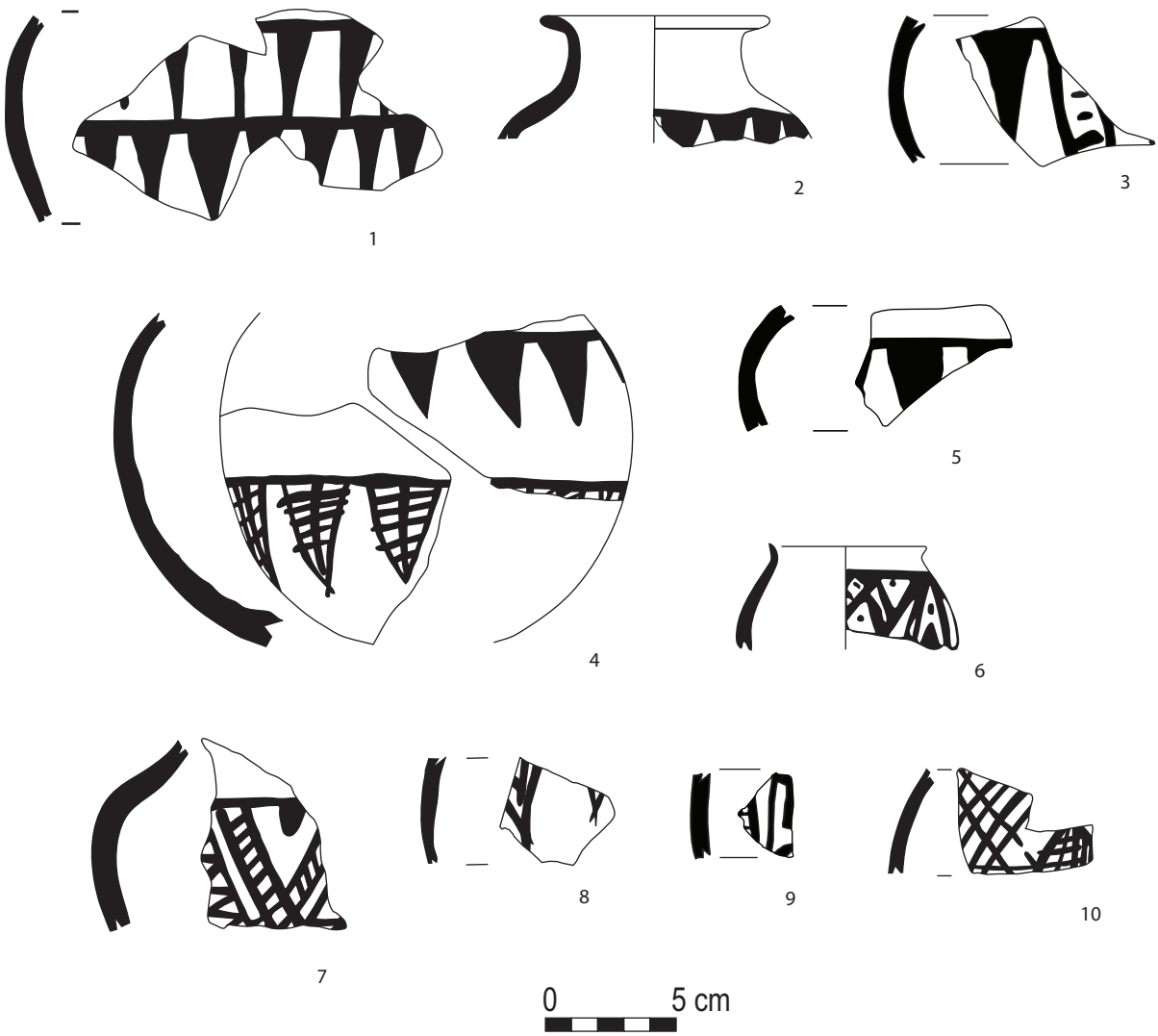

FIGURE 4.22. Level 4 painted.

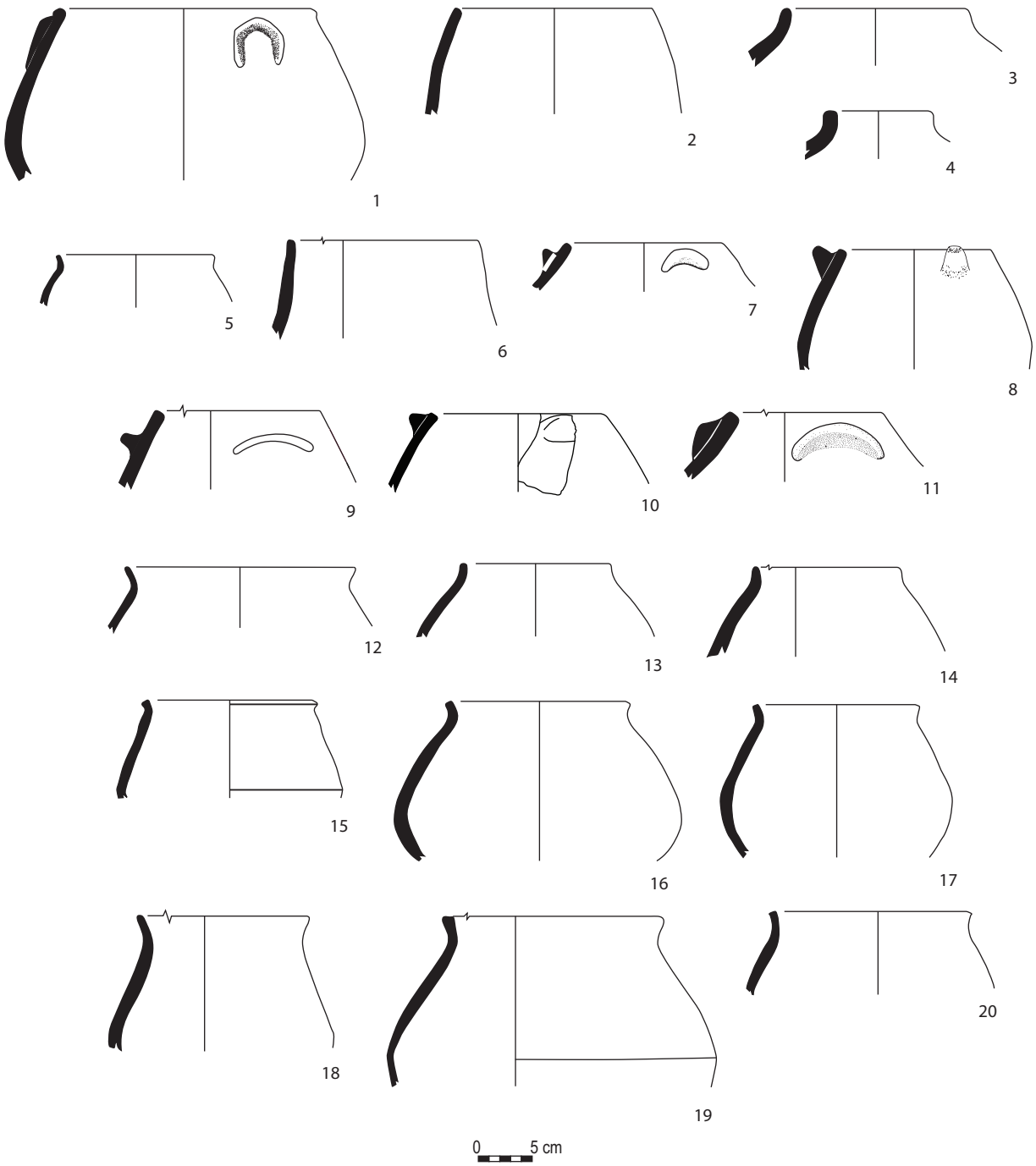

FIGURE 4.23. Level 4 Cooking Ware.

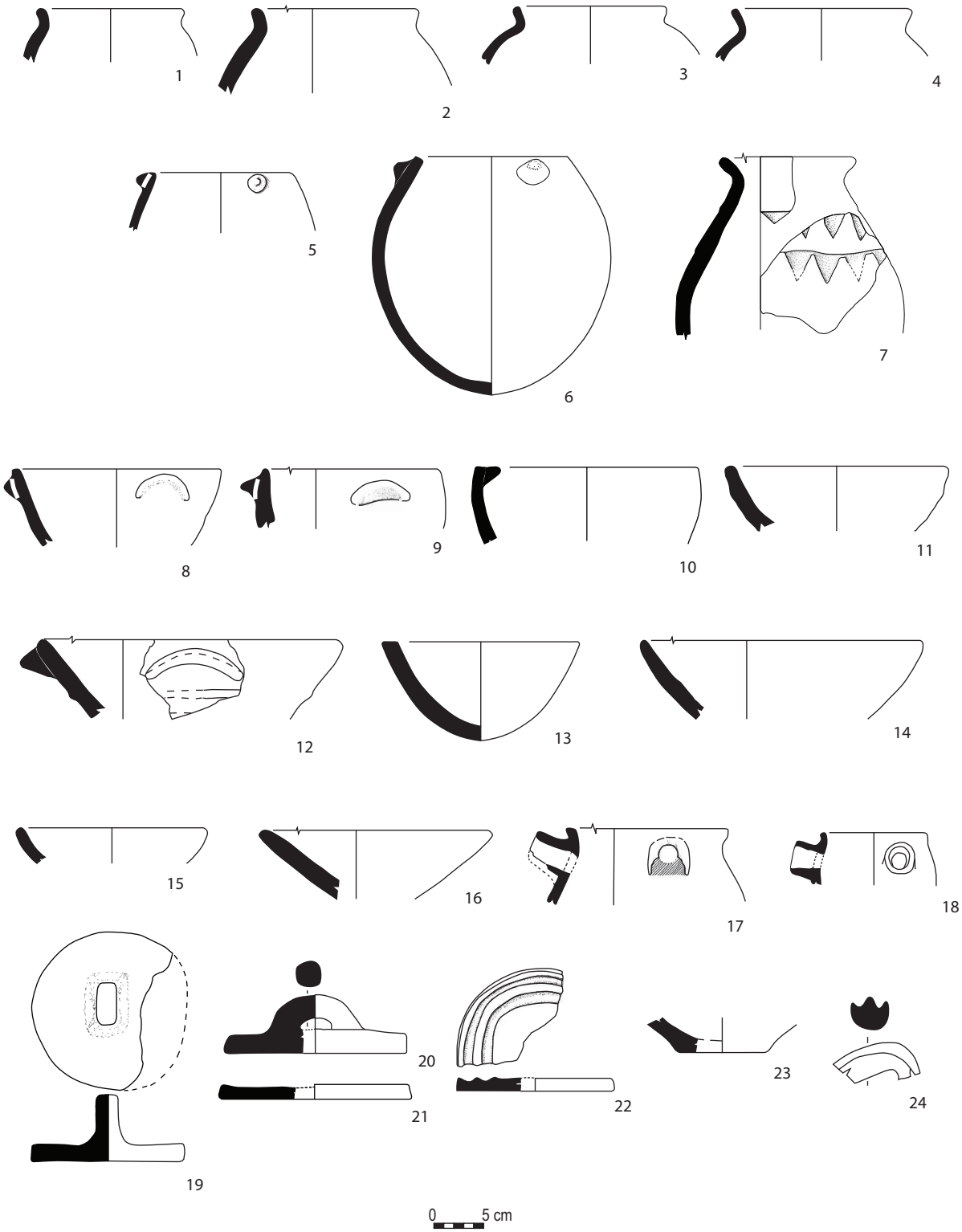

FIGURE 4.24. Level 4 Cooking Ware (*continued*).

FIGURE 4.25. Level 4 Cooking Ware sherds. *Photograph by Glenn Schwartz.*

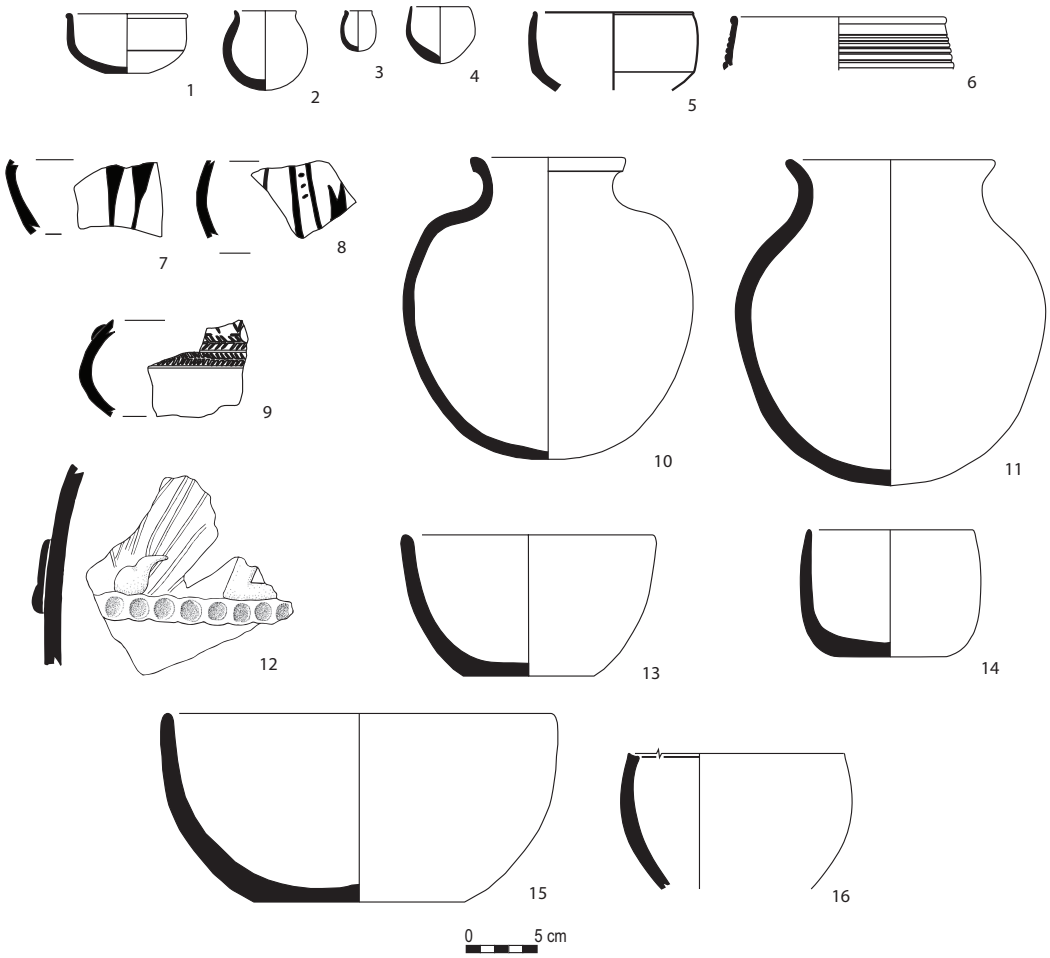

FIGURE 4.26. Level 3 or 4 pottery.

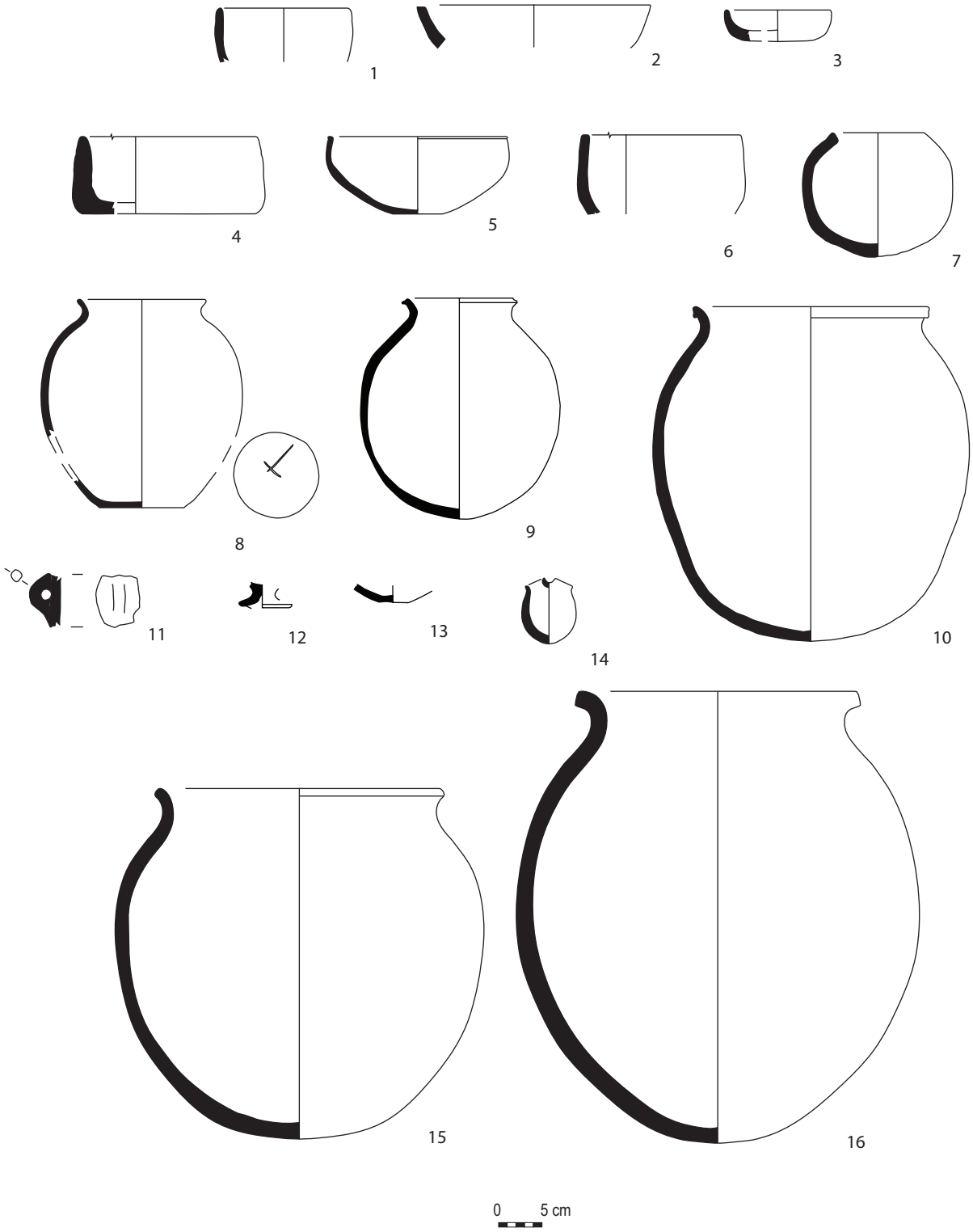

FIGURE 4.27. Level 3 Coarse Simple Ware and Medium Simple Ware.

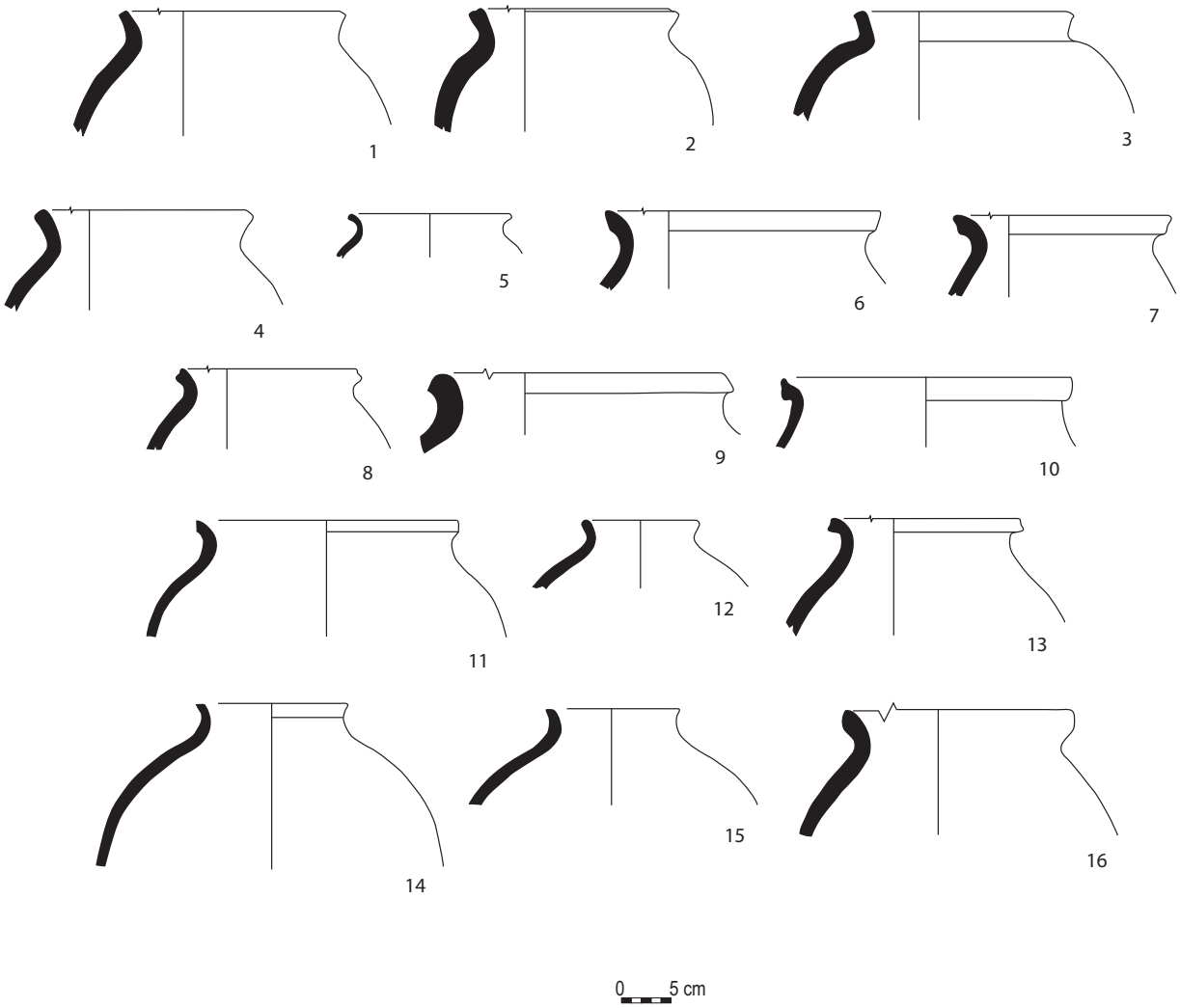

FIGURE 4.28. Level 3 Coarse Simple Ware, Medium Simple Ware, and Vegetal-Tempered Ware.

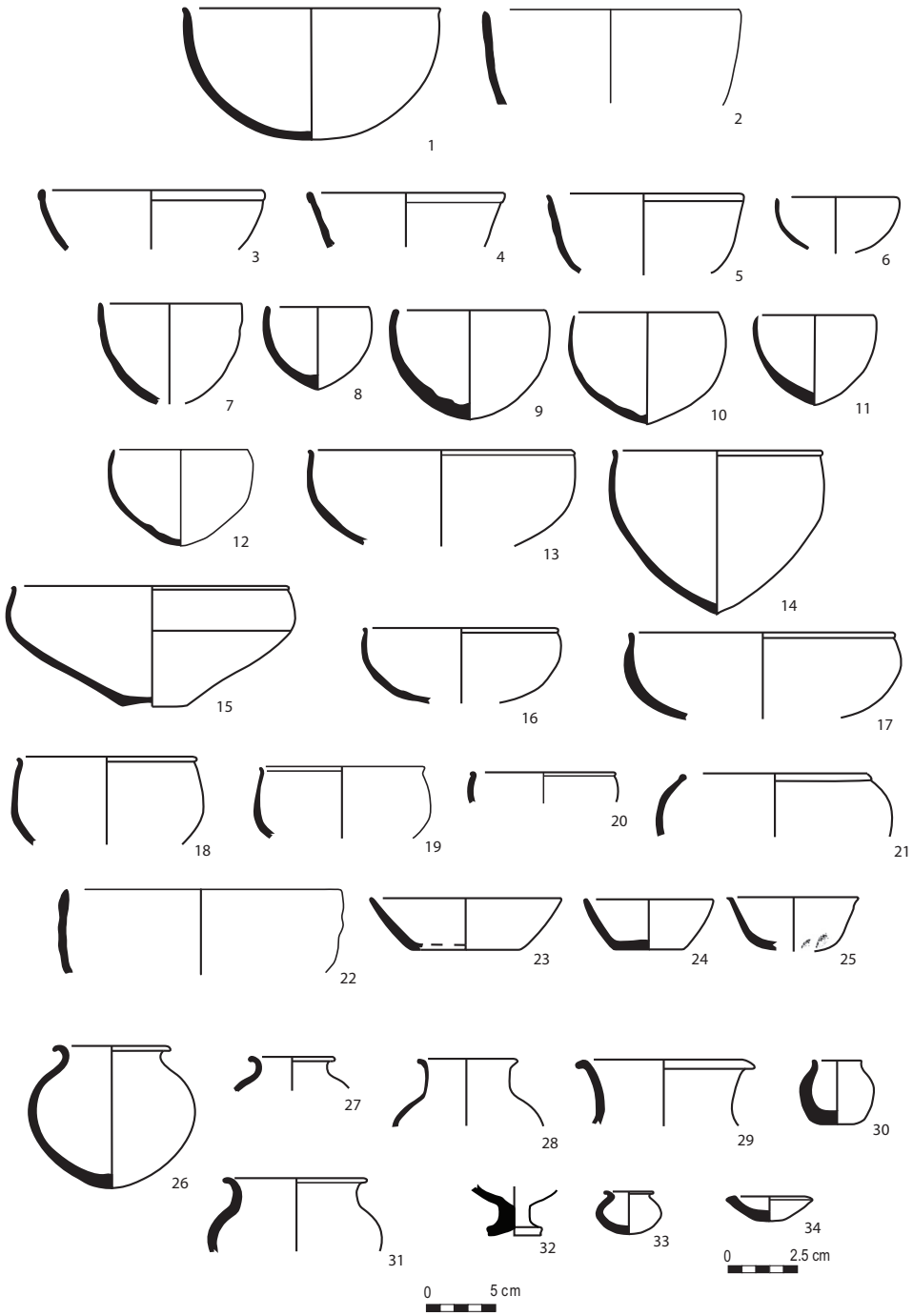

FIGURE 4.29. Level 3 Fine Simple Ware.

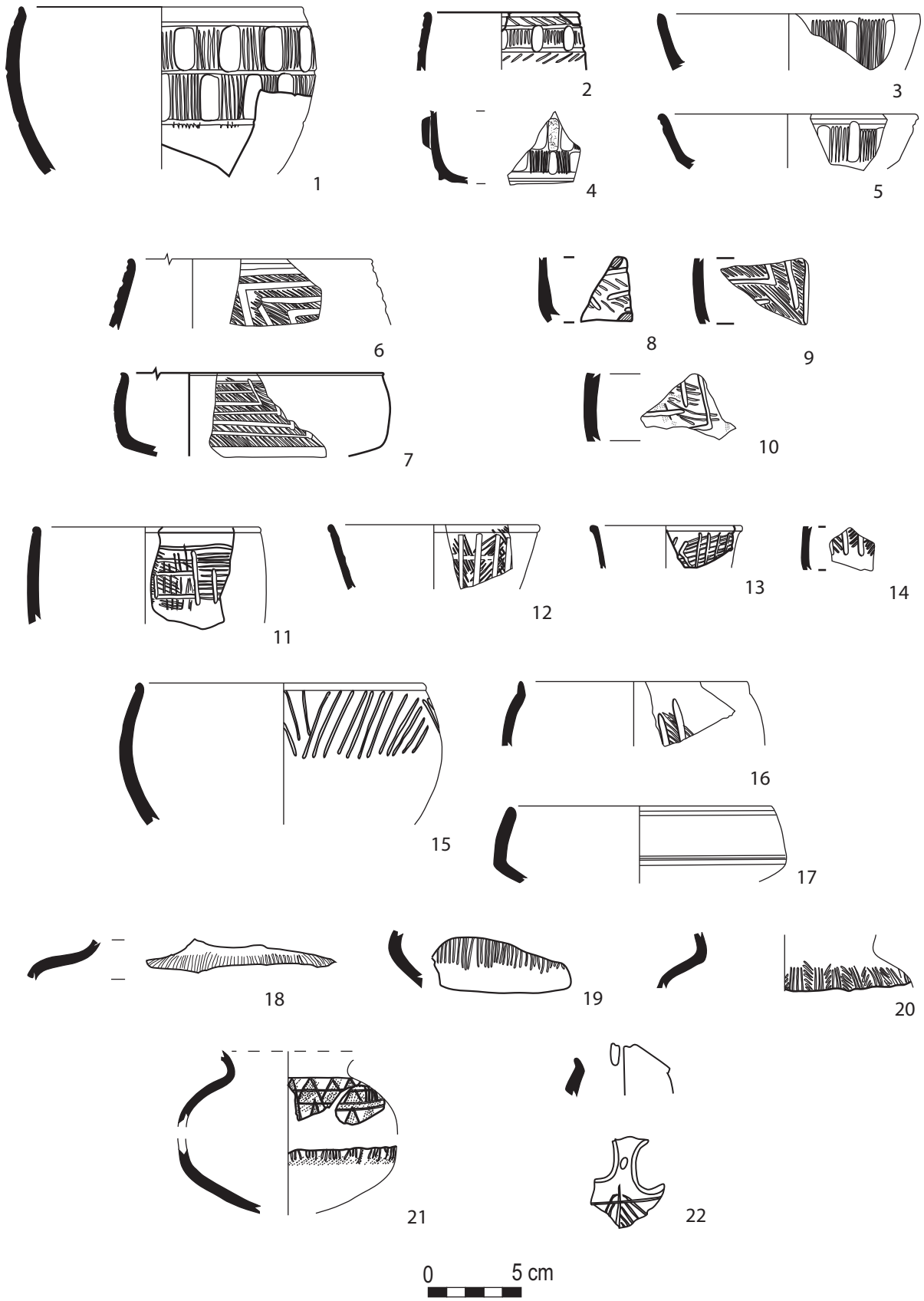

FIGURE 4.30. Level 3 incised.

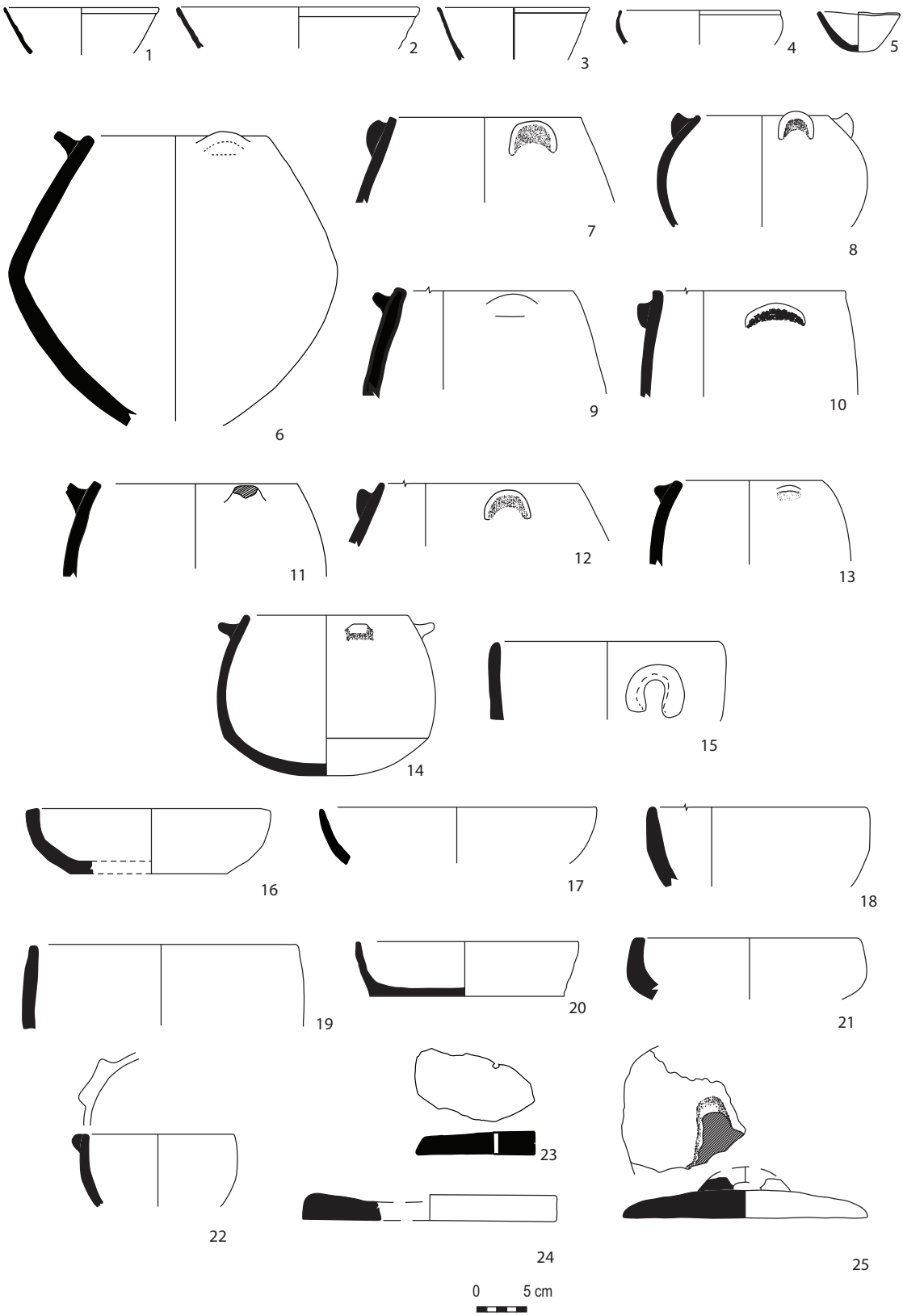

FIGURE 4.31. Level 3 Metallic Ware (1–5) and Cooking Ware (6–25).

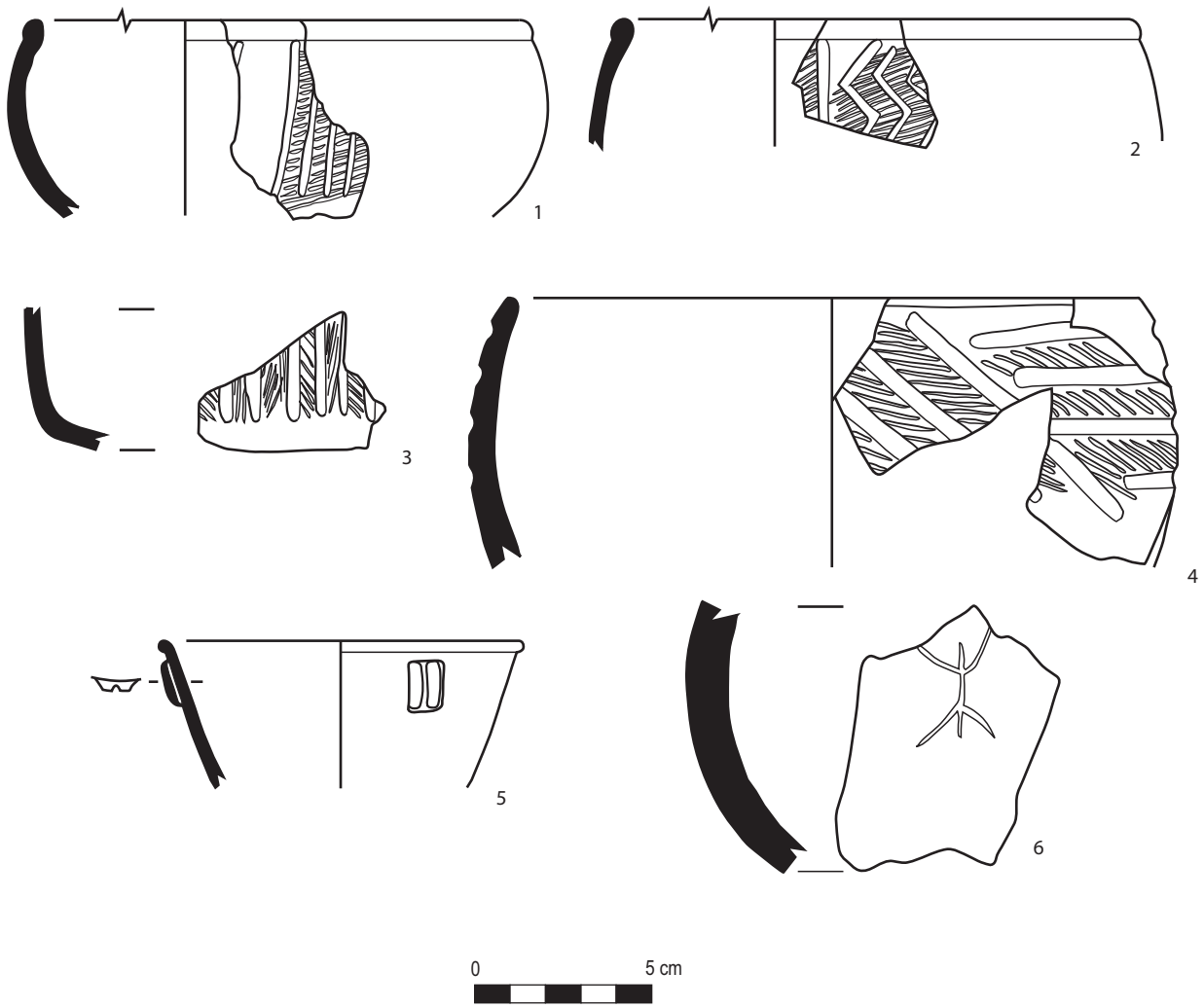

FIGURE 4.32. Above level 3 architecture, below present-day mound surface (originally published as level 3, Curvers and Schwartz 1990: figure 21).

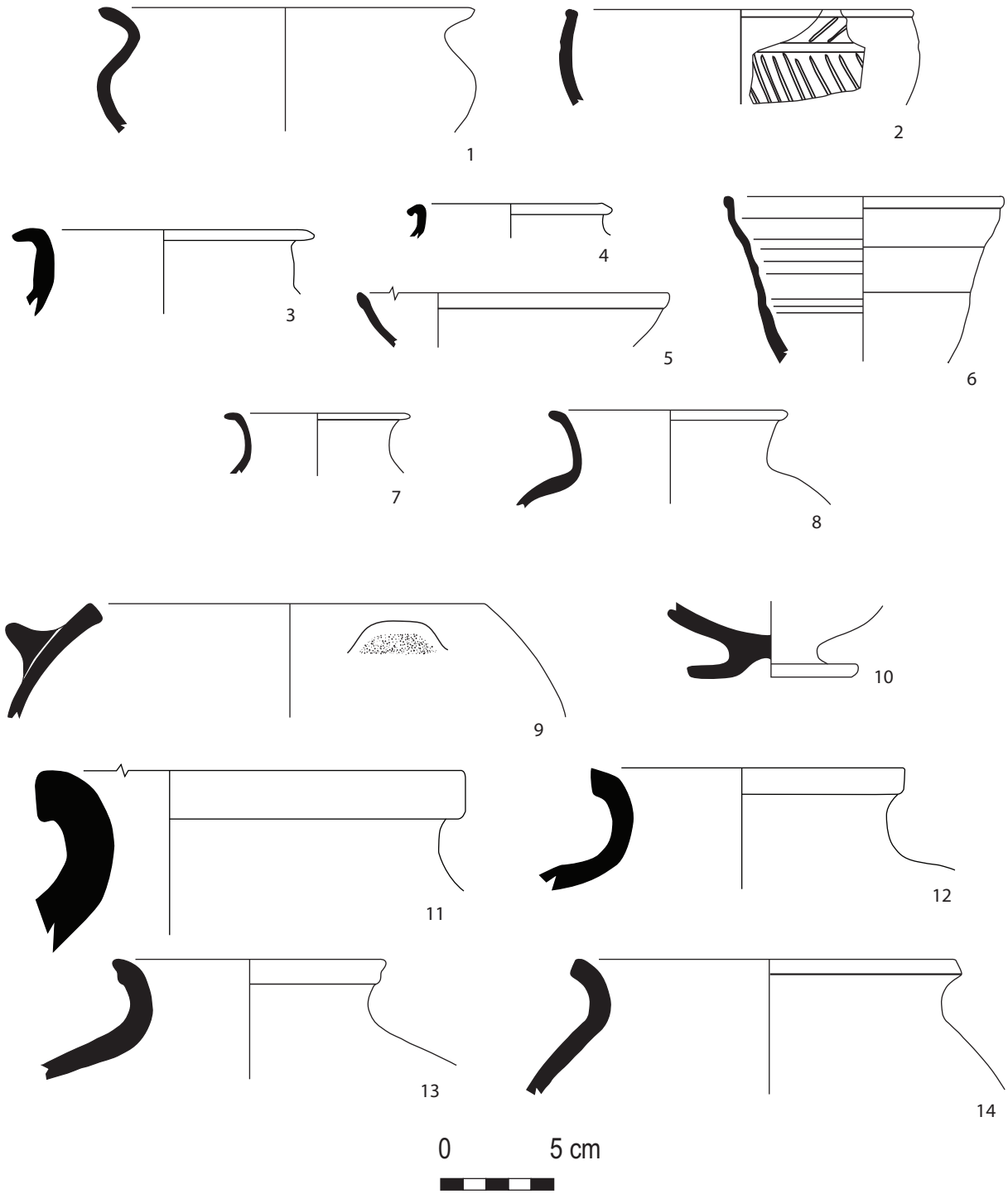

FIGURE 4.33. Level 2 or 3 pottery.

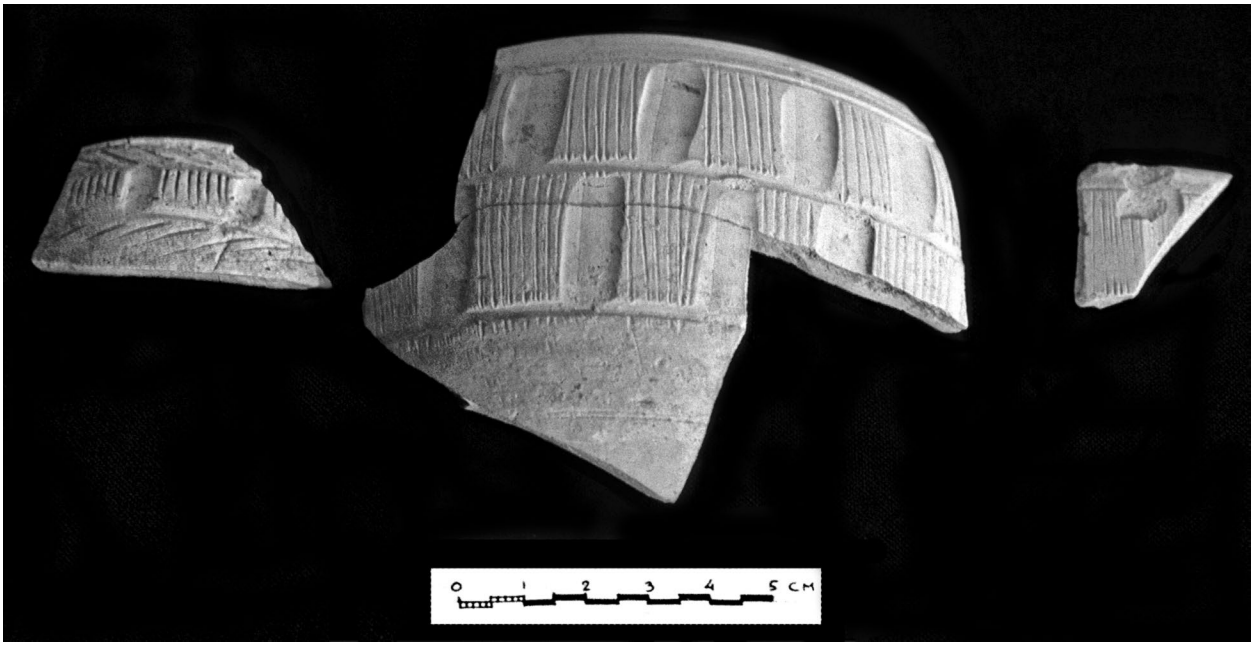

FIGURE 4.34. Level 3 "excised" sherds. *Photograph by Glenn Schwartz.*

FIGURE 4.35. Goblet with incised "simplified" design (Raq 90 P-120), level 3, burial 8 (see Figure 6.9). *Photograph by Hans Curvers.*

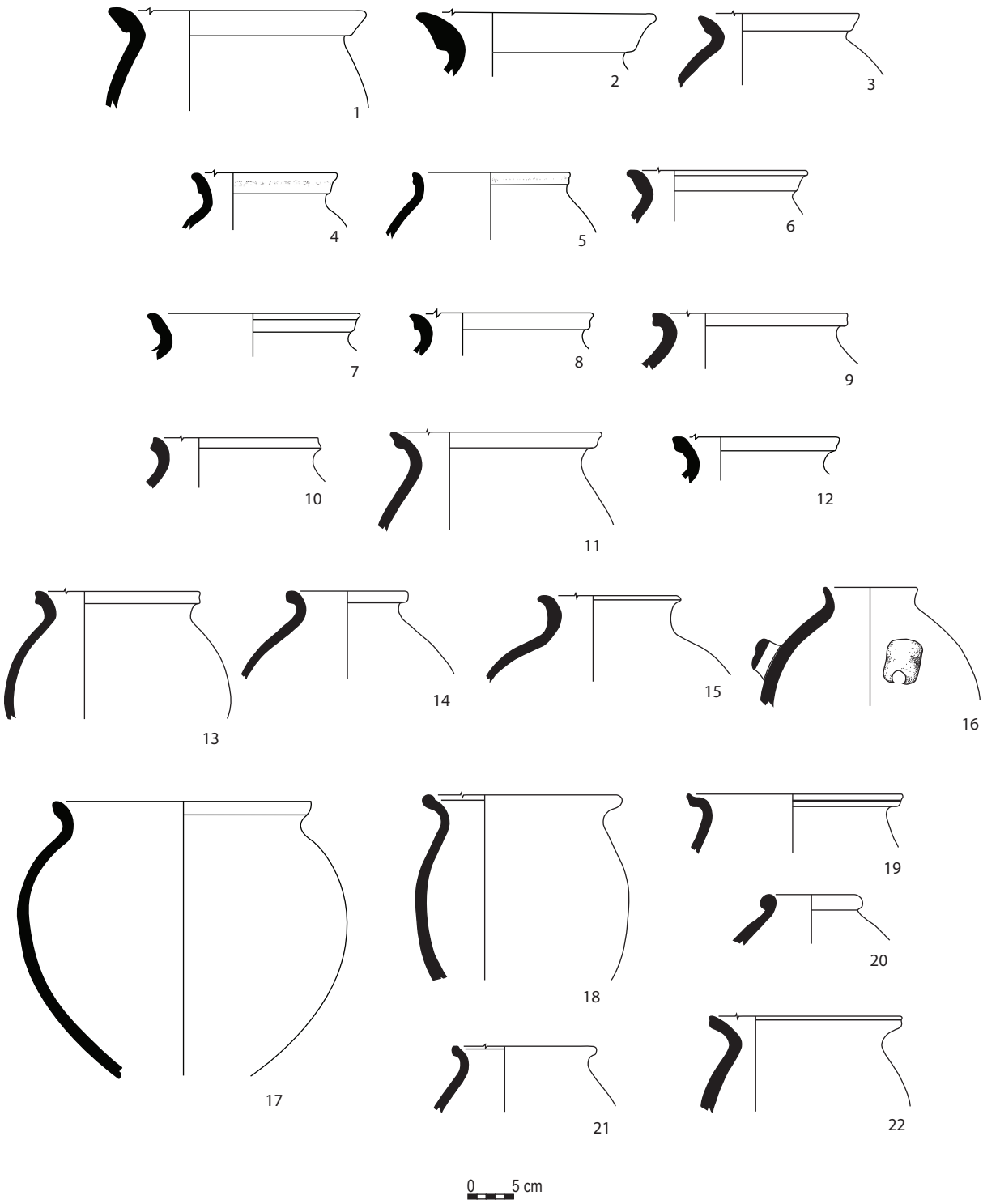

FIGURE 4.36. Level 2 Coarse and Medium Simple Ware.

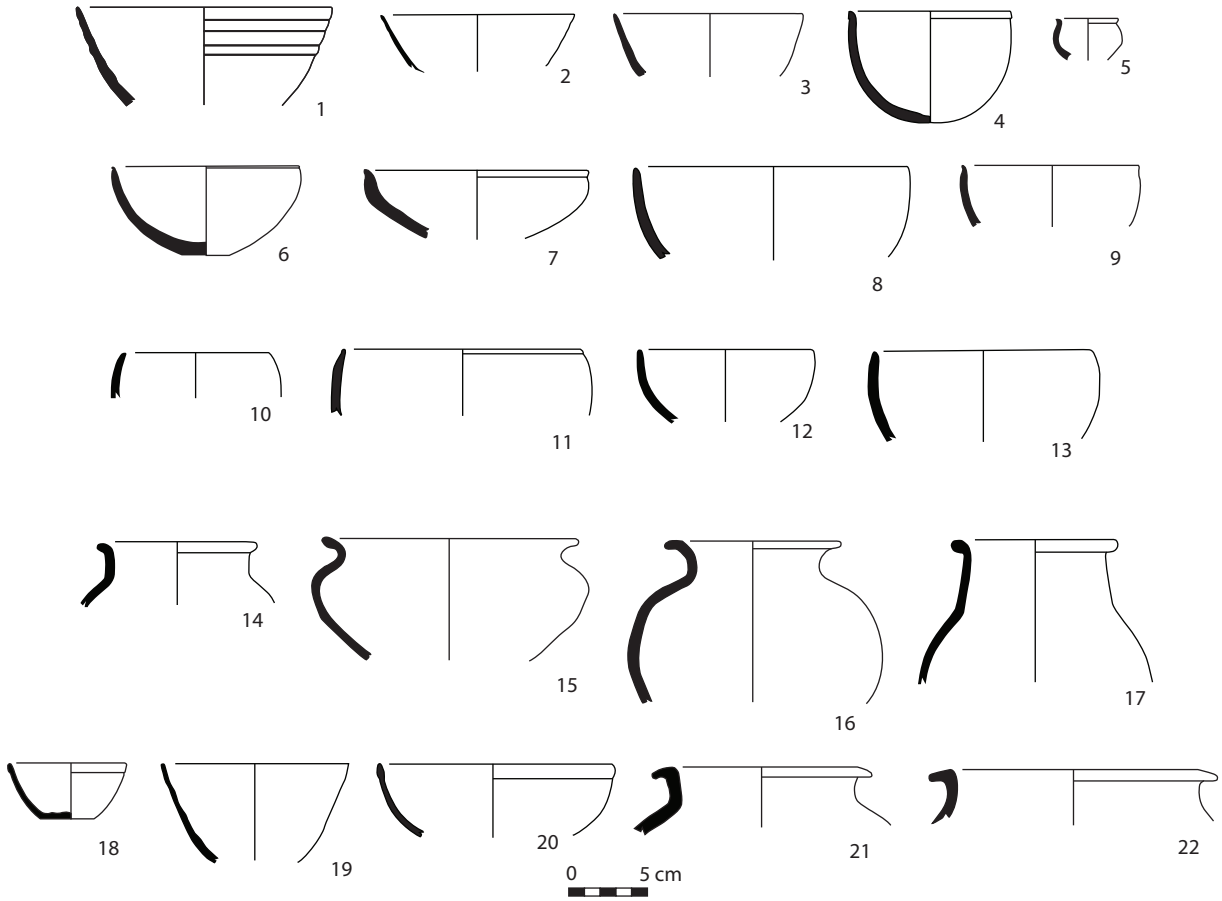

FIGURE 4.37. Level 2 Fine Simple Ware (1–17) and Metallic Ware (18–22).

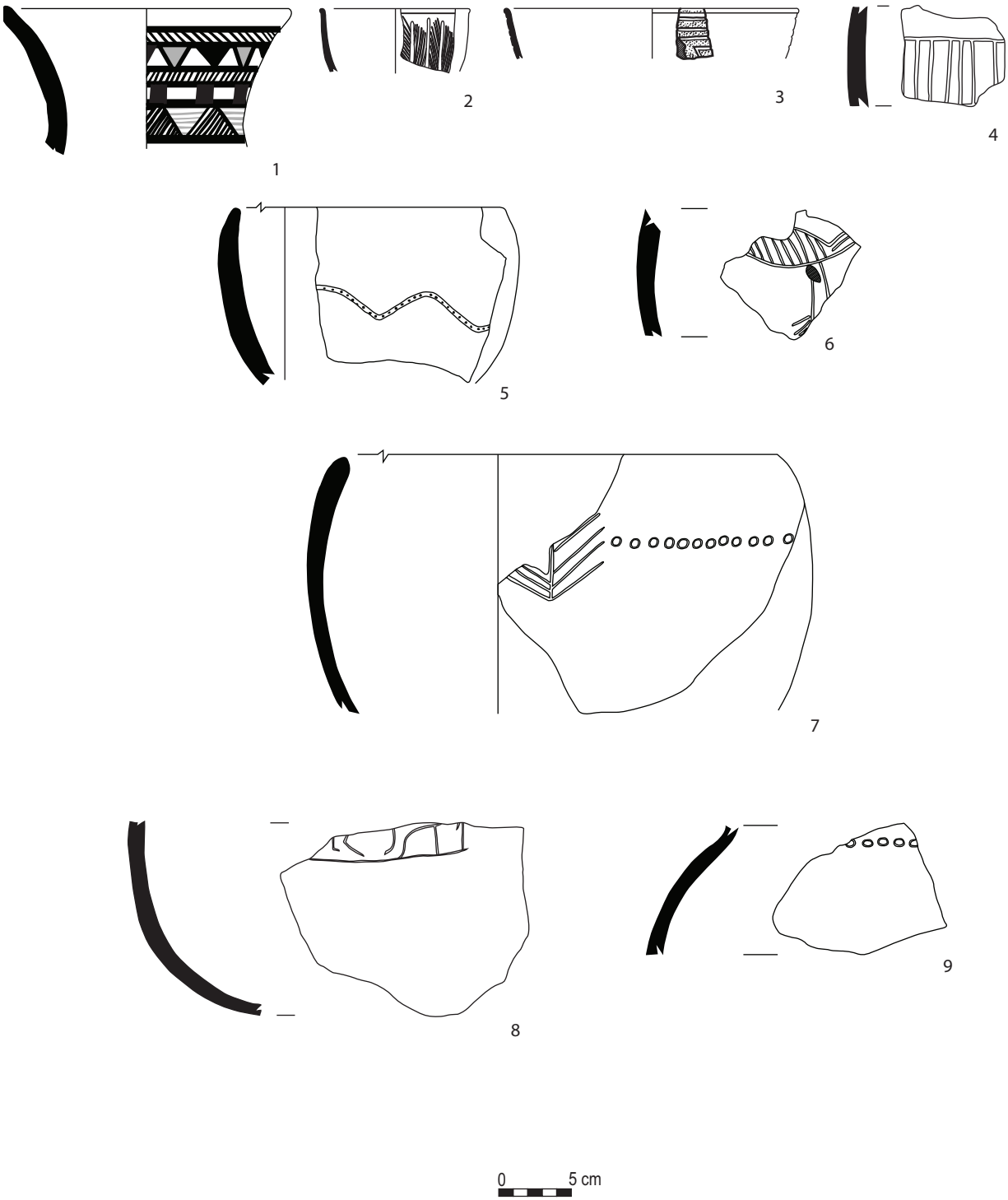

FIGURE 4.38. Level 2 decorated pottery.

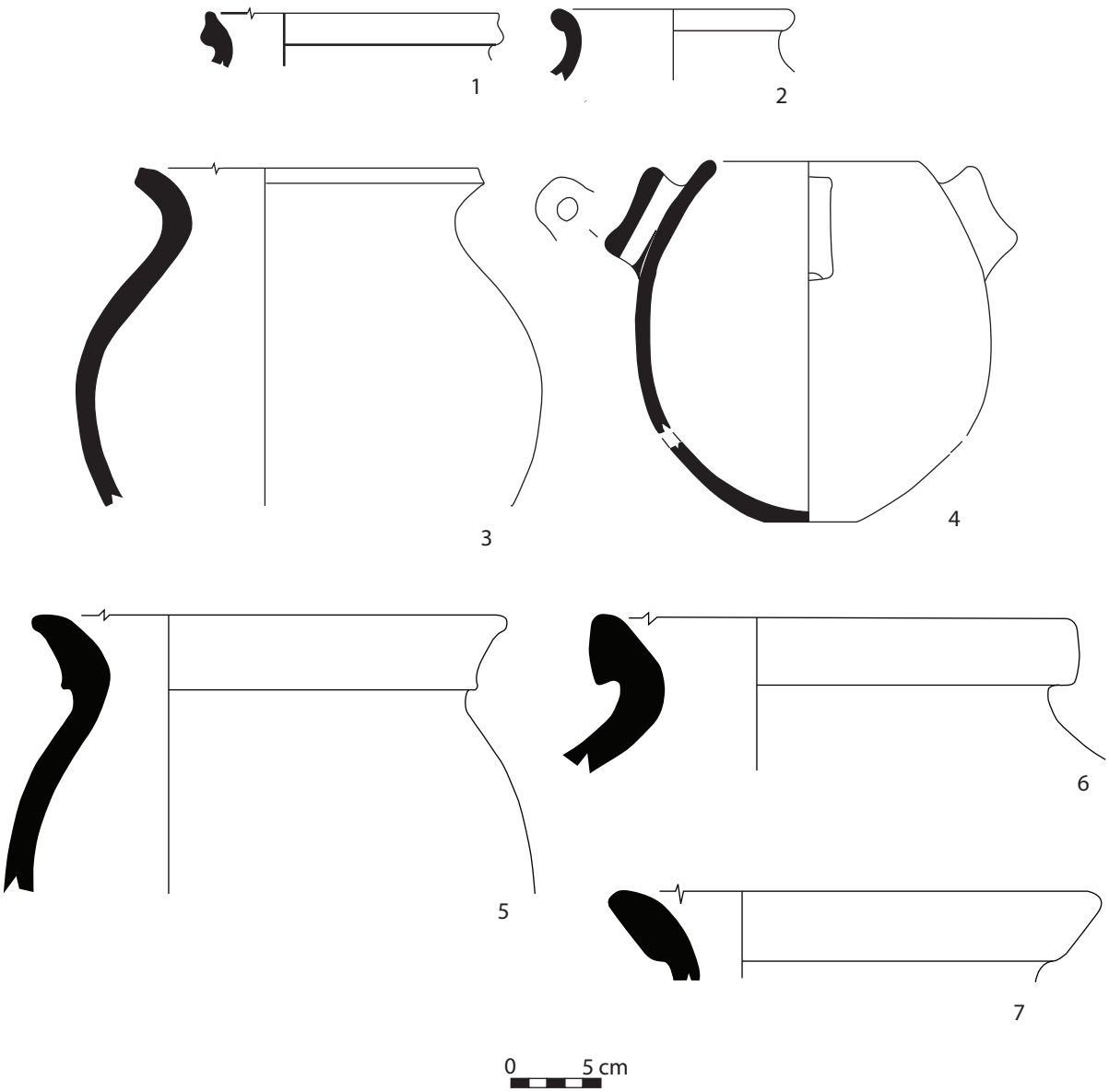

FIGURE 4.39. Level 2 Vegetal–Tempered Ware.

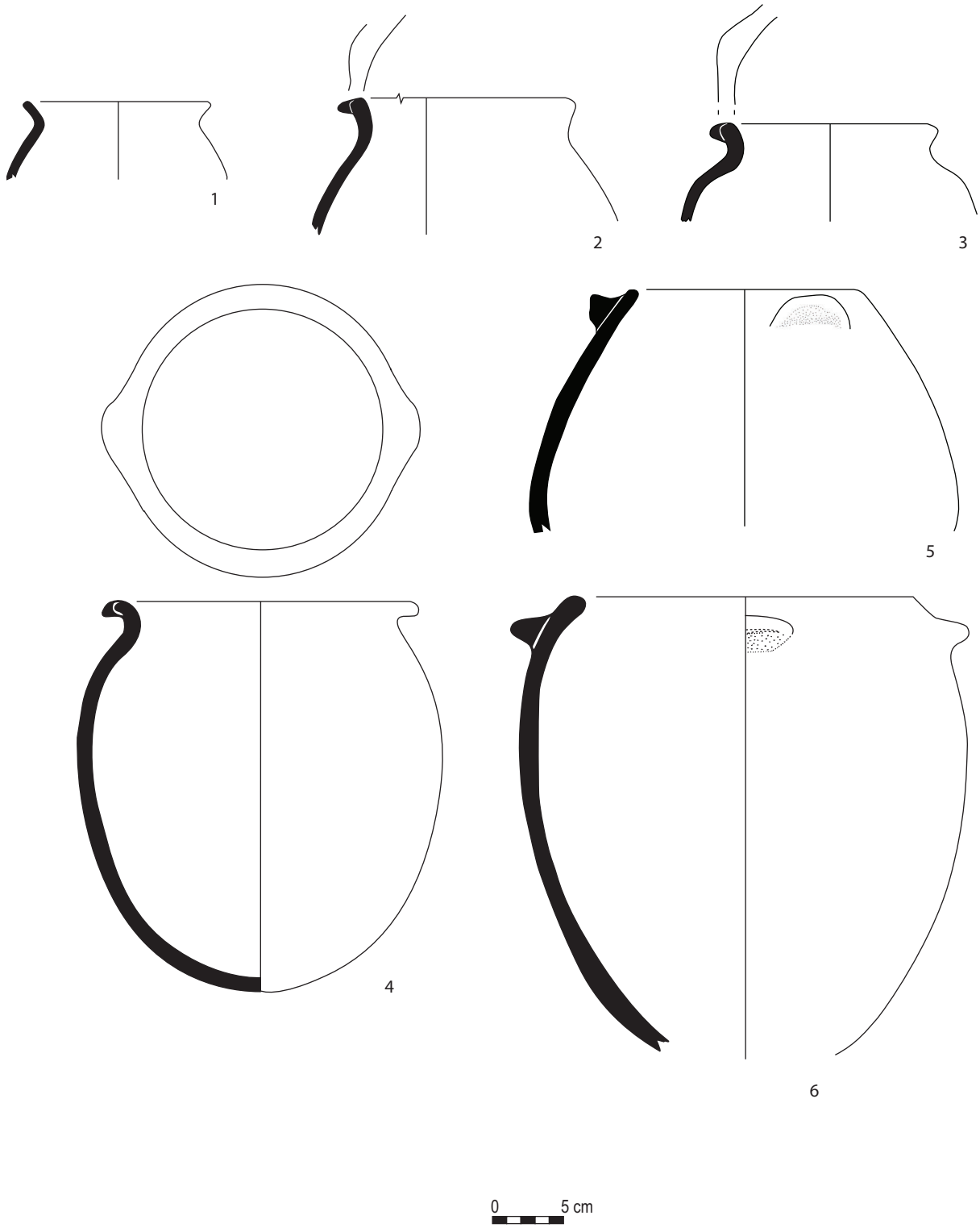

FIGURE 4.40. Level 2 Cooking Ware.

FIGURE 4.41. Miniature chalice (Raq 90 P-095) from level 2, burial 25. (see Figure 6.27). *Photograph by Hans Curvers.*

FIGURE 4.43. Goblet (Raq 87 P-020) from level 2, burial 30 (see Figure 6.36). *Photograph by Hans Curvers.*

FIGURE 4.45. Metallic Ware jar (Raq 87 P-019) from level 2, burial 30 (see Figure 6.36). *Photograph by Hans Curvers.*

FIGURE 4.42. Goblet (Raq 90 P-092) from level 2, burial 25 (see Figure 6.27). *Photograph by Hans Curvers.*

FIGURE 4.44. Jar (Raq 87 P-015) from level 2, burial 31 (see Figure 6.38). *Photograph by Hans Curvers.*

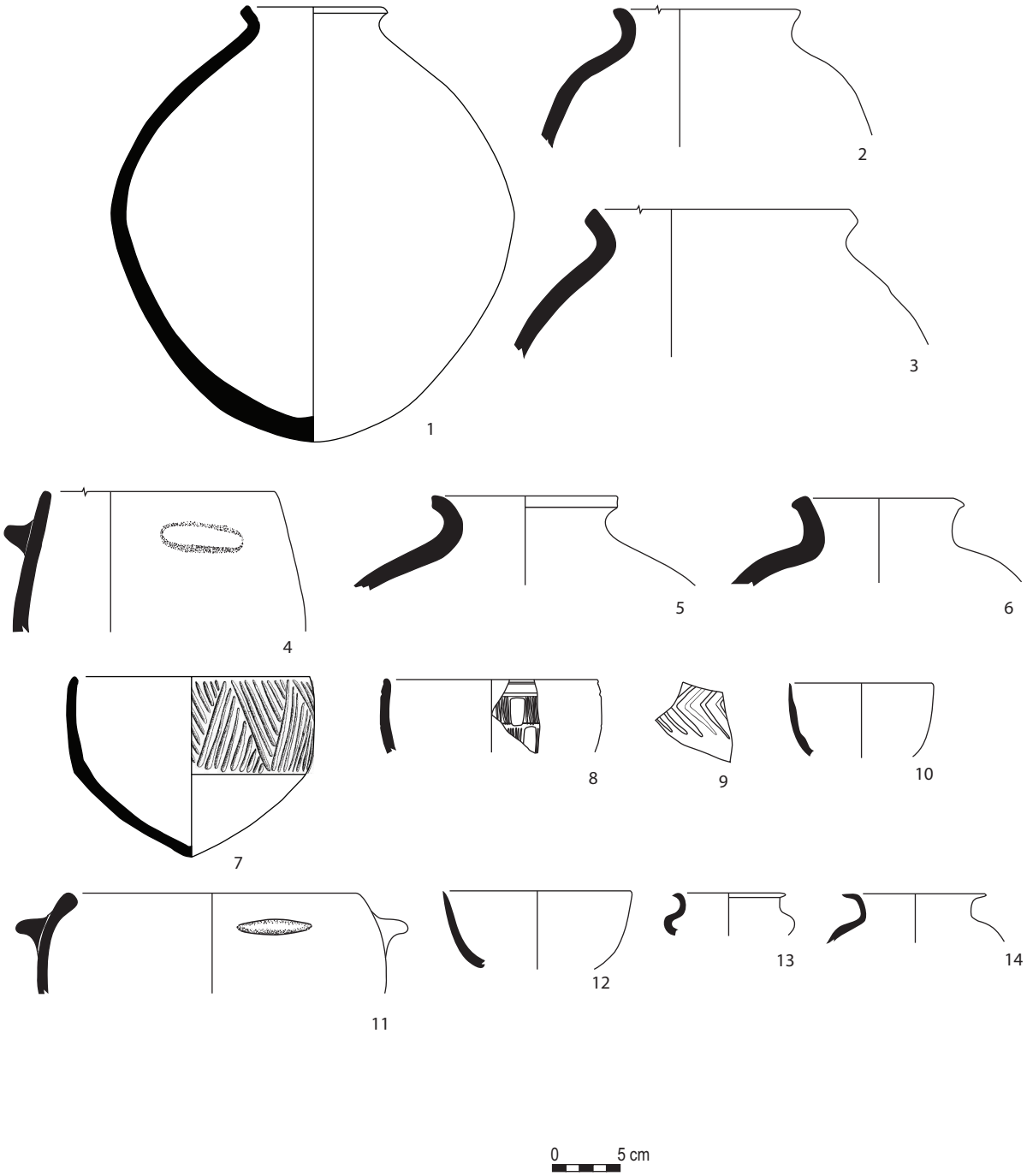

FIGURE 4.46. Pottery from northwest silos (levels 3/4) (nos. 1–9) and "Shop" (level 3 or 2) (nos. 10–13).

NOTES

[1] The authors wish to thank Hans Curvers for his extensive help in producing this chapter.

[2] The authors are also grateful to Violaine Chauvet, Christian Baum, Christopher Brinker, and Harley King for the help preparing the illustrations for publication, and to Ian Graham for his assistance in preparing the tables and catalogue.

[3] We observed a similar pattern in the levels directly above virgin soil at Tell Umm el-Marra in the Jabbul plain of western Syria.

[4] Although the numerical superiority of Fine Simple Ware over Medium Simple Ware is surprising, the distinction between Coarse and Medium Simple Ware may not be so significant given the many rim types common to both, and the "lumping" of Coarse and Medium Simple Ware would produce a ware type that is much more numerous than Fine Simple Ware. Note also the overwhelming predominance of Coarse Simple Ware over both Medium and Fine Simple Ware in the body sherd corpus (see below).

[5] The example published in Figure 4.9 derived from contexts now understood to be level 3 or above, over level 3, area 38; it was first published as deriving from level 3 (Curvers and Schwartz 1990: figure 18:14).

[6] Figures 4.17–4.46 are presented following the catalogue.

[7] See Figure 4.17:14–18.

[8] See Figure 4.17:10.

[9] For 3212, see Figure 4.17:13.

[10] For 3231, see Figure 4.17:20–23.

[11] For 3211, see Figure 4.17:26, 27. For 3221, see Figure 4.17:25.

[12] Figure 4.17:1.

[13] The step pattern sherd derived from 42/116-076, area 3, ca. 30–40 centimeters below the present-day mound surface, so it is possible that the sherd was intrusive.

[14] Figure 4.24:8, 10–16.

[15] For 3121, see Figure 4.23:6, 9–11, Figure 4.24:6. For 3122, see Figure 4.23:2, 7, 8, Figure 4.24:5.

[16] For 3211, see Figures 4. 23:12; 4.24:3, 4. For 3212, see Figures 4.23:5, 16–18, 4.24:1, 2, 7, 18. For 3213, see Figure 4.23:3, 13, 14. For 3231, see Figure 4.24:17.

[17] See Figure 4.18:9.

[18] See Figure 4.18:10–12.

[19] For 3211, see Figure 4.19:2–5, 7, 8, 20, 21, 23, 26, 27. For 3231, see Figure 4.19:1, 9, 11, 12, 14, 19, 24. For 3241, see Figure 4.19:15, 17. For 3271, see Figure 4.19:6.

[20] For 1221, see Figure 4.20:12. For 2113, see Figure 4.20: 5–7. For 2211, see Figures 4.20:3, 4, 8–11; and 4.21:1, 2, 4, 6.

[21] See Figure 4.20:14, 15.

[22] The exception derives from level 4, area 9, phase b. Not included in this excised group is Figure 4.21:1. Although its vertical grooves could be understood as excised, they do not resemble the excised patterns common in level 3.

[23] For 1221, see Figures 4.29:13, 15–17; 4.30:6, 7, 15. For 2211, see Figures 4.29:14, 18–20; 4.30:2, 11, 16.

[24] For 1121, see Figures 4.29:22; 4.30:17. For 2111, see Figure 4.29:7, 11. For 2113, see Figures 4.29:8–10, 12; 4.30:1.

[25] For 1214, see Figure 4.31:1–3. For 1221, see Figure 4.31:4.

[26] See Figure 4.27:1, 3.

[27] For 3211, see Figures 4.27:8, 15; 4.28:5, 6. For 3221, see Figures 4.27:10, 16; 4.28:11, 16. For 3231, see Figures 4.27:9; 4.28:1, 3, 4. For 3241, see Figure 4.28:2, 8, 13.

[28] For 3121, see Figure 4.31:6, 7, 9, 11, 13. For 3122, see Figure 4.31:8, 10, 12, 14.

[29] See Figure 4.31:16, 18.

[30] See Figure 4.31:23–25.

[31] For 1121, see Figure 4.37:13.

[32] See Figure 4.37:1, 12.

[33] See Figure 4.37:10.

[34] See Figure 4.37:15, 16.

[35] See Figure 4.36:9, 13, 17.

[36] For 3241, see Figure 4.36:10. For 3242, see Figure 4.36: 22. For 3243, see Figure 4.36:11, 12.

[37] See Figures 4.36:1–4, 6, 7; 4.39:5, 7.

[38] See Figure 4.40:1, 4.

[39] See Figure 4.40:5.

[40] See Figure 4.40:2, 3.

[41] See Figure 4.37:18, 20.

[42] I am grateful to Elena Rova for providing me an advance copy of her publication on Jezirah relative chronology (Rova 2011).

[43] Note also the presence of nose-lug incised (and ribbed) jar sherds in Raqa'i 4 (Figure 4.21:16–19), a variety that Rova (2011, types 8 and 9) assigns to Early Jezirah 0.

[44] A problematic aspect of the ARCANE Jezirah volume is the absence of a clear explanation for the chronological subdivisions proposed.

[45] In the original Early Jezirah chronology, Raqa'i 3 was assigned to Early Jezirah 2, without any early or late distinctions (Pfälzner 1998).

[46] The incised sherds from the Temple area derived from areas 24 (n = 13 sherds), 62 (n = 10), 21 (n = 4), 23 (n = 4), 61 (n = 3), and 22 (n = 2).

[47] The earliest phase (a) yielded no diagnostics. Phase a/b includes sherds from excavation units (archons) that spanned both phases.

[48] For bowls and goblets, the relative frequencies are 25% (level 5), 29% (level 4), 38% (level 3), and 42% (level 2). For

jars and pots, the figures are 75% (level 5), 67% (level 4), 58% (level 3), and 54% (level 3).

[49] Lest we take these conclusions too uncritically, it must be observed that the patterns exhibited by the body sherd wares do not corroborate the picture of differentiation by site neighborhood in level 3. Instead, the areas had relatively similar percentages of the different ware types.

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Chapter 5

The Small Finds[1]

Sally S. Dunham

All the non-pottery small finds from Tell al-Raqa'i are discussed and catalogued in this chapter. Since the small finds comprise 748 registered items[2] of diverse materials and purposes, the chapter is divided into sections of objects grouped together by their functions, or material, or both: administrative artifacts, all of which are made of clay, except for one Sassanian stone stamp seal; objects of clay; metal objects; bone and shell objects; stone objects; spindle whorls, model wheels, and disks, since they could all have been used for spinning (although the model wheels were probably made for model wheeled vehicles); beads and pendants of all materials; and fragments of a wall painting found in level 4.

The discussions of the various categories take into account what the function of the object could have been. This includes consideration of the "recycling" of certain types, such as model wheels reused as spindle whorls, or grinding stones reused as door sockets or mortars or as building material for drains or walls.[3] A discussion of the distribution of each class of artifact is given in the pertinent section, while for certain types of artifacts distribution plans for levels 3 and 4 are also included (Figures 5.150–5.157).

Administrative Artifacts

Except for one Sassanian stamp seal, all the administrative artifacts belong to the third-millennium BCE (Early Jezirah period). The stamp seal comes from a late, sub-surface burial and will be presented first, after which the third-millennium artifacts will be examined.

Sassanian Stamp Seal

The Sassanian stamp seal, Raq 87 Z-001 (Figures 5.1–5.3), was found in one of the recent subsurface burials. It has a pierced dome shape similar to seal DB2 in Bivar's catalogue of the British Museum collection (Bivar 1969: plate "Shapes III"). The stone is a translucent orange/red-brown color with black/brown spots, probably a micro-crystalline quartz (such as carnelian) which is a common stone for Sassanian stamp seals (Bivar 1969:35).[4] The oval sealing surface depicts a short-legged bird facing left. The body is a rounded rectangular depression on which short straight parallel lines made by a cutting wheel indicate the feathers. The head and neck are set slightly back from the chest with the eye and beak indicated by short straight lines. The tail is three lines in a fan-like arrangement projecting up from the back near the hind end. The legs are short in relation to the long three-toed feet, all again made with the straight marks of a cutting wheel. Material, shape, and subject are all very characteristic of Sassanian stamp seals. Bivar's catalogue includes eight examples of domes with birds on them.[5] He dates dome-shaped seals to the fifth or sixth centuries CE on the basis of the paleography of the inscribed ones (Bivar 1969: 23–24). The bird on the Raqa'i seal seems closest to three in the Dieulafoy Collection in the Louvre.[6] The date of the Raqa'i seal, however, cannot be used as an indication of the date of the burial it was found in, since, as Bivar notes, such objects as engraved gems are easily portable and may have been carried long distances and saved over generations in ancient as well as

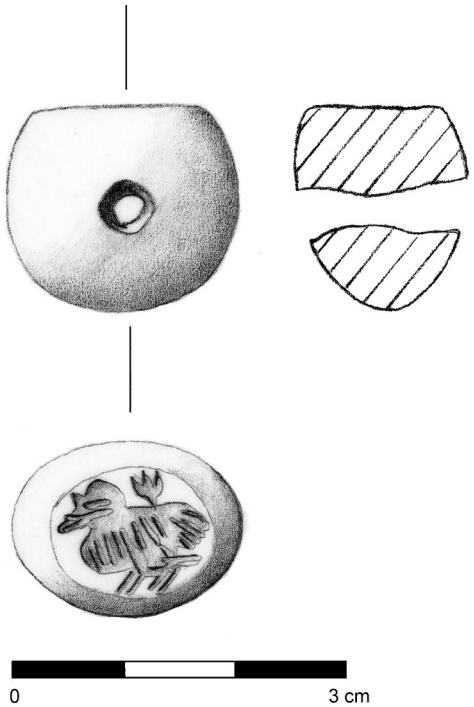


FIGURE 5.1. Raq 87 Z-001.
Illustration prepared by Khaled al-Hamad.

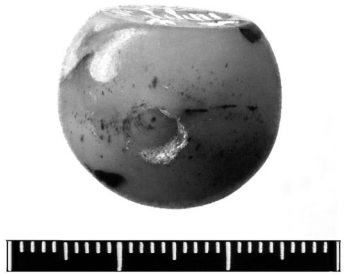


Figure 5.2. Raq 87 Z-001.
Photograph by Anwar 'Abd al-Ghafour.

FIGURE 5.3. Raq 87 Z-001.
Photograph by Anwar 'Abd al-Ghafour.

later times (Bivar 1969:5, note 1; 13–14). Since the seal was found near the neck of the skeleton, perhaps it had been worn on a string (or chain) around the neck.

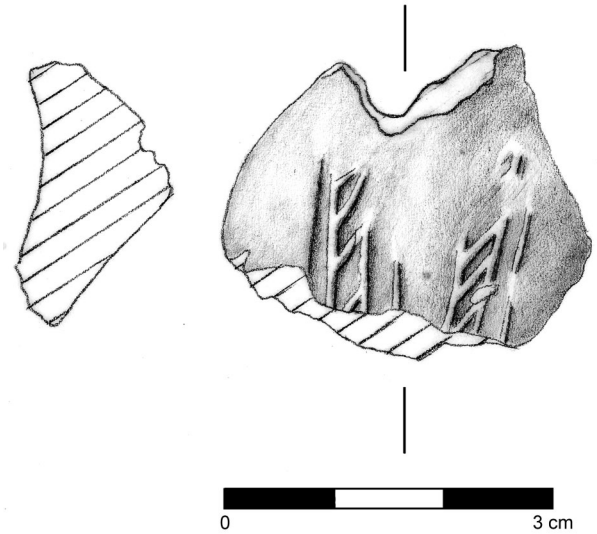
THIRD-MILLENNIUM BCE ADMINISTRATIVE ARTIFACTS

This section includes five third-millennium BCE seal impressions, 140 unimpressed sealing fragments, one small clay tablet with numerical signs, seven possible tablet blanks, and 28 possible tokens.

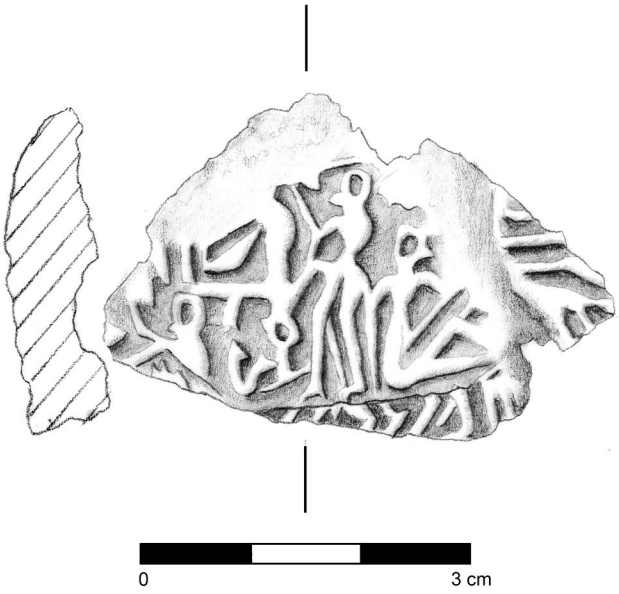
Seal Impressions[8]

Three of the seal impressions were found in the Round Building of level 4.[9] Raq 88 Z-004 (Figure 5.9) was found in the latest phase of the level 4 Round Building. Only one border of the impression is clear, and the details of the design are not well enough preserved to understand it. Since the back of the sealing has straw impressions and is convex, it is most likely a jar sealing. Seal impressions Raq 88 Z-005 (Figure 5.11) and Raq 89 Z-007 (Figure 5.13) were found in the debris inside room 14 of the Round Building. Raq 88 Z-005 was found among 13 fragments of unimpressed sealings (Raq 88 O-027). Like these sealings, Z-005 had a very flat back.[10] Although the top and bottom borders of the seal impression were clear, the design is faint, yet a horned quadruped placed vertically in the field (i.e., parallel to the cylinder seal axis) can be seen at the left.[11] Raq 89 Z-007 was likewise found with a large group of unimpressed fragments of sealings (Raq 89 O-038). The back side of Z-007 is convex, so probably it was part of a jar sealing. The design is a row of three concentric triangles on the left and part of two more, reversed on the right. A single horizontal line forms the borders at the top and the bottom. This impression belongs to Pittman's "incised style" (Pittman 1990:91–92), one of the styles that was frequently used in the Proto-Elamite administrative system and was related to the "glazed steatite style" (see below) through motif and material, and the geographic areas where it is found. Indeed, some of the closest comparisons to Z-007 are impressions and seals found at Susa on cylinders made of glazed steatite.[12] Other close comparisons are found among the impressions on jar rims at Tell Gubba in the Hamrin,[13] as well as at other Ninevite 5 sites such as Leilan.[14]

Raq 88 Z-002 (Figures 5.4 and 5.5) and Raq 88 Z-003 (Figures 5.6 and 5.7) come from debris above area 38 (a street) of level 3 and could belong to either level 3 or 2 (late EJZ 2-EJZ 3a). These impressions were on peg sealings.[15] The impression of Z-002 is quite faint, but it appears to have pairs of diagonal parallel lines connected by short hatchings. Between these pairs is a faint impression of a dotted-center circle. These few details are enough to show that Z-002 belongs to a glyptic style called "Piedmont Jamdat Nasr" (Buchanan 1966) or "Piedmont" (Marchetti 1996) in the literature and extensively studied by Pittman (1990, 1994) who prefers the term "glazed steatite style."[16] Pittman shows that this style was common at Susa in the Proto-Elamite world and can be found as far east as Shahr-i Sokhta. It was one of several styles that were used in the proto-Elamite administrative system and that can be found at sites along the western Piedmont of the Zagros, in northeastern Syria, and occasionally in southern Mesopotamia. Indeed, good comparisons for the few discernible details of Z-002 can be found in Ninevite 5 contexts in north Mesopotamia, in Early Dynastic sites in the Hamrin and Diyala regions, and in proto-Elamite contexts at Susa.[17] Although the floruit of the glazed steatite style is contemporary with Early Dynastic I in Mesopotamia (Pittman 1990:324), examples occur in the Diyala region as late as Early Dynastic III (Pittman 1990:224, 321).[18]



(*Left*): FIGURE 5.4. Raq 88 Z-002. *Illustration prepared by Khaled al-Hamad.* (*Above*): FIGURE 5.5. Raq 88 Z-002. *Photograph by Anwar 'Abd al-Ghafour.*



(*Left*): FIGURE 5.6. Raq 88 Z-003. *Illustration prepared by Khaled al-Hamad.* (*Above*): FIGURE 5.7. Raq 88 Z-003. *Photograph by Anwar 'Abd al-Ghafour.*

Seal impression Raq 88 Z-003 (Figures 5.6 and 5.7) shows a completely different style from Z-002.[19] This impression shows simple nude male human figures with round heads and large hollow eyes. Since several impressions appear to have been rolled in different directions on this sealing, the original scene is difficult to reconstruct. Clearly it had one standing figure facing left and one seated figure facing right.[20] The standing figure appears to hold the arm of an upside down sitting human figure. The details of this area, however, are obscured by a fingerprint that was probably made by the pressing of the sealing against the sealed surface when the clay was not quite dry. The drawing, made from the impression itself, shows parts of two additional human heads in the lower left. Perhaps these are from a further rolling of the same seal.[21] Part of another impression can be seen below the feet of the two main figures, but whether this was the same seal or a different one cannot be known.

Simple nude male human figures with round heads and hollow eyes were a frequent motif in the glyptic of southern Mesopotamia in the first half of the third millennium. They are very numerous in Seal Impression Stratum 4 at Ur (ED II/Early Jezirah 2),[22] where they are shown in various activities, often in a pose very like that of the standing man on Z-003.[23] They also occur in the various glyptic styles at Fara as defined by Martin. Among the ED I seal impressions from Fara, one has a figure very close in position and style to the standing figure on Raq 88 Z-003, walking while holding two hands to one side. The seal impression (Martin 1988:245, no. 214) shows a man walking behind a lion and holding its tail. Martin (1988:71) believes that this seal impression belongs to the later ED I period but notes that Karg (1984) dates it to ED II. The theme of Z-003, however, is uncertain. It might be a variant of some "erotic" subject such as seen on a stamp seal impression from Leilan IIId (Parayre 2003:285, no. 14) or on some impressions from Ur (Legrain 1936: nos. 364–371), but not enough is preserved to be sure. Nevertheless, Z-003 is important, because whereas Z-002, Z-005, and Z-007 seem to reflect influences from the east (northern Mesopotamia and Iran), Z-003 suggests influences from southern Mesopotamia. Matthews (1997) has discussed how Early Dynastic art styles spread from southern Mesopotamia over most of Syria in the Early Dynastic period. Perhaps Raq 88 Z-003 can be considered part of the evidence of this phenomenon.

Catalogue of Seals and Seal Impressions

1. Raq 87 Z-001. Figures 5.1, 5.2, and 5.3. Post-level 1. Dome-shaped stamp seal. Pierced with biconical hole. Oval sealing surface with depiction of a short-legged bird. Slightly translucent red/brown quartz—probably carnelian. H. 1.6 cm; D. 2.1 cm. Sealing surface: L. 1.5 cm; W. 1.4 cm. Archon 29/ 114-009. Burial.
2. Raq 88 Z-002. Figures 5.4 and 5.5. Either level 2 or level 3. Broken cone-shaped sealing fragment, impressed on sloping outer surface. The back shows that it is a peg sealing. The impressed surface shows a faint design of diagonal ladder patterns and a center-dot circle. Dark gray-black clay. Dimensions of outer surface: L. 3.4 cm; H. 2.6 cm. Dimensions of impression: L. 1.9 cm; H. 1.6 cm. Archon 36/102-018. Over area 38 (level 3 designation). Debris of uncertain level.
3. Raq 88 Z-003. Figures 5.6 and 5.7. Either level 2 or level 3. Sealing has one slightly concave side with rope impressions and is possibly a peg sealing. Other side is convex with an impression showing standing and sitting nude male figures. Dark gray clay. Dimensions of sealing: L. 4.1 cm; H. 3.1 cm; Th. 1.1 cm. Dimensions of impression: L. 4.1 cm; H. 2.6 cm. Archon 36/102-021. Over area 38 (level 3 designation). Debris of uncertain level.
4. Raq 88 Z-004. Figures 5.8 and 5.9. Level 4. Sealing fragment with two convex faces, possibly a jar sealing. One shows chaff impressions, and the other has a faint seal impression whose design is unclear. Clay. Dimensions of sealing: L. 1.6 cm; H. 2.7 cm; Th. 1.1 cm (max.). Dimensions of impression: L. 1.6 cm; H. 1.4 cm. Archon 42/114-069. Between wall 13I and the outer wall of the Round Building, Area 13/17, phase d.
5. Raq 88 Z-005. Figures 5.10 and 5.11. Level 4. Sealing fragment. Possible jar sealing (see above). One face is very flat, while the other has a faint seal impression, which perhaps showed a horned quadruped vertically in the field. Dark gray clay. Dimensions of sealing: L. 3.4 cm; H. 3.9 cm; Th. 1.0 cm. Dimensions of seal impression: L. 3.4 cm; H. 2.9 cm. Archon 42/ 114-081. Area 14. Debris in room.
6. Raq 89 Z-007. Figures 5.12 and 5.13. Level 4. Sealing fragment, probably a jar sealing. One face is slightly convex but without distinct markings. The other face has a seal impression showing a pattern of concentric alternating triangles. Dark brown-gray clay. Dimensions of sealing: L. 3.4 cm; H. 2.7 cm; Th. 1.5 cm. Dimensions of impression: L. 3.4 cm; H. 1.6 cm. Archon 42/114-167. Area 14. Debris in room.

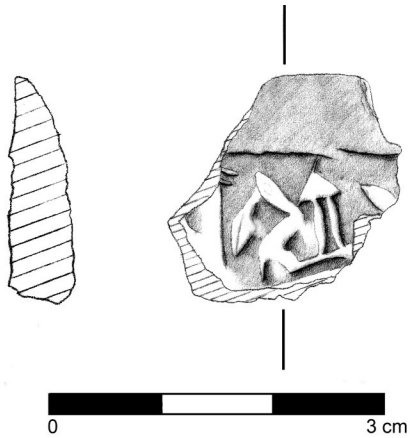
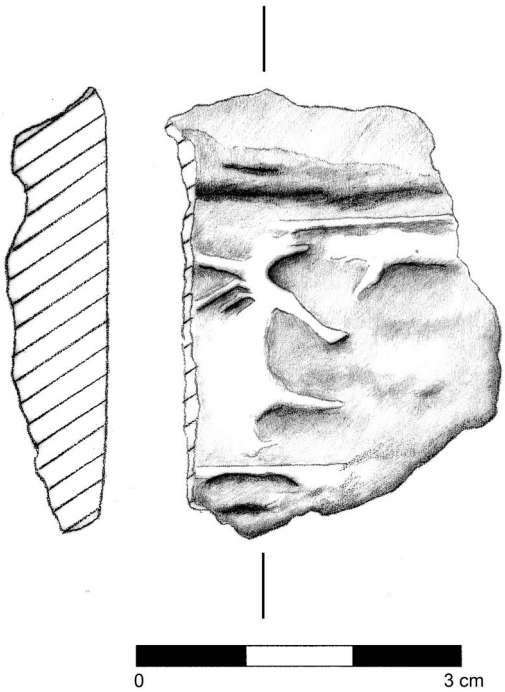


Figure 5.8. Raq 88 Z-004.
Illustration prepared by Khaled al-Hamad.

Figure 5.9. Raq 88 Z-004.
Photograph by Anwar 'Abd al-Ghafour.



(*Left*): Figure 5.10. Raq 88 Z-005. *Illustration prepared by Khaled al-Hamad. (Above):* Figure 5.11. Raq 88 Z-005. *Photograph by Anwar 'Abd al-Ghafour.*

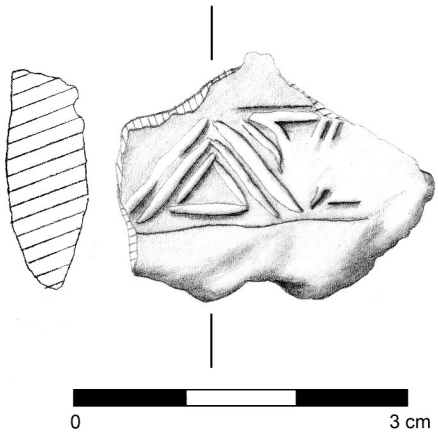


Figure 5.12. Raq 89 Z-007.
Illustration prepared by Khaled al-Hamad.

Figure 5.13. Raq 89 Z-007.
Photograph by Anwar 'Abd al-Ghafour.

Sealings

While only five seal impressions were found, pieces of unimpressed sealings were much more numerous, totaling 140 fragments collected in 40 different archons. Among these could be discerned 29 jar sealings and 9 peg sealings.[24] These numbers seem to imply that most of the evidence stems from individual deliveries. While peg sealings could be interpreted as door sealings, and hence, imply control of certain rooms, pegs can also be used to seal sacks, which would be individual deliveries as well.[25] All of the fragments were very fragile with crumbly edges, so that no joins could be made. Four fragments were from hard white plaster sealings on vessels with rim diameters of ca. 21–23 cm. The inside faces of these showed clear rope impressions. One, Raq 89 S-108 (Figures 5.14 and 5.15), could be matched to fit a rim sherd from a flaring rim vessel (Raq 92 48/108–530, 8671:1).[26] These hard white sealings seem to have been put over ropes that were wrapped around the necks of jars to hold the (cloth?) cover of the jar in place.[27]

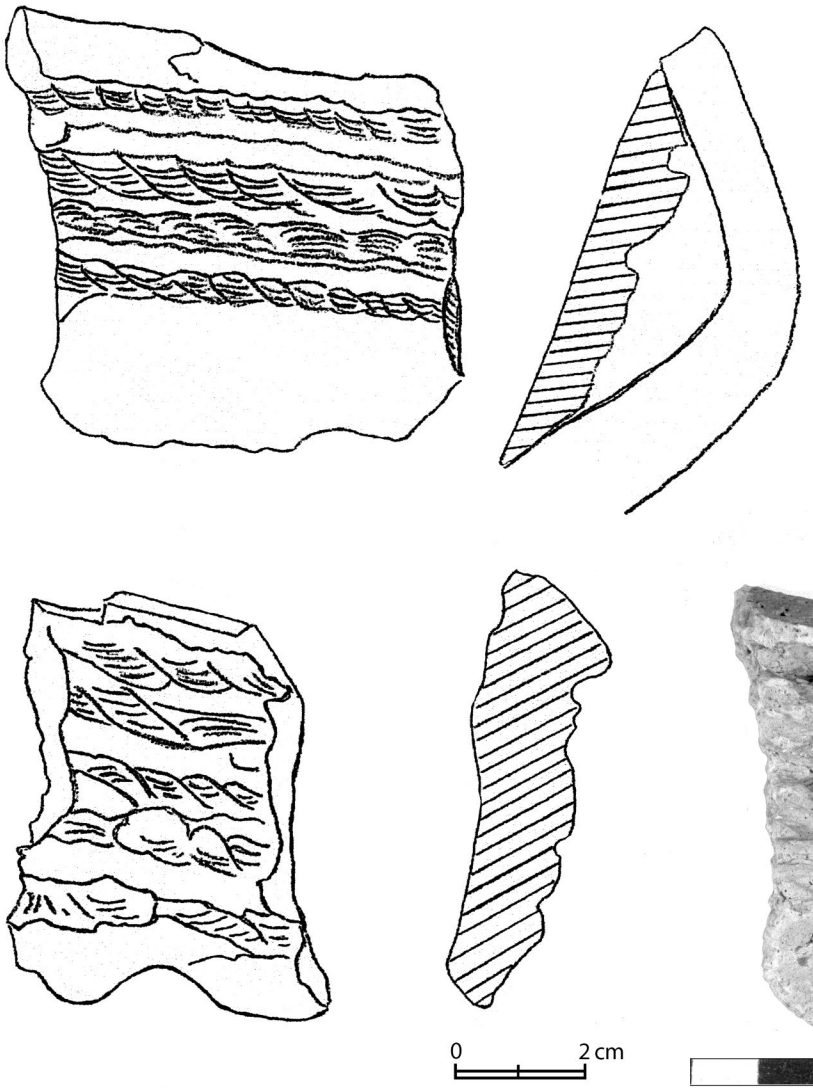


FIGURE 5.14. Plaster jar sealings. Top: Raq 89 S-108, inner face and section shown as fits against sherd Raq 92 48/108-530 8678:1; bottom: Raq 90 S-119. *Illustration prepared by Sally Dunham.*

FIGURE 5.15. Raq 89 S-108. *Photograph by Sally Dunham.*

Catalogue of Sealings

1. Raq 88 O-017. Either level 2 or level 3. Jar sealing. Piece of curved clay ca. 0.4 cm thick. Smooth on outside, irregular impressions on inside. Hard black clay. L. 3.0 cm; W. 2.5 cm; H. 0.5 cm. Archon 36/102-026. Above area 38 (level 3 designation). Debris above architecture, of uncertain level.
2. Raq 88 O-021. Late level 3. Jar sealing. Rope impression inside wider (top) end. Original rim diameter of vessel ca. 21 cm. White lime or gypsum plaster. L. 12.2 cm; H. 6.4 cm; Th. 2.5 cm. Archon 29/120-051. Area 12. On floor.
3. Raq 88 O-027. Level 4. 13 fragments of sealings. Flat pieces with one side flatter than other, as if pressed against an object. Lightly burned clay. Dimensions not recorded. Archon 42/114-081. Area 14. Debris inside room. Seal impression Z-005 was found with these fragments. Possibly a jar sealing (see above).
4. Raq 88 O-028. Either level 3 or level 4. Possible peg sealing. Fragment of clay with one curved surface, as if it had been pressed around an object. Unbaked gray clay. L. 2.8 cm; W. 1.8 cm; H. 1.3 cm. Archon 42/102-039. Area 87 (level 3 designation). Debris from presumed unroofed area in Round Building.
5. Raq 89 O-036. Level 4 or above. Possible peg sealing. Triangular lump with two flat sides perpendicular to each other, as if pressed into a square corner. Sealing? Lightly burned black clay. L. 3.5 cm; W. 2.5 cm; H. 2.7 cm. Archon 49/108-034. Above area 12 (level 4 designation). Debris above architecture.
6. Raq 89 O-037. Level 4 or above. Peg sealing. Triangular fragment with two very flat sides that meet at an acute angle. Lightly burned clay. L. 3.3 cm; W. 2.1 cm; H. 1.2 cm. Archon 49/108-034. Above area 12 (level 4 designation). Debris above architecture.
7. Raq 89 O-038. Level 4. 43 fragments of clay jar sealings. Many have one very flat side, while the other sides show rope or finger impressions. Found with many other fragments (ca. two large plastic bags full), but only these were saved. Unbaked clay. Dimensions, various sizes, but not recorded. Archon 42/114-167. Area 14. Debris inside room. Seal impression Z-007 was among these fragments.
8. Raq 90 O-047. Level 4. Round Building. Two fragments of jar sealings. (a) Larger piece has traces of rope impressions on one side. (b) Smaller piece, no impressions. Blackened clay. (a) L. 4.8 cm; H. 3.4 cm; Th. 1.3 cm; (b) L. 3.6 cm; W. 1.8 cm; Th. 1.4 cm. Archon 42/102-082. Area 21. Debris inside silo.
9. Raq 90 O-048. Level 4. Jar sealing. Piece of clay that has been pressed against an object. The shallow indentation on the flatter side could be worn rope impressions. Blackened clay. L. 4.2 cm; W. 2.0 cm; H. 1.5 cm. Archon 42/102-082. Area 21. Debris inside silo.
10. Raq 90 O-051. Level 4. Fragment of jar sealing. Rope impression inside. Gray clay. L. 3.0 cm; W. 2.6 cm; H. 2.6 cm. Archon 42/114-207. Area 9, phase a. Debris inside room.
11. Raq 90 O-053. Level 4. 18 fragments of possible jar sealings. All have one smooth, flat or slightly concave side. Other side has ridges and irregular impressions. One has a textile impression on it. Some of the concave impressions look like finger impressions. Dark gray clay. L. 7.7–2.7 cm; W. 7.3–2.6 cm; H. 2.2–1.1 cm. Archon 42/114-208. Area 9, phase a. Debris inside room.
12. Raq 90 O-059. Level 4. Peg sealing. Fragment that had been pressed against a round object at least 1.6 cm in diameter. Dark gray clay. L. 4.2 cm; W. 2.4 cm; H. 4.1 cm. Archon 42/114-209. Area 7. Debris inside silo.
13. Raq 90 O-060. Level 4. Two fragments: (a) jar sealing, pressed against something flat; one edge has possible cord impressions; (b) peg sealing, pressed against something round, ca. 1.8 cm D. Has fragment of possible seal impression on outside. (a) L. 2.9 cm; W. 2.9 cm; H. 1.6 cm; (b) L. 4.2 cm; W. 2.0 cm; H. 1.7 cm. Archon 42/114-209. Area 7. Debris inside room.
14. Raq 91 O-079a. Level 4. Small jar (?) sealing piece with three parallel string (?) marks (0.5 cm D.) on one face. Dark gray clay. L. 2.4 cm; W. 2.0 cm; Th. 1.1 cm. Archon 29/120, unit 3560. Area 70.
15. Raq 91 O-080. Level 3. Teardrop-shaped piece of clay that has broken off a larger object. Object widens towards the broken end. One side of the preserved end is relatively flat. Burned clay, pink-gray outside, gray core. May not be a sealing fragment. L. 3.9 × W. 0.7 × Th. 1.0–1.2 cm. Archon 19.5/115.5, unit 0742, elevation 294.08. Area 14.
16. Raq 91 O-081. Level 4. Jar sealing fragment with smooth surface and light orange strip on one corner. Opposite surface has a ridge between two concave grooves. Ridge shows possible faint rope impressions. Light brown baked clay. H. 3.4 cm; W. 3.8 cm; Th. 1.2 cm. Archon 29/120, unit 3472. Area 70.

17. Raq 91 O-082. Level 3. Jar/sack sealing fragment with cloth impressions on one face. Dark gray clay. H. 3.2 cm; W. 4.4 cm; Th. 1.5 cm. Archon 29/120, unit 2780-2. Area 14.
18. Raq 91 O-083. Level 3. Wedge-shaped jar sealing piece that has been pressed against a convex surface. Side toward sealed object has straw impressions. Burned clay-gray outside, pink-buff inside. L. 3.9 cm; W. 3.1 cm; Th. 0.9 cm. Archon 18.5/118, unit 3625, elevation 293.55. Area 93.
19. Raq 91 O-084. Level 4. Jar sealing, ovoid piece of clay that has a clear string impression (of a single string) on one side. The opposite face is flat and smooth. None of the edges appear broken. Hard light brown clay. L. 1.5 × W. 1.4 × Th. 0.7 Archon 24.5/117, unit 1540-2, elevation 293.71. Area 71, phase c.
20. Raq 91 O-087. Level 4. Two fragments: (a) small fragment, one rounded edge preserved—piece of a sealing? Or "tablet-like" object? (b) small flat piece with numerous scratches from being pressed on something. Possible string impressions on one side. Possibly sealing a sack. (a) Light brown baked clay; (b) lightly baked gray clay. (a) 2.7 × 1.8 × 1.4 cm; (b) 2.9 × 2.2 × 0.7 cm. Archon 29/120, unit 3197. Area 70.
21. Raq 91 O-088. Level 4. 13 very small fragments of sealings. Too small to see rope or string impressions. Dark gray burned clay. L. 2.9–1.1 cm; W. 1.6–0.7 cm; Th. 1.4–0.2 cm. Archon 24/116.5, unit 2374, elevation 293.59. Area 71, phase c.
22. Raq 91 O-089. Level 4. Four fragments with straw impressions. Largest piece broken, but is almost circular and plano-convex in section. Possibly pieces of sealings? Burned dark gray clay with vegetal temper. 3.6 × 3.1 × 1.8 cm (largest piece); 1.8 × 2.1 × 0.7 cm (the three others). Archon 21/118, unit 3552, elevation 293.09. Area 70.
23. Raq 91 O-090. Level 4. Possible jar or wall sealing fragment with two distinctly flat surfaces on opposites sides. One shows a square corner—possibly the corner of a seal impression? Gray to pink burned clay, straw temper. L. 3.3 cm; W. 2.4 cm; Th. 2.0 cm. Archon 23/115.5, unit 2285, elevation 293.52. Area 71, phase c.
24. Raq 91 O-091. Level 3. Small piece of possible clay jar sealing with one rounded edge. Top and bottom are smooth planes. Resembles a coarse potsherd. Baked clay, gray brown color. Vegetal and lime inclusions. L. 2.3 × W. 1.7 × Th. 1.2 cm. Archon 30/96-074. Area 33, phase c. Debris inside room.
25. Raq 91 O-092. Level 4. Possible fragment of jar sealing. One side very flat. Other side has ridge as if clay had been pinched up. Dark gray burned clay. L. 2.6 cm; W. 2.1 cm; Th. 1.2 cm. Archon 29/120, unit 3531. Over area 70.
26. Raq 91 O-094. Level 4. Flat jar sealing fragment, on one side of which are two flattened areas as if manipulated by hand. Burned, gray-black clay. L. 4.8 cm; W. 2.5 cm; Th. 1.2 cm. Archon 24.5/110.5, unit 1332, elevation 293.46. Area 75, phases b–c.
27. Raq 91 O-095. Level 4. Fragment that has one very flat side in which are two deeply incised parallel lines—possibly impressions of strings wound around a wet clay sealing? Perhaps sealing from very large jar. Dark burned clay. L. 2.9 cm; W. 2.3 cm; H. 1.7 cm. Archon 19.5/112, unit 1772, elevation 294.09. Area 76, phase b–c.
28. Raq 89 O-96. Level 4. Irregular peg sealing fragment. One surface quite smooth. Opposite surface has two semi-circular grooves as if the clay had been pressed against two round rods (1.5 cm D.). Dark burned clay, coarse texture, vegetal inclusions. L. 4.5 cm; W. 3.5 cm; H. 3.1 cm. Archon 42/114-089. Area 15, phase c. Debris inside room.
29. Raq 91 O-097. Level 4. Three fragments. (a) Largest has one very flat side and on the opposite side indents from fingers pressing the clay, sealing from a large jar; (b) one very flat side; (c) not described. Dark burned clay. (a) 2.7 × 2.9 × 1.3 cm; (b) 3.0 × 2.0 × 0.7 cm; (c) 1.3 × 1.5 × 0.4 cm. Archon 21/116.5, unit 3610. Area 70.
30. Raq 91 O-122. Level 4. Four fragments that look as if they had been pressed against a flat surface. No joins. Possibly pieces of clay sealings. Unbaked tan clay, straw, and grit tempered. L. 2.5–1.7 cm; W. 2.1–1.3 cm; H. 1.7–0.6 cm. Archon 21/116, unit 3542. Area 70.
31. Raq 91 O-123. Level 4. Jar sealing. One side very flat as if pressed against an object. Three edges seem intentionally rounded. Black unbaked clay. L. 2.5 cm; W. 2.0 cm; H. 1.1 cm. Archon 23.5/116.5, unit 2381. Area 71, phase c.
32. Raq 91 O-124. Level 4. Two jar sealing fragments that seem to have been intentionally flattened and pressed against an object. Unbaked tan, straw-tempered clay. L. 2.8–1.6 cm; W. 2.6–1.5 cm; H. 0.7–0.6 cm. Archon 23/117, unit 2282-1, elevation, 293.52. Area 71, phase c.

33. Raq 91 O-125. Level 4. Roughly prismatic shaped piece with one side very smooth and slightly concave. Possibly a piece from a clay jar sealing. Gray straw and grit-tempered clay. L. 2.5 cm; W. 2.0 cm; Th. 1.4 cm. Archon 20.5/118, unit 3551, elevation 293.09. Area 70.
34. Raq 89 O-126. Level 4. Irregularly shaped piece that seems to have been pressed around something round—possibly a peg. Burned clay. L. 4.3 cm; W. 2.7 cm; H. 1.6 cm. Archon 42/114-102. Area 16, phases b and c. Debris inside room.
35. Raq 88 O-128. Late level 3. Piece with one surface quite flat while the opposite surface is convex, suggesting the clay had been pressed against a flat object. Possibly sealing fragment from large jar. Black, burned clay with vegetal temper. L. 3.9 cm; W. 2.8 cm; H. 1.7 cm. Archon 29/120-063. Area 60. Debris outside architecture.
36. Raq 91 O-130. Level 4. Possible sealing fragment with one very flat side as if pressed against something. Opposite side has a pinched ridge. Black, burned clay. L. 3.1 cm; W. 2.0 cm; H. 1.2 cm. Archon 19/114.5, unit 0940. Area 75, phases b–c.
37. Raq 89 S-108. Figures 5.14, top, and 5.15. Possible mix of level 4 and later. White plaster jar sealing. Outside smooth. Side against the jar has four rope impressions (each ca. 0.7 cm wide) of a two-ply rope, Z-twist. Above and below this are smooth sloping planes. This fits exactly the rim sherd Raq 92 48/108-530 8678:1. Rim diameter ca. 23 cm? Gypsum or lime plaster. L. 6.9 cm; H. 6.3 cm; Th. 1.6 cm. Archon 42/102-070. Area 29 (level 4 designation). Debris above architecture—uncertain level.
38. Raq 90 S-119. Figure 5.14, bottom. Level 4. White plaster jar sealing. Smooth outer surface. Side against jar has five rope impressions, each ca. 0.7–0.9 cm wide. Gypsum or lime plaster. Moh's 1–2. L. 4.9 cm; W. 6.1 cm; Th. 1.6 cm. Archon 48/108-069. Area 107. Debris from presumed unroofed areas within the Round Building.
39. Raq 91 S-155. Above level 3, under topsoil (unclear if there are any level 2 strata here). Jar sealing of white plaster. Outside smooth. Side next to jar shows 5 rope impressions, each 0.5–00.6 cm wide. Curve of lower edge suggests D. ca. 22 cm. Upper edge too short to determine rim D. L. 8.2 cm; H. 5.8 cm; Th. 1.6 cm. Archon 48/108-098. Above area 89 (level 3 designation). Debris above architecture.
40. Raq 89 Z-006. Level 4. Clay lump with one very flat side. Sealing. Slightly burned clay. L. 3.8 cm; W. 3.5 cm; H. 1.7 cm. Archon 42/114-114. Area 17, phase a. Debris in room.

Tablet and Tablet-Like Objects

One numerical tablet and seven possible tablet blanks (or fragments) were found. The numerical tablet Raq 88 O-018 (Figures 5.16 and 5.17) comes from a post-Ninevite 5 (Early Jezirah 3) context in level 2. It is an unbaked oval piece of clay with two flat faces and rounded edges. On one face, a centrally-incised line divides the tablet in half along the long axis. Three lines perpendicularly cross this central one and mark off three compartments at one end. The tablet is quite worn, but the two lines nearest the end seem to have a row of dots, while the next line seems to have a row of vertical lines, and the larger space at the other end has a larger impressed circle on either side or the central line. Perhaps the smaller marks represent smaller units and the impressed circles represent larger units.[28] Numerical tablets have been found in Early Jezirah 3 contexts at Bderi and Tell 'Atij.[29] The Bderi tablet is different in shape, size, and appearance, but here also the tablet is divided by incised horizontal lines with an arrangement of circles and shorter vertical lines.[30] The 'Atij tablet also has incised lines, but it only has a repetition of one kind of mark, as if each mark stood for one item and the whole was a "tally." Similar "tallies" are also found on "tablets" from Ninevite 5 (Early Jezirah 1–2) contexts at Tell Kashkashok III and Tell Brak.[31] The example from Kashkashok has rows of incised dots and is divided into compartments by incised lines. The example from 'Atij might be compared to fragments of clay tablets with impressed holes from period VIA at Arslantepe, which have been interpreted as "counting boards" by Liverani (1983:511–518). These were in a rubbish deposit that also contained discarded sealings, many of which had seal impressions on them, and clay lentoid-shaped objects, one of which had a single sign on it (Liverani 1983: 519–521). The blank lentoid-shaped objects are interpreted as tablet blanks by Liverani. Seven objects from level 4 at Raqa'i are suggested to be such "tablet blanks" (items 2–8 in the catalogue below) on the basis of their similarity to the Arslantepe examples. Four of these were found in areas 70 and 71 along with discarded tokens and sealings, suggesting that they had some record-keeping function. Some appear to have been burned, but presumably this happened after they had been discarded.

CATALOGUE OF TABLETS AND TABLET-LIKE OBJECTS

1. Raq 88 O-018. Figures 5.16 and 5.17. Level 2. Flat oval object. One side has possible numerical notation. Unbaked light brown clay. L. 3.2 cm; W. 1.2 cm; H. 1.0 cm. Archon 30/120-038. Area 8, phase a. In mudbrick collapse between buttresses 7C and 8C.
2. Raq 88 O-026. Figure 5.18. Level 4. Oval clay disk. One surface slightly convex. Lightly baked (?) brown clay. L. 4.1 cm; W. 1.4 cm; H. 3.6 cm. Archon 42/114-077. Area 9, phase b. Debris inside room.
3. Raq 89 O-041. Level 4. One half of a disk that thickens towards the middle. Unbaked clay. D. 5.9 cm; H. 1.1 cm. Archon 42/108-061. Area 19. Debris inside silo.
4. Raq 90 O-050. Level 4. Fragment of a clay disk. Lightly burned clay. L. 3.1 cm; W. 2.5 cm; H. 1.0 cm. Archon 42/114-198. Area 7. Debris inside silo.
5. Raq 91 O-079b. Level 4. Piece of clay that has been folded over onto itself. Fragment of a lenticular disk, like O-085? Pink-light brown clay which is very hard. Appears cracked and deformed as if had been heated to a very high temperature. L. 3.3 cm; W. 1.4 cm; Th. 1.6 cm. Archon 20.5/118.5, unit 3560, elevation 293.40. Area 70.
6. Raq 91 O-085. Level 4. Lentoid-shaped object. One side flatter than the other. Chip out of one edge. Light brown clay, no visible temper. Very hard. D. 3.9–3.8 × Th. 1.3 cm. Archon 21.5/118, unit 3499-1, elevation 293.73. Area 70.
7. Raq 91 O-086. Level 4. "Pillow-shaped" object. One side convex. Other side, blackened, is almost flat. One corner chipped. Light brown clay, vegetal temper. Hard. One side blackened, so perhaps burned in a fire. L. 4.1 × W. 3.9 × Th. 2.3 cm. Archon 20.5/117, unit 3495, elevation 292.20. Area 70.
8. Raq 91 O-119. Level 4. One half of a lentil shaped disk. Brown clay. Very hard. Baked? L. 3.8 × W. 2.0 × H. 1.0 cm. Archon 23.5/116.5, unit 1474-1, elevation 293.88. Area 71, phase c.

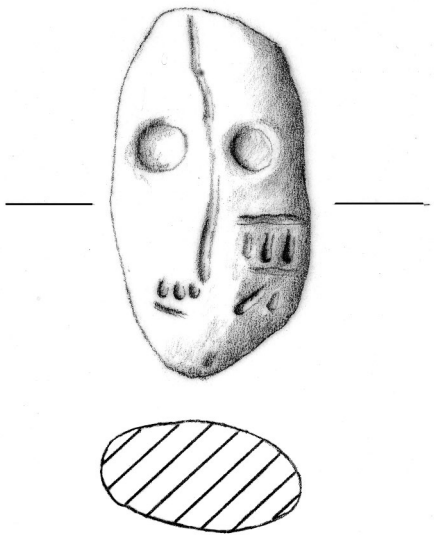


FIGURE 5.16. Raq 88 O-018.
Illustration prepared by Khaled al-Hamad.

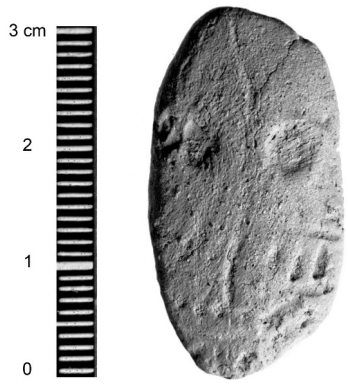


FIGURE 5.17. Raq 88 O-018.
Photograph by Anwar 'Abd al-Ghafour.

FIGURE 5.18. Raq 88 O-026.
Photograph by Sally Dunham.

Tokens

In and around a building in the north area of level 4 were found 17 small baked clay objects of geometric shape.[32] The shapes were lenticular disks, a hemisphere, cones, a truncated cone, a sphere, a tetrahedron, and flat semi-circles. These objects are considered to be tokens, that is, small stone or baked clay objects in geometric shapes that are part of a symbolic system for reckoning and recording. Two additional lenticular disks and two ovoids were found in levels 2 and 3. These are also considered to be tokens, although they may be in secondary context, given their isolated find spots. Four additional small objects from levels 2 and 3, one clay and three stone, are included here because of their size and shape, but whether they were used as tokens is not certain. Finally, two broken pierced clay objects from level 4 (O-078 and O-131)[33] included here are interpreted as tags, although no marks were preserved on them. One (O-131) was found in the same area as some of the tokens (area 71), so perhaps it had some relevance to the use of tokens (a tag for a container with tokens inside?).

The idea that small clay objects of simple geometric shapes had been used for reckoning and recording before the invention of writing is based on the discovery in late fourth millennium contexts at sites in Mesopotamia, Syria and Iran of hollow clay balls containing groups of such "tokens." The outsides of these balls were sometimes marked with seal impressions and impressed marks corresponding to the tokens inside.[34] Hence, the clay balls seem to have been intended to preserve the "record" expressed by the tokens inside.[35] Englund (1998:48) evaluates these clay balls with tokens inside as the first contextually meaningful accounting tools of the Uruk period, and he notes that tokens found within or at least in context with these clay balls are now accepted as "forerunners of the highly developed and conventionalized numerical signs of the earliest Near Eastern tablets."

Fifteen of the "tokens" found in level 4 are types that have been found at other sites in broken examples of the hollow clay balls or in close context with them. These include 11 lenticular disks, 2 cones, a sphere, and a tetrahedron (Figures 5.19–5.22). This is the basis on which the Raqa'i objects are considered tokens and "descendants" of the Uruk Period system of tokens. However, the records expressed by the tokens contained in the hollow clay balls are not "deciphered." Englund stresses that the biggest obstacle to decipherment is

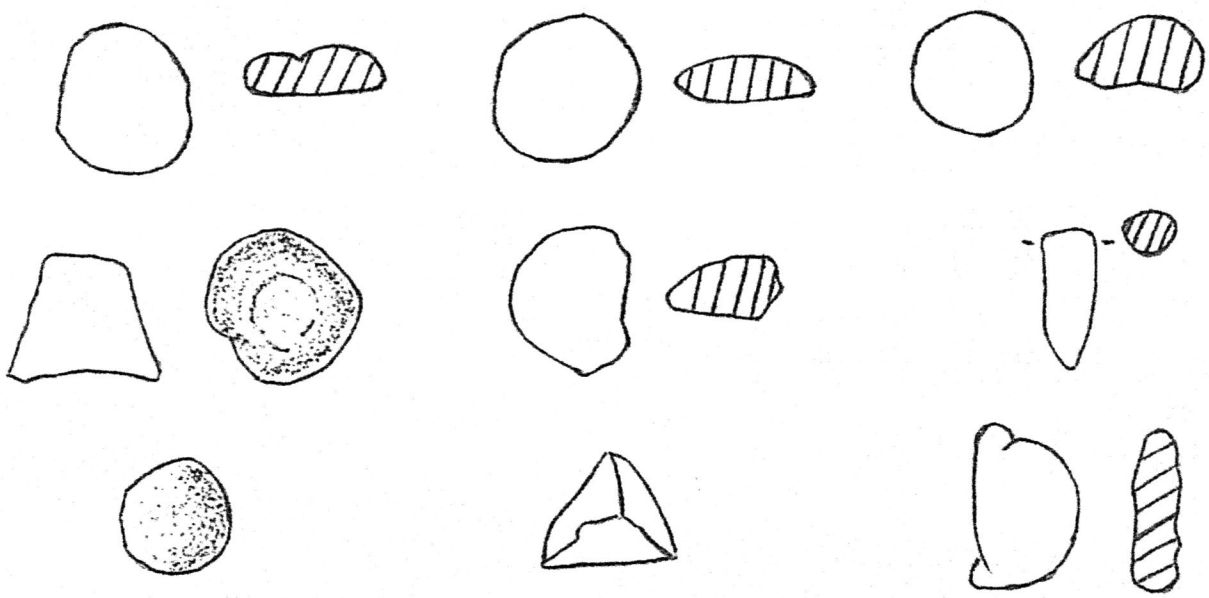


Figure 5.19. Examples of Raqa'i token shapes: top row, left to right (scale 1:1): O-098, O-099 (lenticular disks); O-103 (hemisphere with concave bottom); middle row, left to right: O-104 (truncated cone); 105a (broken lenticular disk); 105b (thin cone); bottom row, left to right: O-108 (sphere); O-110 (tetrahedron); O-112 (flat semi-circle with pinched corners on straight side). *Illustration prepared by Sally Dunham.*

that the majority of the clay balls (80 out of 130) are complete and unable to be opened due the danger of damaging the seal impressions on the outside.[36] As for the Raqa'i tokens, they were found loose and scattered on the ground and therefore have no syntactical relation to one another. All that can be said is that they seem to represent the survival of an older tradition. Such a survival, however, is perhaps not surprising. In his discussion of the "Uruk colonies" in Syria, Nissen (2001:164) notes that wherever the chronological information is sufficiently sensitive, it shows the occupation of these colonies ended just before the advent of writing in southern Mesopotamia. He bases this idea on his observation that while all earlier means of information technology (seals, tokens, spherical bulla, and numerical tablets) were used at these settlements, no writing was found. Quenet (2005) also notes that only numerical tablets come from secure Late Uruk contexts in Northern Mesopotamia, and that after the Uruk period writing only appeared around 2600 BCE on seals of the Fara Style at Mari. Since level 4 of Tell al-Raqa'i dates to the Early Jezirah 1/early Early Jezirah 2, ca. 2700 BCE, according to the ARCANE Jezirah chronology (Quenet 2011), it belongs right at the initial period of writing. Hence, the use of tokens at Raqa'i may represent the continuance of an older practice.[37]

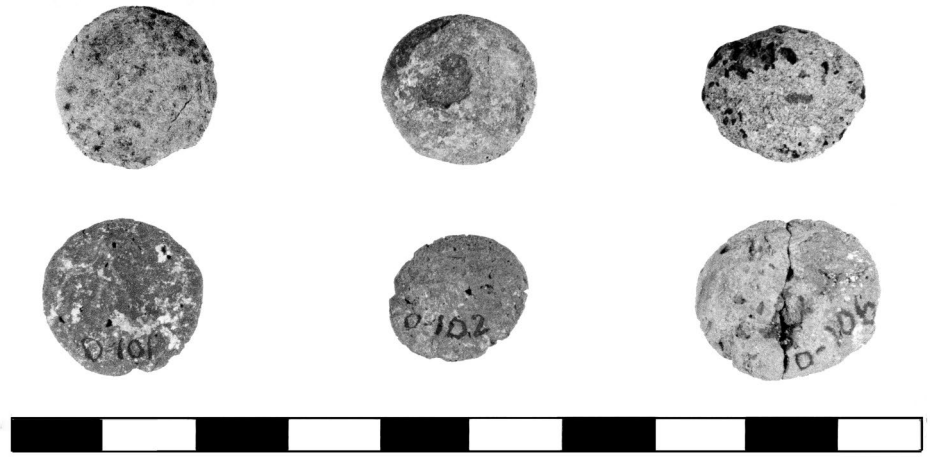


FIGURE 5.20. Raq 91 top row, left to right: O-098, O-099, O-100; bottom row, left to right: O-101, O-102, O-106. *Photograph by Sally Dunham.*

FIGURE 5.21. Raq 91 top row, left to right: O-107, O-109, O-103; bottom row, left to right: O-113, O-115, O-114. *Photograph by Sally Dunham.*

FIGURE 5.22. Raq 91 top row, left to right: O-107, O-109, O-117b, O-113; bottom row, left to right: O-103, O-117a (discussed as wheel fragment), O-118 (discussed as whorl fragment), O-115, O-114. *Photograph by Sally Dunham.*

CATALOGUE OF TOKENS

1. Raq 89 O-045. Figure 5.23. Level 2. Vessel-shaped token? Small object with one narrow end and one wide end. The wide end is concave. With the wide end on top it looks like a tiny cup. With the narrow end up it looks like a miniature gaming piece. Baked clay. H. 1.3 cm; D. 1.0–0.9 cm. Archon 29/132-015. Area 13. Comparanda: Schmandt-Besserat 1992, volume I:228, 13.42 (vessel-shaped token).
2. Raq 90 O-049. Topsoil. Potsherd chipped into a circular form. Token? D. 1.0 cm; Th. 0.3 cm. Archon 29/132-001. Comparanda: Schmandt-Besserat 1992, volume I:211, type 3:84.
3. Raq 90 O-078. Figure 5.24. Level 4. Fragment of a rough rectangular prism with a rounded rectangular end. Has 1 mm hole parallel to preserved end, but near broken end. Tag? Hard clay. L. 2.2 cm; W. 1.8 cm; H. 1.2 cm. Archon 52/100-005. Area 109. Debris outside architecture.
4. Raq 91 O-098. Figures 5.19 and 5.20. Level 4. Lenticular disk. Dark gray baked clay. D. 1.7 × 1.5 cm; H. 0.7 cm. Archon 23.5/117, unit 2767, elevation 293.30. Area 71, phase c. Comparanda: Schmandt-Besserat 1992, volume I:208, type 3.3. This type has been found in broken hollow clay balls at Susa and Warka (Schmandt-Besserat 1992, volume I:118, table 2).
5. Raq 91 O-099. Figures 5.19 and 5.20. Level 4. Lenticular disk. Dark gray baked clay. D. 1.7 × 1.6 cm × H. 0.6 cm. Archon 22/112.5, unit 3525, elevation 293.24. Area 75, phases b–c.
6. Raq 91 O-100. Figure 5.20. Level 4. Lenticular disk. Tan baked clay with lime inclusions. D. 1.7 × 1.8 cm; H. 0.5 cm. Archon 18/112, unit 2526, elevation 293.25. Area 76, phases b–c.
7. Raq 91 O-101. Figure 5.20. Level 4. Lenticular disk. Dark gray baked clay. D. 1.7 cm; H. 0.5 cm. Archon 23.5/115.5, unit 2383, elevation 293.59. Area 71, phase c.
8. Raq 91 O-102. Figure 5.20. Level 3. Lenticular disk. Dark gray baked clay. D. 1.6 × 1.4 cm; H. 0.5 cm. Archon 26/116, unit 1424-1, elevation 294.24. Area 12.
9. Raq 91 O-103. Figures 5.19 and 5.21. Level 4. Hemisphere with concave bottom. Dark gray baked clay. D. 1.4 cm; H. 0.7 cm. Archon unit 1620. Area 75, phase b–c. Comparanda: Schmandt-Besserat 1992, volume I:207, type 2.24, but the drawing here shows a flat base. See also Schmandt-Besserat 1992, volume II:xxii, where photographs of examples from Susa and Warka exhibit less regular shapes.
10. Raq 91 O-104. Level 4. Truncated cone. Gray baked clay with small white grits. D. 1.7–1.0 cm; H. 1.5 cm. Archon 24.5/111.5, unit 1330. Area 75,

phases b–c, elevation 293.46. Schmandt-Besserat 1992, volume I:203, type 1:12.

11. Raq 91 O-105. Level 4. Two tokens: (a) lenticular disk; (b) thin cone. Lightly baked tan clay. (a) D. 1.6 cm; H. 0.7 cm; (b) D. 0.5–0.3 cm; L. 1.5 cm. Archon 22/118, unit 3554, elevation 293.56. Area 70. Comparanda: (a) See above no. 4. (b) Schmandt-Besserat 1992, volume I:203, type 1:1. Cones are found in broken hollow clay balls at Choga Mish, Susa, and Warka (Schmandt-Besserat 1992, volume I:118, table 2).
12. Raq 91 O-106. Figure 5.20. Level 4. Lenticular disk. Gray-brown baked clay with straw temper. D. 2.0 × 1.7 cm; H. 0.8 cm. Archon 20.5/113.5, unit 1059, elevation 293.23. Area 75, phases b–c.
13. Raq 91 O-107. Figures 5.21 and 5.22. Level 4. Broken lenticular disk. Gray baked clay. D. 1.5 × 1.1 cm; H. 0.7 cm. Archon 22/118.5, unit 3567, elevation 293.32. Area 70.
14. Raq 91 O-108. Level 4. Sphere. Dark gray baked clay. D. 1.2 cm. Archon 21/116.5, unit 3543, elevation 293.52. Area 70. Comparanda: Schmandt-Besserat 1992, volume I:206, type 2.1. Spheres have been found in broken hollow clay balls (Schmandt-Besserat 1992, volume I:118, table 2).
15. Raq 91 O-109. Figures 5.21 and 5.22. Level 4. Broken lenticular disk. Tan baked clay. L. 2.1 cm; W. 1.3 cm; H. 0.7 cm. Archon 20.5/117, unit 3472, elevation 293.15. Area 70.
16. Raq 91 O-110. Level 4. Tetrahedron. Dark gray baked clay. L. 1.3 cm; W. 1.3 cm; H. 0.9 cm. Archon 23.5/116.6, unit 2397, elevation 293.52. Area 71, phase c. Comparanda: Schmandt-Besserat 1992, volume I:214, type 5:1. Tetrahedrons have been found in broken hollow clay balls at Farukhabad, Susa, and Warka (Schmandt-Besserat 1992, volume I:118, table 2).
17. Raq 91 O-112. Level 4. Flat, semicircular shaped. The ends on the straight side are pinched. Dark gray baked clay. L. 1.8 cm; W. 1.1 cm; Th. 0.5 cm. Archon 22/118, unit 3566, elevation 293.33. Area 70.
18. Raq 91 O-113. Figures 5.21 and 5.22. Level 4. Broken lenticular disk. The unbroken curved edge looks pinched. Brown baked clay. L. 2.0 cm; W. 1.4 cm; Th. 0.9 cm. Archon 24/115, unit 3484, elevation 293.48. Area 71, phase c.
19. Raq 91 O-114. Figure 5.21. Level 4. Broken lenticular disk. Flat, semi-circular shape. Straight edge looks broken. Dark gray baked clay. L. 1.7 cm; W. 1.1 cm; H. 0.6 cm. Archon 24.5/111, unit 1311, elevation 293.66. Area 75, phase c.
20. Raq 91 O-115. Figures 5.21 and 5.22. Level 3. Broken lenticular disk. Three fragments. One semicircular and two smaller. No joins. Brown baked clay. L. 1.9 cm; W. 1.0 cm; Th. 0.7 cm. Archon 26/117, unit 1455, elevation 294.20. Area 12.
21. Raq 91 O-116. Level 3. Two tokens. (a) Rough, flat semicircle. Tan baked clay. L. 2.1 cm; W. 1.1 cm; Th. 0.5 cm; (b) small ovoid shape. Tan baked clay. L. 1.2 cm; W. 0.9 cm; H. 0.4 cm. Archon 26.5/117, unit 1521, elevation 293.97. Area 60. Comparanda: (a) Seems similar to a flat "crescent" shape in a group of tokens from broken hollow clay balls found at Warka, cf. Damerow and Meinzer 1995: plate 4:2, center. (b) cf. Damerow and Meinzer 1995: plate 4:2, center. Next to the flat crescent are some small oblong shapes that seem similar to (b).
22. Raq 91 O-117b. Figure 5.22. Level 4. Fragment of a lenticular disk. Dark gray clay. L. 1.9 cm; W. 1.2 cm; H. 0.5 cm. Archon 24/117, unit 2392, elevation 293.52. Area 71, phase c.
23. Raq 91 O-121. Figure 5.25. Level 4. Flat cylinder with one end bent over. Other end broken. Token? Dark black burned clay. L. 3.3 cm; W. 1.1 cm; H. 1.6 cm. Archon 19.5/116, unit 3422, elevation 292.78. Area 70. Comparanda: While cylinders have been found in broken hollow clay balls, there are none reported with one end bent over. Since the other end of O-121 is broken, its original length is unknown. Possibly this is not a token, but a piece of clay from which tokens were made (?). The clay is burned, but this could have happened after the object was discarded.
24. Raq 91 O-131. Figure 5.26. Level 4. Rough tetrahedron. One side broken, along which is half of a hole ca. 0.3 cm D. A second hole is perpendicular to this, has the same diameter, and ends at hole near the point opposite the broken side. Tag? Lightly baked tan clay. L. 1.3 cm; W. 1.6 cm; H. 1.3 cm. Archon 29/120, unit 2862. Area 71, phase c.
25. Raq 91 O-132. Level 2. Ovoid. Black burned clay. L. 1.1 cm; D. 0.7 cm. Archon 19.5/113.5, unit 0077, elevation 294.93. Area 18. Comparanda: See above under O-116b.
26. Raq 88 S-072. Level 3. Complete sphere. Token? Cf. Schmandt-Besserat 1992, volume I:206, type 2.1. Stone. D. 0.5 cm. Archon 30/96-037. Area 67. Debris outside architecture.

FIGURE 5.23. Raq 89 O-045, possible token (scale 1:1). *llustration prepared by Sally Dunham.*

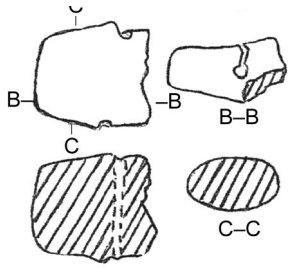


FIGURE 5.24. Raq 90 O-078, possible tag (3:4). *Illustration prepared by Sally Dunham.*

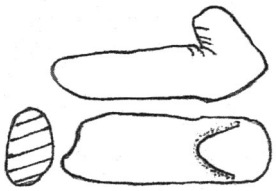


FIGURE 5.25. Raq 91 O-121, possible token (4:5). *Illustration prepared by Sally Dunham.*

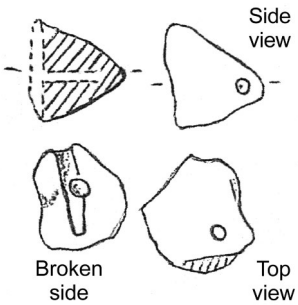


FIGURE 5.26. Raq 91 O-131, possible tag (3:4). *Illustration prepared by Sally Dunham.*

27. Raq 91 S-151. Level 3. Cylinder with rounded ends. Groove 0.1 cm wide around the middle. Token? Cf. Schmandt-Besserat 1992, volume II: xxv, 4:20A. Tan stone which appears unworked except for the groove. Moh's hardness 4. D. 0.6 cm; L. 1.5 cm. Archon 29/114, unit 0367-1. Area 61.
28. Raq 91 S-153. Level 3. Flat disk. Token? Soft white stone. Moh's hardness 2. D. 1.0 cm; H. 0.4 cm. Archon 29/114, unit 1395, elevation 293.82. Area 16, phase a. Comparanda: Oates 1993:152, figures 2 and 3: a small calcite disk from an Akkadian context at Tell Brak. This disk, however, has a depression in the middle and four incised lines around its edge.

Distribution of Third-Millennium Administrative Artifacts

Four types of artifacts provide evidence of the administrative practices used at Tell al-Raqa'i: seal impressions (5), unimpressed sealings (140), tablet-like objects (8), and tokens (29). As Tables 5.1 and 5.2 and the distribution plans for levels 4 and 3 (Figures 5.150–5.157) show, most of these artifacts were found in level 4. In this level, most of the sealings and all of the seal impressions were found in the Round Building, while "tokens" were only found in and around the domestic architecture in the north (a "possible" token was also located in area 109 south of the Round Building). In both areas, "tablet"-like objects were found. Perhaps this suggests that both areas were using all parts of the administrative tool kit, even though not all its parts were preserved in either area. Whether the occurrence of "tokens" in these levels represents the continued use of an older tradition or displaced objects in secondary context is uncertain.[38]

Within the level 4 Round Building, one can note that most of the sealings were found in the southwest. This is not surprising, since the only entrance to the building is through room 6 in the southwest. A great concentration of sealings plus two seal impressions (Raq 89 Z-005 and Z-007) were found in room 14. Due to the heterogeneous nature of the material from this room,[39] these sealings and impressions were probably part of a rubbish dump rather than saved records.[40] Nevertheless, they could be evidence for administrative activity within the Round Building.[41]

The more general picture given by the distribution maps (Figures 5.150–5.157) emphasizes the fact that in both level 3 and level 4 there was a concentration of metal and administrative artifacts in the northwest part of the settlement, while in level 4 metal was more evenly distributed.[42] This might be interpreted as reflective of the higher status of the residents in the northwest, since metal was probably a rarer and more expensive material, while the presence of administrative artifacts could suggest the inhabitants of this zone were in charge of the administration of the community.

TABLE 5.1. Sealings and Seal Impressions.

Object #	Archon	Level	Area of site	Area/room	Number of fragments	Type
Raq 88 Z-002	36/102-018	2 or 3	Southeast	Over 38	1	Peg sealing
Raq 88 Z-003	36/102-021	2 or 3	Southeast	Over 38	1	Peg sealing
Raq 88 Z-004	42/114-069	4	Round Bldg	13, phase d	1	Jar sealing
Raq 88 Z-005	42/114-081	4	Round Bldg	14	1	Jar sealing
Raq 89 Z-007	42/114-167	4	Round Bldg	14	1	Jar sealing
Raq 88 O-017	36/102-026	2 or 3	Southeast	Over 38 level 3	1	Jar sealing
Raq 88 O-021	29/120-051	Late level 3	Northwest	12, floor	1	Plaster jar sealing
Raq 88 O-027	42/114-081	4	Round Bldg	14, debris	13	Jar sealing
Raq 88 O-028	42/102-039	3 or 4	Round Bldg	87, level 3	1	Peg sealing
Raq 89 O-036	49/108-034	4 or above	Round Bldg	Above 12	1	Peg sealing
Raq 89 O-037	49/108-034	4 or above	Round Bldg	Above 12	1	Peg sealing
Raq 89 O-038	42/114-167	4	Round Bldg	14, debris	43	Jar sealings
Raq 90 O-047	42/102-082	4	Round Bldg	21	2	Jar sealing
Raq 90 O-048	42/102-082	4	Round Bldg	21	1	Jar sealing
Raq 90 O-051	42/114-207	4	Round Bldg	9, phase a	1	Jar sealing
Raq 90 O-053	42/114-208	4	Round Bldg	9, phase a	18	Jar sealing
Raq 90 O-059	42/114-209	4	Round Bldg	7, debris	1	Peg sealing
Raq 90 O-060	42/114-209	4	Round Bldg	7, debris	2	1 jar, 1 peg sealing
Raq 91 O-079a	29/120u3560	4	North	70	1	Jar sealing
Raq 91 O-081	29/120u3472	4	North	70	1	Jar sealing
Raq 91 O-082	29/120u2780-2	3	Northwest	14	1	Jar/sack sealing
Raq 91 O-083	18.5/118u3625	3	Northwest	93	1	Jar sealing
Raq 91 O-084	24.5/17u1540-2	4	Northwest	71, phase c	1	Jar sealing
Raq 91 O-087	29/120u3197	4	Northwest	70	2	Sack sealing
Raq 91 O-088	24/116.5u2374	4	Northwest	71, phase c	13	? (very small)
Raq 91 O-089	21/118u3552	4	Northwest	70	4	Sealings
Raq 91 O-090	23/115.5u2285	4	Northwest	71, phase c	1	Jar/wall sealing
Raq 91 O-091	30/96-074	3	North	33, phase c	1	Jar sealing
Raq 91 O-092	29/120u3531	4	North	over 70	1	Jar sealing
Raq 91 O-094	24.5/110.5u1332	4	North	75, phase b–c	1	Jar sealing
Raq 91 O-095	19.5/122u1772	4	North	76, phase b–c	1	Jar sealing
Raq 91 O-096	42/114-089	4	Round Bldg	15, phase c	1	Peg sealing
Raq 91 O-097	21/116.5u3610	4	North	70	3	Jar sealing
Raq 91 O-122	21/116u3542	4	North	70	4	Jar sealings
Raq 91 O-123	23.5/116.5u2381	4	North	71, phase c	1	Jar sealing frag
Raq 91 O-124	23/117u2282-1	4	North	71, phase c	2	Jar sealing frgs
Raq 91 O-125	20.5/118u3551	4	North	70	1	Jar sealing
Raq 89 O-126	42/114-102	4	Round Bldg	16, phase b–c	1	Peg sealing
Raq 88 O-128	29/120-063	Late level 3	North	60	1	Jar sealing
Raq 91 O-130	19/114.5u0940	4	North	75, phase b–c	1	Sealing
Raq 89 S-108	42/102-070	Uncertain	Round Bldg	Above 29 (level 4)	1	Plaster jar sealing
Raq 90 S-119	48/108-069	4	Round Bldg	107	1	Plaster jar sealing
Raq 91 S-155	48/108-098	Above 3	Central South	Above 89	1	Plaster jar sealing
Raq 89 Z-006	42/114-114	4	Round Bldg	17, phase a	1	Sealing

Table 5.2. "Tablets," Tokens, and "Tags."

Object #	Archon	Level	Area of site	Area/room	Type
Raq 88 O-018	30/120-038	2	West	8, phase a	Tablet
Raq 88 O-026	42/114-077	4	Round Bldg	9, phase b	"Tablet"
Raq 89 O-041	42/108-061	4	Round Bldg	19	"Tablet"
Raq 90 O-050	42/114-098	4	Round Bldg	7	"Tablet"
Raq 91 O-079b	20.5/118.5u3560	4	North	70	"Tablet"
Raq 91 O-085	21.5/118u3499-1	4	North	70	"Tablet"
Raq 91 O-086	20.5/117u3495	4	North	70	"Tablet"
Raq 91 O-119	23.5/116.5u1474-1	4	North	71, phase c	"Tablet"
Raq 89 O-045	29/132-015	2	Northwest	13	Vessel-shaped token?
Raq 90 O-049	29/132-001	Topsoil	Northwest	—	Circular sherd disk, token?
Raq 90 O-078	52/100-005	4	South of Round Bldg	109	"Tag?"
Raq 91 O-098	23.5/117u2767	4	North	71, phase c	Lenticular disk token
Raq 91 O-099	22/112.5u3525	4	North	75, phase b–c	Lenticular disk token
Raq 91 O-100	18/112u2526	4	North	76, phase b–c	Lenticular disk token
Raq 91 O-101	23.5/115.5u2383	4	North	71, phase c	Lenticular disk token
Raq 91 O-102	26/116u1424-1	3	North	12	Lenticular disk token
Raq 91 O-103	Unit 1620	4	North	75, phase b–c	Hemispherical token
Raq 91 O-104	24.5/111.5u1330	4	North	75, phase b–c	Truncated cone
Raq 91 O-105	22/118u3554	4	North	70	(a) Lenticular disk; (b) Cone
Raq 91 O-106	20.5/113.5u1059	4	North	75, phase b–c	Lenticular disk token
Raq 91 O-107	22/118.5u3567	4	North	70	Broken lenticular disk
Raq 91 O-108	21/116.5u3543	4	North	70	Sphere
Raq 91 O-109	20.5/117u3472	4	North	70	Broken lenticular disk
Raq 91 O-110	23.5/116.6u2397	4	North	71, phase c	Tetrahedron
Raq 91 O-112	22/118u3566	4	North	70	Semi-circular disk
Raq 91 O-113	24/115u3484	4	North	71, phase c	Broken lenticular disk
Raq 91 O-114	24.5/111u1311	4	North	75, phase c	Broken lenticular disk
Raq 91 O-115	26/117u1455	3	Northwest	12	Broken lenticular disk
Raq 91 O-116	26.5/117u1521	3	Northwest	12	(a) Semi-circle; (b) Ovoid
Raq 91 O-117b	24/117u2392	4	North	71, phase c	Broken lenticular disk
Raq 91 O-121	19.5/116u3422	4	North	70	Cylinder with bent end
Raq 91 O-131	29/120u2862	4	North	71, phase c	Pierced tetrahedron, tag?
Raq 91 O-132	19.5/113.5u0077	2	North	18	Ovoid
Raq 88 S-072	30/96-037	3	Northeast	67	Small stone sphere, token?
Raq 91 S-151	29/114u0367-1	3	Temple	61	Stone cylinder w/ round ends, token?
Raq 91 S-153	29/114u1395	3	Temple	16, phase a	White stone disk, token?

Clay Objects

Human and Animal Figurines and Model Wheeled Vehicles

Human Figurines

Only 10 clay human figurines were recovered (see Table 5.3).[43] Three very simple examples appear to be complete, but the others are only partially preserved. None were found in primary context. With respect to level assignment, four came from level 3, four from level 4, one from a context that could be level 3 or 4, one from the site surface.

Baked and unbaked clay human figurines represent a long tradition in the Ancient Near East from the Neolithic period onward.[44] Many of them, however, like the Raqa'i figurines, are found in contexts that do

TABLE 5.3. Human and Animal Clay Figurines and Model Vehicles.

Object #	Archon	Level	Area of site	Area/room	Type
Raq 88 H-001	Topsoil	—	Surface find	—	Female? Head
Raq 88 H-002	42/108-027	3	Round Bldg	47, phase b	Male? Head
Raq 88 H-003	36/96-007	3	Northeast	71, phase b	Column torso
Raq 89 H-004	30/120-035	3 or 4	Northwest	4, phase c	Nude female torso
Raq 90 H-005	30/108-052	3	Temple area	22, phase a–b	Conical torso, head
Raq 90 H-006	30/108-058	3	Temple area	62, phase c	Cylinder with wider ends
Raq 90 H-007	48/108-078	4	Round Bldg	12, phase a	Head with wide hat
Raq 90 H-008	30/108-090	4	Central North	82	Head with pinched nose
Raq 91 H-009	27/110.5u1925	4	North	74, phase b–c	Pillar torso, wide base
Raq 87 A-003	48/90-007	2	Southeast	26; burial 35	Short, thick torso
Raq 87 A-004	42/114-036	3 or above	Central south	89 (level 3 area number)	Front end of sheep
Raq 87 A-005	42/116-071	4	South of Round Bldg	34	Bull head and neck
Raq 87 A-006	30/126-030	3	Northwest	7, phase d, Pit	Bovid—left front leg; broken tail
Raq 87 A-007	42/96-015	3	Southeast	37, phase b	Sheep/bovid? No head
Raq 88 A-008	29/120-046	3	Northwest	59	"Weasel"?
Raq 88 A-009	29/120-047	3	Northwest	59	Bovid head and neck
Raq 88 A-010	42/102-043	3 or 4	Above Round Bldg	Above level 4, area 29	Neck, torso, and 3 legs, bovid or caprid
Raq 88 A-011	30/120-045	3 or 4	Northwest silos	Area 6 (level 3 area number)	Sheep—front end with front right leg
Raq 88 A-012	42/114-093	4	Round Bldg	16, phase b–c	Goat—torso, back of head, one horn (twisted)
Raq 88 A-013	42/114-093	4	Round Bldg	16, phase b–c	Sheep: torso, front part of nose and top of legs.
Raq 89 A-014	30/120-035	3 or 4	Northwest silos	Area 4 (level 3 area number)	Sheep/bovid; back legs; part of tail
Raq 89 A-015	42/114-097	4?	Round Bldg	Above 17, phase b	Torso and legs; hole in underside
Raq 89 A-016	36/120-056	3	West/outside architecture	Area 49	Bull head, horns broken
Raq 89 A-017	36/108-035	Post-level 1			Torso, neck, leg stumps, species uncertain
Raq 89 A-018	42/114-115	4	Round Bldg	16, phase b	Head, species uncertain
Raq 89 A-019	42/114-114	4	Round Bldg	17, phase a	Sheep, head chipped
Raq 89 A-020	30/96-080	3	Northeast	Area 33, phase c	Male torso and neck, species uncertain
Raq 89 A-021	42/114-114	4	Round Bldg	Area 17, phase a	Hind end, species uncertain
Raq 89 A-023	42/114-167	4	Round Bldg	Area 14	Neck, chest, top of front legs, species uncertain
Raq 89 A-024	42/108-049	3 or 4	Round Bldg	Area 88 (level 3 area number)	Head and ears—dog?
Raq 89 A-025	42/114-167	4	Round Bldg	Area 14	Head of bull
Raq 89 A-026	29/132-015	2	Northwest	Area 13	Bovid? Head
Raq 90 A-027	48/108-055	4	Round Bldg	Area 24, phase a	Torso—species uncertain
Raq 90 A-028	42/108-103	4	Round Bldg	Area 18, phase a	Neck, stumps of ears—species uncertain
Raq 90 A-029	42/114-198	4	Round Bldg	Area 7	Torso—goat?
Raq 90 A-030	42/114-198	4	Round Bldg	Area 7	Equid torso
Raq 90 A-031	42/114-208	4	Round Bldg	Area 9, phase a	Muzzle and one ear; species uncertain

Table 5.3, *continued*.

Object #	Archon	Level	Area of site	Area/room	Type
Raq 90 A-032	42/102-094	4	Round Bldg	Area 1	Fragment—species uncertain
Raq 90 A-033	42/102-094	4	Round Bldg	Area 1	Torso—equid?
Raq 90 A-034	42/102-094	4	Round Bldg	Area 1	Back of head, species uncertain
Raq 90 A-035	48/108-078	4	Round Bldg	Area 12, phase a	Torso—species uncertain
Raq 90 A-036	42/102-094	4	Round Bldg	Area 1	Fragment—species uncertain
Raq 90 A-037	42/102-094	4	Round Bldg	Area 1	Torso and legs—species uncertain
Raq 90 A-038	42/102-094	4	Round Bldg	Area 1	Fragment, species uncertain
Raq 90 A-039	30/108-049	4	Central north	Area 82	Sheep head
Raq 90 A-040	30/108-080	4	Central north	Area 83, phase a	Torso, left legs, penis, tail—pig?
Raq 90 A-041	36/120-235	5	Central west	Area 19, phase d	Torso with one leg—species uncertain
Raq 90 A-042	42/102-125	4	Round Bldg	Area 29	Fragment—species uncertain
Raq 90 A-043	42/102-134	4	East	Area 104	Hind end—species uncertain
Raq 90 A-044	42/114-255	4	South	Area 30	Hind end, torso, part of neck—sheep?
Raq 90 A-045	48/108-131	4	Round Bldg	Area 3	Hind end—sheep?
Raq 90 A-046	29/126-185	3 or 4	Northwest	Under level 3, area 56	Hind end, with penis—sheep/bovid?
Raq 90 A-047	52/100-005	4	South	Area 109	Fragment—species uncertain
Raq 91 A-048	29/120u3531	4	North	Over area 70 of level 4	Fragment—species uncertain
Raq 91 A-049	22.5/113u3183	4	North	Area 75, phase b–c	Torso, head, tops of legs—sheep or bovid
Raq 91 A-050	20.5/115u1064	4	North	Area 75, phase b–c	Fragment—species uncertain
Raq 91 A-051	21/113.5u2808	4	North	Area 75, phase b–c	Fragment—species uncertain
Raq 91 A-052	29/114u0473-1	3	Temple area	Area 61	Fragment—species uncertain
Raq 91 A-053	21.5/114.5u0950	4	North	Area 75, phase b–c	Fragment—species uncertain
Raq 91 A-054	19/111u0453	4	North	Area 75, phase b–c	Conical shape, animal horn?
Raq 91 A-055	20.5/113u2811	4	North	Area 75, phase b–c	Back of head and left ear—bovid?
Raq 92 A-200	48/108-511	4	Round Bldg	Area 11, phase a	Head, neck, and shoulders—bull
Raq 92 A-201	42/114N-018	4	Central north	Area 89, phase b	Hind end—species uncertain
Raq 92 A-202	29/120-554	4	Northwest	Area 99	Miniature horn—bovid?
Raq 92 A-203	48/108-531	4	South of Round Bldg	Area 108	Fragment with lump—sheep muzzle?
Raq 88 C-001	36/102-021	2 or 3	Southeast	Above level 3, area 38	Body of square, two wheeled vehicle; incised decoration on front
Raq 89 C-002	29/126-040	2 or 3	Northwest	Above level 3 area 58	Possibly fragment of wheeled vehicle
Raq 88 C-003	30/102-018	2	Central north	Area 21	Flat fragment with top of axle hole

not help to suggest their function. Important exceptions to this situation occur at Selenkahiye and Umm el-Marra where clay figurines have been found buried under the floors or door sills of third-millennium houses, a situation giving clear evidence for their ritual value.[45]

Given the small sample size, the fragmentary nature and the lack of primary context of the Raqa'i figurines, one cannot really be sure whether they were representations of deities meant to be worshipped, figurines used in magic rituals or having apotropaic powers, votive gifts, or children's toys. Both Voigt and

Dales, however, have noted that to a certain extent the symbolism of figurines can be validly analyzed apart from their specific function (Dales 1960:260–261; Voigt 1983:189). That is, to a certain extent the stylistic details of their dress and attributes are more dependent on the society that made them than on their function. Thus, comparisons of the Raqa'i figurines with those elsewhere may suggest cultural affinities, even if the precise function of the figurines is uncertain.

Good comparisons for the Raqa'i figurines can be found among the published figurines at other sites in the Khabur region and the Jezirah. For instance, the figurine head Raq 88 H-001 (Figures 5.27 and 5.28) seems to be closest to a type well-represented at Tell Chuera and present at Selenkahiye and Tell Hazna. These figurines have broad, round faces with eyes that are circular holes sunk in the clay. The back of the head is flat, and sometimes an applied band crosses the forehead above the nose.[46] The Tell Hazna example has a body with triangular stumps for arms, similar to those of the Raqa'i figurine torso H-004 (Figures 5.33 and 5.34). This combination of head and body type occurs once at Tell Chuera,[47] but since this head type occurs also with other body types at Chuera, one cannot be sure what kind of body Raq 88 H-001 had. This head very likely originally had a round face, since a large chip is missing on each side of the head. It differs from the other examples mentioned, however, in having a mouth indicated.

Raq 90 H-007 (Figures 5.39 and 5.40), a figurine head from level 4, also has eyes made by incised holes, but it has a round, spreading headdress. The middle of the headdress is a convex bump, perhaps indicating a soft cap pushed down on the head. Figurines with a similar headdress have also been found at Tell Hazna.[48] This headdress appears to be the same kind worn by male figures on Early Dynastic seal impressions at Fara and Nippur, a stone votive plaque at Nippur, and inlaid panels at Kish and Mari.[49] The earliest and most securely dated of these appear to be the seal impressions from level IXB of the Inanna Temple at Nippur, which show bearded men spearing lions or riding in a boat. According to Hansen, level IX belongs in his Late Early Dynastic I period, dated to ca. 2850–2600 BCE (Porada et al. 1992: figure 5). Similar scenes occur on the seal impressions at Fara, especially those of men spearing lions. Not all the men wearing these headdresses clearly have beards, and in a partially preserved mosaic panel from Mari that shows a procession of soldiers and prisoners, some of the soldiers clearly do not (Parrot 1956: plates 56–57). These comparisons suggest that H-007 wears a headdress that was known in both northern Syria and southern Mesopotamia in the third millennium BCE and was perhaps associated with military activities.

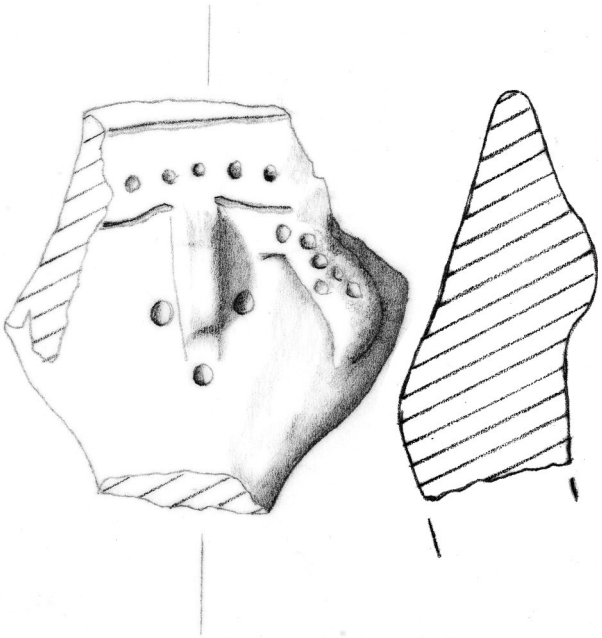


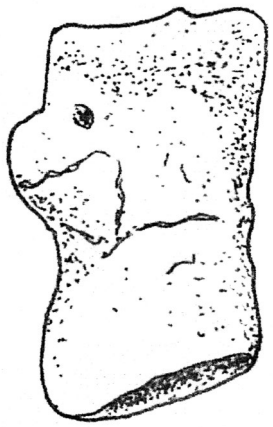
FIGURE 5.27. Raq 88 H-001.
Illustration prepared by Khaled al-Hamad.

FIGURE 5.28. Raq 88 H-001.
Photograph by Sally Dunham.

Another figurine from level 4, Raq 90 H-008 (Figures 5.41 and 5.42), has a pinched nose with hollows on either side for eyes. Such simple heads have been found in Ninevite 5 levels in area HS at Tell Brak.[50] Raq 88 H-002 (Figures 5.29 and 5.30) is also a very simple head with a pinched nose, but here it is directly attached to a short splaying base and appears to be complete. A figurine made of just a head and base has been found at Selenkahiye from a context dated to the second half of the third millennium, but this figure is much more elaborate with an incised mouth, pellet eyes and details of the headdress indicated.[51]

Figurines of Early Bronze Age Syria most often had a simple stalk-like body below the chest, and two of the Raqa'i figurines consist of fragments of this part. One, Raq 91 H-009, from level 4, is undecorated, but the other, Raq 88 H-003, from level 3 (Figures 5.31 and 5.32) has incised dots on the surface, perhaps representing a pattern on a garment. The closest parallel for this comes from Tell Hazna.[52] Not quite as similar is a female figurine from the "House Quarter" (area H) at Tell Chuera whose torso is covered with carefully incised circles.[53]

Another parallel between Tell Hazna and Raqa'i is a nude female figurine with triangular stumps for arms. Both the Raqa'i figurine, Raq 89 H-004 (Figures 5.33 and 5.34), and the example from Tell Hazna have crossing diagonal lines on the chest.[54] Similar nude figurines have been found at Abu Hafur, Melebiya, and 'Atij.[55] The Melebiya example has a short concave base below its waist, which the Tell Hazna example also appears to have in the published photograph. Whether the Raqa'i figurine had such a base or had legs is uncertain. A fragment from level 4, Raq 93 H-300, is the



(*Top*): Figure 5.29. Raq 88 H-002.
(Bottom): Figure 5.30. Raq 88 H-002.
Illustration and Photograph by Sally Dunham.

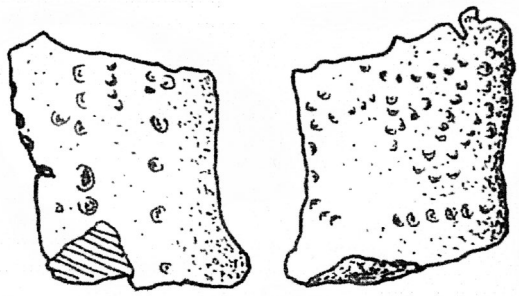


Figure 5.31. Raq 88 H-003.
Illustration prepared by Sally Dunham.

Figure 5.32. Raq 88 H-003.
Photograph by Sally Dunham.

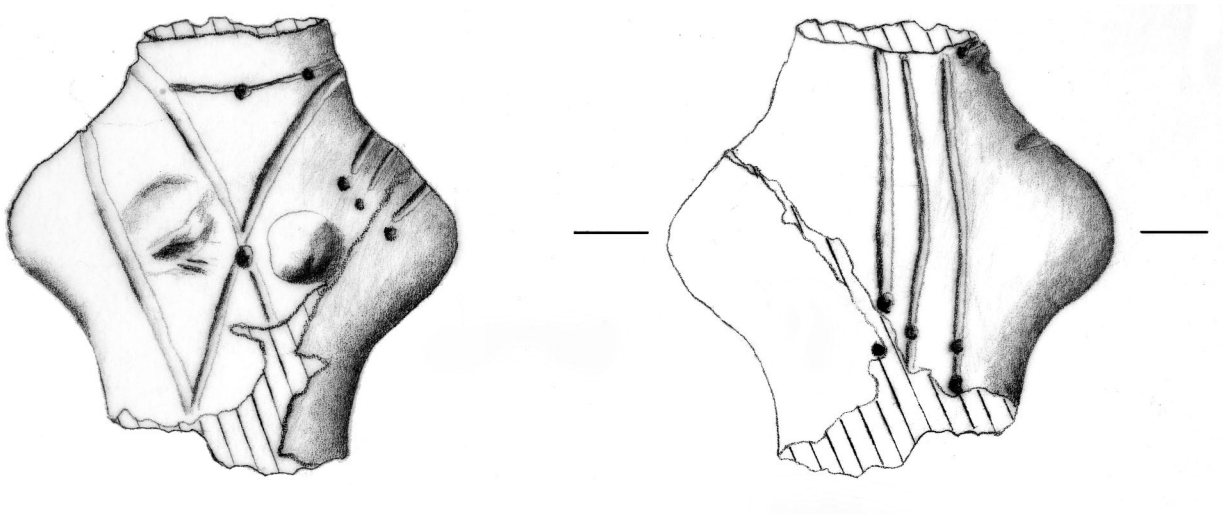


FIGURE 5.33. Raq 89 H-004. *Illustration prepared by Khaled al-Hamad.*

FIGURE 5.34. Raq 89 H-004. *Photograph by Hans Curvers.*

lower part of a nude female. Here the pubic triangle is outlined with incised dots. Below this, a cylinder with a splayed base is divided by a line of dots to indicate two legs.[56]

CATALOGUE OF HUMAN FIGURINES

1. Raq 88 H-001. Figures 5.27 and 5.28. Topsoil. Hand-made head of a figurine. Outer edge chipped on both sides. Flat front and back. Eyes and mouth are impressed circles. Band with row of incised dots across forehead. Ridge with impressed dots on left side of face. Light brown baked clay. W. 3.3 cm; H. 3.5 cm; 1.1 cm. Th. Surface find.
2. Raq 88 H-002. Figures 5.29 and 5.30. Level 3. Hand-made rough cylinder with splayed, concave ends, one wider than the other. Below the narrower end the clay is pinched out to form a nose, on either side of which eyes are indicated by incised holes. Complete. Unbaked brown clay. W. 2.6 cm; H. 4.0 cm; Th. 1.9 cm. Archon 42/108-027. Area 47, phase b. Brick collapse.
3. Raq 88 H-003. Figures 5.31 and 5.32. Level 3. Fragment of a hand-made lower torso of a figurine. Cylinder with oval cross section. Part of a flaring base preserved at one side. Surface incised with a pattern of large and small dots. One side looks slightly burnished. Lightly baked clay (?). L. 2.9 cm; W. 2.4 cm; Th. 1.5 cm. Archon 36/96-007. Area 71, phase b. Debris inside room.
4. Raq 89 H-004. Figures 5.33 and 5.34. Level 3 or 4. Hand-made female torso fragment. Only part from neck to waist preserved. The breasts are indicated, and the right one is chipped. Arms are triangular stumps. Front has incised line around neck with three incised dots on it; two diagonal lines cross between the breasts at an incised hole; another diagonal line leads from the figurine's right shoulder; and three diagonal lines ending in dots are on the left shoulder. The back has three vertical incised lines leading down from neck and ending in incised dots. Light brown unbaked clay. L. 4.6 cm; W. 4.4 cm; Th. 2.1 cm. Archon 30/120-035. Area 4 (level 3 designation), phase c. Debris inside silo.

5. Raq 90 H-005. Figures 5.35 and 5.36. Level 3. Hand-made cylinder with splayed, concave ends. Near one end the clay is pinched out to form a nose on either side of which are incised holes for eyes. This end is chipped. Other, wider end is complete. Lightly baked (?) gray clay with black core. H. 4.0 cm; max. D. 2.1–2.8 cm. Archon 30/108-052. Area 22, phases a and b. Debris outside architecture.
6. Raq 90 H-006. Figures 5.37 and 5.38. Level 3. Hand-made cylinder with flaring, concave ends. Unfinished figurine? The surface of the cylinder is slightly bumpy as if it had been manipulated by fingers. Hard, unbaked gray clay. L. 4.4 cm; D. 1.7 (body)—1.9 (ends) cm. Archon 30/108-058. Area 62, phase c. Outdoor surface. This object is classed here because of H-002 above. It resembles a clay object from Brak (Matthews 2003:Figure 5.75, No. 7) which is only called a "cylinder," but the Brak specimen appears to have smooth sides, while the Raqa'i example does not.
7. Raq 90 H-007. Figures 5.39 and 5.40. Level 4. Hand-made head from broken figurine. Cylindrical neck which widens out to a splaying headdress above the nose. On either side of the nose the eyes are indicated by cylindrical holes sunk into the clay. The nose is a ridge extending down from the headdress brim and is chipped at both ends. The headdress has a row of incised dots just below the brim all around the head. The middle of the top of the headdress is a convex bump, perhaps indicating a soft cap pushed down on the head. Unbaked (?) dark gray clay. H. 3.8 cm; D. 3.7 (hat) and 1.7 (neck) cm. Archon 48/108-078. Area 12, phase a. Debris inside of room.
8. Raq 90 H-008. Figures 5.41 and 5.42. Level 4. Fragment from a hand-made figurine head. Broken at

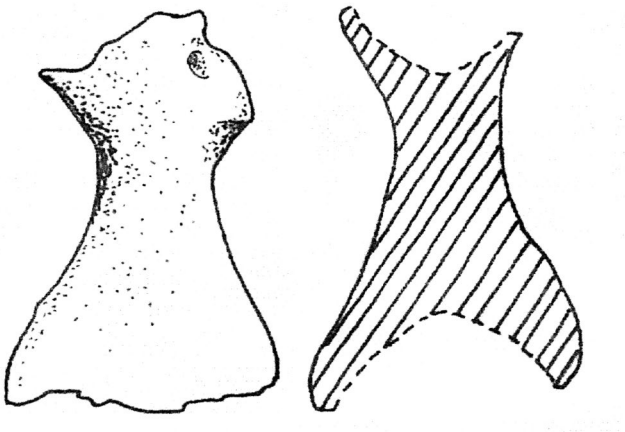


Figure 5.35. Raq 90 H-005.
Illustration prepared by Sally Dunham.

Figure 5.36. Raq 90 H-005.
Photograph by Sally Dunham.

(Far left): Figure 5.37. Raq 90 H-006.
Illustration prepared by Sally Dunham.

(Left): Figure 5.38. Raq 90 H-006.
Photograph by Sally Dunham.

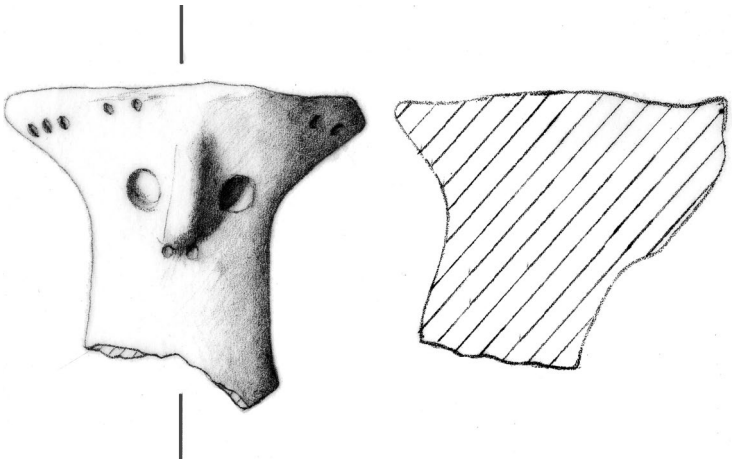


FIGURE 5.39. Raq 90 H-007.
Illustration prepared by Khaled al-Hamad.

FIGURE 5.40. Raq 90 H-007.
Photograph by Sally Dunham.

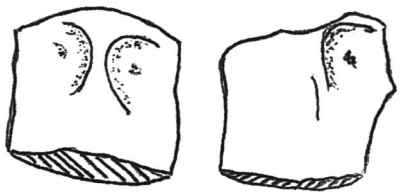


FIGURE 5.41. Raq 90 H-008.
Illustration prepared by Sally Dunham.

FIGURE 5.42. Raq 90 H-008.
Photograph by Sally Dunham.

top and bottom. Cylinder with pinched nose and hollows for eyes on either side. Unbaked clay. 2.3 cm H; 2.1 cm D. Archon 30/108–090. Area 82. Debris outside architecture.

9. Raq 91 H-009. Level 4. Lower part of a hand-made human figurine with stalk-like torso. Circular cross-section. Torso flares slightly at base. Base concave. Light buff baked clay, well fired. 4.1 cm H; 3.5 cm D. 27/110.5, unit 1925. Area 74, phases b–c.

Animal Figurines

A total of 56 fragmentary clay animal figurines were found in the 1987–1992 seasons at Raqa'i. With the exception of one possible bird figurine (Raq 89 O-033, catalogued under Miscellaneous Clay Objects), all the animals were quadrupeds, probably representing domestic animals such as sheep, goats, cattle, and dogs. Twenty-two examples were too fragmentary to be reliably identified with respect to species.[57] Eight were clearly bovids, of which five had horns, showing they were bulls. These were Raq 87 A-005 (Figures 5.43 and 5.46), Raq 89 A-016, Raq 88 A-009 (Figure 5.48), Raq 89 A-025 (Figure 5.43), and Raq 92 A-200. Sheep (A-011) (Figure 5.49) and goats (A-012) (Figure 5.43) were also represented. Raq 87 A-003, a small figurine with a squat body, might be a canine; since it seems to have a flat end to its nose.[58] One figurine with an especially long neck is considered to be an equid, possibly a horse (A-030, Figure 5.43).[59] All of the figures are of a size easily held in one hand, but if their legs were preserved, they were able to stand on their own. Facial details are usually not rendered, and all are just standing—that is, none is portrayed in any activity or movement. Further, their bodies have plain surfaces with no painted or incised markings indicating the texture of their coats. Most of the figurines are made of a hard, dark temper-free (or "invisible" temper?) clay whose surface disintegrated if it was inadvertently washed in water. Nevertheless, the possibility exists that they had been intentionally fired at a low temperature. Clay animal figurines from Jarmo exhibited

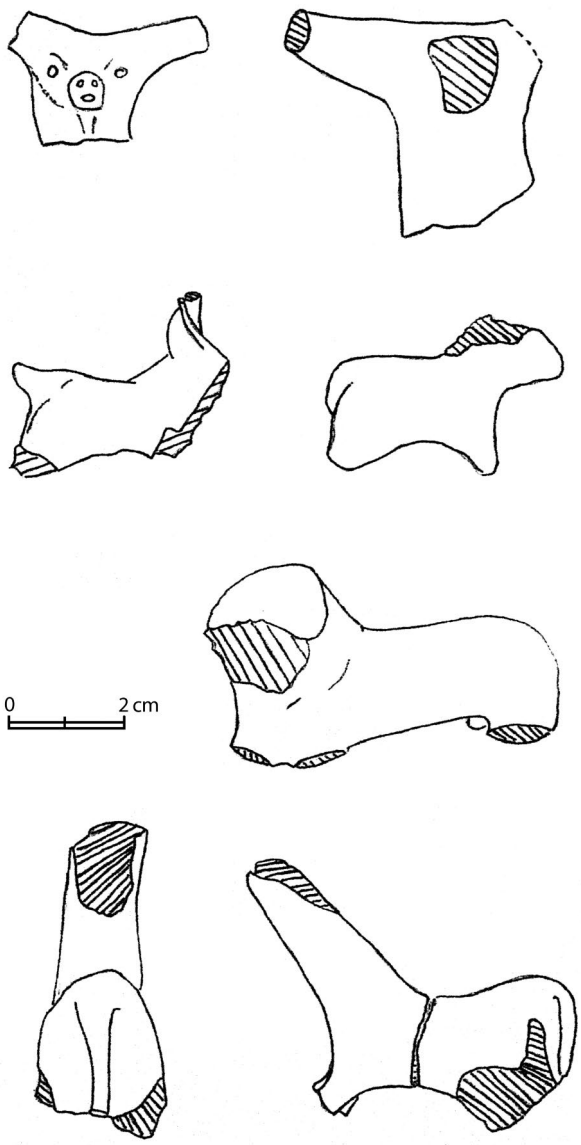


FIGURE 5.43. Animal figurines. Top row, left to right: Raq 87 A-005; Raq 89 A-025; second row, left to right: Raq 88 A-012; Raq 89 A-019; third row: Raq 89 A-020; bottom row: Raq 90 A-030. *Illustration prepared by Sally Dunham.*

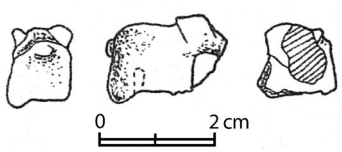


FIGURE 5.44. Raq 87 A-003.
Illustration prepared by Sally Dunham.

these same qualities and were found to have probably been baked at about 450 °C (Morales 1983:369, note 1).

Only one animal figurine can be considered to have been in primary context, A-003 (Figure 5.44), found in the badly preserved remains of a brick box child burial of level 2 (Burial 35, see Chapter 6). A-003 is a small compact quadruped, possibly a canine. It is smaller than the other animal figurines and it has on its underside a hole partially piercing its body. Perhaps it was mounted on a wooden or metal pin as a toy (?) for the buried child.[60] A-003 was accompanied by beads, two of which were of white stone crafted in the shape of bulls (A-001 and A-002, Figures 5.126 and 5.127; see Beads and Pendants section). Such beads could possibly have been protective amulets.[61] Whether A-003 also had an apotropaic function cannot be known but is possible.

Two other animal figurines have details that might suggest a ritual function. One, A-008 (Figure 5.47), from level 3, has an elongated hollow body with a hole on each end. One end has a clear neck, but the head is broken off. Four stumps on its bottom show it was meant to be a quadruped, and its sides are lightly scraped as if to represent stripes. Perhaps it represents some kind of weasel or ferret-like animal. Attempts to make a sound by blowing through it were not successful, but this could have been due to its damaged state. Fragments of hollow pig figurines from the "Ash-Tip" at Abu Salabikh are suggested to have belonged to pig-shaped rattles with pebbles in them (McAdam 1993:86 and figure 3:9). While rattles can be toys for babies, they are also idiophones that were known in the Ancient Near East (Kilmer 1995:2604). A third animal figurine for which some ritual function might be suggested is A-020 (Figure 5.43), the torso of a male quadruped[62] with the neck and the tops of the legs. The top of the neck, however, is not broken, but intentionally flattened. This suggests the deliberate manufacture of a headless animal before the clay had hardened, perhaps in a "magic" ritual to render the spirit/being symbolized by the figurine impotent.

The other animal figurines do not have characteristics or derive from contexts that suggest ritual use. Simple clay animal figurines are a frequent find in third-millennium settlements of north Syria, and they are often found in domestic contexts like the anthropomorphic figurines of this period, but their significance and function is unclear. Some archaeologists have considered them to be a complement to the anthropomorphic figurines and to belong to the same

realm of folk-religion/magic as these.[63] Pfälzner, however, considers that the animal figurines were made by or for children, because of their simple forms and because they have not been found in any clearly ritual context, unlike the anthropomorphic figurines (see Human and Animal Figurines and Model Wheeled Vehicles section). In support of his idea, he cites ethnographic examples from Africa.[64] At Umm el-Marra, however, a sub-floor pit in an Early Bronze IV period house contained a figurine of a bull, fragment of a model wheeled vehicle, and three fragments of anthropomorphic figurines.[65] While the exact significance of this deposit is uncertain,[66] it is clear evidence that zoomorphic figurines could have the same ritual/symbolic value as the anthropomorphic ones.

This example suggests that animal figurines could have a ritual/symbolic function in third- millennium settlements of northern Syria. Whether any of the Raqa'i pieces did, however, is usually not clear from either their contexts or characteristics. In studies of the ethnographic literature, both Voigt and Ucko note that most figurine industries are diverse with more than one functional class and that often figurines of different functions can be very similar. Voigt also cites instances where the same figurine can be a vehicle of magic and a toy.[67]

Catalogue of Animal Figurines

1. Raq 87 A-003. Figure 5.44. Level 2. Dog. Thick short torso with hind end, short tail and one short hind leg preserved. Front of head broken away, but part of ears (or horns?) preserved at back of head. There is a hole 0.2 cm D. × 0.5 cm L. on underside near the back leg. Baked clay, black, plant and fine sand temper. L. 2.0+ × W. 1.4 × H. 1.4+ cm. Archon 48/90-007. Area 26. Burial 35.
2. Raq 87 A-004. Figure 5.45. Level 3 or above. Front end. Two short legs. Front of head with round muzzle preserved, but horns/ears broken off. Probably a sheep. Black-gray baked clay. L. 1.8 × W. 2.0 × H. 3.2 cm. Archon 42/114-036. Area 89 (level 3 designation). Brick installation.
3. Raq 87 A-005. Figures 5.43 and 5.46. Level 4. Bull head and neck. Short, flat round muzzle with nostrils and mouth incised holes. Dewlap at throat. Wide horns, broken off at their ends. Baked clay. Orange, but blackened by fire. Fine sand temper. L. 2.5+ × W. 3.3 × H. 2.3+ cm. Archon 42/116-071. Area 34. Debris outside architecture.
4. Raq 87 A-006. Level 3. Torso with broken tail left front leg. Other three legs broken. Head broken away. Thick throat suggests a bovid. Medium-fired clay, blackened by fire. Fine sand temper. L. 3.0 × W. 1.0 × H. 1.5 cm. Archon 30/126-030. Area 7, phase d. Pit.
5. Raq 87 A-007. Level 3. Thick torso with short, thick legs, two of which are broken. Head completely broken away. Short tail, chipped on one side. Bovid or sheep. Black-gray baked clay, sand tempered. L. 3.2 × W. 2.1 × H. 2.8 cm. Archon 42/96-015. Area 37, phase b. Debris inside silo/ bin (?).
6. Raq 88 A-008. Figure 5.47. Level 3. Hollow elongated torso with a hole on each end. One end has clear neck, but head broken off. Bottom has four stumps where the legs had broken off. Top and sides of body lightly scraped, perhaps to appear striped. Possibly a weasel like animal? Buff baked clay. L. 8.3 × W. 3.0 × H. 2.7 cm. Archon 29/120-046. Area 59. Debris outside architecture.
7. Raq 88 A-009. Figure 5.48. Level 3. Bull. Head and neck only. Muzzle has flat end and horns spread to either side, ends broken off. Probably bovid. Incised hole for nostril on each side of nose. Slight indentations for eyes (?). Black, lightly baked (?) clay. L. 1.9 × W. 3.0 × H. 2.7 cm. Archon 29/120-047. Area 59. Debris outside architecture.
8. Raq 88 A-010. Level 3 or 4. Complete except for head and left front leg. The rump is chipped and only a stub of the tail is preserved. Three remaining legs end in pointed stubs. Left hind leg has two dabs of clay as if to represent a cloven hoof. Sheep or bovid. Gray-black lightly baked (?) clay. L. 4.5 × W. 2.2 × H. 3.5 cm. Archon 42/102-043. Above area 29 (level 4 designation). Debris outside architecture.
9. Raq 88 A-011. Figure 5.49. Northwest silos, level 3 or 4. Front end with neck, head and part of right front leg. The front of the head has a convex profile, so it is probably a sheep. Horns project to side but are broken off. Dark gray lightly baked (?) clay. L. 3.1 × W. 2.8 × H. 4.2 cm. Archon 30/120-045. Area 6 (level 3 designation). Debris inside silo.
10. Raq 88 A-012. Figure 5.43. Level 4. Torso, neck back part of head, part of one horn and part of the tail preserved. The horn has a clear twist, so a goat is indicated. The tail stands up. Lightly baked (?) dark gray clay. L. 3.5 × W. 1.6 × H. 3.0 cm. Archon 42/114-093. Round Building, area 16, phases b and c. Debris inside room.

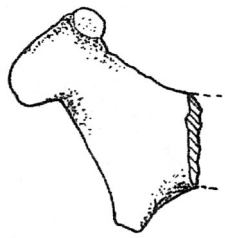


FIGURE 5.45. Raq 87 A-004. See Catalogue for dimensions. *Illustration prepared by Sally Dunham.*

FIGURE 5.46. Raq 87 A-005. *Photograph by Hans Curvers.*

FIGURE 5.47. Raq 88 A-008. *Photograph by Hans Curvers.*

FIGURE 5.48. Raq 88 A-009. *Photograph by Hans Curvers.*

(*Left*): FIGURE 5.49. Raq 88 A-011. *Photograph by Sally Dunham.*

11. Raq 88 A-013. Level 4. Torso with neck, front part of head, beginning of the tail, and the very top part of the legs. Has convex top line to nose so probably a sheep is indicated. Lightly baked (?) dark gray clay. L. 4.0 × W. 1.3 × H. 2.9 cm. Archon 42/114-093. Round Building Area 16, phases b and c. Debris inside room.
12. Raq 89 A-014. Figures 5.50 and 5.51. Northwest silos, level 3 or 4. Sheep or bovid. Thick torso. Hind end has complete short, right leg and part of the tail. At front end only the beginning of the neck is preserved. On the left side there is an indent about the size of a thumbnail. Lightly baked (?) clay. L. 6.1 × W. 3.4 × H. 3.3 cm. Archon 30/120-035. Area 4 (level 3 designation), phase c. Debris inside silo.
13. Raq 89 A-015. Figures 5.52 and 5.53. Level 4. Species uncertain: sheep/bovid/dog? Torso and legs. Head and neck missing. Wide tail ends in a point three-quarters down the hind legs. Intentional hole 0.2 × 0.6 cm in middle of the under side does not go all the way through the body. Perhaps mounted on pin. Cf. Raq 87 A-003 (No. 1).

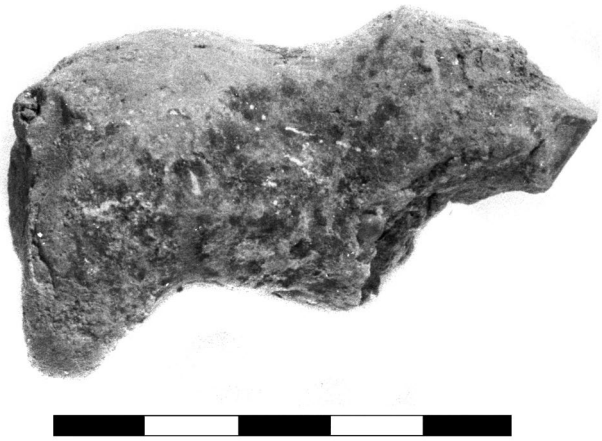


FIGURE 5.50. Raq 88 A-014. *Photograph by Sally Dunham.*

FIGURE 5.52. Raq 89 A-015. *Photograph by Sally Dunham.*

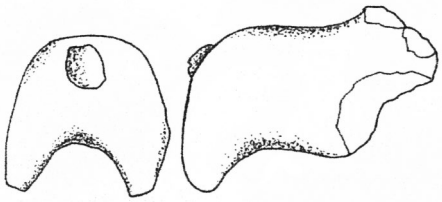


FIGURE 5.51. Raq 88 A-014 (scale 1:2). *Illustration prepared by Sally Dunham.*

FIGURE 5.53. Raq 89 A-015 (bottom view). *Photograph by Sally Dunham.*

Dark brown and black clay, which looks burned but has a dark core. L. 3.1 × W. 2.0 × H. 2.2 cm. Archon 42/114-097. Area 17, phase b.

14. Raq 89 A-016. Level 3. Head of bull. Muzzle broken off. Top line of preserved part of muzzle concave (so probably not a sheep). Only stumps of horns protruding to either side are preserved. Hard gray clay, either unbaked or only lightly baked. L. 1.6 × W. 2.3 × H. 2.3 cm. Archon 36/120-056. Area 49. Debris outside architecture.
15. Raq 89 A-017. Post-level 1. Quadruped, uncertain species. Torso, neck and stumps at top of legs preserved. Original surface inadvertently washed away by cleaning with water. Unbaked clay. L. 3.6 × W. 1.7 × H. 2.9 cm. Archon 36/108-035. Burial.
16. Raq 89 A-018. Level 4. Head and part of neck. Species uncertain—bovid/canine? Muzzle broken away. Short rounded points on either side of the head may be horns or ears. The tip of the right one is broken. Gray clay, perhaps lightly baked. L. 1.5 × W. 2.1 × H. 1.9 cm. Archon 42/114-115. Round Building, area 16, phase b. Debris inside room.
17. Raq 89 A-019. Figure 5.43. Level 4. Almost complete compact bodied quadruped. Top of head chipped, so ears/horns missing. Thick muzzle with convex top line, so probably a sheep. Legs are short stumps, but not broken. Unbaked clay. L. 3.9 × W. 1.8 × H. 2.9 cm. Archon 42/114-114. Round Building, area 17, phase a. Debris inside room.
18. Raq 89 A-020. Figure 5.43. Level 3. Male, species uncertain. Torso, neck and top of legs. Tail area badly chipped. Top of neck appears intentionally flattened. Penis clearly indicated. Unbaked clay. L. 6.2 × W. 2.9 × H. 4.7 cm. Archon 30/96-080. Area 33, phase c. Debris inside room.
19. Raq 89 A-021. Level 4. Species uncertain. Fragment of hind end. Only one side and part of tail and right hind leg. Lightly baked clay (?) Black outside, red/gray interior. L. 4.2 × W. 2.8 × H. 3.5 cm. Archon 42/114-114. Round Building, area 17, phase a. Debris inside room.
20. Raq 89 A-023. Level 4. Species uncertain. Part of front end: part of neck and part of each front leg. Unbaked or only lightly baked clay. L. 1.9 × W. 0.9

× H. 1.7 cm. Archon 42/114-167. Round Building, area 14. Debris inside room.

21. Raq 89 A-024. Level 3 or 4. Neck, back of head and ears. Short pointed ears. Possibly a dog. Unbaked clay. L. 1.7 × W. 1.5 × H. 2.1 cm. Archon 42/108-049. Area 88 (level 3 designation). Inside wall.
22. Raq 89 A-025. Figure 5.43. Level 4. Neck and part of head of bull. Muzzle broken away. Right horn partially preserved, but tip is broken. Only a short stump of the left horn remains. Unbaked clay. L. 2.6 × W. 4.0 × H. 3.7 cm. Archon 42/114-167. Round Building, area 14. Debris inside room.
23. Raq 89 A-026. Level 2. Head and neck. Bovid? Bottom of neck pressed flat as if intentionally. Short, small ears, right is pointed, left is square. Nose ends in small blunt point. Dark brown unbaked clay. L. 2.7 × W. 1.7 × H. 1.5 cm. Archon 29/132-015. Area 13.
24. Raq 90 A-027. Figure 5.54. Level 4. Species uncertain, sheep or bovid? Torso and tail, top of legs and lowest part of the neck. One side slightly disintegrated because inadvertently washed. Gray-brown clay unbaked, but with burned spots. L. 4.2 × W. 1.8 × H. 1.5 cm. Archon 48/108-055. Round Building, area 24, phase a. Debris inside a room.
25. Raq 90 A-028. Level 4. Species uncertain. Neck, broken stumps of ears and back of head. Muzzle and upper face broken away. Unbaked clay, slightly burned. L. 2.2 × W. 2.0 x. H. 2.0 cm. Archon 42/108-103. Area 18, phase a. Debris from presumed unroofed area in Round Building.
26. Raq 90 A-029. Level 4. Species uncertain, goat? Hind end, torso, back of head preserved. Upright neck. Very short tail. Muzzle, face and front legs completely broken away. Lightly burned clay. L. 2.6 × W. 1.4 × H. 2.5 cm. Archon 42/114-198. Round Building, area 7. Debris inside room.
27. Raq 90 A-030. Figures 5.43 and 5.55. Level 4. Equid. Torso, long neck, long slender tail broken at end. The long neck and tail suggest it might be an equid (?). Lightly burned gray clay. L. 5.7 × W. 2.9 × H. 4.6 cm. Archon 42/114-198. Round Building, area 7. Debris inside room. Comparanda: Mallowan 1947: plate 54, nos. 10 and 17 (Brak, Akkadian period); Speiser 1935: plate 77:1 and 2 (Gawra, level VI, Akkadian).
28. Raq 90 A-031. Level 4. Species uncertain, Part of head and neck. Muzzle and left ear broken off. Right ear is short round stump. Black, lightly burned clay. L. 2.4 × W. 2.9 × H. 1.7 cm. Archon 42/114-208. Round Building Area 9, phase a. Debris inside of room.
29. Raq 90 A-032. Level 4. Fragment which might be part of an animal torso. Unbaked clay. L. 3.5 × W. 1.7 × H. 1.5 cm. Archon 42/102-094. Round Building, area 1. Debris inside of silo.
30. Raq 90 A-033. Level 4. Equid? Torso with lower part of upright neck. Right side has short legs preserved. The tail is long, pinched high and arches like that of a horse. Unbaked clay. L. 4.2 × W. 1.9 × H. 3.5. Archon 42/102-094. Round Building, area 1. Debris inside of silo.
31. Raq 90 A-034. Level 4. Species uncertain. Part of head: only the back of the head and the stump of one ear (or horn). Unbaked gray clay. L. 2.5 × W. 1.6 × H. 1.3 cm. Archon 42/102-094. Round Building, area 1. Debris inside of silo.
32. Raq 90 A-035. Level 4. Species uncertain. Torso, right hind leg and part of right front leg. Unbaked

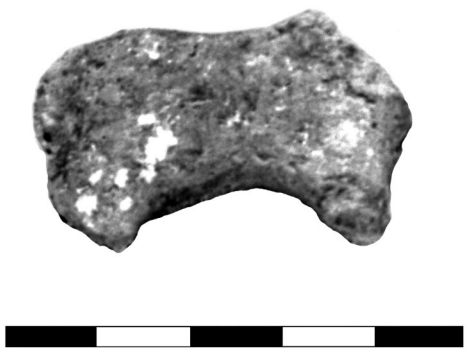


Figure 5.54. Raq 90 A-027. *Photograph by Sally Dunham.*

Figure 5.55. Raq 90 A-030. *Photograph by Sally Dunham.*

or lightly baked clay. L. 5.0 × W. 2.2 × H. 3.5 cm. Archon 48/108-078. Round Building, area 12, phase a. Debris inside of room.

33. Raq 90 A-036. Level 4. Species uncertain. Possible fragment of animal figurine (?). Unbaked clay. L. 3.1 × W. 2.8 × H. 3.3 cm. Archon 42/102-094. Area 1, debris inside of silo.
34. Raq 90 A-037. Level 4. Species uncertain. Small torso with short pointed tail and four short pointed legs. Head and neck missing. Unbaked or only lightly baked clay. L. 1.9 × W. 1.1 × H. 1.3 cm. Archon 42/102-094. Round Building, area 1. Debris inside of silo.
35. Raq 90 A-038. Level 4. Species uncertain. Possible fragment of a quadruped. Unbaked or lightly baked clay. L. 4.1 × W. 2.0 × H. 2.0 cm. Archon 42/102–094. Round Building, area 1. Debris inside of silo.
36. Raq 90 A-039. Level 4 (but see below). Sheep head and neck. Straight top line to nose. Muzzle ends in rounded point. Stumps at either side may be ears. Unbaked or lightly baked clay. L. 2.7 × W. 2.5 × H. 5.0 cm. Archon 30/108-049. Area 82. Debris above architecture.
37. Raq 90 A-040. Level 4. Pig? Torso with left legs, hind end and tail. Legs short with pointed ends. The tail is thin and curves. Penis indicated. Unbaked clay. L. 4.6 × W. 2.4 × H. 2.9 cm. Archon 30/108-080. Area 83, phase a. Debris outside architecture.
38. Raq 90 A-041. Level 5. Species uncertain. Torso with complete right hind leg and stumps of the other three. Head and neck broken away. Lightly baked clay. L. 4.1 × W. 2.3 × H. 3.2 cm. Archon 36/120-235. Area 19, phase d. Debris outside architecture.
39. Raq 90 A-042. Level 4. Species uncertain. Slightly curving conical piece of clay that ends in a blunt point. Could be part of a horn (?) or leg (?). Unbaked or lightly clay. L. 3.2 × (max.) D. 1.1 cm. Archon 42/102-125. Area 29. Debris from presumed unroofed areas in Round Building.
40. Raq 90 A-043. Figure 5.56. Level 4. Species uncertain. Hind end with the top of both hind legs. Tail broken off. Unbaked or lightly baked clay. L. 3.2 × W. 2.5 × H. 2.1 cm. Archon 42/102-134. Area 104. Debris outside architecture.
41. Raq 90 A-044. Level 4. Bovid or sheep? Hind end, middle torso and part of neck preserved. No legs, tail, or head. Two fragments which fit together. Surface damaged because inadvertently washed. Unbaked clay. L. 7.7 × W. 2.9 × H. 4.7 cm. Archon 42/114-255. Area 30. On green plaster floor.
42. Raq 90 A-045. Level 4. Species uncertain. Bovid or sheep? Hind end with top of right hind leg. Short pointed tail. Unbaked clay. L. 4.5 × W. 2.0 × H. 3.4 cm. Archon 48/108-131. Round Building, area 3. Debris inside of silo.
43. Raq 90 A-46. Level 3 or 4. Bovid or sheep? Hind end with tops of both hind legs and tail. Penis indicated. Unbaked clay. L. 3.0 × W. 3.0 × H. 3.1 cm. Archon 29/126-185. Under level 3, area 56. Debris below architecture.
44. Raq 90 A-047. Level 4. Species uncertain. Possible fragment of an animal figurine. Unbaked clay. L. 2.2 × W. 1.4 × H. 1.9 cm. Archon 52/100-005. Area 109. Debris outside architecture.
45. Raq 91 A-048. Level 4. Species uncertain. Conical piece of clay with oval section and blunt pointed end. Wider end broken. Two incised lines on one side. Possibly horn or leg of animal figurine. Baked buff colored clay. L. 1.8 × W. 1.0 × Th. 0.7 cm. Archon 29/120, unit 3531. Above area 70.
46. Raq 91 A-049. Level 4. Bovid or sheep. Part of head, neck torso, tops of four legs, part of tail. Dark gray-black hard clay. No visible temper. L. 4.1 × W. 1.8 × H. 3.5 cm. Archon 22.5/113, unit 3183, elevation 293.64. Area 75, phases b–c.
47. Raq 91 A-050. Level 4. Species uncertain. Short, cylindrical piece of clay with a pointed appendage at one side of one end. Possibly animal figurine fragment. Brown baked clay. L. 1.7 × W. 1.7 × H. 1.6 cm. Archon 20.5/115, unit 1064 elevation 293.95. Area 75, phases b–c.
48. Raq 91 A-051. Level 4. Species uncertain. Cylindrical shaped piece of clay with a small appendages on either side. Possibly fragment of a human or animal figurine. Tan, hardened or lightly baked clay. L. 2.2 × W. 1.3 × H. 1.3 cm. Archon 21/113.5, unit 2808, elevation 293.04. Area 75. phases b–c.

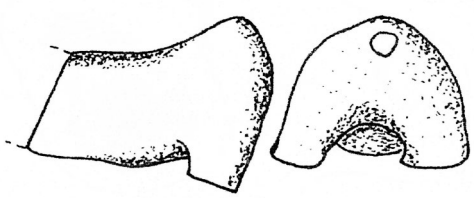


FIGURE 5.56. Raq 90 A-043 (scale 1:1).
Illustration prepared by Sally Dunham.

49. Raq 91 A-052. Level 3. Species uncertain. Cylindrical piece of clay with one flattened end and pinched clay on opposite sides. One side looks like a nose and two eyes. Perhaps very simplified human, but too vague to be sure, so it is classed as an animal figurine. Baked tan clay, fine vegetal temper. Archon 29/114, unit 0473-1. Area 61.
50. Raq 91 A-053. Level 4. Species uncertain. Part of a cylinder with a squat cylinder protruding from one side. Horn? Nose? Of animal figurine? Lightly baked dark tan/gray clay with grit temper. L. 1.4x W. 1.2 × H. 1.2 cm. Archon 21.5/114.5, unit 0950, elevation 293.61. Area 75, phases b–c.
51. Raq 91 A-054. Level 4. Species uncertain. Conical shaped piece of clay. The narrow end is a blunt point. Four lightly incised lines on one side. L. 1.7 × D. (max.) 1.1–0.5 cm. Archon 19/111, unit 0453. Area 75, phases b–c.
52. Raq 91 A-055. Level 4. Species uncertain, bovid? Head and neck. Muzzle broken away. Left ear is complete and has a round end. Right ear longer and broken at very end. Baked tan clay with fine grit temper. L. 2.5 × W. 1.7 × H. 1.4 cm. Archon 20.5/113, unit 2811, elevation 293.04. Area 75, phases b–c.
53. Raq 92 A-200. Level 4. Head, neck and shoulders of a bull. Flat top to head and horns spread wide horizontally and curve forward. Horns broken at ends. Some clay on the front of chest looks like it had formed short, stubby legs, one of which has been pushed up against the body. Blackened hard clay. Perhaps not intentionally baked. L. 4.0 × W. 3.8 × H. 4.1 cm. Archon 48/108-511. Round Building, area 11, phase a. Debris inside room.
54. Raq 92 A-201. Species uncertain. Level 4. Manipulated piece of clay that resembles hind end of an animal. Blackened, hard clay. L. 3.2 × W. 2.7 × H. 2.6 cm. Archon 42/114N-018. Area 89, phase b. Debris inside room.
55. Raq 92 A-202. Level 4. Miniature horn, probably from a bovid figurine. Horn has slight twist. Broken at both ends. Dark gray-brown lightly baked clay. L. 3.3 × D. (max.) 1.5–(min.) 0.5 cm. Archon 29/120-554. Area 99. Debris outside architecture.
56. Raq 92 A-203. Level 4. Sheep or bovid? Small piece of clay that has a protruding lump that could be the muzzle of a bovid or sheep. Black, hard (baked?) clay. Lime temper. L. 2.5 × W. 2.1 X H. 1.7 cm. Archon 48/108–531. Area 108. Debris outside architecture.

Models of Wheeled Vehicles

Three fragmentary baked clay objects have been classified as parts of model wheeled vehicles. Only one, Raq 88 C-001 (Figures 5.57–5.59), is preserved enough to compare to other known examples. This has a square body with the top part of the axle hole preserved midway between the front and back. The front panel, decorated with an incised zigzag below a row of small circles,[68] is taller than the other three sides. Since it is damaged, its full height is unknown. The back end is broken, so the original thickness is not preserved. Very likely Raq 88 C-001 was a "platform-car" as defined by Littauer and Crouwel (1979). This was a two-wheeled vehicle with a tall front panel. It could have lower side panels, or open sides; and either a thick back side for a seat or only a place for the driver to stand.[69] Raq 88 C-001 also has a hole for the draft pole from the front though the back of the body at a level above that of the axle hole, an arrangement found on models at Tell Brak.[70]

Terracotta models of wheeled vehicles have been found at many sites in Mesopotamia and Syria.[71] As with the animal figurines, the purpose of such models, usually found broken and in secondary context, is uncertain. One possibility is that they had symbolic religious significance, since wheeled vehicles had an important role in ancient Near Eastern religion, as can be seen in third- and early second-millennium texts from Mesopotamia. Enmetena and Uru'inimgina of Lagash both record the building of Ningirsu's coach house,

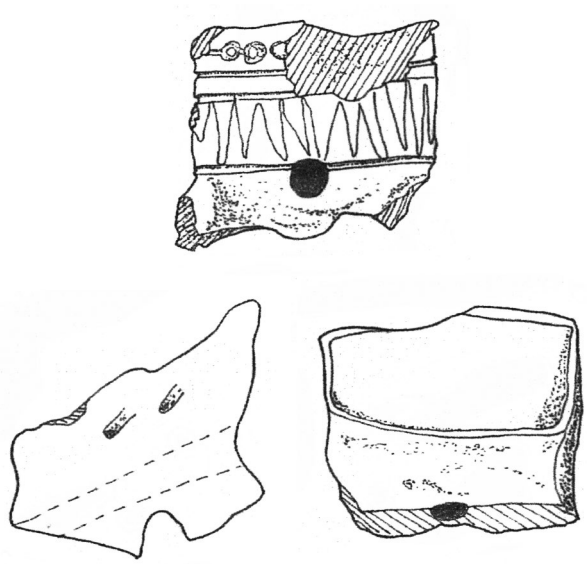


Figure 5.57. Raq 88 C-001 (scale 7:10).
Illustration prepared by Sally Dunham.

FIGURE 5.58. Raq 88 C-001 (front).
Photograph by Sally Dunham.

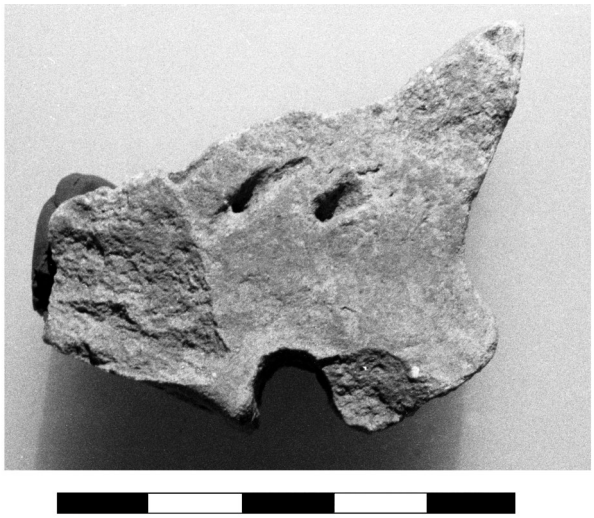


FIGURE 5.59. Raq 88 C-001 (side).
Photograph by Sally Dunham.

while Enmetena made a chariot for the god as well.[72] When Gudea rebuilt the temple of Ningirsu, he received divine instructions to make the god a well-appointed chariot and to harness a donkey stallion to it.[73] The making of a chariot for Enlil by Išme-Dagan of Isin was commemorated in a hymn that describes the blessings the king will receive because of his gift (Civil 1968). Possibly clay models were humbler versions of such royal gifts. In the early second millennium, terracotta models of platform cars with representations of deities or their symbols on the inside of the front panel are found at southern Mesopotamian sites. While the purpose of these is debated, their symbolic religious import cannot be denied (Stone 1993).

CATALOGUE OF MODELS OF WHEELED VEHICLES

1. Raq 88 C-001. Figures 5.57, 5.58, and 5.59. Either level 2 or level 3. Part of the square body of a two wheeled vehicle. The top of the hole for the axle is preserved halfway between the front and back. The front is taller than the other three sides, but upper edges of all sides are damaged, so their full heights are unknown. The front is decorated with an incised zig-zag between two incised parallel lines. Above this are another two parallel lines, the top of which has three incised circles along its preserved part. A hole for the draught-pole is at the lower edge of the zig-zag and runs diagonally through the body above the level of the axle hole. The right side has three slanting holes of uncertain purpose. The outside surface of both sides and the back are damaged, so their original thickness is unknown. The bottom of the vehicle body is also broken away. Baked clay. L. 4.7 × W. 4.5 × H. 4.1 cm. Archon 36/102-021. Above level 3, area 38. Debris above architecture, likely to be of uncertain level.
2. Raq 89 C-002. Either level 2 or level 3. Flattish piece of intentionally shaped clay. Rectangular at one end. Has shallow diagonal hole in the short side of this end and a transverse semicircular groove (0.7 cm wide) across this edge. The other short end is broken away. The longer sides are smoothed. Might not be a fragment of a wheeled vehicle model. Baked Clay. L. 6.3 × W. 5.0 × Th. 1.9 cm. Archon 29/126-040. Above level 3, area 58. Debris above architecture.
3. Raq 88 C-003. Level 2. Piece of clay with one flat surface and the opposite surface broken, but preserving part of the top of an axle hole. All sides broken. Baked clay. L. 5.1 × W. 3.9 × H. 1.8 cm. Archon 30/102-018. Area 21. Debris outside architecture.

Distribution of Human and Animal Clay Figurines and Model Vehicles

Animal figurines occur in levels 2–5 and human figurines in levels 3–4, but model chariots were only

found in levels 2–3.[74] Level 2 produced only two animal figurines (Raq 87 A-003, from burial 35; and Raq 89 A-026) and one possible fragment of a model chariot (Raq 88 C-003). Levels 3 and 4, however, contained sufficient numbers of examples of animal and human figurines to compare the patterns of distribution (10 for level 3[75]; 41 for level 4[76]). In level 3, one figurine (H-002) was found in the Round Building, while the rest were dispersed in the settlement around it. In level 4, however, 23 were found inside the Round Building, while 18 were found outside it, either near the outside wall to the east and south or in the North Area. In the doorless rooms 1, 7, 14, and 16, more than one figurine was found. Some were found high up in the fill and could have been discarded there after the building went out of use, but some figurines were found in the earliest phases of the rooms and so may have been part of the active life of the building.[77]

Andirons

Andirons are solid, lightly baked clay objects that are thought to have supported pots in a hearth. Sixteen examples were found at Raqa'i (see Table 5.4).[78] Given their fragmentary state, an identification of "types" must be tentative.[79] Raq 87 O-006, from level 3, area 10, has a flat bottom and a convex top and was wider at one end that the other. On the top near the wider end was a handle.[80] This example could be compared to an object found in Ninevite 5 levels at Tell Brak,[81] but the Brak object has a concave bottom and is said to have "large voids" in it. Another andiron with a handle is Raq 91–92 O-205 from area 59 of level 3. This one is a solid elliptical base, one of the wider sides of which has a solid handle two centimeters thick and six centimeters high that is roughly rectangular and curves slightly to one side. No comparison for this example has been found yet. The side opposite the handle is damaged but at one place has a smooth concave curve as if an object had been pressed against it.

Andiron Raq 88 O-019 is a round-topped pillar with an elliptical section whose bottom is broken away.[82] Possibly Raq 88 O-019 was one of a pair on a connected stand similar to one found by Mallowan at Tell Brak.[83] Other pillar-like andirons are: Raq 87 O-009; Raq 87 O-016; Raq 88 O-020 (Figure 5.60, third from left), and Raq 89 O-030 (Figure 5.61). Raq 87 O-009 is a clay cylinder 12 cm long and 6.5–9.5 cm in diameter that is broken at both ends. Raq 87 O-016 is a semi-circular column that widens to a splaying base. Its top, narrower, end is broken. This piece was found in the level 3 silo 5, as was Raq 88 O-020, a fragment of part of the bottom edge and part of one side of what was probably another pillar-type andiron. Raq 89 O-030 (Figure 5.61) is the base of another pillar-like andiron that narrows as it rises and whose top is broken away. At the bottom of one face are two holes measuring 4–5 cm in diameter, perhaps allowing for the movement of the object in the hearth or for carrying it. Good comparisons for Raq 90 O-067 have been found at Tell Arbid.[84] Finally, Raq 91 O-401, from area 75 in level 4, could be the conical top of a pillar-type andiron. Exactly how these "pillars" were used to support a pot over a hearth fire is difficult to reconstruct with these very fragmentary pieces. Perhaps they were in a hearth surrounded by a raised edge and two pillars, and part of the edge was used.[85]

Andirons Raq 88 O-023 and Raq 90 O-056 could be fragments from a different type of andiron.[86] In Figure 5.60, both appear to have smooth sloping sides and

Table 5.4. Andirons from Discrete Levels.

Object #	Level	Archon	Area of site	Area/room	Illustration
Raq 87 O-006	3	30/126-014	West	10, phase b	None
Raq 87 O-009	3	36/114-035	West	81	None
Raq 88 O-019	3	36/102-039	East	72	Figure 5.60
Raq 89 O-046	4	30/126-069	Northwest	52, phase a	None
Raq 90 O-054	4	42/114-208	Round Bldg	9, phase a	None
Raq 90 O-056	4	36/120-176	Center west	87, phase a or 101, phase a	Figure 5.60
Raq 90 O-062	4	42/114-227	South	31, debris in room	None
Raq 90 O-067	5	36/120-229	Central	19, phase c, debris in room	Figure 5.60
Raq 91-92 O-205	3	Unit 1400	Northwest	59	None
Raq 91 O-401	4	21.5/113u2803	North	75, phases b–c	None
Raq 89 O-402	3	42/108-035	Round Bldg	88, phase b, brick installation	None

FIGURE 5.60. Raq 88-90, andirons (left to right: Raq 90 O-056; Raq 88 O-019; Raq 88 O-020; Raq 90 O-067; Raq 88 O-023). *Photograph by Sally Dunham.*

very flat bases, but their tops are broken. Raq 88 O-023 has a semicircular plan to its front, but its back is very straight. If one thinks of it with its back at the bottom, then the broken edge of its top in the illustration (Figure 5.60) could be a broken place that had originally connected to (been a part of) a raised border around a semicircular hearth, as illustrated by Diamant and Rutter (1969:158, Figure 10d).[87]

Distribution of Andirons

Of the 16 andirons found at Raqa'i, one, Raq 90 O-067 one was from level 5; 5 were from level 4; 5 were from level 3; and 4 were from contexts that could be either level 3 or 4. Although not numerous, they were dispersed throughout the settlement. Only one example might be considered in primary context, Raq 87 O-006, which was found near a tannur oven in area 10 of level 3. One is tempted to think it had some relation to the tannur, but this is, of course uncertain. Raq 92 O-205 was found in level 3, area 59, which was an area between buildings containing an oven. Another, Raq 88 O-019, was found near a tannur in area 72 of level 3. Although all of the contexts are classed as "debris" since the specimens are very fragmentary, some may not have been far from their original place of use since they were made of lightly baked clay and were easily broken.

CATALOGUE OF ANDIRONS

1. Raq 87 O-006. Level 3. Fragment of a solid massive object with one wider end. One face is convex and has handle. Other side is flat. One end is wider, broken at corners. Narrower end is broken. Lightly baked clay. Brown exterior. Orange/brown core. L. 13 × W. 10 × Th. (?) 5 cm. Archon 30/126-014. Area 10, phase b. Debris within room, near a tannur oven.
2. Raq 87 O-009. Level 3. A cylinder that is wider at one end. Narrower end broken. Baked clay, gray-brown color. D. of narrower end 6.5; D. of wider end 9.5 × L. 12 cm. Wt. 892 g. Archon 36/114-035. Area 81. Debris outside of architecture.
3. Raq 87 O-016. Level 3 or 4. Solid half cylinder with splaying base. Top end is narrower and broken off. Lightly baked clay. Sand tempered. W. 12 × H. 14 × Th. 5 cm. Archon 30/126-024. Area 5 (level 3 designation). Debris in silo.
4. Raq 88 O-019. Level 3. Blunt, conical object with elliptical section. Wide end is broken. Lightly baked clay. L. 10.7 × D. 8.3 + 7.0 cm. Archon 36/102-039. Area 72. Debris outside architecture.
5. Raq 88 O-020. Figure 5.60. Level 3 or 4. Fragment from base of an andiron. One curving edge preserved. Lightly fired clay. L. 10 × H. 9 × Th. 4 cm. Archon 30/120-042. Area 5 (area 3 designation). Debris in silo.

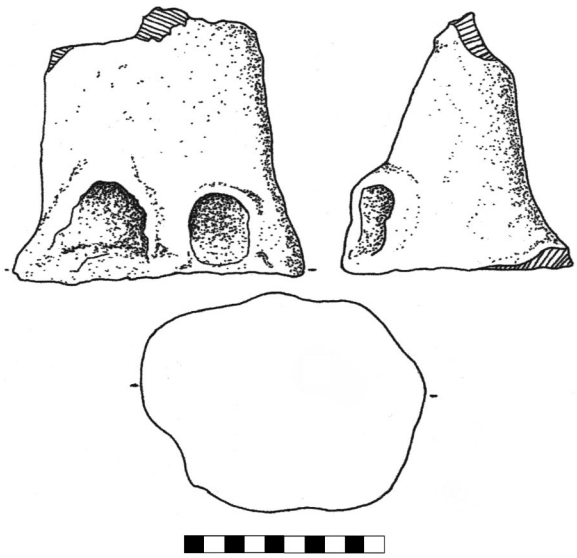


Figure 5.61. Raq 88 O-030.
Illustration prepared by Sally Dunham.

6. Raq 88 O-023. Figure 5.60. Post-level 1. Fragment of a massive object of roughly semicircular section. One flat side preserved, but whether this is the top or bottom is uncertain. Object narrows toward the opposite face, which is broken off. Lightly baked clay. 14 × 11 × 10 cm. Archon 42/108-010. Burial.
7. Raq 89 O-030. Figure 5.61. Level 3 or 4. Massive object of elliptical section. Base preserved. Narrows as rises, but narrower end broken. Two holes (ca. 4 cm in D.) near base on one side. Lightly baked or unbaked clay. H. 14 × D. 11 + 13.5 cm. Archon 30/120-035. Northwest silos. Area 4 (level 3 designation).
8. Raq 89 O-046. Level 4. Three fragments from a massive clay object, circular in section. The fragments do not join, but they probably derive from a single object. Lightly baked clay, gray-brown color. (a)9.2 × 5.0 × 65.cm; (b) 8.7 × 3.4 × 3.7 cm; (c) 4.3 × 2.9 × 2.5 cm. Archon 30/126-069. Area 52, phase a. Debris in room.
9. Raq 90 O-054. Level 4. Fragment of a massive rectangular object. Two corners preserved. Possibly fragment of an andiron. Baked, red clay with vegetal temper. L. 7.8 × W. 8.2 × H. 5.7 cm. Archon 42/114-208. Round Building, area 9, phase a. Debris in room.
10. Raq 90 O-056. Figure 5.60. Level 4. Fragments from a massive clay object. Widest end is rectangular in section. Narrower end broken; 6 cm from the widest end is a groove 2 cm wide. Perhaps the widest end is the bottom. Baked clay. L. 11.2 x. W. 8.6 × H. 8.2+ cm. Archon 36/120-176. From either Area 87, phase a (debris inside room) or Area 101, phase a (outside of architecture).
11. Raq 90 O-062. Level 4. Fragment of a solid clay object with sloping sides. Lightly baked clay. L. 7.0 × W. 4.3 × H. 3.2 cm. Archon 42/114-227. Area 31. Debris inside room.
12. Raq 90 O-067. Figure 5.60. Level 5. Massive clay object, perhaps originally a hexahedron. One end wider than other. Narrower end broken. Pierced with hole 2 cm in D. on its short axis. Baked clay. Coarse inclusions. 17.3 × 11.6 × 10.3 cm. Archon 36/120-229. Area 19, phase c. Debris inside room.
13. Raq 90 O-069. Level 3 or 4. Fragment of solid clay object of probably originally rectangular section at base and narrower at the top, which is broken. Lightly baked clay. L. 6.7 cm × H. 11.5 × W. 11.5 cm. Archon 42/102-117. Area 29 (Round Building, level 4). Debris outside architecture.
14. Raq 91-92 O-205. Level 3. Fragment from solid clay object. Elliptical base. One of the wider faces has a solid handle. Opposite face convex. Lightly baked clay (?). Surface orange-buff color. Coarse inclusions. 12.5 × 8.5 × 8 cm. Archon, unit 1400. Area 59.
15. Raq 91 O-401. Level 4. Solid clay fragment of triangular section. Wider end broken. Original surface of sloping sides preserved. Gray clay with lime inclusions and some black inclusions. Preserved height 11 cm. W. 11 cm. Archon 21.5/113, unit 2803, elevation 293.04. Area 75, phases b–c. Debris outside architecture.
16. Raq 89 O-402. Level 3. Fragment from andiron. Wt. 36 g. Found in sherd lot. Archon 42/108-035. Round Building Area 88, phase b. Brick installation.

Miscellaneous Clay Objects

Discussion of Miscellaneous Clay Objects

The 34 objects included in this section are those of which there is only one or a very few examples (from 1 to 5).[88] This discussion will examine the different groups, beginning with the four jar stoppers that were found. These occurred above level 3 (Raq 87 O-004), in level 3 itself (Raq 87 O-010 and Raq 91 O-127) and above level 5, area 18 (Raq 92 O-201). O-004 and O-201

are small ellipsoids (greatest diameter less than 5 cm) whose lower parts have smaller diameters than their upper parts, with a clear overhang between the two, which marked the place where the lower part protruded into the mouth of the jar. Raq 87 O-010, however, is a more massive truncated cone, 9 cm in diameter and 6.5 cm high, and can be compared to some gypsum jar stoppers/sealings found at Melebiya (Lebeau 1993: plate 199:10–13). Raq 91 O-127 is an irregular oblate shape which is similar in size to O-004 and O-201, but it does not have a clear ledge marking an upper and lower part, so its use as a jar stopper is not as certain.

Five objects were cylindrical. Raq 88 O-031 (Figure 5.65), from level 3, near an oven in area 75, is a solid, lightly baked clay cylinder, 25 cm high, with flaring ends, one of which is flat and one concave. When standing on the flat end, it tilts slightly. It can be compared to some similarly shaped objects from Early Dynastic contexts at Abu Salabikh and Khafajah which seem to have been pot supports,[89] so Raq 89 O-031 may have been used for the same purpose. Raq 89 O-032, from level 4, a much smaller baked cylinder (H. 3.4 cm) with slightly flaring ends, is paralleled in Ninevite 5 contexts at Tell Brak.[90] Similar objects found at Fara and Kurban Höyük are interpreted as spools.[91] The other three cylinders, Raq 90 O-64, Raq 90 O-076, and Raq 90 O-202, are less regularly shaped. Raq 90 O-064, which is completely preserved, is from a post–Bronze Age context.[92] Raq 90 O-076 and Raq 92 O-202, both from level 4, are roughly shaped cylinders broken at both ends.

Two objects are baked clay cones, Raq 89 O-042 and Raq 89 O-043, both found in the level 4, Round Building, in areas 15 and area 9, respectively. O-042 is a slender cone 5.8 cm long with one blunt and one broken end. O-043 is part of a cylinder with both ends broken, one of which is narrower than the other. Similar baked clay cones have been found in the Ninevite 5 levels of Matthews' excavations at Tell Brak.[93]

Raq 90 O-070 and Raq 90 O-077 are fragments of handles. Raq 90 O-070, from level 5, area 19, phase b, is a rectangular baked clay object with an elliptical section, flat bottom, and rounded top. On the top is an incised pattern of eight parallel rectangles enclosed between a top and bottom line. One end is broken, while the other end curves down slightly to a blunt point. The pattern of parallel rectangles can be compared to that on an object from an unbaked clay stand (?) found at Tell Brak.[94] O-077, from a wall in area 51, level 3, is an unbaked clay object of trapezoidal plan, the longest side of which is attached to a taller flat piece of clay that seems to have been the wall of some vessel. So possibly O-077 was a lug handle on a vessel.

Two objects are small loose bases. Raq 87 O-015 (Figures 5.63 and 5.64) comes from level 2, area 18, and is a carefully made baked clay base with a concave bottom and a broken conical top that is divided by four incised lines. Between the incised lines are small incised circles made with a hollow, circular tube-like tool such as a reed, or bone. The top narrows to 1.0 × 0.6 cm, where it is broken. The other base, Raq 90 O-066 was found in level 3, area 54. It is a small, handmade solid pedestal of unbaked gray clay base with flaring concave base and top.[95]

Five possible examples of clay lids were found: Raq 89 O-039 (Level 4; Round Building area 14); Raq 90 O-063 (Level 4; Round Building area 4); Raq 90 O-071 (Level 4; area 66); Raq 90 O-075 (Level 4; Round Building, area 2) and Raq 88 O-403 (Level 3 or 4; in area 5 of level 3). O-039 and O-071 are much smaller than the other three lids; while they could be lids for narrow-necked jars, this is far from certain. They are both of unbaked clay, and O-071 has a concave bottom, as if it had been pressed against the rounded outline of the shoulder of a jar. The other three examples (O-063, O-075 and O-403) are more probably lids. O-063 is a fragment of a flat lid with an arched handle in the middle, made of unbaked clay. Although the handle is completely preserved, only a small portion of the lid is preserved, so its original diameter could not be measured. Examples of this type in baked clay have been found at Telul eth-Thalathat, Tell Kutan, and at Tell al-Raqa'i.[96] Raq 90 O-075 is a fragment of a flat, baked clay object with a part of a curving edge, which can be determined to have originally had a diameter of ca. 16.5 cm. O-403 is part of a flat, baked clay disk 1.5 cm thick and 28 cm in diameter.[97]

Two miniature miscellaneous clay objects were found in level 4: a small spoon of unbaked gray clay, Raq 89 O-040 (Figure 5.68), and a miniature model of a stool, Raq 90 O-072 (Figure 5.70). The spoon is only 4.7 cm long with a straight handle ca. 1.1 cm in diameter and a bowl ca. 2 cm in diameter and 1.5 cm high. A larger spoon of the same type was found at Telul eth-Thalathat Mound V.[98]

The identification of Raq 90 O-072 as a model of a stool is tentative, since it has only two partially preserved legs, although stumps of the other two are clear. The furniture models discussed by Cholidis (1992) date to the late third to early second millennium and are quite different, and have molded decoration. A

small cylinder of black clay with tapering ends from area 22 of level 2 might be a small sling pellet (Raq 88 O-029). Another ceramic find is a sherd from a fenestrated pot stand, Raq 86 O-001 (from just under topsoil), which can be compared to one at Tell Brak dated to early Ninevite 5.[99] Raq 90 O-061, from area 32 of level 4, is a sherd from a wheelmade vessel that has been cut into a rectangular shape. Raq 90 O-68 is a curving rim fragment that gives the full profile of a circular (?) flat-based object of lightly baked clay, but the function of the object is unclear (tray, drain, hearth?). It was found in area 29 of the level 4, Round Building. Raq 89 O-033 from level 3, area 56, might be a broken bird figurine: an ovoid shape of baked clay has one convex side, which might be the bird's back (?), while the opposite side is flat with a cylindrical protrusion extending downward near one end (legs?). Above this, a broken area might be where the bird's neck was broken off. Raq 89 O-034 (Figures 5.66 and 5.67) is a carefully made lightly baked clay cube from area 9 in the level 4, Round Building. On each side is an incised square, while the top and bottom are plain.[100]

Found inside the area 1 silo of the level 4, Round Building, Raq 90 O-055 (Figure 5.69[101]) is a group of ca. 300 hard clay or stone balls.[102] Seventy-eight of these were registered and measured (D. 3.5–15 cm). Although it was difficult to tell whether these balls were soft stone or hard clay, some could be broken by hand. Finally, Raq 91 O-120 is a small fragment of worked clay with one broken end, while the other tapers to a blunt point. It was found in level 4, area 75, phase b–c, in a locus where tokens were found, but it does not match any token shape known to the author. The object might be a fragment from an animal figurine, but this is also uncertain.

Distribution of Miscellaneous Clay Objects

Table 5.5 shows the distribution of those items that were found in clear stratigraphic context. Fourteen derive

Table 5.5. Miscellaneous Clay Objects.

Object #	Description	Level	Archon	Area of site	Area/room
Raq 86 O-0001	Sherd from a potstand	Above 3	36/114-013	West	Above area 20, level 3
Raq 87 O-004	Jar stopper	Above 3	30/108-022	Temple area	Above area 21, level 3
Raq 87 O-010	Jar stopper	3	30/126-026	West	7, phase d
Raq 87 O-015	Incised lid/base	2	29/114-017	North	18
Raq 88 O-029	Sling pellet	2	30/102-019	Temple area	22
Raq 88 O-031	Cylinder w/ flaring ends	3	42/84-009	East	75
Raq 89 O-032	Possible spool	4	30/120-048	Northwest	100
Raq 89 O-033	Possible bird figurine	3	29/126-050	West	56
Raq 89 O-034	Incised clay cube	4	42/114-134	Round Bldg	9, phase b
Raq 89 O-039	Small lid (?)	4	42/114-167	Round Bldg	14
Raq 89 O-040	Miniature spoon	4	42/114-167	Round Bldg	14
Raq 89 O-042	Broken clay cone	4	42/114-164	Round Bldg	15, phase c
Raq 89 O-043	Broken tapering cylinder	4	42/114-178	Round Bldg	9, phase a
Raq 90 O-055	300 hard clay spheres	4	42/102-094	Round Bldg	1
Raq 90 O-061	Potsherd cut as a rectangle	4	42/114-234	South of Round Bldg.	32
Raq 90 O-063	Clay lid handle	4	48/108-093	Round Bldg	4
Raq 90 O-066	Small pedestal base	3	29/132-047	West	54
Raq 90 O-070	Incised handle	5	36/120-249	West	19, phase b
Raq 90 O-071	Lid fragment?	4	29/126-155	North	66
Raq 90 O-072	Miniature stool?	4	30/108-119	North	82, phase b
Raq 90 O-075	Fragment from small lid	4	42/102-147	Round Bldg	2
Raq 90 O-076	Broken clay cylinder	4	48/108-126	Round Bldg	26
Raq 90 O-077	Unbaked lug handle	3	29/126-063	West	51
Raq 91 O-120	Small broken object	4	21.5/114u2805	North	75, phase b–c
Raq 91 O-127	Jar stopper	3	29/114u0447	Temple area	61
Raq 92 O-202	Clay cylinder	4	48/108-530	South of Round Bldg.	108
Raq 88 O-403	Part of a flat clay lid	3 or 4	30/120-042	West	5 of level 3

from level 4, seven from level 3, two from level 2, and only one from level 5. Of the items in level 4, nine were found in the Round Building. This situation may be a result of the deeper deposit of level 4, which hence had better preservation, and the fact that the Round Building was a center of activity for the community.

CATALOGUE OF MISCELLANEOUS CLAY OBJECTS (FIGURES 5.62–5.70)

1. Raq 86 O-0001 (86). Above level 3, under topsoil (unclear if there are any level 2 strata between level 3 and topsoil in this area). Sherd from a fenestrated pot stand. Complete profile. Part of a rectangular opening 4 cm high is preserved at each side edge of the sherd. Baked clay. Chaff and lime temper. Gray core. Orig. D. 9 × H. 9.4 × Th. 1.2 cm. Archon 36/114-013. Over level 3 area 20. Debris above architecture (likely to be of uncertain level). Comparanda: Oates, Oates and McDonald 2001: figure 462, no. 1599 (early Ninevite 5); no. 1603 (Akkadian period).
2. Raq 87 O-004. Above level 3 under topsoil (unclear if there are any level 2 strata between level 3 and topsoil in this area). Jar stopper. Sphere whose lower part has a smaller diameter than the upper part, with a clear overhang between the two. Medium fired buff colored clay with fine sand, lime and plant temper. D. 2.8 +2.1 cm. Wt. 18 g. Archon 30/108-022. Over level 3 area 21. Debris above architecture (likely to be of uncertain level).
3. Raq 87 O-005. Figure 5.62. Topsoil. Oil lamp. Nearly complete. Upper side is decorated with radiating incisions. Traces of burning at the nozzle. Concave disk base. Baked clay, plant and lime temper, medium fired. L. 11.4 × W. 6.0 × H. 3.5 cm. Rim D. 1.6 cm. Nozzle 1.5 cm. W. nozzle 2.1 cm. W. handle 2.5 cm. Wt. 86 g. Archon 29/108-001. Comparanda: Ploug 1986:112, figure 38.
4. Raq 87 O-008. Level 3. Ceramic slag. Rim sherd, rounded outward. Green, vitrified clay. Plant and lime tempered. L. 3.0 × W. 2.0 × Th. 0.5 cm. Original D. 8.0 cm. Archon 30/126-013. Area 7, phase e. Debris outside architecture.
5. Raq 87 O-010. Level 3. Jar Stopper. Rough truncated cone shape. Broken on one side. Unbaked red-brown clay. Fine sand temper. H. 6.5 × D. 9.0 cm. Archon 30/126-026. Area 7, phase d. Outdoor surface.
6. Raq 87 O-015. Figures 5.63 and 5.64. Level 2. Possible lid or statue base. A circular base with a slightly concave bottom and a conical top that is divided by four incised lines, between which are incised dots, made by a hollow, circular tool such as a reed, a straw or a bone. The top narrows to 1.0 × 0.6 cm where it is broken. Baked clay. H. 2.5 × D. 4.6 cm. Archon 29/114-017. Area 18. Debris outside architecture.
7. Raq 88 O-024. Post-level 1. Die (one of a pair). Has standard pattern of numbers; opposite sides are: 5–2; 3–4; 6–1. Unbaked clay. L. 1.4 × W. 1.4 × H. 1.4 cm. Archon 30/102-003. Late burial.
8. Raq 88 O-025. Post-level 1. Bowl of a clay pipe. Decoration (top to bottom): notched border; two plain ridges with a row of dots in between them; a broad band of crosshatching; a band of raised ovals surrounded by dots; another band of crosshatching; small notches; and a palmette on the bottom of the bowl. Mold-made. L. (includes part of pipe stem) 4.5 × H. 4.8 × D. 3.0 cm. Archon 36/96-002. Late burial.
9. Raq 88 O-029. Level 2. Cylinder with tapering ends. Small sling pellet? Hard, lightly baked? Clay. L. 4.8 × D. 1.5 cm. Archon 30/102-019. Area 22. Debris outside architecture.
10. Raq 88 O-031. Figure 5.65. Level 3. Solid clay cylinder with flaring ends. One end is flat (D. 9.3 cm). The other end is concave (D. 8.0 cm). The shaft gets thicker toward the flat end. When the object is stood on its flat end the shaft leans slightly one way. Lightly baked clay. H. 25 cm; D. of shaft 5.3–5.9 cm. Archon 42/84-009. Found next to oven. Area 75.
11. Raq 89 O-032. Level 4. Cylinder with flaring ends. One end (D. 2.8 cm) is broken. The other end has a concave base. Gray-brown baked clay. H. 3.4 × D. (shaft) 2.6 × D. (unbroken end) 2.8 cm. Archon 30/120-048. Area 100. Debris outside architecture.
12. Raq 89 O-033. Level 3. Possible bird figurine (?). Oval piece of shaped clay with one pointed end. One long face is convex (the bird's back?), while the opposite face is flat. Near the wider end of the flat face a cylinder extends down vertically but is broken. The wide end begins to form a cylinder (beginning of a neck?) but is broken. Lightly baked or unbaked clay. L. 4.0 × W. 2.5 × H. 3.0 cm. Archon 29/126-050. Area 56. Debris inside room.
13. Raq 89 O-034. Level 4. Figures 5.66 and 5.67. Small cube with a square incised on each side, but nothing on the top or bottom. Lightly baked clay. L. 3.0

Figure 5.62. Raq 87 O-005, terracotta oil lamp. *Photograph by Hans Curvers.*

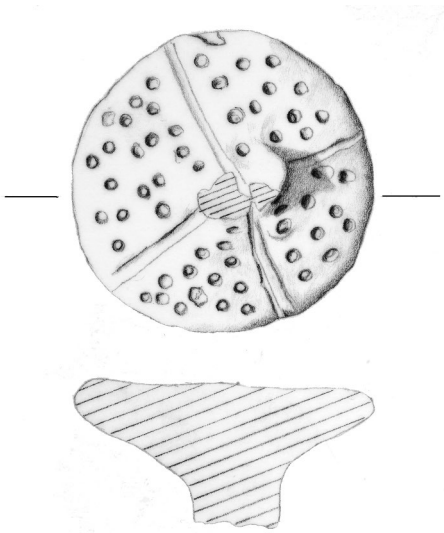


Figure 5.63. Raq 87 O-015.
Illustration prepared by Khaled al-Hamad.

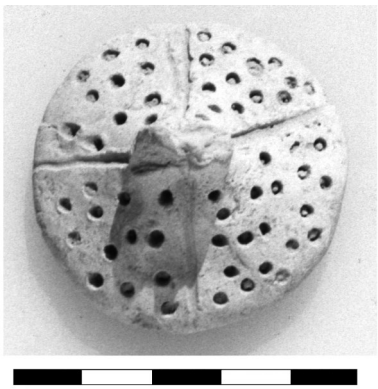


Figure 5.64. Raq 87 O-015.
Photograph by Sally Dunham.

Figure 5.65. Raq 89 O-031.
Photograph by Hans Curvers.

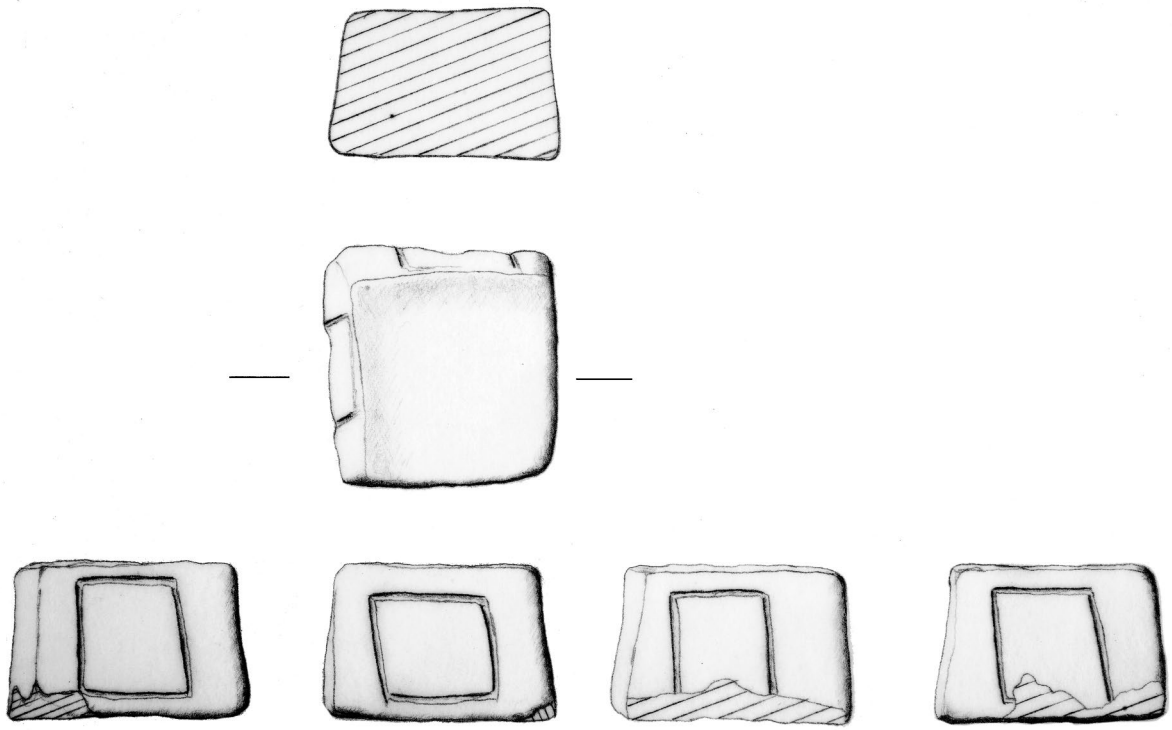


FIGURE 5.66. Raq 89 O-034. *Illustration prepared by Khaled al-Hamad.*

FIGURE 5.67. Raq 89 O-034. Clay cube with incised squares on its sides. *Photograph by Anwar ʿAbd al-Ghafour.*

× W. 2.5 × H. 2.0 cm. Archon 42/114-134. Area 9, phase b of Round Building. Debris inside room.

14. Raq 89 O-039. Level 4. Lentil-shaped piece of clay. One face is slightly convex. Opposite face is slightly gabled and has a square indent in the center. Possibly a small lid? Unbaked clay. D. 4.3 × H. 1.2 cm. Archon 42/114-167. Area 14, Round Building. Debris inside room.
15. Raq 89 O-040. Figure 5.68. Level 4. Handmade miniature spoon. Lightly baked (?) gray clay. L. 4.7 × W. 1.7 × H. 0.5 cm. Archon 42/114-167. Area 14, Round Building. Debris inside room.

Figure 5.68. Raq 89 O-040, miniature clay spoon. *Photograph by Sally Dunham.*

Figure 5.69. Raq 90 O-055 (sample). *Photograph by Sally Dunham.*

16. Raq 89 O-042. Level 4. Clay cone with a blunt end. The other end is broken. Possibly part of a handle (?) Or architectural decoration? Unbaked clay. L. 5.8 × max. D. 2.3 cm. Archon 42/114-164. Area 15, phase c, Round Building. Debris inside of room.
17. Raq 89 O-043. Level 4. Piece of a cylindrical object. One end slightly narrower than the other. Both ends are broken off. Outside looks as if it had been smoothed and slightly polished. Possibly part of a handle (?) Or architectural decoration? Lightly baked clay. Gray interior. Max. D. 2.8 × L. 5.5 cm. Archon 42/114-178. Area 9, phase a, Round Building. Debris inside room.
18. Raq 90 O-055. Figure 5.69 (sample). Level 4. Ca. 300 hard clay spheres. Irregularly shaped. Clay, sun-dried to a very hard consistency. It was difficult to tell if they were soft stone or very hard clay. Some seemed were breakable by hand. D. 3.5–15 cm. Archon 42/102-094. Area 1 in Round Building. Fill in silo.
19. Raq 90 O-061. Level 4. A wheelmade potsherd that has been intentionally shaped into a rectangle. Buff surface color. Buff fabric, grit temper. L. 4.5 × W. 2.8 × H. 0.7 cm. Archon 042/114-234. Area 32. Debris outside architecture.
20. Raq 90 O-063. Level 4. Part of an unbaked clay lid. Several sherds which fit together to form an arching handle which is attached to a fragment of a flat clay lid. The handle has a circular cross-section 3 cm in diameter. The preserved part of the "lid" is 2.0–2.4 cm thick. The handle curves up to 4.5 cm above the flat top of the lid, and leaves an arching hole, 2 cm high above the flat top of the lid. Archon 48/108-093. Area 4 in the Round Building. Debris in room/silo. Overall dimensions: L. 12.6 × W. 8.5 × H. 7.5 cm. Comparanda: Chapter 4, Figure 4.31:25.
21. Raq 90 O-064. Post-level 1. Roughly shaped cylinder with one blunt end and one flat end. Unbaked clay. Sand temper. L. 18 × D. 5.5 cm. Archon 48/108-095. Pit filled with mudbrick fragments.
22. Raq 90 O-066. Level 3. Small, solid pedestal base with flaring concave base and top. Handmade. Unbaked, dark gray clay. H. 2.8 × max. D. 2.8 cm. Archon 29/132-047. Area 54. Debris outside architecture.
23. Raq 90 O-068. Possible mix of level 4 and later. Two fragments of a tray (or drain?). The fragments join to give a profile from rim to base, but the plan of the object is uncertain. Baked clay. L. 19.2 × W. 8.5 × H. 10.9 cm. Archon 42/102-114. Area 29, level 4, Round Building. Debris from presumed unroofed area in Round Building.
24. Raq 90 O-070. Level 5. Baked clay object, rectangular in plan and oval in section. One face (the bottom?) is flat, while the opposite face is convex. The convex side is incised with incised lines that form eight parallel rectangles. One end widens and curves down slightly. The other end is broken, so this object was part of a larger object. Perhaps a handle? Brown, baked clay. L. 4.6 × W. 3.1 × H. 1.4 cm. Archon 36/120-249. Area 19, phase b. Debris outside architecture.
25. Raq 90 O-071. Level 4. About one quarter of a circular object with a flat base and a top that rises to a very narrow part. Possibly part of a small lid? Unbaked, dark gray clay. L. 2.5 × W. 2.5 × H. 2.0 cm. Archon 29/126-155. Area 66. Debris inside room.
26. Raq 90 O-072. Figure 5.70. Level 4. A small square object with two partially preserved legs. From the broken places on its underside, perhaps it originally had four legs. A miniature seat or table? Unbaked clay. L. 3.2 × W. 3.4 × H. 2.4 cm. Archon 30/108-119. Area 82, phase b. Debris outside architecture.

FIGURE 5.70. Raq 90 O-072, miniature clay stool. *Photograph by Sally Dunham.*

27. Raq 90 O-075. Level 4. Flat fragment of baked clay with one curving edge. One face is very flat and the opposite face is slightly convex. Perhaps a piece from a clay lid. Gray baked clay. Handmade. L. 6.7 × W. 2.6 × H. 1.0 cm. Archon 42/102-147. Area 2, Round Building. Debris in silo.
28. Raq 90 O-076. Level 4. Clay cylinder. Broken at both ends. Roughly shaped. Unbaked clay. L. 8.1 × D. 4.6 cm. Archon 48/108-126. Area 26, Round Building. Debris inside room.
29. Raq 90 O-077. Level 3. A flat, trapezoidal object. One long edge is rounded, while the opposite edge is pressed flat as if it had attached to some object. Possibly a lug handle of an unbaked vessel? Unbaked gray clay. L. 6.1 × W. 3.3 × Th. 1.5 cm. Archon 29/126-063. Area 51. Inside wall.
30. Raq 91 O-120. Level 4. Fragment of worked clay with one broken face that tapers slightly to a round blunt end. Tan clay. Lightly baked? L. 1.4 × W. 1.3 × H. 1.1 cm. Archon 21.5/114, unit 2805, elevation 293.04. Area 75, Phases b–c.
31. Raq 91 O-127. Level 3. Several fragments which fit together to form part of an oblate shaped object. Possibly a jar stopper. Burned gray and tan clay. L. 4.8 × W. 4.9 × H. 2.7 cm. Archon 29/114, unit 0447. Area 61.
32. Raq 92 O-200. Between levels 3 and 4. About one half of a flat semicircle. Plano-convex section. Baked clay, gray outside, with pink/gray core with coarse black grits. L. 2.7 × W. 2.5 × H. 0.7 cm. Archon 29/120–532. Debris above area 70, level 4.
33. Raq 92 O-201. Level 4 or 5. Jar stopper. Oblate-shaped object. Near the widest diameter is a shallow groove as if it had been pressed against the rim of a jar. One edge is slightly chipped. Hardened, unbaked clay. Brown color, with black grits. D. 4.1 × 2.9 cm. Archon 42/114N-009. Over area 18, level 5. Debris below or above architecture.
34. Raq 92 O-202. Level 4. Handmade clay cylinder. One end is broken; the other end is smooth. Body of slightly irregular shape. Reddish-brown baked clay, dark brown grits. L. 6.3 × D. 3.1 + 3.5 (elliptical section). Archon 48/108–530. Area 108. Debris outside architecture.
35. Raq 88 O-403. Level 3 or 4. Part of a flat clay disk (lid?), poorly fired and containing large, plastic inclusions. D. 28 cm. Th. 1.5 cm. Archon 30/120-042. Area 5 of level 3. Debris in silo.

METAL OBJECTS

Ninety metal objects were registered for the seasons 1986–1992 at Raqa'i, of which 70 are "bronze," 16 are iron, 1 is lead, and 3 are silver. Most of these are fragmentary and some are too badly preserved to identify what the object originally was. The catalogue and discussion are arranged according to material ("bronze," iron, lead, and silver);[103] within each section, the discussion is ordered according to the catalogue number assigned in the field.

The twelve artifacts analyzed by Franke, Pigott, and Nash (Chapter 8) are indicated in the catalogue. Lead isotope analysis done on four artifacts suggests the source of their materials was one of the ore fields north of the Bolkardağ valley in the Taurus Mountains (M-014, M-016; Yener et al. 1991) or the Black Sea region of Anatolia (M-001, M-0015 [Raq 86]) (Yener, personal communication).

"BRONZE" OBJECTS

The most complete metal objects from Bronze Age contexts were articles of personal adornment: toggle pins and spiral rings. Although nine toggle pins were recovered, only one was found in a primary context (see Figures 5.71–5.73).[104] This is M-016, discovered on the chest of a child skeleton in Burial 30 of level 2. Unfortunately, only the shaft of this pin was preserved.[105] A well-preserved pin, M-003 (Figure 5.72), was found under the bricks of a blocked doorway in level 2 (see Chapter 2). This pin has a bend above the hole in the shaft and a spherical head. In Klein's 1992 study of Bronze Age pins, this is type I.8.A.3a (or b), a form very characteristic of Early Bronze Age Syria where examples have been found in graves at Halawa,

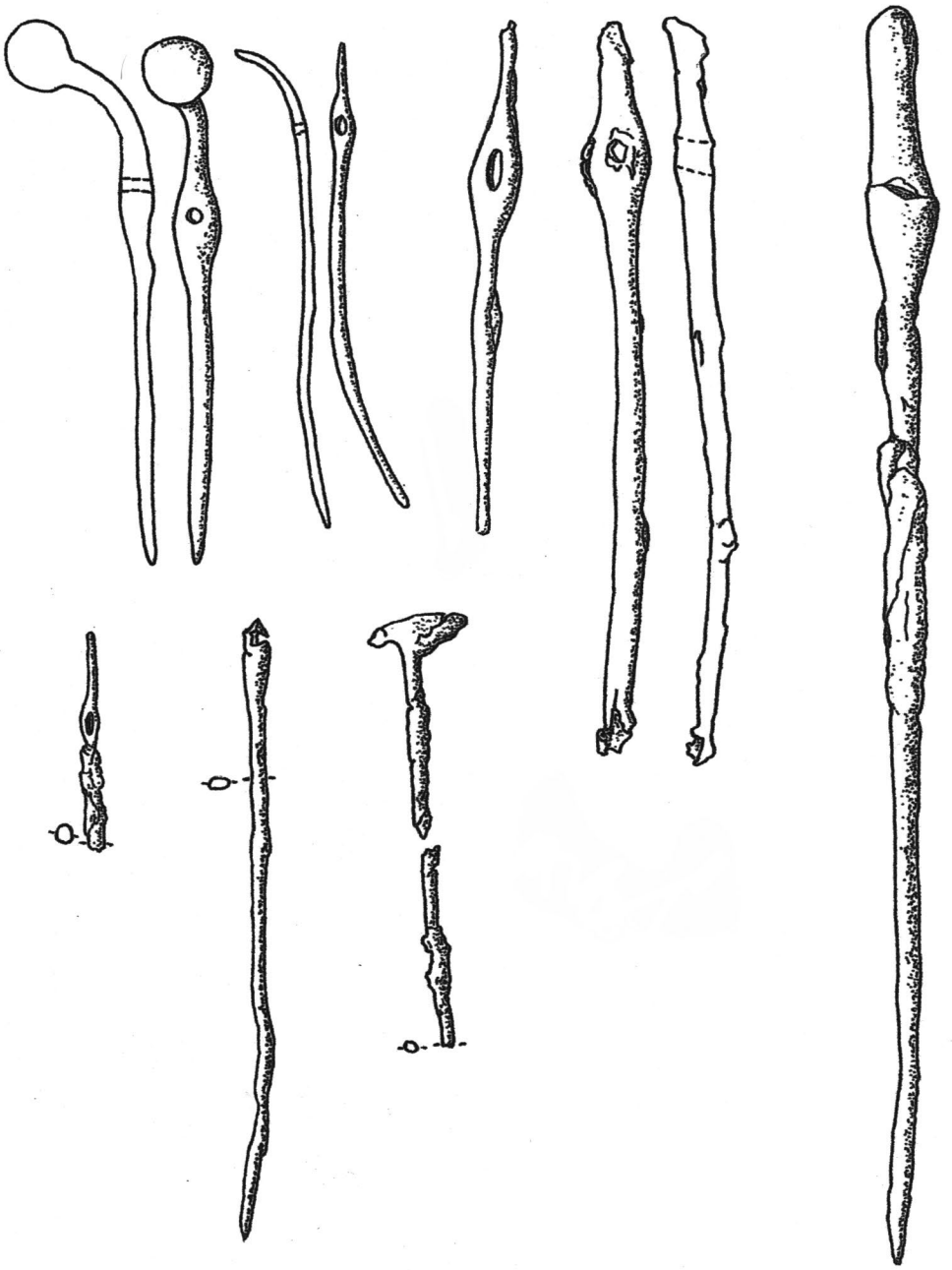


FIGURE 5.71. Top row, left to right: Raq 87 M-003; Raq 87 M-006; Raq 90 M-045; Raq 90 M-048; Raq 90 M-049; bottom row, left to right: Raq 88 M-024; Raq 88 M-030; Raq 88 M-032. See Catalogue for dimensions. *Illustration prepared by Sally Dunham.*

FIGURE 5.72. Raq 87 M-003, toggle pin. *Photograph by Hans Curvers.*

FIGURE 5.73. Raq 87 M-006, toggle pin. *Photograph by Hans Curvers.*

Chuera, Tawi, Mashnaqa, Selenkahiye, Til Barsip, Wreide (Klein 1992:78), and Beydar.[106] Raq 88 M-024 (Figure 5.71), another pin from level 2, has only the head and the upper part of the shaft preserved. It seems to be Klein's type I.1.A.2a, although this type has only been found in western Syria, except for one example from Chuera (Klein 1992:33). A similar pin, Raq 87 M-006 (Figure 5.73), from either level 2 or 3, is a toggle pin with a pointed head. This is Klein's type I.1.A.3a, which is found only in Syria in the third millennium, especially at Carchemish.

A pin from level 3, M-030 (Figure 5.71), has a partly preserved hole near its top. It is similar to Klein's type I.1.A.1a, which is found in Mesopotamia, Iran, and North Syria, although in the last third of the third millennium (Klein 1992:32). M-032 (Figure 5.71), a fragmentary pin with a wide, slightly curved head, has no visible hole, but the place on the shaft where the hole might have been is covered with much corrosion. This pin can be compared to a pierced example from a Ninevite 5 grave at Chagar Bazar (Mallowan 1936: figure 8, 8; Klein's type I.9.A.1a) or to unpierced pins of fourth to third-millennium date from Tepe Hissar, Iran (Klein 1992:84 and plate 102:8–10). Since M-032 was found in area 47 of the level 3, Round Building, it may have originally belonged to Burial 18, found against the northwest wall of this area. M-045, M-048, and M-049 (Figure 5.71) are all examples of Klein's type I.3.A.1a, a type that can be paralleled in a Ninevite 5 grave at Chagar Bazar (Klein 1992:42; Mallowan 1936: figure 8:5). M-045 (Figure 5.83) was associated with level 3 burial 19, which was intrusive into area 6 of the level 4 Round Building. M-048 (Figure 5.85) and M-049 were also found in this small room and may belong to burial 19 as well. Another pin from level 4 area 6, M-046 (Figures 5.74 and 5.84) may likewise derive from this burial. This pin has a flat triangular head with a wide top edge that is rolled over. Only the head and the beginning of the shaft are preserved, but it is clearly Klein's type l.14.B.6a (see also Klein 1992: plate 128). Examples of this type have been found in Syria (Tell Aswad, Tell Chuera, and Mari) and northern and southern Iraq (Tell Fisna, Abu Salabikh, Khafajah, and Ur). Complete specimens do not have a hole, and evidence from Ur suggests they were worn on the head (cf. Klein 1992: 130; Woolley 1934:241). They occur later in the third millennium as well as in the Ninevite 5 period. An example of this type of pin was also found in the terminal phase of the Kura-Araxes culture at Geoy Tepe in Transcaucasia (Burton-Brown 1951:34, 47, no. 1204; Sagona 1984:121).

Six spiral rings were found. Two came from secondary contexts (M-010, M-037), while the rest were found in two child burials of level 2 (burials 24 and 27). M-010 (Figures 5.74 and 5.75) was found between two bricks of level 2 wall 1B, the same wall that contained toggle pin M-003. M-37 was found among the stones of the architectural remains of level 1. Since the stone masonry of this level was sunk into levels 3 or 4 to a depth of as much as one meter, very possibly M-037 could have been transferred here with dirt removed for the construction of the level 1 building. In Burial 24 of level 2, the spiral rings M-042 and M-043 (Figures 5.74 and 5.82) were placed on either side of the skull. M-042 and M-043 consisted of one spiral ring with two curving fragments from a second spiral stuck by corrosion inside. In burial 27, the spiral ring M-054 (Figure 5.74) was on the right shoulder. This spiral ring had another complete specimen inside it.

Spiral rings like these examples from Raqa'i are known from third-millennium contexts at numerous sites in Mesopotamia, northern Syria, Iran, Anatolia, and the Caucasus.[107] They occur in silver and gold as well as bronze, and they can be much larger than those found at Raqa'i.[108] Sometimes the ends are very tightly overlapping and sometimes slightly spread apart, but it is difficult to ascertain whether this was intentional or the result of use or damage after the ring was buried. At Ur, examples were found where one spiral ring was linked to another (Woolley 1934: plate 219, type 3).

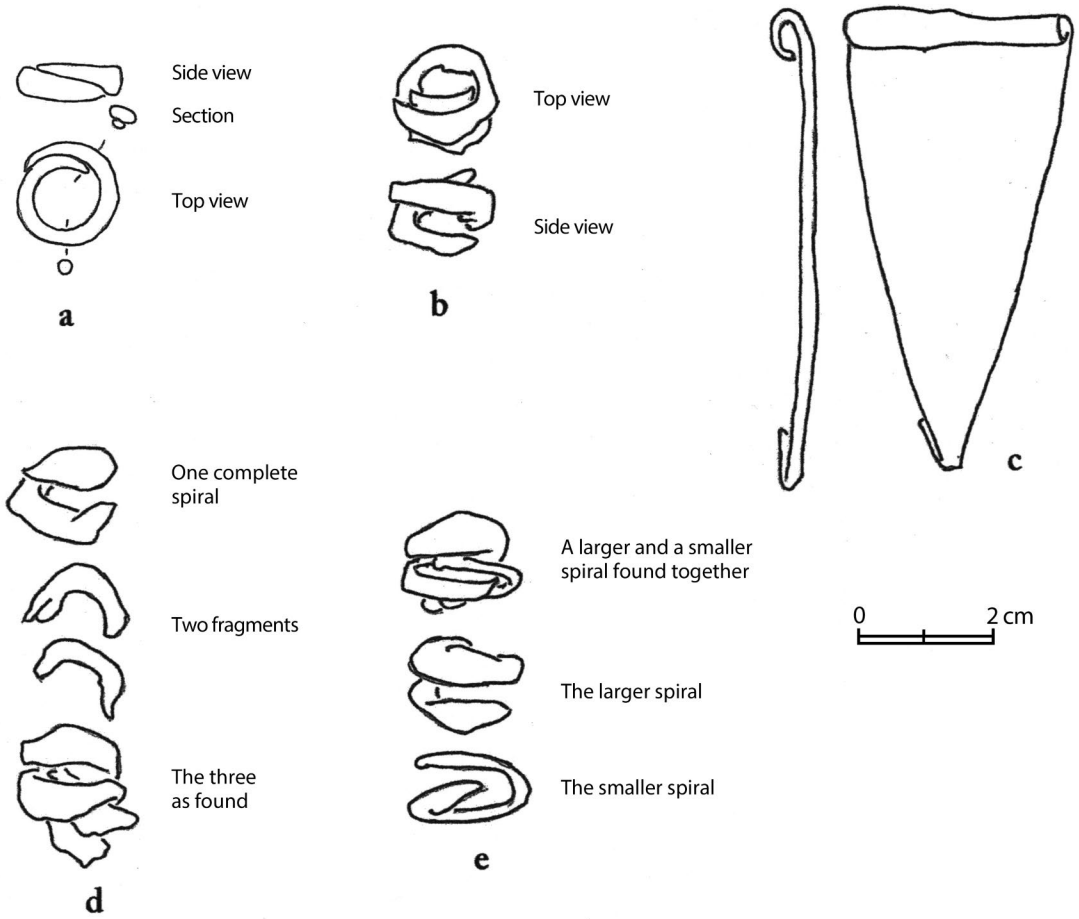


Figure 5.74. (a) Raq 87 M-010; (b) Raq 89 M-043; (c) Raq 90 M-046; (d) Raq 89 M-042; (e) Raq 90 M-054. *Illustration prepared by Sally Dunham.*

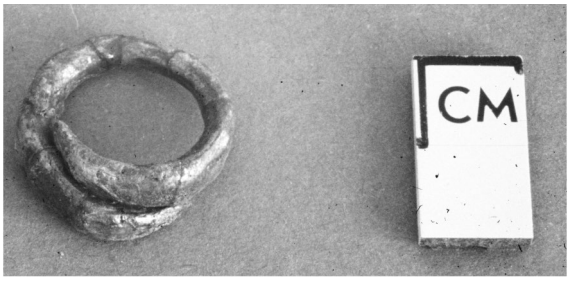


Figure 5.75. Raq 87 M-010, spiral ring. *Photograph by Hans Curvers.*

Since M-042, M-043, and M-054 had smaller spiral rings inside, they may have been were worn like the Ur examples. In one grave at Tell Biʿa, small spirals were arranged in a vertical line above a large spiral on either side of the skull (Strommenger and Kohlmeyer 1998: 42–43, plate 49 and 165 (5, 8), grave 25/48; 5). Whether many of the examples were used for ear decoration or hair decoration is uncertain.[109] The Raqa'i examples seem most comparable to examples from Tell Brak, Tell Chuera, Munbaqa, and Norşuntepe.[110]

The rest of the metal objects from levels 2, 3, and 4 are very fragmentary. M-001, from the level 3 temple, is a piece of a thin curving rod of almost pure copper (Chapter 8, this volume). It might be part of a bracelet, but this is very uncertain.

The bronze finds from topsoil, post-level 1 and level 1 are fragments, personal ornaments (finger rings, an earring, and fragments of bracelets), nails, and small tools such as M-0011 (86), a spatula. As Curvers (1987) notes, this spatula can be compared to examples from neo-Assyrian and Hellenistic levels at Nimrud (Stronach 1958: plate 36:12 and 13). It also resembles two objects called "styli" from the Graeco-Roman town at Hama (Ploug 1985:219 and figures 53d, 55g).

DISTRIBUTION OF "BRONZE" OBJECTS

Tables 5.6 and 5.7 show the details for the pattern of distribution of metal objects mentioned above—that in the northwest area of both levels 3 and 4 there is a concentration of metal artifacts along with administrative artifacts, perhaps suggesting the higher status of the inhabitants of this area.[111]

IRON OBJECTS

Probably all but one of the iron objects recovered post-date level 1. M-033 (see Figures 5.86, 5.87), a much corroded spearhead, was found in an intrusive pit in the upper part of the west wall of the level 3 temple and might belong to level 1. The overall shape of M-033 seems to be "leaf-shaped" (cf. Gjerstad 1948:130, type 2). A midrib can be discerned on one side, but the socket end is broken and has too much corrosion to reveal whether it was a hollow socket or a solid tang.

The iron objects said to come from archons of uncertain level[112] ("above level 2, under topsoil" (M-0009 [86]); "above level 3, under topsoil" (M-0014 [86]); "level 2 or level 3" (M-0015 [86] and M-035); "Level 3 or above" (M-009)) are probably intrusive from post–Bronze Age levels, since the uncertainty implies that the context is not clearly sealed from the soil above, and the level 2 remains were often fragmentary and seriously disturbed by later burial pits and erosion. Three objects derive from archons assigned to level 4 (M-044 and M-047) and level 3 (M-031), but these objects are also very likely intrusive. M-044 and M-047 come from loose ashy fill in area 7 of the level 4 Round Building. In this location, however, a rain gulley had cut deep into the surface of the mound, damaging the southern wall of area 7. M-031 was found in the fill of area 47 of the level 3 Round Building. In this area were many late burials post-dating the Bronze Age architecture, and at least one reached down far enough to cut the southeast wall of area 47, while another intruded into the area south of the area 47 doorway to this area (see Chapter 2, Figure 2.155).

TABLE 5.6. "Bronze" Finds, Level 3.

Object #	Area of Site	Area/room
Raq 89 M-039	West center	95, burial 17
Raq 88 M-064	Northwest	11
Raq 88 M-019	Northwest	14
Raq 88 M-020	Northwest	14
Raq 89 M-034	Northwest	56
Raq 91 M-056	Temple area	15, phase c
Raq 91 M-057	Temple area	15, phase c
Raq 91 M-063	Temple area	15, phase c
Raq 91 M-065	Temple area	Inside wall 15B/16D
Raq 87 M-001	Temple area	21
Raq 91 M-058	Temple area	61
Raq 88 M-030	Northeast	33, phases d–e
Raq 87 M-014	Southeast	42, phase a
Raq 88 M-032	Round Bldg	47, phase b
Raq 88 M-018	Round Bldg	87, phase b, oven 87B
Raq 90 M-045	Round Bldg (level 4)	6, intrusive burial 19
Raq 90 M-046	Round Bldg (level 4)	6, intrusive burial 19
Raq 90 M-048	Round Bldg (level 4)	6, intrusive burial 19
Raq 90 M-049	Round Bldg (level 4)	6, intrusive burial 19

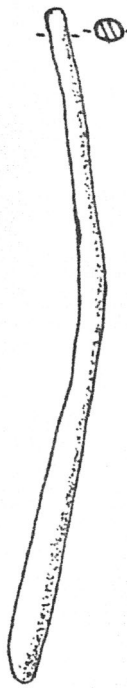
TABLE 5.7. "Bronze" Finds, Level 4.

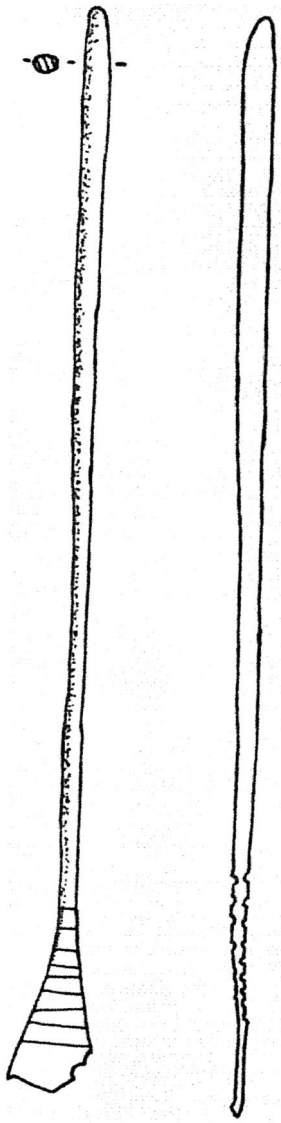
Object #	Area of site	Area/room
Raq 89 M-038	Round Bldg	19
Raq 90 M-055	Round Bldg	20
Raq 92 M-200	Round Bldg	90, phase b
Raq 90 M-052	Southwest	64
Raq 89 M-036	West	46, lime plaster bin 46I
Raq 89 M-040	West center	60, phase b
Raq 89 M-041	West center	60, phase b
Raq 90 M-050	North center	83
Raq 91 M-061	North	70
Raq 91 M-062	North	74, phase b–c
Raq 91 M-066	North	74, phase b–c
Raq 91 M-067	North	74, phase b–c
Raq 91 M-059	North	75, phase b–c
Raq 91 M-068	North	75, phase b–c
Raq 91 M-060	North	76, phase b–c

CATALOGUE OF METAL OBJECTS (FIGURES 5.76–5.87)

"Bronze"

1. Raq 86 M-0001 (86). Topsoil. A flat metal strip, 1.5 cm wide, which has been folded to form a teardrop shaped loop. At the end away from the folded edge both ends have been pierced by a hole. L. 2.2 × W. 1.5 × H. 0.6 cm. Archon 42/116-003. Above area 83 of level 3. Published: Curvers 1987: figure 17, no. 88.
2. Raq 86 M-0002 (86). Figure 5.76. Topsoil. A cylindrical rod with a complete wider round end and a broken narrower end. L. 9.1 × D. 0.25–0.4 cm. Archon 36/114-000. Published: Curvers 1987: figure 17, no. 86.





(Above left): FIGURE 5.76. Raq 86 M-0002 (scale 1:1). *Illustration prepared by Sally Dunham.*

(Above right): FIGURE 5.77. Raq 86 M-0011 (scale 1:1). *Illustration prepared by Sally Dunham.*

3. Raq 86 M-0003 (86). Above level 3, under topsoil. Unclear if there are any level 2 strata between level 3 and topsoil in this location. Small fragment of a cylindrical rod. Both ends are broken. L. 1.7 × D. 0.15 cm. Archon 36/120-001. Debris above architecture, uncertain level.
4. Raq 86 M-0004 (86). Topsoil. Shaft and pointed tip of a pin. Other end broken. L. 7.6 × D. 0.2 cm. Archon 36/120-002.
5. Raq 86 M-0005 (86). Topsoil. Nail with a broad head. Corroded, so uncertain if full length of shaft preserved. L. 3.8 × D. (shaft) 0.4–(head) 2.5 cm. Archon 36/114-001. Published: Curvers 1987: figure 17, no. 82.
6. Raq 86 M-0006 (86). Post-level 1. Piece of curved bronze rod of round section. Broken at both ends. If it was part of a bracelet, the diameter would have been 3 cm. L. 2.33 × D. of rod 0.3 cm. Archon 30/114-002. Late burial.
7. Raq 86 M-0007 (86). Post-level 1. Finger ring made of a wire lentoid in section. D. of ring 2.0 cm; D. of wire 0.3 + 0.1 cm. Archon 30/108-005. Late burial. On right hand of skeleton.
8. Raq 86 M-0011 (86). Figure 5.77. Above level 3, under topsoil. Unclear if there are any level 2 strata between level 3 and topsoil in this location. Spatula. A cylindrical rod which widens at one end to a broad flat triangle. On both faces of the triangular part are incised parallel lines from about halfway up the triangle to the first 0.2 cm of the shaft. L. 14 × W. 1.1 (triangular end) × D. (shaft) 0.3 cm. Archon 36/114-005. Published: Curvers 1987: figure 17, no. 85. Hellenistic.
9. Raq 86 M-0012 (86). Post-level 1. Ring made from a flat band with a flat bezel on which is incised a simplified image of a standing bird. W. of band 0.4 cm; bezel 1.2 × 1.0 cm; D. of ring 2.1 cm. Archon 36/120-008. Late burial. On third finger of left hand of skeleton. Published: Curvers 1987: figure 17, no. 84.
10. Raq 86 M-0016 (86). Post-level 1. Ring made from a cylindrical wire. At one place is a bulge—presumably where some decoration had been, but the whole ring is covered with green corrosion. D. 2.0 × Th. (of wire) 0.1 cm. Archon 36/114-006. Late burial. On right hand of skeleton. Published: Curvers 1987: figure 17, no. 83.
11. Raq 86 M-0018 (86). Possible mix of level 4 and later. One large and two small fragments of a much corroded rod shaped object which fit together. Copper (see Chapter 8, this volume). 11.5 × 0.8 × 0.4 cm. Archon 42/116-034. Above area 8 of level 4. Debris above architecture.
12. Raq 86 M-0019 (86). Above level 3, under topsoil (unclear if there are any level 2 strata between level 3 and topsoil in this location). Rectangular lump. L. 2.6 × W. 1.8 × H. 1.1 cm. Archon 36/114-013. Above area 20, level 3. Debris above architecture.
13. Raq 86 M-0020 (86). Possible mix of level 4 and later. Twelve small scraps. Largest piece 1.4 × 1.2 ×

0.2 cm. Archon 42/116-040. Above area 8, level 4. Debris above architecture.

14. Raq 86 M-0021 (86). Above level 3, under topsoil (uncertain if any level 2 strata between level 3 and topsoil in this location). Seven very small pieces and two longer pieces of a pin or rod. Arsenical copper (see Chapter 8, this volume). Longest fragments: 2.3–1.4 × D. 0.2 cm. Archon 30/114-027. Above area 18, level 3. Debris above architecture.
15. Raq 87 M-001. Level 3. Piece of a curved rod. Copper (see Chapter 8, this volume). L. 2.7 × D. 0.15. Wt. 1 g. Archon 29/108-005. Area 21. Debris inside room.
16. Raq 87 M-002. Post-level 1. Earring. Flat circular disk. One side has raised design of a triangle of three circles. Below this is a row of three circles, the middle of which is a hole. Loop for hanging on edge above the triangle of circles. Copper (?). L. 1.5 × W. 1.5 × Th. 0.1 cm. Archon 30/120-001. Late burial. Along the right side of the cranium.
17. Raq 87 M-003. Figures 5.71 and 5.72. Level 2. Complete bent-headed toggle pin with a spherical head. L. 10.3 × W. at hole 1 0.7 cm. Archon 42/116-047A. Area 1. Found in blocked doorway in wall 1B. Comparanda: Klein 1992:type I.8.A.3a (or b).
18. Raq 87 M-006. Figures 5.71 and 5.73. Above level 3, under topsoil (uncertain if any level 2 strata between 3 and topsoil in this location). Complete toggle pin with pointed, slightly bent head above the hole. L. 9.5 × D. 0.5 cm. Archon 36/114-022. Above area 20, level 3. Debris above architecture. Comparanda: Klein 1992:type I.1.A.3a.
19. Raq 87 M-007. Above level 3, under topsoil (unclear if there are any level 2 strata between level 3 and topsoil in this location). Rod fragment, circular in section. Arsenical copper (see Chapter 8, this volume). L. 4.3 × D. 0.15 cm. Archon 36/114-022. Above area 20, level 3. Debris above architecture.
20. Raq 87 M-008. Above level 3, under topsoil (unclear if there are any level 2 strata between level 3 and topsoil in this location). Flat piece of metal that narrows at one end. Arsenical copper (Chapter 8, this volume). L. 4.3 × W. 1.0–0.3 × Th. 0.5 cm. Archon 36/114-022. Above level 3, area 20. Debris above architecture.
21. Raq 87 M-010. Figures 5.74 and 5.75. Level 2. Spiral ring. One end overlaps the other for about one third of the circumference. The overlapping parts touch each other their full length. D. 1.7 + 1.6 × H. 0.2 cm. Wt. 3 g. Archon 42/116-047B. Area 1. Inside wall 1B.
22. Raq 87 M-011. Above level 3, under topsoil (unclear if there are any level 2 strata between level 3 and topsoil in this location). Flat fragment of roughly pentagonal shape. L. 1.7 × W. 1.6 × Th. 0.2 cm. Wt. 3 g. Archon 29/108-003. Above level 3, area 62. Debris above architecture.
23. Raq 87 M-012. Topsoil. Two pieces of curved wire with a square section. One piece has a knob-like end. Both have incised decoration of wedges, triangles and lozenges. L. 7.5 × Th. 0.4 cm. Archon 42/96-000.
24. Raq 87 M-013. Post-level 1. Complete finger ring made from a wire which is rectangular in section. D. 2.0 × Th. 0.2 cm. Archon 36/102-001. Late burial.
25. Raq 87 M-014. Level 3. Fragment arsenical copper "casting waste." (Chapter 8, this volume). L. 2.0 × W. 1.5 × H. 0.8 cm. Archon 48/90-021. Area 42, phase a. On floor.
26. Raq 87 M-015. Post-level 1. Thin metal rod. One end is bent back on itself. L. 1.6+ × D. 0.2–0.3 cm. Archon 36/102-010. Late burial.
27. Raq 87 M-016. Level 2. Shaft of a pin. Arsenical-antimonial copper (see Chapter 8, this volume). L. 12.5 cm. Archon 42/90-011. Area 26. Burial 30. Found on chest of skeleton. Burial 30 is published in Curvers and Schwartz 1990:14, Figure 16. .
28. Raq 88 M-017. Level 2. Fragment of a rod which is narrower at one end. L. 4.5 × D. 0.96 cm. Archon 29/120-027. Stone conglomeration surrounding area 14.
29. Raq 88 M-018. Level 3. A flat fragment. L. 2.8 × W. 2.1 × H. 2.0 cm. Archon 42/102-018. Area 87, phase b, in Round Building. Oven 87B.
30. Raq 88 M-019. Level 3. Fragment of a rod. L. 2.5 × D. 0.2 cm. Archon 29/120-050. Area 14. Debris inside room.
31. Raq 88 M-020. Level 3. Fragment of a rod. L. 2.6 × D. 0.5 cm. Archon 29/120-050. Area 14. Debris inside room.
32. Raq 88 M-021. Post-level 1. Finger ring, broken in three pieces, which join. One area has a flat, vertical protrusion. L. 2.4 × W. 1.9 × H. 0.2 cm. Archon 48/102-007. Late Burial.
33. Raq 88 M-023. Post-level 1. A finger ring with a very thin band (0.1 cm) and a bezel for mounting a stone (H. 1.4 × W. 1.1 cm). Stone not preserved. D. of ring 2.0 cm. Archon 29/126-005. Late burial.

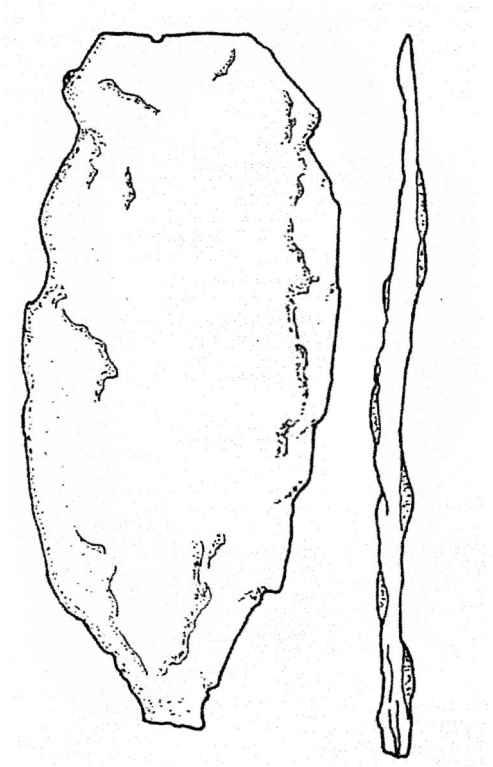


Figure 5.78. Raq 88 M-028 (9:10). *Illustration prepared by Sally Dunham.*

Figure 5.79. Raq 88 M-028, flat bronze blade. *Photograph by Hans Curvers.*

Figure 5.80. Raq 88 M-030, pin. *Photograph by Hans Curvers.*

34. Raq 88 M-024. Figure 5.71. Level 2. Head with a hole and top part of the shaft of a toggle pin. L. 4.2 × D. 0.3 cm. Archon 29/126-018. Area 15. Debris outside architecture. Klein type I.1.A.2a.
35. Raq 88 M-026. Post-level 1. Finger ring with flat band (H. 0.5 × Th. 0.1 cm) and a round bezel (D. 1.6 cm) set with a red and tan agate. "Bronze"/ agate. D. of ring 2.3 cm. Archon 29/126-005. Late burial.
36. Raq 88 M-028. Figures 5.78 and 5.79. Above level 2, under topsoil. Flat blade. Part of tang preserved. The other end may be broken as well. L. 10 × W. 4.5 × H. 0.3 cm. Archon 29/126-025. West of area 15 (level 2 designation). Debris above architecture, of uncertain level.
37. Raq 88 M-030. Figures 5.71 and 5.80. Level 3. Pin with partly preserved hole at thicker end. Original length uncertain. L. 11.7 × D. 0.3 cm. Archon 36/96-003. Area 33, phases d-e, inside wall. Comparanda: Klein type I.1.A.1a.
38. Raq 88 M-032. Figure 5.71. Level 3. Two larger and three very small fragments of a pin with a broad, round head. Shaft beneath head very corroded, so not sure if there was a hole. Original length unknown. L. 9.5 × D. (head) 1.2 cm. Archon 42/102-034. Area 47, phase b. Debris inside room. Comparanda: Klein 1992, type I.9.A.1a or I.9B.1a.
39. Raq 89 M-034. Figure 5.81. Level 3. Fragment of rod with a square section. The unbroken end ends

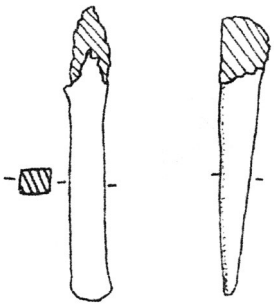


FIGURE 5.81. Raq 89 M-034 (scale 3:4). *Illustration prepared by Sally Dunham.*

FIGURE 5.82. Raq 89 M-042 (left) and M-043 (right), spiral rings. *Photograph by Anwar ʿAbd al-Ghafour.*

in a sharp edge, like a chisel. L. 4.8 × W. 0.6 × H. 0.6. Archon 29/126-050. Area 56. Debris inside room.

40. Raq 89 M-036. Level 4. Fragment. Amorphous shape. L. 0.6 × W. 0.6 × H. 0.6 cm. Archon 36/126-046. Area 46. In lime plastered bin 46I.
41. Raq 89 M-037. Level 1. Spiral ring, very corroded. H. 1.1 × D. 1.5 cm. Archon 49/108-038. Area 1. Stone conglomeration.
42. Raq 89 M-038. Level 4. Roughly cone-shaped corroded lump. L. 1.3 × W. 1.0 × H. 0.7 cm. Archon 42/108-055. Area 19. Debris in silo.
43. Raq 89 M-039. Level 3. Two fragments of a rod-shaped object. Uncertain whether they join. (a) L. 3.4 × D. 0.3 cm. (b) L. 1.3 × D. 0.5 cm. Archon 36/126-035. Area 95. Burial 17.
44. Raq 89 M-040. Level 4. Piece of a rod-shaped object with a square cross-section. L. 12.3 × W. 0.6 × H. 0.7 cm. Archon 36/120-132. Area 60, phase b. Debris outside architecture.
45. Raq 89 M-041. Level 4. Flattish corroded lump. L. 1.4 × W. 1.2 × H. 0.5 cm. Archon 36/120-129. Area 60, phase b. Debris outside architecture.
46. Raq 89 M-042. Figures 5.74 and 5.82. Level 2. One complete spiral ring with two curving fragments stuck, by corrosion, inside of it. H. 2.1 × D. 1.7 cm. Archon 29/132-012. Area 13. Burial 24.
47. Raq 89 M-043. Figures 5.74 and 5.82. Level 2. One complete spiral ring with a piece of another stuck, by corrosion, inside of it. Complete spiral: H. 1.2 × D. 1.7; Piece: L. 0.6 × D. 1.7 cm. Archon 29/132-012. Area 13. Burial 24.
48. Raq 90 M-045. Figures 5.71 and 5.83. Level 3. Fragment of a toggle pin. Most of the head, the hole and part of the shaft are preserved. Copper (Chapter 8, this volume). L. 9.5 × W. 0.9 × D. (of shaft) 0.4 cm. Archon 42/114-217. Above Area 6, level 4, Round Building. Burial 19. Comparanda: Klein 1992:type I.3A.1a, plate 61:3 (= Mallowan 1936: figure 8, 5 from burial 70.).
49. Raq 90 M-046. Figures 5.74 and 5.84. (Intrusive burial into Level 4.) Flat triangular object that is narrow at one end and rolled over at the wide end. Probably the head of a pin. L. 6.9 × W. 3.2 × Th. 0.9 cm. Archon 42/112-06. Area 6 in level 4, Round Building. Debris inside of room (possibly belongs to Burial 19). Comparanda: Klein 1992:type I. 14.B.6a.
50. Raq 90 M-048. Figures 5.71 and 5.85. (Intrusive burial into level 4.) Toggle pin. Both ends damaged, but hole and large parts of head and shaft preserved. Arsenical copper (see Chapter 8, this volume). L. 13.7 × W. 1.2 × D. (of shaft) 0.5 cm. Archon 42/114-223. Area 6 in level 4, Round Building. Debris inside room (possibly belongs to burial 19). Comparanda: Klein 1992:type I. 3A.1a.
51. Raq 90 M-049. Figure 5.71. (Intrusive burial into level 4.) Complete toggle pin. Broke into two pieces upon removal from soil. Tin-bronze (Chapter 8, this volume). L. 23.7 × W. (at hole) × D. (of shaft) 0.5 cm. Archon 42/114-223. Area 6 in level 4, Round Building. Debris inside room (possibly belongs to burial 19). Comparanda: Klein 1992: type I.3A.1a.
52. Raq 90 M-050. Level 4. Five very small fragments. L. 0.9–0.4 × W. 0.5–0.1 × Th. 0.5–0.2 cm. Archon 30/108-078. Area 83. Debris outside of architecture.
53. Raq 90 M-052. Level 4. Small fragment. L. 2.1 × W. 0.9 × Th. 1.7 cm. Archon 42/120-050. Area 64. Debris inside room.
54. Raq 90 M-053. Possible mix of level 4 and later. Small fragment. L. 0.3 × W. 0.2 × Th. 0.3 cm. Archon 42/102-131. Area 29 of level 4. Debris of uncertain level.
55. Raq 90 M-054. Figure 5.74. Level 2. Two spiral rings, one inside the other. Corroded together. H. 1.5 × D. 1.9 cm. Archon 29/132-068. Area 13. Burial 27.

(*Above*): Figure 5.83. Raq 90 M-045, toggle pin. *Photograph by Anwar ʿAbd al-Ghafour.*

(*Left*): Figure 5.84. Raq 90 M-046, head of bronze pin. *Photograph by Anwar ʿAbd al-Ghafour.*

(*Below*): Figure 5.85. Raq 90 M-048, toggle pin. *Photograph by Anwar ʿAbd al-Ghafour.*

56. Raq 90 M-055. Level 4. Fragment. L. 1.8 × W. 0.7 × Th. 0.4 cm. Archon 42/102-202. Area 20, Round Building. Debris inside silo.
57. Raq 91 M-056. Level 3. Two pieces of rod shaped objects that do not join. One has what looks like part of a hole in the shaft preserved at one end. Possibly fragments of a toggle pin. Dimensions not recorded. Archon 29/114, unit 117-2, elevation 294.72. Area 15, phase c.
58. Raq 91 M-057. Level 3. Fragment. L. 1.4 × W. 1.3 × H. 0.7 cm. Archon 29/114, unit 0118-2, elevation 294.72. Area 15, phase c.
59. Raq 91 M-058. Level 3. Fragment which has a square cross-section. L. 1.0 × W. 0.5 × H. 0.5 cm. Archon 29/114, unit 196. Area 61.
60. Raq 91 M-059. Level 4. Piece of a rod. L. 5.0 × D. 0.3 cm. Archon 21.5/113.5, unit 1051, elevation 293.23. Area 75, phase b–c.
61. Raq 91 M-060. Level 4. Two small fragments. (a) L. 1.1 × W. 1.5 × h. 0.4 cm; (b) L. 0.4 × W. 0.5 × H. 0.4 cm. Archon 19.5/112, unit 1714-2, elevation 293.17. Area 76, phase b–c.
62. Raq 91 M-061. Level 4. Fragment of a rod. L. 2.2 × W. 0.5 × H. 0.35 cm. Archon 19.5/116, unit 3422, elevation 292.78. Area 70.
63. Raq 91 M-062. Level 4. Fragment. L. 0.7 × W. 0.5 × H. 0.6 cm. Archon 26/111, unit 2671, elevation 293.38. Area 74, phase b–c.
64. Raq 91 M-063. Level 3. Two fragments. (a) L. 1.1 × W. 0.9 × H. 0.4 cm; (b) L. 0.6 × W. 0.7 × H. 0.2 cm. Archon 29/114, unit 119-2, elevation 294.72. Area 15, phase c.
65. Raq 88 M-064. Level 3. Fragment. L. 1.0 × W. 0.7 × H. 0.8 cm. Archon 30/132-021. Area 11. Outdoor surface.
66. Raq 91 M-065. Level 3. Fragment. L. 0.7 × W. 0.5 × H. 0.5 cm. Archon 29/114, unit 1392-1. In wall 15B/16D.
67. Raq 91 M-066. Level 4. Fragment. L. 1.3 × W. 0.6 × H. 0.5 cm. Archon 29/114, unit 1942-2, elevation 293.59 elevation. Area 74, phase b–c.
68. Raq 91 M-067. Level 4. Fragment. L. 0.7 × W. 0.5 × H. 0.4 cm. Archon 24.5/114, unit 1269. Area 74, phase b–c.

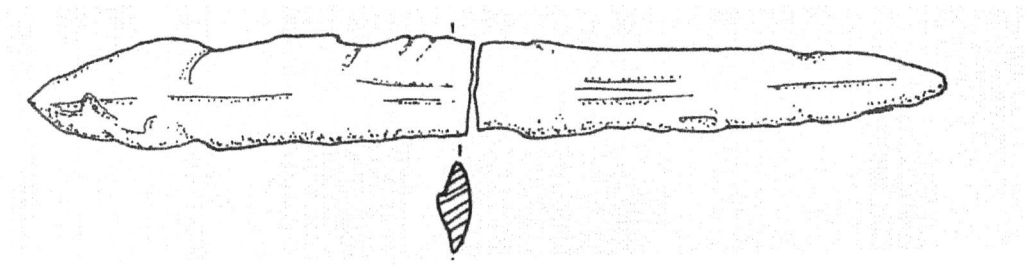


FIGURE 5.86. Raq 88 M-033 (scale 1:1). *Illustration prepared by Sally Dunham.*

69. Raq 91 M-068. Level 4. Fragment. L. 1.6 × W. 0.2 × H. 0.1 cm. Archon 19.5/113.5, unit 1014, elevation 293.44. Area 75, phase b–c.
70. Raq 92 M-200. Level 4. Fragment of a rod-shaped object. L. 7.8 × D. 0.3 cm. Archon 42/114E-013. Area 90, phase b. Debris inside room.

Lead

1. Raq 86 M-0017 (86). Under topsoil. Post-level 1, level 1 or level 2. Fragment. Two phase lead alloy (see Chapter 8, this volume). L. 1.4 × W. 0.8 × Th. 0.6 cm. Archon 42/116-019. Above area 3 of level 2. Debris of uncertain level.

Iron

1. Raq 86 M-0008 (86). Post-level 1. A strip, 1.2 cm thick and 2.8 cm wide, bent into a square U-shape, which is 6.1 cm wide. 1.4 cm from each open end is a hole, presumably for a nail. Iron. H. 6.6 × W. 6.1 cm. Archon 30/114-002. Late burial.
2. Raq 86 M-0009 (86). Above level 2, under topsoil. A flat metal strip with one long edge that makes a smooth curve. The other edges appear broken. L. 7.5 × W. 4.1 × Th. 0.1 cm. Archon 30/108-004. Debris of uncertain level.
3. Raq 86 M-0010 (86). Post-level 1. Piece of a rod with one end bent over. L. 7.1 × W. 1.0 × H. 0.85 cm. Archon 30/114-007. Late burial.
4. Raq 86 M-0013 (86). Post-level 1. Heavily rusted nail. L. 7.5 × D. 0.7 (shaft)–1.2 (head). Archon 30/108-009. Late burial. Possibly the nail is from the coffin.
5. Raq 86 M-0014 (86). Above level 3, under topsoil (unclear if there are any level 2 strata between level 3 and topsoil in this location). Piece of a rusty rod. L. 4.0 × D. 1.0 cm. Archon 36/114-013. Above area 20 of level 3. Debris above architecture.
6. Raq 86 M-0015 (86). Level 2 or 3 or later. Part of a very small, thin wire ring (on iron identification, see Chapter 8, this volume). D. 1.5 × Th. (of wire) 0.2 cm. Archon 36/120-012. Above area 2 of level 3. Debris of uncertain level.
7. Raq 87 M-009. Level 3 or above. Part of the head and shaft of a nail. Black/dark gray color. L. 3.2 × W. (of head) 2.2 cm. Archon 42/114-021. Area 91 in level 3, Round Building. Outdoor surface. Probably intrusive from post–Bronze Age strata.
8. Raq 88 M-022. Post-level 1. Rusty open bracelet with two flattened ends. D. of bracelet 7.3 × D. of rod 1.1 cm. Archon 29/126-005. Late burial. On right arm of skeleton.
9. Raq 88 M-027. Post-level 1. Complete closed bracelet made from a rod. D. of bracelet 4.7 × D. of rod 0.7 cm. Archon 42/108-015. Late burial. Associated with the arms of this infant burial.
10. Raq 88 M-029. Topsoil. Rusty nail with conical head. L. 12.5 × D. (of shaft) 0.3 cm. Archon 36/90-000.
11. Raq 88 M-031. Level 3. Two fragments of a rusty curving rod. Iron. L. 4.4 × D. of rod 0.4 cm. Archon 42/108-032. Area 47, phase b, in Round Building. Debris inside of room. (Probably intrusive from one of the numerous late burials in this area).
12. Raq 88 M-033. Figures 5.86 and 5.87. Above level 3, under topsoil (unclear if there are any level 2 strata between level 3 and topsoil in this location). Two pieces of a leaf-shaped spearhead. L. 11.9 × W. 1.4 cm. Archon 30/108-034. Intrusive pit.
13. Raq 89 M-035. Level 2 or level 3. Two small fragments. (a) L. 1.4 × W. 0.8 × H. 0.5; (b) L. 1.0 × W. 0.5 × H. 0.3 cm. Archon 29/126-040. Above area 58, level 3. Debris of uncertain level.
14. Raq 90 M-044. Level 4. Piece of a bent rusty wire. L. 9.2 × D. (of wire) 0.3 cm. Archon 42/114-198. Area 7, Round Building. Probably intrusive into room fill due a rain gulley cutting into the architecture in this area.
15. Raq 90 M-047. Level 4. Rusty ring with overlapping ends. D. 2.5 × D. of rod 1.0 cm. Archon 42/

Figure 5.87. Raq 88 M-033, iron spearhead. *Photograph by Sally Dunham.*

114-209. Area 7, Round Building. Probably intrusive into the room fill due to a rain gulley cutting into the architecture in this area.

16. Raq 90 M-051. Post-level 1. Rusty piece of a curving rod. Possibly part of a bracelet. L. 4.7 × D. of rod 0.3 cm. Archon 29/132-043. Late burial.

Silver

1. Raq 87 M-004. Post-level 1. Small finger ring made of thin wire with overlapping ends. D. of ring 2.0 × D. of wire 0.2 cm. Archon 30/120-003. Late burial. On right hand of skeleton.
2. Raq 87 M-005. Above level 3, under topsoil (unclear if there are any level 2 strata between level 3 and topsoil in this location). Earring, open at top, thickened at bottom. D. of ring 1.5 × D. of wire 0.3 cm. Archon 36/126-001. Above area 8, level 3. Debris above architecture.
3. Raq 88 M-025. Post-level 1. Two small finger rings, open ended. (a) D. 2.6 × D. of wire 0.3; (b) D. 2.4 × D. of wire 0.3. Archon 02/9126-007. Late burial. On right hand of skeleton.

Bone and Shell Objects

Discussion of Bone and Shell Objects

Eighty bone or shell artifacts were recovered in the 1986–1992 seasons at Tell al-Raqa'i.[113] The catalogue and the discussion are arranged in three sections: awls, pins and needles, and miscellaneous objects. Within in each section of the catalogue, the objects are arranged by the number assigned to them in the field.[114] A total of 51 are awls, 14 are pins, and 15 are diverse objects.[115]

Awls

Bone awls have a long history going back to Paleolithic times, as Doyen (1986) has noted. They are usually made on the shafts of long bones, often metapodial bones of small ungulates. This seems to be the case at Raqa'i as well, in the few cases where all or part of the handle end of the awl was preserved. Bone awls can be made with flint tools (by percussion, grooving and splitting), by abrasive techniques, or by a combination of both (Campana 1989; Doyen 1986; Murray 1979). Microscopic examination was not performed on the Raqa'i tools and, therefore, it was not determined which of these methods was used. Very few of the bone awls were completely preserved, although most were clearly distinguishable from pins and needles. Usually part of the pointed end, if not the very tip, and part of the shaft of the bone, which was too wide to be a needle, were preserved. Several of the Raqa'i awls show evidence of polish at the tip that also extends a short way up the shaft, suggesting they had been used to pierce something repeatedly.

Seven of the Raqa'i awls are complete. Their sizes range from 4.6 to 13.3 cm long:

Raq 88 I-012 (level 3): L. 7.0 × W. 2.3 × H. 1.3 cm (Figure 5.89)

Raq 89 I-017 (level 4): L. 13.3 × W. 2.3 × H. 90.7–1.1 cm (Figures 5.91 and 5.92)

Raq 89 I-021 (level 4): L. 7.7 × W. 1.9 × H. 0.8 cm (Figures 5.92 and 5.93)

Raq 89 I-026 (level 3 or 4): L. 5.9 × W. 2.8 × H. 1.7 cm (Figure 5.91)

Raq 91 I-036 (level 3): L. 7.3 × W. 2.1 × H. 1.7 cm

Raq 92 I-203 (level 3 or 4): L. 4.6 × W. 1.7 × H. 0.8 cm (Figure 5.95)

Raq 90 SI 1395 (level 4): L. 4.892 × W. 2.566 × H. 1.643 cm

All of these specimens end in a sharp tip. Eight of the other awls are almost complete but are missing the tip. These awls are the specimens: Raq 92 I-203, Raq 88 SI-292, Raq 90 SI-445, Raq 89 SI-577, Raq 90 SI-025, Raq 88 SI-1200, Raq 90 SI-1345, and Raq 90 SI-1677. Finally, there are 17 examples of tips that broke off of

bone awls.[116] As Nosch observes, in the Late Bronze Age bone awls with a very sharp tip were used to correct weaving mistakes in tapestry weaving, and often the tips would break off due to the strong tension of the fibers on the loom and be found loose in the soil.[117] These Late Bronze Age awls, however, were made on flat, wide rib bones and are very different from the awls found at Raqa'i. Nevertheless, E. Andersson-Strand of the Danish National Research Foundation's Centre for Textile Research examined photographs of the Raqa'i awls[118] and considers that the Raqa'i awls would be excellent for weaving, especially tapestry weaving.[119] Barber notes that the earliest occurrence of this technique in Egypt is in the tomb of Thutmose IV and suggests that the origin of the technique could have been Syria or Palestine, since Thutmose III brought great quantities of clothing to Egypt from his sack of Megiddo and records Syrian captives working as artisans in the temple of Amun.[120] Andersson-Strand's assessment of the Raqa'i bone awls suggests that the technique did indeed have a long history in Syria.[121]

Pins and Needles

The specimens in the small collection of bone pins and needles are simply but carefully shaped. Three complete examples seem too short to have been garment pins and so are interpreted as needles (I-018, I-019, and I-029).[122] Their lengths range from 4.8 to 5.7 cm. Although length is not an absolutely certain criterion for distinguishing needles from pins, two nearly complete examples appear excessively long for needles (I-042—11.0+ cm and I-045—7.0+ cm) (Figure 5.98). The shafts of all the bone pins and needles are circular in cross-section, and the heads, where preserved, are almost all simple and round (e.g., I-045, Figure 5.98) or consist of a straight edge perpendicular to the shaft (e.g., I-018, Figure 5.98). The two complete needles have the latter type of head and can be classed as Klein's type II.3.A.1a, a shape found at Eshnunna, Nuzi, Tarsus, and Byblos in the Early Bronze Age (Klein 1992:161). Three examples with completely preserved simple round heads are Klein's type II.1.A.1a (I-045, I-202, I-046)[123], while three additional pins with partially preserved heads also may be of this type.[124] This simple type has a long history from the Neolithic to the Early Iron Age (Klein 1992:155–156). The bone toggle pin I-015 (Figure 5.97) found in a burial of level 3 does not seem to match any of Klein's bone pin types, but rather seems to be a copy of a metal type, I.3.A.3a, which was especially characteristic of North Mesopotamia and Syria in the Early Dynastic and Akkadian periods (Klein 1992:45 and plate 64:1–8).

Miscellaneous Objects

Among the entries in this category are fragments of bone rings. I-022 was found in a level 3 grave along with a fragment of a bone awl (I-023). Since this was a grave, possibly the "awl" was used in place of a toggle pin and the bone ring fragment belonged to a bead or pendant. I-002 comprises three fragments of curving bone rods, none of which join. I-006, 57 unpierced fresh water gastropods, might also be grouped with the faunal remains, but since it has been listed among the burial goods in Chapter 6, it is included here. I-048 is a small piece of porous bone that appears to have been carefully shaped into a blunt point, which stops at an even line 1.7 cm above the point. Above this is an area of rough bone, perhaps to be stuck into another material.

I-201 (Figure 5.100) is a fragment of a notched bone implement. Fragments of two others were found in the 1987 season and three more in the season of 1993.[125] All these objects have a row of closely spaced linear notches (3–10 mm), ca. 1 mm deep on one edge or surface of the bone. On the two examples that this writer was able to examine personally (I-201 and I-300 from the 1993 season), the area of the notches is very highly polished, especially the ridges between them. On I-300, this polish can be seen to extend slightly beyond the end of the row of notches in a strip that is just as wide as the height of the notches. Outside of this strip the bone surface is matt and rough. Hence, the polish appears to be the result of an object rubbing back and forth over the notches. Indeed, on I-201 the ends of some of the notches are worn away. This latter specimen has been published in a detailed article (Dunham 1994), where arguments are presented for the interpretation of these notched bone implements as parts of musical rasps, or scrapers, a kind of percussion instrument that can be made of different materials and is still known in various parts of the world today. Examples of similar bones have been found at ancient Near Eastern sites in contexts dating from the Neolithic period to Hellenistic times. All were made from scapulae or long bones of ungulates and have row of notches similar in size and spacing to the Raqa'i examples. Wherever some description is given, "wear" or "polish" is mentioned in

the area of the notches.[126] At Enkomi in Cyprus and Tel Miqne in Israel, examples were found in sanctuaries, suggesting their use in ritual (Dunham 1994). At Tell ed-Dabʿa, a notched Bos metacarpal was found in a hut complex that also contained three small terracotta drums not far from the bone, suggesting it was part of a percussion ensemble (Dunham 1994). Although none of the Raqa'i notched bones was found in such suggestive contexts, their interpretation as percussion instruments used in ritual activities involving music and rhythm seems reasonable.[127]

Distribution of Bone and Shell Objects

Three bone or shell objects were found in level 2, 28 in level 3, 33 in level 4, and 3 from level 5.[128] As the distribution plan (see Figure 5.156) and table (Table 5.8) for level 3 show, bone was more evenly found throughout the settlement than was the case for metal objects. Fifteen bone objects were found in the eastern part of the settlement, while 13 were found in the western part.[129] In level 4 (see Figure 5.152; Table 5.9) the distribution is less even: 21 of the artifacts were found in the Round Building, but in the north area only 10 were found. In both levels 3 and 4, awls were the most numerous type of object: 18 of the 28 objects in level 3 were awls, of which 12 were found in the eastern part

Table 5.8. Bone Objects, Level 3.

Catalogue/Object #	Area of site	Area/room	Type
1. Raq 88 I-015	Northwest	6, burial 14	Pin
11. Raq 91 I-046	Northwest	13	Pin/needle
3. Raq 89 I-019	Northwest	59	Needle
18. Raq 90 I-032	Northwest	59	Awl
19. Raq 90 I-034	Northwest	59	Awl
14. Raq 92 I-204	Northwest	93, burial 5	Pin
49. Raq 87 SI-2418	West center	18	Awl
12. Raq 87. SI-2405	West center	18	Notched bone
6. Raq 88 I-013	West center	49	Awl
21. Raq 91 I-036	Temple area	15, phase a	Awl
4. Raq 91 I-048	Temple area	15, phase a	Tool?
25. Raq 91 I-041	Temple area	15	Awl
7. Raq 91 I-042	Temple area	16	Pin
5. Raq 88 I-012	Northeast	28, phase b	Awl
15. Raq 89 I-026	Northeast	32, phase c	Awl
14. Raq 89 SI-2884	Northeast	32, phase c	Tool?
13. Raq 89 I-024	Northeast	32/33, phases a–b	Awl
68. Raq 88 I-022	Northeast	66, burial 1	Ring
12. Raq 89 I-023	Northeast	66, burial 1	Awl
3. Raq 88 I-009	Northeast	72	Awl
14. Raq 89 I-025	Northeast	73	Awl
46. Raq 87 SI-2122	Southeast	37, phase b	Awl
4. Raq 88 I-010	Southeast	38	Awl
28. Raq 88 SI-292	Southeast	38	Awl
2. Raq 87 I-007	Southeast	44, phase b	Awl
2. Raq 89 I-018	Southeast	76	Needle
47. Raq 89 SI-2189	Southeast	76	Awl
48. Raq 89 SI-2274	Southeast	79	Awl

Table 5.9. Bone Objects, Level 4.

Catalogue/Object #	Area of site	Area/room	Type
32. Raq 90 SI-925	Round Bldg south	7	Awl
33. Raq 90 SI-926	Round Bldg south	7	Awl
39. Raq 90 SI-1395	Round Bldg south	7	Awl
6. Raq 89 SI-883	Round Bldg south	9, phase a	Tool?
11. Raq 89 I-021	Round Bldg south	9, phase b	Awl
10. Raq 89 I-020	Round Bldg south	10, phase b	Awl
29. Raq 90 SI-445	Round Bldg south	11, phase c	Awl
7. Raq 88 I-014	Round Bldg center	13, phase a	Awl
35. Raq 88 SI-1200	Round Bldg center	13, phase d	Awl
9. Raq 89 I-017	Round Bldg center	17, phase b	Awl
34. Raq 89 SI-1180	Round Bldg center	17, phase b	Awl
31. Raq 89 SI-841	Round Bldg west	14	Awl
4. Raq 89 I-029	Round Bldg west	16, phase a	Needle
37. Raq 89 SI-1345	Round Bldg west	16, phase b	Awl
36. Raq 89 SI-1259	Round Bldg north	19	Awl
40. Raq 91 SI-1651	Round Bldg north	20	Awl
41. Raq 90 SI-1652	Round Bldg north	20	Awl
42. Raq 90 SI-1660	Round Bldg north	20	Awl
43. Raq 90 SI-1661	Round Bldg north	20	Awl
44. Raq 90 SI-1677	Round Bldg northeast	29	Awl
9. Raq 90 SI-1741	Round Bldg northeast	29	Tool
7. Raq 90 SI-906	South	32	Tool
30. Raq 89 SI-577	Center west	60, phase b	Awl
24. Raq 91 I-40	North	70	Awl
23. Raq 91 I-038	North	71, phase c	Awl
8. Raq 91 I-043	North	72, phase c	Pin/needle
22. Raq 91 I-037	North	75, phases b–c	Awl
6. Raq 91 I-039	North	75, phases b–c	Pin/needle
9. Raq 91 I-044	North	75, phases b–c	Pin/needle
12. Raq 91 I-047	North	79, phase b	Pin/needle
5. Raq 92 I-201	North	79, phase a	Notched bone
5. Raq 89 I-031	North	99	Needle
26. Raq 92 I-200	North	99	Awl

of the settlement, while 6 were found in the west; in level 4, 23 of the 33 objects were awls, of which 18 were found in the Round Building and 4 in the north area. Since awls are an essential tool for weavers, one is tempted to see these patterns as reflections of where weavers worked, but since awls are small portable objects, this idea is probably speculative.

CATALOGUE OF BONE AND SHELL OBJECTS (FIGURES 5.88–5.100)[130]

Awls

1. Raq 87 I-001. Level 2. Made on piece from a long bone. Both ends are broken. Narrower end polished, presumably by use. Bone. L. 7.0 × W. 1.7 × H. 1.0 cm. Archon 30/120-008. Area 8, phase a. Debris inside room.
2. Raq 87 I-007. Figure 5.88. Level 3. Fragment of a long bone with one end sharpened to a blunt point. Bone. L. 6.2 × W. 1.5 × H. 0.7 cm. Archon 48/90-025. Area 44, phase b. Debris outside architecture.
3. Raq 88 I-009. Level 3. Piece of a long bone. Tip preserved. Wider end broken. Polish on outside of bone. Bone. L. 5.4 × W. 1.9 × H. 0.7 cm. Archon 36/102-039. Area 72. Debris outside architecture.
4. Raq 88 I-010. Level 3. Piece from a long bone. Tip preserved. Other end broken. Cut marks near tip. Bone. L. 5.7 × W. 1.45 × H. 1.1 cm. Archon 36/102-045. Area 38. Debris outside architecture.
5. Raq 88 I-012. Figure 5.89. Level 3. Complete awl made from the distal end of a sheep/goat metapodal bone. Bone. L. 7.0 × W. 2.3 × H. 1.3 cm. Archon 30/102-028. Area 28, phase b. Debris inside room. Comparanda: Klein 1992:type II.7.B.2.
6. Raq 88 I-013. Level 3. Fragment of an awl. Only the pointed tip and lowest part of the shaft are preserved. Bone. L. 5.0 × W. 0.9 × H. 0.7 cm. Archon 36/120-046. Area 49. Debris in courtyard.
7. Raq 88 I-014. Level 4. Fragment of an awl. Only the pointed tip and lowest part of the shaft are preserved. Bone. L. 3.1 × W. 0.9 × H. 0.4 cm. Archon 42/114-047. Round Building Area 13, phase d. Debris inside room.
8. Raq 88 I-016. Figure 5.90. Level 3 or 4. Only pointed tip and part of the shaft preserved. Has slight polish. Bone. L. 5.1 × W. 0.9 × H. 0.4 cm. Archon 48/108-022. Above area 23 (in level 4, Round Building). Debris of uncertain level.
9. Raq 89 I-017. Figures 5.91 and 5.92. Level 4. Complete awl. Made from a long bone and part of proximal end of that bone is preserved. Not sure what bone or species. Polished on pointed end and along the interior side of the handle end. Bone. L. 13.3 × W. 2.3 × H. 0.7–1.1 cm. Archon 42/ 114-103. Round Building, area 17, phase b. Debris inside room. Comparanda: Klein 1992:type II.3.B.1.
10. Raq 89 I-020. Level 4. Tip of an awl (or needle or pin). Tip highly polished. Gray in color—found in ashy fill, so probably burned. Bone. L. 2.5 × D. 0.4 cm. Archon 42/114-136. Round Building, area 10, phase b. Debris inside room.
11. Raq 89 I-021. Figures 5.92 and 5.93 Level 4. Complete awl made from the proximal end of a long bone. One side and point polished. Bone. L. 7.4 × W. 1.9 × H. 0.8 cm. Archon 42/114-138. Round Building, area 9, phase b. Debris inside room.
12. Raq 89 I-023. Level 3. Tip and part of the shaft of an awl. Bone. L. 6.0 × W. 1.2 × H. 0.4–0.2 cm. Archon 29/201-034. Area 66. Burial 1.
13. Raq 89 I-024. Figure 5.94. Level 3. Tip and part of the shaft of an awl. Polished. Bone. L. 4.1 × W. 1.2 × H. 0.6 cm. Archon 30/96-086. Area 32/33, phase a- b. Debris inside room.
14. Raq 89 I-025. Level 3. Fragment of lower shaft and tip end of an awl. Both ends broken. Short, diagonal scratch marks near the tip end. Bone. L. 4.7 × W. 0.8 × H. 0.3 cm. Archon 30/096-094. Area 73. Debris outside architecture.
15. Raq 89 I-026. Figure 5.91. Level 3. Complete awl made from the proximal end of a long bone. Polished. Bone. L. 5.9 × W. 2.9 × H. 1.7 cm. Archon 30/096-079. Area 32, phase c. Floor.
16. Raq 89 I-027. Figure 5.95 and 5.96. Level 3 or 4. Awl made from the shaft of a metapodal bone. Full diameter of the shaft used. Both ends broken. Polished. Bone. L. 6.1 × W. 1.4 × H. 1.1 cm. Archon 42/108-054. Area 88 of level 3. Debris of uncertain level.
17. Raq 89 I-028. Figure 5.95. Level 3 or 4. Fragment of an awl. Point and small part of shaft preserved. Bone. L. 5.1 × W. 0.7 × H. 0.6 cm. Archon 42/108-054. Area 88 of level 3. Debris of uncertain level.
18. Raq 90 I-032. Level 3. Polished point. Fragment of a bone awl, pin or needle. Circular cross-section. Bone. L. 3.4 × D. (max.) 0.7 cm. Archon 29/126-070. Area 59. Found in mud remains of oven 59A.
19. Raq 90 I-034. Level 3. Fragment of awl. Point and part of shaft. Point polished. Bone. L. 5.0 × W. 1.2 × H. 0.4 cm. Archon 29/126-138. Area 59. Wall.
20. Raq 90 I-035. Level 3 or 4. Fragment of awl. Tip of point broken. Part of shaft preserved. Bone. L. 7.0

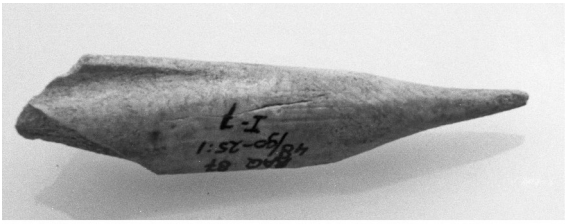


FIGURE 5.88. Raq 87 I-007, bone awl tip.
See Catalogue for dimensions.
Photograph by Sally Dunham.

FIGURE 5.89. Raq 88 I-012, complete bone awl.
See Catalogue for dimensions.
Photograph by Sally Dunham.

FIGURE 5.90. Raq 88 I-016, bone awl tip, outside.
See Catalogue for dimensions.
Photograph by Sally Dunham.

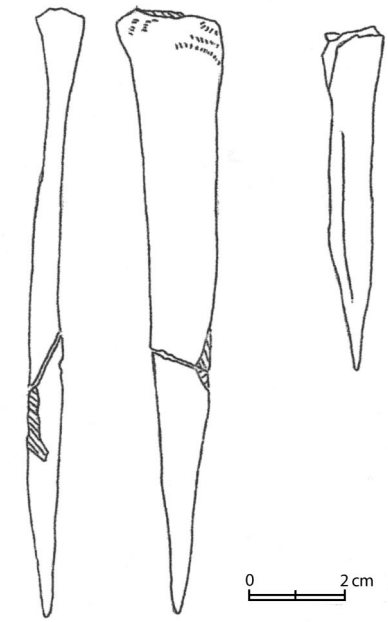


FIGURE 5.92. Bone awls Raq 89 I-017 (left), I-021 (right).
Illustration prepared by Sally Dunham.

FIGURE 5.93. Raq 89 I-021, complete bone awl.
Photograph by Sally Dunham.

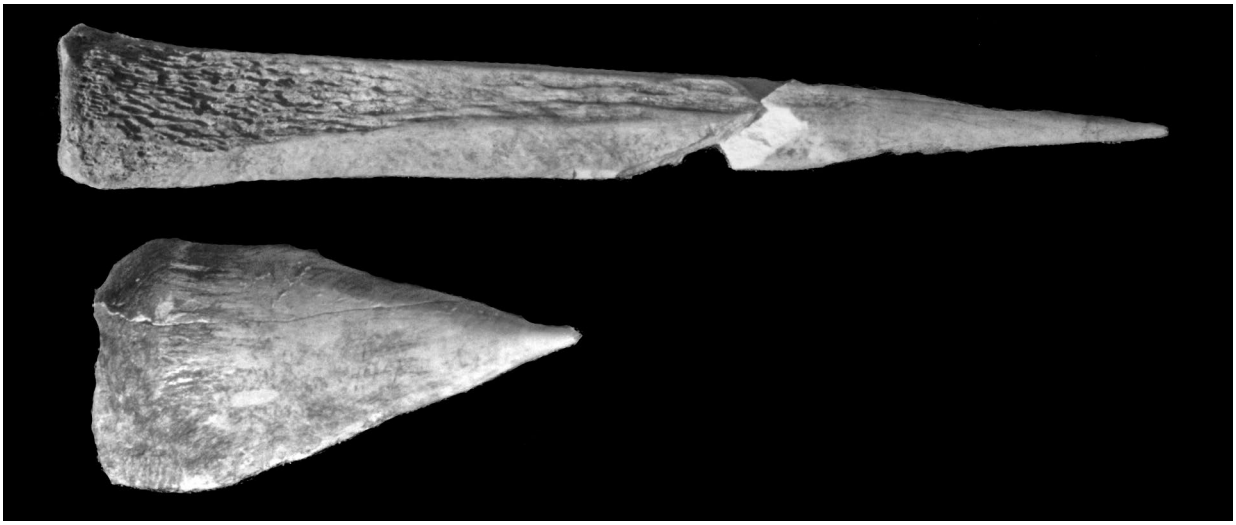


FIGURE 5.91. Complete bone awls. Raq 89 I-017 (top), I-026 (bottom). See Catalogue for dimensions.
Photograph by Hans Curvers.

FIGURE 5.94. Raq 89 I-024, bone awl tip. *Photograph by Sally Dunham.*

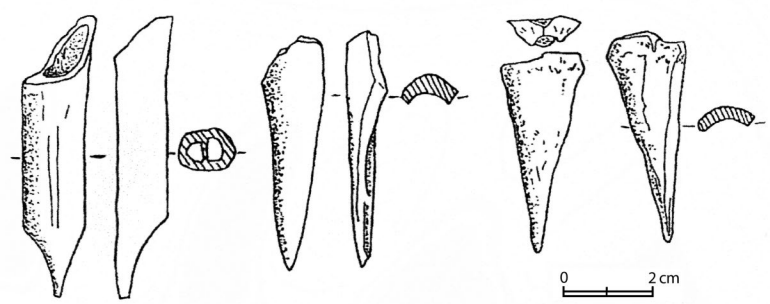


FIGURE 5.95. Bone awls, left to right: Raq 89 I-027, I-028; Raq 92 I-203. *Illustration prepared by Sally Dunham.*

× W. 2.0 (max.) × H. (max.) 0.9 cm. Archon 29/126-128. Below area 59 of level 3. Debris outside architecture.

21. Raq 91 I-036. Level 3. Complete awl. Field record states: "made of sheep bone, one end with joint; other end sharpened." Bone. L. 7.3 × W. 2.1 × H. 1.5 cm. Archon 29/114, unit 0234-2, elevation 294.05. Area 15, phase a.
22. Raq 91 I-037. Level 4. Fragment of awl. Point and short part of shaft preserved. Bone. L. 3.4 × W. 0.75 × H. 0.4 cm. Archon 21/114, unit 2809, elevation 293.04. Area 75, phases b and c.
23. Raq 91 I-038. Level 4. Fragment of an awl. Piece of a long bone with one end shaped and polished to make a solid point. Tip of point broken. Wider end also broken. Extending up 3.6 cm from the preserved end of the point are polish and what look like striations parallel to the long axis of the bone. The striations were made before the polish and are not neat but cross over one another. Perhaps they were made by abrasion (cf. Campana 1989). Bone. L. 6.7 × W. 1.1 × H. 0.7 cm. Archon 23.5/115, unit 3483, elevation 293.45. Area 71, phase c.
24. Raq 91 I-40. Level 4. Fragment of an awl. Tip complete. Wider end of tool broken. At 2 cm up from tip, diameter is 0.9 cm. Regular parallel diagonal striations going around the shaft near the tip suggest manufacture by abrasion. Polish noted on full length of piece. Bone. L. 4.1 × W. 0.9 × H. 0.7 cm. Archon 20.5/116.5, unit 3494. Area 70.
25. Raq 91 I-041. Level 3. Point. Shaft above tip is oval in cross-section. Probably from an awl. Very thin and flat. Tip completely preserved and very thin and sharp. Bone has some black substance adhering to it, which makes the striations going around it very clear to see. Bone. L. 3.4 × W. 0.6 × H. 0.3 cm. Archon 29/114, unit 0318-1. Area 15.

FIGURE 5.96. Raq 89 I-027, bone awl point. *Photograph by Sally Dunham.*

26. Raq 92 I-200. Level 4. Fragment of an awl. Only tip and fragment of shaft preserved. Polish on tip and up to 3.0 cm. above the tip. Bone. L. 5.2 × D. (1.0 cm up from tip) 0.4 cm. Archon 29/120–552. Area 99. Debris outside architecture.
27. Raq 92 I-203. Figure 5.95. Level 3 or 4. Complete awl, except tip broken. Made on proximal end of a bone (metapodal?)—One side of the epiphysis is preserved. Shows polish from tip to epiphysis on outer bone surface. Same surface has longitudinal and diagonal scratches. Bone. L. 4.6 × W. 1.7 × H. 0.8 (max.) cm. Archon 29/120–568. Area 93 (level 3 designation). Debris outside architecture.
28. Raq 88 SI-292. Level 3. Awl. Goat metatarsal III–IV. Nearly complete awl, missing only very tip, with distal end of metatarsal forming the base of the tool and the tip fashioned out of the shaft; maximum dimensions: 63.15 mm × 13.36 mm × 18.40 mm. Archon 36/102-045. Area 38. Debris outside architecture.
29. Raq 90 SI-445. Level 4. Sheep or goat tibia. Nearly complete awl, missing only the very tip, with distal end of tibia forming the base of the tool and the tip fashioned out of the shaft; maximum dimensions: 76.44 mm × 28.14 mm × 21.70 mm. Level 4. Archon 48/108-079. Round Building, area 11, phase c. Debris inside room.

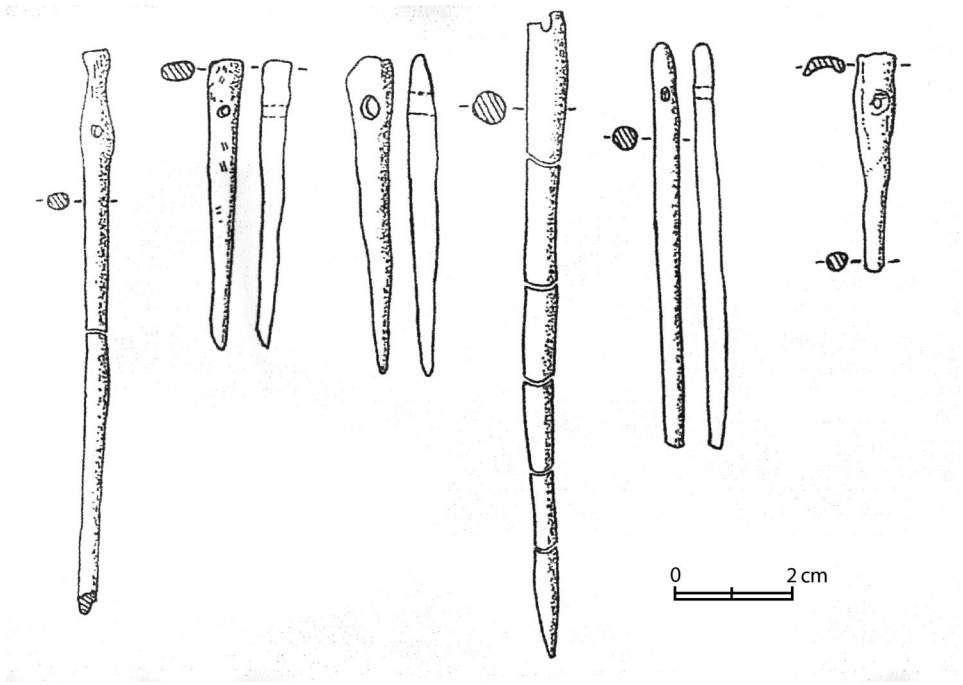
30. Raq 89 SI-577. Level 4. Sheep metatarsal III–IV. Nearly complete awl, missing only very tip, with distal end of metatarsal forming the base of the tool and the tip fashioned out of the shaft. Maximum dimensions: 53: 66 mm × 23,89x 17.19 mm. Archon 36/120-134. Area 60, phase b. Debris outside architecture.
31. Raq 89 SI-841. Level 4. Medium Artiodactyl. Metapodial. Fragment of a bone awl, burned. Archon 42/114-167. Round Building, area 14. Debris inside room.
32. Raq 90 SI-925. Level 4. Gazelle. Metatarsal III–IV. Nearly complete awl, missing only very tip, with distal end of metatarsal forming the base of the tool and the tip fashioned of the shaft; maximum dimensions: 73.39 × 20.25 × 14.32 mm. Archon 42/114-198. Round Building, area 7. Debris inside silo.
33. Raq 90 SI-926. Level 4. Sheep. Metatarsal III–IV. Essentially complete awl, with distal end of metatarsal forming the base of the tool and the tip fashioned out of the shaft; maximum dimensions: 68.11 × 13.74 × 18.39 mm. Archon 42/114-198. Round Building, area 7. Debris inside silo.
34. Raq 89 SI-1180. Level 4. Sheep Metacarpal III–IV. Essentially complete awl, with distal end of metacarpal forming the base of the tool and the tip fashioned out of the shaft; maximum dimensions: 66.67 × 22.29 × 15.51 mm. Archon 42/114-110. Round Building, area 17, phase b. Debris inside room.
35. Raq 88 SI-1200. Level 4. Sheep or goat. Tibia. Nearly complete awl, missing only tip, with distal end of tibia forming the base of the tool and the tip fashioned out of the shaft; maximum dimensions: 63.27 × 23.42 × 17.86 mm. Archon 42/114-071. Area 13, phase d. Debris from presumed unroofed areas in Round Building.
36. Raq 89 SI-1259. Level 4. Medium mammal. Long Bone. Fragment of a bone awl, burned; maximum dimensions: 36.38 × 7.87 × 4.78 mm. Archon 42/108-055. Round Building, area 19. Debris inside silo.
37. Raq 89 SI-1345. Level 4. Goat. Metatarsal III–IV. Nearly complete awl, missing only tip, with distal end of metatarsal forming the base of the tool and the tip fashioned out of the shaft; maximum dimensions: 68.43 × 21.30 × 16.24 mm. Archon 42/114-115. Round Building, area 16, phase b. Debris inside room.
38. Raq 90 SI-1363. Level 5. Equid. 1st Phalanx. Fragment of a bone awl; maximum dimensions: 59.83 × 42.41 × 16.24 mm. Archon 42/114–310. Area 2. Debris outside architecture.
39. Raq 90 SI-1395. Level 4. Sheep. Metacarpal III–IV. Complete bone awl; maximum dimensions: 48.92 × 25.66 × 16.43 mm. Archon 42/114-198. Round Building, area 7. Debris inside silo.
40. Raq 91 SI-1651. Level 4. Sheep. Metacarpal III–IV. Nearly complete awl, missing only very tip, with distal end of metacarpal forming the base of the tool and the tip fashioned out of the shaft; maximum dimensions: 64.37 × 26.12 × 18.44 mm. Archon 42/102-202. Round Building, area 20. Debris inside silo.
41. Raq 90 SI-1652. Level 4. Goat. Metapodial III–IV. Fragment of a bone awl, burned completely black prior to working and/or use; maximum dimensions: 76.71 × 19.63 × 14.73 mm. Archon 42/102-202. Round Building, area 20. Debris inside silo.
42. Raq 90 SI-1660. Level 4. Sheep. Metacarpal III–IV. Specimen exhibits a polish and may be the base of an awl; maximum dimensions: 46.46 × 22.14 × 14.99 mm. Archon 42/102-202. Round Building, area 20. Debris inside silo.
43. Raq 90 SI-1661. Level 4. Gazelle. Metatarsal III–IV. Fragment of a bone awl; maximum dimensions: 76.71 × 19.63 × 14.73 mm. Archon 42/102-202. Round Building, area 20. Debris inside silo.
44. Raq 90 SI-1677. Level 4. Sheep. Metacarpal III–IV. Nearly complete awl, missing only very tip (which exhibits partial burning), with distal end of metacarpal forming the base of the tool and the tip fashioned out of the shaft; maximum dimensions: 75.96 × 27.91 × 18.33 mm. Archon 42/102-144. Area 29. Debris from presumed unroofed area of Round Building.
45. Raq 87 SI-2110. Level 2. Sheep or goat. Radius. Fragment of a bone awl; maximum dimensions: 86.46 × 18.43 × 9.41 mm. Archon 42/96-007. Area 26. Debris outside architecture.
46. Raq 87 SI-2122. Level 3. Large mammal. Long bone. Fragment of a bone awl, burned; maximum dimensions: 32.14 × 16.91 × 11.53. Archon 42/96-015. Area 37, phase b. Debris inside room.
47. Raq 89 SI-2189. Level 3. Medium mammal. Long bone. Fragment of a bone awl. Archon 42/84-008a. Area 76. Debris inside room.
48. Raq 89 SI-2274. Level 3. Sheep or goat. Metacarpal III–IV. Fragment of a bone awl. Archon 42/84-026. Area 79. Debris inside room.

49. Raq 87 SI-2418. Level 3. Medium mammal. Long bone. Fragment of a bone awl, representing most of the tip; maximum dimensions: 62.38 × 13.33 × 7.96 mm. Archon 30/114-034. Area 18. Debris inside room.
50. Raq 87 SI-2506. Level 3 or 4. Medium mammal. Tibia. Specimen shows evidence of polishing and likely served as an awl; maximum dimensions: 87.77 × 30.78 × 20.28 mm. Archon 30/120-026. Northwest silos area 4, phase d (level 3 designation). Debris inside silo.
51. Raq 90 SI 2806. Level 3 or 4. Cow or aurochs. Metatarsal III–IV. Fragment of a bone awl; maximum dimensions: 104.07 × 29.31 × 22.20 mm. Archon 29/132-048. Below area 52, level 3.

Pins and Needles

1. Raq 88 I-015. Figures 5.97 and 5.98. Level 3. Toggle pin. Complete except for pointed end. Head flat and cylindrical with slightly bulging rim. 1.5 cm down from top is a hole 0.2 cm in diameter. Shaft widens to 0.6 cm. around hole and then narrows to 0.4 below bulge for hole. Bone. L. 9.7 × D. 0.4 + 0.3 cm. Archon 36/120-049. Area 6. Burial 14. Comparanda: Mallowan 1937: figure 12, no. 5, "copper pin"; Klein 1992:type I.3.A.1a).
2. Raq 89 I-018. Figure 5.98. Level 3. Complete needle. End with hole has flattened oval cross-section. Shaft has a circular section. Bone. L. 4.8 × D. (max.) 0.6 cm; D. of hole 0.2 cm. Archon 42/84-013. Area 76. Wall. Comparanda: Klein 1992:type II.3.A.1a.
3. Raq 89 I-019. Figure 5.98. Level 3. Complete needle. Slightly wider head end tapers smoothly to a point. Shaft is oval in cross section. Bone. L. 5.4 cm × D. 0.7 + 0.4 cm. D. of hole 0.4 cm. Archon 29/126-048. Area 59. Debris outside architecture.
4. Raq 89 I-029. Figure 5.99. Level 4. Complete needle. Hole end wider and slightly rounded. Sides taper evenly to the tip of the point. Shaft has circular cross-section. Bone. L. 5.7 × W. 0.8 × H. 0.4 cm; D. of hole 0.1 cm. Archon 42/114-177. Round Building, area 16, phase a. Debris inside room.
5. Raq 89 I-031. Figure 5.99. Level 4. Bone needle. Point, shaft and lower edge of the hole preserved. Shaft has a circular cross-section. Bone. L. 5.3 × D. 0.4 cm. Archon 29/126-087. Area 99. Debris outside architecture.
6. Raq 91 I-039. Level 4. Highly polished point. The tip is preserved, but the other end is broken. Probably part of a needle or pin. Shaft above the tip has circular cross-section. Bone. L. 3.0 × D. 0.4 cm. Archon 22.5/113.5, unit 3191, elevation 293.14. Area 75, phases b and c.
7. Raq 91 I-042. Figure 5.98. Level 3. Six fragments which fit together to form one pin. Point and whole shaft and bottom of the hole preserved. Probably a toggle pin, though head is not preserved, so unsure of type. Surface of pin is badly weathered. Bone. L. 11.0 × D. (max.) 0.6 cm. Archon 29/114, unit 1390. Area 16. Inside wall.
8. Raq 91 I-043. Figure 5.99. Level 4. Four fragments which fit together to form part of a pin or needle. Both ends are broken. The bottom part of the hole is preserved. Surface is badly weathered, so cannot tell if polished. Under magnifier (12x) can see parallel diagonal lines going around shaft—suggests the artifact was shaped by abrasion. Shaft is circular in cross-section, but more oval near the hole. Bone. L. 6.4 × W. (max.) 0.6 × H. (max.) 0.4 cm. Archon 25.5/113.5, unit 3055-1, elevation 293.28. Area 72, phase c.
9. Raq 91 I-044. Figure 5.99. Level 4. Fragment of a pin or needle. Both ends broken. Full height of hole preserved on one end of it. Shaft has a circular cross-section and tapers slightly below the hole. Surface weathered, but is very smooth and shows some polish where better preserved. Bone. L. 6.4 × D. 0.5 cm; D. of hole 0.2 cm. Archon 24.5/ 111.5, unit 1326, elevation 293.56. Area 75, phases b and c.
10. Raq 91 I-045. Figure 5.98. Level 4. Fragment of a bone pin. Head end and part of shaft preserved. Hole 0.7 cm down from top. Head end highly polished. Shaft is polished as well, although somewhat weathered. In one place can be seen faint diagonal parallel striations, so perhaps the pin was shaped by abrasion. Shaft has a circular cross-section. Bone. L. 7.0 × D. 0.4 cm. Archon 25.5/113, unit 1561, elevation 293.96. Above area 72. Comparanda: Klein 1992:type II.1.A.1a.
11. Raq 91 I-046. Figure 5.99. Level 3. Top, hole and small part of the shaft of a pin or needle. Flat, oval cross-section. One face concave, so it was made on only part of the circumference of the shaft, and this would be the inside of the bone shaft. The convex face (the outside) has diagonal striations. The shaft widens for the hole and then tapers slightly to the top of the pin. Bone. L. 2.1 × W. (max.) 0.7 × Th. 0.4 cm; D. of hole 0.2 cm. Archon 29/120, unit 1412. Area 13. Comparanda: Klein 1992:type II.1.A.1 a or b.

12. Raq 91 I-047. Level 4. Fragment of a pin or needle. Piece of tapering shaft of circular cross-section. Both ends are very flat, as if they had been cut. Shaft has very faint diagonal striations and deeper striations going parallel to the long axis of the bone. Both these appear to have been polished over. Bone. L. 2.9 × D. 0.5–0.3 cm. Archon 29/120, unit 2935-1. Area 79, phase b.
13. Raq 92 I-202. Level 5. Bone needle. Complete except for the pointed tip. Surface has slight polish. Head end is flattened with a round end. Shaft has a circular cross-section. Bone. L. 5.7 × W. 0.7 × H. 0.3 cm; D. of hole 0.4 cm. Archon 42/114E-052. Area 6. Debris outside architecture.
14. Raq 92 I-204. Figure 5.98. Level 3. Head, hole, and part of the shaft of a pin or needle. The part above



(*Left*): FIGURE 5.97. Raq 88 I-015, complete bone toggle pin. *Photograph by Hans Curvers.*

(Above): FIGURE 5.98. Pins and needles. Left to right: Raq 88 I-015; Raq 89 I-018, I-019; Raq 91 I-042; Raq 91 I-045; Raq 92 I-204. *Illustration prepared by Sally Dunham.*

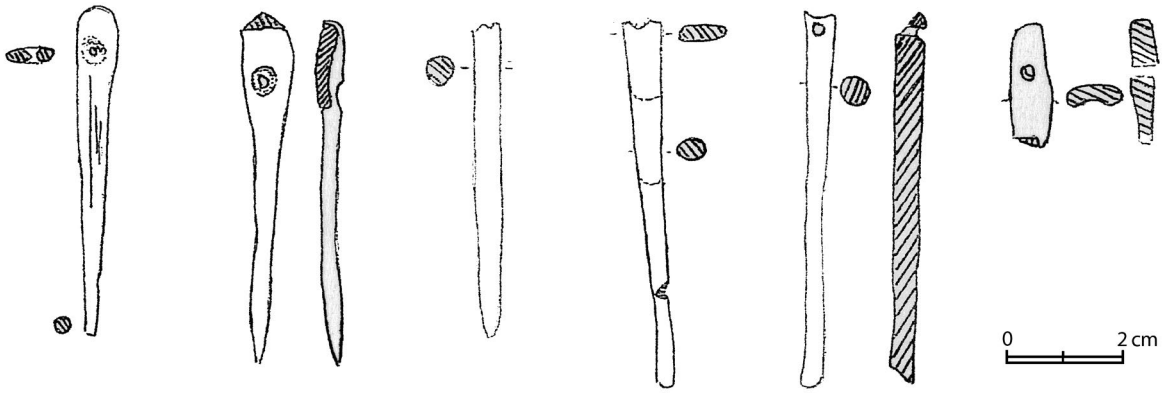


FIGURE 5.99. Bone pins and needles. Left to right: Raq 92 I-202; Raq 89 I-029, I-031; Raq 92 I-043; Raq 91 I-044; Raq 91 I-046. *Illustration prepared by Sally Dunham.*

the hole is 0.8 cm long, which seems awkward for a needle. Head end is concave in section and slightly wider and tapers to a narrower shaft below the hole. Shaft had a circular cross-section. Surface of bone is much weathered and shows no polish. Bone. L. 3.8 × W. (of head) 0.6 × D. (of shaft) 0.3 cm; D. of hole 0.3 cm. Archon 29/120–567. Area 93, burial 5.

Miscellaneous Bone and Shell Objects

1. Raq 87 I-002. Above level 3, under topsoil (unclear if there are any level 2 strata between level 3 and topsoil in this location). Three fragments of curving bone rods. Of different thicknesses. The bone rods have one rounded face and three perpendicular ones. Bone. Th. 0.4–0.5 cm. Archon 30/114-032. Debris of uncertain level.
2. Raq 87 I-006. Level 2. 57 specimens of Unpierced Melanopsis (freshwater snails, identification by D. Reese). Shell. L. 2.0–1.1 cm. Archon 42/90-011. Inside vessel P-019 in burial 30.
3. Raq 88 I-022. Level 3. Piece of a curving bone rod. Polished. Circular cross-section. Bone. L. 1.2 × D. 0.4 cm. Archon 29/102-034. Area 66, burial 1.
4. Raq 91 I-048. Level 3. Piece of very porous bone (horn core fragment?) that has been shaped into a smooth straight blunt point at one end. Near the pointed end parallel diagonal striations can be seen (21x magnification), suggesting manufacture by abrasion. Tip completely preserved. 1.7 cm from tip, the smooth worked surface stops and the remaining tapers slightly in what looks like a rough "tang" to be inserted into another material. Bone. L. 2.5 × W. (max.) 0.6 × H. (max.) 0.4 cm. Archon 29/114-134, elevation 294.05. Area 15, phase a.
5. Raq 92 I-201. Figure 5.100. Level 4. Two fragments of a notched bone implement, which join. Made on a piece of a rib of a small ungulate. Broken on three edges and one face. The preserved face of the bone has nine incised lines perpendicular to the long axis of the bone. Part of a tenth incised line can be seen at one end of the bone. L. 8.3 x W. 2.4 x Th. 1.0 cm. Archon 29/114–414. Area 79, phase a.
6. Raq 89 SI-883. Level 4. Sheep or goat. Metatarsal III–IV. Specimen exhibits rounded and polished surfaces, possibly due to sediment abrasion but could represent use as an unmodified tool or an early stage of intentional working. Archon 42/114-139. Round Building, area 9, phase a. Debris inside room.
7. Raq 90 SI-906. Level 4. Large mammal. Ulna. Bone fragment of crude triangular shape with one edge worked into a point; maximum dimensions: 58.84 × 29.58 × 14.46 mm. Archon 42/114-238. Area 32. Debris outside architecture.
8. Raq 90 SI-1365. Level 5. Equid. First phalanx. Specimen has been polished along all surfaces and has depressions along both the proximal and distal posterior surfaces worn into the bone; maximum dimensions: 75.57 × 32.97 × 25.12 mm. Archon 42/114–304. Area 5. Debris inside room.
9. Raq 90 SI-1741. Level 4. Sheep or goat. Metatarsal III–IV. Specimen bears one polished surface and may be the base of a tool; maximum dimensions: 54.55 × 21.30 × 21.13 mm. Archon 42/102-141. Area 29. Debris from presumed unroofed area of Round Building.
10. Raq 88 SI-2077. Level 3 or 4. Gazelle. Metatarsal III–IV. Posterior and medial surfaces exhibit a sheen and the specimen may be a fragment of a tool; maximum dimensions: 43.14 × 15.52 × 11.00 mm. Archon 48/108-023. Over area 17 of level 4.
11. Raq 87 SI-2150. Level 2 or 3. Sheep or goat. Scapula. Specimen bears a polish and several notches of varying depth; maximum dimensions: 87.30 × 34.94 × 22.93 mm. Archon 42/96-010. Over area 37 of level 3. Debris outside architecture.
12. Raq 87 SI-2405. Level 3. Medium Mammal. Bone element unknown. Specimen bears 8 notches

FIGURE 5.100. Raq 92 I-201, notched rib bone. *Photograph by Sally Dunham.*

along one edge and is likely a rib fragment, but could also be a long bone fragment; maximum dimensions: 26.10 × 5.39 × 4.39 mm. Archon 30/114-034. Area 18. Debris inside room.

13. Raq 86 SI-2446. Above level 3, under topsoil (unclear if there are any level 2 strata between level 3 and topsoil in this location). Medium artiodactyl. Scapula. 3 fragments of a scapula, one of which bears 6 notches on the posterior margin; maximum dimensions of notched fragment: 17.27 × 15.91 × 5.84 mm. Archon 30/114-027. Over Area 18 of level 3.
14. Raq 89 SI-2884. Level 3. Equid. Second phalanx. Specimen exhibits rounded and polished surfaces, possibly due to sediment abrasion but could represent use as an unmodified tool or an early stage of intentional working. Archon 30/96-079. Area 32, phase c. On floor.
15. Raq 89 SI-2990. Level 2 or 3. Species unknown. Bone element unknown. Specimen appears to be a fragment of fossilized bone and bears a highly polished surface and rounded edges, likely due to working but possibly due to post-depositional abrasion; maximum dimensions: 22.56 × 19.05 × 6.87 mm. Archon 29/126-040. Over area 58 of level 3.

Stone Objects

Stone Objects—Discussion[131]

The stone objects constitute one of the largest categories of small finds from the seasons of 1986–1992. One probable reason for this resides in the fact that most of the items are grinding stones, pestles, door sockets, or mortars—large durable objects that are often recycled. Broken grinding stones are sometimes transformed into door sockets, and whole objects or broken ones can be reused as building material in drains, walls, and so on.

All of the grinding stones and many of the pestles and door sockets are made of basalt. While Raqa'i is not far from an area of abundant basalt—the extinct volcano Kaukab and its environs—investigations by the University of Laval Expedition to Tell 'Atij have shown that Tell 'Atij and some of the other small sites in the middle Khabur river valley, including Raqa'i, obtained basalt from the upper Khabur region on the Ard esh-Sheikh plateau north of Hasseke.[132] Intriguing questions that require further research include whether raw material or finished products were obtained from this locality and what the socio-political aspects of the use of this resource were. Later texts from Mari record shipments of grinding stones being sent to that site via the river (Lease 2000, citing Burke 1964).

Hayden's (1987) research concerning contemporary *metateros* in Guatemala has shown that the production of basalt grinding stones (*metates* and *manos*) is a highly specialized skilled craft involving knowledge of where and how to obtain the right stone for the product as well as the right stone tools to work the basalt. No area devoted to this kind of stone working was identified at Raqa'i, although the few type B door sockets that were made from ends of type A grinding stones (see below), might have been fashioned on-site.

The discussion of the stone objects is divided into four parts: grinding stones; pestles; door sockets, mortars, and perforated stones; and miscellaneous stone objects. The catalogue is also divided into four sections.

Grinding Stones

All of the 71 grinding stones from Tell al-Raqa'i were of vesicular basalt. Most of the recovered specimens were broken. Practically all of these can be classified into three types according to their cross and longitudinal sections. Type A is plano-convex in both its cross and longitudinal sections (e.g., Raq 89 S-088, Figure 5.101, 64 examples). Type B is plano-convex in its cross-section but concave-convex in its longitudinal section (Raq 88 S-031, Figure 5.101, and Raq 89 S-101, Figure 5.109, 5 examples).[133] Type C is plano-plano in both cross-section and longitudinal sections (Raq 89 S-080, Figure 5.101, 2 examples).[134] Grinding stones such as these are found on almost all ancient Near Eastern sites from the Neolithic to the Iron Age and were probably parts of reciprocal hand mills—the flat face of one stone (the "top stone") was pushed back and forth on the flat side of a second stone (the bottom stone) to grind whatever substance was being processed (Runnels 1981; Sumner 1967). Raqa'i type A is sometimes considered to be the top stone ("hand stone," "hand grinder,"—Sumner 1967; Leenders 1988, 630; Wright 1992:67–69), while type B is suggested to be the bottom stone or "grinding slab" (Leenders 1988; Sumner 1967, "dormant stone"; Wright 1992, 63–65).[135] Presumably type C would also be a "grinding slab." Since at Tell al-Raqa'i most examples are type A and very few are type B or C, it is likely that grinding slabs could also be type A as well. Such a possibility is

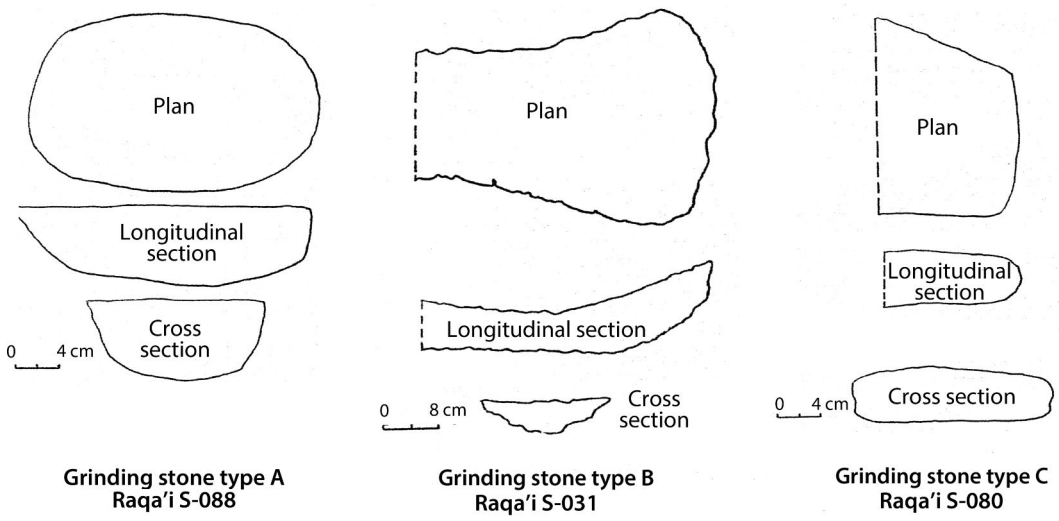


FIGURE 5.101. Grinding stone types. *Illustration prepared by Sally Dunham.*

considered to be the case by Sumner (1967:30) and Runnels (1981:110), both of whom note the difficulties in distinguishing between hand stones and grinding slabs.[136] A similar proportion of type A to types B and C is also to be seen at Tell 'Atij and Tell Gudeda.[137] In addition to these three types, one specimen of a top stone of a rotary hand mill (Raq 92 S-201, Figure 5.110) was found in a context of uncertain date. This has been classified as type D.[138] Very likely the possibility considered by Sumner and Runnels is true at Raqa'i, since as noted above in Chapter 2,[139] a variety of lime-plastered mud and or/brick bin features in level 3 are probably to be considered installations for grinding flour. These features have a basin-like depression which would be very suitable for supporting type A grinding stones as the lower element in a hand mill. In addition, in level 5 a grinding stone of type A (Raq 92 S-203) was found on a lime-plastered surface next to a depression of the same shape as the stone.[140]

Pestles

The term pestle is used here to classify all those stone tools that were small enough to be held in one hand and were usable for pounding, hammering, crushing, or rubbing. While this classification may mix some functions, it helps distinguish these tools from "grinding stones," which were always too big to hold in one hand while being used. At Raqa'i, 36 pestles were recovered from the seasons of 1986–1992. These have been divided into 10 types. The identifications of the kinds of stones used could only be done macroscopically in the field and therefore have to be considered somewhat tentative. The different types are defined as follows (Figure 5.102):

1. Type A: Small, spherical or sub-spherical stones of 8 cm or less in diameter. It is uncertain if these were natural rocks picked for their convenient shape or stones which were wholly or partially worked into this shape (four examples) (e.g., Raq 86 S-0001, Figure 5.102).
2. Type B: Stones that were modified to make one end clearly narrower than the other. Sometimes the narrower end has relatively parallel sides and so looks like a handle, while the wide end has an intentionally made concave surface. Usually type B is made of basalt, but one example is made of a hard white stone (S-221) (Figure 5.113). This is the largest type of pestle, measuring 13–25 cm in length (nine examples).[141]
3. Type C: Oblong, water-worn cobbles up to 16.5 cm long. In three examples, the whole cobble was used and one or both ends showed pecking marks, suggesting the implement had been used to hammer with. Seven other examples have one broken and one smooth end and hence appear to have been broken off larger pieces. The smooth end is always the pecked end. A dense, hard (Moh's 6–7) gray stone was used (9 examples).[142] (See the five examples shown in Figure 5.111.)

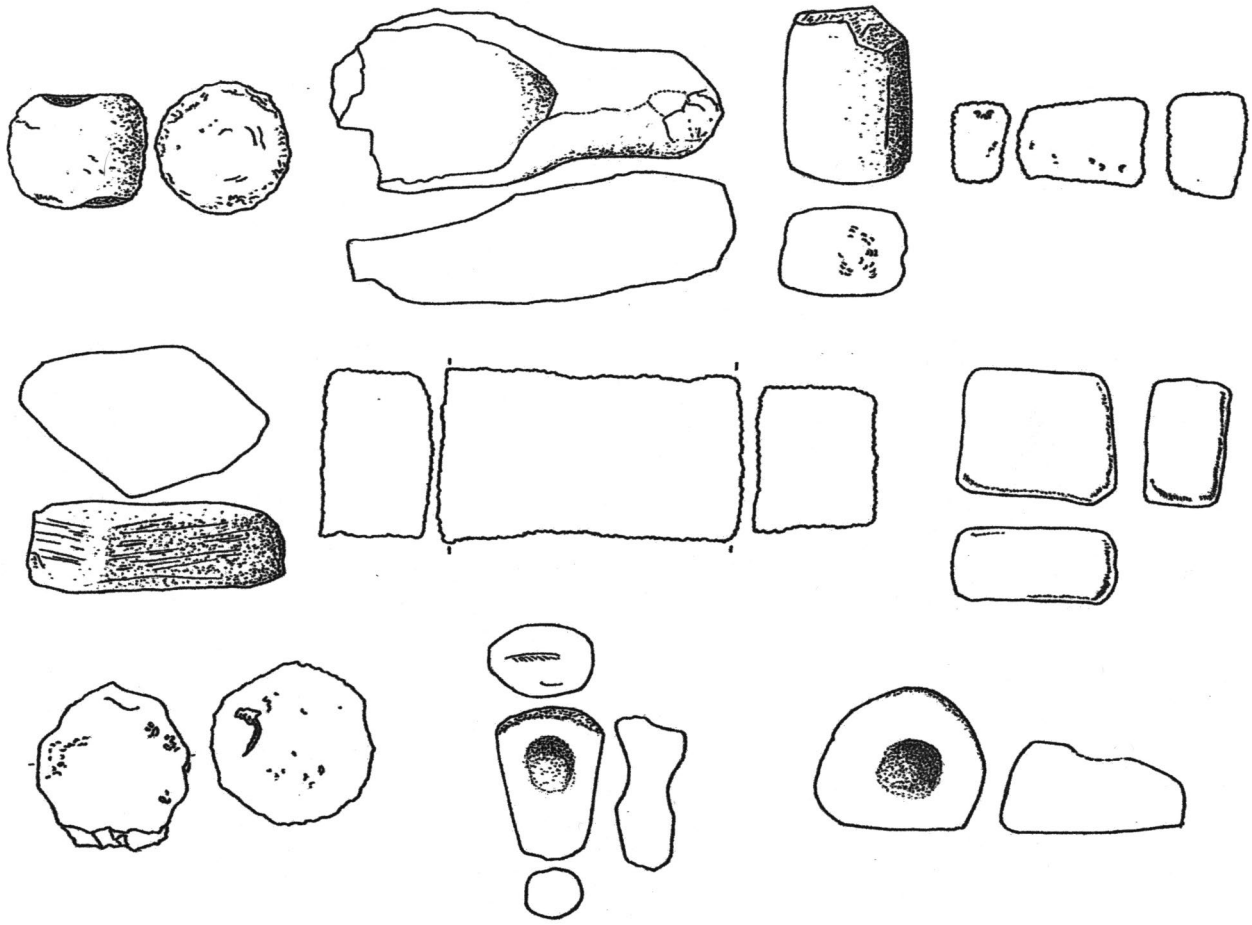


FIGURE 5.102. Pestle types.Top row, left to right: type A (Raq 86 S-0001); type B (Raq 91 S-221); type C (Raq 88 S-069); type D (Raq 88 S-047); second row, left to right: type E (Raq 89 S-091); type F (Raq 88 S-058); type G (Raq 91 S-150); third row, left to right: type H (Raq 88 S-024); type J (Raq 89 S-078); type K (Raq 89 S-092). See Catalogue for dimensions. *Illustration prepared by Sally Dunham.*

4. Type D: Small pieces of vesicular basalt (greatest dimension 7.1 cm) which have been shaped into prismoids (2 examples) (e.g., Figure 5.102, Raq 88 S-047).
5. Type E: Flat, dense gray/tan stones about 4 cm thick whose wide sides are parallelograms, thus creating two pointed ends, one or both of which show pecking marks. These appear to be natural rocks chosen for their convenient shape (2 examples) (Figure 5.102, Raq 89 S-091).
6. Type F: Pieces of vesicular basalt (identification not absolutely certain) that appear to have one or more sides intentionally flattened. In all instances, the edges of the vesicles are much sharper that those on types D and B. In one example, the piece was shaped like a rectangular block (S-058), while another was loaf-shaped (S-209) (5 examples) (Figure 5.102, Raq 88 S-058).
7. Type G: Flat, squat prismatic rocks of rectangular section. One, S-150 (Figure 5.102), is of a hard (Moh's 7) brown-pinkish stone and shows some pecking on all edges, but whether this is from manufacture or use of the object is uncertain (two examples).
8. Type H: A flint nodule that appears to have been intentionally shaped into a rough sphere (Figure 5.102, Raq 88 S-024). Perhaps this was used as a hammer stone (one example).
9. Type J: A small basalt piece shaped like a truncated triangle with an oval cross-section. Near the

wider end each wide side has a concavity, perhaps to facilitate holding the tool (one example) (Figure 5.104, Raq 89 S-078).

10. Type K: A very hard, dark stone of sub-triangular plan. One surface is very flat as if it was used for rubbing (?). The other surface is convex with a concavity 3 cm in diameter near the center. This concavity may or may not have been the product of human modification (1 example) (Figure 5.102, Raq 89 S-092).

The precise tasks for which the grinding stones and pestles were used and how they might have been related to the storage of grain can only be very tentatively suggested. One possibility for the pestles is to pound the grain after it had been parched.[143] This is to separate the grain from its spikelets and release it from its enveloping husk. If barley[144] is the grain being processed, after threshing and winnowing, it has to be pounded to remove the basal bit of the awn remaining whether it is being prepared for animal or human food (Hillman 1985). Pestle types B, C, E, and perhaps G seem suitable for such "pounding" tasks. Although only three certain and one possible mortar were found at Raqa'i, one (S-022) was found in the Round Building of level 3, while in level 4 two-thirds of the pestles were from the Round Building (see Tables 5.14 and 5.15). This suggests that separating the spikelets from the grain could have been conducted in the Round Building. Five grinding stones were found in the level 4, Round Building. One was a type C (Raq 89 S-080), two were type B (Raq 90 S-124, and Raq 190 S-128), and two were type A (Raq 89 S-110 and Raq 87 S-020). These could have been used as surfaces to pound on. Hillman (1984:130) has suggested that mortars made of plaster and sometimes sunk below the floor could have been used. At Raqa'i, lime-plastered basins occur in several of the rooms of the level 3 settlement, but these are interpreted as installations for grinding grain, and they are not sunk below the floor. Another possible use of some of the pestles is to resharpen the working surfaces of grinding stones. Hayden (1987) observes that people in the highlands of Guatemala use prehistoric celts found in their surroundings for this task.

Reciprocal hand mills such as those to which grinding stone types A, B, and C probably belonged were most often used to grind grain into flour. In Chapter 2, the probability is mentioned that some of the lime-plastered "basins" in the level 3 houses were grinding tables, a suggestion based on discoveries at Bderi (Pfälzner 2001:139). Only feature 34G has all the characteristics Pfälzner defines for such an installation: the lower grinding stone could have been placed so that one end was higher than the other, there is space behind the higher end for the person doing the grinding to stand (or kneel), and there could have been room to either side of the stone so that ground grain (flour) could be caught in the basin and eventually swept down to a receptacle at the (lower) front end of the table.[145] Pfälzner emphasizes the need for space both in front (for the receptacle for the flour) and behind the grinding table (for the grinder to stand or kneel). Feature 34G has two basins, perhaps for grinding stones that were used to grind different substances. Pfälzner notes that in West Africa each grinding table has places for two grinding stones, to avoid having the residue left from grinding one substance get mixed with another one. That a similar situation could have existed in the ancient Near East is suggested by some Old Babylonian dowries published by Dalley (1980). Here the bride's dowry often includes more that one grinding stone, with each grinding stone being qualified by a different product: for example, "one grinding stone for ZÍD-GU-flour, one grinding stone for *tappinnum*-flour" (Dalley 1980:60–61, lines 10–11).[146]

Although the other lime-plastered "bins" of level 3 do not appear to have all the characteristics of feature 34G, they still might have been used as grinding tables. For instance, features 15F and 17D are in the corners of rooms, so either the grinder had to stand on the table in the corner and grind toward the room or stand on the floor of the room and grind toward the corner.[147] The latter position seems more likely. The flour from grinding would still be caught in the basin and could be swept into a receptacle in front of the table. Features 12D and 29F, G, and H are very low tables that could have been used by a person kneeling on the floor.

Since some of the grinding stones were found in the Round Building in levels 3 and 4 (see Tables 5.11 and 5.12), one may ask whether they had any part in preparing the grain for storage, such as de-husking the grain after parching. Although Hillman observes that mortars and pestles are much more effective for this latter procedure, he notes that in one province in eastern Turkey domestic rotary querns are used to de-husk emmer (Hillman 1984:138). This produces a mixture of, "grain fragments (grits), floury particles of an endosperm, fine chaff and weed seeds," which is refined by winnowing and fine sieving, tasks not traceable archaeologically. Perhaps a similar mixed product would

also result using a reciprocal hand mill and could be refined further by the same processes. Hillman (1984: 131) also reports that modern experiments have shown that using a fist-sized stone on a "saddle quern" was very successful at breaking spikelets. While neither of these techniques seems very efficient to modern eyes, they do seem like techniques that could have been employed by the ancient inhabitants of Raqa'i.

Door Sockets, Mortars, and Perforated Stones

Under this heading are stones of cobble or boulder size[148] that have a cavity or hole made by human agency. These have been classified into three types according to the cavity or hole: type A with a depression on one of the faces (13 examples)[149]; type B with a biconical perforation (28 examples)[150]; and type C with an L-shaped hole (2 examples) (Figures 5.103, 5.104, 5.105). In fact, types A and B were part of a single mechanism used for the bottom of a doorpost. Type A was the lower part, underneath floor level, where the bottom of the doorpost would rest. Type B would be a cover stone for the type A stone. The doorpost would go through the type B stone and rest on the bottom of the cavity of the type A stone.[151] At Raqa'i, however, there were no examples of types A and B together in primary context.

In level 3, 10 door sockets were found in primary contexts next to doorways, but unfortunately only five were registered. From photographs of the pertinent areas, two more could be identified as to type. The complete list follows:

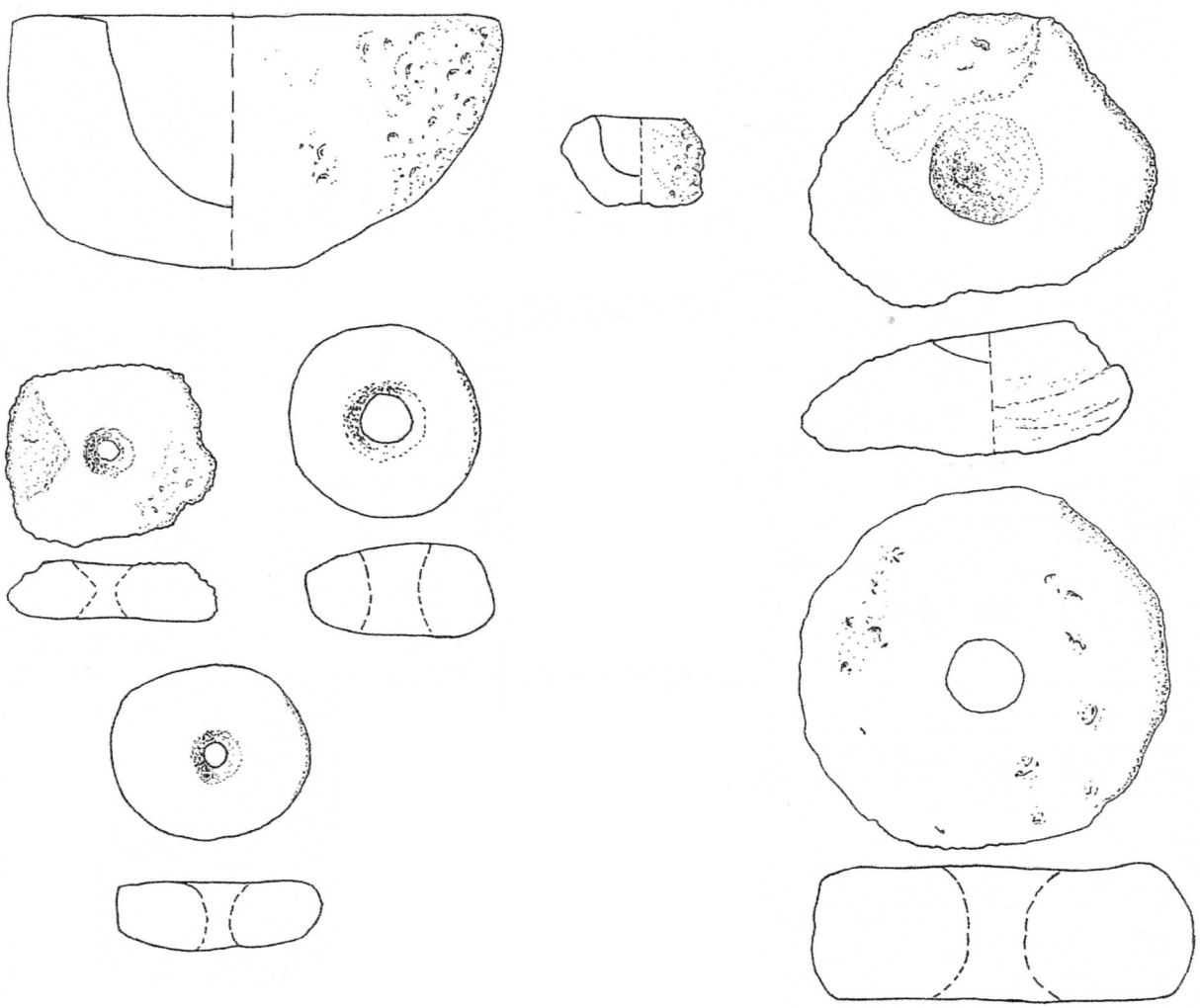


FIGURE 5.103. Door sockets and mortars. Top row, left to right: Raq 87 S-011 (type A); Raq 88 S-050 (type A); Raq 88 S-071 (type A); middle row, left to right: Raq 88 S-070 (type B); Raq 89 S-085 (type B); bottom row, left to right: Raq 90 S-141 (type B); Raq 87 S-019 (type B). See Catalogue for dimensions. *Illustration prepared by Sally Dunham.*

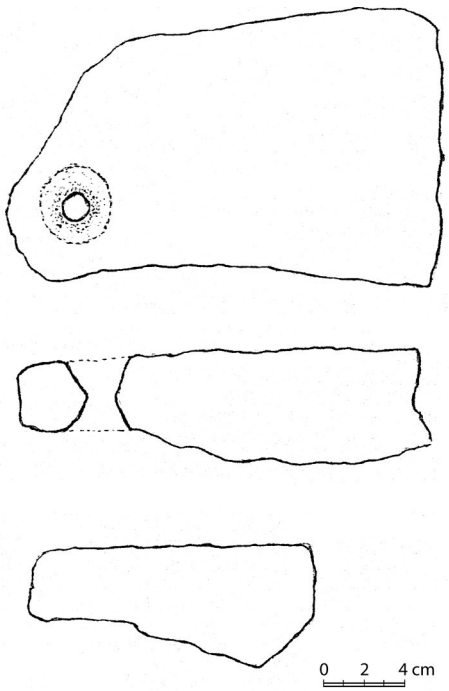


FIGURE 5.104. Raq 92 S-204, door socket type B (?) or possibly an anchor? *Illustration prepared by Sally Dunham.*

Area 1/2, phase b (not registered). Photo shows circular door socket with either a depression or a hole (type A or B).

Area 8 (not registered). Photo shows type A.

Area 15, phase a (not registered).

Area 16, phase c. S-050, type A (Figure 5.103).

Area 18, phase a. S-011, type A (Figure 5.103).

Area 47, phase b. S-070, type B (Figure 5.103).

Area 51, S-100, type A.

Area 52, phase a (not registered).

Area 70, phase a (not registered). Photo shows type A.

Area 79, S-111, type B.

Type A includes four examples of mortars or possible mortars. One mortar, Raq 87 S-022, was found broken in two halves but was perhaps in primary context in the level 3, Round Building. It had a diameter of 27 cm and an interior bowl 12.5 cm deep. S-011 (no. 5 on the list above) had similar dimensions and was probably employed as a mortar before its reuse as a door socket. S-074 is one end of a type A grinding stone with a bowl-shaped depression made in its flat face to facilitate reuse as a mortar. Found in the debris of level 3 area 16, phase b, S-052 is a natural stone with one concave side deep and wide enough to use as a mortar.

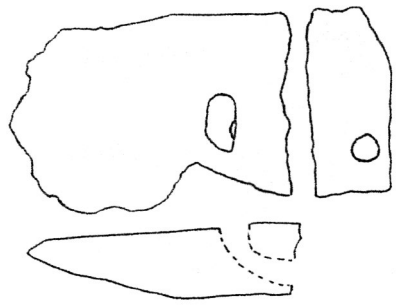


FIGURE 5.105. Raq 88 S-075, perforated stone, type C (scale 1:7). *Illustration prepared by Sally Dunham.*

Type B was the most frequent variety attested. The perforation is biconical because it had been drilled from both sides, with a narrow ridge where the drillings met. The holes are usually 3–5 cm at their widest part at the surface of the stone and narrow to 1.8–2.7 cm. Seven examples were made on ends of broken grinding stones of type A. One type B example is only 9.2 cm in diameter and might have been a weight.[152] Raq 92 S-204 (Figure 5.104), from level 4, has its hole at one end of a rough trapezoidal slab and appears similar to specimens suggested to be anchors at Tell ʾAtij (Fortin 1990c:564 and figure 29). Indeed, the hole of S-204 shows some polish in its narrowest part, and the ridge between the two conical sections seems to be rounded, perhaps from a rope being pulled through it. S-210 may be a broken example of the same type.

The two examples of type C, S-075 (Figure 5.105) and S-228, are both of a white, slightly translucent stone. Near one end is a hole on the broad side which makes a right angle to come out on the narrow end edge. These objects could not have been door sockets and may have served as weights or anchors.

Miscellaneous Stone Objects

Plaster lids, mace heads, hammer heads, stone bowls, personal ornaments, and objects of uncertain use are discussed in this section.

Nine fragments of thick (ca. 1.6–4.5 cm) slabs of a white plaster-like material may have derived from lids for large storage jars. Fragments of one such lid, S-107, were found in primary context in the mouth of jar P-087, sunk below the floor level of area 63, level 3 (see

Figure 2.130). The diameters that could be determined ranged from 17 to 48 cm. Since the white material is usually soft enough to be scratched easily with a fingernail (Moh's hardness 1–2), it may be gypsum, although it seemed harder in one instance (Raq 91 S-145). Lime plaster is attested elsewhere at Raqa'i (Rehhoff et al. 1990), so the possibility exists that some lids were made of lime plaster. Similar plaster lids have been found at Melebiya and Bderi. Sometimes the lids at these sites have impressions of reed mats, straw, or grass on one face. These marks are suggested to be from the surface on which the lid was made; no such impressions were noted at Raqa'i. The maximum size of the lids at Bderi and Melebiya is ca. 40 cm, which is smaller than some of the Raqa'i examples (Lebeau 1993:524 and plates 200 and LI; Pfälzner 2001:209).

Five shaped stones with diameters of less than 10 centimeters may have been mace heads or hammer heads. One of these, S-005 (Figure 5.106), was a mace head with an unfinished hole on its top and bottom. S-149, from level 4, is a broken mace head of oblate shape which was reused as a pestle, as pecking marks on one of its broken edges show. S-118 and S-146, both of which are broken, may have been similar to objects called "boat-shaped battle axes" at Tepe Gawra (level VIII, Speiser 1935:88 and plate 40b:8–11) or "hachettes" from the Temple of Ishtar at Mari (Parrot 1956: 174–175, plate 63). None of the examples at Gawra or Mari appears to have had a sharp cutting edge, so perhaps they should be called "hammer heads" rather than axe heads.

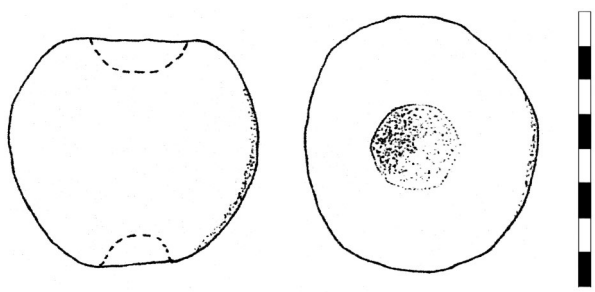


FIGURE 5.106. Raq 87 S-005. Unfinished mace head. *Illustration prepared by Sally Dunham.*

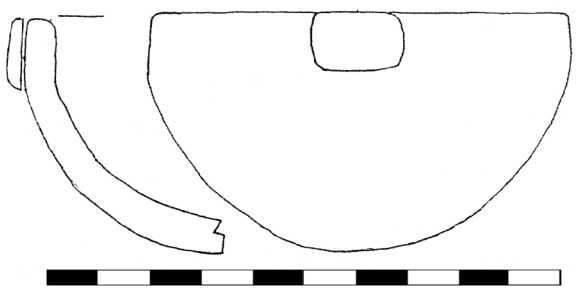


FIGURE 5.107. Raq 90 S-133, stone bowl. *Illustration prepared by Sally Dunham.*

One complete and one broken stone bowl were found. The complete example, S-086, is small and crude with an uneven rim. Since it was found immediately below the mound surface, it is difficult to date. The broken specimen, S-133 (Figure 5.107), consists of two sherds that fit together to form the complete profile of a small round-bottomed white stone bowl. It has a plain, flat rim with a solid rectangular lug at the rim. The closest parallel for this bowl comes from a Ninevite 5 grave at Chagar Bazar (Mallowan 1936: grave 71, figure 20:14).

Three stone objects presented in this section were probably personal ornaments. S-002 and S-154 are diminutive stone rings whose interior diameters (1.0–1.1 cm) are so small that it is likely they were used as beads or pendants rather than finger rings. The objects given the designation S-115 (Figure 5.114) are three segmented stone cylinders that are not pierced. Identical objects have been found at Tell 'Atij[153] and Khafajah.[154] Specimens from Mari and Tell Brak have a slightly different arrangement and spacing of the ridges.[155] Since the Brak example was found in a vase containing silver and gold jewelry (Mallowan 1947: 114) and the Raqa'i examples were found among a large group of beads in a child burial, the objects probably served as personal ornaments.

The last eight objects in this section are of uncertain use. S-129, S-130, and S-131 (Figure 5.116) are small, flat pieces of white plaster found in silo 1 of the level 4 Round Building. Two of them have incised crossed lines on one of their faces. Whether these were meant to be some kind of token or whether they are fragments from some larger object is uncertain. S-152 is a much eroded stone cylinder with a straight hole through its long axis. Although it is hourglass-shaped and its ends have an elliptical cross-section at present, perhaps it was once cylindrical and is a completely eroded cylinder seal.

DISTRIBUTION OF STONE OBJECTS

Distribution plans are presented for pestles and grinding stones for levels 3 and 4 (see Figures 5.153, 5.157)

and distribution tables for grinding stones, pestles, door sockets and mortars are provided for levels 2, 3 and 4 (Tables 5.10–5.18).[156] The distribution plans for levels four and three both show that pestles and grinding stones occur in the Round Building.[157] In the north area, five grinding stones but no pestles were found in level 4, while both grinding stones and pestles were retrieved from the Temple area and the northwest part of level 3.[158] In level 3, the Round Building was only preserved in its northernmost part, but a grinding stone and pestle were found in area 47 and two grinding stones in area 88. As noted above, Hillman observes that fist-sized pestles can be effective for dehusking grain after parching it; perhaps the persistence of pestles in the same areas as grinding stones in levels 3 and 4 implies their use in the dehusking grain for parching, but this is only tentative.

The tables for levels 2 and 3 also list the reuse of stone objects as building material in the packing of stones around area 14 in level 2 and in the drain 15H in level 3.

TABLE 5.10. Grinding Stones, Level 2.

Catalogue/Object #	Area/room	Type
38. Raq 89 S-101	13	B
39. Raq 89 S-102	13	A
44. Raq 89 S-114	13	A
11. Raq 88 S-026	14E–F	A
12. Raq 88 S-027	14E–F	A
13. Raq 88 S-028	14E–F	A
14. Raq 88 S-029	14E–F	A
15. Raq 88 S-030	14E–F	A
16. Raq 88 S-031	14E–F	B
17. Raq 88 S-032	14E–F	A
18. Raq 88 S-033	14E–F	A
19. Raq 88 S-034	14E–F	A
20. Raq 88 S-035	14E–F	A
21. Raq 88 S-036	14E–F	A
22. Raq 88 S-037	14E–F	A
59. Raq 91 S-212	18	A

Note: All were found in northern part of site.

TABLE 5.12. Grinding Stones, Level 4.

Catalogue/Object #	Area of site	Area/room	Type
43. Raq 89 S-110	Round Bldg southeast	27	A
45. Raq 90 S-124	Round Bldg west	9 phase a	B
48. Raq 90 S-128	Round Bldg center	12, phase b	B
9. Raq 87 S-020	Round Bldg center	13, phase d	A
32. Raq 89 S-080	Round Bldg center	17	C
61. Raq 91 S-214	North	71, phase c	A
63. Raq 91 S-216	North	71, phase c	A
66. Raq 91 S-220	North	72, phase c	A
64. Raq 91 S-217 a–b	North	75, phases b–c	A
52. Raq 92 S-200	North	79, phase a	A

TABLE 5.11. Grinding Stones, Level 3.

Catalogue/Object #	Area of site	Area/room	Type
27. Raq 88 S-057	Northwest	12	A
40. Raq 89 S-103	Northwest	59	A
41. Raq 89 S-104	Northwest	59	A
42. Raq 89 S-105	Northwest	59	A
25. Raq 88 S-051	Temple area	16, phase b	A
10. Raq 87 S-021	Temple area	22, phase c	A
55. Raq 91 S-205	Temple area	61, drain 15H	A
56. Raq 91 S-206	Temple area	61, drain 15H	A
57. Raq 91 S-208	Temple area	61, drain 15H	A
60. Raq 91 S-213	Temple area	61, drain 15H	A
62. Raq 91 S-215	Temple area	61, drain 15H	A
64. Raq 91 S-217b	Temple area	61, drain 15H	A
65. Raq 91 S-218	Temple area	61, drain 15H	A
68. Raq 91 S-223	Temple area	61, drain 15H	A
58. Raq 91 S-211	Temple area	61, north of area 15	A
67. Raq 91 S-222	Temple area	61, north of area 15	A
69. Raq 91 S-224	Temple area	61, north of area 15	A
49. Raq 90 S-132	Temple area	62, phase c	A
23. Raq 88 S-048	Temple area	92, east of area 16	A
24. Raq 88 S-049	Temple area	92, east of area 16	A
28. Raq 88 S-064	Round Bldg	47 phase b	A
29. Raq 88 S-065	Round Bldg	88, phase b	A
30. Raq 88 S-066	Round Bldg	88, phase b	A

TABLE 5.13. Pestles, Level 2.

Catalogue/Object #	Area/room	Type
3. Raq 87 S-003	8, phase a	B
5. Raq 88 S-024	14E–F	H
9. Raq 88 S-058	15	F
12. Raq 88 S-063	18	C

Note: All were found in northern part of site.

TABLE 5.14. Pestles, Level 3.

Catalogue/Object #	Area of site	Area/room	Type
36. Raq 91 S-221	Northwest	12	B
8. Raq 88 S-047	Temple area	15, phase c	D
35. Raq 91 S-219	Temple area	61 (drain 15 H)	B
32. Raq 91 S-150	Temple area	61, north of area 15	G
34. Raq 91 S-209	Temple area	61, north of area 15	F
14. Raq 88 S-069	Round Bldg	47	C

TABLE 5.15. Pestles, Level 4.

Catalogue/Object #	Area of site	Area/room	Type
24. Raq 90 S-116	Round Bldg northeast	29	B
25. Raq 90 S-117	Round Bldg south	7	B
27. Raq 90 S-121	Round Bldg south	9, phase a	A
28. Raq 90 S-122	Round Bldg south	9, phase a	E
30. Raq 90 S-125	Round Bldg south	105	B
29. Raq 90 S-123	Round Bldg center	12, phase d	B
11. Raq 88 S-061	Round Bldg center	13, phase d	D
22. Raq 89 S-109	Round Bldg center	23	F
19. Raq 89 S-091	Round Bldg west	15, phase c	E
20. Raq 89 S-092	Round Bldg west	15, phase c	K
15. Raq 88 S-076	West	52, phase b	C
16. Raq 88 S-077	West	52, phase b	B
31. Raq 90 S-136	North center	83	F
10. Raq 88 S-060	South	35	A
13. Raq 88 S-068	South	42, phases a–b	C

TABLE 5.16. Door Sockets, Mortars, and Perforated Stones, Level 2.

Catalogue/Object #	Area of site	Area	Type
8. Raq 88 S-025	North area	14E–F	A
9. Raq 88 S-038		"	B
10. Raq 88 S-039		"	B
11. Raq 88 S-040		"	B
12. Raq 88 S-041		"	B
18. Raq 88 S-056		16	B

TABLE 5.18. Door Sockets, Mortars, and Perforated Stones, Level 4.

Catalogue/Object #	Area of site	Area/room	Type
19. Raq 88 S-062	South	36	B
40. Raq 91 S-225	North	75	A
37. Raq 92 S-204	North	76	B
42. Raq 92 S-228	North	76	C

TABLE 5.17. Door Sockets, Mortars, and Perforated Stones, Level 3.

Catalogue/Object #	Area of site	Area/room	Type
(not registered)	West center	*1–2, phase b	*A or B
26. Raq 89 S-084	West center	3	B
3. Raq 87 S-011	West center	*18, phase a	*A (m)
2. Raq 87 S-010	West center	94	B
(not registered)	Northwest	*8	*A
31. Raq 89 S-100	Northwest	*51	*A
(not registered)	Northwest	*52, phase a	*
30. Raq 89 S-099	Northwest	59	A
(not registered)	Temple area	*15, phase a	*
15. Raq 88 S-052	Temple area	16, phase b	A (m?)
14. Raq 88 S-050	Temple area	*16, phase c	*A
5. Raq 87 S-019	Temple area	24	B
38. Raq 91 S-207	Temple area	61 (drain 15H)	B
39. Raq 91 S-210	Temple area	61, north of area 15	B
41. Raq 91 S-226	Temple area	61, north of area 15	B
16. Raq 88 S-053	Northeast	29	B
24. Raq 88 S-074	Northeast	32, phase a	A (m)
25. Raq 88 S-075	Northeast	33, phase e	C
28. Raq 89 S-087	Northeast	66	B
27. Raq 89 S-085	Northeast	69, phase d	B
(not registered)	Northeast	*70, phase a	*A
22. Raq 88 S-071	Southeast	34	A
33. Raq 89 S-111	Southeast	*79	*B
34. Raq 89 S-112	Southeast	79	B
21. Raq 89 S-070	Round Bldg	*47, phase b	*B
13. Raq 88 S-042	Round Bldg	87, phase b	A
20. Raq 88 S-067	Round Bldg	88, phase b	B
6. Raq 87 S-022	Round Bldg	89, phase b	A (m)
29. Raq 89 S-093	Round Bldg	91	B

Note: m = mortar.
* When asterisk appears before area number and type designation, the door socket was found in primary context. Where stone is listed as "not registered," type has been inferred from photograph of area.

CATALOGUE OF STONE OBJECTS (FIGURES 5.101–5.116)

Grinding Stones

1. Raq 86 S-0003 (86). Above level 3, under topsoil. Grinding stone type A. One end preserved. Vesicular basalt. L. 12.0 × W. 10.5 × H. 4.9 cm. Archon 36/114-013. Above level 3 area 20. Debris of uncertain level.
2. Raq 87 S-004. Above level 3, under topsoil. Grinding stone type A. One end preserved. Vesicular basalt. L. 17.0 × W. 16.0 × H. 6. 8 cm. Archon 36/126-001. Above level 3 area 8. Debris of uncertain level.
3. Raq 87 S-009. Topsoil. Grinding stone type A. One end preserved. Vesicular basalt. L. 23.0 × W. 16.0 × H. 4.0 cm. Archon 30/120-000. Debris of uncertain level.
4. Raq 87 S-012. Topsoil. Grinding stone type A. One end preserved. Vesicular basalt. L. 19.0 × W. 12.5 × H. 5.0 cm. Archon 48/90-000. Debris of uncertain level.
5. Raq 87 S-013. Topsoil. Grinding stone type A. One end preserved. Vesicular basalt. L. 19.0 × W. 12.0 × H. 6.0 cm. Archon 48/90-000. Debris of uncertain level.
6. Raq 87 S-014. Topsoil. Grinding stone type A. One end preserved. Vesicular basalt. L. 15.0 × W. 14.0 × H. 6.0 cm. Archon 48/90-000. Debris of uncertain level.
7. Raq 87 S-016. Topsoil. Grinding stone type A. Complete. Rectangular with rounded ends. Vesicular

basalt. L. 21.0 × W. 12.5 × H. 5.5 cm. Archon 42/96-000. Debris of uncertain level.

8. Raq 87 S-018. Above level 2, under topsoil. Grinding stone type A. One end preserved. Vesicular basalt. L. 12.7 × W. 11.5 × H. 5.0 cm. Archon 42/096-002. Above level 2 area 26. Debris outside architecture.
9. Raq 87 S-020. Level 4. Grinding stone type A. One end preserved. Vesicular basalt. L. 16.5 × W. 20.0 × H. 8.0 cm. Archon 42/114-050. Round Building, area 13, phase d. Debris.
10. Raq 87 S-021. Level 3. Grinding stone type A. Complete. Rectangular with rounded ends. Vesicular basalt. L. 27.0 × W. 12.7 × H. 5.6 cm. Archon 29/108-032. Area 22, phase c. Debris inside room.
11. Raq 88 S-026. Level 2. Grinding stone type A. One end preserved. Vesicular basalt. L. 23.4 × W. 16.2 × H. 9.1 cm. Archon 29/120-027. Area 14E–F. Packing of stones and bricky material.
12. Raq 88 S-027. Level 2. Grinding stone type A. One end preserved. Vesicular basalt. L. 22.5 × W. 14.7 × H. 9.5 cm. Archon 29/120-027. Area 14E–F. Packing of stones and bricky material.
13. Raq 88 S-028. Level 2. Grinding stone type A. One end preserved. There is a depression on the flat side as if someone began to make it into a door socket. Vesicular basalt. L. 24.3 × W. 17.5 × H. 9.1 cm. Archon 29/120-027. Area 14E–F. Packing of stones and bricky material.
14. Raq 88 S-029. Level 2. Grinding stone type A, but grinding surface slightly convex. The full length is preserved, but a fragment is missing on one side of one end. Vesicular basalt. L. 32.0 × W. 14.7 × H. 9.1 cm. Archon 29/120-027. Area 14E–F. Packing of stones and bricky material.
15. Raq 88 S-030. Level 2. Irregular fragment of what was probably a type A grinding stone. Vesicular basalt. L. 19.5 × W. 19.1 × H. 9.1 cm. Archon 29/120-027. Area 14E–F. Packing of stones and bricky material.
16. Raq 88 S-031. Figure 5.101. Level 2. Grinding stone type B. One end preserved. This has a round edge that joins to sides that narrow toward the middle of the stone. Vesicular basalt. L. 42 × W. 19.1–26.0 × H. 9.7. Archon 29/120-027. Area 14E–F. Packing of stones and bricky material.
17. Raq 88 S-032. Level 2. Grinding stone type A. One end preserved. Vesicular basalt. L. 16.8 × W. 14.9 × H. 8.4. Archon 29/120-027. Area 14E–F. Packing of stones and bricky material.
18. Raq 88 S-033. Level 2. Grinding stone type A. Slight concavity of the flat side may be due to use wear. One end preserved. L. 13.2 × W. 13.2 × H. 6.3 cm. Archon 29/120-027. Area 14E–F. Packing of stones and bricky material.
19. Raq 88 S-034. Level 2. Grinding stone type A. One end preserved. Vesicular basalt. L. 14.5 × W. 15.6 × H. 8.0 cm. Archon 29/120-027. Area 14E–F. Packing of stones and bricky material.
20. Raq 88 S-035. Level 2. Grinding stone type A. Fragment only. Vesicular basalt. L. 13.1 × W. 14.3 × H. 7.9 cm. Archon 29/120-027. Area 14E–F. Packing of stones and bricky material.
21. Raq 88 S-036. Level 2. Grinding stone type A. One end preserved. Vesicular basalt. L. 15.2 × W. 16.8 × H. 8.8 cm. Archon 29/120-027. Area 14E–F. Packing of stones and bricky material.
22. Raq 88 S-037. Level 2. Grinding stone type A. One end preserved. Vesicular basalt. L. 12.2 × W. 15.6 × H. 10.1 cm. Archon 29/120-027. Area 14E–F. Packing of stones and bricky material.
23. Raq 88 S-048. Level 3. Grinding stone type A. One end preserved. Vesicular basalt. L. 8.5 × W. 10.5 × H. 4.5 cm. Moh's hardness 4. Archon 29/114-052. Area 92. Outdoor surface.
24. Raq 88 S-049. Level 3. Grinding stone type A. One end preserved. Vesicular basalt. L. 9.5 × W. 10.5 × H. 5.0 cm. Archon 29/114-055. Area 92. Debris outside architecture.
25. Raq 88 S-051. Level 3. Grinding stone type A. One end preserved. Vesicular basalt. L. 21.0 × W. 11.5 × H. 4.5 cm. Archon 29/114-041. Area 16, phase b. Debris inside room.
26. Raq 88 S-054. Level 2 or level 3. Grinding stone type A. One end preserved. Vesicular basalt. L. 8.4 × W. 17.0 × H. 6.4 cm. Archon 36/102-026. Above area 38, level 3. Debris of uncertain level.
27. Raq 88 S-057. Late level 3. Grinding stone type A. Fragment. Vesicular basalt. L. 11.3 × W. 14.0 × H. 6.0 cm. Archon 29/120-049. Area 12. Debris inside room.
28. Raq 88 S-064. Level 3. Grinding stone type A. Complete. Vesicular basalt. L. 29.0 × W. 15.4 × H. 8.0 cm. Moh's hardness 5. Archon 42/108-032. Area 47, phase b. Debris inside room.
29. Raq 88 S-065. Level 3. Grinding stone type A. One end preserved. Vesicular basalt. L. 18.0 × W. 18.0 × H. 6.8 cm. Archon 42/108-034. Area 88, phase b. Debris from presumed unroofed area in Round Building.

30. Raq 88 S-066. Level 3. Grinding stone type A. Full length preserved. Chip out of one side of one end. Vesicular basalt. L. 28.0 × W. 17.5 × H. 7.5 cm. Archon 42/108-038. Area 88, phase b. Debris from presumed unroofed area in Round Building.
31. Raq 89 S-079. Level 3 or 4. Grinding stone type A. One end preserved. Vesicular basalt. L. 14.0 × W. 15.0 × H. 6.3 cm. Archon 30/120-035. Area 4, phase c (level 3 designation). Debris in silo.
32. Raq 89 S-080. Figure 5.101. Level 4. Grinding stone type C. Only one end preserved. Vesicular basalt. L. 17.6 × W. 12.4 × H. 4.9 cm. Moh's hardness 5. Archon 42/114-104. Area 17, phase b. Debris in room.
33. Raq 89 S-083. Above level 3, under topsoil. Grinding stone type A. One end preserved. Vesicular basalt. L. 18.9 × W. 12.8 × H. 5.5 cm. Archon 42/114-122. Above area 91, level 3. Debris of uncertain level.
34. Raq 89 S-088. Figures 5.101 and 5.108. Level 3 or 4. Grinding stone type a. Complete. Vesicular basalt. L. 27 × W. 15.4 × H. 6.4 cm. Archon 48/108-027. Above Area 17, level 4. Debris of uncertain level.
35. Raq 89 S-095. Post-level 1. Grinding stone type A. Complete. Vesicular basalt. L. 26 × W. 14.3 × H. 6.0 cm. Archon 42/102-061. On top of a late burial.
36. Raq 89 S-096. Post-level 1. Grinding stone type A. Complete. Elliptical plan. Vesicular basalt. L. 21.9 × W. 17.1 × H. 7.2 cm. Archon 42/102-061. On top of a late burial.
37. Raq 89 S-097. Post-level 1. Grinding stone type C. One end preserved. Fine grained basalt. L. 18.1 × W. 15.6 × H. 3.3 cm. Archon 42/102-061. On top of a late burial.
38. Raq 89 S-101. Figure 5.109. Level 2. Grinding stone type B. Complete. Elliptical plan. Vesicular basalt. L. 32 × W. 12.4 × H. 7.4 cm. Archon 29/132-005. Above area 13.
39. Raq 89 S-102. Level 2. Grinding stone type A. Fragment from middle. Both ends broken off. Vesicular basalt. L. 16.0 × W. 19.0 × H. 7.5 cm. Archon 29/132-005. Area 13.
40. Raq 89 S-103. Level 3. Grinding stone type A. One end preserved. Vesicular basalt. L. 15.5 × W. 14.5 × H. 7.5 cm. Archon 29/126-051. Area 59. Debris outside architecture.

FIGURE 5.108. Raq 89 S-088, grinding stone type A. *Photograph by Sally Dunham.*

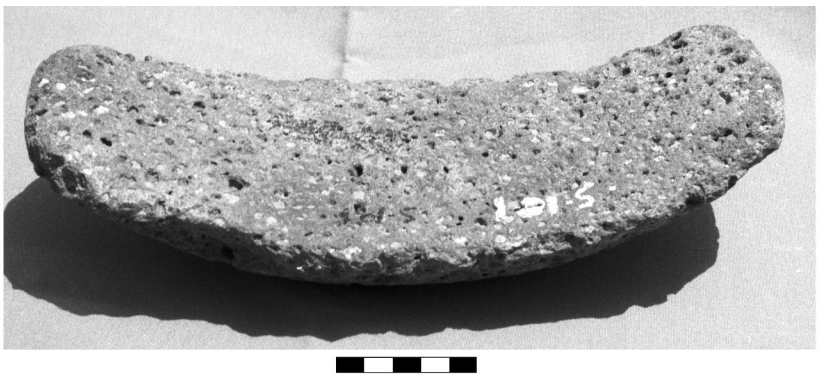


FIGURE 5.109. Raq 89 S-101, grinding stone type B. *Photograph by Sally Dunham.*

41. Raq 89 S-104. Level 3. Grinding stone type A. Both ends broken. Vesicular basalt. L. 10.0 × W. 13.7 × H. 7.9 cm. Archon 29/126-051. Area 59. Debris outside architecture.
42. Raq 89 S-105. Level 3. Grinding stone type A. One end preserved. Flat surface has shallow circular depression near broken end. Vesicular basalt. L. 15.0 × W. 12.0 × H. 7.2 cm. Archon 29/126-048. Area 59. Debris outside architecture.
43. Raq 89 S-110. Level 4. Grinding stone type A. Both ends broken. Vesicular basalt. L. 17.0 × W. 22.7 × H. 8.2 cm. Archon 49/108-045. Round Building, area 27. Brick platform.
44. Raq 89 S-114. Level 2. Grinding stone type A. One end preserved. Vesicular basalt. L. 14.0 × W. 12.5 × H. 6.3 cm. Archon 29/132-005. Area 13.
45. Raq 90 S-124. Level 4. Grinding stone type B. One edge preserved. Vesicular basalt. L. 15.2 × W. 13.7 × H. 5.3 cm. Archon 42/114-208. Round Building, area 9, phase a. Debris inside room.
46. Raq 90 S-126. Level 3 or 4. Grinding stone type A. One end preserved. Vesicular basalt. L. 22.8 × W. 20.2 × H. 11.7 cm. Archon 42/108-099. Round Building area 88 (level 3 designation). Debris of presumed unroofed area in Round Building.
47. Raq 90 S-127. Level 3 or 4. Grinding stone type A. Rectangular plan with rounded corners. Complete except for one corner of the flat face. Vesicular basalt. L. 23.3 × W. 18.4 × H. 11.9 cm. Moh's hardness 4. Archon 42/108-099. Round Building area 88 (level 3 designation). Debris of presumed unroofed area in Round Building.
48. Raq 90 S-128. Level 4. Grinding type B. Fragment, only one edge preserved. Vesicular basalt. L. 24.9 × W. 15.7 × H. 6.6 cm. Archon 48/108-072. Round Building, area 12, phase b. Debris within room.
49. Raq 90 S-132. Level 3. Grinding stone type A. One end preserved. Vesicular basalt. L. 10.5 × W. 12.9 × H. 5.0 cm. Archon 30/108-058. Area 62, phase c. Outdoor surface.
50. Raq 90 S-140. Post-level 1 or level 1. Grinding stone type A. One end preserved. Vesicular basalt. L. 16.1 × W. 20.5 × H. 8.8 cm. Archon 42/102-107. Area 3 (level 1 designation) Pit.
51. Raq 90 S-142. Post-level 1 or level 1. Grinding stone type A. One end preserved. Vesicular basalt. L. 19.6 × W. 12.7 × H. 5.3. Archon 42/102-107. Area 3 (level 1 designation). Pit.
52. Raq 92 S-200. Level 4. Grinding stone type A. Triangular cross-section. One end preserved. Stone blackened in places as if it had been in a fire. Flat surface bumpy, not obviously suitable for grinding. Basalt. Vesicles 0.1–0.5 cm D., and appear to be smaller than those in other grinding stones. L. 12.3 × W. 11.1 × H. 6.0 cm. Moh's hardness 4. Archon 29/114–514. Area 79, phase a.

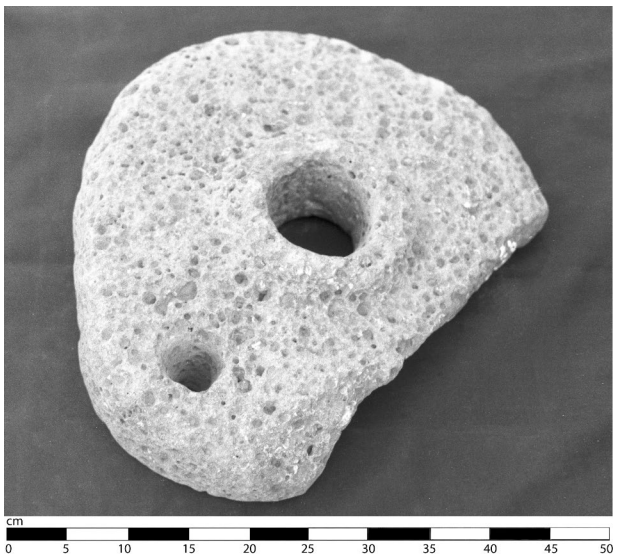


FIGURE 5.110. Raq 89 S-201, grinding stone type D. *Photograph by Sally Dunham.*

53. Raq 92 S-201. Figure 5.110. Level 3 or above. Grinding stone type D. Top stone of a rotary hand mill, with one broken edge. Thick ridge around central hole. The hole for the handle narrows towards the grinding surface, which is the bottom of this stone. The top of the stone is slightly convex. In plan, the object resembles a circle with flattened sides. The grinding surface is extremely flat with short straight striations in some areas, as if from turning and scraping against a lower stone. The interior surface of the central hole has clear polish on it, probably from turning around the central pole. Vesicular basalt. D. 35 × H. 9.5 cm. D. of central hole 7.4; of smaller hole 3.1 cm. Archon 29/120–560. Area 93, level 3. Found in test probe near a group of stones that probably belong to a late intrusion, so the date is uncertain.
54. Raq 92 S-203. Level 5. Grinding stone type A. One end preserved. Rectangular plan with rounded corners. Vesicular basalt. Large vesicles (up to D. 2.5 cm). L. 17.4 × W. 17.7 × H. 8.0 cm. Moh's hardness 4. Archon 17/114-013. Area 22, phase d. On floor.

55. Raq 91 S-205. Level 3. Grinding stone type A. One end preserved. Flat side shows some smoothing and is slightly convex in cross-section, presumably from use wear. Vesicular basalt. L. 17.4 × W. 12 × H. 5.0 cm. Moh's hardness 4. Archon 29/114, unit 0225. Area 61. Reused in drain 15H.
56. Raq 91 S-206. Level 3. Grinding stone type A. Complete. Plan is rectangular with rounded ends. Vesicular basalt. L. 21 × W. 14.5 × H. 7.5 cm. Moh's hardness 4–5. Archon 29/114, unit 0188. Area 61. Reused in drain 15H.
57. Raq 91 S-208. Level 3. Grinding stone type A. One end preserved. Flat side shows little use-wear (pores quite rough). Vesicular basalt. L. 21 × W. 14.5 × H. 7.5 cm. Moh's hardness 4–5. Archon 29/ 114, unit 0179. Area 61. Reused in drain 15H.
58. Raq 91 S-211. Level 3. Grinding stone type A. One end preserved. Flat side does not appear to have much use wear. Vesicular basalt. L. 18.4 × W. 16.3 × H. 7.5 cm. Archon 29/114, unit 0818-1. Area 61, north of area 15.
59. Raq 91 S-212. Level 2. Grinding stone type A. One end preserved. Flat side shows some use wear. Vesicular basalt. L. 8.4 × W. 13.1 × H. 5.5 cm. Moh's hardness 5. Archon 23/114, unit 0044, elevation 294.93. Area 18.
60. Raq 91 S-213. Level 3. Grinding stone type A. One end preserved. Vesicular basalt. L. 18.3 × W. 11.6 × H. 5.5 cm. Moh's hardness 4. Archon 29/114, unit 0265. Area 61. Reused in drain 15H.
61. Raq 91 S-214. Level 4. Grinding stone type A. One end preserved. Vesicular basalt. L. 14.7 × W. 15.2 × H. 6.2 cm. Moh's hardness 4. Archon 24/116, unit 2900, elevation 293.13. Area 71, phase c.
62. Raq 91 S-215. Level 3. Grinding stone type A. One end preserved. Vesicular basalt. L. 17.9 × W. 13.2 × H. 6.7 cm. Moh's hardness 4–5. Archon 29/114, unit 0225. Area 61. Reused in drain 15H.
63. Raq 91 S-216. Level 4. Grinding stone type A. One end preserved. Vesicular basalt. L. 15.8 × W. 13.0 × H. 6.3 cm. Moh's hardness 5. Archon 23/116.5, unit 2891-1, elevation 293.13. Area 71, phase c.
64. Raq 91 S-217a and b. Level 3 or 4. Grinding stone type A. Two fragments which join to make a complete specimen. One piece from level 3 and one from level 4. Plan has round ends and long straight sides. Vesicular basalt. L. 28.3 × W. 11.7 × H. 5.9 cm. Archon 29/114, unit 1880 (a) + 265 (b). Area 75, phases b–c (a) and area 61 (b).
65. Raq 91 S-218. Level 3. Grinding stone, type A. One end preserved. Vesicular basalt. L. 8.4 × W. 12.6 × H. 5.1 cm. Moh's hardness 6. Archon 29/114, unit 1849. Area 61. Reused in drain 15H.
66. Raq 91 S-220. Level 4. Grinding stone type A. One end preserved. Vesicular basalt. L. 10.4 × W. 12.8 × H. 4.2 cm. Moh's hardness 4. Wt. 280 g. Archon 29/120, unit 2743-1. Area 72, phase c.
67. Raq 91 S-222. Level 3. Grinding stone type A. One end preserved. Vesicular basalt. L. 10.7 × W. 14.1 × H. 8.7 cm. Moh's hardness 6. Archon 29/114, unit 1857. Area 61. North of area 15.
68. Raq 91 S-223. Level 3. Grinding stone type A. One end preserved. Vesicular basalt. L. 15.5 × W. 13.9 × H. 6.4 cm. Moh's hardness 5. Archon 29/114, unit 0265. Area 61. Reused in drain 15H.
69. Raq 91 S-224. Level 3. Grinding stone type A. One curving edge preserved but not clear how close to the end it was. Vesicular basalt. L. 8.9 × W. 8.5 × H. 6.8 cm. Moh's hardness 4–5. Archon 29/120-0413. Area 61. North of area 15.
70. Raq 91 S-227. Level 3 or 4. Grinding stone type A. Only the tip of one end preserved. Vesicular basalt. L. 5.1 × W. 13.2 × H. 3.1 cm. Moh's hardness 4–5. Archon 29/120–566. Area 93 (level 3 designation). Debris outside architecture.
71. Raq 91 S-229. Above level 5, under topsoil. Grinding stone type A. Complete. Oval plan. Vesicular basalt. L. 32.5 × W. 23.9 × H. 7.0 cm. Moh's hardness 4–5. Archon 42/144E-057. Above area 7, level 5. Debris of uncertain level.

Pestles

1. Raq 86 S-0001 (86). Figure 5.102. Level 3 or above. Pestle type A. Complete squat cylinder with convex sides. The sides appear to be evenly pecked, while both ends are flattened and smoothed as if from rubbing something. Gray stone. D. 6.3 × H. 5.4 cm. Archon 30/114-005. Debris of uncertain level.
2. Raq 86. S-0002 (86). Level 3 or above. Pestle type A. Complete rectangular cubic shape with rounded edges. One of the large sides is very smooth as if from rubbing. The other sides are rough. Basalt. L. 8.0 × W. 6.5 × H. 4.8 cm. Archon 30/114-012. Debris of uncertain level.
3. Raq 87 S-003. Level 2. Pestle type B. Complete. No use-polish. Basalt. L. 13.0 × D. 7.0–4.8 cm. Archon 30/120-007. Area 8, phase a. Debris inside room.
4. Raq 87 S-015. Figure 5.111. Level 2 or 3. Pestle type C. Cylindrical with slightly flattened ends.

Complete. Gray stone. L. 10.1 × D. 4.5–4.8 cm. Wt. 500 g. Archon 29/108-004. Above area 22, level 3. Debris of uncertain level.

5. Raq 88 S-024. Level 2. Figures 5.102 and 5.112. Pestle type H. Spherical flint (or chert?) nodule. One side seems intentionally flattened. Flint (or chert?). D. 7.6 cm. Archon 29/120-027. Area 14. Packing of stones and bricky material 14E–F.
6. Raq 88 S-043. Figure 5.111. Topsoil. Pestle type C. Oblong water worn cobble. One end appears broken. The other end appears to be pecked as if it had been used to pound something. Dark gray stone. L. 9.0 × W. 5.2 × H. 4.0 cm. Archon 42/102-000.
7. Raq 88 S-044. Above level 3, under topsoil. Pestle type C. Oblong water- worn cobble, one end slightly pecked. Gray stone. L. 16.5 × W. 6.0 × H. 5.0 cm. Archon 42/102-003. Above area 87, level 3. Debris of uncertain level.
8. Raq 88 S-047. Figures 5.102 and 5.111. Level 3. Pestle type D. Small four-sided truncated pyramid. Basalt. L. 6.5 × W. 4.0–5.0 × Th. 2.5–3.5 cm. Archon 29/114-049. Area 15, phase c. Debris inside room. Comparanda: Martin 1988:206, no. 167.
9. Raq 88 S-058. Figure 5.102. Level 2. Pestle type F. Rectangular block. One end wider than the other. Basalt. L. 14.7 × W. 6.7–5.9 × H. 7.2 cm. Moh's hardness 4. Archon 29/126-018. Area 15. Debris outside architecture.
10. Raq 88 S-060. Level 4. Pestle type A. Flattened top and bottom. Circular plan. Basalt (?). D. 5.7 × H. 4.3 cm. Moh's hardness 5. Archon 60/120-009. Area 35. Debris outside architecture.
11. Raq 88 S-061. Level 4. Pestle type D. Complete. Triangular in cross-section. Plan is trapezoidal with rounded corners. Basalt. L. 7.1 × W. 3.8 × H. 4.0 cm. Archon 42/114-073. Round Building, area 13, phase d. Debris of uncertain level.
12. Raq 88 S-063. Level 2. Pestle type C. Oblong water worn cobble with a roughly elliptical cross-section. One end is rounded and pecked. Gray stone. L. 11.5 × W. 6.8 × H. 5.2–3.4 cm. Archon 29/120-070. Area 18. Oven.
13. Raq 88 S-068. Level 4. Pestle type C. Oblong water worn cobble. One end appears to have had two large chips removed to make it horizontal. Dark gray stone. L. 8.0 × W. 5.5 × H. 3.0 cm. Archon 60/120-042. Area 42, phases a and b. Debris of uncertain level.
14. Raq 88 S-069. Figures 5.102 and 5.111. Level 3. Pestle type C. Oblong stone. One end shows pecking. Other end looks broken, as if chipped (?) off. Gray stone. L. 8.0 × W. 5.6 × H. 4.0 cm. Archon 42/108-036. Round Building, area 47. On floor next to door socket S-070.
15. Raq 88 S-076. Figure 5.111. Level 4. Pestle type C. Oblong stone. Wider end has an elliptical cross-section. Narrower end has a circular section and shows pecking. Gray stone. L. 8.0 × W. 6.7–4.0 × H. 4.3 cm. Archon 30/126-052. Above area 52, phase b. Outdoor surface.
16. Raq 88 S-077. Level 4. Pestle type B. Flat-bottomed; intentionally shaped with a cylindrical handle adjoining a wider end whose top has a concave surface. Basalt. L. 20.5 × W. 10.6 and 6.4 × H. 6.7 cm. Archon 30/126-052. Above Area 52, phase b. Outdoor surface.
17. Raq 89 S-078. Figure 5.102. Level 3 or 4. Pestle type J. Intentionally shaped stone of oval cross-section with one wider end and one narrower end. Near the wider end are two conical indentations for holding the pestle. Basalt. L. 7.2 × W. 4.9 × H. 3.6 cm. Archon 42/108-049. Round Building area 88, level 3. Wall.
18. Raq 89 S-081. Above level 2, under topsoil. Pestle type C. Water worn cobble of rectangular plan with an oval cross-section. Pecking on both ends. Gray stone. L. 16.0 × W. 7.0 × H. 5.0 cm. Archon 29/102-003. Above area 23, level 2. Debris of uncertain level.
19. Raq 89 S-091. Figure 5.102. Level 4. Pestle type E. Flat stone, diamond-shaped in plan. Opposite pointed ends show pecking marks. Stone. L. 11.4 × W. 6.3 × H. 4.1 cm. Archon 42/114-164. Round Building, area 15, phase c. Debris inside room.
20. Raq 89 S-092. Figure 5.102. Level 4. Pestle type K. Stone with a very flat bottom and a convex top. The top has an indent about the size of a thumb; uncertain if natural or result of human modification. In plan, the pestle is circular with one very flat segment as if the object had used for rubbing. Black stone. L. 7.0 × W. 6.5 × H. 4.2 cm. Archon 42/114-166. Round Building, area 15, phase c. Debris inside room.
21. Raq 89 S-094. Post-level 1. Pestle type B. Triangular plan. Longitudinal section is plano-convex, while the cross-section is rectangular with rounded corners. Possibly a grinding stone of type A made into a pestle of type B. Vesicular basalt. L. 24.3 × W. 15.2–8.9 × H. 7.2 cm. Archon 42/102-061. On top of a late burial.

(*Above*): Figure 5.111. Raq type C pestles. Top row, left to right: Raq 88 S-043, S-069; bottom row, left to right: Raq 88 S-047, Raq 87 S-015, Raq 88 S-076. *Photograph by Sally Dunham.*

(*Left*): Figure 5.112. Raq 88 S-024, pestle type H. *Photograph by Sally Dunham.*

22. Raq 89 S-109. Level 4. Pestle type F. Prismatic block with one narrower end. Sides have been worked so they meet at right angles. The narrower end is an irregular surface as though the piece had been broken off a larger piece and not smoothed down. Basalt. L. 9.8 × W. 11.1 × H. 7.4 cm. Moh's hardness 6. Archon 48/108-041. Round Building, area 23. Debris inside room.
23. Raq 89 S-113. Level 3 or 4. Pestle type F. A piece of volcanic rock that has been intentionally flattened on three sides. Basalt (pumice?). L. 6.9 × W. 6.0 × H. 4.7 cm. Archon 48/108-025. Above area 25, level 4, Round Building. Debris of uncertain level.
24. Raq 90 S-116. Level 4. Pestle type B. Rectangular in cross-section. One end is narrower than the other, and both ends show evidence of pecking. Gray-

black stone (fine grained basalt?—stone does not have holes like the vesicular basalt of the grinding stones, but it does have very small holes all over). L. 25.0 × W. 10.2 × H. 7.8 cm. Archon 42/102-087. Round Building, area 29. Debris from presumed unroofed areas of the Round Building.

25. Raq 90 S-117. Level 4. Pestle type B. The wider end and the beginning of the handle are preserved. Basalt. L. 18.2 × W. 9.5 (max.) × H. 6.8 cm. Archon 42/114-198. Round Building, area 7. Debris inside silo.
26. Raq 90 S-120. Topsoil. Pestle type G. Prismatic stone with all edges smoothly rounded (water-worn? use wear?) Dark, fine grained stone. L. 10.0 × W. 6.1 × H. 4.8 cm. Moh's hardness 7. Archon 29/132-000.
27. Raq 90 S-121. Level 4. Pestle type A. Ellipsoid. Possibly used as a small hammer-stone or as sling stone. Gray stone. D. 4.6 + 5.3 cm. Archon 42/114-208. Round Building, area 9, phase a. Debris inside room.
28. Raq 90 S-122. Level 4. Pestle type E. Flat, fine grained stone of "diamond"-shaped plan. The two larger flat sides appear to be polished, while one pointed end has pecking marks as if used to pound something. Fine grained gray stone. L. 11.5 × W. 6.5 × H. 4.4 cm. Archon 42/114-208. Round Building, area 9, phase a. Debris inside room.
29. Raq 90 S-123. Level 4. Pestle type B. The wide end and part of the handle are preserved. Vesicular basalt. L. 16.6 × W. 13.4 × H. 7.9 cm. Archon 48/108-072. Round Building, area 12, phase b. Debris inside room.
30. Raq 90 S-125. Level 4. Pestle type B. Complete. Wider end has a rectangular cross-section. Narrower ("handle") end has a circular cross-section. Vesicular basalt. L. 22.5 cm × W. 13.0–7.0 × H. 8.0 (max.). Archon 42/114-210. Round Building, area 105. Debris inside room.
31. Raq 90 S-136. Level 4. Pestle type F. Irregular prismatic with four flat sides. Basalt. L. 7.8 × W. 5.7 × H. 4.7 cm. Archon 30/108-077. Area 83. Debris outside architecture.
32. Raq 91 S-150. Figure 5.102. Level 3. Pestle type G. Prismatic shape. All edges show some pecking, but whether this is from the manufacture or the use of the implement is not certain. One broad side shows a slight concavity pecked in its center, implying pounding activity. Brown-pinkish stone. L. 6.1 × W. 5.8 × H. 3.7–3.8 cm. Moh's hardness 7. Archon 29/114, unit 1850. Area 61, north of area 15.
33. Raq 92 S-202. Level 4 or level 5. Pestle type C. Cross section rectangular with rounded corners. One end is a diagonal plane. The other end is chipped into a blunt point. The fractures do not look conchoidal, but they are somewhat concave. No surface looks pecked, so it is possible that the blunt end was used for chopping. Dark, gray-brown smooth cobble. L. 7.3 × W. 4.9 × Th. 3.7 cm. Moh's hardness 7. Archon 42/114N-026. Over area 18, level 5. Debris of uncertain level.
34. Raq 91 S-209. Level 3. Pestle type F. Plano-convex stone of a size that is comfortable to hold in one hand. Flat side is very slightly concave. The vesicles on the flat side are sharper and more open than on the convex side. Vesicular basalt. L. 9.9 × W. 6.3 × H. 5.0. Moh's hardness 6. Archon 20.5/112, unit 0236, elevation 294.16. Area 61, north of area 15.
35. Raq 91 S-219. Level 3. Pestle type B. Fragment from a cylindrical object. Perhaps part of the handle end of a pestle of type B. Vesicular basalt. D. 7.8 and 5.7 × L. 4.3 cm. Archon 29/114, unit 1849. Area 61. Reused in drain 15H.
36. Raq 91 S-221. Figures 5.102 and 5.113. Level 3. Pestle type B. Seems to have been made from a stone that had a narrower and a wider part naturally. These were modified by rough chipping at both ends, with a shallow scoop chipped out of the wider end. Gray-white stone. L. 18.9 cm × W. 5.5 cm (D. of handle); 8.8 cm (D. of scoop) × H. 3.7 cm. Moh's hardness 6. Archon 25.5/116, unit 1499, elevation 294.11. Area 12. Oven.

FIGURE 5.113. Raq 91 S-221, pestle type B. *Photograph by Sally Dunham.*

Door Sockets, Mortars, and Perforated Stones

1. Raq 87 S-008. Topsoil. Type B. Ovoid stone with plano-convex cross-section, with biconical hole in center. Appears to be a fragment of a reused grind-

ing stone of type A. Basalt. L. 15.0 × W. 14.0 × H. 8.0 cm; D. of hole 4.5–2.5 cm. Archon 30/120-000. Debris of uncertain level.

2. Raq 87 S-010. Level 3. Type B. Stone of semicircular plan with unfinished hole along the straight side. The hole had begun to be drilled from both sides. Most likely a fragment of a reused type A grinding stone. Basalt. L. 11 × W. 14.5 × H. 5.0 cm. Archon 30/114-047. Area 94. Debris outside architecture.
3. Raq 87 S-011. Figure 5.103. Level 3. Type A. Mortar. Fragment of a bowl-shaped mortar with round base. Basalt. D. 24.0 × H. 10.0 cm. Inside cavity D. 14.5 × H. 9.0 cm. Archon 30/114-047. Area 18. Immediately inside south side of doorway.
4. Raq 87 S-017. Possible mix of level 4 and later. Type B. Fragment of a pierced slab of plano-convex cross-section. One curving edge preserved. Part of a biconical hole at the broken edge, which is straight. Basalt. L. 8.0 × W. 9.0 × H. 5.0 cm. Archon 42/116-059. Area 30 (level 4 designation). Debris outside architecture.
5. Raq 87 S-019. Figure 5.103. Level 3. Type B. Complete circular flat pierced stone with biconical hole. Basalt. D. 17.5 × H. 6.5 cm; D. of hole 2.9–3.0 cm. Archon 29/108-026. Area 24. Debris outside architecture.
6. Raq 87 S-022. Level 3. Type A. Mortar. Complete but broken in two halves. Basalt. D. 27.0 × H. 18.0 cm. Depth of cavity 12.5 cm. Archon 42/114-023. Round Building, area 89, phase b. Outdoor surface.
7. Raq 87 S-023. Topsoil. Type B. Complete. Plan pentagonal with one curving edge, with biconical hole in center. Plano-convex cross-section. Probably a fragment of a type A grinding stone that has been reused. Basalt. D. 15.5 × H. 4.9 cm; D. of hole 2.5–4.5 cm. Archon 29/114-000.
8. Raq 88 S-025. Level 2. Type A. Irregularly-shaped cube with human-made cavity on top and a relatively flat bottom. White stone. L. 13.2 × W. 12.5 × H. 8.3 cm. Moh's hardness 2. Cavity: D. 7.1 × 2.2 cm deep. Archon 29/120-027. Area 14E–F. Packing of stones and bricky material.
9. Raq 88 S-038. Level 2. Type B. One end of a type A grinding stone, with part of a biconical hole at the broken edge. Basalt. L. 13.7 × W. 14.1 × H. 8.9 cm; D. of hole 5.4 –3.2 cm. Archon 29/120-027. Area 14E–F. Packing of stones and bricky material.
10. Raq 88 S-039. Level 2. Type B. One end of a type A grinding stone. At the broken edge is part of a biconical hole. Basalt. L. 11.5 × W. 12.7 × H. 4.7 cm; D. of hole 5.1–2.3 cm. Archon 29/120-027. Area 14E–F. Packing of stones and bricky material.
11. Raq 88 S-040. Level 2. Type B. Part of a circular (?) stone with plano-convex cross-section. Along its broken edge is part of a biconical hole. Basalt. L. 14.7 × W. 8.7 × H. 5.7 cm. W. of hole 5.3–2.0 cm. Archon 29/120-027. Area 14E–F. Packing of stones and bricky material.
12. Raq 88 S-041. Level 2. Type B. Part of stone with one rectangular end and a plano-convex section. Along its broken edge is part of a biconical hole. Basalt. L. 13.2 × W. 7.8 × H. 5.7 cm; D. of hole 4.3–2.9 cm. Archon 29/120-027. Area 14E–F. Packing of stones and bricky material.
13. Raq 88 S-042. Level 3. Type A. Complete. Stone of oval plan and plano-convex cross-section. The flat side has a shallow depression. Basalt. D. 16.3 and 14.5 × H. 6.0 cm. D. of depression 4.4 cm × 1.0 cm deep. Archon 42/102-016. Round Building, area 87, phase b. Debris in presumed unroofed areas of Round Building.
14. Raq 88 S-050. Figure 5.103. Level 3. Type A. Roughly shaped cylindrical piece with a smooth hemispherical depression. Complete. Basalt. D. 13.0 × H. 7.5 cm. D. of depression 8.8 cm × 4.3 cm deep. Archon 29/114-055. Area 92. Debris outside architecture.
15. Raq 88 S-052. Level 3. Mortar type A? Oval stone. One side is concave enough to be used as "basin" or mortar. The opposite face is convex. Possibly a natural stone used as a mortar or basin? Limestone. L. 29.5 × W. 14.5 × H. 7.5 cm. Archon 29/114-041. Area 16, phase b. Debris inside room.
16. Raq 88 S-053. Level 3. Type B. Fragment of an oval or round piece of basalt with a plano-convex cross-section. Biconical hole drilled through it. Basalt. L. 6.9 × W. 12.9 × H. 5.0 cm. max. D. of hole 4.7 cm. Archon 36/102-031. Area 29. Debris inside room.
17. Raq 88 S-055. Level 2 or level 3. Type A. Fragment of a square or rectangular piece of basalt with one flattened side and a hollowed out cavity (D. 12.4 × 1.5 cm deep). One corner or the original object preserved. Basalt. L. 16.2 × W. 12.1 × H. 7.1 cm. Archon 36/102-026 Above area 38, level 3. Debris of uncertain level.
18. Raq 88 S-056. Level 2. Type B. Flat piece of stone. Along one edge is an unfinished biconical hole. Along the outer edge, white plaster appears to be adhered to the stone. Limestone. L. 17 × W. 9.9 ×

H. 5.5 cm. Archon 29/120-033. Area 16. Found next to broken ceramic vessel.

19. Raq 88 S-062. Level 4. Type B. One half of a circular stone with a lentil-shaped cross-section. The broken edge is straight and shows the interior of the stone to have concentric layer. Unfinished biconical hole along the broken edge. Tan, pitted stone. L. 18 × W. 9.5 × H. 7.0 cm. Archon 60/120-005. Area 36. Debris inside room.
20. Raq 88 S-067. Level 3. Type B. Complete irregular oval stone of plano-plano cross-section. Biconical hole in center (D. 3.1–2.1 cm). Basalt. L. 16 × W. 15.4 × H. 6.5 cm. Archon 42/108-038. Round Building, area 88, phase b. In debris immediately below mud-brick pavement, between two parallel walls.
21. Raq 88 S-070. Figure 5.103. Level 3. Type B. Complete stone of irregular rectangular plan and plano-plano cross-section. Biconical hole in center (D. 2.5–0.07 cm) Basalt. L. 18 × W. 16 × H. 5.5 cm. Archon 42/108-036. Round Building, area 47, phase b. Found on floor with pestle S-069 against northwest corner of doorway.
22. Raq 88 S-071. Figure 5.103. Level 3. Type A. Stone of roughly triangular plan and trapezoidal cross-section. Shallow conical cavity in center of top (i.e., smaller) face. Limestone. L. 16.5 × W. 12.7 × H. 4.9 cm. Archon 36/90-007. Area 34. Debris inside room.
23. Raq 88 S-073. Level 3 or 4. Type B. Complete. Stone of oval plan. Plano-plano cross-section, biconical hole approximately in the center (D. 4.5–1.8 cm). Basalt. L. 13 × W. 11.5 × H. 6.3 cm. Archon 42/108-045. Round Building, area 88 (level 3 designation). Debris from presumed unroofed areas of the Round Building.
24. Raq 88 S-074. Level 3 or above. Type A mortar. One end of a type A grinding stone that has had a bowl-shaped depression (4.1 cm W. × 1.9 cm deep) made into the flat face. Basalt. L. 17 × W. 13 × H. 5.5 cm. Archon 30/96-010. Area 32, phase e. Debris inside room.
25. Raq 88 S-075. Figure 5.105. Level 3. Type C. Complete. One end has a roughly circular plan, while the other end is somewhat trapezoidal in plan. The cross-section is rectangular, but the longitudinal section is triangular with the circular part ending in a blunt point. A hole in the end edge of the trapezoidal end produces a curve on the broad face of the stone. This hole is D. 2.5 cm. on the end edge and 3.0 × 5.0 cm. on the broad face. Limestone (?). L. 24 × W. 17 × H. 6.0 cm. Archon 30/96-031. Area 33, phase e. Debris inside room.
26. Raq 89 S-084. Level 3. Type B. Fragment of a roughly circular perforated stone. Cross section roughly hemispherical. Diameter of hole 4.0–4.6 cm. Basalt. L. 13.2 × W. 9.0 × H. 7.6 cm. Archon 30/120-050. Area 3. In line of stones against the north wall of area 2.
27. Raq 89 S-085. Figure 5.103. Level 3. Type B. Complete. Circular plan. Cross section convex–convex. Biconical hole. D. of hole 3.6–2.7 cm. Basalt. D. 9.2 × 4.1 cm. Archon 29/102-049. Area 69, phase d. Debris inside room.
28. Raq 89 S-087. Level 3. Type B. Complete. Irregular circle in plan. Cross section plano-convex. Biconical hole. D. of hole 4.0–1.2 cm. Basalt. D. 14.4 × H. 5.5 cm. Archon 29/102-049. Area 66. Debris inside room.
29. Raq 89 S-093. Level 3. Type B. Complete. Roughly oval plan. Convex-convex cross-section. Biconical hole in center. Basalt. L. 18.8 × W. 14.3 × H. 7.5 cm. Archon 42/114-179. Area 91. Wall.
30. Raq 89 S-099. Level 3. Type A. About half of a door socket. Turning lines visible in the pivot depression. White stone. L. 16.2 × W. 10 × H. 7.2 cm. Archon 29/126-048. Area 59. Debris outside architecture.
31. Raq 89 S-100. Level 3. Type A. Complete. Roughly trapezoidal plan. Can see turning lines in pivot depression on upper face. White stone. L. 29.5 × W. 13.1 × H. 12.8 cm. Archon 29/126-071. Area 51. On floor. In primary context at southeast corner of doorway. (See Chapter 2, Figure 2.111.)
32. Raq 89 S-106. Level 3 or 4. Type B. Half of circular stone with hole in the middle. Basalt. D. 17.9 × H. 6.6 cm. Archon 42/114-180. Below level 3 area 83.
33. Raq 89 S-111. Level 3. Type B. One end of a Type A grinding stone. Near the broken end a biconical hole has been made (D. 4.9–2.1 cm). Basalt. L. 17.0 × W. 16.5 × H. 6.0 cm. Archon 42/84-028. Area 79. On bench (Feature 79D).
34. Raq 89 S-112. Level 3. Type B. Complete. Circular plan. Biconical hole in center (D. 5.0–2.7 cm). Basalt. D. 14.6 × H. 5.4 cm. Archon 42/84-026. Area 79. Debris inside room.
35. Raq 90 S-139. Post-level 1 or level 1. Type A. Roughly circular plan. Convex–convex cross-section. Cavity in center D. 7.0 cm and 1.5 cm deep. Light buff-colored stone (limestone?). L. 13.2 × W.

12.4 × H. 7.2 cm. Archon 42/102-107. Area 3, phase e. Pit filled with stones.

36. Raq 90 S-141. Figure 5.103. Possible mix of level 4 and later. Type B. Complete. Oval plan. Plano-convex cross-section, biconical hole in center (D. 4.1–2.2 cm). Basalt. L. 18.4 × W. 16.2 × H. 6.2 cm. Archon 42/102-114. Round Building, level 4, area 29. Debris from presumed unroofed area of Round Building.
37. Raq 92 S-204. Figure 5.104. Level 4. Type B (or possible anchor). Complete. Flattish stone of roughly trapezoidal plan. Cross section has one relatively flat and one rough face. One corner is elongated, forming a blunt point perforated by a biconical hole (D. 4.1–1.7 cm). Hole shows some use polish in the narrowest part, where the ridge between the two conical sections seems to be rounded, perhaps from a rope being pulled through it. White opaque stone (limestone?). L. 22 × W. 16.0 × H. 4.0–5.0 cm. Moh's hardness 3. Archon 17/114-025. Area 76. Debris outside architecture.
38. Raq 91 S-207. Level 3. Type B. Two fragments which fit to form one end of a Type A grinding stone. Biconical hole halfway between the preserved end and the broken edge (D. of hole 4.0–2.5 cm). This hole did not show much use wear, and the stone had broken at the middle of the hole. Vesicular basalt. L. 18.6 × W. 13.0 × H. 5.0 cm. Archon 29/114-unit 0223 + 0265. Area 61. Reused in drain 15H.
39. Raq 91 S-210. Level 3. Type B. A stone that has a shape similar to S-204 but not as flat. One edge has the beginning of a protrusion, where there is a conical depression on either face of the stone. This is probably an incomplete hole, since the stone broke at this point. White opaque stone (limestone?). L. 24 × W. 16 × H. (max.) 9.9 cm. Moh's hardness 4. Archon 29/114, unit 0818-2. Area 61. North of area 15.
40. Raq 91 S-225. Level 4. Type A. A natural stone oval in plan and cross-section. One wide face has a human-made conical depression (D. 5.0 cm × 2.0 cm deep) with some rough striations inside. The opposite face has a natural depression. Tan-whitish stone (limestone?). L. 17.7 × W. 14.6 × H. 9.4 cm. Moh's hardness 3. Archon 25/110.5, unit 3347-1, elevation 293.66. Area 75, phase c.
41. Raq 91 S-226. Level 3. Type B. A roughly triangular flattish stone with biconical hole made near one edge. The stone is broken across the middle of the hole (D. 5.6–2.0 cm). Tan stone, grainy texture (sandstone or limestone?). L. 21.8 × W. 17.2 × H. 7.3 cm. Moh's hardness 4. Archon 29/114, unit 0296-1. Area 61. North of area 15.
42. Raq 92 S-228. Level 4. Type C. Thick, flat stone of triangular plan. Roughly a right triangle. One face is very flat, while the opposite face is rough. On the flat face a biconical hole was drilled diagonally so that it emerges on the edge of the stone. Slightly translucent white stone. Moh's hardness 1–2 (gypsum?) L. 25.0 × W. 16.5 × Th. 10.2 cm. Wt. 5.090 kg. Archon 17/114-041. Area 76, phase a. Debris outside architecture.

Plaster Lids

1. Raq 89 S-098. Level 3. Two parts of a circular lid with a raised ridge. White plaster-like material —Gypsum (?). D. 48 × Th. 1.0 cm. Archon 30/126-083. Area 7, phase a. Debris outside architecture.
2. Raq 89 S-107. Level 3. Flat pieces of gypsum that fit together to form a lid for jar P–087. White plaster like material—Gypsum (?). D. unkown. Archon 29/102-071. Area 63. Vessel.
3. Raq 90 S-137. Level 4. Rim sherd from a lid. Original diameter could not be determined. Gypsum (?). L. 13.7 × W. 14.0 × H. 3.2 cm. Archon 42/120-050. Area 64. Debris inside room.
4. Raq 90 S-138. . Level 2 or level 4. Three sherds of a flat lid that join. Gypsum (?). D. 42 × Th. 2.6 cm. Archon 42/120-041. Area 2 (level 2). Debris outside architecture.
5. Raq 91 S-144. Level 4. Small rim sherd from a lid. Gypsum. L. 4.7 × W. 3.2 × Th. 1.6 cm. Moh's hardness 2. Archon 21/112.5, unit 3523-1, elevation 293.24. Area 75, phases b and c.
6. Raq 91 S-145. Level 3. Rim sherd from a lid. Flat on both faces. Top is slightly convex and wet smoothed. White plaster-like material (gypsum or lime?). L. 6.2 × W. 7.4 × Th. 2.1 cm. Moh's hardness 3. Archon 29/126-099. Area 56. Debris from below floor next to wall foundations, possibly from level 4.
7. Raq 90 S-156. Level 4. Rim sherd from a lid. Flat on both faces. White plaster (gypsum?). Moh's hardness 2. D. 18 × Th. 1.6 cm. Archon 42/114-227. Area 31. Debris inside room.
8. Raq 89 S-400. Level 3. Rim sherd from a lid. Gypsum. D. 17.0 × Th. 1.9 cm. Archon 29/102-027. Area 64. Oven.

9. Raq 89 S-401. Level 2. Rim sherd from a lid. Gypsum. D. 27.0 × Th. 2.0 cm. Archon 29/132-023. Area 13. Debris outside architecture.

Mace Heads and Hammer Heads

1. Raq 87 S-005. Figure 5.106. Level 3 and above. Spherical mace head. Unfinished hole on top and bottom. Polished. White stone (limestone?). D. 7.2 × H. 7.0 cm. Archon 36/126-001. Above area 8, level 3. Debris of uncertain level.
2. Raq 90 S-118. Level 3. Hammer/Axe One end of an oblong stone with a blunt edge. Cross section is oval with one flattened side. One half of the hole is preserved. Red stone. Moh's hardness 4. L. 5.7 × W. 4.6 × H. 4.6 cm. Archon 30/108-053. Area 62, phase c. Debris outside architecture.
3. Raq 90 S-135. Level 2. One end of flat oblong stone. At the broken end is part of a hole that had gone through the short axis of the stone. Possibly part of a stone hammer? Gray stone. L. 6.2 × W. 4.2 × Th. 1.8 cm. Archon 42/120-034. Area 3, phase a. Debris inside room.
4. Raq 91 S-146. Level 3. One end plus part of the shaft hole of a mace or hammerhead. End of the stone is a blunt point. Gray stone. L. 3.4 × W. 4.9 × H. 4.7 cm. Moh's hardness 4. Archon 29/114, unit 0160-1. Area 61.
5. Raq 91 S-149. Level 4. Part of an oblate mace or hammer head. Preserved is part of the biconical hole which pierced it on its short axis. Surface of the stone is slightly polished. Pecking marks on the broken edge show the piece had been reused as a pestle. Brown stone. D. 5.8 × H. 2.6 cm. D. of hole 1.5–1.0 cm. Archon 26.5/111, unit 1919, elevation 293.66. Area 74, phases b and c.

Stone Bowls

1. Raq 89 S-086. Topsoil. Very small bowl with uneven rim. Faint parallel lines incised four times around rim. Found near glass bottle Q-003. White stone. D. 5.9 × H. 3.2 cm. Archon 29/132-000.
2. Raq 90 S-133. Figure 5.107. Level 4. Two sherds of bowl which join to form a complete profile. Round bottom. Flat rim. Rectangular lug at rim. White stone (alabaster?) D. 8.0 × H. 4.1 cm. Archon 42/102-094. Round Building, area 1. Debris in silo.

Personal Ornaments

1. Raq 87 S-002. Level 3 and above. Small ring. White stone (alabaster?). Possibly a bead or pendant. Outside diameter 2.4 cm × inside diameter 1.0 cm. Archon 36/126-001. Above area 8, level 3. Debris of uncertain level.
2. Raq 89 S-115. Figure 5.114. Level 2. Three segmented stone cylinders, not pierced: (a) 1 white stone, L. 2.0 × D. 1.3 cm; (b) 1 pink stone, L. 1.5 × D. 0.9 cm; (c) 1 white translucent stone, L. 1.5 × D. 0.7 cm. Archon 29/132-012. Area 13. Burial 24.
3. Raq 91 S-154. Level 3. Fragment of a small ring, perhaps a bead or pendant. White stone. Moh's hardness 2 (alabaster?). Outside D. 1.7; inside D. 1.1 cm. Archon 29/114, unit 1850. Area 61. Debris outside architecture.

Objects of Uncertain Use

1. Raq 89 S-082. Figure 5.115. Level 3. Cylinder with a hole through its vertical axis. Slightly damaged on both ends. White stone (limestone?). Outer D. 6.5 × H. 6.5 cm. D. of hole 1.7 cm. Archon 36/96-035. Area 70, phase a. Debris inside room.
2. Raq 90 S-129. Figure 5.116. Level 4. Small white, flat pentagonal piece of plaster that has a tree-like or cross-like design incised on one face. Gypsum (?). L. 2.9 × W. 2.4 × H. 0.6 cm. Moh's hardness 1–2. Archon 42/102-094. Round Building, area 1. Debris inside silo.
3. Raq 90 S-130. Figure 5.116. Level 4. Small fragment that has been pressed against a square edge. On the outside surface is an incised line. Perhaps a fragment from a lid or sealing. Gypsum (?). Moh's Hardness 1–2. L. 1.5 × W. 1.3 × H. 0.7 cm. Archon 42/102-094. Round Building, area 1. Debris inside silo.
4. Raq 90 S-131. Figure 5.116. Level 4. Small round piece with two incised intersecting lines. Gypsum (?). Moh's hardness 1–2. L. 2.1 × W. 1.8 × H. 0.7 cm. Archon 42/102-094. Round Building, area 1. Debris inside silo.
5. Raq 90 S-143. Level 4. Small stone disk with has a depression in the middle as if it was used to grind a substance like cosmetics. Translucent white stone (calcite?). Moh's hardness 3. D. 3.5 × H. 1.0 cm. Archon 30/108-114. Area 82.
6. Raq 91 S-147. Level 3. Small stone hexahedron. Apparently intentionally shaped. Almost square in section and about twice as long as high and wide. On one long face there are many parallel scratches at one end. White stone (calcite?). Moh's hardness 3. L. 2.5 × W. 1.2 × H. 1.3 cm. Archon 29/114, unit 1441. Area 13. Debris inside room.

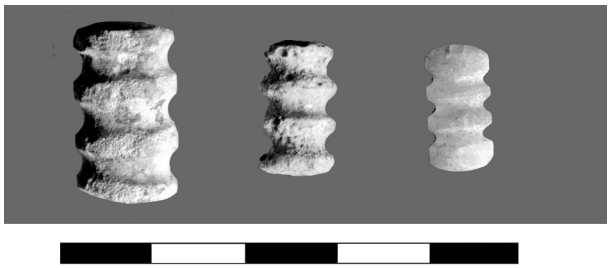


FIGURE 5.114. Raq 89 S-115. Stone toggles. *Photograph by Anwar 'Abd al-Ghafour.*

FIGURE 5.115. Raq 89 S-082. *Illustration prepared by Sally Dunham.*

FIGURE 5.116. Left to right: Raq 90 S-129, S-130, S-131, incised plaster pieces. *Photograph by Sally Dunham.*

7. Raq 91 S-148. Level 3. Small bi-cone. One end damaged. Vesicular basalt. Moh's hardness 5–6. L. 5.9 × max. D. 2.4–2.2 cm. Archon 29/120, unit 1207. Area 61.
8. Raq 91 S-152. Level 3. Stone cylinder with a hole (D. 0.4 cm) lengthwise through it. The cylinder is much eroded so that it has concave sides. Its middle is 0.9 × 1.1 cm, while its ends are 1.2 × 1.4 cm. Possibly the cross-section may have been originally circular rather than elliptical. Perhaps this is a completely eroded cylinder seal. White stone (alabaster?). Moh's hardness 1–2. L. 2.0 × D. 1.2 + 1.4–0.9 + 1.1 cm. Archon 29/114, unit 2508. Area 61.

WHEELS, WHORLS, AND DISKS

DISCUSSION

Ninety-eight possible spindle whorls were recovered. These can be morphologically divided into five categories: spindle whorls (20 examples), model wheels (23), small wheels (16), potsherd disks (28), and other disks (11). Seven of these objects came from post–Bronze Age contexts,[159] while 20 were found in contexts of uncertain level. The evaluation of these five categories of objects as suitable tools for spinning owes much to information from A. Williams, a professional spinner and weaver from Darien, Connecticut (USA), who discussed the Raqa'i material with me in 1995.

Twenty examples are clearly spindle whorls. All of these had well-centered holes and ranged in size from 2.1–4.7 cm in diameter and 1.5 to 2.5 cm thick, with the diameter of the holes measuring 0.2 to 0.9 cm. Attested shapes included bicones (12 examples), hemispheres (3), cones (2), thick oblate disks (3), one fragment of a small lenticular disk, and one plano-convex stone disk (Raq 90 W-042, from topsoil) (Figure 5.119).[160] Most were of unbaked or lightly baked clay, but two of the hemispheres from level 4 were white stone (Raq 90 W-045; Raq 90 W-052—Figure 5.119). The third hemisphere was bone, made from the proximal end of a bovid femur (Raq 89 W-030). This example was found on top of a lentil-shaped stone that had a protrusion that exactly fit the hole in the bottom of the hemisphere. Williams has suggested that the stone acted as a weight which was tied to the spindle below the bone to give it more weight and hence a longer spin. Although similar bone whorls are attested at Tepe Gawra (Speiser 1935: plate 52B, level VIII), Aphrodisias (Joukowsky 1986: figure 311.4, Late Chalcolithic), and Arslantepe (Frangipane and Palmieri 1983b:570, figure 30-1, Early Bronze I), no parallel for the accompanying stone of Raq 89 W-030 has been found. Of the whorls that were weighed (13 examples) the weights ranged from 10 to 20 g, while the bone and stone whorl (Raq 89 W-030) weighed 40 g. Barber (1991:52–53) has noted that the weights of whorls may be indicative of the type of fiber spun. She suggests that a clustering in the 15 to 60 g range could be expected for short wool, such as early domestic sheep must have had, and notes that modern peasants of Afghanistan use whorls of about 8 g for spinning short, fine wool and a medium-light whorl of about 33 g for "long staple medium wool." Perhaps one could suggest, then, that the spindle

whorl with the bone hemisphere and accompanying stone was used for a longer, heavier fiber than most of the whorls, which weigh between 10 and 20 g. Williams, however, feels that estimating the weight of the fiber spun is difficult, since a heavy whorl can be supported (on the ground or in a bowl) to spin a very lightweight fiber.[161]

The model wheels are distinguished by the clear representation of a nave ("hub") around the axle hole on both faces of the wheel. The nave usually has the form of a truncated cone or a cylinder.[162] These model wheels were probably representations of solid wooden disk wheels, the only type known in the third millennium (Littauer and Crouwel 1979; Piggott 1968). Such wheels were made from three planks: a central one, through which the axle passed, and which could have a lentoid shape or straight sides and curving ends, and two flanking panels which were either crescent or half-moon shaped. These wheels could be held together by internal dowels or external bonding slats (Littauer and Crouwel 1979:18; Piggott 1968). The nave could be made by starting with a very thick plank for the central panel and trimming away the surfaces toward the edges, leaving the central part on both faces standing out like a wide-based truncated cone (Littauer and Crouwel 1979:18), just like the shapes of the naves on many of the model wheels from Raqa'i. One clay wheel from Raqa'i (Raq 87 W-009; Figure 5.121) has an incised line on either side of the nave on one face of the wheel. These lines probably represent the seams between the panels. Similar markings can be seen on clay wheels from Tepe Gawra (Speiser 1935: plate 78:5), Chagar Bazar (Mallowan 1936: figure 6:8), Hammam et-Turkman (Rossmeisl and Venema 1988: plate 181: 76), and Tell 'Atij (Fortin 1990a: figure 24). On the other side of the wheel from Tell 'Atij are incised lines that have been suggested to represent a boat, but perhaps they represent seams between planks and external bonding slats, such as those seen on a wheel from Susa (Littauer and Crouwel 1979: figure 5). Since fragments of model chariots were found at Raqa'i, at least some of the model wheels could have been used for these. Another possibility for objects associated with the wheels are wheeled theriomorphic vessels such as have been discussed by Cholidis (1989). One sherd from a theriomorphic vessel was found at Raqa'i in area 22 of the level 4 Round Building (Figure 4.18:13). Further, a very large wheel from level 4 (Raq 89 W-041),[163] found in area 9 of the Round Building, is 13 cm in diameter and might have been used for an object like the terracotta "cult wagon" found in the Sin Temple at Khafajah (Frankfort 1935: figure 48). Similar large wheels have been found at Tell Gudeda (unpublished, personal communication M. Fortin), Fara (Martin 1988:199, no. 85) and Nippur (McCown and Haines 1967:94).

The large wheel from Raqa'i is not too large to have been a spindle whorl, but the two protruding naves would make it awkward to wind the spun yarn around.[164] This same reservation applies to the other model wheels as well. Some of the wheels have the nave completely broken off on one face, and perhaps this had been done intentionally to reuse them as spindle whorls.[165] As was the case at Raqa'i, model wheels are almost always found loose in the soil, unassociated with any model vehicles, animal figurines, or vessels that they may have originally belonged to.[166] Pfälzner (2001:220–221) has suggested, noting that model wheels are often found without any model vehicle or other wheeled object, that they were probably used secondarily as spindle whorls.[167] This is very likely,[168] although they can also be interpreted as evidence of cultic refuse, as Matthews implies for some of the deposits above level 11 in the HS4 Trench at Tell Brak (Matthews 2003:107). That a model wheel was one of the objects found inside the altar of the HS4 level 5 temple at Brak (Matthews 2003:109), suggests a cultic association as well. Since, as mentioned above, the shape of the model wheels is not the most advantageous one for winding yarn, the model wheels perhaps should be considered as objects only secondarily used for spinning, not "purpose-made" spindle whorls.

Fifteen "wheels" were 4.2 cm or less in diameter and with naves less distinct than larger examples that may not have interfered with the winding of the thread.[169] They are similar in thickness and weight to the spindle whorls and, hence, are very likely intentionally-made spindle whorls. In three cases, they look like they were made from model wheels whose disk part was greatly cut down.[170]

The 28 potsherd disks were made from well-fired medium thick (0.7–1.6 cm) sherds which usually had diameters greater than 5 cm. The complete examples weighed 26 to 72 g, a weight range similar to that of the model wheels. Four sherds chipped into circular disks but with no hole have been included here because they could be unfinished objects, since two of the disks have an unfinished hole.[171] The unpierced sherds, however, could have been small lids or scrapers instead. Most of the potsherd disks have fairly well-centered holes, but even those without that feature could have been used

as spindle whorls. Although Barber (1991:52) states that an off-center whorl hole produces a counter-productive wobble, Williams opines that the centering of the hole is not critical, since the quality of the thread produced is more dependent on the skill of the spinner.[172] Perforated potsherd disks have been reported from third-millennium contexts at Melebiya (Lebeau 1993:510) and Tell Brak (Oates, Oates, and McDonald 2001:275) where their possible use as spindle whorls is also suggested.

The category "Other Disks" includes six whole or fragmentary flat disks of a soft white "plaster"-like material. A similar object was found at Melebiya (Lebeau 1993:523, 552–3, Plate 198, 2) where it is suggested to be a gypsum lid. At Melebiya, gypsum was also used for larger lids and jar sealings (see above). Likewise at Raqa'i a white plaster (gypsum?) was used for lids and jar sealings (see above). It is possible then, that the "plaster" disks were lids rather than spindle whorls. They are similar, however, in size and hole diameter to the potsherd disks, and so also could have been used as spindle whorls.[173]

Distribution of Wheels, Whorls, and Disks

Examples of all these five categories occur in the third-millennium levels of Tell al-Raqa'i,[174] and very possibly all were used as spindle whorls. The model wheels and the potsherd disks can be considered to represent the use of recycled materials, a phenomenon also noted in Ochsenschlager's study of the weavers of the modern village of al-Hiba in Iraq. Only from levels 3 and 4 were enough examples recovered to consider patterns of distribution. In level 3 were 33 spindle whorls, and in level 4 were 32. These are detailed in the distribution tables (5.19, 5.20) for levels 3 and 4.[175] Although all of these objects were found in secondary contexts (in the debris in and around the buildings), if one assumes they were discarded not far from the area of their last use, their distribution can be interpreted to suggest areas where spinning was done. The most striking characteristic of these patterns is the evenness of their distribution. In level 4, 18 were found inside the Round Building, while fifteen were found in the areas excavated to the north of it. In level 3, seven were found in the west, fifteen in the temple area, and 11 in the east.[176] Hence, spindle whorls show a fairly even distribution in all excavated areas. This might be a reflection of the observation by Barber (1991:4) that in antiquity and in some rural societies even up to the 20th century CE women spent every available moment spinning, even when they were performing other chores such as tending an oven or cooking pot.[177] Thus, the examples found in the Round Building might have been brought in by women intermittently spinning while doing other tasks.

It is also striking that spindle whorls are very frequently found near bone awls (see Tables 5.8, 5.9, 5.19, and 5.20). Since spindle whorls and awls are associated with the production of yarn (spindle whorl) and the weaving of it (awl), this is hardly surprising. It might also reflect the fact that the spun yarn was kept on the spindle until it was made into a warp on a loom.[178]

Table 5.19. Wheels, Whorls, and Disks, Level 3.

Object/Catalogue #	Area of site	Area/room	Type
9. Raq 91 W-070	West	13	StD
9. Raq 89 O-044	West	57	PS
21. Raq 89 W-040	West	58	PS
6. Raq 89 W-031	West	58	PlD
20. Raq 89 W-028	West	59	PS
9. Raq 89 W-029	West	59	SmW
19. Raq 91 W-065	Temple area	15, phase a	SpW
22. Raq 91 W-066	Temple area	15, phase c	MW
22. Raq 91 W-061	Temple area	15	PS
26. Raq 91 W-069+071	Temple area	16	PS
5. Raq 87 W-008	Temple area	21	SmW
2. Raq 91 O-111	Temple area	61	SpW
3. Raq 91 O-118	Temple area	61	SpW
6. Raq 88 W-013	Temple area	61, phase c	MW
21. Raq 91 W-059	Temple area	61	MW
16. Raq 91 O-203	Temple area	61	PS
24. Raq 91 W-067	Temple area	61	PS
25. Raq 91 W-068	Temple area	61	PS
8. Raq 91 W-055	Temple area	61	StD
11. Raq 90 O-057	Temple area	62, phase a	PS
13. Raq 90 O-065	Temple area	62, phase a	PS
27. Raq 88 W-074a	Northeast	29	PS
8. Raq 88 W-020	Northeast	32, phase e	SmW
8. Raq 89 W-030	Northeast	32/33, phases a–b	SpW
8. Raq 89 O-035	Northeast	33, phase c	PS
10. Raq 89 W-039	Northeast	67	SmW
4. Raq 88 W-019	Northeast	71, phase b	F
5. Raq 88 W-017	Northeast	71, phase b	SpW
6. Raq 88 W-012	Northeast	72	SmW
19. Raq 89 W-025	Northeast	84	PS
5. Raq 89 W-021	Northeast	84	PlD
7. Raq 88 W-011	Northeast	87, phase b	SmW

Notes: SpW = spindle whorl; MW = model wheel; SmW = small wheel; PS = potsherd; PlD = plaster disk; StD = stone disk; F = fragment of wheel or whorl (too small to determine which).

TABLE 5.20. Wheels, Whorls, and Disks, Level 4.

Catalogue/Object #	Area of site	Area/room	Type
10. Raq 90 O-052	Round Bldg south	6	PS
17. Raq 90 W-047	Round Bldg south	7	MW
12. Raq 90 O-058	Round Bldg south	7	PS
16. Raq 89 W-041	Round Bldg south	9, phase a	MW
20. Raq 90 W-054	Round Bldg south	9, phase a	MW
12. Raq 90 W-046	Round Bldg south	11, phases b–c	SmW
9. Raq 88 W-018	Round Bldg west	14	MW
13. Raq 89 W-036	Round Bldg west	14	MW
14. Raq 89 W-037	Round Bldg west	14	MW
15. Raq 89 W-038	Round Bldg west	15, phase c	MW
6. Raq 89 W-024	Round Bldg west	16, phase b	SpW
17. Raq 89 W-058	Round Bldg west	16, phase a	SpW
10. Raq 89 W-023	Round Bldg center	17, phase b	MW
9. Raq 89 W-032	Round Bldg north	22	SpW
11. Raq 90 W-034	Round Bldg north	18, phase a	SpW
15. Raq 90 W-052	Round Bldg southeast	27	SpW
16. Raq 90 W-053	Round Bldg southeast	28	SpW
18. Raq 90 W-050	Round Bldg northeast	29	MW
15. Raq 91 W-057	North	70	SmW
16. Raq 91 W-062	North	70	SmW
1. Raq 91 O-117a	North	71, phase c	SmW
10. Raq 91 W-072	North	71, phase c	PlD
4. Raq 91 O-129	North	75, phases b–c	SpW
14. Raq 91 W-056	North	75, phases b–c	SmW
11. Raq 91 W-073	North	75, phases b–c	PlD
1. Raq 91 O-093	North	75, phase c	SpW
20. Raq 91 W-074	North	76, phases b–c	SpW
18. Raq 91 W-063	North	76, phase c	SpW
19. Raq 90 W-051	North center	82, phase a	MW
13. Raq 90 W-045	North center	86, phase a	SpW
11. Raq 89 W-027	Northwest	100	MW
14. Raq 90 O-073	Northwest	99	PS

Notes: SpW = spindle whorl; MW = model wheel; SmW = small wheel; PS = potsherd; PlD = plaster disk.

CATALOGUE OF WHEELS, WHORLS, AND DISKS (FIGURES 5.117–5.125)

Spindle Whorls

1. Raq 91 O-093. Level 4. Fragment of a thick clay disk of oblate form with central hole 0.5 × 0.25 cm D. One face is smooth and convex, while the opposite is bumpy. Dark gray burned clay. D. 2.7 × Th. 1.1 cm. Archon 29/114-084, elevation 293.64. Area 75, phase c.
2. Raq 91 O-111. Level 3. Thick broken disk partially pierced with hole 0.3 cm. D. Unfinished spindle whorl? Dark gray baked clay with lime and vegetal temper. L. 2.1 × W. 1.8 × Th. 1.4 cm. Archon 22/114, unit 0373, elevation 294.20. Area 61.
3. Raq 91 O-118. Level 3. Fragment of an oblate disk with central hole 0.3 cm D. Brown, baked clay, vegetal temper. L. 2.5 × W. 1.5 × Th. 1.2 cm. Archon 29/114, unit 2540. Area 61.
4. Raq 91 O-129. Level 4. Fragment of a biconical spindle whorl. Broken along the hole. Black, burned clay, lime temper. L. 2.7 × W. 2.5 × Th. 1.3 cm; D. hole 0.3 cm. Archon 20/114, unit 0998. Area 75, phases b–c.
5. Raq 88 W-017. Figure 5.117. Level 3. Complete hemispherical spindle whorl. Top of hemisphere is flattened. Hole slightly diagonal. Baked clay. D. 3.9 × H. 1.9 cm; D. hole 0.9 cm. Archon 36/96-007. Area 71, phase b. Debris inside room.
6. Raq 89 W-024. Level 4. Biconical spindle whorl. Slightly chipped around the hole on one side. Lightly baked clay. D. 2.3 × Th. 1.3 cm; D. hole 0.4 cm. Archon 42/114-115. Area 16, Round Building, phase b. Debris inside room.
7. Raq 89 W-026. Either level 2 or level 3. Complete biconical spindle whorl. Hardened or lightly baked clay. D. 4.3 × Th. 2.4 cm. D. hole 0.6 cm. Archon 29/126-044. Above area 59, level 3. Debris above architecture.
8. Raq 89 W-030. Figure 5.118. Level 3. Hemispherical bone spindle whorl. Found on top of a tan lentil-shaped stone that has a dark brown protrusion chipped into a triangular shape that was fit into the hole in the bottom of the bone hemisphere. Bone, probably part of the head of a bovid femur. Bone: D. 4.7 × H. 1.9 cm. D. hole 0.6 cm. Wt. 20 g. Stone: D. 3.4 × Th. 1.4 cm. Wt. 20 g. Archon 30/96-086. Area 32/33, phases a and b. Debris inside room.
9. Raq 89 W-032. Level 4. Biconical spindle whorl. Complete. Lightly baked or unbaked clay. D. 2.0 × Th. 1.2 cm. D. hole 0.3 cm. Archon 42/108-058. Round Building, area 22. Debris from presumed unroofed areas within Round Building.
10. Raq 89 W-33. Either level 3 or level 4. Biconical spindle whorl. Rim badly chipped about halfway around. Unbaked clay. L. 3.0 × W. 3.2 × Th. 1.9 cm. D. hole 0.3 cm. Archon 48/108-026. Above area 24, level 4. Debris above architecture.
11. Raq 90 W-034. Level 4. Biconical spindle whorl. Edge badly chipped. Unbaked clay. D. 3.1 × Th. 1.8

cm. D. hole 0.5 cm. Wt. 10 g. Archon 42/108-069. Round Building, area 18, phase a. Debris in presumed unroofed areas of Round Building.

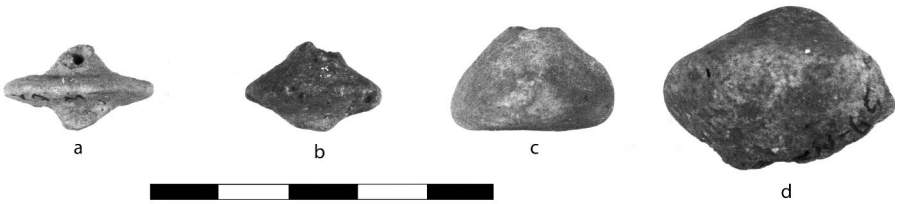
12. Raq 90 W-042. Figure 5.119. Topsoil. Circular disk plano-convex in section. Complete. Polished gray stone. D. 3.4 × H. 0.9 cm. D. hole 0.6 cm. Wt. 16 g. Archon 29/132-000. Probably Hellenistic (see above).
13. Raq 90 W-045. Figure 5.119. Level 4. Conical stone spindle whorl. Two thirds preserved. Top flattened. Hole drilled from one side. White stone. D. 3.0 × H. 1.7 cm. D. hole 0.4 (top)–0.6 (bottom). Wt. 10 g. Area 86, phase a. Debris outside architecture.
14. Raq 90 W-049. Figure 5.117. Topsoil. Biconical spindle whorl. Rim slightly chipped. Baked clay. Burnished. D. 3.4 × Th. 1.8 cm. D. hole 0.3 cm. Wt. 14 g. Archon 42/114-000.
15. Raq 90 W-052. Figure 5.119. Level 4. One half of a hemispherical stone spindle whorl. White slightly translucent stone. D. 3.7 × H. 1.6 cm. D. hole 0.5 cm.(bottom)–0.3 cm (top). Wt. 10 g. Archon 48/108-125. Round Building, area 27. Debris inside room.
16. Raq 90 W-053. Level 4. About one quarter of a biconical spindle whorl. Hardened or lightly baked clay. L. 3.0 × W. 2.1 × H. 2.5 cm. Archon 48/108-126. Round Building, area 28. Debris inside room.
17. Raq 89 W-058. Figure 5.120c. Level 4. Complete conical spindle whorl. Baked gray clay. D. 2.3 × H. 1.5 cm. D. hole 0.5 cm. Wt. 10 g. Archon 42/114-186. Round Building, area 16, phase a. Debris inside room.
18. Raq 91 W-063. Figure 5.120b. Level 4. Spindle whorl of irregular biconical shape. Complete. Hardened or lightly baked dark gray clay. D. 2.0 × Th. 1.3 cm. Wt. less than 10 g, ca. 5 g. Archon 29/120, unit 2839. Area 76, phase c.
19. Raq 91 W-065. Figure 5.120d. Level 3. Biconical spindle whorl. Almost complete. Rim chipped. Black/gray clay (unbaked?). Vegetal, grit and lime temper. Coarse texture. Hole very thin—for a metal spindle? D. 3.1 × Th. 2.6 cm. D. hole 0.2 cm. Wt. 19 g. Archon 29/114, unit 048-1. Area 15, phase a.
20. Raq 91 W-074. Level 4. Fragment of a small lenticular disk. The broken edge has part of a hole in the middle, but the original diameter of the hole is uncertain. Baked, brown clay. L. 1.7 × W. 0.9 × Th. 0.6 cm. Wt. < 5 g. Archon 18.5/112, unit 2516, elevation 293.33. Area 76, phases b–c.

Figure 5.117. Whorls. Left to right: Raq 88 W-017; Raq 90 W-049; Raq 88 W-012. *Photograph by Sally Dunham.*

Figure 5.118. Whorls. Raq 89 W-030, side view. *Photograph by Sally Dunham.*

Figure 5.119. Whorls. Left to right: Raq 90 W-052; W-045; W-042. *Photograph by Sally Dunham.*

(Right): Figure 5.120. Whorls. (a) Raq 91 W-062; (b) Raq 91 W-063; (c) Raq 89 W-058; (d) Raq 91 W-065. *Photograph by Sally Dunham.*



Model Wheels

1. Raq 86 O-0002 (86). Above level 3, under topsoil (unclear if any level 2 strata between level 3 and topsoil in this location). Outer disk of the wheel has large pieces broken away on opposite sides. Naves complete on both wheel faces. Baked clay. D. 6.7 × max. Th. 2.6 cm. D. of hole 0.6 cm. Archon 30/108-016. Above area 24, level 3. Debris above architecture.
2. Raq 87 W-001. Topsoil. Less than one half preserved. Full thickness of nave preserved on one wheel face. Opposite face is flat with the hole. Only small part of original rim left. Baked clay. Orange color. Plant, lime and fine sand temper. Medium fired. Surface smoothed. D. more than 7.0 × max. Th. 3.0 cm. D. of hole 0.6 cm. Archon 30/120-000.
3. Raq 87 W-003. Above level 2, under topsoil. About two thirds preserved. Full thickness of naves preserved on both wheel faces. Baked clay. Orange color. Gravel, plant and fine sand temper. Medium fired. Surface smoothed. D. 6.0 × max. Th. 3.0 cm. D. of hole 0.4 cm. Archon 48/90-002. Debris above architecture.
4. Raq 87 W-004. Above level 2, under topsoil. About one third preserved. Full thickness of naves preserved on both wheel faces. Baked clay. Orange color. Plant and fine sand temper. Gray/black color. Surface smoothed, perhaps burnished. D. 4.0 × max. Th. 2.0 cm. D. of hole 0.2–0.4 cm. Archon 48/90-006. Debris above architecture.
5. Raq 87 W-009. Figure 5.121. Level 2. More than two thirds complete. Nave completely preserved on one wheel face. Other face the nave somewhat worn. One face of wheel has an incised line on either side of the nave, probably indicating a tripartite disk wheel. Baked clay. D. 5.5 × max. Th. 2.3 cm. D. of hole 0.4 cm. Archon 29/114-017. Area 18. Debris outside architecture.

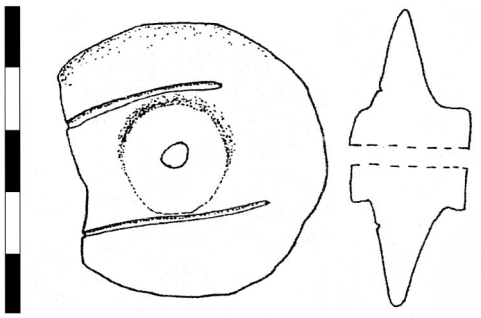


FIGURE 5.121. Raq 87 W-009.
Illustration prepared by Sally Dunham.

6. Raq 88 W-013. Level 3. About one-third preserved. Full thickness of naves preserved. Edge of hole has slightly raised border. Baked clay. D. 4.2 × Th. 1.2–2.3 cm. D. hole 0.5 cm. Wt. 16 g. Archon 29/114-059. Area 61, phase c. Debris outside architecture.
7. Raq 88 W-014. Figure 5.124. Post-level 1. Complete wheel. Naves complete. Baked clay. D. 4.7 × Th. 1.1–2.3 (at nave) cm. D. of naves 1.7 cm. D. hole 0.5 cm. Wt. 22 g. Archon 30/132-025. Late burial.
8. Raq 88 W-015. Figure 5.122. Above level 3, under topsoil (unclear if any level 2 strata between level 3 and topsoil in this location). Rim very chipped. Naves almost complete on both faces of wheel. Baked clay. Tan color. Lime spots. D. originally at least 7.2 × max. Th. 2.7. D. naves 1.9 cm. D. hole 0.4 cm. Wt. 48 g. Archon 42/108-008. Above area 88 of level 3, Round Building. Debris above architecture.
9. Raq 88 W-018. Level 4. Rim chipped all the way around. Full thickness of naves preserved. Lightly baked clay. L. 4.4 × W. 3.4 (originally D. maybe 5.2) × max. Th. 3.4 cm. D. hole 0.6 cm. Wt. 10 g. Archon 42/114-081. Area 14, Round Building. Debris inside room.
10. Raq 89 W-023. Level 4. About one third preserved. Original surface and nave preserved on only one wheel face. Baked clay. Radius 3.0 × max. Th. 2.4 cm. D. nave 1.6 cm. D. hole 0.4 cm. Wt. 16 g. Archon 42/114-105. Round Building, area 17, phase b. Debris inside room.
11. Raq 89 W-027. Level 4. Less than one quarter preserved. Less than one quarter of naves preserved, but full thickness on both faces of wheel. Baked clay. Radius 3.4 × max. Th. 2.5 cm. Wt. 12 g. Archon 30/120-046. Area 100. Debris outside archi tecture.
12. Raq 89 W-035. Figure 5.122. Above level 4 under topsoil (unclear if any levels 2–3 strata in this location). One edge chipped. Otherwise fairly complete. Dark burned friable clay. D. 6.6 × max. Th. 1.7 cm. D. of naves 3.0. D. of hole 0.4 cm. Wt. 52 g. Archon 42/102-057. Above level 4, Round Building area 29. Debris above architecture.
13. Raq 89 W-036. Level 4. Almost complete. Edge of wheel slightly chipped. Burned, friable clay. D. 7.2 × H. (at nave) 3.8 cm. D. of naves 2.3 cm. D. of hole 0.6 cm. Archon 42/114-167. Round Building, area 14. Debris inside room.
14. Raq 89 W-037. Level 4. Almost complete. Slight chip out of one place of wheel rim. On one face of the wheel the nave has been completely broken off,

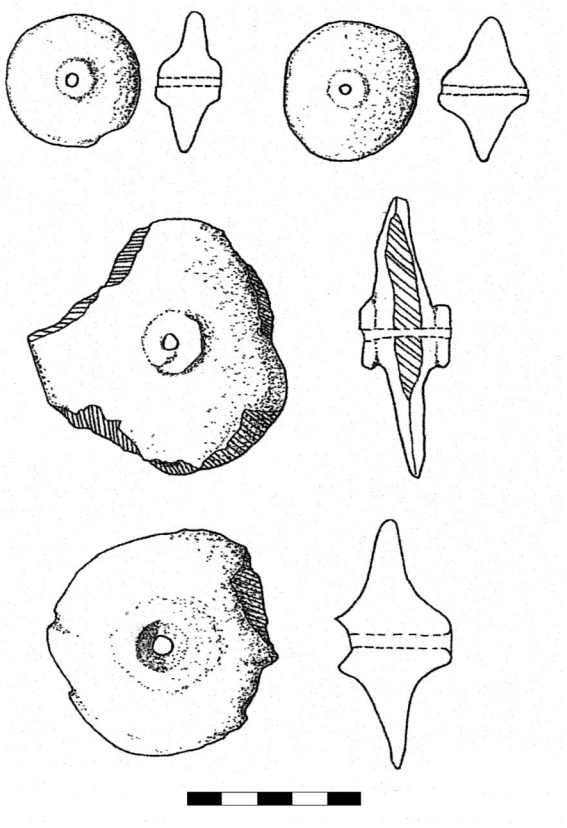


Figure 5.122. Top row, left to right: Raq 87 W-007; Raq 89 W-039; middle: Raq 88 W-015; bottom: Raq 89 W-035, wheels and whorls. *Illustration prepared by Sally Dunham.*

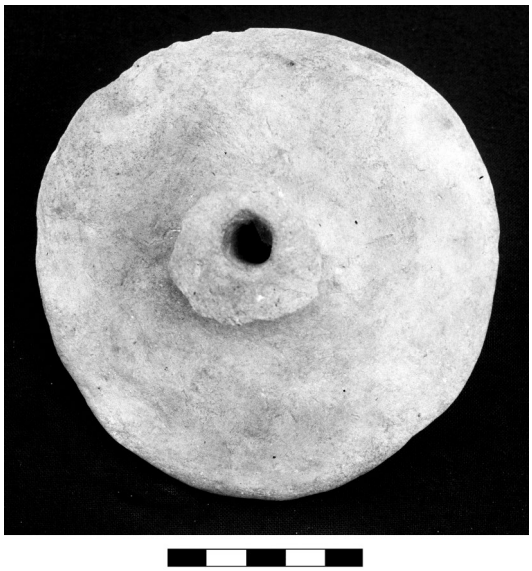


Figure 5.123. Wheel. Raq 89 W-041. *Photograph by Hans Curvers.*

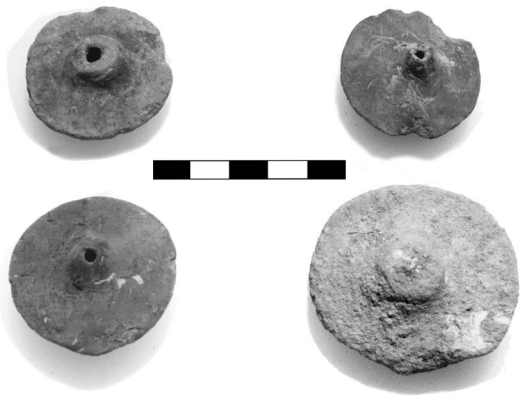


Figure 5.124. Wheels. Top row, left to right: Raq 87 W-007; Raq 90 W-051; bottom row, left to right: Raq 89 W-039; Raq 88 W-014. *Photograph by Sally Dunham.*

so this side is completely flat. On the other face the nave is complete. D. 7.3 × max. H. 2.5 cm. D. naves 2.3 cm. D. hole 0.7 cm. Wt. 86 g. Archon 42/114-167. Round Building, area 14. Debris inside room.

15. Raq 89 W-038. Level 4. Edge of wheel badly chipped on all sides. Edge of nave on one face of wheel is chipped. On the other face the nave has been completely broken away so the surface is flush with the hole. Lightly baked or unbaked clay. D. 7.5 × max. Th. 2.7 cm. D. naves 2.4. D. hole 0.6 cm. Wt. 66 g. Archon 42/114-169. Round Building, area 15, phase c. Debris inside room.
16. Raq 89 W-041. Figure 5.123. Level 4. Almost complete. Slight chip out of wheel rim. Naves slightly chipped on one end. Baked clay. D. 13.0 × max. Th. 7.3 cm. D. naves 3.8 cm. D. hole 1.3 cm. 42/114-190. Round Building, area 9, phase a. Debris inside room.
17. Raq 90 W-047. Level 4. Only part of rim and nave from one wheel face. Lightly baked clay. L. 5.5 × Th. 2.6. D. nave 2.3 cm. Wt. 44 g. Archon 42/114-209. Round Building, area 7. Debris inside silo/ room.
18. Raq 90 W-050. Level 4. Only the thicker part of the disk of the wheel and part of the naves preserved. On one face the nave is badly worn, while the other face is a cylinder with a flat end. Baked clay. Preserved D. 4.4 × max. Th. 2.9 cm. D. nave 1.8 cm. D. of hole 0.4 cm. Wt. 30 g. Archon 42/102-125. Round Building, area 29. Debris from presumed unroofed areas in Round Building.
19. Raq 90 W-051. Figure 5.124. Level 4. Wheel with shallow biconical disk shape. Narrow conical

naves. Rim chipped. D. 3.5 × Th. 1.9. D. hole 0.3 cm. Wt. 10 g. Archon 30/108-115. Area 82, phase a. Debris outside architecture.

20. Raq 90 W-054. Level 4. One third of a wheel. Nave preserved on only one face of the wheel. On the other the nave is broken away and the wheel disk is almost flush with the hole. Baked clay. D. 4.5 × max. Th. 2.5 cm. D. hole 0.35 cm. D. nave 1.5 cm. Wt. ca. 10 g. Archon 42/114-208. Round Building, area 9, phase a. Debris inside room.
21. Raq 91 W-059. Level 3. About one third of wheel preserved. Nave almost completely preserved. Baked clay. Sand and lime temper. Well-fired. Light beige color. D. 6.9 × max. Th. 3.1 cm. D. of naves 2.4 cm. D. hole 0.7 cm. Wt. 40 g. Archon 29/114, unit 1852. Area 61.
22. Raq 91 W-066. Level 3. Only part of the outer disk of the wheel preserved. Original diameter unknown. Complete height of nave preserved on only one face of the wheel, while the other face is flush with the hole. Possibly a wheel modified to serve as a spindle whorl. Baked clay. Grit, sand, and vegetal temper. Medium coarse texture. Beige color. D. 3.7 × max. Th. 1.9 cm. D. hole 0.4 cm. Wt. ca. 9 g. Archon 29/114, unit 0147-1. Area 15, phase c.
23. Raq 92 W-200. Either level 3 or level 4. Large chip out of wheel outer edge. Otherwise almost completely preserved. Naves have rounded edges. Red baked clay, even color, no visible temper. D. 6.3 × max. Th. 3.2. D. naves 2.5. D. hole 0.6 cm. Wt. 58 g. Archon 29/120–560. Area 93 (level 3 designation). Debris outside architecture.

Small Wheels (Probably Spindle Whorls)

1. Raq 91 O-117a. Figure 5.22, bottom row. Level 4. Fragment of a small wheel. Broken through the hole, so the diameter of the hole is uncertain. There is a small raised edge around the remaining part of the hole. Tan baked clay. L. 2.6 × W. 1.4 × H. 1.1 cm. Archon 24/117, unit 2392, elevation 293.52. Area 71, phase c.
2. Raq 87 W-005. Above level 2, under topsoil. Almost complete. Outer face of one nave broken. Baked clay. Blackened. Originally orange color. Fine sand and plant temper. D. 2.5 × max. Th. 1.4 cm. D. of hole 0.2 cm. Archon 42/96-002. Above level 2 area 26. Debris outside architecture.
3. Raq 87 W-006. Level 2. Almost complete. Slight damage to the nave on one wheel face. Baked clay Orange-brown color. D. 2.4 × max. Th. 1.3 cm. D. of hole 0.2 cm. D. of naves 1.0 cm. Archon 42/96-007. Area 26. Debris outside architecture.
4. Raq 87 W-007. Figures 5.122 and 5.124 Level 2. Complete. Naves are protrude only 0.5 cm. on each wheel face and are quite rounded. Baked clay. Brown color. D. 3.5 × max. Th. 1.6 cm. D. of hole 0.4 cm. D. of naves 1.3. Archon 42/096-007. Area 26. Debris outside architecture.
5. Raq 87 W-008. Level 3. Only one quarter preserved. Only small portion of naves preserved. Baked clay. Black color. Medium fired? Radius 1.5 × max. Th. 1.3 cm. Archon 29/108-033. Area 21. Debris inside room.
6. Raq 88 W-012. Figure 5.117. Level 3. Roughly circular, lentoid shape. Edge of hole has a slightly border. Unbaked clay. D. 2.9 × max. Th. 1.6 cm. D. of hole 0.4 cm. Wt. 8 g. Archon 36/102-039. Area 72. Debris outside architecture.
7. Raq 88 W-011. Level 3. Only about one quarter preserved. Part of naves also preserved. Lightly baked clay. Radius 2.1 × max. Th. 1.5 cm. Wt. Less than 1 g. Archon 42/102-016. Area 87 in Round Building, phase b. Debris from presumed unroofed areas in Round Building.
8. Raq 88 W-020. Level 3 or above. About one half preserved. Has part of a round cone protruding from middle of both faces. Baked clay. D. 3.6 × max. Th. 2.1 cm. Wt. 8 g. Archon 30/96-010. Area 32 (level 3 designation, phase e or above). Debris inside room.
9. Raq 89 W-029. Level 3. Almost complete. A small rounded "nave" on both faces. Lightly baked or unbaked clay. D. 3.1 × max. Th. 3.1 cm. D. "nave" 0.9 cm. D. of hole 0.3 cm. Archon 29/126-049. Area 59. Debris outside architecture.
10. Raq 89 W-039. Figures 5.122 and 5.124. Level 3. Complete. Almost a biconical shape, except that a rounded "nave" 1.4 cm D. protrudes 0.5 cm from both faces. Lightly baked or unbaked clay. D. 3.8 × max. Th. 2.2 cm. D. hole 0.3 cm. Wt. 16 g. Archon 29/102-063. Area 67. Debris outside architecture.
11. Raq 90 W-043. Above level 4, under topsoil (unclear if any levels 2–3 strata in this location). Fragment of edge and part of nave. Lightly baked or unbaked clay. L. 3.3 × W. 1.6 × Th. 1.4 cm. Wt. less than 1 g. Archon 42/114-205. Above level 4 area 31. Debris above architecture (likely to be of uncertain level).
12. Raq 90 W-046. Level 4. Only half preserved. Lightly baked gray clay. D. 7 cm × max. Th. 1.8 cm. D. of

nave 1.1 cm. Wt. 10 g. Archon 48/108-081. Round Building, area 11, phases b and c. Debris inside room.

13. Raq 90 W-048. Level 5. Small thick wheel. Part of rim gone. Naves are short protruding cylinders. Baked clay. D. 2.3 × max. Th. 2.0 cm. D. hole 0.6 cm. D. nave 1.6 cm. Wt. 12 g. Archon 36/120-214. Area 19, phase d. Debris inside room.
14. Raq 91 W-056. Level 4. Hole with sloping naves on both faces and a small part of the disk of the wheel are preserved. Gray-brown baked clay. One side blackened as if burned. D. 2.8 and 2.1 × max. Th. 1.9 cm. D. nave 1.1 cm. D. hole 0.4 cm. Wt. less than 5 g. Archon 23/113.5, unit 1262. Area 75, phases b–c.
15. Raq 91 W-057. Level 4. Preserved are the nave on one wheel face and a small part of the wheel disk. Baked, burned clay. The wheel has been subjected to so much heat that it is deformed and gray-brown to black. The clay has vitrified and blocked the hole on the side without a nave. D. 2.0 and 2.2 × max. Th. 1.5 cm. D. nave 1.1 cm. D. hole 0.3 cm. Wt. less than 5 g. Archon 29/120, unit 3246. Area 70.
16. Raq 91 W-062. Figure 5.120a. Level 4. Complete. Small disk with slightly protruding "naves" on either face. Disk is more elliptical than circular. Hardened or very lightly baked light tan clay. D. 2.3 and 2.1 × max. Th. 1.1 cm. D. hole 0.2 cm. Wt. less than 10 g, perhaps ca. 5 g. Archon 21.5/117, unit 3601. Area 70.

Potsherd Disks

1. Raq 87 O-002. Above level 3, under topsoil (unclear if there are level 2 strata between level 3 and topsoil in this location). Pierced potsherd disk. Complete. Sherd curves and includes part of a flat base. Body has sharp striations. Ceramic. Cream color. Sand tempered. D. 6.5 × Th. 0.8 cm. D. of hole 0.7–0.5 cm. Wt. 44 g. Archon 36/114-022. Above level 3 area 20. Debris above architecture.
2. Raq 87 O-003. Above level 3, under topsoil (unclear if there are level 2 strata between level 3 and topsoil in this location). Pierced potsherd. Roughly circular shape. Hole biconical and in center. Ceramic, cream colored. D. 3.7 and 3.5 × Th. 0.5 cm. D. hole 0.3 cm. Archon 36/114-022. Above level 3 area 20. Debris above architecture.
3. Raq 87 O-007. Topsoil. One half of a pierced potsherd disk. Biconical hole. Ceramic. Cream color. Lime tempered. Medium high-fired. Fabric has gray center with orange either side. Surface smoothed. D. 7.8 × Th. 1.2 cm. D. hole 0.4 cm. No archon recorded.
4. Raq 87 O-011. Above level 3, under topsoil (unclear if level 2 strata between level 3 and topsoil in this location). One half of a pierced potsherd disk. Cylindrical hole. Ceramic. Cream color. Fine sand and lime temper. D. 5.5 × Th. 0.8 cm. D. hole 1.0 cm. Archon 48/96-001. Debris above architecture.
5. Raq 87 O-012. Level 3. One half of a pierced potsherd disk. Biconical hole. Ceramic. Poorly fired, brown color. Plant and lime temper. D. 5.5 × Th. 1.0 cm. D. hole 0.6 cm. Archon 48/90-011. Area 44, phase c. Debris above architecture, possibly of uncertain level.
6. Raq 87 O-013. Above level 2, under topsoil. Pierced potsherd disk. Complete. Ceramic. Cream colored, sand tempered. D. 6.0 × Th. 1.2 cm. D. hole 0.3 cm. Wt. 46 g. Archon 42/96-002. Above level 2 area 26. Debris outside architecture.
7. Raq 87 O-014. Above level 3, under topsoil (unclear if there are level 2 strata between level 3 and topsoil in this location). Less than one half of a pierced potsherd disk. Ceramic. Cream color. Sand and lime temper. D. 3.5 × Th. 0.9 cm. D. of hole 1.4 cm. Archon 48/96-006.
8. Raq 89 O-035. Level 3. Potsherd disk. Unpierced (unfinished?). Ceramic. Tan color. Well-fired. D. 7.2 × Th. 0.7 cm. Archon 30/96-083. Area 33, phase c. Debris inside room.
9. Raq 89 O-044. Level 3. Pierced potsherd. Trapezoidal shape. Complete. Ceramic. L. 6.0 × W. 5.7–4.0 × Th. 1.2 cm. Wt. 54 g. Archon 29/126-042. Area 57. Debris outside architecture.
10. Raq 90 O-052. Level 4. Potsherd disk. Unpierced (unfinished?). Ceramic. Brown fabric. Vegetal and grit temper. D. 4.8 × Th. 1.7 cm. Wt. 44 g. Archon 42/114-206. Round Building, area 6. Debris in room.
11. Raq 90 O-057. Level 3. Pierced potsherd disk. Square shape with rounded sides. Cylindrical hole. Ceramic. Tan color. Well-fired. L. 6.2 × W. 5.0 × H. 1.1 cm. D. hole 1.0 cm. Wt. 42 g. Archon 30/108-063. Area 62, phase a. Debris outside architecture.
12. Raq 90 O-058. Level 4. Potsherd disk. Unfinished hole on one face. Ceramic. Coarse ware. Orange/buff outer surface, gray core. D. 3.3 × Th. 1.1 cm. Archon 42/114-209. Round Building, area 7. Debris inside silo/room.
13. Raq 90 O-065. Level 3. A piece of baked clay of irregular square shape with a cylindrical hole in

center. Gray-tan color with no visible temper. Reused potsherd? L. 3.3 × W. 3.1 × Th. 0.9. D. hole 0.4 cm. Archon 30/108-063. Area 62, phase a. Debris outside architecture.

14. Raq 90 O-073. Level 4. Pierced potsherd disk. Complete. Biconical hole, off center. Ceramic. D. 7.9 × Th. 1.6 cm. D. hole 0.7 cm. Archon 29/126-148. Area 99. Debris outside architecture.
15. Raq 90 O-074. Either level 3 or level 4. Pierced potsherd disk. Biconical hole. Complete. Ceramic. Light cream slip, reddish fabric, lime temper. D. 6.2 × Th. 1.3 cm. Wt. 48 g. Archon 29/126-136. Below level 3 area 59. Debris outside architecture.
16. Raq 91 O-203. Level 3. Complete unpierced disk. Smoothed edges. Ceramic. Cream colored surface. D. 4.0 × Th. 0.9 cm. Wt. 18 g. Archon 20.5/111, unit 0279. Area 61.
17. Raq 89 O-204. Above level 2, under topsoil. Unpierced disk. Smoothed edges. Ceramic. Orange cream surface. D. 5.0 × Th. 1.0 cm. Wt. 30 g. Archon 29/102-001. Above level 2 area 23. Debris above architecture.
18. Raq 89 W-022. Either level 2 or level 3. One half of a pierced potsherd disk. Ceramic. D. 5.6 cm. Th. 0.7 cm. Wt. 12 g. Archon 29/126-040. Above level 3 area 58. Debris above architecture.
19. Raq 89 W-025. Level 3. Complete pierced potsherd disk. Ceramic. Fabric green color. High fired. Vegetal and grit temper. D. 6.0 and 5.5 × Th. 1.0 cm. D. hole 0.5 cm. Wt. 26 g. Archon 36/96-034. Area 84. Outdoor surface.
20. Raq 89 W-028. Level 3. Potsherd disk with off-center unfinished hole. Ceramic. Buff color. D. 5.9 × Th. 1.1 cm. Wt. 46 g. Archon 29/126-048. Area 59. Debris outside architecture.
21. Raq 89 W-040. Level 3. One half of a pierced potsherd disk. Pierced on an angle. Ceramic. D. 4.2 × Th. 1.1 cm. Wt. 10 g. Archon 29/126-056. Area 58. Debris outside architecture.
22. Raq 91 W-061. Level 3. Complete pierced potsherd disk. Rounded rectangular plan. Hole biconical. Ceramic. Fabric is an even buff color. Medium vegetal, grit and sand temper. L. 5.3 × W. 4.7 × Th. 1.3 cm. D. hole 0.7–1.3 cm. Wt. 30 g. Archon 29/120, unit 3461. Area 15.
23. Raq 91 W-064. Level 4. About one half pierced potsherd disk. Biconical hole completely preserved. Ceramic. Medium coarse ware, greenish gray color, lime, grit and vegetal temper. Well-fired. D. 6.5 × Th. 1.3 cm. D. hole 0.8–0.5 cm. Wt. 30 g. Archon 29/114, unit 2270. Over area 77.
24. Raq 91 W-067. Level 3. One half of pierced potsherd disk. Biconical hole. Ceramic. Fabric buff color throughout. Fine vegetal and sand temper. D. 5.7 × Th. 0.9 cm. D. hole 0.7–0.5 cm. Wt. ca. 15 g. Archon 29/114, unit 1805. Area 61.
25. Raq 91 W-068. Level 3. Complete pierced potsherd disk. Irregular rectangular plan. Biconical hole. Ceramic. Light greenish gray fabric. Sand and "glitters" temper. L. 5.1 × W. 4.6 × Th. 1.4 cm. D. hole 1.2–0.5 cm. Wt. 30 g. Archon 29/114, unit 1852. Area 61.
26. Raq 91 W-069 +071. Level 3. Pierced potsherd disk. Two halves from two different units which join to make a complete disk. Biconical hole. Ceramic. Fabric orange tan color throughout. Cream exterior. Medium temper with lime, vegetal and grits. D. 6.9 × Th. 0.9 cm. D. hole 0.7–0.5 cm. Wt. ca. 29 g. Archon units 3341 and 1396. Area 16.
27. Raq 88 W-074a. Level 3. Complete pierced potsherd disk. Outside color cream/yellow. Inside color pink/orange. Fine sand/lime inclusions. D. 4.0 × Th. 0.5 cm. D. of hole 0.7 cm. Wt. 12 g. Archon 36/102-031. Area 29. Debris inside room.
28. Raq 88 W-075. Topsoil. Complete pierced potsherd disk. Biconical hole. Ceramic. Outside color yellow/cream. Inside color pink/orange. Temper lime, sand. Medium inclusions. D. 6.7 × Th. 1.6 cm. D. hole 0.6 cm. Wt. 72 g. Archon 30/90-000.

Other Disks

1. Raq 87 W-002. Above level 3, under topsoil (unclear if there are any level 2 strata between level 3 and topsoil in this location). Outer segment of a circular clay disk, no hole preserved. Fragment lentoid in section. Baked clay. Cream color. Medium fired. D. 9.0 × Th. 1.9 cm. Archon 36/114-022. Above level 3 area 20. Debris above architecture.
2. Raq 88 W-010. Figure 5.125. Either level 2 or level 3. Complete flat circular disk. Cylindrical hole slightly off center. Hard whitish plaster-like material (gypsum or lime?). D. 6.0 × Th. 1.2 cm. D. hole 1.1–0.8 cm. Wt. 44 g. Archon 36/102-021. Above level 3 area 38. Debris above architecture.
3. Raq 88 W-016. Topsoil. One half of a circular clay disk with an unfinished hole along the straight edge. Apparently not a reused sherd. Baked clay. D. 4.4 × Th. 0.7 cm. D. hole 1.2 cm. Wt. 16 g. Archon 36/96-000.

Figure 5.125. Plaster disks. Left to right: Raq 88 W-010; Raq 90 W-044; Raq 89 W-031. *Photograph by Sally Dunham.*

4. Raq 88 W-019. Level 3. Outer segment of a circular clay disk. No hole preserved. Lentoid in section. Lightly (?) baked clay. D. 5.5 × Th. 1.2 cm. Wt. 10 g. Archon 36/96-007. Area 71, phase b. Debris inside room.
5. Raq 89 W-021. Level 3. Irregular disk with biconical hole. Gypsum (? white plaster-like material). D. 3.2 × Th. 0.7 cm. D. hole 1.0–0.5 cm. Wt. 6 g. Archon 36/096-031. Area 84. Debris outside architecture.
6. Raq 89 W-031. Figure 5.125. Level 3. Irregular circular disk with cylindrical hole. White plaster–like material (gypsum?). D. 6.1 × Th. 1.5 cm. C. Hole 0.9 cm. Wt. 46 g. Archon 29/126-055. Area 58. Debris outside architecture.
7. Raq 90 W-044. Figure 5.125. Level 2. Irregular disk with cylindrical slightly off center. White plaster-like material (gypsum?). D. 5.5 × Th. 1.4 cm. D. hole 0.6–0.5 cm. Wt. 36 g. Archon 29/132-028. Area 13. Debris outside architecture.
8. Raq 91 W-055. Level 3. Circular pierced disk. Cylindrical hole Surface rough only the edge is smoothed. Soft whitish stone (gypsum?—Moh's 2). D. 5.3 × Th. 1.5 cm. D. hole 0.8. Wt. 40 g. Archon 29/114, unit 0357-1. Area 61.
9. Raq 91 W-070. Level 3. A flat round stone with many small concretions on it. Unfinished hole—partly pierced from both side. Hole extremely off center. Probably a stone collected to be pierced because of its useful shape. White stone. Moh's 3 (calcite?). D. 4.0 and 3.8 × Th. 1.2 cm. D. "hole" 0.7–0.3. Wt. ca. 19 g. Archon 29/120, unit 1436-2. Area 13.
10. Raq 91 W-072. Level 4. About one half of a irregularly shaped disk with a hole in it. Grayish hard plaster like material. Moh's 2 (gypsum?). D. 4.9 × Th. 1.3 cm. D. hole 0.6 cm. Wt. ca. 11 g. Archon 23.5/116.5, unit 2895-1. Area 71, phase c.
11. Raq 91 W-073. Level 4. Part of an irregular shaped disk with a hole drilled from both sides. Plaster-like material with grits and pores in it (gypsum or lime?) L. 3.9 × W. 2.9 × Th. 1.1 cm. D. hole 0.5–0.3–0.6 cm. Wt. ca. 9 g. Moh's 2. Archon 23.5/114, unit 1989-2. Area 75, phases b–c.

Beads and Pendants

Discussion

In the ancient Near East, beads and pendants were a common form of personal adornment and were probably valued both as status markers and as amulets. For instance, a neo-Assyrian text from Assur (Köcher 1971: text no. 376; Yalvaç 1965) lists the magical properties of different kinds of stones, most being useful to ward off evil or disease or to appease angry gods. Included in this list is an amulet in the shape of a dog said to be for the appeasement of Gula, Šamaš, and Ištar (Yalvaç 1965:331–332). Neo-Assyrian medical texts contain numerous references to stones worn as protection against various ailments, as the references under *samtu* (carnelian, "red stone") in the *Chicago Assyrian Dictionary* demonstrate. The largest groups of beads are often found in burials, a situation that applies at Tell al-Raqa'i. At Raqa'i, child burials in level 2 had varying numbers of beads, from several hundred to none at all. This situation probably reflects the wealth and social position of the family that buried the child, as well as

the child's age (see Chapter 6). Since beads were easily portable, they could be traded long distances, although it is more likely that it was the raw materials that were traded, with the beads manufactured at large urban centers such as Ur, Brak, and Nineveh, where evidence of bead manufacture has been found (Beck 1931; Mallowan 1947; Woolley 1934).

Thus, beads may reflect such aspects of ancient life as social status, trade connections, and ritual or magic beliefs and practices. This last aspect is the most difficult to trace archaeologically, especially at a site as early as Tell al-Raqa'i, but it nevertheless should be kept in mind. The following report on the Tell al-Raqa'i beads is meant to characterize the collection as a whole and to make specific information on the various beads easily accessible.

The beads have been classified using Beck's (1927) typology for shape and perforation type.[179] To this has been added a classification for size: small = beads whose greatest dimension is less than 0.6 cm; medium = beads whose greatest dimension is 0.6–1.4 cm; and large = beads whose greatest dimension is greater than 1.4 cm, or two of whose dimensions are over 1.0 cm. The distribution for level 2, 3 and 4 examples are given in Tables 5.21–5.23. The identifications of the materials are those made macroscopically in the field and make no claim to being completely accurate.

The categories used in the bead tables (Tables 5.21–5.23) are defined as follows: WS = "white stone," which is usually a dull, translucent white stone (gypsum?), but in a few instances is an opaque white stone (limestone?). Quartz (Qtz) was identifiable by its shiny, transparent or almost transparent quality and by its hardness (Moh's 7). Carnelian (Crl) is a hard (Moh's 7), orange-red stone. Bone (Bne) was usually off-white and slightly polished. "Other stone" (OS) refers to other colors of stone. These were usually a dark color, or black, but in a few instances they were light pinkish (see individual catalogue entries). Many of the Raqa'i beads are of a silicate material; several have traces of glaze and are therefore faience (Fai).[180] The majority, however, did not, and it is uncertain whether they are merely so worn as to have lost all trace of glaze or never had any. Here the former condition is assumed, since evidence from Tepe Gawra and Tell Brak has indicated a well established industry in faience in North Mesopotamia/Syria in the fourth and third millennium (Moorey 1994).

Some graves contained many tiny beads of a soft white material (SWM). These tended to be very fragile to handle, and it was difficult to ascertain whether they are stone, shell, or a silicate material. Beads with a similar appearance found at Tepe Gawra are said to be of shell (Speiser 1935:134 and Plate 53a, 4 and 9). Four beads appeared to be of baked clay (BkC) and one of these was in the form of a miniature jar (B-048). Only five metal (Met) beads were found, all of a greenish color, but they have not been tested as to whether they are bronze or another copper alloy. The label "Oth" (other) in the tables refers to beads whose material could not be identified (see individual entries in the catalogue). Shells (Shl) were popular among the beads in the child burials, mostly used in their natural shapes.[181]

The tables clearly show that the differences between the levels are only in quantity. The same types that occurred in level 2 also occurred in levels 3 and 4, but in smaller numbers. The near total absence of "small" beads from levels 3 and 4 is probably due to the fact that only one bead-rich burial was found in these levels. In level 2, where small beads comprise 79% of the total, 82% of the small beads are made of "faience" or the "soft white material," both of which are extremely fragile. Hence, they were probably preserved because they were buried in a grave. In the entire Raqa'i bead assemblage, most of the shapes were small to medium cylinders or disks (71%), shapes that are easy to mass-produce as opposed to spherical beads (shape IC1a), with only one attestation (B-032). Stone beads make up only 16% of the total collection and 40% of these were soft enough to have the hole drilled from one end (perforation type IV). Only 17 carnelian beads and no lapis lazuli beads were found, even though these two stones were popular in the third millennium at larger urban centers such as Ur, Mari, and Brak. This situation may reflect Raqa'i's subordinate position, only able to obtain such exotic and valuable materials through the intermediary of a dominant urban polity.[182] Possibly one could even see such a reflection in the collection as a whole, since small beads and soft materials predominate.

Nevertheless, the Raqa'i collection finds many comparisons throughout north Syria and Mesopotamia, showing that it was very much integrated into the contemporary network of exchange. Faience beads are very common at many sites. Biconical and segmented types such as B-051b, e, and f are quite numerous at Brak (Mallowan 1947:254). Bi-cones of green silicate and simpler forms of other colors are attested at Warka in the Early Dynastic period (Limpir 1988). Black, beige, and gray "frit" beads are reported from the

TABLE 5.21. Beads, Level 2.

Beck shape	Description	Size	Perforation	WS	Qtz	Crl	Bne	OS	SWM	Fai	BkC	Met	Oth	Shl	Total
IA1a	Oblate disk	S	IV				5								5
	Oblate disk	M	I		26										26
	Oblate disk	M	IV	1											1
IA1b	Barrel disk	M	I				2								2
IA2b	Cylindrical disk	S	I			8									8
	Cylindrical disk	S	IV						3	1					4
	Cylindrical disk	M	I			3									3
	Cylindrical disk	M	IV	2				5							7
IB1a	Oblate	M	IV							1					1
IB1b	Short barrel	M	IV									2			2
IB2b	Short cylinder	S	IV	2				44	384.5	33					463.5
IB2b/ IC2b	Short/standard cylinder	S	IV						52	32					84
IB2b	Short cylinder	M	IV	9				1		2			1		13
IB2e	Short bicone	M	IV							3					3
IC1b	Standard barrel	S	IV							40					40
	Standard barrel	M	IV							5		2		1	8
IC2b	Standard cylinder	S	IV						302	171					473
	Standard cylinder	S	VIa									1			1
	Standard cylinder	M	IV							1					1
	Standard cylinder	M	VIa	1											1
ID1a	Ellipsoid	M	IV							3					3
ID1b,XXIII	Ellipsoid, fluted	L	IV							7					7
ID1b	Long barrel	M	IV							15					15
ID1b, XXIII	Long barrel, fluted	M	IV							1					1
ID1e	Long bicone	L	IV							1					1
ID2b	Long cylinder	M	IV	2				2		20					24
	Long cylinder	M	VIa							1					1
ID2b, XVIIA1	Long cylinder segmented	L	IV							1					1
VIIIB2bd	Triangular short chamfered cylinder	M	IV	1											1
VIIID2bd	Triangular long chamfered cylinder	M	IV	1											1
IXA2b, IA2b	Square or round cylindrical disk	S	IV				58								58
XA2c	Rectangular cone disk	M	IV	1											1
XIIID2b	Hexagonal long cylinder	M	VIa				1								1
XXIA1d	Flattened annular	L	VIa											1	1
	Flattened annular	L	VIb											2	2
XXIB2a	Drop pendant	M	IV	3											3
XXVIIA1	Natural shells	Br	Br											15	15
	Natural shells	M	IV											22	22
		M	Br											17	17
	Natural shells	M	NP											14	14
	Natural shells	M	?											9	9
	Mold representative of shells	L	IV							1					1

Continued on next page

TABLE 5.21. Beads, Level 2 (*continued*).

Beck shape	Description	Size	Perforation	WS	Qtz	Crl	Bne	OS	SWM	Fai	BkC	Met	Oth	Shl	Total
XXX	Humans	L	IV	2											2
XXXI		Natural shells	IV										3		3
XXXIIA	Animal bead	M	IV	1				1							2
	Animal bead	L	IV	2										1	3
XXXIIB	Animal pendant	M	IV	3											3
	Animal pendant	L	IV	7										7	7
XXXIIB9	Dog, pendant.	L	IV									1			1
XXXIIIA	Bird bead	L	IV	1									2		3
XXXIIIB	Bird pendant	L	I											1	1
	Bird pendant	L	IV											1	1
XXXIIIB3	Bird pendant spread wing	L	IV											2	2
XXXIVB6	Snake pendant	L	IV				1								1
XXXIVB7	Fish pendant	L	IV				1							2	3
No Beck shape	Various shapes	M	I	1											1
		M	IV	6				6							12
		L	Br											1	1
		L	IV	1							1				2
Total				**40**	**26**	**11**	**68**	**59**	**741.5**	**341**	**1**	**4**	**8**	**138**	**1436.5**

Notes: In the first column, the letters A, B, C, or D refer to the proportions between the length of the bead, measured along its perforation, to its greatest diameter, measured at a right angle to its length. A (disc beads) have a length less than one-third the diameter; B (short beads) have a length more than one third and less than nine-tenths the diameter; C (standard beads) have a length more than nine-tenths and less than one and one-tenth times the diameter; and D (long beads) have a length more than one and one-tenth times the diameter (Beck 1981: 6). See the text discussion for abbreviations used in the other columns.

TABLE 5.22. Beads, Level 3.

Beck shape	Description	Size	Perforation	WS	Qtz	Crl	Bne	OS	Fai	Shl	Total
IA1a	Oblate disk	M	I	1	94	1					96
	Oblate disk	L	I	1							1
IA2b	Cylindrical disk	M	I			2		1			3
IB1a	Oblate	M	I			1					1
	Oblate	L	IV	1							1
IB2b	Short cylinder	M	IV	1							1
IC1a	Standard circl	M	IV						1		1
IC2b	Standard cylinder	M	IV	1				1			2
ID2b	Long cylinder.	M	IV				1				1
	Long cylinder	L	IV	1							1
XXA1d	Flattened annular	L	VIb	1							1
XXVIIA1	Natural shells	L	IV							5	5
	Natural shells	L	NP							2	2
XXXIIB	Animal pendant	L	IV				1				1
LB1	Irregular pendant	L	IV	1							1
No Beck shape	Various shapes	M	IV	1							1
		L	IV				1				1
Total				**9**	**94**	**4**	**3**	**2**	**1**	**7**	**120**

Table 5.23. Beads, Level 4.

Beck shape	Description	Size	Perforation	WS	Qtz	Crl	Bne	OS	SWM	Fai	BkC	Met	Oth	Shl	Total
IA1a	Oblate disk	L	IV	2											2
	Oblate disk	M	I		12										12
IA2b	Cylinder disk	M	I	1											1
	Cylinder disk	S	IV						1						1
	Cylinder disk	S	IV				1								1
IB1a	Oblate	L	IV								1				1
	Oblate	M	IV								1				1
	Oblate	M	IV									1			1
IB1b	Short barrel	M	IV	1											1
IB2b	Short cylinder	M	IV			2									2
IC2b	Standard cylinder	S	IV						2						2
IC2e	Standard bicone	M	IV								1				1
ID2b	Long cylinder	L	IV	1											1
LB2	Irregular pendant	L	I	1											1
XLIXB	Irregular pendant	L	I										1		1
XXVIIA1	Shell	L	IV											3	3
No Beck type		L	X					1							1
		L	X						1						1
		L	IV											1	1
Total				**5**	**12**	**2**	**1**	**1**	**4**		**3**	**1**	**2**	**4**	**35**

Temple of Ištar at Mari (Parrot 1956:168), and various "frit" beads are reported among the grave goods in the burials at Tawi (Kampschulte and Orthmann 1984). Bi-cones, segmented cylinders and barrel shapes are among the faience beads found in the so-called "bead layer" at Nineveh, which has been suggested to be the remains of a bead factory (Beck 1931; cf. Moorey 1994:174 on the date of this layer). Bead B-051e, a segmented cylinder, is interesting because it shows a clear ridge running lengthwise along the bead on opposite sides, indicating the line of the mold in which the bead was made.

Another bead type with a wide distribution is an oblate disk made of quartz (type IA1a). One hundred thirty-two of these were found at Raqa'i, with one level 3 grave containing over 70 of them (Burial 19, B-057a). Quartz disk beads are reported from Tell Brak, Chagar Bazar, Warka, Tawi, Mari, and Fara.[183] Mallowan stated that some of the specimens from Brak were glazed, an observation probably based on an analysis by Beck (Beck 1935; Mallowan 1947:160). The Raqa'i disks are very lustrous, but more study is needed to determine if they are glazed. At Brak, an unpierced quartz cylinder engraved with seven rings probably was intended for the production of eight quartz disk beads (Mallowan 1947: 161–162, plate 29B). Hence, it is very likely that the Raqa'i disks originated in one of the urban centers of north Syria.

Exotic shells were another popular trade item in the third millennium. Imported shells among the Raqa'i beads include Engina Mendacaria shells, rings made from Conus shells, and pendants made from the outer lip of Mediterranean Helmet shells (B-005i; I-011). All three types have been found at other third-millennium sites in Mesopotamia and north Syria (Gensheimer 1984; Reese 1989). In one burial was a faience bead in the shape and color of an Engina Mendacaria shell (or a Conus shell) (B-078d). Whether this was meant to be a cheaper substitute for a real shell or a more prestigious representation of a natural object, it emphasizes the importance attached to exotic shells.

Seven of the child burials contained one or more beads that were representations of humans, animals, or, in one example, a jar (see Table 5.24).[184] It is very probable that these miniature representations had a magic or symbolic value. As mentioned above, theriomorphic stone amulets are well-attested in historic period texts of the ancient Near East. Dunham (1993) has noted parallels between some of the shapes and animals in the beads in the Raqa'i child burials and the iconography of the later Lamashtu rituals to protect babies.[185]

Whether there is a relationship between these early images and the much later texts is, however, unlikely.[186]

A spread-winged bird pendant is included among the beads of Burials 24 (B-044) (Figure 5.136) and 25 (B-045) (Figure 5.137). This is a type found at numerous other third-millennium sites in Syria, Mesopotamia and Elam in burials and other contexts.[187] Spread-eagle birds are a frequent motif in Early Dynastic art, sometimes with a head that looks like the face of a lion. This lion-headed eagle has been identified as Anzu, the mythical eagle known from Sumerian and Akkadian literature. Whether the spread-eagle pendants in the Raqa'i burials represent the lion-headed eagle is difficult to say, due to the extreme simplification of their heads.

TABLE 5.24. Representational Beads from Raqa'i Child Burials.

Burial	Beads and pendants
24 (29/132-012)	B-042 Fish
	B-043 Anthropormorphic figure
	B-044 Bird with spread wings
	B-089b Flat shell bead in shape of quadruped with small head and large body
25 (29/132-021)	B-041 Six fragments of theriomorphic beads
	B-045 Bird with spread wings
	B-046 Bird in profile
	B-047a Two "feet" or "shoes"
	B-048 Round-bottomed jar
26 (29/132-031)	B-059a One simplified bird
27 (29/132-068)	B-079k One "foot"-(or "sandal")-shaped bead
	B-079p Two fragments of theriomorphic pendants
	B-079q Two birds on either side of lozenge
30 (42/90-011)	B-005b Human figurine
	B-005c Stylized bull head
32 (42/96-035)	B-075a Dog
	B-075b Two fish hanging by their mouths
	B-075c Snake
	B-075d "Boat" with animal head ends
	B-075e "Boat" with animal head ends
	B-075f Quadruped, species uncertain
	B-075g Broken theriomorphic bead
	B-076g "Foot" or "shoe"
	B-076k Two quadrupeds, species uncertain
35 (48/90-007)	A-001 "Bull"
	A-002 "Bull"
	I-004 Fish

CATALOGUE OF BEADS AND PENDANTS (FIGURES 5.126–5.151)

1. Raq 87 A-001. Figures 5.126 and 6.45. Level 2. Type XXXIIB8 large IV. Stylized bovid figurine. Flat piece of stone. A pair of concentric circles is on each flank and shoulder. Body is pierced top to bottom in middle of back. Horns curve across top of head. Complete. White Stone. L. 2.6 × W. 0.6 × H. 2.0 cm. Published: Curvers and Schwartz 1990: figure 15. Comparanda: Martin and Wartke 1993/1994:210, figure 15; Zettler 1997: figure 3.18. Archon 48/90-007. Area 26. Burial 35.
2. Raq 87 A-002. Figures 5.127 and 6.45. Level 2. Type XXXIIB8 large IV. Stylized bovid figurine. Flat piece of stone. Pierced on back from top to bottom. A pair of concentric circles is on each flank. One is worn. White stone. L. 1.5 × W. 0.6 × H. 1.1 cm. Published: Curvers and Schwartz 1990: figure 15. Archon 48/90-07. Area 26. Burial 35.
3. Raq 89 A-022. Figure 5.128. Level 3. Type XXXIIA large IV. Flat animal figurine carved from a slightly curved piece of bone. Incised dot on either side of head represents an eye. Standing, pointed ears, short pointed tail. Perhaps a dog. Body pierced with hole. Bone. L. 2.9 × W. 0.3 × H. 1.0 cm. D. hole 0.22 cm. Archon 29/120-055. Area 58. Debris outside architecture.
4. Raq 86 B-0002 (86). Topsoil. ID medium IV. Debris of uncertain level. A small cylindrical bead. Both ends appear broken so the original length is unknown. Pierced along the long axis by a cylindrical hole. Black stone. L. 1.0 × D. 0.5 cm. D. hole 0.3 cm. Archon 30/108-001.
5. Raq 86 B-0003 (86). Level 3. XXVIIA1 large IV. A small conical shell, species not identified. Has spiral rows of knobs. The upper end has been pierced. Shell. L. 1.6 × W. 1.1. D. hole 0.4 cm. Comparanda: von den Driesch and Falkner 1989: plate 20:1 (Melanopsis nodosa). Archon 42/116-007. Area 49.
6. Raq 86 B-0004 (86). Level 3. XXVIIA1 large IV. Pierced shell, probably used as a bead. Same type of shell and pierced the same way as B-0003 (86). Shell. L. 1.7 × W. 1.1 cm. D. hole 0.3 cm. Archon 42/116-007. Area 49, phase a.
7. Raq 87 B-003. Level 3. Debris inside room. ID2b large IV. One large (a) and one small (b) cylindrical brown stone bead. Brown stone. (a) L. 2.0 × D. 0.7, (b) L. 1.5 × D. 0.3 cm. Archon 30/126-014. Area 10, phase b.

FIGURE 5.126. Raq 87 A-001.
Photograph by Anwar ʿAbd al-Ghafour.

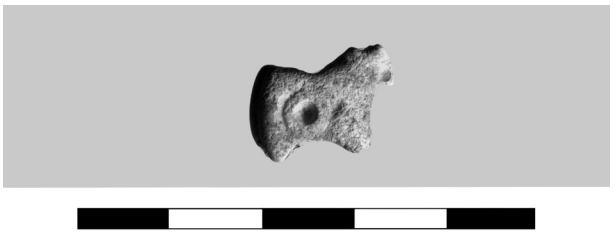


FIGURE 5.127. Raq 87 A-002.
Photograph by Anwar ʿAbd al-Ghafour.

FIGURE 5.128. Raq 88 A-022.
Photograph by Sally Dunham.

8. Raq 87 B-004. Level 2. IB2b. Medium IV. 1 cylindrical disk. Dark stone. H. 0.1 × D. 0.7 cm. Archon 48/90-007. Area 26. Burial 35.
9. Raq 87 B-005. Level 2. Archon 42/090-011. Area 26. Burial 30. Beads of various materials:
   (a) ID1a, XXIII large IV, 6 gray faience fluted ellipsoids. L. 1.5 × D. 0.4 cm. Published: Curvers and Schwartz 1990: figure 16:4.
   (b) XXX large IV. Figure 5.129. 1 soft white stone human figurine. Arms crossed on chest. String hole in bump at back of head. L. 2.1 × 0.6 × 0.5 cm. Published: Curvers and Schwartz 1990: figure 16:1.
   (c) XXXIIA medium IV. Figures 5.130 and 6.36. Stylized bull head. Faience. 1.1 × 1.0 × 0.9 cm. Published: Curvers and Schwartz 1990: figure 16:2.
   (d) XXVIIA1 medium IV. 5 engina mendacaria shells. Pierced. Published: Curvers and Schwartz 1990: figure 16:5.
   (e) B2b small IV. 1 short cylinder. Faience. Greenish white. ca. 0.3 × D. 0.4 cm. Published Curvers and Schwartz 1990: figure 16:6.
   (f) D2b medium IV. 1 long cylinder. Faience. Greenish white. 1.0 × D. 0.4 cm. Published: Curvers and Schwartz 1990: figure 16:7.
   (g) ID2b medium IV. 2 long cylinders. Translucent white stone. 1.0 × D. 0.6 cm. Published: Curvers and Schwartz 1990: figure 16:8.
   (h) VIIID2bd medium IV. 1 stone chamfered cylinder, triangular section. White stone. 1.0 × 0.7 × 0.7 cm. Published: Curvers and Schwartz 1990: figure 16:9.
   (i) No Beck type. Large. Broken. 1 crescent shaped piece of a Helmet shell. Published Curvers and Schwartz 1990: figure 16:3.
   (j) IA1a medium IV. 2 white stone oblate disks. 0.2 × D. 0.6 cm.

FIGURE 5.129. Raq 87 B-005b. Stylized anthropomorphic figurine. *Photograph by Anwar ʿAbd al-Ghafour.*

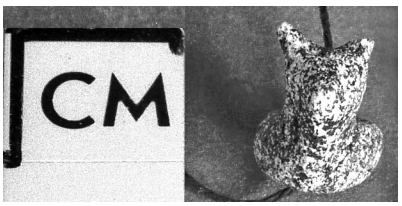


FIGURE 5.130. Raq 87 B-005c. Faience bead in the shape of a stylized bull. *Photograph by Anwar ʿAbd al-Ghafour.*

(k) IC2b small VIa. 1 "bronze" standard cylinder. 0.5 × D. 0.5 cm. Published: Curvers and Schwartz 1990: figure 16:11.
(l) IA2b small I. 8 carnelian cylindrical disks. 0.2 × D. 0.5 cm. Published: Curvers and Schwartz 1990: figure 16:12.

10. Raq 87 B-006. Level 2. IA1a medium I. 4 clear quartz disk beads. H. 0.2 × D. 0.8 cm. Complete. Archon 48/90-007. Area 26. Burial 35.
11. Raq 87 B-007. Level 2. XXVIIA1 large IV. 5 engina mendacaria shells, pierced. Complete. 5 white gastropod shells (species unidentified), pierced. L. 1.4-1.7, W. 0.6-1.2 cm. Archon 48/90-007. Area 26. Burial 35.
12. Raq 87 B-010. Level 2. Archon 42/90-011. Area 26. Burial 30.
    (a) XXVIIA1 medium IV. 5 pierced engina mendacaria shells.
    (b) No Beck type, large IV. One biconical pendant of white translucent stone, pierced near one end.
    (c) IC2b medium VIa. 1 white stone standard cylinder. L. 0.7 × D. 0.6 cm.
    (d) ID2b medium IV. 4 long cylinders, gray faience.
    (e) ID1a, XXIII large IV. 1 fluted ellipsoid, gray faience. L. 1.5 × D/0.7 cm.
13. Raq 88 B-012. Level 2. IC2b small IV. 8 standard cylinders. Soft white material. L. 0.2 × D. 0.3 cm. Archon 29/120-022. Area 18. Burial 21.
14. Raq 88 B-013. Level 2 or 3. Debris of uncertain level. XXVIIA large IV. Melanopsis—very water-worn hole apex, irregular hole on body (identification and description, D. Reese). Archon 36/102-021. Over area 38, level 3.
15. Raq 88 B-014. Figure 5.131. Level 3. Debris outside of architecture. IB1a One large irregular oblate shaped bead. Straight hole, slightly off center. White translucent stone. D. 2.9 × 2.5 × H. 1.3 cm. D. hole 0.4 cm. Archon 30/132-012. Area 11.
16. Raq 88 B-020. Topsoil. Hemispherical shape. Pierced vertically in center. D. hole 0.5 × 0.7 cm. Rock quartz. D. 1.9 × H. 0.75 cm. Possibly a small spindle whorl.
17. Raq 88 B-021. Figure 5.132. Late level 3. Debris outside architecture. LB1, large, IV. A flat trapezoidal shaped piece of stone that has been pierced near the narrow end. Soft, white translucent stone. Moh's hardness 1–2. L. 2.3 x W. 1.5-1.1 x H 0.4 cm. Archon 29/120-074. Area 12.
18. Raq 88 B-022. Level 4. Debris inside of room. IC2e medium IV. Standard bi-cone. Middle ridge chipped on one side. Dark gray baked clay. L. 1.3 × D. 1.1–1.3 cm. Comparanda: Martin 1988:217, no. 224 (Fara, Jamdat Nasr context). Archon 42/114-089. Round Building, area 15, phase c.
19. Raq 88 B-023. Level 3 or above. IA1a medium I. Oblate disk. Complete. Quartz. H. 0.15 × D. 1.1 × 1.3 cm. Archon 30/96-010. Area 32 (level 3 designation, phase e or above). Debris inside room.
20. Raq 88 B-026. Level 3 or above. Debris of uncertain level. XXA1d large VIb. Flattened annular bead of whitish, dull, slightly translucent stone. H. 0.4 cm. D. 1.9 cm. D. hole 0.7 cm. Archon 42/84-001. Over level 3 area 77.
21. Raq 89 B-027. Level 3. IA1a medium I. Oblate disk. Slightly translucent white stone. H. 0.4 × D, 1.9 cm. D. hole 0.3 cm. Archon 29/126-041. Area 51. Debris inside room.
22. Raq 89 B-028. Level 3. Debris outside architecture. XXVIIA1 large IV. Unio valve. Archon 42/84-006. Area 77, phase b.

FIGURE 5.131. Raq 88 B-014. *Photograph by Sally Dunham.*

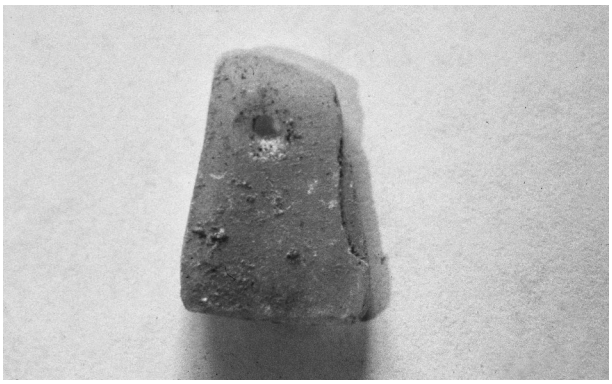


FIGURE 5.132. Raq 88 B-021. See Catalogue for dimensions. *Photograph by Sally Dunham.*

23. Raq 89 B-029. Level 3. Debris outside architecture. IC2b small IV. Standard cylinder. Black stone. H.0.4 × D. 0.4 cm D. of hole 0.2 cm. Archon 42/84-006. Area 77, phase b.
24. Raq 89 B-030. Level 3. IA1a medium I. Oblate disk. Quartz. H.0.1 × D. 0.8 cm. Archon 30/96-074. Area 33, phase c. Debris inside room.
25. Raq 89 B-031. Level 3. Archon 42/108-032. Round Building, area 47, phase b. Debris inside room. In association with burial 18, 9 beads:
    (a) IA1a medium I. 8 oblate disks. Quartz. L. 0.3–0.2 × D. 0.7–0.9 cm.
    (b) IA1a medium I. 1 oblate disk. Carnelian. L. 0.2 × D. 0.6 cm.
26. Raq 89 B-032. Level 3. IC1a medium IV. 1 standard cylinder (sphere). Faience. Very worn. D. 1.4 cm. Archon 29/126-050. Area 56. Debris inside room.
27. Raq 89 B-035. Level 4. Debris inside room/silo. XXVIIA1 large IV. Shell: Xerocrassa- hole on body toward lip (probably natural)—information from D. Reese. L. 2.6 × W. 2.2 × H. 1.7 cm. Archon 42/114-136. Round Building, area 10, phase b.
28. Raq 90 B-036. Level 1. ID1a large II. Ellipsoid. Black and white mottled stone. L. 1.7 × D. 1.6 (max.) D. hole 0.4 cm. (Note: M-037 was adhering to this bead.) Archon 49/108-038. Stone conglomeration.
29. Raq 89 B-037. Level 4. IA1a medium I. Oblate quartz disk. L. 0.2 × D. 0.7 cm. Archon 42/114-164. Round Building, area 15, phase c. Debris inside room.
30. Raq 89 B-038. Level 4. IA1a medium I. Oblate disk. Quartz. L. 0.1 × D, 0.7 cm. Archon 36/120-130. Area 60, phase b. Mud brick packing.
31. Raq 89 B-039. Level 2. IA1a medium I. 2 oblate disks. White faience (? Made of white grainy material with some glitters in it.). L. 0.3 × D. 0.9; L. 0.2 × D. 0.9 cm. D. holes 0.2 cm. Archon 29/132-12. Area 13. Burial 24.
32. Raq 89 B-040. Level 2. Archon 29/132-012. Area 13. Burial 24.
    (a) IA1a medium I. 2 oblate disks. Quartz. L. 0.6 × D. 0.7 cm.
    (b) IC2b small IV. 15 standard cylinders, soft white material. D. 0.1–0.5 cm.
    (c) IB2b medium IV. 2 short cylinders. Soft orange colored material. L. 0.4 × D. 0.6 cm.
33. Raq 89 B-041. Level 2. Archon 29/132-021. Area 13. Burial 25. XXXIIB large IV. 6 fragments of flat theriomorphic shell pendants (or beads). 4 have part of the hole preserved. Sizes:
    (a) L. 2.3 × W. 1.2 × H. 0.1 cm.
    (b) 1.4 1.0 0.1
    (c) 1.3 1.4 0.1
    (d) 1.2 1.1 0.1
    (e) 1.0 1.0 0.05
    (f) 0.9 0.6 0.1
34. Raq 89 B-042. Figure 5.133. Level 2. XXXIVB7 large IV. Pendant carved in the shape of a fish, with herringbone pattern on the top and the bottom. Eyes were circles with dots in the middle. Left eye—the circle has worn away. Right eye—circle preserved. Short tail and short protrusion right before the tail. Bone has brown substance/corrosion on it. Hole for stringing at mouth. Bone. L. 5.0 × W. 1.2 × Th. 0.7 cm. Archon 29/132-012. Area 13. Burial 24.
35. Raq 89 B-043. Figures 5.134 and 5.135. Level 2. XXX large IV. Anthropomorphic pendant of white stone. Simplified human figure. Upper body is cone-shaped and wider than legs, which narrow toward the bottom. Head is tilted back and eyes, mouth and teeth are delicately incised. Back of head is elongated to a point to allow for a hole for suspension. White stone. L. 1.9 × W. 1.1 × H. 0.9 cm. Archon 29/132-012. Area 13. Burial 24.
36. Raq 89 B-044. Figure 5.136. Level 2. XXXIIIB3 large IV. Shell pendant carved as a simplified rendering of a bird with spread wings seen from the front. The hole for suspension is in a rectangular

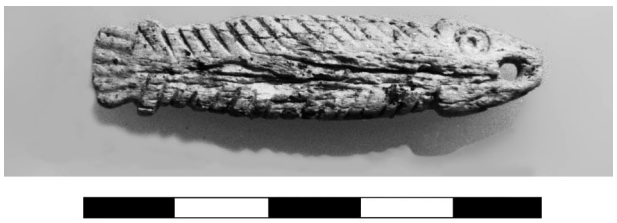


FIGURE 5.133. Raq 89 B-042. *Photograph by Sally Dunham.*

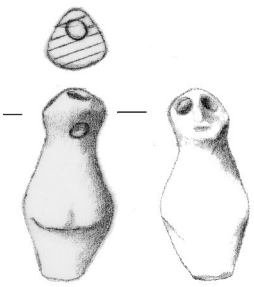


FIGURE 5.134. Raq 89 B-043. *Illustration prepared by Khaled al-Hamad.*

FIGURE 5.135. Raq 89 B-043. *Photograph by Sally Dunham.*

protrusion between the wings. This must also represent the head. Incised, radiating lines on the wings indicate the feathers. Shell. L. 2.7 × W. 2.0 × Th. 0.3 cm. Figure 5.136. Archon 29/132-012. Area 13. Burial 24.

37. Raq 89 B-045. Figure 5.137. Level 2. XXXIIIB3 large. Shell pendant in the shape of a bird facing front with wings spread. Hole is where the head is. Has brown substance adhering to it. The bead has badly damaged edges and surface and the original form is nowhere near as clear as that of B-044. Shell L. 2.7 × W. 1.5 × Th. 0.2 cm. Archon 29/132-021. Area 13. Burial 25.
38. Raq 89 B-046. Level 2. XXXIIIB large IV. Shell pendant in the shape of a bird (sitting?) in profile. Shell. L. 2.5 × W. 1.4 × Th. 0.2 cm. Archon 29/132-021. Area 13. Burial 25.
39. Raq 89 B-047. Figure 5.138. Level 2. Archon 29/132-021 Area 13. Burial 25. 211 beads:
    (a) XXXIA medium IV. 2 "foot-shaped" beads of light orange-pink color (soft stone?). L. 0.3 × W. 0.9 × Th. 0.4 cm.
    (b) IB2e medium IV. 3 short bi-cones. Dark brown faience. L. 0.7 × D. 0.9 cm.
    (c) IA1a medium I. 2 oblate disks. Quartz. D. 0.9 × Th. 0.4 cm.

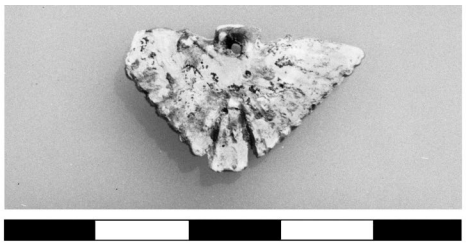


FIGURE 5.136. Raq 89 B-044.
Photograph by Sally Dunham.

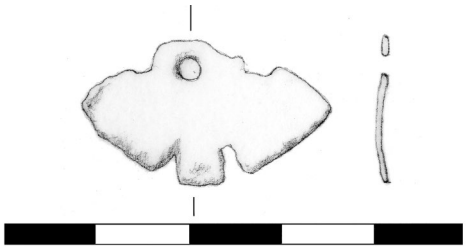


FIGURE 5.137. Raq 89 B-045.
Illustration prepared by Khaled al-Hamad.

    (d) ID2b, XVIIA1a. 1 long cylinder, segmented (three segments). Light green faience. L. 0.8 × D. 0.5 cm.
    (e) No Beck type. Medium. I. 1 biconical pendant. Dull white translucent stone. Pierced for stringing near one end. L. 1.2 × (max.)D. 0.9 cm.
    (f) ID1b medium IV. 3 long barrel-shaped faience beads. Dark gray-green faience. Encrusted with brown and whitish material. L. 1.1–1.0 cm × D. 0.8 cm.
    (g) IC1b medium IV. 2 standard barrels. Pink/whitish material (limestone?). L. 0.7 × D. 0.7 cm.
    (h) IC2b medium IV. 1 Standard cylinder. White and light green faience. L. 0.7 × D. 0.7 cm.
    (i) IC2b small IV. 143 small standard cylinders. Light green gray to very dark brown faience. 2 main sizes: L. 0.5 × D. 0.4 and L. 0.2 × D. 0.2 cm.
    (j) IC2b small IV. 43 small standard cylinders. Soft white material. L. 0.2 × D. 0.2 cm.
    (k) XXVIIA1 medium. 10 broken shells which were presumably pierced for stringing. L. 0.9–1.2 × D. 0.7 cm (all about the same size).
40. Raq 89 B-048. Level 2. Figure 5.139. No Beck type. Large. IV. 1 solid baked clay pendant in the shape of a round-bottomed jar with a flaring rim. Light greenish color. Pierced vertically. L. 2.7 × D. 2.1 cm. Archon 29/132-021. Area 13. Burial 25.
41. Raq 89 B-049. Level 2. Archon 29/132-012. Area 13. Burial 24.
    (a) IA1a medium IV. 15 oblate disks. Quartz H. 0.4–0.1 × D. 0.8–0.4 cm.
    (b) XXIIIB2a medium IV. 3 drop pendants. Dull translucent white stone. 1.2–1.0 × 0.9–0.5 × 0.5 cm.
    (c) IB2b medium IV. 9 short cylinders. Dull translucent white stone. 0.9–0.1 × D. × 0.5 cm.
42. Raq 89 B-050. Level 2. IB2b small IV. 34 short cylinders. Dark red opaque stone, polished. One bead is stuck to a tan cylindrical bead of the same size but softer material (clay?). 0.3 × D. 0.4 cm. Archon 29/132-012. Area 13. Burial 24.
43. Raq 89 B-051. Level 2. Archon 29/132-012. Area 13. Burial 24.
    (a) ID2b medium IV. 1 long cylinder. Faience, white with black specks. 0.6 × D. 0.2 cm.
    (b) ID2b, XVIIA1 medium IV. 1 long cylinder, segmented. Faience. White color. 0.7 × D. 0.4 cm.

FIGURE 5.138. Raq 89 B-047. *Photograph by Sally Dunham.*

FIGURE 5.139. Raq 89 B-048. *Photograph by Sally Dunham.*

(c) No Beck type. Medium IV. 1 pentagonal bead. Dark green-gray faience. 0.7 × 0.4 × 0.5 cm.
(d) ID1b medium IV. 6 long barrels. Faience. Black with white specks or vice versa. 0.6–0.7 × D. 0.4 cm.
(e) ID2b, XVIIA1 large IV. 1 long cylinder, segmented. Faience. Brown color. Mold line clear. 1.7 × D. 0.7 cm.
(f) ID1e large IV. 1 long bi-cone. Faience. Green color. 1.7 × D. 0.5 cm.
(g) IB2b small IV. 7 short cylinders. Dark stone. 0.2–0.4 × D. 0.4–0.6 cm.
(h) ID2b medium IV. 1 long cylinder. Faience. Blue. 0.7 × D. 0.5 cm.
(i) IA1b medium IV. 2 barrel disks. Bone. 0.2 × D. 0.6 cm.
(j) No Beck type; medium IV. 4 tan beads, slightly blackened. Clay–like (baked clay?).
(k) IB2b small IV. 4 tiny short cylinders. Soft white material. 0.2 × D. 0.4–0.6 cm.
(l) IB2b small IV. 8 tiny short cylinders. Faience. White or light green. 0.2–0.3 × D. 0.4–0.5 cm.

44. Raq 89 B-052. Level 2. Archon 29/132-012. Area 13. Burial 24. 366 beads.
    (a) IB2b small IV. 342 short cylinders. Soft white material. L. 0.1 × D. 0.2 cm.
    (b) IB2b small IV. 24 short cylinders. Faience. Light green to dark brown. 0.3 × D. 0.3 cm.
45. Raq 89 B-053. Level 2. Archon 29/132-012. Area 13. Burial 24. Shells, some pierced, some too fragmentary to tell if they had been pierced:

(a) XXA1d large VIb. Conus/Strombus apex whorl bead (circular)–abraded. Th. 0.4 × D. 2.3 cm. D. of central hole 1.0 cm.
(b) XXVIIA1 large IV. 11+ Engina mendacaria. 11 holed, at least 3 ground down on body.
(c) 10 Arcularia, 10 holed.
(d) 9 Anachis. 8 lack apex. 1.1 × D. 0.7 cm.
(e) 5 unidentifiable fragments.

46. Raq 89 B-054. Level 3. Debris from below floor, next to wall foundation, possibly from preceding period. Ia2b medium I. 1 cylindrical disk. Dark red stone. L. 0.2 × D. 0.6 cm. Archon 29/126-098. Area 56.
47. Raq 90 B-055. Level 4. IA1a medium I. 1 oblate disk. Quartz. One half preserved. H. 0.4 × D. 0.9 cm. Archon 42/102-082. Round Building, area 21. Debris inside silo.
48. Raq 90 B-056. Level 4. XXVIIA1 large IV. Fossil Oyster piece (identification, D. Reese). Waterworn. Distal Fragment, holed in upper center. Hole drilled from both sides. L. 4.1 × W. 3.2 × Th. 1.1 cm. Archon 48/108-072. Round Building, area 12, phase b. Debris inside room.
49. Raq 90 B-057. Figure 5.140. Level 3. Archon 42/114-217. Over area 6 of Round Building of level 4. Burial 19 (intrusive burial into level 4) 77 beads:
    (a) IA1a medium. I. 72 oblate disks. Quartz Th. 0.2–0.3 × D. 1.0–0.7 cm.
    (b) IA2b medium. I. 2 cylindrical disks. Carnelian. Th. 0.3 × D. 0.6 cm.
    (c) IB1a medium I. 1 oblate shaped bead. Carnelian. 0.4 × D. 0.8 cm.
    (d) IC2b small IV. 1 standard cylinder. White stone. 0.4 × D. 0.3 cm.
    (e) XXVIIA medium. 1 Conus (?), unpierced. 0.9 × D. 0.6 cm.
50. Raq 90 B-058. Level 3. IA1a medium I. 8 oblate disks. Quartz. Th. 0.2 × D. 0.8–0.9 cm. Archon 42/114-223. From area 6 of level 4, Round Building, probably belonging to Burial 19 (intrusive burial). Debris inside room.
51. Raq 90 B-059. Level 2. Archon 29/132-031. Area 13. Burial 26.
    (a) XXXIIIA large IV. 1 bird shaped bead. Hole vertically through body. Incised dot for eye. White stone(? Or shell?). L. 1.9 × Th. 0.4 × H. 0.9 cm.
    (b) ID2b medium IV. 2 long cylinders Black stone. 1.1 × D. 0.5 cm.
    (c) IA2b medium IV. 4 cylindrical disks. 3 pink stone, 1 green stone. O.2 × D. 0.7 cm.
    (d) IC1b medium IV. 1 standard barrel. Faience. White. 0.7 × D. 0.7 cm.
    (e) XIIID2b medium VIa. 1 hexagonal long cylinder. Bone. 0.7 × D. 0.4 cm.
    (f) IA2b medium I. 1 cylindrical disk. Carnelian. O.2 × D. 0.6 cm.
    (g) IA2b medium IV. 1 cylindrical disk. Black stone. 0.2 × D. 0.6 cm.

FIGURE 5.140. Raq 89 B-057. String of quartz disk beads, 3 carnelian beads.
Photograph by Anwar ʿAbd al-Ghafour.

(h) XXVIIA1 medium IV. 5 arcularia shells. 1.1 × o.4 cm.
(i) XXVIIA1 medium IV. 2 Engina mendacaria shells. 1.1 × 0.7 cm.
(j) IB1a medium IV, 1 oblate disk. Faience. Light green. 0.2 × D. 0.6 cm.
(k) ? 1 Conus shell.

52. Raq 90 B-060. Level 4. IA1a medium I.1 oblate disk. Quartz. H.0.1 × D. 0.9 cm. Archon 48/108-080. Round Building, area 11, phase b–c. Debris inside room.
53. Raq 90 B-061. Level 4. IA1a medium. 1 oblate disk. Quartz. Th. 0.2 × D. 1.2 cm. Archon 30/108-098. Area 82. Debris outside architecture.
54. Raq 90 B-062. Level 4. IA1a medium I. 1 oblate disk. Quartz. Th. 0.2 × D. 0.9 cm. Archon 30/108-082. Area 86. Debris outside architecture.
55. Raq 90 B-063. Level 4. IA2b medium I. 1 cylindrical disk. White stone. Th. 0.4 × D. 1.2 cm. Archon 42/114-231. Area 30. Debris inside room.
56. Raq 90 B-064. Level 4. ID2b large IV, 1 long cylinder. White opaque stone. L. 1.5 × D. 1.0 cm. D. hole 0.4 cm. Archon 30/108-091. Area 82. Debris outside architecture.
57. Raq 90 B-066. Level 4. IA2b small IV. 1 small cylindrical disk. Bone. Th. 0.2 × D. 0.5 cm. Archon 42/120-050. Area 64. Debris inside room.
58. Raq 90 B-067. Level 2 or level 4. Debris outside architecture. IC1b medium IV. 1 standard barrel. White stone. L. 0.6 × D. 0.6 cm. D. hole 0.2 cm. Archon 42/120-058. Area 4, level 2.
59. Raq 90 B-068. Level 4. IA1a medium I. 1 oblate disk. Quartz. Th. 0.3 × D. 0.9 cm. Archon 30/108-114. Area 82. Debris outside architecture.
60. Raq 90 B-069. Level 4. IA1a large IV. 1 oblate disk. White stone. Th. 0. × D. 2.4 cm. Archon 30/108-114. Area 82. Debris outside architecture.
61. Raq 90 B-070. Level 4. IA1a medium I. 1 oblate disk. Quartz. Th. 0.2 × D. 0.6 cm. Archon 48/108-115. Round Building, area 107. Debris inside room.
63. Raq 90 B-071. Figure 5.141. Level 4. XLIXB large I. Flat oval pebble which has a biconical hole near one end. Opaque gray stone. L. 2.5 × W. 2.1 × Th. 0.5 cm. Archon 48/108-125. Round Building, area 27.
64. Raq 90 B-072. Level 4. IB1a medium IV. 1 oblate shaped bead. Possible traces of fluting. "Bronze"/copper alloy. H. 0.6 × D. 0.7 cm.
65. Raq 90 B-073. Level 4. Archon 48/108-138. Round Building, area 4. Debris inside silo. IA1a medium I. 1 oblate disk. Quartz. Th. 0.2 × D. 0.7 cm. Archon 48/108-131. Round Building, area 3.
66. Raq 90 B-074. Level 2. Archon 42-096-035. Area 26. Burial 32. Near stomach, probably a bracelet. 82 beads:
    (a) XXVIIA1 large IV. 4 engina mendacaria shells, pierced. 1.5 × D. 1.0 cm.
    (b) No Beck type; medium IV. 2 biconical pendants. White dull translucent stone. 1.4 × 0.7 × 0.7 cm.
    (c) XA2c medium IV. 1 rectangular cone disk. White dull translucent stone. 0.4 × 0.5 × 0.7 cm.
    (d) XXVIIA1 large IV. Strombus/Conus, upper half cut off. 1.7 × D. 1.3 cm
    (e) IB2b small IV. 2 short cylinders. White stone. L. 0.2 × D. 0.5 cm.
    (f) IXA2b, IA2b small IV. 58 square or round cylindrical disks. 0.2 × D. 0.5.
    (g) IC2b small IV. 14 standard cylinders. Soft white material. 0.2 × D. 0.2 cm.
67. Raq 90 B-075. Figure 5.142. Level 2. Archon 42/96-035. Area 26. Burial 32. Near neck, part of a necklace: 269 beads:
    (a) XXXIIB9 large IV. 1 dog-shaped bead. Hole for stringing vertically through middle of the back. Appears to have collar around neck. Bronze/copper. L. 2.9 × H. 1.8 × Th. 0.6 cm.
    (b) XXXIVB7 large IV. 1 flat pendant in the shape of two fish hanging by their mouths. Shell. 2.9 × 1.8 × 0.2 cm.
    (c) XXXIVB6 large IV. 1 pendant carved in the shape of a snake. The snake's eye is the hole for

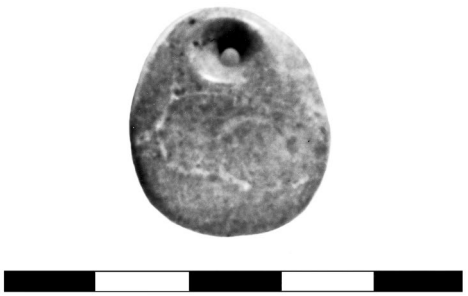


FIGURE 5.141. Raq 90 B-071.
Photograph by Sally Dunham.

stringing. The mouth is incised on the side of the face and seems to show teeth. Bone 3.0 × D. 0.5 cm.

(d) XXXIIIA large IV. 1 double bird bead. Two bird heads come out of either end of one body. Hole for stringing is in the center between the two heads. White color. Material uncertain (soft stone, shell, or faience?) 1.8 × 0.7 × 0.3 cm.

(e) XXXIIIA large IV. 1 double bird bead. Broken. Same, color, size and material as (d).

(f) XXXIIA medium IV. 1 theriomorphic bead. Species uncertain (bear?). Dull white translucent stone. Hole for stringing vertically through back. 1.2 × 0.6 × 0.7 cm.

(g) XXXIIA large IV. 1 flat theriomorphic. Broken. Shell. 1.5 × 1.1 × 0.2 cm.

(h) IB1b medium IV. 2 short barrels. Bronze/copper. 0.5 × D. 0.6 cm.

(i) IC2b small IV. 221 tiny standard cylinders. Soft white material. 0.1 × D. 0.1 cm.

(j) IC2b small IV. 26 standard cylinders. Silicate. Dark color. 0.1–0.2 × D. 0.1 cm.

(k) IA2b medium I. 2 cylindrical disks. Carnelian. 0.5–0.2 × D. 0.7–0.5 cm.

(l) ID1b medium IV. 3 long barrels. Faience. 0.9 × D. 0.5 cm.

(m) IC1b large IV. 1 standard barrel. Faience. White and brown. 1.1 × D. 1.0 cm.

(n) IA2b medium IV. 2 cylindrical disks. White translucent stone. 0.3 × D. 0.5 cm.

(o) IA1a small IV. 5 oblate disks. Bone. 0.2 × D. 0.4 cm.

68. Raq 90 B-076. Level 2. Archon 42/96-035. Area 26. Burial 32. Beads, near the arm:

(a) XXVIIA1 large IV. 5 engina mendacaria shells. 1.5 × D. 0.9 cm.

(b) XXVIIA1 medium IV. 1 shell of the same shape, but without the stripes. 1.4 × D. 0.8 cm.

(c) No Beck type; medium IV. 1 biconical pendant, Dull, white stone. 1.3 × 0.6 × 0.7 cm.

(d) IB2b small IV. 6 tiny short cylinders. Soft white material. 0.1- 0.2 × D. 0.1- 0.2 cm.

(e) IA2b small IV. 2 cylindrical disks. Soft white material. 0.1 × D. 0.3 cm.

(f) XXVIIA1 medium IV. Strombus/Conus–upper half cut off and smoothed. 1.4 × D. 0.9 cm.

(g) No Beck type. Medium. IV. 1 broken chip. Translucent, dull white stone bead (perhaps "foot-shaped"–cf. B-47). 1.2 × 0.4 × 0.7 cm.

(h) No Beck type; medium IV. 1 broken chip. Translucent, dull white stone, 0.7 × 0.3 × 0.6 cm.

(i) No Beck type; medium IV. 1 biconical pendant. Pink-tan colored. Uncertain material (stone?). 1.0 × D. 0.5 cm.

(j) No Beck type; medium. IV. 1 convex rectangular bead with rounded edges. Soft white stone. 1.4 × 0.7 × 0.5 cm.

(k) XXXIIIA medium IV. 2 theriomorphic beads. Very simplified quadrupeds. Species uncertain. Soft white stone. 1.1–1.4 × 0.3–0.6 × 0.3–0.6 cm.

69. Raq 90 B-077. Level 2. Archon 29/132-068. Area 13. Burial 27. Beads near leg.

(a) ID2b medium IV. 1 long cylinder. Faience. Dark gray-green. One end broken. L. 0.8 × D. 0.5 cm. D. hole 0.3 cm.

(b) XXVIIA1 large IV. 1 Strombus/Conus, upper half cut off and smoothed, hole near distal end. L. 2.2 × W. 1.7 cm. D. hole 0.3 cm.

70. Raq 90 B-078. Figure 5.143. Level 2. Archon 29/132-068. Area 13 Burial 27. Beads near arm.

(a) XXA1 large VIa. Conus/Strombus whorl bead (circular). Shell ring with hole. H. 0.5 × D. 2.5 cm.

(b) XXVIIA1 large IV. 3 Engina mendacaria shells. All worn, ground-down and holed on body. L. 1.5 × D. 1.0 cm.

(c) XXVIIA1 large, broken. 9 Arcularia, all open body, badly worn.

(d) XXVIIA3 large IV. 1 black and white striped faience bead made to imitate a shell (Conus or engina?). L. 1.9 × D. 1.1 cm.

71. Raq 90 B-079. Figure 5.144. Level 2. Archon 29/132-068. Area 13. Burial 27.

(a) IB2b, IC2b small IV. 52 short or standard cylinders. Soft white material. L. 0.1–0.2 × D. 0.2 cm.

(b) IB2b, IC2b small IV. 32 short or standard cylinders. Faience. Dark color. L. 0.1–0.2 × D. 0.2 cm.

(c) IC1b small IV. 35 standard barrels. Faience. Green-gray. L. 0.3 × D. 0.3 cm.

(d) IC1b small IV. 5 standard barrels. Faience. Light green, white and black. L. 0.4 × D. 0.4 cm.

(e) XXVIIA1 medium IV. 2 Engina mendacaria L. 1.1 × D. 0.7 cm.

(f) XXVIIA1 medium IV. 2 gastropods with pointed ridges (Melanopsis?). L. 1.2 × D. 0.7 cm.

(g) XXVIIA1 medium. Broken. 2 Arcularia. L. 1.1 × 0.7 × 0.5 cm.

FIGURE 5.142. Raq 90 B-075. Bronze dog pendant; 2 fish, snake, 2 bird-headed beads, surrounded by a string of tiny white disks and other tiny beads. *Photograph by Sally Dunham.*

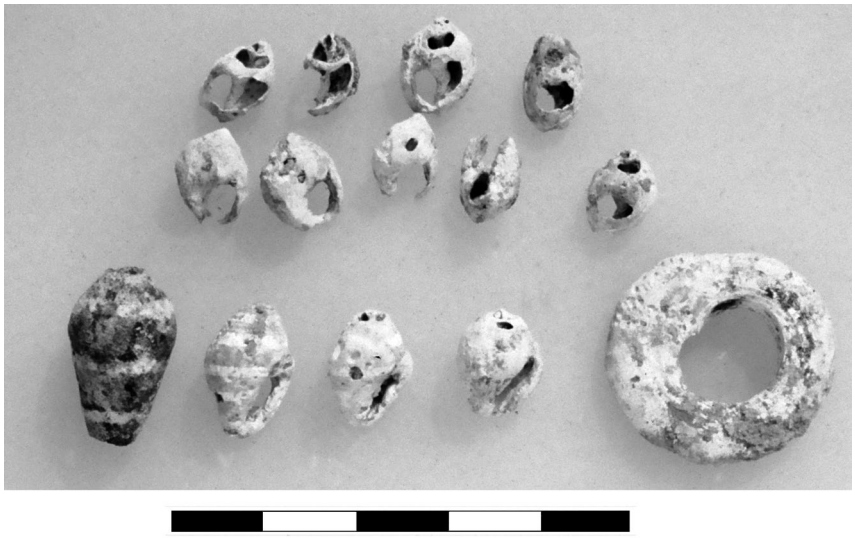


FIGURE 5.143. Raq 90 B-078. Shells: Arcularia shells, large striped faience bead in the shape of a shell, Engina mendacaria shells, and Conus/Strombus whorl bead. *Photograph by Sally Dunham.*

(h) XXVIIA 1 medium. 13 Anachis. L. 1.0 × D. 0.5 cm.
(i) ID1b XXIII medium IV. 1 long barrel, fluted. Faience. Gray. 1.1 × D. 0.7 cm.
(j) ID1b, XXIII medium IV. 2 long barrels. Faience. Pale green-gray. 1.1 × D. 0.7 cm.
(k) XXXIA medium IV. 1 "foot" (Flattish triangular with a tail). Soft pink stone (material uncertain). 1.0 × 0.2 × 0.7 cm.
(l) XXVIIA1 medium IV. 2 distal sections of small marine gastropods (nicely cut) with drilled hole.
(m) IB1b medium IV. 4 short barrels. Faience. Light pink/tan-white. L. 0.5 × D. 0.6 cm.
(n) ID1b medium IV. 1 long barrel. Faience. White. L. 0.7 × D. 0.5 cm.
(o) VIIIB2bd medium IV. 1 short chamfered cylinder. Dull, translucent white stone. 0.5 × 0.4 × 0.7 cm.
(p) XXXIIB medium IV. 2 flat theriomorphic pendants. Soft white stone (shell?). 1.2 × 0.6 × 0.2; 1.0 × 0.7 × 0.2 cm.
(q) XXXIIIB large I. 1 flat shell bead carved in the shape of two birds back to back on either side of a diamond. 1.8 × 1.4 × 0.2 cm.

72. Raq 91 B-080. Level 4. No Beck type. Large. X. A prismoid whose sides are trapezoids. The wider end is broken, but the remains of a hole can be seen on this broken surface. A second hole 1.5 cm from this end is preserved, cylindrical and 0.2 cm in diameter. At one end the surface around this hole is flat, but on the opposite side there is a flat ridge around the hole. This ridge looks as if the hole was made from one side and some of the material was pushed out at the other end forming the ridge. So perhaps the object is made of clay, although it seems very hard.(Moh's hardness 4). Where preserved, the surface has a soapy feel. L. 2.8 × W. 1.1–1.5 cm × Th. 0.8–0.9 cm. Archon 19/118, unit 3563, elevation 293.31. Area 70.
73. Raq 91 B-081. Level 4. XXVIIA1, large IV. 1 Engina mendacaria shell. Ground down on body and holed. L. 1.2 × D. 0.8 cm. Archon 29/120, unit 3533. Over area 70,
74. Raq 91 B-082. Level 4. IA1a large IV. 1 oblate disk. Dull white stone. Moh's hardness 2. Th. 0.4 × D. 2.0 cm. Archon 24/116.5, unit 1543-2, elevation 293.71. Area 71, phase c.
75. Raq 91 B-083. Level 2. XXVIIA1 large IV. 2 Cardita. Waterworn. Holed umbo.[188] L. 2.2 × W. 2.0 × H. 1.0 cm; L. 2.5 × W. 2.3 × H. 0.9 cm. Archon 29/114-094. Area 18. Burial 20.
76. Raq 91 B-084. Level 2. IB2b small IV. 32 ½ short cylinders. Soft white material. Moh's hardness L. 0.3–0.2 × D. 0.6–0.4 cm. D. of hole 0.25 cm. Archon 29/114-094. Area 18. Burial 20.
77. Raq 91 B-085. Level 2. ID2b, XVIIIA1a medium IV. 11 long segmented cylinders. Some whole, some fragmentary. Faience. Light green. Sizes: Longest: L. 0.7 × D. 0.3 cm. All the beads are of the same diameter with the same size hole, but different numbers of segments are preserved: 1 with 4, 2 with 3, 3 with 2 and 3 with 1 segment. Each segment is ca. 0.1 cm long. Archon 29/114-094. Area 18. Burial 20.
78. Raq 91 B-086. Level 2. Archon 29/114-094. Area 18. Burial 20.
    (a) IA2b small IV. 1 cylindrical disk. Faience. Light green. 0.15 X D. 0.4 cm. D. of hole 0.2 cm.
    (b) IC2b small IV. 2 standard cylinders. Faience. White. 0.5 X D. 0.5 cm. D. of hole 0.2 cm.
    (c) IB2b medium IV. 1 short cylinder. Faience. Pink. 0.3 X D. 0.6 cm. D. of hole 0.2 cm.
    (d) Fragments of at least two more beads of the same material.
79. Raq 89 B-088. Level 4. IB1a medium IV. 1 oblate-shaped weathered tan bead. Hole is off center. Soft material—clay? D. 0.9–0.8 × Th. 0.4 cm. Archon 20.5/108, unit 3106, elevation 293.58. Area 75, phases b–c.
80. Raq 89 B-089. Figure 5.145. Level 2. Archon 29/132-012. Area 13. Burial 24.
    (a) XXVIIA1 medium IV. 1 engina mendacaria shell. Ground-down hole on body. Lacks apex. L. 1.2 × W. 0.9 cm.
    (b) XXXIIB large IV. Worked Pinctada flat, theriomorphic bead. Very weathered. Animal with small head and large body. Two concentric circles incised on one side of head for the eye. Another pair of concentric circles incised near rear end. Hole near center of back for stringing. 3.2 × 2.5 × 0.3 cm. D. hole 0.2 cm.
81. Raq 91 B-090. Level 4. IA2b small IV. 1 cylindrical disk. Soft white material. 0.25 × d. 0.2 cm. D. of hole 0.1 cm. Archon 24.5/111.5, unit 2274, elevation 293.20. Area 75, phases b–c.
82. Raq 91 B-091. Level 4. IB2b medium I. 1 short cylinder. Carnelian. 0.4 × D. 0.7 cm. D. hole 0.2 cm. Moh's hardness, 7. Archon 23.5/116.5, unit 2768, elevation 293.30. Area 71, phase c.

FIGURE 5.144. Raq 90 B-079. String of tiny white or dark beads, surrounding other beads, some of them bird-shaped. *Photograph by Sally Dunham.*

83. Raq 91 B-092. Level 4. IA1a medium. 1 oblate disk. Quartz. 0.2 × D. 0.7 cm. D. of hole 0.2 cm. Moh's hardness, 7. Archon 23.5/117, unit 2755, elevation 293.40. Area 71, phase c.
84. Raq 91 B-093. Level 3. IA1a medium I. 1 oblate disk. Quartz. 0.2 × D. 0.7 cm. D. hole 0.2 cm. Moh's hardness 7. Archon 029/114, unit 1394. Area 16, phase a.
85. Raq 91 B-094. Level 4. IB1b medium IV, One half of a short barrel, broken lengthwise. Dull, translucent soft whitish stone. Moh's hardness 2. L. 0.4 × D. 0.6 cm. D. of hole 0.3 cm. Archon 29/120, unit 1405-2. Area 71, phase c.
86. Raq 91 B-95. Level 4. IC2b small IV. 1 standard cylinder. White material (shell?). Moh's hardness 3. The ends are very flat as if they had been sliced from a long tube, and the hole goes straight through. L. 0.3 × D. 0.3 cm. D. of hole 0.1 cm. Archon 24.5/116, unit 1538, elevation 293.71. Area 71, phase c.
87. Raq 91 B-096. Level 4. IB1a large IV. One half of an oblate-shaped bead. Has two rows of incised dots, each ca. 0.1 cm. D. around the largest circumference. Baked clay. Greenish color. H. 1.1 × D. 1.7 cm. D. of hole 0.3 cm. Archon 21.5/110.5, unit 0844, elevation 293.67. Area 75, phase c.
88. Raq 91 B-097. Level 4. No Beck type. Large. Small curved object. Near on end is a small perforated protrusion. Bone. 1.8 × 0.6 × 0.6 cm. Archon 25.5/114, unit 2712-1, elevation 293.83. Area 72, phase c.

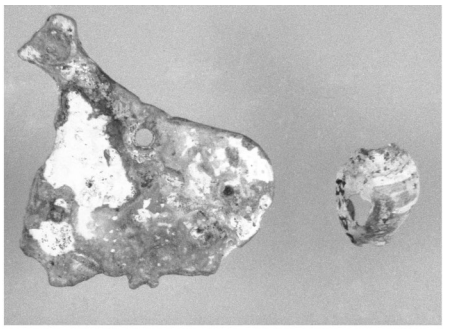


FIGURE 5.145. Raq 89 B-089. Right—pierced Engina mendacaria shell; left—flat theriomorphic bead. *Photograph by Sally Dunham.*

89. Raq 91 B-98. Level 3. IB2b medium IV. 1 short cylinder. Hole drilled from one side. Edge of bead slightly faceted, but facets appear to have been smoothed (by abrasion?). Dull translucent whitish stone. Moh's hardness 2. Th. 0.3 × D. 0.7 cm. D. of hole 0.2 cm. Archon 26.5/114, unit 1968, elevation 294.05. Area 13.
90. Raq 91 B-099. Level 3. No Beck type. Large IV. Highly polished black stone pendant. Rectangular plan, plano convex cross-section. Hole through convex side near one end. Flat side has three incised lines forming a sort of U. Black stone. Moh's hardness 2. 1.4 × 1.1 × 0.5 cm. D. of hole 0.3 cm. Archon 26.5/113, unit 1252, elevation 294.21. Area 15, phase b.
91. Raq 91 B-100. Level 4. IA1a medium I. 1 oblate disk, broken. Quartz. Moh's hardness 7. 0.2 × D. 1.0 cm. D. of hole 0.2 cm. Archon 29/120, unit 1406. Over Area 71, phase c.
92. Raq 91 B-101. Level 3. IC2b small IV. 1 standard cylinder. Soft white material. Moh's hardness 1. 0.3 × D. 0.3 cm. D. of hole 0.1 cm. Archon 29/114, unit 138. Area 13.
93. Raq 91 B-102. Level 3. ID2b medium IV. 1 long cylinder. Bone, burned gray. Broken lengthwise, half preserved. On outside are seven diagonal notches (each 0.1 or less in width). One has a white substance in it. Bone. L. 1.2 × D. 0.5 cm. D. of hole 0.2 cm. Archon 29/114, unit 1445-2. Area 13.
94. Raq 91 B-103. Level 3. IA1a medium I. 1 oblate disk. Quartz. Moh's hardness 7. 0.2 × D. 0.7 cm. D. of hole 0.1 cm. Archon 29/120, unit 1961-2. Area 13.
95. Raq 91 B-104. Level 4. IC2b small IV. 1 standard cylinder. White material, possibly shell. 0.2 × D. 0.2 cm. D. of hole 0.1 cm. Moh's hardness 2. Archon 21.5/111, unit 1867, elevation 293.34. Area 75, phases b–c.
96. Raq 91 B-105. Level 3. IA1a medium I. One oblate disk. Quartz. Moh's hardness 7. 0.2 × D. 0.6 cm. D. of hole 0.2 cm. Archon 29/114, unit 3342. Area 60.
97. Raq 91 B-106. Level 4. IB2b medium I. One short cylinder. Carnelian. Moh's hardness 7. 0.3 × D. 0.7 cm. D. of hole 0.2 cm. Archon 20.5/117, unit 3158. Area 70.
98. Raq 91 B-107. Level 4. LB2 large I. One irregular flat triangular pendant. Dull translucent white stone. Moh's hardness 2. 1.5 × 1.1 × 0.2 cm. D. of hole 0.3 cm. Archon 29/114, unit 3149. Area 77.
99. Raq 91 B-108. Level 4. No Beck type. Large X. One oblong bead of triangular section with two holes (spacer?). Faience. White. L. 1.8 × 0.7 × 0.6 cm. D. of the holes 0.2 cm. Archon 20/113, unit 2858, elevation 293.16. Area 75, phases b–c.
100. Raq 91 B-109. Level 3. No Beck type. Medium X. Small tapering opaque white stone pendant. One end tapers to a blunt point. The other end is broken off. The pendant has a circular cross-section. A cylindrical hole has been drilled from one side between the two ends. Archon 29/120, unit 2035. Area 61.
101. Raq 92 B-200. Level 2. Archon 29/120–524. Area 18. Burial 4.
    (a) One land snail, unpierced. 0.5 × D. 0.9 cm.
    (b) ID1a medium IV. 3 ellipsoids. Faience. White. 0.7–0.6 × D. 0.5–0.6 cm.
    (c) XXVIIA1 medium IV. 1 Arcularia–ground down dorsum 0.9 × 1.1 × 0.5 cm.
    (d) Ia2b small IV. 1 cylindrical disk. Soft white material. 0.1 × D. 0.3 cm.
102. Raq 87 I-003. Level 2? XXA1d. Large VIb. Conus/Strombus apex whorl bead (circular) (like B-53a). H. 0.5 × D. 2.1 cm. Archon 42/120-008. Area 3. Debris of uncertain level.
103. Raq 87 I-004. Figure 5.146. Level 2. XXXIVB7 large IV. One pendant in the shape of a fish. Head end wider than tail end. Hole near top of head end for stringing. Two small dots incised below this hole. Limestone (or shell?). L. 4.0 × W. 1.7 × Th. 0.2 cm. Published: Curvers and Schwartz 1990: figure 14. Archon 48/90-007. Area 26. Burial 35.
104. Raq 87 I-008. Level 3. Debris outside architecture. XXVIIA.1.large. Hole not preserved. Fragment of a shell pendant made from the lip of a Mediterranean Helmet shell (similar to I-011). L. 2.6 × W. 0.6 × H. 0.3 cm. Comparanda: Reese 1989. Archon 36/108-011. Area 24.
105. Raq 88 I-011. Late level 3. XXVIIA.1. Large IV. Fragment of a pendant made from the lip of a

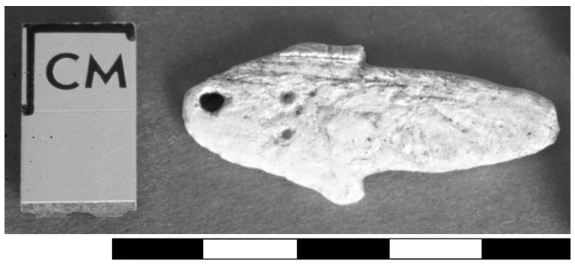


FIGURE 5.146. Raq 87 I-004. Fish-shaped pendant. *Photograph by Hans Curvers.*

Mediterranean Helmet shell. Half of the hole for stringing is preserved at the wide end of the pendant. L. 2.3 × W. 0.6 × H. 0.6 cm. Comparanda: Reese 1989. Archon 29/120-076. Area 12. Debris outside architecture.

Wall Painting Fragments

As noted in Chapter 2, fragments of a wall painting[189] depicting a human figure were found on fallen mud-brick in room 9 of the level 4, Round Building (Figures 5.147–5.149). Although 23 fragments showing black paint on a white background were recovered, only the two illustrated ones show any recognizable forms.[190] The white background is lime plaster, a common wall and floor covering in levels 3 and 4. The black seems to have derived its color from a carbon-containing substance, but its exact composition is uncertain.[191]

The two illustrated fragments probably had been plastered over more than once. There was at least one layer of white, on top of which was a layer of mud with white flecks that was covered by another layer of white (Figure 5.148). Beneath the black figures, one can also note several layers of white alternating with thin layers of mud, visible at the left edge of the fragment. The black pigment is thinly applied in relatively free strokes that vary in intensity and allow the flecks of the white and mud-colored background to show through—for instance, in Figure 5.149, where the skirt of the figure meets the legs and the various tones of the legs.[192]

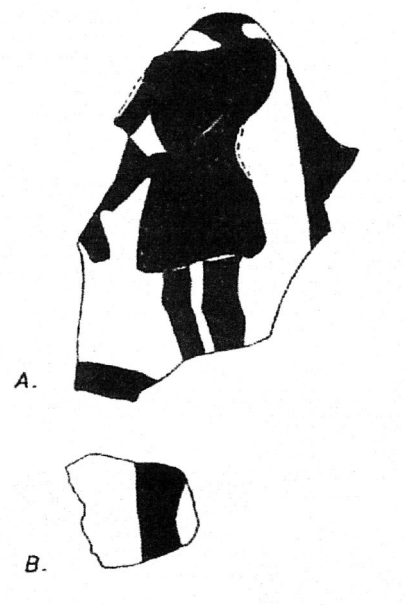


Figure 5.147. Raq 89 X-002. Fragments of a wall painting. (A) Fragment of a human (scale 5:8). (B) Fragment showing part of a human leg (?) (scale 3:5). *Illustration prepared by Sally Dunham.*

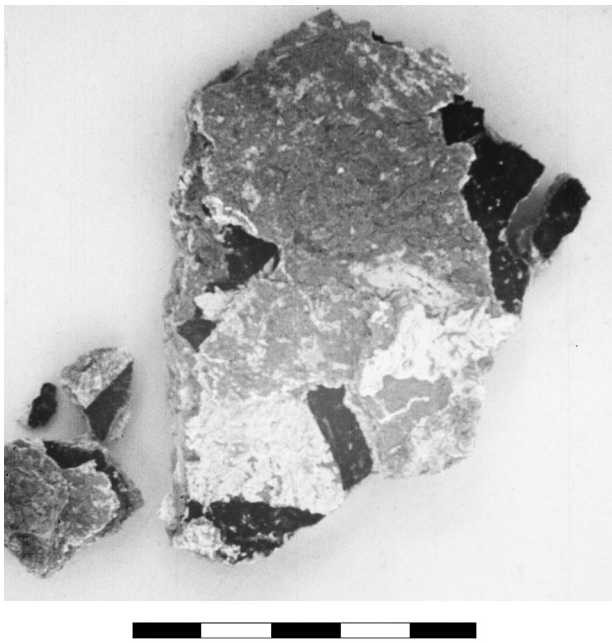


Figure 5.148. Raq 89 X-002. Wall painting as found. *Photograph by Glenn Schwartz.*

Figure 5.149. Raq 89 X-002. Wall painting after removal of plaster. *Photograph by Glenn Schwartz.*

The largest fragment (8.8 × 5.5 cm) has a human figure facing left[193] with both arms holding an object at the left. Only the neck and the lowest part of the head are preserved, but this is enough to show that the figure was not bearded. The shoulders and chest are presented frontally, with the right arm diagonally crossing the body so that the right hand appears at the waist on the left side. The short skirt the figure is wearing flares slightly to form an approximately triangular shape. Since the outlines of the knees are very simply indicated, the two legs below the skirt appear to be in profile.[194] There is a straight black border to the right of the figure, but its width cannot be known. A curving black border is below the figure at the left, but its relation to the legs (and missing feet) is also unknown. At the left edge a black triangular shape with an appendage below it is part of the object that the figure puts its hands on.

The smaller fragment (2.6 × 2.6 cm) shows only a white background with a black stripe. The wide angle along this stripe's right edge suggests that it represents a human knee. It is likely that the original painting had more than one human figure, and this second figure either had a short skirt (above the knees) like the first one or was nude.

Although the Raqa'i painting is only fragmentary and, indeed, illustrates only part of a very simplified human figure, available comparative material demonstrates that it belongs firmly in the Syro-Mesopotamian artistic tradition of the third millennium and suggests some possibilities for the activities that figure may have been engaged in. The Raqa'i figure is wearing a short skirt that clearly ends above the knees. This detail alone suggests that it represents a male, since females in third-millennium art are never depicted wearing short skirts that end above the knees.[195] Furthermore, in ancient Mesopotamian and Near Eastern art, a short skirt that leaves the knees free generally implies an active male role: a servant, an entertainer, a hunter or herder, a warrior, and so on. This can be clearly seen in detailed representations in various mediums spanning the Uruk through Akkadian period.[196] Much more simplified renderings, however, are also common in the glyptic art of Mesopotamia and Syria during the third millennium and show the range of activities in which such figures were depicted: in combat with animals,[197] as driver or attendant of a plow or chariot,[198] or as an attendant in a banquet scene.[199] Some seals show this figure following two animals, which, as Moortgat-Correns (1985) has suggested, may represent the conflict between herd animals and wild predators. Then the human figure would be a "protector" of the domestic herds. In another medium, parallels to the Raqa'i figure are found on a Scarlet Ware vessel in the British Museum. Here one sees not only the activities mentioned above, but also an apparent ritual scene involving a large boar. Each of the human figures is shown in black silhouette with an ovoid head, a triangular chest and a short, triangular skirt, and the legs are two thick black lines. As with the Raqa'i figure, no beards are indicated.[200] Thus, a simplified human figure in a short skirt is a well-attested motif in Syro-Mesopotamian art of the third millennium, and indeed, from the above-mentioned examples one can suggest several possibilities for the Raqa'i figure: a servant or entertainer at a banquet or ritual, a driver (or attendant) of a chariot or plow, or a figure in procession or in combat with animals. In the art of this period these activities can be represented by a standing figure with both arms directed to one side, like the Raqa'i figure.[201]

At Mari and in the Middle Euphrates sites of Halawa, Sweyhat, and Munbaqa, wall paintings have been found associated with public buildings of the third millennium.[202] The iconography of these images seems to be mostly related to cultic, religious matters.[203] In addition to a purely cultic purpose, however, religion was also important for the legitimization of political power throughout ancient Near Eastern history, and here the visual arts played a key role, as the decoration of temples, palaces, and other public monuments attests.[204] Could the two Raqa'i wall painting fragments have been part of a visual composition that fulfilled such a function?

As noted above in Chapter 2, the wall painting fragments were found on a fallen mudbrick in the southeast corner of room 9, and they may have belonged to a mural on the southeast wall of the room. The fallen mudbrick was 50 cm above the bottom of the blocking of the doorway between rooms 9 and 10, when the rooms were converted into doorless "silos" in phase b. The painting, as found, had been plastered over, probably more than once, so it may have belonged to the earlier phase of the room (phase a), when there was a wide doorway between rooms 9 and 10. In this phase, the only entrance to the Round Building was through rooms 6 and 10, since room 10 was separated from area 11 by wall 11B.[205] A doorway connected room 10 to room 12, where one could turn east to a doorway to area 11 or north to a doorway to area 23.

The wide doorway of room 9 seems to emphasize its close relation to what took place in room 10, while the tall buttress-like doorjambs on either side of the door appear to emphasize it as a "special" space. As noted in an earlier study (Dunham 1993a:137) these doorjambs make the relation of rooms 9 and 10 appear like that of cella and ante-cella in third-millennium temples in northern Mesopotamia and north Syria. Rooms 9 and 10, however, seem to be for a different purpose, because room 10 is really an access way to the interior parts of the Round Building, and the finds in phase a of room 9 do not support its identification as a cella.[206] The most suggestive of the finds from this phase are 19 clay jar sealing fragments, since as a putative grain processing and storage center, administration would have been one of the main functions of the Round Building. Although the quantity of any class of artifact at Raqa'i is small, the majority of sealing fragments (including some seal impressions) came from the level 4 Round Building (n = 87). Perhaps room 9 was more like the "office" of the official or officials controlling access to the Round Building, which was the building most important to the well-being of the community. Visual imagery which expressed the legitimization of such control would certainly be suitable for such a context. Although the one figure that is preserved is only a minor one, with an attendant's role as suggested above, it certainly could have been part of such imagery.

Spatial Distribution of Small Finds, Levels 2–5: General Comments

When considering the spatial distribution of small finds, one must bear in mind the likely secondary context of all or nearly all of them, with the exception of objects found in burials. As a result, their final disposition may be only loosely related to their original area of use. It is also important to remember, when comparing the number of small finds recovered in different parts of the ancient community, that some areas were more extensively sampled through excavation than others. For instance, in level 4, excavations were especially concentrated in the Round Building, which thus might be expected to have yielded more objects than other areas. Finally, the more intensive excavation techniques in trenches 29/114 and 29/120 in the 1991 and 1991–1992 seasons (see Chapter 2) are likely to have yielded a larger number of small object fragments from that part of the north neighborhood.

The number of objects recovered from levels 5 and 2 was modest, and their spatial distribution shows no obvious concentrations in particular zones. In consequence, we discuss only the possible patterns of spatial distribution in levels 4 and 3 (Figures 5.150–5.157).

In level 4, examples of most object categories were found in a fairly broad area of dispersal, with few obvious cases of object types being noticeably restricted to one zone or another. However, exceptions can be noted. For example, clay tokens almost exclusively derive from the north, and unimpressed clay sealings primarily derive from the Round Building and the North area, ostensibly indicating that administrative activities were more likely to take place in those two areas. Within the Round Building, the sealings primarily derive from the rooms in the western part of the structure, not from the spaces identified as silos. Activities in the western rooms, therefore, could include administration of materials stored in the silos.

While grinding stones are represented in a diversity of areas, pestles are primarily found in the Round Building. Conversely, bone pins/needles are found primarily in the North. Clay animal figurines are particularly common in the Round Building and comprise one of the few categories significantly represented in the South area. Human figurines are far rarer than animal figurines but are not obviously restricted to a particular zone.

An important general observation of the level 4 distribution of small finds is the relative paucity of objects from either the West or South areas. Since the West includes structures interpreted as grain silos, it may be reasonable not to expect many objects from such contexts (but note, however, the recovery of some objects from the silos inside the Round Building).

The level 3 distribution of objects in most categories is characterized either by too small a sample to draw plausible conclusions about spatial patterning or by a relatively even distribution of examples in the main neighborhoods of the level, the West, Temple, East, and Round Building. However, there are some patterns that may be taken into consideration. One is the relative paucity of objects in the East, despite the large area excavated, with the exception of a large number of bone awl fragments. Since the East also included a large number of spindle whorls and other disks and wheels interpretable as spindle whorls, one might suggest that this zone was a location for textile manufacture.

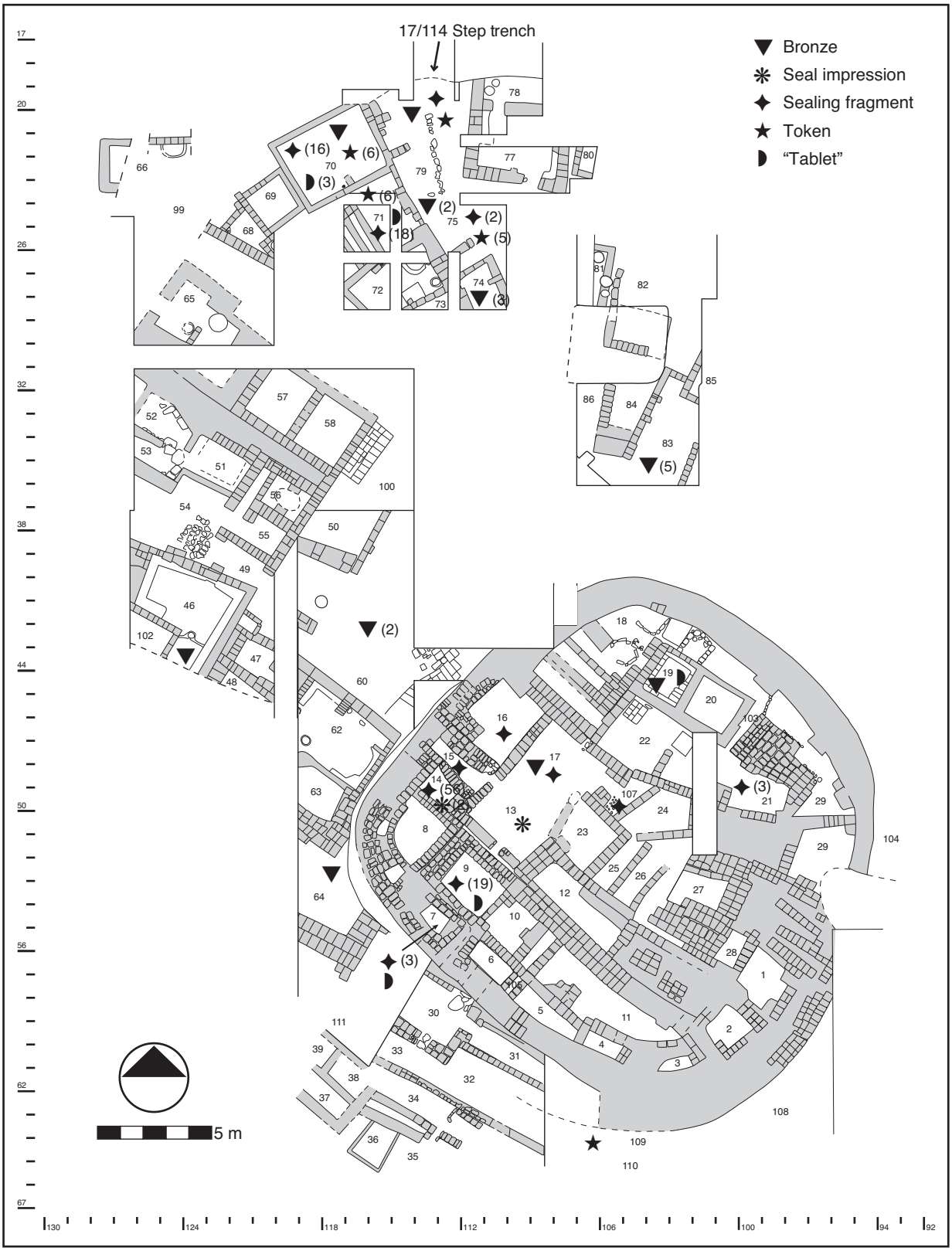


FIGURE 5.150. Level 4 distribution of bronze objects, seal impressions, sealing fragments, tokens, and "tablets."
Illustration prepared by Harley King

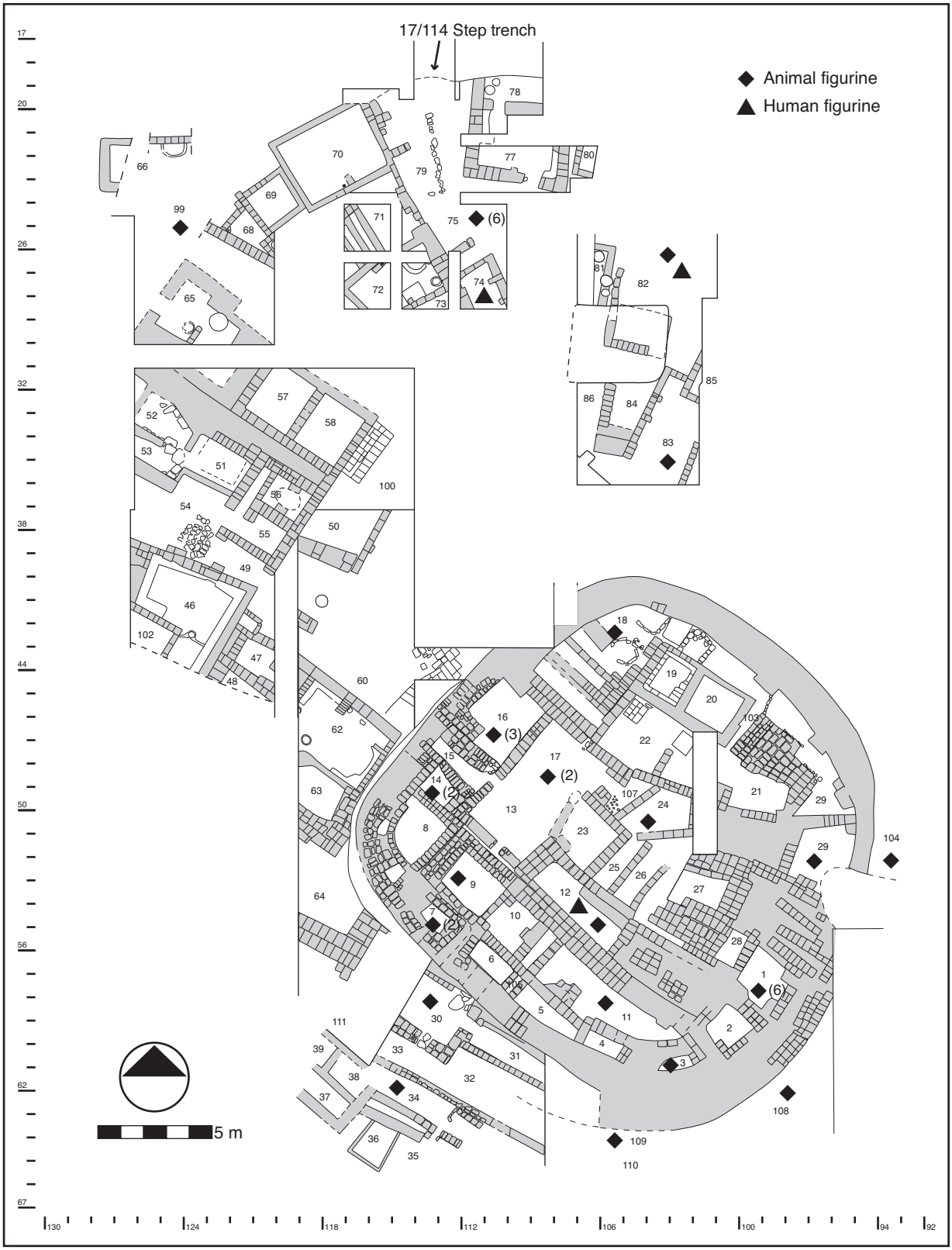


FIGURE 5.151. Level 4 distribution of clay figurines. *Illustration prepared by Harley King.*

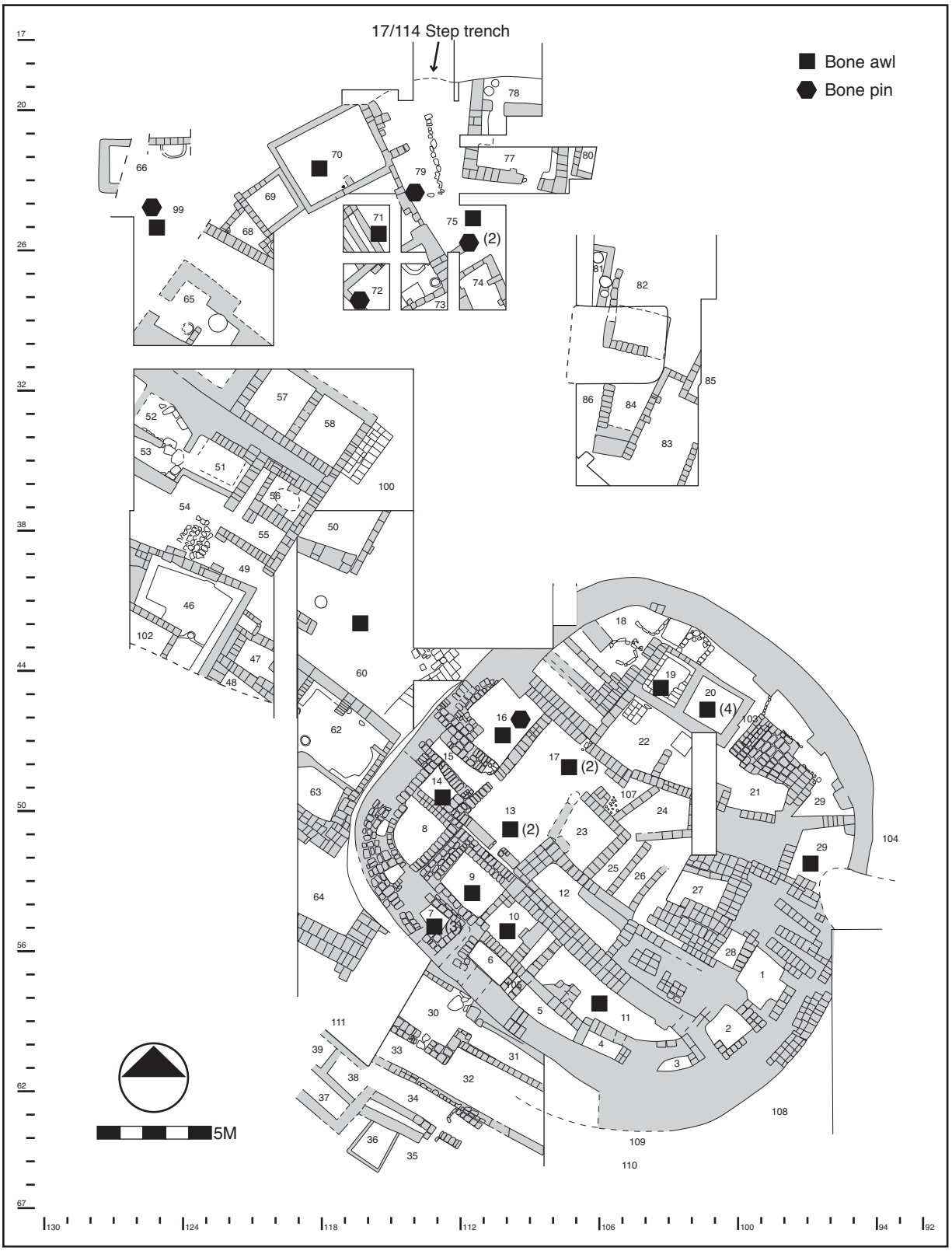


FIGURE 5.152. Level 4 distribution of bone awls and pins. *Illustration prepared by Harley King.*

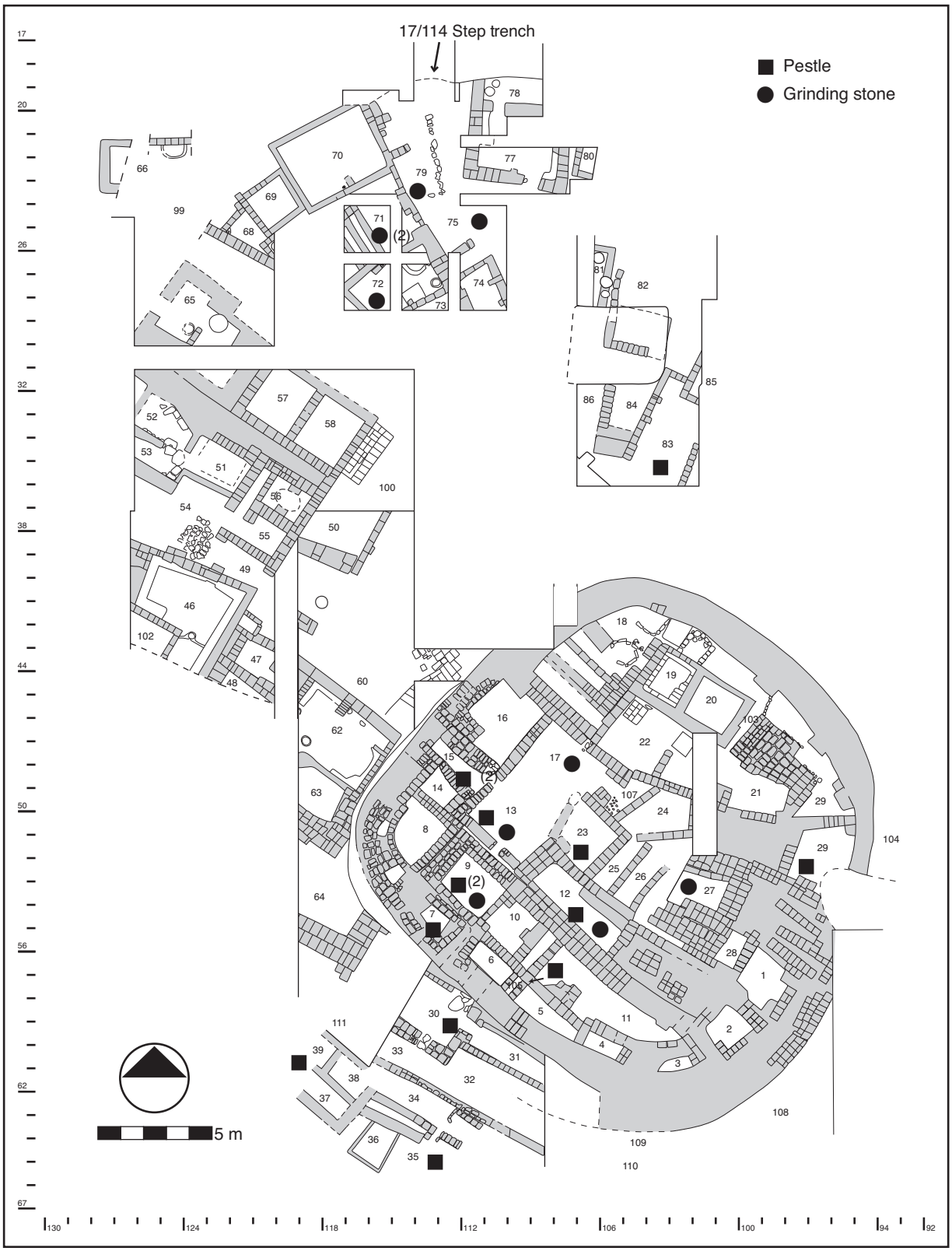


FIGURE 5.153. Level 4 distribution of pestles and grinding stones. *Illustration prepared by Harley King.*

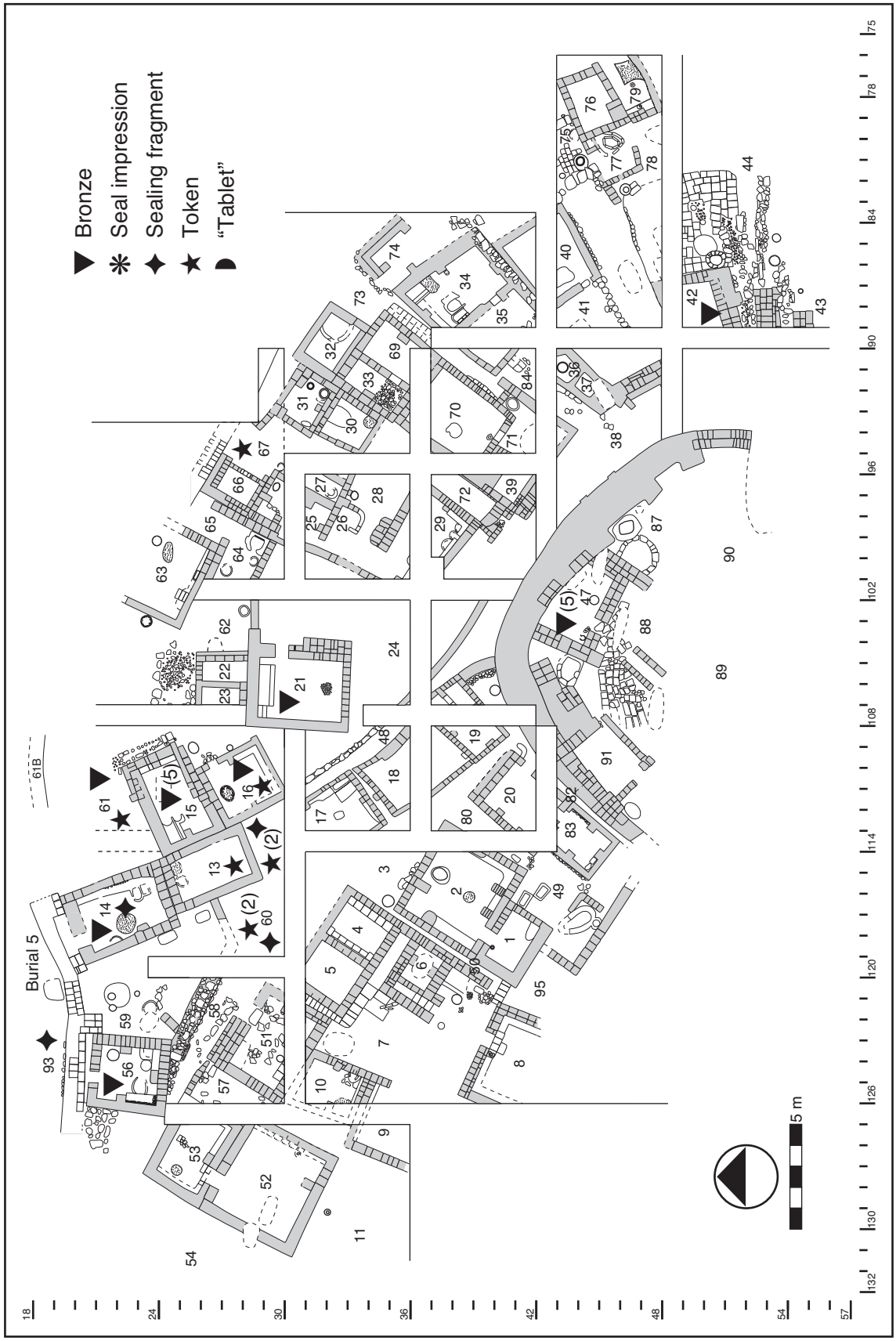


FIGURE 5.154. Level 3 distribution of bronze objects, seal impressions, sealing fragments, tokens, and "tablets." *Illustration prepared by Harley King.*

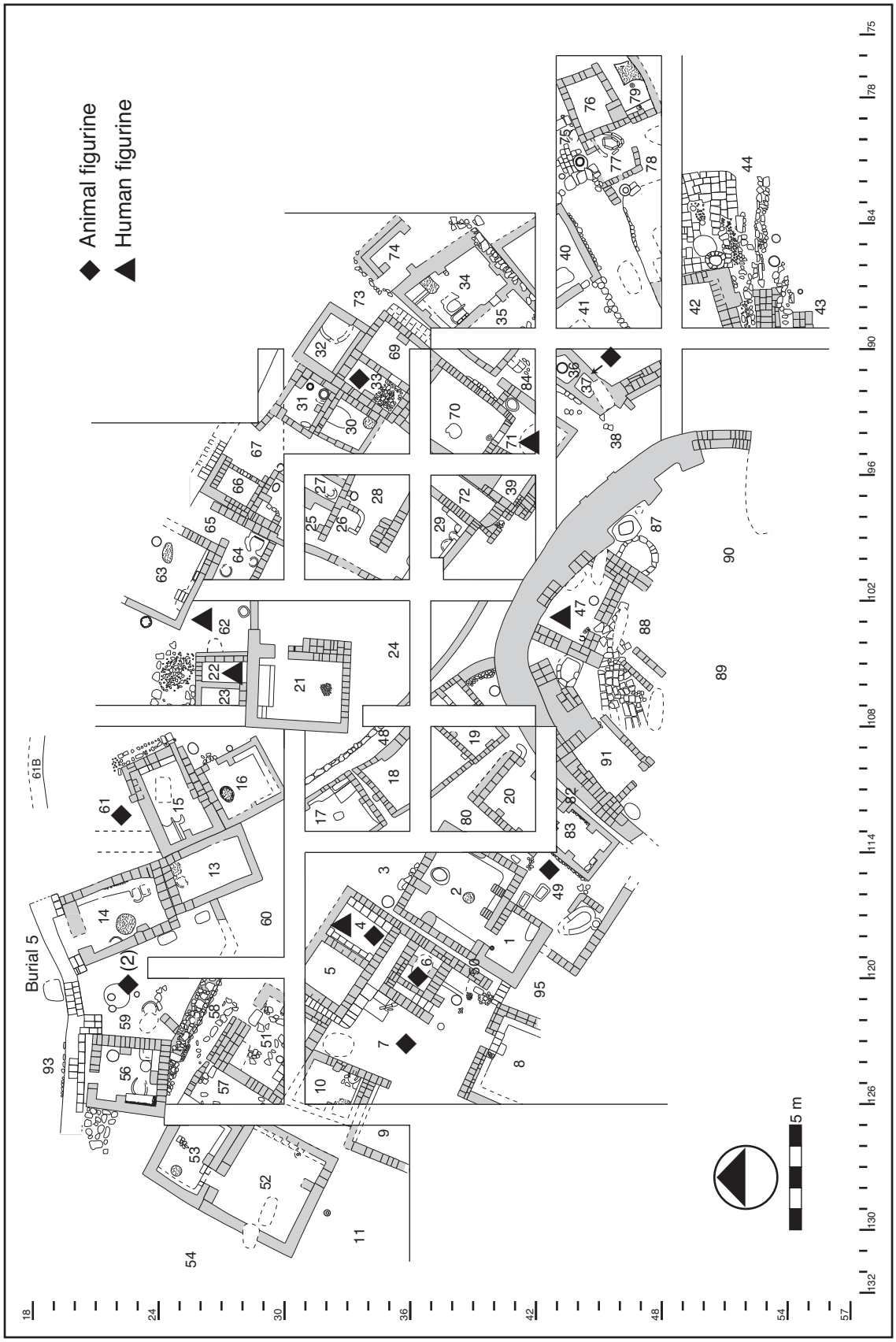


FIGURE 5.155. Level 3 distribution of clay figurines. *Illustration prepared by Harley King.*

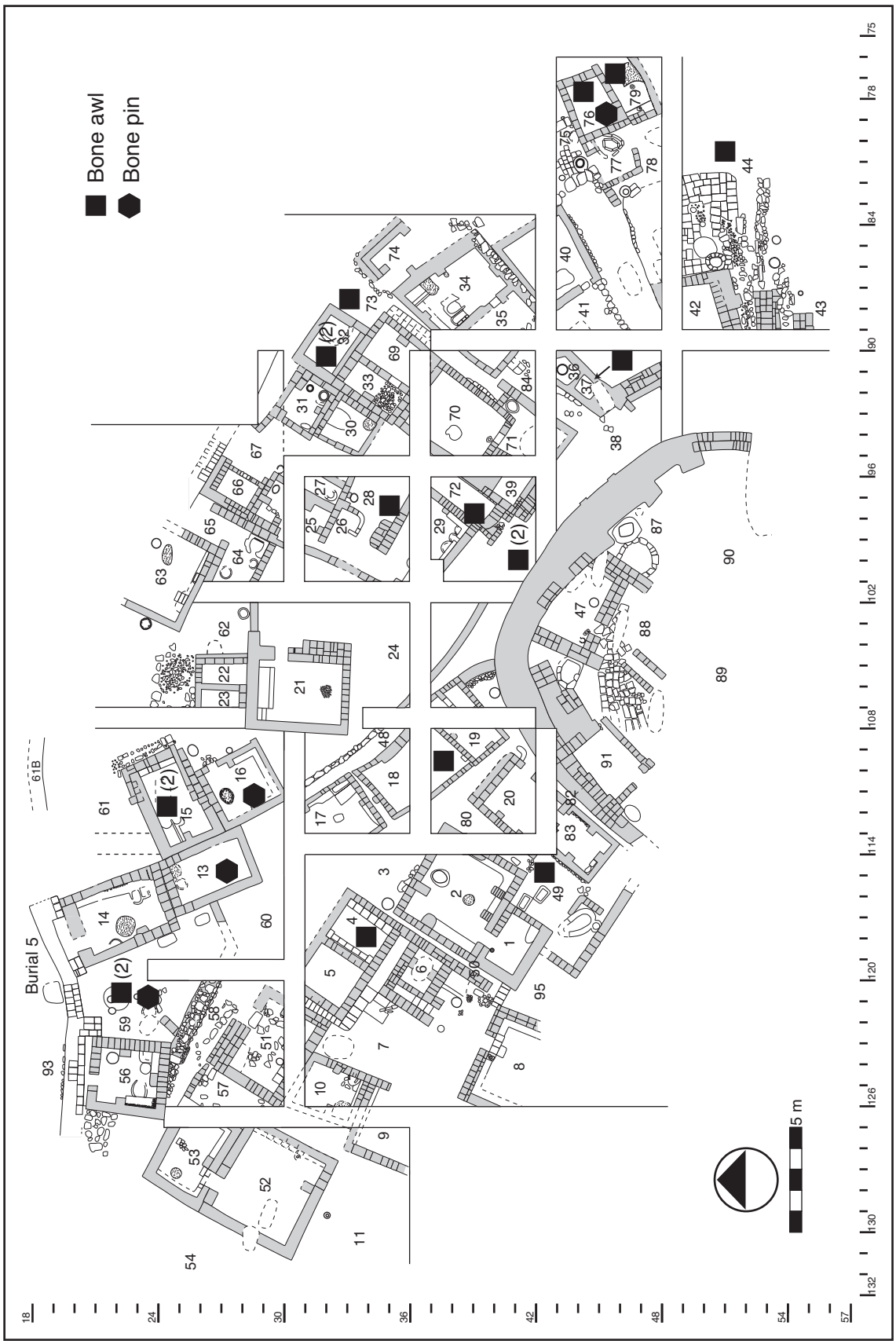


FIGURE 5.156. Level 3 distribution of bone awls and pins. *Illustration prepared by Harley King.*

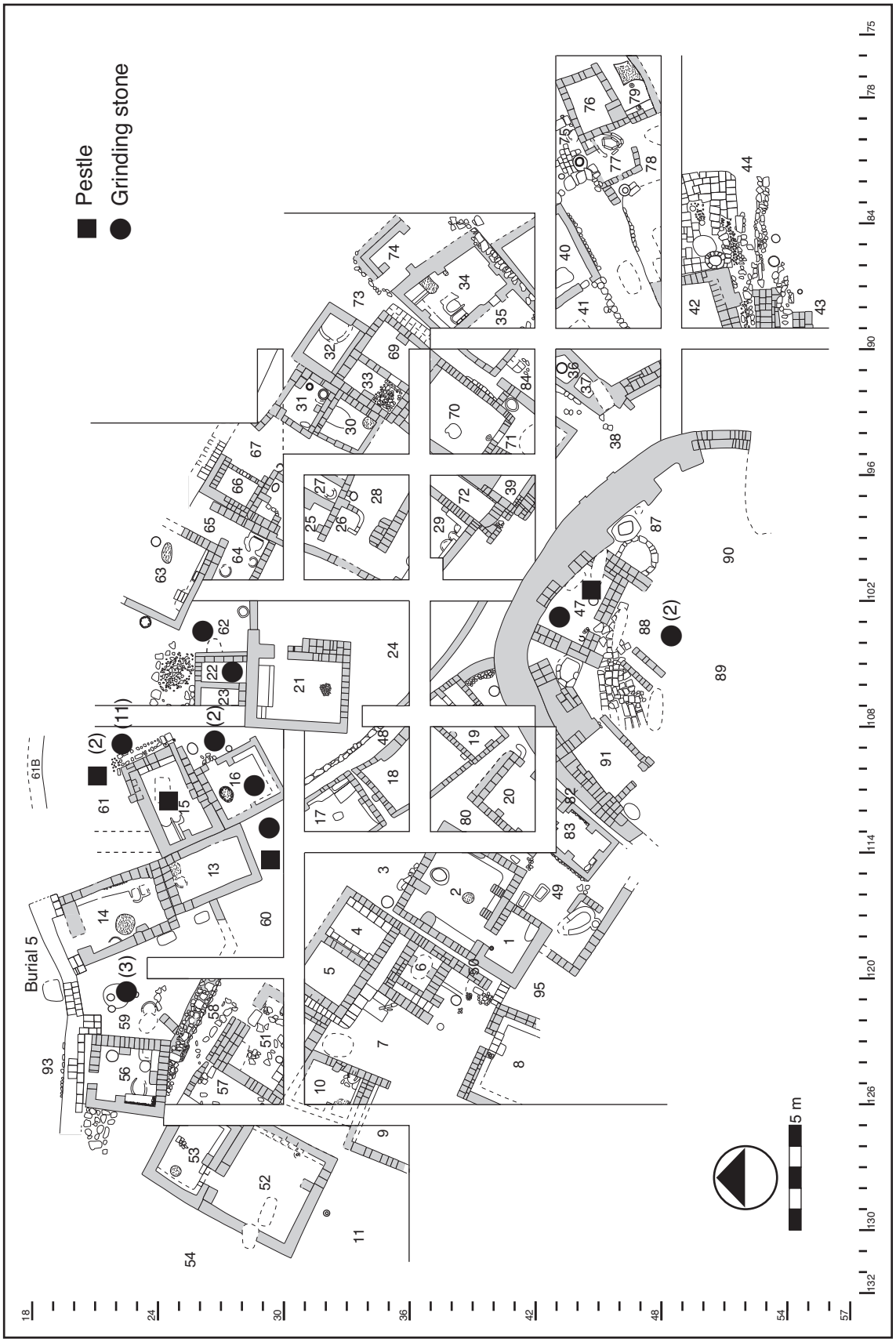


FIGURE 5.157. Level 3 distribution of pestles and grinding stones. *Illustration prepared by Harley King.*

Bronze fragments or objects are primarily found in the Temple and West areas. Unimpressed sealings are found only in the West area, as are the majority of clay animal figurine fragments. The preponderance of metal and sealings might signify the presence of higher status individuals in the Temple and West areas.

As in level 4, human figurines are much rarer than animal figurines.

NOTES

[1] I would like to thank the directors of the Tell 'al-Raqa'i expedition, Glenn M. Schwartz and Hans H. Curvers, for giving me the opportunity to participate in the work at Raqa'i and to study and publish these objects, and for their help and advice. I am grateful to Inge Rossmeisl for letting me include the objects from the Raqa'i 1987 season in this study. I would also like to thank Michel Fortin, director of the Canadian Archaeological Mission in Syria, for giving me information about and letting me examine finds from Tell 'Atij and Tell Gudeda, David Reese for identifying the shells found at Raqa'i, and Zainab Bahrani for analyzing the backs of the seal impressions.

[2] Some items have more than one "object" in them, such as groups of beads, or sealing fragments that were collected from the same archon.

[3] Because only eight objects were found in level 5, there are no distribution plans for that level. Thus, the following list of pertinent objects and areas in which they were found is provided to assist interested readers locate their findspots on level 5 plans: Raq 90 SI-1363 (awl) (Area 2); Raq 92 I-202 (bone needle) (Area 6); Raq 90 SI-1365 (polished equid 1st phalanx) (Area 5); Raq 90 O-070 (clay handle with incised decoration) (Area 19, phase b); Raq 91 A-041(animal figurine fragment) (Area 19, phase b); Raq 92 S-203 (grinding stone type A) (Area 22, phase d); Raq 90 O-067 (andiron) (Area 19, phase c) (Figure 5.60); Raq 90 W-048 (small clay wheel) (Area 19, phase d).

[4] The description of the seal is from a color slide. I have not had the opportunity to examine the seal itself.

[5] Bivar 1969: nos. HB3, HC3, HD4, HF2, HF15, HG3, HG8, and Hl9.

[6] Delaporte 1920: plate 55, nos. 14 (D167), 15 (D168) and 16 (D169).

[7] See Kriss and Kriss-Heinrich 1962:38 about carnelian and other semiprecious stones used as amulets in Islamic societies.

[8] I would like to acknowledge the gracious help of the late Professor Edith Porada who examined photographs of the Raqa'i seal impressions and advised me on them.

[9] Level 4 is dated to Early Jezirah 1/early Early Jezirah 2 (ca. 2700 BCE; see Chapter 4).

[10] Several gypsum lids were found at Raqa'i, one of which (Raq 89 S-107) was found on a large jar sunk below the floor in level 3, area 63 (see Chapter 2). Seal Raq 88 Z-005 may have been placed on such a lid.

[11] The animal is standing, not rearing. Perhaps the vertical position of the animal's body is a simplified way of suggesting a rearing animal. A good comparison for this motif has been found at Abu Hujeira I (McCarthy 2011: 290) in an Early Jezirah 3b context, but McCarthy notes that the style of this seal is typical of Early Jezirah 1–3. Quadrupeds set vertically in the field also occur on seal impressions from Shahr-i Sokhta (Amiet 1983:201 and figure 2, Period I, Early Dynastic) and Susa (Amiet 1972: 173 and plate 30, no. 1410, Early Dynastic II).

[12] Amiet 1972: nos. 1246 and 1247 (both glazed steatite).

[13] Ii 1988: figure 20:90, 102; figure 21:104; figure 22:124 (Early Dynastic I = Early Jezirah 1). Other comparisons are Buchanan 1966: no. 66 (steatite, from Jamdat Nasr, Iraq); Frankfort 1955: nos. 7 (Khafajah, Sin Temple II, Jamdat Nasr period), 212 (Sin IV Early Dynastic I); Roaf 1983: figure 4, nos. 17 and 19 (grave 54V:23, "incised Ninevite period"); and Amiet 1972: nos. 1244, 1245, 1285 (Proto Elamite). D. Matthews (1997:76) lists comparisons found in Syria and Anatolia, but these do not seem as close as those from Gubba and Susa. Marchetti (1996:94) compares Z-007 to the Leilan impression L87-1123 (period IIIa, Early Jezirah 1, cf. Parayre 2003:288–289), which has alternating triangles separated by parallel zigzag lines.

[14] Parayre 2003: plate 3, no. 5, from Leilan IIIa (Early Jezirah 1).

[15] Identification made by Z. Bahrani, personal communication.

[16] See also Marchetti 1998 and D. Matthews 1997:77–86, both of whom differ from Pittman on certain details of the definition, origin, and function of this style.

[17] Ninevite 5: Kutan: Forest 1987: figure 10 (cylinder seal, material not given); Telul eth-Thalathat: Fukai, Horiuchi, and Matsutani 1974: plates 38:6 and 58:18 (alabaster cylinder seal). Early Dynastic I contexts in the Hamrin region: Tell Razuk: Gibson 1981: plate 49, no.2 (broken cylinder seal, white shell); Tell Yelkhi: Bergamini 1987: figure 5 (seal impression on a storage jar); Kheit Qasim: Lebeau 1984: figure 1 (cylinder seal of glazed steatite, broken). Early Dynastic III contexts in the Diyala region: Tell Asmar: Frankfort 1955: plate 42, no. 448 (gray stone cylinder seal). Proto-Elamite Susa: Amiet 1972: plate 120, no. 1209 (broken terracotta cylinder seal). In addition, two cylinders purchased by Mallowan in the Khabur region have

similar "ladder" patterns with center dot circles or plain dots: D. Matthews 1997: plate 10, nos. 56 (glazed steatite) and 57 (black stone).

[18] Marchetti, however, considers that examples of the "Piedmont" style in Early Dynastic III contexts are older reused pieces or just "related" in style (1998:100).

[19] Photographs of Raq 88 Z-003 have previously been published in Curvers and Schwartz 1990: figure 23 and Schwartz 1994: figure 9.

[20] Left and right are the viewer's left and right.

[21] The details of this area are not clear in the photograph.

[22] Porada et al. 1992: vol. 2, 100.

[23] That is, walking to one side with both arms holding something in front of him. Legrain 1936: nos. 241, 242, 247, 250, 252, 256, 316. In these examples, the man holds the tail of an animal in one hand while spearing it with the other.

[24] The rest of the sealing fragments were too small to determine whether they were peg or jar sealings.

[25] Feriola and Fiandra 1983:474–479 and figure 6.

[26] Of course this does not mean that S-108 necessarily went with this shape, since it could have fit another shape as well. The sherd derived from level 4, area 108.

[27] At Melebiya, gypsum jar stoppers were found (Lebeau 1993:523, plates L—LI), but these fit inside the mouth of the jar, not over the rim and down the side like the Raqa'i gypsum sealings.

[28] See Krebernik 1998:303–304, for the shapes of signs representing different numbers or measures of land in the tablets from Fara and Abu Salabikh. Here a short stroke is one fourth of an iku, while a vertical stroke is a larger unit of land and a circle is a much larger unit of land. This is not to suggest an interpretation of Raq 88 O-018 but only the possibility that the marks on it are indeed of numerical value. The Fara and Abu Salabikh tablets belong to the Early Dynastic IIIa period (Porada et al. 1992), which is approximately contemporary with Early Jezirah 3a and level 2 of Raqa'i (Rova 2003).

[29] Bderi: Maul 1992:11 and plate 8, 4 and 5. Tell 'Atij: Fortin 1989:46; 1990a:240; Boileau 2005: CD PO6.

[30] On the Bderi tablet, the circles and the shorter vertical lines are incised on the horizontal lines (Maul 1992:11 and plate 8:4–5).

[31] Talon and Van Lerberghe 1998:214-215 (Kashkashok); Matthews 2003:108, figure 5.17 (Brak). The tablet illustrated in Matthews 2003: figure 5.45 is said to be found with Early Jezirah 0 pottery.

[32] The building is in areas 69–70. The objects were found in areas 70, 71, 75, and 76.

[33] These are illustrated in Figures 5.26 (Raq 91 O-131) and 5.24 (Raq 90 O-078). In the distribution plan (Figure 5.150), their findspots are marked with the same symbol used for tokens (a star) in area 109 (Raq 90 O-078) and area 71 (Raq 91 O-131, which was found with five tokens).

[34] Sometimes the marks do not correspond to the tokens inside. See Damerow and Meinzer 1995:26.

[35] As Jasim and Oates (1986) note, the use of these hollow clay balls seems to be part of the "Uruk expansion," since they appear when Mesopotamian influence is dominant, as at Susa (levels 18–17 of the Acropolis Sounding, Lebrun and Vallat 1978) and in Uruk colonies such as Habuba Kabira South (Sürenhagen and Topperwein 1973). Cf. Algaze 1993; Damerow and Meinzer 1995:29.

[36] Englund 1998:49. He also notes that tomographic analysis has yielded only limited results. Cf. Damerow and Meinzer 1995.

[37] Whether the use of a set of tokens required special knowledge or training cannot be known based on present evidence, but may be a possibility. Lieberman (1980) noted that in lexical texts of the Old Babylonian period listing officials in a school, one is called "man of the clay stones" (lú im-$^{na}{}_{4}$ na). He suggests this refers to someone who gave instruction in how to use clay tokens, but he cautions that this does not really inform us about this person, his status, the subject, or whether others, "particularly illiterate farm workers, did not have use of 'clay stones' as their primary accounting device" (Lieberman 1980:350).

A group of "tokens" was found at Tell 'Atij, just downstream from Raqa'i. Except for one clay sphere, these are very different from the Raqa'i tokens, not only in their shapes but in the use of incised lines. See Fortin 1990a:226, figure 6.

[38] On the continued use of tokens in historic times, see Abusch 1981, Lieberman 1980, and Schmandt-Besserat 1992, volume I:97–98, note 27, citing M. Sigrist.

[39] The objects (besides potsherds) include: 2 clay cylinder seal impressions, 56 unimpressed clay sealings, 140 fragments of sealings (plus a large plastic bag of sealing fragments), 2 fragments of animal figurines, a miniature clay spoon, a small clay lid, a fragmentary bone awl, and three model wheels.

[40] Concerning such rubbish dumps in the early to mid-third millennium in Mesopotamia, see Matthews 2003:104.

[41] It is possible that they were sealings moved from elsewhere in the Round Building to be stored or dumped out of the way.

[42] This impression, however, may be an artifact of differential preservation, since in level 3 the Round Building was only preserved in its northern part, while in level 4 it

was preserved in its entirety and contained some metal objects. See also Chapter 3, this volume, and Schwartz and Klucas 1998 concerning the social aspects of spatial distribution at Tell al-Raqa'i.

[43] Only nine of these are published in this report. The tenth, Raq 93 H-300, will be published by H. Curvers in his report on the 1993 season at Raqa'i.

[44] Pruß (2002:537, note 1) observes, however, that anthropomorphic figurines seem to be completely absent in the Late Uruk period and are very rare in the first half of the third millennium.

[45] Van Loon 2001:6.343–6.344; Schwartz et al. 2000:424–425.

[46] Tell Chuera: Hempelmann and Klein 1995:228, head type 1.2. and references cited there. Thirty-seven examples were found, some in contexts dating to Chuera periods IC–IE (= Early Jezirah 3a–4a, Pfälzner 1998:71). Selenkahiye: Liebowitz 1988: plate 20:1, 2; Badre 1980: plate 47:192. Tell Hazna: Munchaev, Merpert and Bader 1990:115, figure 3, right; Munchaev and Merpert 1994:42, figure 30:4.

[47] Hempelmann and Klein 1995:253, no. 311, surface find.

[48] Personal communication from S. Amirov, October 2006.

[49] The pertinent references are Fara: Martin 1988, seal impressions, nos. 197, 198, 214, 216, 226, 288, 323, 360; Nippur: seal impressions: Hansen 1971: plates 17d, 18b, and 19f; votive plaque: Hansen 1963: plate 5; inlaid panel from Mari: Parrot 1956:38, 136, plates 56–57; inlaid panels from Kish: Mackay 1929: plates 35:2–3; 36:3.

[50] Matthews 2003: figures 5.75:10; 5.74:21.

[51] Van Loon 2001:6.385 and plate 6.5e SLK75 H-38. For the dating, see Schwartz in Van Loon 2001:5A.252.

[52] Munchaev and Merpert 1994:42 figure 30:4; 1998:504.

[53] Moortgat 1960a:42, abb. 42a; Badre 1980: plate 33, no. 18; Hempelmann and Klein 1995:248, no. 165, F. Nr. 58.H.362, torso type 4.3.

[54] Munchaev and Merpert 1994: figure 30, 2.

[55] Abu Hafur: Kolinski 2000:42, figure 5:10; Melebiya: Lebeau 1993:507 and plate 188:1; 'Atij: ATJ87.F18A1.Tc22 (unpublished, personal communication, M. Fortin).

[56] This figurine will be published by H. Curvers along with the other objects from the 1993 season. It can be compared to figurine fragments from Melebiya and Abu Hijara (Lebeau 1993:533, figure 188:4; Martin and Wartke 1993/1994:213, abb. 18).

[57] Raq 89 A-015; Raq A-017, A-018, A-020, A-021, A-023; Raq 90 A-028, A-031, A-032, A-034, A-035, A-036, A-037, A-038, A-041, A-042, A-043, A-047, A-048, A-050, A-051, A-052, A-053, A-054, A-055, A-201.

[58] Pruß and Link (1994:113, tabelle I) consider a flat-ended nose characteristic of terracotta dog figurines at Halawa.

[59] Raq 90 A-033 might also be a horse, because it seems to have part of a high, arching tail preserved.

[60] A-015 (Figures 5.52 and 5.53) is a similar compact quadruped (missing its head) that also has a hole partially piercing its body on its underside.

[61] See Dunham 1993b and Beads and Pendants section below.

[62] The penis is clearly indicated.

[63] Pruß and Link 1994, 119–121, and references cited there. See also Cooper (2006:117–121), who interprets the human and animal figurines as "vehicles of magic." For this term, see Voigt 1983:189–191.

[64] Pfälzner 2001, 257. See also the discussion of human figurines, note 4.

[65] Schwartz et al. 2000:424–425 and figure 6. This pit is also referred to in Human and Animal Figurines and Model Wheeled Vehicles section.

[66] For possible interpretations, see Schwartz et al. 2000: 425. Possibly the presence of a fragment of a model wheeled vehicle with the draft animal to pull it was an allusion to the high status of the beings represented by the anthropomorphic figurines, since wheeled vehicles were a mark of high status in the third millennium. Ebla texts mention the use of wheeled vehicles for royal funerals (see Archi 2002).

[67] Ucko 1968:422; Voigt 1983:189–191.

[68] Comparable incised decoration occurs on the front of other model chariots, as in examples at Tell Chuera (Orthmann, Klein, and Lüth 1986:31, figure 16). Littauer and Crouwel have suggested that such patterns reflect the wickerwork with which the front panel was made (2002a: 395; 2002b:405).

[69] Littauer and Crouwel 2002a:394; 2002b:405–406; 1979: 22 and 40. See also Bollweg 1999: types I, II, and III, a and b.

[70] Oates, Oates, and McDonald 2001: figure 488, nos. 27, 28, 31, 34.

[71] For instance, Adams 1993 (Abu Salabikh); Bollweg 1999; Lebeau 1993 (Melebiya); Lebeau and Suleiman 1997: 115, plate I (Tell Beydar); Oates, Oates and McDonald 2001 (Tell Brak); Orthmann, Klein and Lüth 1986 (Tell Chuera).

[72] Steible 1982: Ent 22:1–7; 79, 2:8–10; Ukg 10, 2:3-2; 11: 38–41. From the inscriptions one cannot know what the vehicle translated as "chariot" looked like. For Enmetena and Uru'inimgina, it probably resembled one of the three kinds of vehicles seen in the contemporary two- and

three-dimensional representations. None of these (the four-wheeled "battle car," the two-wheeled "straddle car" or the platform car) are what Littauer and Crouwel (1979) consider to be the "true chariot." Nevertheless, these earlier vehicles seem to be associated with battles, hunts, and ritual processions, activities for which the later "true chariot" was used.

[73] Jacobsen 1987:395–396.

[74] Raq 88 C-001 and Raq 89 C-002 are considered to be from level 2 or 3.

[75] Four human figurines; 6 animal figurines.

[76] Three human figurines; 38 animal figurines.

[77] For instance, Raq 90 A-028 (area 18, phase a); Raq 90 A-031 (room 9, phase a); Raq 92 A-200 (area 11, phase a); Raq 90 H-007 and Raq 90 A-035 (area 12, phase a); Raq 89 A-019 and Raq 89 A-021 (area 17, phase a); and Raq 89 A-027 (area 24, phase a).

[78] Only 11, however, were in clearly stratified contexts.

[79] The writer has not seen any of the examples from the 1987 or 1991 seasons or Raq 89 O-402, so the analysis of these is based only on the excavation records.

[80] The narrower end was broken off, so the full length is not known. The wider end was broken at the corners. Possibly Raq 87 O-006 is similar to some objects recently reported from Tell Arbid (Smogorzewska 2012:245, figure 21). I have never seen Raq 87 O-006, except in a rough field sketch.

[81] Matthews 2003:109 and figures 5.23 and 5.80:1.

[82] Two fragmentary clay pillars of similar shape were found at Uch Tepe in the Hamrin region of central Mesopotamia (Gibson 1981:43–44, plate 54, nos. 4 and 5). Gibson calls these "firedogs."

[83] Mallowan 1947:184, plate 39:2; Diamant and Rutter 1969:167, 169, figure 28.

[84] Smogorzewska 2012:245, figure 21. Here they are pot supports.

[85] Diamant and Rutter (1969:166, figure 19) illustrate one such possibility from Mersin.

[86] In Figure 5.60, Raq 90 O-056 is on the far left, and Raq 88 O-023 on the far right.

[87] This is not to suggest a connection between the Raqa'i piece and the one illustrated by Diamant and Rutter, which belongs to the Kura Araxes culture, but just to suggest one possibility for the shape of the object of which the Raqa'i fragment had been a part. See also Smogorzewska 2012:237, figure 13.

[88] Three of the objects included in this section are of post-Bronze age date and were found in topsoil or late burials: Raq 87 O-005, an oil lamp; Raq 88 O-024, a die (one of a pair), and Raq 88 O-025, the bowl of a clay pipe. These are included in the catalogue, but they are not otherwise discussed.

[89] Delougaz 1940:53, figure 41; Hansen 1974:11 and figure 5; Postgate and Moorey 1976:146 and plate 22a.

[90] Matthews 2003: figure 5.75, no. 7.

[91] Martin 1988: 191, no. 13 (Early Dynastic I); Yener 1990: plate 156 A and B (Kurban VIA, IVA).

[92] Raq 90 O-064 is circular in cross section and has a flat bottom and a slightly concave top. Its sides, however, are not straight planes, but undulate slightly.

[93] Matthews 2003: figure 5.74:17, 20; figure 5.78:8, 18; figure 5.81:4, 5.

[94] Matthews 2003: figure 5.78:5, 6.

[95] It might be compared to a similar object in terracotta found at Chagar Bazar. Mallowan 1936: figure 6:7.

[96] Thalathat: Fukai, Horiuchi and Matsutani 1974: plate 34, 4; Tell Kutan: Bachelot 2003: figure 34; Raqa'i: Chapter 4, this volume, Figure 4.31:25—here the top of the lid is convex, not flat.

[97] Raq 88 O-403 is known to me only by a description provided by H. Curvers.

[98] Fukai, Horiuchi and Matsutani 1974:73, no. 65; plate 58, no. 16. This spoon is ca. 11 cm long, and the bowl of the spoon is ca. 6 cm in diameter. The bowl of another spoon is illustrated in the 2003 report on Tell Fisna, but no measurements are given (Numoto 2003:145, plate 6c).

[99] Oates, Oates and McDonald 2001: figure 462, no. 1599.

[100] Perhaps it was used as a weight measure?

[101] The photo, Figure 5.69, shows a sample of these balls.

[102] See Chapter 2, this volume.

[103] With the exception of the artifacts analyzed by Yener et al. 1991 and Franke, Pigott, and Nash (see Chapter 8, this volume), these are the identifications that were made macroscopically in the field, so the term "bronze" should be understood as bronze/copper/copper alloy. One lead object and three silver objects found in post-Bronze Age or uncertain contexts are described in the catalogue but not discussed further.

[104] The nine pins are Raq 87 M-003 (level 2; Figures 5.71 and 5.72); Raq 87 M-006 (above level 3; Figures 5.71 and 5.73); Raq 87 M-016 (shaft only; level 2); Raq 88 M-024 (level 2; Figure 5.71); Raq 88 M-030 (level 3; Figures 5.71 and 5.80); Raq 88 M-032 (level 3; Figure 5.71); Raq 90 M-045 (level 3; Figure 5.71); Raq 90 M-048 (level 3; Figure 5.71); and Raq 90 M-049 (level 3; Figure 5.71).

[105] In Curvers and Schwartz 1990: figure 16, the grave goods of burial 30, level 2 are illustrated. The toggle pin in this illustration, however, is not Raq 87 M-16 but 87 M-003. Since only the shaft of Raq 87 M-016 was found, the nature of its head is unknown.

[106] Bianchi and Franke 2011:208–212, type A6; Tonussi 2008: plate 10.

[107] Mesopotamia: Ur: Woolley 1934: plate 219, types 2, 3, 4, and 5; Abu Salabikh: Martin, Moon and Postgate 1985: 11–12; Tell Fisna: Numoto 1988, plate 23, no. 234; Tell Taya: Reade 1973: plate 67a; Syria: Tell Brak: Mallowan 1947: plate 36:4, 8, 9, 10, 16, 21; Matthews 2003:256, figure 6.66:7–8, 10–13; Munbaqa: Wäfler 1974:35 and figure 50; Czichon and Werner 1998: plate 212, nos. 1908, 1909, 1983; Tell Bi'a: Strommenger and Kohlmeyer 1998: plate 221; Tawi: Kampschulte and Orthmann 1984: plate 2a:9; plate 16, T.21-18; plate 30, T.27-10, 11; Tell Chuera: Moortgat 1960b:7, figure 12; Halawa: Orthmann 1981: plate 70:128 and 131; Mari: Jean-Marie 1999:115 and plate 24, Tomb 86; 8 and 24, plate 242, Grave 1082; Anatolia: Kültepe: Özgüç 1986:42, figure 3:37; Korucutepe: van Loon 1978:61 (not illustrated); Norşuntepe: Hauptmann 1976: plate 47; Tilkitepe: Korfmann 1982:128, figure 28-7, 8(?), 9(?); Georgia: Kvatskhelebi (Shida Kartli): Dzhavakhsvili and Glonti 1962: table 36 (grave of period C-3—mid-third millennium BCE—reference courtesy of P. Kohl); Samashvilde: Sagona 1984:45 (reference courtesy K. Rubinson); Iran: Susa: Tallon 1987 volume II, nos. 1124–1127, 1130, 1138, 1139; volume I, nos. 258–260; Giyan Tepe: Conteneau and Ghirshman 1935: plate 30, t.102.

[108] A pair of silver examples from Tomb 4 at Umm el-Marra measured 4.5 cm in diameter and 3.2 cm in height. See Schwartz et al. 2006:613, note 36 for further references.

[109] See the discussion in Martin, Moon, and Postgate 1985:11–12, with references.

[110] Through a careful study of parallels among metal artifacts, as well as ceramic parallels, Yener (1980) has made a case for the probable existence of a sophisticated network of interregional trade in the third millennium BCE among Anatolia, Syria, and Mesopotamia. Such a network is indicated not only by the parallels cited above but by recent lead isotope analyses that show artifacts from Raqa'i and Khafajah to have possibly come from the same ore source in Anatolia (Yener et al. 1991:561, 566).

[111] See Chapter 3, this volume, and Schwartz and Klucas 1998 for a discussion of the possible spatial and socioeconomic differentiation among the areas of level 3 of Raqa'i.

[112] Above level 2, under topsoil (M-0009 [86]); above level 3, under topsoil (M-0014 [86]), level 2 or level 3 (M-0015 [86] and M-035), level 3 or above (M-009).

[113] This figure does not include beads and pendants of bone or shell, which are presented with the rest of the beads, or the single bone spindle whorl.

[114] Thirty-four of the catalogued items are specimens that are stored with the faunal remains at the Smithsonian Institution in Washington, D.C. The present writer thanks Scott Rufolo for generously supplying the information about these pieces. In the catalogue, these pieces are identified by the tracking numbers assigned to them by the Smithsonian Institution Archaeobiology Program (SI #).

[115] These include small pieces of curved bone rods (Raq 87 I-002; Raq 88 I-022); 57 fresh water snail shells from burial 30 (Raq 87 I-006); 4 examples of bones with an intentional row of notches (Raq 92 I-201; Raq 87 SI-2150; Raq 87 SI-2405; Raq 86 SI-2446); one piece of polished, fossilized bone (Raq 89 SI-2990); and seven other bones with evidence of working or use.

[116] Raq 87 I-007 (Figure 5.88); Raq 88 I-009; Raq 88 I-010; Raq 88 I-013; Raq 88 I-014; Raq 89 I-016 (Figure 5.90); Raq 89 I-020; Raq 89 I-023; Raq 89 I-024 (Figure 5.94); Raq 89 I-025; Raq 89 I-028 (Figure 5.95); Raq 90 I-032; Raq 90 I-034; Raq 91 I-037; Raq 91 I-040; Raq 91 I-041; and Raq 91 I-200.

[117] Lecture at Yale University by M.-L. Nosch, director, Danish National Research Foundation's Centre for Textile Research. Cf. Smith 2012.

[118] The photographs were of the following awls: Raq 88 I-012 (Figure 5.89); Raq 89 I-017 (Figure 5.91), I-023, I-024 (Figure 5.94), I-026 (Figure 5.91), I-027 (Figure 5.95), and I-028 (Figure 5.95).

[119] "Tapestry weaving" is a specific technique used to weave areas of solid color into the warp of a cloth. See Barber 1991:157—"tapestry, a plain-weave technique in which wefts of different colors are woven back and forth to fill in just those areas where the particular colors are needed for the design, and packed down so that the warp doesn't show through and spoil the solidity of the color field."

[120] Barber 1991:157–158.

[121] I would like to thank M.-L. Nosch and E. Andersson Strand for their insights about the Raqa'i bone awls.

[122] Figures 5.98 (I-018, I-019) and 5.99 (I-029).

[123] I-045, Figure 5.98; I-202, I-046, Figure 5.99.

[124] I-042, I-043, and I-044.

[125] The examples from the 1993 season will be published by H. Curvers. Those from the 1987 season are catalogue nos. 11 (Raq 87 SI-2150) and 12 (Raq SI-2405). A small fragment was found in 1986 in a context of uncertain level (catalogue no. 13, Raq 86 SI-2446).

[126] See Dunham 1994:38–39 (table). The example from Tell Gudeda mentioned there has now been published in Fortin 1994:386–387. Excavations by the joint Expedition to Umm el-Marra of the Johns Hopkins University and

the University of Amsterdam have recovered four further examples from Late Bronze Age contexts.

[127] A recent suggestion for some notched bone specimens is that they were "bridges" for a stringed instrument such as a lute (Marom, Bar-Oz, and Münger 2006) or a lyre (Dumbrill 2007).

[128] The three objects from level 5 were: Raq 90 SI-1363 (awl fragment from area 2); Raq 92 I-202 (complete bone needle from area 6); and Raq 90 SI-1365 (a polished equid first phalanx from area 5).

[129] The occurrence of spindle whorls in the eastern part of the settlement, sometimes in the same room as an awl (e.g., 32/33, phase a), suggests that this was an area where textile manufacture was performed.

[130] The items with SI # are those specimens that are stored at the Smithsonian Institution, with information provided by Scott Rufolo. Rufolo provided the following information about the measurements of these items: "Dimensions given in the description follow the order: maximum length by maximum width by maximum depth as determined by orienting the specimen in its standard anatomical position, where the element is known, and/or according to its most likely orientation in use as a tool; where the element is not identified or a tool category unknown or not applicable, then the largest dimension was measured as length, the next largest recorded as width, etc."

[131] This does not include the chipped stone artifacts (flint and obsidian). For these see Chapter 7, this volume.

[132] Lease 2000; Lease and Laurant 1998; Lease et al. 2001. Tell 'Atij also obtained basalt from the Feidat el-Mieza plateau, located about 60 km south of 'Atij on the Khabur River.

[133] A sixth example was found during the 1993 season in level 4 and will be published by H. Curvers.

[134] Three more examples were found during the 1993 season and will be published by H. Curvers.

[135] Such hand mills are well exemplified by the sets found in one room of the Middle Bronze Age Western Palace at Ebla. These sets were raised on a bench (perhaps 25+ cm high) adjacent to three walls of the room. The grinding slabs were placed on this bench with their long axis perpendicular to the wall (Matthiae 1982: figure 5).

[136] Wright also alludes to this difficulty in her discussion of "hand stones": "When such an artifact has a flat use surface, it is distinguished from a grinding slab/quern if it can be easily manipulated" (Wright 1992:67).

[137] This statement is based on an examination of the excavation records that I was able to make in Quebec in 1991 with the kind permission of M. Fortin.

[138] At Bderi small rotary hand grinders were found, consisting of two circular stones with a hole in their centers placed on top of one another. The top stone has an additional hole for inserting a wooden handle (Pfälzner 2001: 205 and abb. 92). The illustrated example is about half the size of S-201 and does not have a ridge around the central hole, as S-201 does. While some of the type-B Raqa'i door sockets might be interpreted as lower stones of such rotary grinders, no top stones like the Bderi one were found, so none of the Raqa'i pieces provide certain evidence for a rotary grinder.

[139] Pertinent features include 7E/F, 14I, 15F, 34G, and 56E/J. Similar installations occur also at 'Atij and Gudeda. Area 12 in late level 3 was probably also a grain grinding area.

[140] See Chapter 2, this volume, level 5, area 22.

[141] Of all the pestles, type B probably required the most work to produce. I have seen parallels for this type only among unpublished stone tools at Abu Hujeira in the upper Khabur, although one published pestle from Bderi might be a simpler version (Pfälzner et al. 1988: plate 56a, upper left). Possible ceramic examples are reported from Tell Leilan, period III (Schwartz 1988:34 and figure 35:11).

[142] Type C pestles are common in third-millennium contexts at other sites. Examples derive from nearby Tell Bderi, where several were found in primary context on the floor of a burned room (Pfalzner et al. 1988: plate 56a right) and Kurban Höyük in southeastern Anatolia (Ataman 1986: figure 34F).

[143] This discussion is based on Hillman 1984 and 1985. Hillman (1985) cautions the reader that his presentation is a "gross simplification of a broad spectrum of practical realities." Nevertheless it offers some basic possibilities to suggest here.

[144] Barley remains were much more numerous than wheat at Raqa'i (see Chapter 9, this volume). The barley is always of the hulled type.

[145] This is essentially the same arrangement as that in the "grinding room" in the Middle Bronze Age Western Palace at Ebla (see above, note 135). Horsfall (1987:348) notes that women grinding maize on reciprocal hand mills in Guatemala say that raising the grinder's end of the stone makes the grinding easier. Horsfall estimates that before the advent of European alternatives to metates a woman probably spent three hours per day grinding maize.

[146] The room in which feature 34G is located contains another type of feature that is found several times near grinding tables and/or tannurs (areas 14, 13, 72, 12, 2). These are two hard, shiny black surfaces. Although these

have been interpreted as places for kneading dough, or working places by some scholars, in this report they are considered to be domestic hearths for heating and cooking (see Chapter 2). In area 34, however, one could question why there would be two fireplaces in a small room with a double grinding table. If as, suggested here, the two places on the table are for stones used to grind different types of flour, then the two shiny black surfaces might have been used for kneading dough from two different kinds of flour. In area 72 fragments of a "fireplace" were found immediately adjacent to a tannur that parallels a situation at Selenkahiye, which van Loon (1977/1978) suggested may be a "dough platform" next to a tannur. At the Raqa'i expedition's living quarters, the local woman who made the expedition's bread used just such a surface to knead the dough immediately next to her tannur. Possibly then, some of the "fireplaces" were surfaces where dough was kneaded or were occasionally used for that purpose.

[147] Feature 17D involved two parts: a basin in the corner (built first) and a wider platform with a slightly concave top (added to the west side of the basin). Once the wider platform was built, perhaps the basin was used to store grain.

[148] Cobble = stone with a diameter between 65 and 256 mm; boulder = stone with a diameter greater than 256 mm (Wright 1992:56).

[149] For instance, Figure 5.103, Raq 87 S-011; Raq 88 S-050.

[150] For instance, Figure 5.103, Raq 88 S-019; Raq 88 S-070; Raq 89 S-085; Raq 90 S-141.

[151] Damerji 1987:42–49.

[152] For the possibility that some of the type B examples could have been bottom stones for small rotary hand grinders, see above, note 138.

[153] Personal communication, M. Fortin.

[154] KhIV.19, KhIII.183, surface finds; KhII.55, Temple Oval III, Early Dynastic III. Unpublished, personal communication, C. Meyer. See Meyer 1981:288.

[155] Mari: Parrot 1956: plate 63:202, 419, 435 (Temple of Ishtar, "priests quarters, and houses" north of the temple); Brak: Mallowan 1947: plate 15:8, CH site, in an Akkadian period jar. An example from Knedig comes from an uncertain level (Klengel-Brandt, Kulemann-Ossen, and Martin 2005: plate 206:1236).

[156] The tables specify the catalogue number of each specimen to enable interested researchers to easily find them in the catalogues. In level 4 (Figure 5.153), the pestle symbol in area 39 refers to a pestle (Raq 88 S-068) found in area 42, located below area 39. In the table of door sockets in level 4 (Table 5.18), two are listed from area 76, which is located below area 70.

[157] Three grinding stones and one pestle were found in the level 3 Round Building, while five grinding stones and 10 pestles were recovered from the level 4 Round Building.

[158] The number 11 in parentheses outside the north corner of area 15 refers to grinding stones that were reused in a drain outside the east wall of room 15 and area 61 to the north of 15. See Table 5.10.

[159] The seven from post-Bronze Age contexts follow: Raq 87 W-001 (model wheel); Raq 87 O-007 (small wheel); Raq 88 W-014 (model wheel); Raq 88 W-016 (other disk); Raq 90 W-041 (model wheel); Raq 90 W-042 (spindle whorl); and Raq 88 W-75 (potsherd disk).

[160] Raq 90 W-042. This object probably dates to the Hellenistic period, since it is a type found at Jebel Khalid. See Crewe 2002.

[161] In a study of third-millennium spindle whorls, which includes the Raqa'i whorls from the seasons of 1986–1990, Kimbrough (2006:64) has considered that "drop or suspended spindles" were the norm for the period. She comments that "iconography from Mesopotamia overwhelmingly indicates the use of drop-spindles" and cites Barber (1991:57–59) and Keith (1998:503). However, the five artistic representations cited by these authors, referring to the same monuments, do not clearly show a "drop-spindle," and some may not show spinning at all (e.g., Barber 1991: figure 2.21; cf. Muscarella 1992:201, citing Calmeyer). Barber feels that they show a preference for the high-whorl spindle and notes that "we have no representations of the spindle being dropped in either the European or the Egyptian fashion."

[162] The purpose of the nave is to keep the wheel from wobbling when it turns on a fixed axle. This was most likely the type of axle used in the third-millennium Near East. Rotating axles with fixed wheels are known from third-millennium BCE contexts in Europe. Here the wheels do not have naves, but they have square holes (Schlichtherle 2004).

[163] Figure 5.123.

[164] Williams notes that wool winds best if it can go flush against the spindle, not against a protruding hub. In her collection of spindles is a Navajo spindle with a flat wood disk whorl of 15 cm in diameter. The spindle was a thick wood stick, and the spinner would rest the tip of the spindle on the ground with the whorl at the lower end and roll the spindle along the side of the thigh. For more on Navajo weaving, see Bennett and Bighorse 1997. Barber (1991: 52) observes that supported spindles tend to be light, citing examples from India. She does not mention the Navajo examples.

165 Raq 87 W-001; Raq 89 W-037; Raq 89 W-038; Raq 90 W-054; Raq 91 W-066.

166 At Halawa, 86 model wheeled vehicles and 108 model wheels were found, but in only one instance were wheels found with the body of the vehicle they belonged to (Neufang and Pruß 1994:162). At Tell Brak, 102 model vehicles, seven wheeled sheep figurines, and 278 model wheels were found, but none were in primary context (Oates, Oates, and McDonald 2001:280, 284).

167 At Kurban Höyük, nine objects were identified as model wheels (Yener 1990: plate 155), some of which had diameters similar to those of the model wheels at Raqa'i. Yener (1990) and Wattenmaker (1998) consider that they must have served as spindle whorls, because no model vehicles or vessels with holes for axles were found. However, this may just be the result of chance; on the preceding plate (Yener 1990: plate 154) are illustrated fragments of theriomorphic vessels whose legs are not preserved but which resemble wheeled examples discussed by Cholidis (1989). Furthermore, one of the wheels (Yener 1990: plate 155 L) has incised lines that appear to represent slats holding the planks of the wheel together, and another Kurban object has radial lines painted on both faces. For comparison, Wattenmaker cites spindle whorls of the Mehmeh and Bayat phases in the Deh Luran plain (Hole, Flannery, and Neely 1969: 206), but these are very different objects, being hollow cones with painted decorations on their exteriors. Thus, the Kurban objects may have been wheels that were reused as spindle whorls.

168 Ochsenschlager (2004:217) notes that although the villagers of al-Hiba, Iraq, usually use a spindle made of a long reed shaft together with a whorl made from one or more oblong sections of reed or wood drilled to fit on it, the shape and material of the whorl often varies. If needed, almost anything can serve, such as a drilled potsherd, an ancient "toy chariot wheel" from the surface of the nearby ancient mound (Tell al-Hiba), or even a lump of dried mud. He does not, however, give any description of these "toy wheels."

169 This contrasts with the model wheels, whose average diameter was 6.1 cm and ranged from 3.7 to 13 cm.

170 Raq 90 W-48; Raq 91 W-056; Raq 91 W-057.

171 Raq 89 O-035; Raq 90 O-052; Raq 91 O-203; and Raq 89 O-204 have no hole. Raq 90 O-058 and Raq W-028 have unfinished holes.

172 Oschsenschlager (2004:217) notes that the hole is almost never dead center in the whorls used by the villagers of al-Hiba.

173 The gypsum disk from Melebiya has a smaller hole, ca. 0.3 cm in diameter.

174 The polished gray stone hemispherical spindle whorl Raq 90 W-042 (Figure 5.119) from topsoil is probably Hellenistic in date (see above).

175 The tables include disks with unfinished holes and unpierced potsherd disks. Since these were found in the same areas as spindle whorls, they were probably intended to be made into the latter.

176 Only one example was found in the Round Building, which was preserved only in its northernmost extent in this level.

177 The production of cloth is extremely labor-intensive work. E. Andersson Strand notes that to spin 2 km of yarn using an 8-g whorl, 50 hours of spinning are needed. Two kilometers of yarn is sufficient to produce only one square meter of cloth with a thread count of 10 threads per square centimeter (Andersson Strand 2010:12–13).

178 Occasionally more than one spindle whorl is found near a bone awl.

179 In Tables I–III, Beck's definition of each shape is provided in the column "description." Each of these refers to a precise range of proportions for Beck's divisions I and II (regular rounded and regular facetted beads; Beck 1927: 5–11 and plate 2-3). In the Raqa'i typology, Roman numerals I through IX under the "shape" column belong to these divisions. Roman numerals XX through XLVIII refer to Beck's division III (special type beads and pendants), while XLIX and L refer to his division IV (irregular beads and pendants). The latter two divisions do not follow regular geometric proportions. The perforation types found in the Raqa'i collection are as follows: I = double cone perforation, bored from both ends with conical holes; II = drilled from both ends, holes are parallel or only slightly conical; IV = plain perforation, bored from one end and approximately parallel; VI = large perforation, (a) medium large = hole more than one quarter and less than half the diameter of the bead, (b) extra large = hole is half or more than half of the bead's diameter; Xa = multiple parallel perforations.

180 Moorey (1994:167) defines faience as "a composite material consisting of a sintered quartz body and a glaze." He cites Stone and Thomas's (1956:38) description of the body as "finely powdered quartz grains cemented together by fusion with small amounts of alkali or lime or both, and is usually colorless though impurities have occasionally tinted it brown or gray."

181 The identifications of the shells are by D. Reese, whom the expedition thanks for sharing his expertise. Photos or drawings of beads from burials 24, 25, and 32 have already been published in Dunham 1993b. In Chapter 6, beads that were found in burials are illustrated in figures with each burial.

[182] Hermann (1968) noted that the lapis lazuli trade focused on the cities of ancient Mesopotamia, with areas closer to the lapis sources yielding only a handful of lapis artifacts. Concerning the paucity of carnelian at Tell al-Raqa'i in contrast to larger urban centers, one can mention Tell Leilan, where one burial alone contained 117 carnelian beads (Weiss 1990:391).

[183] Tell Brak: Mallowan 1947:160, 256 and plates 28 and 85:13 (Jamdat Nasr–Early Dynastic periods); Oates and Oates 1989: plate 25c and d (Akkadian period). Chagar Bazar: Mallowan 1947:160. Warka: Limpir 1988: plates 14: 106; 15:109; 17:111d (over 1300 examples, Early Dynastic). Tawi: Kampschulte and Orthmann 1984:87 (Grave T65-07). Mari: Parrot 1956:168, M.506. Fara: Martin 1988:218–219, no. 272 (Jamdat Nasr–Early Dynastic I).

[184] Theriomorphic beads have been found in third-millennium burials at other North Syrian sites such as Tell 'Atij (Fortin 1990a: figure 21) and Abu Hujeira (Martin and Wartke 1993/1994: figure 14).

[185] On Lamashtu, see Farber 1983; Thureau-Dangin 1921; Wiggerman 2000.

[186] Cf. Wiggerman 2000:218, note 7.

[187] Mari: Parrot 1956:159 (M.369, M.672), plate 58 (bird pendants [a]): 210, 213, 235–237, 246) (all shell, 8 examples from the "priests' quarters" of the Temple of Ištar, one from a house east of the temple); Parrot 1967:278, M.2747 (shell, Temple of Ištarat and Ninni-Zaza); Tell 'Atij: Fortin 1990b: plate 6 (burial); Abu Salabikh: Postgate and Moorey 1976: plate 26b and c (4 examples, of lapis lazuli; Early Dynastic III); Fara: Martin 1988:209, no. 197 (of "gray stone," Early Dynastic IIIa); Tell Asmar: Frankfort 1934: figure 28, 29 (of lapis and silver, Akkadian); Kish: Mackay 1929: plate 42, 2797 (shell, Grave 140, Cemetery A, Early Dynastic III); Susa: Amiet 1986:289, no. 66 (lapis lazuli, Early Dynastic III); Tawi: Kampschulte and Orthmann 1984: plate 30a, no. 12 (shell, Grave T27); Kurban Höyük (Anatolia): Reese 1990: plate 164 I, U (shell, period IV, mid-late Early Bronze Age) (pictured upside down).

[188] Cardita is a type of clam shell found in shallow waters around the world (Wye 2000:259). The umbo is the protuberance where the two shells of a bivalve meet.

[189] Raq 89 X-002, level 4, area 9, archon 42/114-134. Figures 5.147–5.149.

[190] Dunham 1993a is a detailed description and discussion of this wall painting. There the comparative material is illustrated and discussed in detail.

[191] Dr. Prudence Harper of the Metropolitan Museum of Art kindly arranged to have a sample of the pigments analyzed by the Objects Conservation Department of the museum. Mark Wypyski, research assistant in this department, gave the following report: "Samples of the white and black pigments from the wall painting fragment from Tell al-Raqa'i, sq. 42/114 134-2, X-2, were examined by energy dispersive x-ray spectrometry (EDS) to determine their elemental compositions. The white sample was mostly calcium with large amounts of silicon and magnesium, and small amounts of aluminum, potassium, titanium and iron. This may be a mixture of dolomitic lime (calcium and magnesium carbonate) and clay. The black material showed a similar mixture of elements, with smaller amounts of calcium and magnesium. The black pigment here seems to be a carbon black, although I cannot say for sure as the EDS can detect very light elements such as carbon, but nothing else is showing up here which could act as a pigment." We are grateful to Dr. Harper, Mr. Wypyski, and other members of the Metropolitan Museum staff for generously providing this service.

[192] The photograph of the largest fragment, Figure 5.149, shows it to be in several pieces, but the breakage occurred as it was removed from the brick mass. The painting was extremely fragile and, despite cautious handling, lost some of the black paint in the first two or three weeks after it was found. With the help of Peter Pfälzner, director of the Tell Bderi expedition, the largest fragment was treated with movalite to preserve it. One should note that this had the effect of making the black look much thicker and denser that it previously appeared. The photograph published here, Figure 5.149, was taken before the movalite treatment. We are grateful to Dr. Pfälzner for his assistance.

[193] Right and left in the following description refers to the viewer's right and left.

[194] There are some discrepancies between the photograph shown here and the drawing. The drawing was produced about one and a half hours after the painting was excavated and represents a collaborative effort between Glenn Schwartz and me. The right edge of the torso lost some of its black paint as the plaster was being removed. Thus, the contour is uncertain here, and the upper torso may not have been as triangular-looking as it appears in the photographs. In the drawing, a dotted line indicates this uncertainty. The left arm originally extended down toward the object the figure holds (cf. Dunham 1993a: figure 4), but its lower edge was broken. Hence, the restoration of the left arm touching the object is very likely but not absolutely certain. The skirt in the photograph published here does not flare out as much as in the drawing because the photograph has the two fragments forming the lower part of the skirt shifted slightly to the right out of align-

ment with the upper torso (note the spaces between these fragments and the main upper fragment).

[195] They are shown either in a longer garment or nude.

[196] Good examples may be found in Strommenger 1964: plate 16, bottom row—the "helper" to the ruler figure in an Uruk seal; plate 19—the "helper" who follows the ruler figure on the upper register of the Uruk vase; plate 45—servants playing a harp or offering a cup in a banquet scene in the top row of an Early Dynastic period wall plaque; plate 72 and color plates 10 and 11—men leading onagers or carrying sacks in the lowest register of the "peace" side of the Standard of Ur, spear carriers on the backs of chariots in the lowest side of the "war" side, and soldiers in second row of this side who wear long cloaks over shorter skirts; plate 113—two short-skirted figures carrying burdens beneath the inscription on an Akkadian seal; plate 114—a soldier leading away captives on an Akkadian stele; plate 122—figure of Naram Sin on Naram Sin stele.

[197] For instance, Frankfort 1955: no. 246 (Khafajah); Parrot 1956: plate 67:368 (Mari); Buchanan 1966: nos. 757 and 758; Mazzoni 1984: no. 7 (Mardikh); Moortgat 1960a: figure 31; 1960b: figure 14 (Chuera); Moortgat-Correns 1988b: abb. 11 and 13b (Chuera).

[198] For instance, Moortgat-Correns 1988a:73, figure 11a–c; Al Gailani-Werr 1982: no. 11; Buchanan 1966: nos. 766 and 774.

[199] For instance, Buchanan 1966: nos. 756 and 775.

[200] Delougaz 1952:69–72, plates 62 and 138.

[201] A late fourth-millennium seal impression from Arslantepe suggests another possibility. This impression shows a figure seated on a stool beneath an arched covering. The arch and stool are on a sledge drawn by an ox. Behind the sledge walk two partially preserved attendants. The first of these has a slight flaring below his waist that could be a simplified rendering of a short skirt. He holds both arms toward the sledge and in one hand holds a wide-fingered fork-like object (Frangipane and Palmieri 1983a: figure 67, no. 1). Littauer and Crouwel have discussed this and related representations and suggest they show a harvest ceremony for which, in southern Mesopotamia, there seem to be some archaeological and textual hints (Littauer and Crouwel 1990; Steinkeller 1990). The fork-like object could be a winnowing shovel of a type for which there are striking ethnographic parallels in the Near East and Greece (Dalman 1933: figures 27 and 28; Littauer and Crouwel 1990: 17). The depiction of an agricultural ceremony is, perhaps, well-suited to the context of the Raqa'i painting, which was in a building that is interpreted to have been concerned with the processing and storage of agricultural products.

[202] Mari: Parrot 1940, 1955. Halawa: Luth 1989. Sweyhat: Danti and Zettler 2002; Holland 2006. Munbaqa: Machule et al. 1986.

[203] Akkermans and Schwartz 2003:227; Cooper 2006: 91–94; Danti and Zettler 2002; Dunham 1993a; Holland 2006; Machule et al. 1986.

[204] Dunham 1993a:137 and especially notes 37 and 38.

[205] In the southeast corner of area 29, a later pit had destroyed the outer wall of the Round Building, but deeper excavations in this area showed that the outer wall had existed at this point. Thus, the only entrance was through rooms 6 and 10. See Chapter 2, Figure 2.34.

[206] Room 9, phase a had a brown earth surface covered with ashy debris. A burned area in the west corner contained many tannur fragments, but no oven was found (see Chapter 2, this volume). The registered objects from this phase follow: A-031, head of an animal figurine; O-043, broken tapering clay cylinder; O-051, fragment of a jar sealing; O-053, 18 fragments of jar sealings; O-054, fragment of an andiron; S-124, fragment of a grinding stone; S-121, pestle; S-122, pestle; W-041, large clay model wheel (D. 13 cm); W-054, one-third of a smaller clay model wheel (D. 4.5 cm).

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Chapter 6

Burials

Barbara Stuart

The excavations at Tell al-Raqa'i exposed a total of 214 burials. The majority of these derived from post–level 1 contexts in approximately 1 m of debris deposited on top of the third-millennium remains. These burials mainly contained remains of individuals interred according to Islamic burial practices. From the third millennium BCE, 38 graves were excavated, most of which belong to Raqa'i levels 2 and 3. Although a fairly large area of level 4 was exposed, only two burials were excavated from that level. This small number might seem remarkable considering the relatively large level 4 architectural sample; possibly level 4 burials were dug into earlier contexts not sampled as extensively.

Of the post–third millennium burials, 150 were undoubtedly of recent date, since they were dug from the present surface of the mound or because their upper edge was located within topsoil. Of the remaining burials, some contained 20th-century objects (plastic beads, contemporary coins) or combined an Islamic orientation with a post–level 1 stratigraphy or post–third millennium grave goods, while others just have an Islamic orientation or were found well above the uppermost architectural levels at Tell al-Raqa'i. These graves are all considered to be late.

The total number of burials includes seven features of uncertain designation. These include discolorations of the soil with only a few teeth or a scrap of bone in it, elongated pits resembling graves while lacking any human remains, or features registered as tombs but—for various reasons—never excavated. The excavation units concerned will be incorporated in the list of burials but will not be discussed in detail in this chapter.

The Post–Level 1 Burials

The mound was used extensively as a burial site in recent times (Curvers 1987). All recent graves have an east–west orientation, the deceased facing south. The graves can be classified into four types:

Type I: A rectangular pit with horizontal floor; a niche proceeds at an oblique angle below the southern edge of the pit (cf. Figure 2.20). The deceased was placed in this niche, which was subsequently sealed by a low wall of mudbrick, stone, or any other material at hand (in some cases fragments of concrete).

Type II: An elongated pit, just big enough to contain the skeleton. Nearly a fifth of the type II graves have some form of burial marker lining the pit (stones, mudbricks, or pieces of concrete blocks).

Type III: A small oval pit, very shallow. Some of these graves were marked by a line of small stones or a large stone covering the grave at an oblique angle.

Type IV: A long rectangular pit with a horizontal floor, into which a smaller pit was dug lengthwise. The dead individual was placed in the smaller pit and the body covered, first by reed mats and then by mudbricks or mudbrick fragments. The larger pit was then closed.

All types of graves contained both adults and children. The distribution of these two age groups between the grave types is uneven. (Note: A grave containing mother and infant counts as a single burial, so the

number of graves listed below may differ from the total number of buried individuals.)

Type I graves (N = 20) contain 11 children, one sub-adult, eight adults, and one infant buried with its mother.

Type II graves (N = 92) contain 19 children, six sub-adults, 53 adults, six infants buried with their mother, and 14 individuals of unspecified age.

Type III graves (N = 43) contain 36 children and three adults and four individuals of unspecified age.

Type IV graves (N = 4): contain three adults and one infant.

The presence of grave goods was attested in grave types I, II, and III with both adults and children, and in type IV with adults. Nineteen percent of the total number of burials contained grave goods. Beads were found exclusively in the graves of children, a pattern duplicated by the third-millennium burials at Raqa'i.

Most of the items found with the dead were personal belongings such as finger-rings, earrings, bracelets, beads from necklaces, a small leather pouch, and a belt buckle. Carried on the body or fastened to clothing in life, they were buried with the deceased. Only a few items can be considered purposefully included in the burial, such as a clay die, a clay pipe, a blue glass ring found at the feet of a baby, a miniature jar, and some coins.

The miniature jar is a third-millennium type that was included in the Islamic burial when the grave pit was dug, cutting a third-millennium tomb. The purpose of the coins was explained by local people: when, upon digging the grave, the grave diggers encountered the bones of an earlier burial, money was included to "buy" the space of the earlier grave for the next occupant's use.

THE THIRD-MILLENNIUM BURIALS

The common mortuary procedure at Tell al-Raqa'i during the third millennium was inhumation; there is no evidence for the practice of cremation or the use of fire in the graves. All inhumations were single interments, and 30 of the 38 burials were certainly primary inhumations. The eight uncertain examples follow:

Two infant jar burials (burials 15 and 21)

Two cases in which remains of a child's skull were found unaccompanied by any element of the postcranial skeleton (burials 11 and 17)

Four cases in which the skeletal material either had perished completely (burial 28) or consisted of merely a few scraps of bone (burials 31, 33, and 35)

The grave constructions can be divided into three types:

Type V *Vessel burials* (n = 2): The remains of a deceased infant were placed in a ceramic vessel that was buried without any kind of permanent grave construction other than the vessel itself. Both burials of this type (burials 15 and 21) involved the remains of newborns, whose tiny and supple bodies would fit into a sizeable vessel; it is therefore most likely that these are primary burials.

Type VI *Pit burials* (n = 15): A pit was dug and the body of the deceased was placed inside, after which the pit was filled with earth. In one case, traces of reed matting were observed (burial 30), while in another the burial pit was lined on one side with limestone boulders (burial 5).

Type VII *Tomb burials* (n = 21): This grave type comprises all cases in which a mudbrick container was constructed to hold the remains of the deceased. In most cases, a pit was dug and mudbricks were placed on edge along the walls of the pit, creating a rectangular box. Occasionally the box was provided with a floor of horizontally laid mudbricks. The deceased was placed in the box, usually in the fetal position and accompanied by grave goods. Some graves still had an intact cover of mudbricks placed in a vertical or horizontal position. The author assumes that originally, for hygienic, aesthetic, or other reasons, all burial containers were closed after interment had taken place, whether by bricks, mudbrick fragments, loose dirt, or matting or other perishable materials such as wood.

Two of the type VII tombs consisted of a rectangular plan of horizontally placed mudbricks without traces of bricks on edge (burials 33 and 35). These structures were interpreted as the bottom of once-complete mudbrick boxes. Both are in an area that was subject to much erosion and other disturbing factors such as animal burrowing.

One tomb displays a much different concept of construction: burial 9 was found in what could be called a burial *chamber* that was installed at the end of a deep pit. The chamber was sealed by a vaulted mudbrick wall. Although this structure differs considerably

from the usual type of pit grave found at Tell al-Raqa'i, it is considered an elaboration of the simple pit and therefore classified as a type VI grave.

Liesbeth Smits analyzed the bone material excavated before the 1989 season, and material from the 1989–1993 seasons was analyzed by the author, kindly assisted by Liesbeth Smits. The analysis of the skeletal material is mainly based on information given by Bass, Ubelaker, and Gentry Steele and Bramblett (Bass 1984; Gentry Steele and Bramblett 1988; Ubelaker 1984).

Whenever age could not be specified, two general categories are used: *child* and *adult* (age groups C and A). In a few cases, the age is counted in *lunar months*; this term is used to indicate intra-uterine months. A full pregnancy involves a total of 10 lunar months (Kosa 1989).

Most individuals were either of a very young age and/or poorly preserved, which prevented the determination of sex for the majority of the burials.

The objects buried with the deceased are referred to as g*rave goods* instead of *burial gifts*. The objects found in a grave might include so-called *coincidental depositions* (O'Shea 1984:24). These differ from intentional depositions by being not specifically intended as part of the funerary treatment. In the case of the Tell al-Raqa'i grave contents, one could consider the copper/bronze toggle pins and spirals and some of the beads and pendants to be coincidental depositions. The pins were probably used for fastening a shroud or the clothing in which the deceased was buried, while the spirals were applied around locks of hair or braids. Some beads seem to have been sewn onto the fabric the deceased was clothed or wrapped in, while other beads and pendants were part of necklaces and bracelets (possibly meant to ward off evil spirits and combat illness; see Dunham 1994). Since the organic matter perished, these were the only items that remained of the original burial outfit, and they would subsequently be identified as grave inclusions.

By *position of the grave goods*, we refer to their position in relation to the body of the interred individual. For a detailed description of the objects associated with the burials, the reader should consult the catalogue of objects (Dunham, Chapter 5, this volume) and, when relevant, Dunham's study of the function and meaning of some of the beads and pendants (Dunham 1994).

After well over four millennia of being exposed to the chemical agents present in the soil, the physical state of the third-millennium burial sample has severely deteriorated. Nevertheless, almost every specimen was in a state that allowed for determination of body position at the time of burial and age at time of death, while (occasionally) allowing determination of the sex of the deceased.

The burials listed below represent an incomplete sample of the mortuary population at Tell al-Raqa'i. Many burials must have been disturbed, mainly by the building activities of subsequent inhabitants. In the southern part of the mound, for example, remains of both the level 2 and level 3 occupations were heavily damaged or even completely removed by a large rectangular limestone enclosure of Hellenistic date. Terracing activities and erosion damaged the southwestern side of the mound, and burial activities of the 20th-century CE occasionally cut deeply into the third-millennium remains.

Excavations focused on the tell, and any inhumations outside the settlement have therefore not been detected. The presence of a cemetery outside the tell, however, may be hypothesized on the basis of the incomplete burial population within the tell settlement. Since these graves contained mainly infants and children, the mortuary treatment of at least part of the adult population must have included extramural burial or practices that eschewed burial.

Catalogue of the Third-Millennium Burials

In the following chapter, objects associated with burials are noted with administrative numbers given by object registrars Sally Dunham (1986 and 1988-1993) and Inge Rossmeisl (1987). Numbered circles in figures showing burial plans represent ceramic vessels numbered in the order presented in the grave goods lists.

Burial 1, 29/102-034 (Figure 6.1)

Level 3
Age 17–25 years
Sex Female
Type VII

Description: The skeleton of an adult woman was found lying in a contracted position on the left side of the body, facing northeast. The arms were flexed in front of the chest, the hands lying in front of the face. The right femur was positioned at about a 90-degree angle to the vertebral column, while the left leg was tightly flexed and drawn up towards the chest. A bone

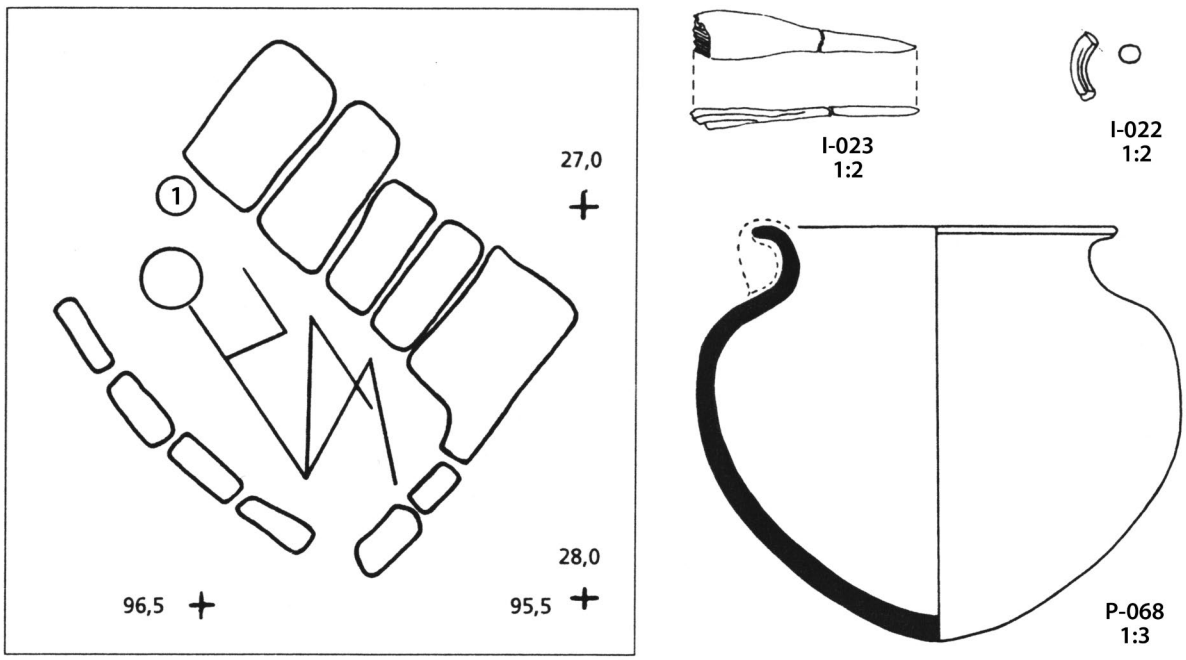


FIGURE 6.1. Burial 1. Scale of burial plan 1:20. For details on small finds in burials, see Chapter 5. Pottery in burials includes complete vessels, complete profiles, and occasional incomplete profiles. *Illustration prepared by Barbara Stuart.*

awl and part of a bone ring were associated with this burial.

The tomb consisted of a line of mudbricks on edge behind the back and at the feet of the individual, while three courses of horizontally positioned mudbricks made up the northeast side of the tomb. An additional three courses of mudbricks were present in the east section of the square, extending over the grave. The northwest side of the tomb was devoid of any building material.

The burial was dug into level 3, room 66 (Figure 2.132), but no traces of a grave pit were recognized. The left thigh showed traces of burning and the top of an ash pit was found at the bottom of the grave, as well as some lime plaster fragments (under the thighs). These unusual features could be either the remains of activities carried out as part of the mortuary ritual or the result of pre-burial activities in the area.

The northern corner of the tomb held a jar with pointed base. The jar was positioned directly in front of the forehead of the individual. The pointed base is a level 3 characteristic.

Grave goods:		**Position of grave goods:**
I-022	Bone ring fragment	Unknown
I-023	Bone awl	Unknown
P-068	Jar	In front of the forehead

Burial 2, 29/102-048 (Figures 6.2, 6.3)

Level 3
Age 20–34 years
Sex Female
Type VII

Description: This tomb held the skeleton of an adult woman, lying in a contracted position on her left side, facing northwest. The right arm was bent in an angle of 90 degrees, with the lower arm crossed over the abdominal area. The thighs were drawn up towards the upper body, the legs flexed at a 45-degree angle.

The tomb was created by using pre-existing architectural remains. Walls 25C and 25D of level 3, room 25 and their buttresses made up three sides of the tomb (Figure 2.132). A line of mudbricks on edge between the two buttresses completed the construction. This configuration implies that the grave was arranged when the architectural remains were still visible or became visible when the burial pit was being dug.

The southern corner of the tomb held two vessels, positioned behind the head of the individual. The fill directly above the burial yielded a miniature bowl that might belong to the mortuary goods. The position deep in the room fill and the level 3 characteristics of the pottery suggest a level 3 date for this burial, subsequent to the initial use of the architecture.

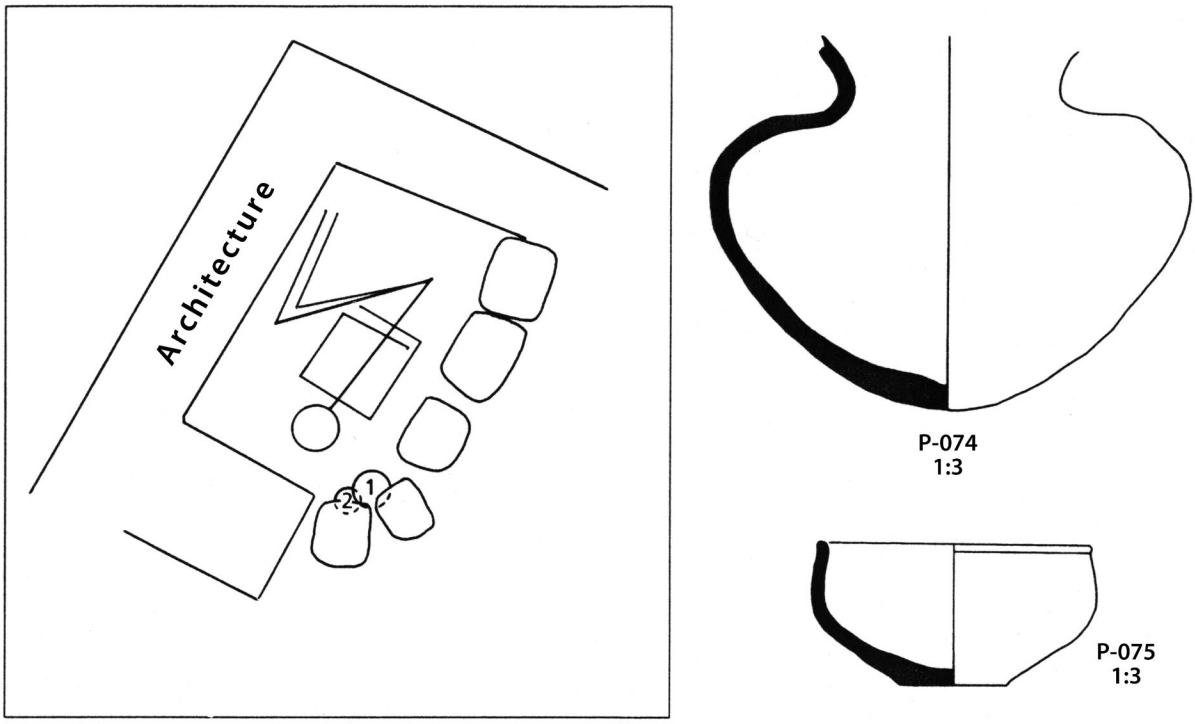


FIGURE 6.2. Burial 2. Scale of burial plan 1:20. *Illustration prepared by Barbara Stuart*.

FIGURE 6.3. Burial 2. Looking east. *Photograph by Hans Curvers/Glenn Schwartz*.

Grave goods:		Position of grave goods:
P-074	Jar	Behind the head
P-075	Bowl	Behind the head

Burial 3, 29/120-080 (Figure 6.4)

Level 3
Age 12–16 months
Sex Unknown
Type VII

Description: A mudbrick structure contained the skeletal remains of a child. The position of the bones, although disturbed and badly preserved, indicated the child had been buried lying on the right side, facing southwest. The legs were tightly flexed and contracted. The lower arm bones were disturbed, but their position—although somewhat away from the body, parallel to the upper arm and with the elbow towards the lower body—might indicate the arms had originally been flexed in front of the chest. The length of the bones, developmental stage of the dental elements and vertebrae indicated the child was between 12 and 16 months old when death occurred.

Single mudbricks on edge formed the rectangular burial container, with one extra brick added to the northwest side. At least four bricks on edge served as a cover and one horizontal brick was laid at the bottom of the box. The grave pit was first observed a few centimeters below oven 60D (Figure 2.120) in level 3 area 60 west of area 13 (Figure 2.119). The pit cut into debris situated above level 4 architecture.

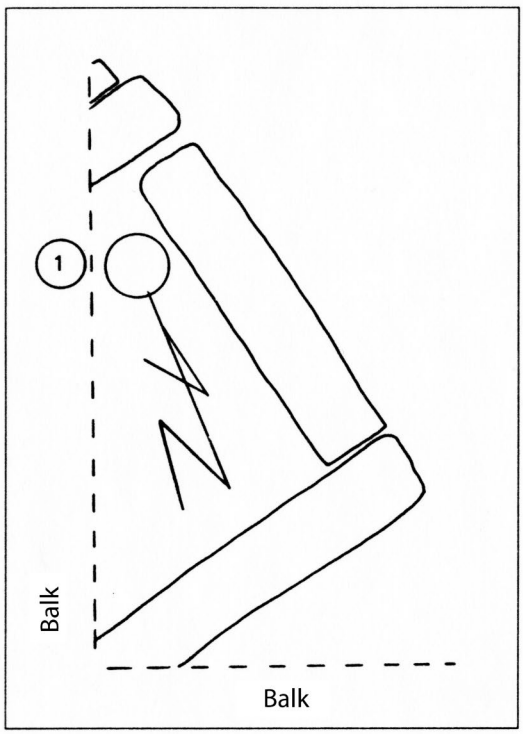
Grave goods:		Position of grave goods:
P-086	Jar	In front of forehead

Burial 4, 29/120-524 (Figures 6.5, 6.6)

Level 3
Age 4–9 months
Sex Unknown
Type VII

Description: A mudbrick box with intact cover contained the skeleton of a young infant. Some bones, including the skull, had been displaced slightly—probably due to rodent action since the grave itself had not been disturbed—but the general position of the skeletal remains was clear. The child had been buried on the right side, looking southwest, with contracted and tightly flexed limbs. The dimensions of the long-bones and the developmental stage of vertebrae and dentition indicated the infant had died aged between four and nine months.

The container was a closed box of single mudbricks on edge with an extra brick at the foot end. The cover consisted of seven mudbricks on edge, and the floor was formed by a single horizontal mudbrick.



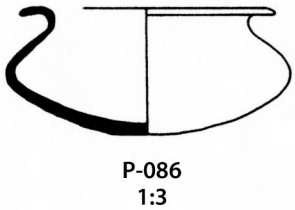


FIGURE 6.4. Burial 3. Scale of burial plan 1:10. *Illustration prepared by Barbara Stuart.*

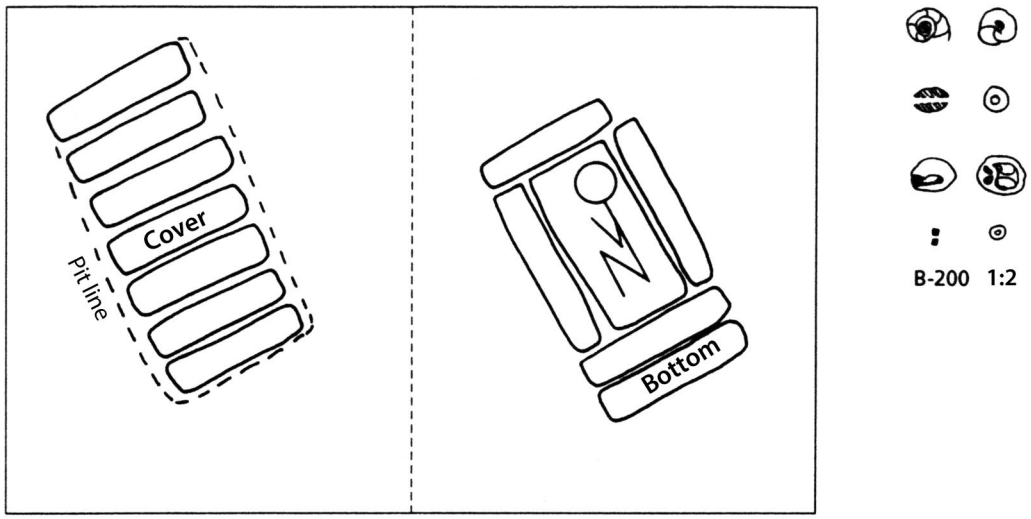


FIGURE 6.5. Burial 4. Scale of burial plan 1:20. *Illustration prepared by Barbara Stuart.*

FIGURE 6.6. Burial 4. Looking east. *Photograph by Hans Curvers/Glenn Schwartz.*

The grave pit was first recognized deep in the fill contiguous to the southwestern wall (14A) of level 3, area 14 (cf. Figure 2.119). The pit cut into the debris located above level 4 architecture and was at least 1.13 m deep.

Four beads and two shells were found near the lower arms, possibly once part of a bracelet.

Grave goods:	**Position of grave goods:**
B-200 Beads/shells	Near lower arms

Burial 5, 29/120-567 (Figure 6.7)

Level 3
Age 25–35 years
Sex Unknown
Type VI

Description: A pit lined with a few limestone boulders contained the disturbed and incomplete skeleton of an adult individual. The skull was the only well-preserved skeletal element. Assuming that it was

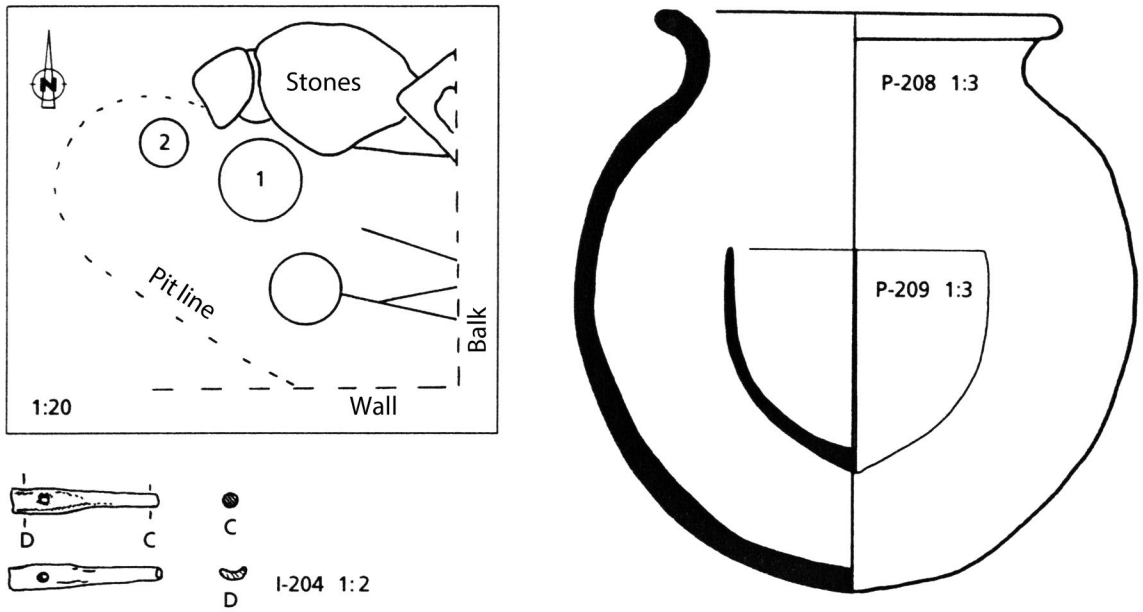


FIGURE 6.7. Burial 5. Scale of burial plan 1:20. *Illustration prepared by Barbara Stuart.*

still in situ, the deceased would have been buried lying on the left side looking north. Some hand bones were found in front of the face, indicating that the arms were tightly flexed in front of the chest, of which a few ribs were still present.

Between the skull and the boulders was a large jar lying on the side, with a goblet directly west of it. A bone pin was also associated with the burial.

The grave was located on the outside of the level 3 retaining wall 56L/14H at the northern edge of the mound (cf. Figures 2.83, 2.114), next to the wall's lowest course. Signs of a grave pit were not observed in the section above the grave. The pottery characteristics suggest a level 3 date for this burial.

Grave goods:		**Position of grave goods:**
I-204	Bone pin:	Unknown
P-208	Jar	In front of forehead
P-209	Goblet	Next to vessel P-208

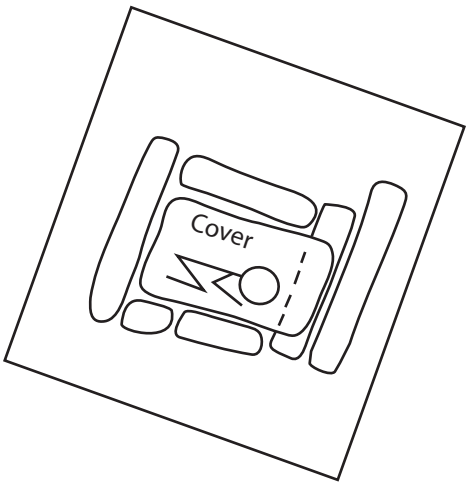


FIGURE 6.8. Burial 6. Scale of burial plan 1:20. *Illustration prepared by Barbara Stuart.*

Burial 6, 29/126-078 (Figure 6.8)

Level 3
Age Newborn
Sex Unknown
Type VII

Description: A mudbrick structure contained the skeleton of a newborn infant. The baby had been buried on its left side, facing south, in a contracted position. The burial container was a box of mudbricks and mudbrick fragments on edge, with a horizontal mudbrick covering the box. Two bricks on edge made up the east-side of the burial container.

The grave pit had been dug through the stone pavement of level 3 area 51 (cf. Figure 2.111), and the architectural remains of the northwest corner of the room were incorporated into the grave construction. Two limestone slabs covered the top of the grave pit, which was situated at a slightly higher level than the stone pavement.

Grave goods: None.

Burial 7, 30/96-043

Level 3
Age 1–2 years
Sex Unknown
Type VI

Description: The skull and part of an upper arm of a young child were found among some large mudbrick fragments in the level 3 debris of level 3 area 31 (cf. Figure 2.139). No substantial traces of a grave structure were present. In other parts of the room the debris was sealed by a level 3 floor, but it is not clear if this floor was intact above the burial. Since the child was buried in a haphazard way in the corner of the room, architectural remains may still have been visible when the grave pit was dug. For this reason and because no burial goods were included we assign a level 3 date.

Grave goods: None.

Burial 8, 30/108-081 (Figure 6.9)

Level 3
Age 5.5–7 years
Sex Unknown
Type VII

Description: An oval space surrounded by some mudbrick fragments held the skeleton of a child. The child had been buried in a contracted position on the left side, facing north. The legs were tightly flexed, the right femur in a 90-degree angle with the vertebral column, the left femur drawn up further towards the chest. The right arm was also bent in a 90-degree angle, lying parallel to the right femur. The length of the long-bones, the developmental stage of the deciduous and permanent dentition and the ossification of the vertebrae indicated the child was between five-and-a-half and seven years old when death occurred.

Two vessels were placed next to the top of the head.

The tomb consisted of mudbrick fragments on edge, placed north and west of the body. On the south side, wall 24B was incorporated to complete the construction of the tomb. The east side of the grave remained unexcavated in the east balk of unit 30/108. The grave pit had been dug from level 3 area 62 (east of level 3, area 22; cf. Figure 2.127), cutting a surface of plaster and pebbles and intruding into the debris covering the architectural remains of level 4. A clear line of white dots visible in the east balk section of 30/108 may be the mineral remains of a reed mat covering the burial.

Grave goods:		**Position of grave goods:**
P-119	Jar	Next to head
P-120	Goblet	Inside P-119

Burial 9, 30/108-144 (Figures 6.10, 6.11)

Level 3
Age Minimum of 25–35 years
Sex Unknown
Type VI

Description: A sealed tomb held the skeleton of an adult individual, lying in a contracted position on the right side, facing south. Both femora were in a 90-degree angle to the vertebral column, the legs slightly flexed. The arms were flexed more tightly, the hands lying in front of the face. The wear of several elements of the dentition indicated that the minimum age of this individual at death was 25 to 35 years. Three vessels were positioned near the head.

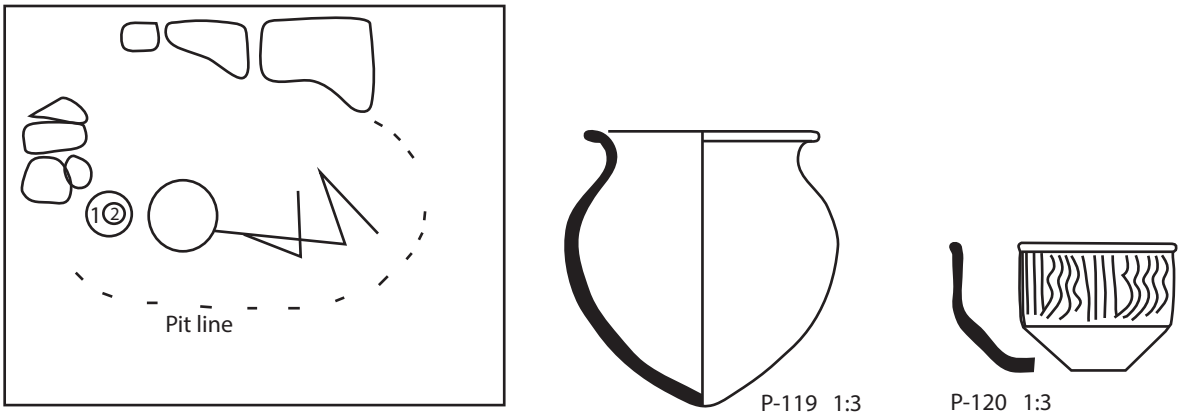


FIGURE 6.9. Burial 8. Scale of burial plan 1:20. *Illustration prepared by Barbara Stuart.*

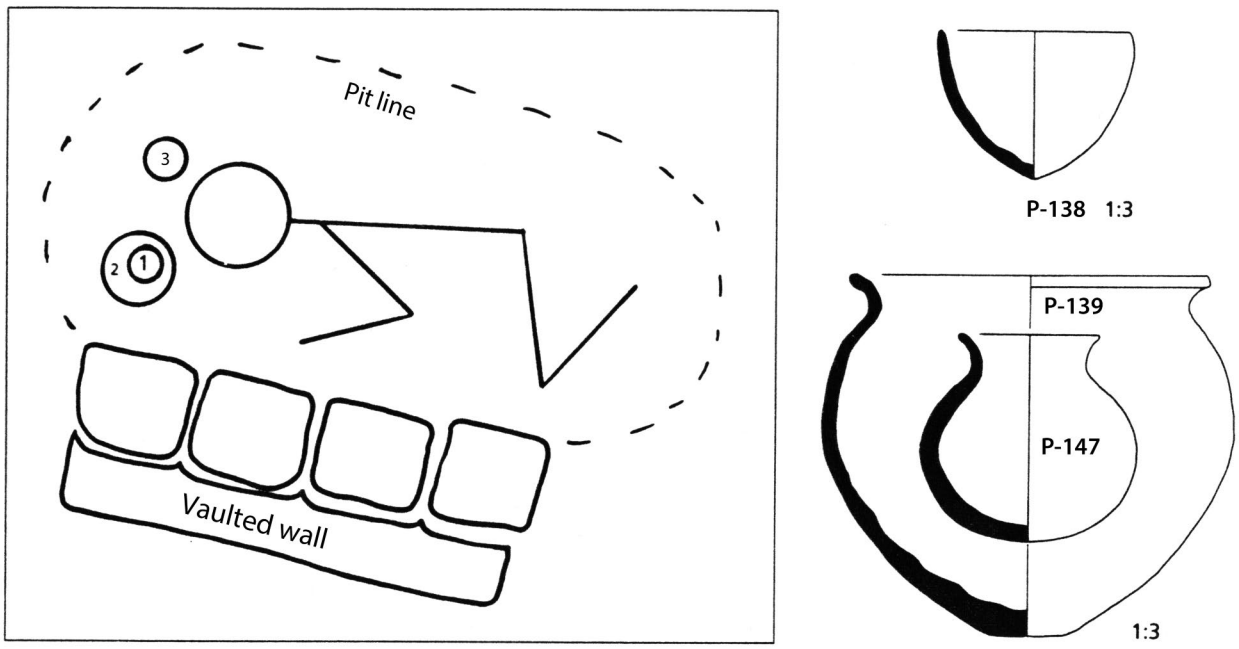


FIGURE 6.10. Burial 9. Scale of burial plan 1:20. *Illustration prepared by Barbara Stuart.*

FIGURE 6.11. Burial 9. Looking south. *Photograph by Hans Curvers/Glenn Schwartz.*

The grave was a chamber dug sideways from a deep pit, sealed by an unplastered, slightly vaulted brick wall of six courses high and four mudbricks long. The grave pit, with a minimum depth of 134 cm, cut into debris covering level 4 architectural remains. It was disturbed at a higher level by a large animal hole first observed in the fill of level 3 area 22. The original level from which the pit had been dug remains obscure, but it clearly post-dated the construction of area 22, given the damage done to wall 22A (cf. Figures 2.127–2.129). The characteristics of the pottery found in the grave suggest a level 3 date for this burial.

Grave goods:		**Position of grave goods:**
P-138	Goblet	Inside P-139
P-139	Jar	West of head
P-147	Goblet	Northwest of head

Burial 10, 30/132-011 (Figure 6.12)

Level 3
Age Minimum 25–35 years
Sex Unknown
Type VI

Description: Immediately below topsoil the badly preserved skeletal remains of an adult individual were found, together with three ceramic vessels. The body had been buried in an extended position facing southeast. The abdominal region held the remains of a large cooking vessel containing a pointed-base goblet (marked "2" on Figure 6.12). Directly west of the head was a small jar (marked "1" on Figure 6.12).

The burial was found in the level 3 debris, on the same level as the top of the mudbrick wall separating level 3, areas 9 and 11 (cf. Figures 2.83, 2.113). Traces of a grave pit were not recognized, as the burial was located immediately below topsoil. Characteristics of the pottery suggest a level 3 date for this burial.

Grave goods:		**Position of grave goods:**
P-037	Small jar	West of the head
P-038	Goblet	Abdomen (inside vessel)

Burial 11, 36/102-034

Level 3
Age 7–9 years
Sex Unknown
Type VI

Description: The skull of a child was found on bench 29D in level 3 area 29 (cf. Figure 2.131), without any trace of the postcranial skeleton. The skull was not surrounded by any form of permanent grave construction, nor was it accompanied by grave goods. The cause for this separation from the postcranial skeleton is not clear. Complete disintegration of the skeleton seems unlikely, especially since the skull, consisting of rather thin bone segments in a child, would have been one of the first skeletal elements subject to this process. Differential mortuary treatment as the result of personal deeds in life or circumstances of death seems unlikely when it concerns a young individual. Therefore post-depositional processes seem the most likely cause for the separation of the skeletal parts.

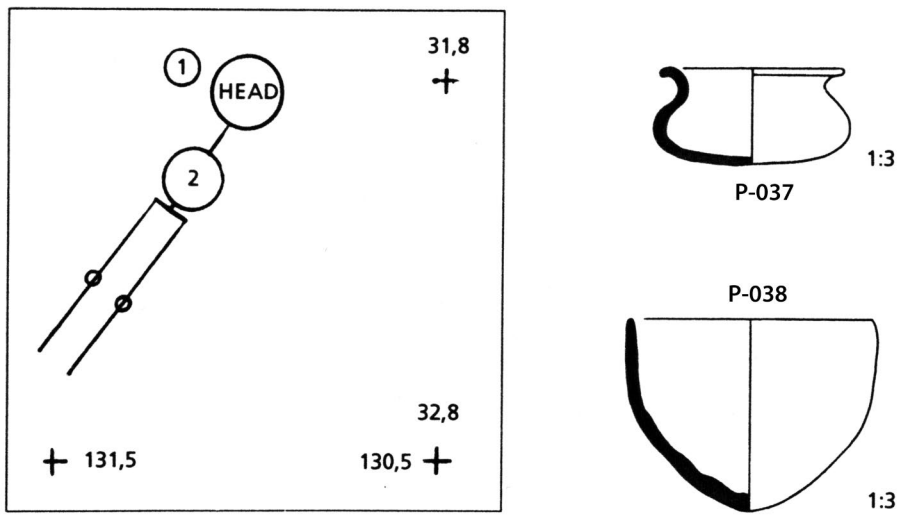


FIGURE 6.12. Burial 10. Scale of burial plan 1:20. *Illustration prepared by Barbara Stuart.*

FIGURE 6.13. Burials 12 and 13. Looking north. *Photograph by Hans Curvers/Glenn Schwartz.*

Grave goods: None.

Burial 12, 36/120-047 (Figure 6.13)
Level 3
Age 0–2 months
Sex Unknown
Type VII

Description: A simple tomb of mudbricks on edge held the tightly flexed skeleton of a newborn infant. The child had been buried on the right side, facing south. No grave goods accompanied the infant.

This grave was found in the mudbrick tumble accumulated in level 3, open area 49, in the corner of the two outer walls 1B and 2A of level 3, rooms 1 and 2 (cf. Figure 2.92). Traces of a grave pit were not observed. A photograph of this burial, together with the adjacent burial 13, was published by Curvers and Schwartz (1990:15, figure 17).

Grave goods: None.

Burial 13, 36/120-048 (Figure 6.13)
Level 3
Age Newborn
Sex Unknown
Type VII

Description: A small tomb held the skeletal remains of a newborn infant. The disturbed state of the remains did not allow a reconstruction of the position of the body at the time of interment.

The tomb consisted of mudbricks on edge; the western side of the construction was missing. The mudbrick forming the northern edge of the grave was positioned over the body at an oblique angle.

The grave was found in the mudbrick tumble that had accumulated in level 3, area 49, in the corner of the two outer walls 1B and 2A of level 3, rooms 1 and 2 (cf. Figure 2.92), adjacent to burial 12. A photograph of these burials was published by Curvers and Schwartz (1990:15, figure 17).

Grave goods: None.

Burial 14, 36/120-049 (Figures 6.14, 6.15)
Level 3
Age 55–64 years
Sex Male
Type VI

Description: The ashy fill of level 3 "silo" 6 (Figure 2.98) revealed the skeleton of an adult male. The individual had been buried in a contracted position on the left side, facing north. Both legs and arms were tightly

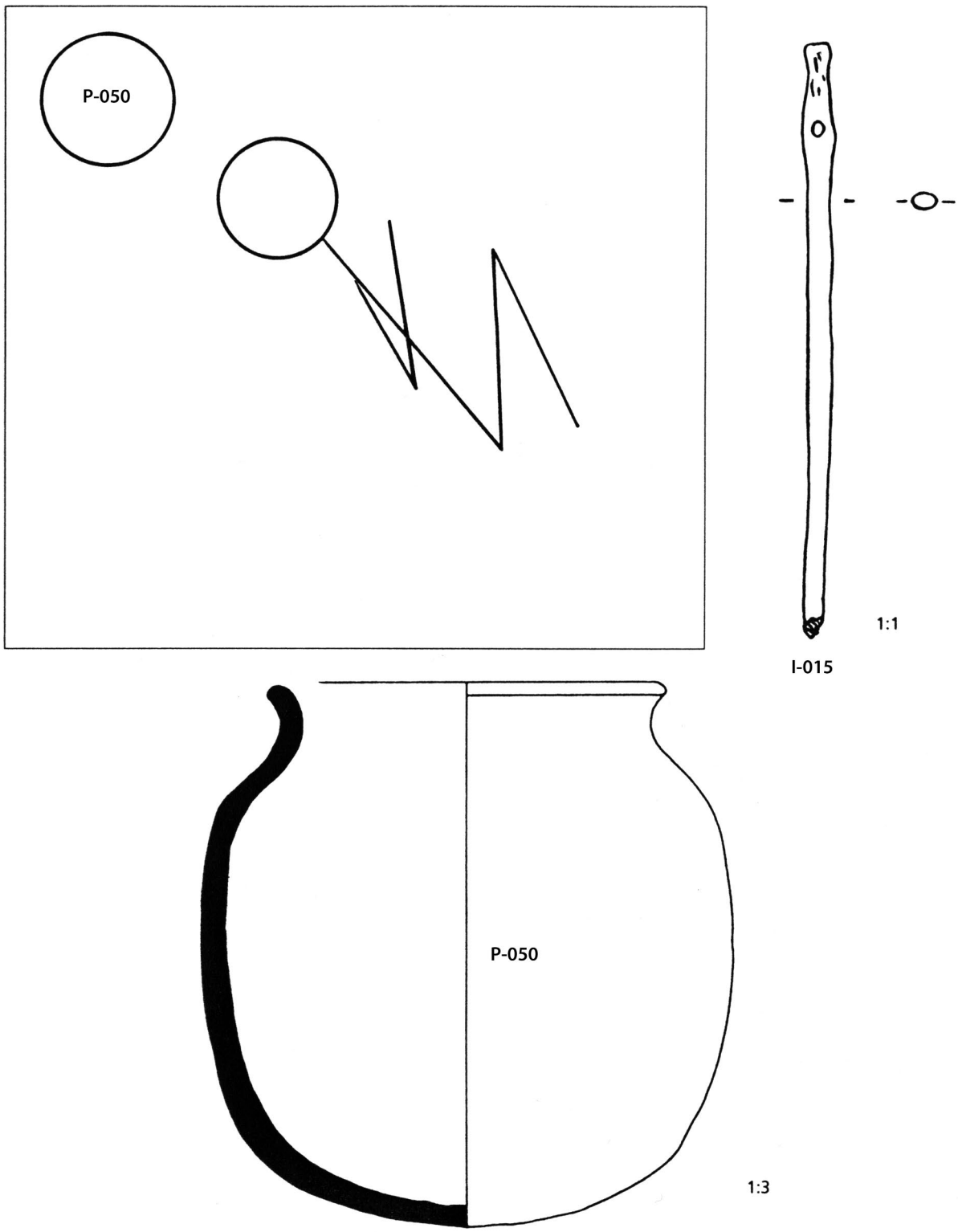


FIGURE 6.14. Burial 14. Scale of burial plan 1:20. *Illustration prepared by Barbara Stuart.*

FIGURE 6.15. Burial 14. Looking north. *Photograph by Hans Curvers/Glenn Schwartz.*

flexed. A large jar was positioned directly west of the head.

Traces of a burial pit were not evident, but one of the buttresses of the silo had been disturbed by the burial. Because the debris filling the silo was sealed by an undisturbed floor associated with level 2 area 7 (cf. Figure 2.163), the burial must pre-date this floor and can therefore be assigned to (late) level 3.

Grave goods:		**Position of grave goods:**
I-015	Bone toggle pin	Unknown
P-050	Jar	West of head

Burial 15, 36/120-062 (Figure 6.16)

Level 3
Age 9.5 lunar months
Sex Unknown
Type V

Description: A jar held the skeletal remains of an infant. The burial jar (Figure 4.27:10) was found in the debris between the two floors (phases a and b) of level 3, room 1 (cf. Figure 2.87). The grave pit cut the phase a floor, but the phase b floor was undisturbed, suggesting that interment took place during a period when the house was not inhabited.

Grave goods: None.

Burial 16, 36/120-084

Level 3
Age 9.5 lunar months
Sex Unknown
Type VI

Description: The skeleton of a slightly prematurely born infant was found lying in an extended position on the right side, facing southeast. The burial was situated in a pit dug into the uppermost level 4 debris below level 3, open area 49 (cf. Figure 2.92). The burial contained no pottery to provide a guide to the period of interment, but its position near the top of the debris covering the architecture of level 4 indicates a post–level 4 date.

Grave goods: None.

Burial 17, 36/126-035 (Figure 6.17)

Level 3
Age 3–5 years
Sex Unknown
Type VII

Description: A rectangular enclosure of horizontally placed mudbricks held the skull of a young child. No remains of the postcranial skeleton were retrieved (cf. burial 11). Elements of the dentition indicated that

the child was between 3 and 5 years old at death. Two fragments of a copper/bronze object were found directly west of the head, as well as a jar and a miniature bowl.

A level 4 wall was incorporated into the grave structure (Figure 2.65), suggesting that the level 4 architecture was still visible when the grave was dug in level 3 area 95. The large amount of mudbrick collapse found inside the burial enclosure suggests that it originally had a mudbrick cover. Two ceramic vessels were later discovered in the fill against the level 4 wall and are probably associated with the burial.

FIGURE 6.16. Burial 15, with upper part of vessel removed. Looking west. *Photograph by Hans Curvers/Glenn Schwartz.*

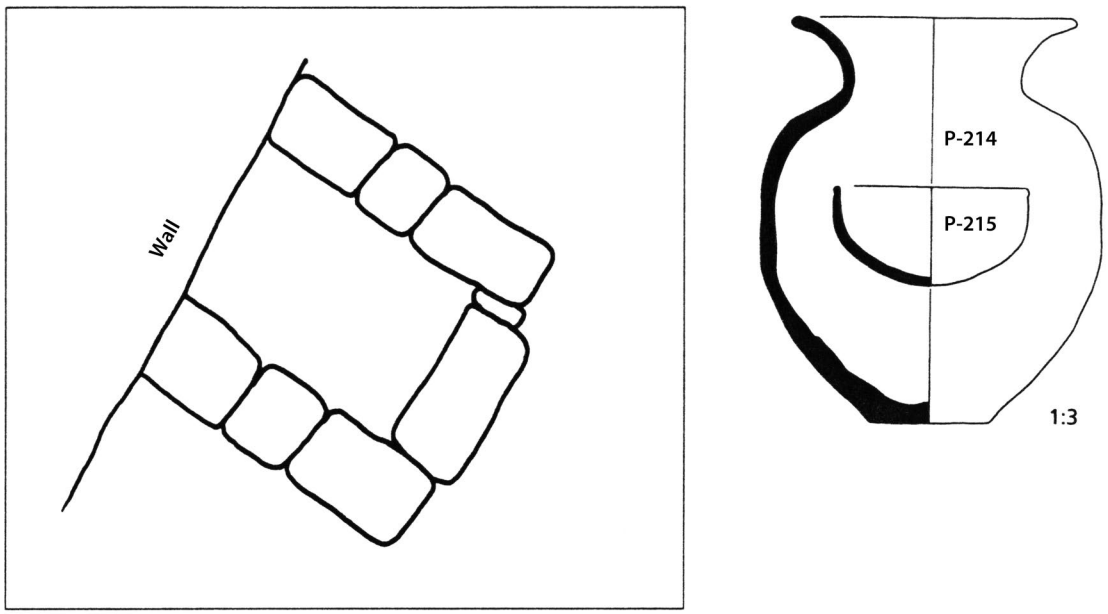


FIGURE 6.17. Burial 17. Scale of burial plan 1:20. *Illustration prepared by Barbara Stuart.*

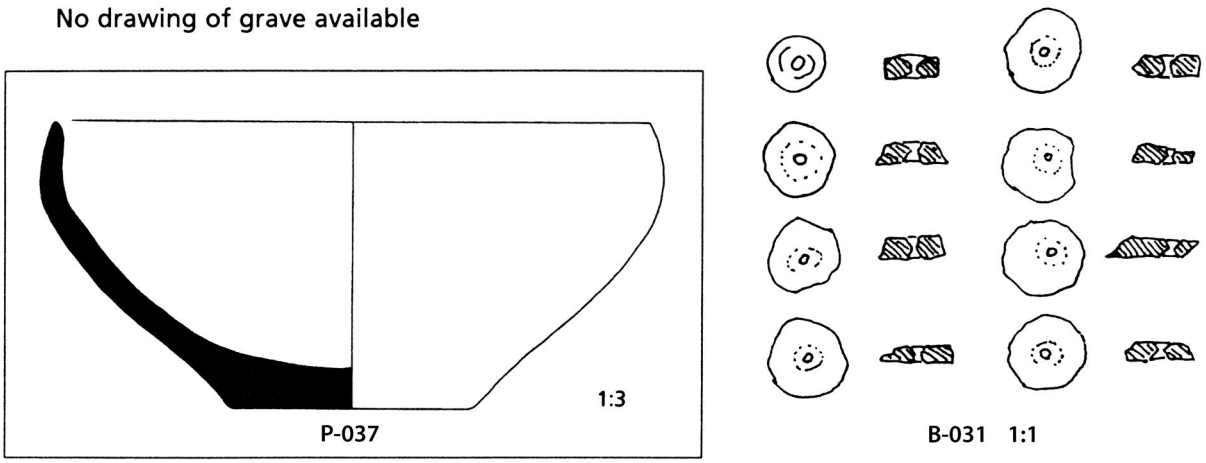


FIGURE 6.18. Burial 18. *Illustration prepared by Barbara Stuart.*

Grave goods:	**Position of grave goods:**
M-039 2 copper/ bronze rod fragments	West of head
P-214 Jar	Idem
P-215 Small bowl	Idem

Burial 18, 42/108-037 (Figure 6.18)

Level 3
Age Adult
Sex Male
Type VI

Description: The postcranial skeleton of an adult male was found on a level 3 floor in the Round Building, area 47 (Figure 2.155). The individual had been buried on the right side, with the legs in a contracted position. Nine beads and a bowl were retrieved near the area where the head would have been.

No signs of a permanent grave construction were present. The location of the skeleton on the level 3 floor suggests a late level 3 date for this burial.

Grave goods:	**Position of grave goods:**
B-031 Beads	Near head
P-037 Bowl	Idem

Burial 19, 42/114-217 (Figure 6.19)

Level 3
Age 30–50 years
Sex Female
Type VI

Description: Two incomplete long bones and part of a skull are the only indicators of this burial. Traces of a permanent grave construction were not observed. The bones were exposed deep in the fill of room 6 in the level 4 phase of the Round Building (Figure 2.41). A total of 85 beads and three copper/bronze toggle pins were found nearby in the room fill and are regarded as part of the original mortuary furnishing of this burial. The toggle pins are most comparable to level 3 examples (see Dunham, Chapter 5).

Grave goods:	**Position of grave goods:**
B-057 Beads	Unknown (in room fill)
B-058 Beads	Idem
M-045 Toggle pin	Idem
M-048 Toggle pin	Idem
M-049 Toggle pin	Idem

Burial 20, 29/114-094 (Figure 6.20)

Level 2
Age 3–5 years
Sex Unknown
Type VII

Description: A mudbrick tomb with two compartments held the skeleton of a child. The child had been buried in a contracted position on the right side, facing south. Both arms and legs were tightly flexed, the hands lying in front of the face. The skeletal material was in poor condition. Three elements of the deciduous dentition, combined with the formation stage of the permanent teeth embedded in the jaw, indicated that the age at death was between 3 and 5 years.

Under the body, near the wrists and neck, a series of beads were found. The beads were made of various materials such as shell, stone, and faience, and their position suggests that the child had been wearing a bracelet and necklace when buried.

The tomb consisted of mudbricks on edge forming two separate compartments. The eastern compartment held the skeletal remains. In the western com-

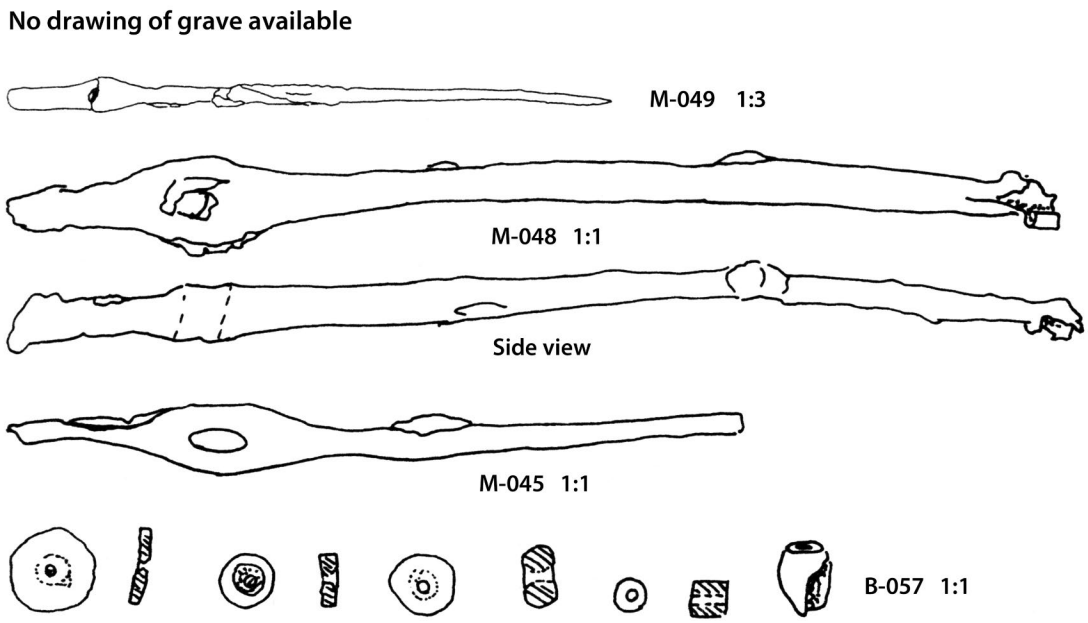


FIGURE 6.19. Burial 19. Selection of beads shown. *Illustration prepared by Barbara Stuart.*

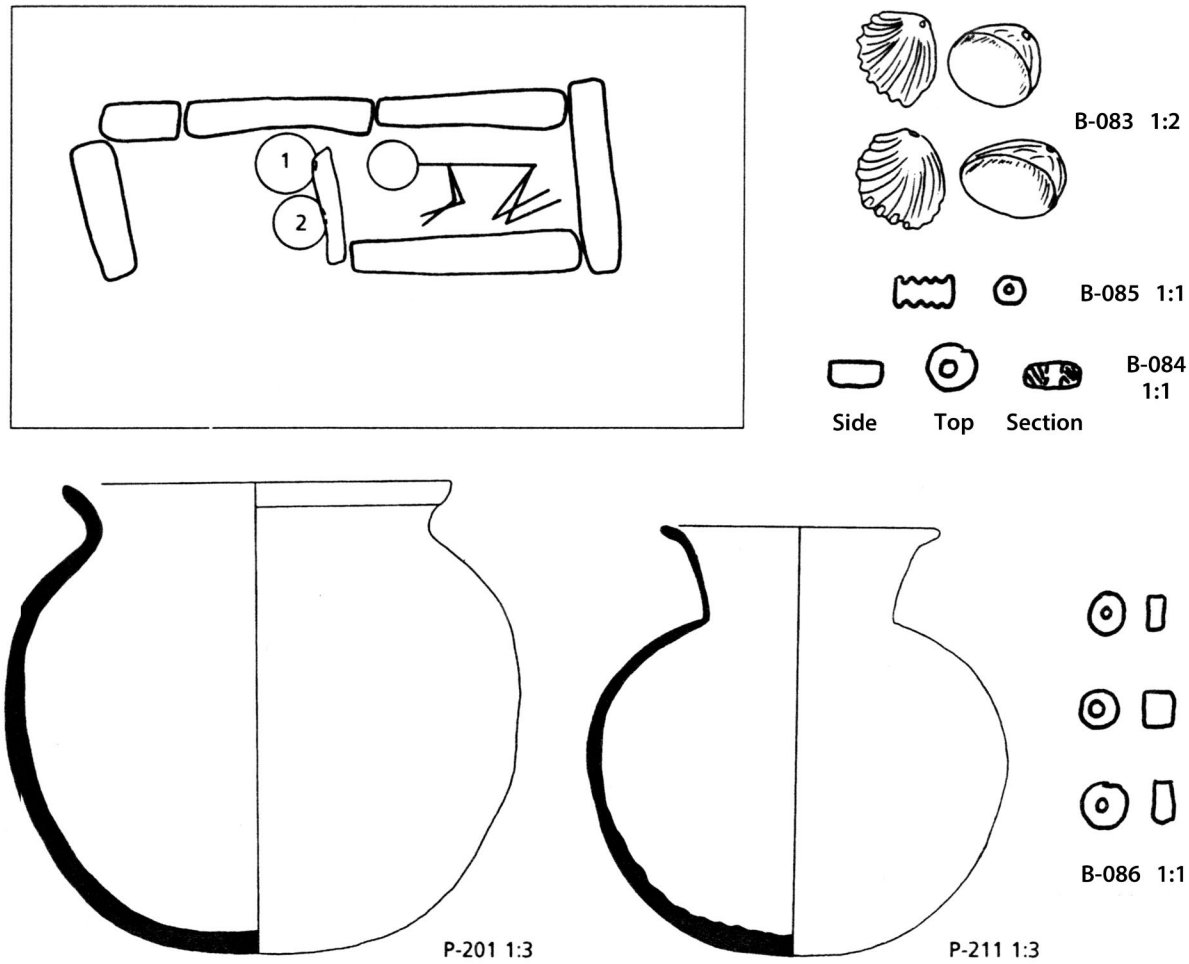


FIGURE 6.20. Burial 20. Scale of burial plan 1:20. Selection of beads shown. *Illustration prepared by Barbara Stuart.*

partment two ceramic vessels had been placed against the partition wall. The remainder of this compartment was empty but may originally have contained grave goods of perishable matter such as food or clothing.

The grave pit cut the lowest floor (phase a) of level 3 area 15 as well as the debris covering the architecture of level 4 (cf. Figures 2.121, 2.122). The highest floor associated with the level 3 architecture (phase c) was very disturbed above the location of the grave, suggesting that the grave pit was dug from a level above this floor. The characteristics of the pottery associated with the burial suggest a level 2 date.

Grave goods:	**Position of grave goods:**
B-083 2 shell beads:	Under body
B-084 32 stone beads	At wrists
B-085 11 faience beads	Near neck
B-086 4 faience beads	Under body
P-201 Jar	West compartment of tomb
P-211 Jar	West compartment of tomb

Burial 21, 29/120-022 (Figure 6.21)

Level 2
Age 0–2 months
Sex Unknown
Type V

Description: A round-based burial vessel contained the remains of a newborn baby as well as 8 white frit beads. The vessel was found in level 2, area 18 (cf. Figure 2.165). Traces of a grave pit were not found.

Grave goods:	**Position of grave goods:**
B-012 8 beads of soft white material	Unknown

Burial 22, 29/126-043 (Figures 6.22, 6.23)

Level 2
Age 2–6 months
Sex Unknown
Type VII

Description: A mudbrick tomb contained the badly preserved skeleton of a young infant. The position of arm and leg bones indicated that the child had been buried in a contracted position on the left side, facing northeast, with the hands in front of the face. A miniature jar (P-063) was positioned behind the head.

The tomb consisted of three extant walls of two courses of mudbricks on edge, no bricks being evident

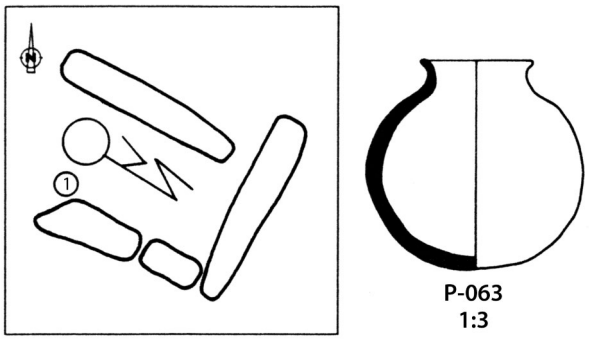
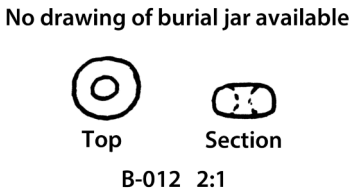


FIGURE 6.22. Burial 22. Scale of burial plan 1:20. *Illustration prepared by Barbara Stuart.*



(*Above*): FIGURE 6.21. Burial 21. Selection of beads shown. *Illustration prepared by Barbara Stuart.*

(*Right*): FIGURE 6.23. Burial 22. Looking south. *Photograph by Hans Curvers/Glenn Schwartz.*

on the west side. The burial pit had been dug into the debris covering level 3, area 51 remains. The floor of level 2, area 10 (cf. Figure 2.165) was heavily disturbed above the burial, indicating that the grave pit had been dug from a later level 2 context.

Grave goods:	**Position of grave goods:**
P-063 Miniature jar	Behind head

Burial 23, 29/126-117 (Figures 6.24, 6.25)

Level 2
Age 4–6 months
Sex Unknown
Type VII

Description: A mudbrick tomb held the fragmentary skeleton of an infant, buried on the right side, facing southwest, the face turned slightly upwards. The legs were slightly flexed. The upper arms had been somewhat displaced; originally they had been tightly flexed, the hands in front of the face. The fairly well-preserved upper and lower jaws indicated that the age of the infant was between 4 and 6 months. A miniature goblet was found in the corner of the tomb, opposite the forehead.

The tomb was a box of mudbricks on edge on all sides, with a floor of three horizontal bricks and a cover of six bricks on edge. Two medium-sized stones and one mudbrick were crammed into the space between the mudbricks of the tomb and the wall of the oval grave pit, at the head end of the grave and along the south wall of the box, respectively.

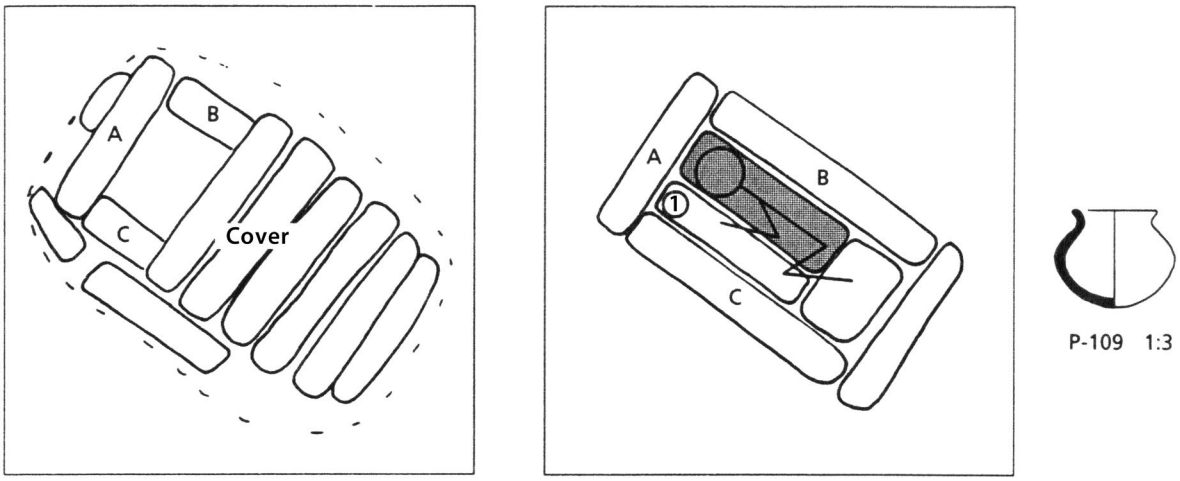


FIGURE 6.24. Burial 23. Scale of burial plan 1:20. *Illustration prepared by Barbara Stuart.*

FIGURE 6.25. Burial 23. Looking north. *Photograph by Hans Curvers/ Glenn Schwartz.*

The burial was located in level 2 area 15, dug into the fill of level 3 and cutting level 3, oven 59A (Figures 2.114, 2.165).

Grave goods:		**Position of grave goods:**
P-109	Miniature goblet	In front of forehead

Burial 24, 29/132-012 (Figure 6.26)

Level 2
Age 3–5 years
Sex Unknown
Type VII

Description: A mudbrick tomb contained a badly preserved child skeleton. Only a few fragments of the ribs, arms, and lower legs remained from the postcranial skeleton. The skull was mostly crushed, possibly by the weight of the soil that had gathered in the tomb. The position of the remains indicated that the child had been buried on the right side with the head pointing west, facing south, with arms and legs flexed.

A large quantity of beads and pendants lay under and around the skull. Two copper/bronze hair spirals were found on either side of the skull. The space between the head and the side of the tomb had been filled with vessels of various sizes.

The tomb consisted of a surrounding structure of mudbricks on edge with an interior mud plaster lining and a cover of five mudbricks. The tomb floor had been built with half-size bricks. The burial container had been built in a rectangular pit and was missing its construction material on the west side. Located in level 2 area 13 (cf. Figure 2.159), the burial had been dug into level 3 remains.

Grave goods:

B-039	2 beads (frit?)
B-040	19 beads of quartz and faience
B-042	Bone pendant, fish-shaped
B-043	Anthropomorphic pendant
B-044	Shell pendant, bird-shaped
B-049	27 quartz beads and pendants
B-050	34 red stone beads
B-051	37 stone and faience beads
B-052	366 faience beads
B-053	36 shell beads
B-089	Shell bead, theriomorphic bead
M-042	Copper/bronze spiral
M-043	Copper/bronze spiral
P-084	Jar
P-099	Jar
P-100	Bowl
P-101	Bowl
P-102	Bowl
P-103	Jar
P-104	Jar
S-115	3 stone cylinders

Position of grave goods: All ceramic vessels were placed around the head. One of the copper/bronze spirals was found under the right temple, the other on the left temple. Lying under the skull were the pendants and some of the beads, probably once part of a necklace. The stone cylinders and many of the beads were in front of the face and some black beads were actually found on the neck. A large quantity of very small white beads, scattered throughout the grave fill on the north side of the skeleton, may have been sewn onto an item of clothing (see also Dunham 1994 for a detailed description of these beads and an explanation of their meaning and presence in children's graves).

Burial 25, 29/132-021 (Figures 6.27, 6.28)

Level 2
Age 8–16 months
Sex Unknown
Type VII

Description: A mudbrick box contained the fragmentary skeleton of an infant. Especially the bones of the lower body had been badly preserved; only two fragments of the pelvis were retrieved. The child had been buried on the left side, facing north. The arms were flexed, the hands positioned in front of the chest. The process of fusion of the vertebrae and the developmental stage of the deciduous dentition indicated the age of the child had been between 8 and 16 months at death.

A collection of miniature and full-sized pottery had been placed around the upper body and head of the child, and a large quantity of beads was found under the skeleton.

Except for the east edge, which had horizontally placed bricks, the tomb was constructed of mudbricks on edge. Remains of the cover included one complete brick on edge and one fragment of a brick. Located in level 2, area 13, the grave had cut part of level 3 wall 52D (cf. Figures 2.113, 2.159). Since the burial was found almost immediately below the topsoil, traces of a grave pit were not recognized.

Grave goods:

B-041	6 shell beads, fragmentary
B-045	Shell pendant, bird-shaped

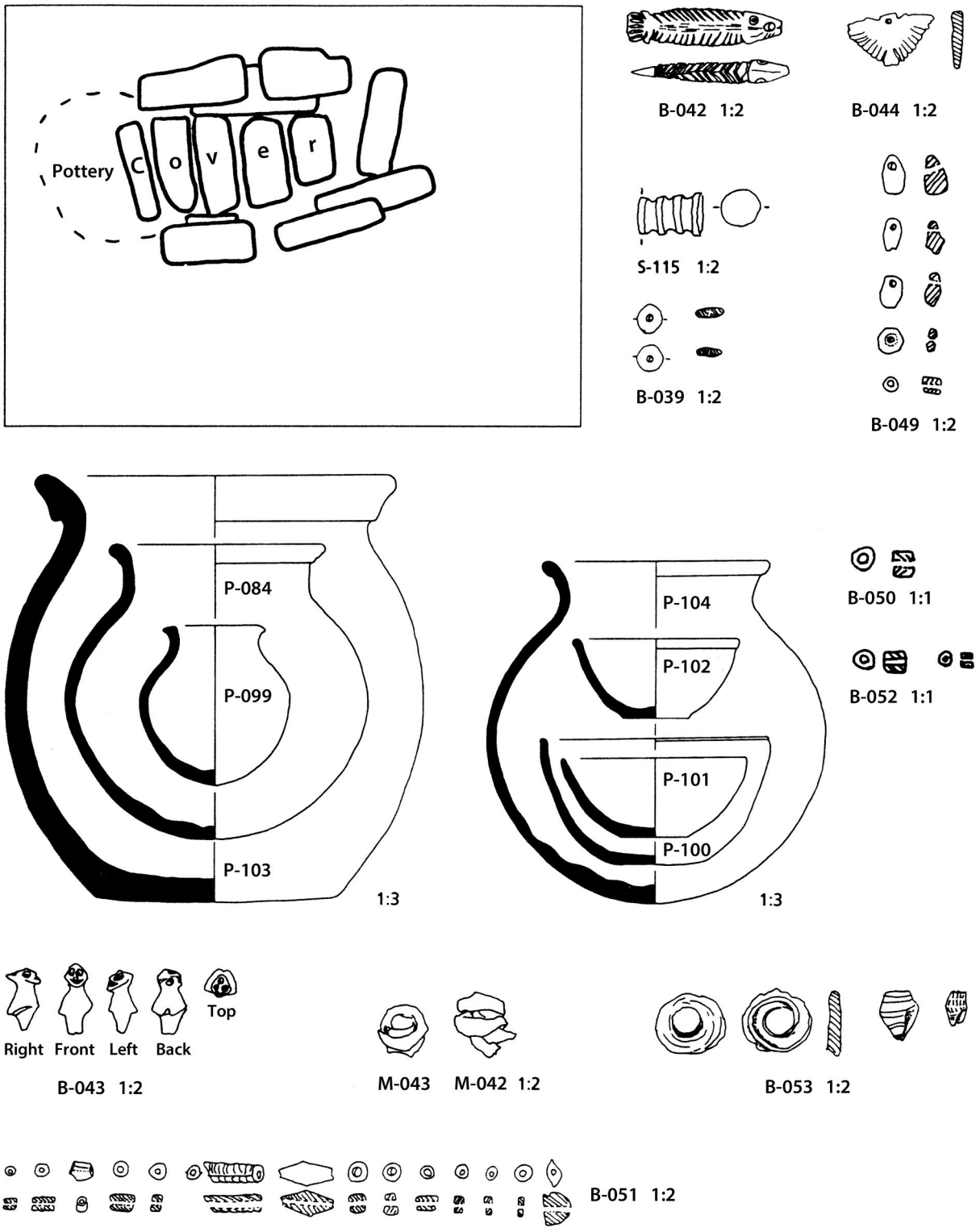


FIGURE 6.26. Burial 24. Scale of burial plan 1:20. Selection of beads shown. *Illustration prepared by Barbara Stuart.*

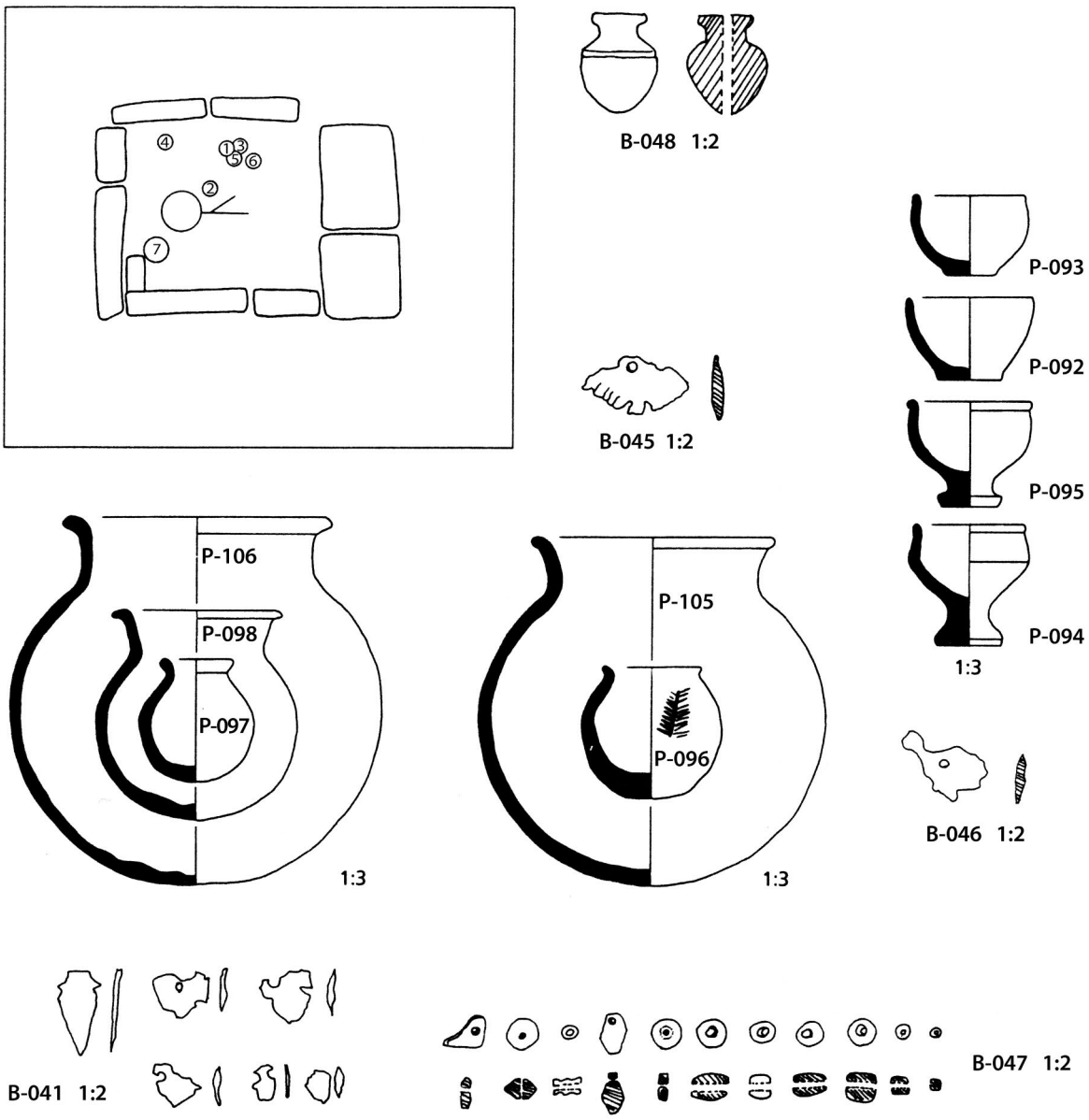


FIGURE 6.27. Burial 25. Scale of burial plan 1:20. Selection of beads shown. *Illustration prepared by Barbara Stuart.*

B-046	Shell pendant, bird-shaped
B-047	211 beads
B-048	Clay pendant, jar-shaped
P-092	Miniature goblet
P-093	Miniature goblet
P-094	Miniature goblet
P-095	Miniature goblet
P-096	Miniature goblet
P-097	Miniature goblet
P-098	Jar
P-105	Jar
P-106	Jar

Position of grave goods: The jars were placed behind and above the head, while the miniature vessels, as well as a few beads, lay in front of the chest. Most of the beads, including the jar-shaped pendant, were found under the skeleton, indicating that they had been part of a necklace (see also Dunham 1994 for a detailed description of the beads and an explanation of their function).

FIGURE 6.28. Burial 25 (with contents emptied). Looking south. *Photograph by Hans Curvers/ Glenn Schwartz.*

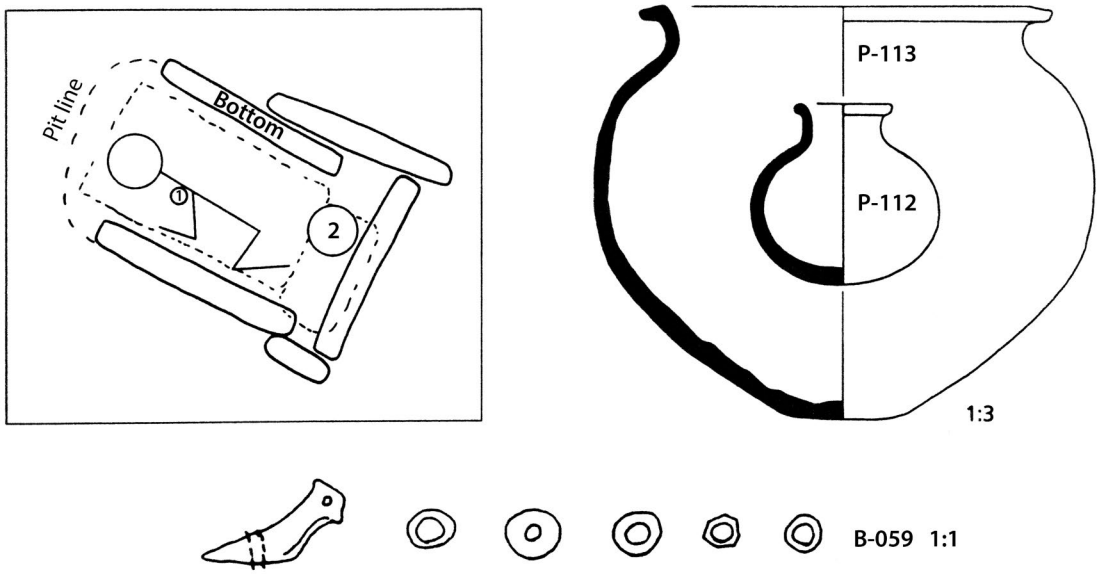


FIGURE 6.29. Burial 26. Scale of burial plan 1:20. Selection of beads shown. *Illustration prepared by Barbara Stuart.*

Burial 26, 29/132-031 (Figure 6.29–6.31)

Level 2
Age 2–4 years
Sex Unknown
Type VII

Description: A simple mudbrick tomb contained the skeleton of a young child, buried in a contracted position on the right side, facing south. Both arms and legs were tightly flexed, the hands lying in front of the face. The postcranial skeleton had been badly preserved. The developmental stage of the deciduous dentition put the age of the child at between 2 and 4 years.

A line of 20 beads was found near the finger bones and wrists, with two of the beads under the skull. A

FIGURE 6.30. Burial 26. Looking south. *Photograph by Hans Curvers/ Glenn Schwartz.*

FIGURE 6.31. Burial 26 (with contents emptied). Looking south. *Photograph by Hans Curvers/ Glenn Schwartz.*

miniature jar was found in the bend of the arms, while a full-sized jar stood behind the lower body in the eastern corner of the tomb.

The tomb walls were constructed of mudbricks on edge except for the west side of the grave, where the small amount of space between the head and the edge of the grave pit did not accommodate the presence of mudbricks. Lack of space also inhibited the end-to-end placement of the bricks on the side walls (Figure 2.159). The floor consisted of one-and-a-half horizontal bricks, and one horizontal brick course covered the tomb.

Situated in level 2, area 13, this burial had been dug into level 3 deposits.

Grave goods:		**Position of grave goods:**
B-059	20 beads	Near hands (2 beads under skull)
P-112	Miniature jar	In bend of arms
P-113	Jar	Behind lower body

Burial 27, 29/132-068 (Figures 6.32, 6.33)

Level 2
Age 2–4 years
Sex Unknown
Type VII

Description: A line of mudbrick fragments on edge surrounded the skeleton of a young child buried on the left side, facing north. The lower body had been badly preserved but the extant remains of some leg and foot bones indicated a contracted position. The skull had been crushed *postmortem* by a brick. The state of fusion of the vertebrae and the developmental stage of the deciduous dentition indicated the child had been 2 to 4 years old at death.

Three groups of beads were found near the arms, legs, and neck, and a bronze spiral was lying on the right shoulder. Several vessels were positioned near the head.

Heavily damaged by the grave pit of later level 2, burial 24, the mudbrick tomb structure was only partly preserved on the north and south sides, while some mudbrick fragments were found on the west side. One whole brick and part of a brick served as the floor of the tomb.

The grave was found in level 2, area 13, and had been dug into level 3, area 52 (cf. Figures 2.113, 2.159). A selection of beads and pendants was published by Schwartz and Curvers (1992:400, figure 4).

Grave goods:		**Position of grave goods:**
B-077	1 shell bead and 1 faience bead	Near legs
B-078	13 shells and 1 faience bead	Near arms
B-079	136 beads and 22 shells	Around the neck
M-054	Copper/bronze spiral	On right shoulder
P-125	Miniature goblet	Unknown
P-136	Miniature goblet	Unknown
P-142	Jar	In front of face
P-143	Jar	In front of face
P-144	Bowl	Inside P-142
P-145	Miniature goblet	Under head

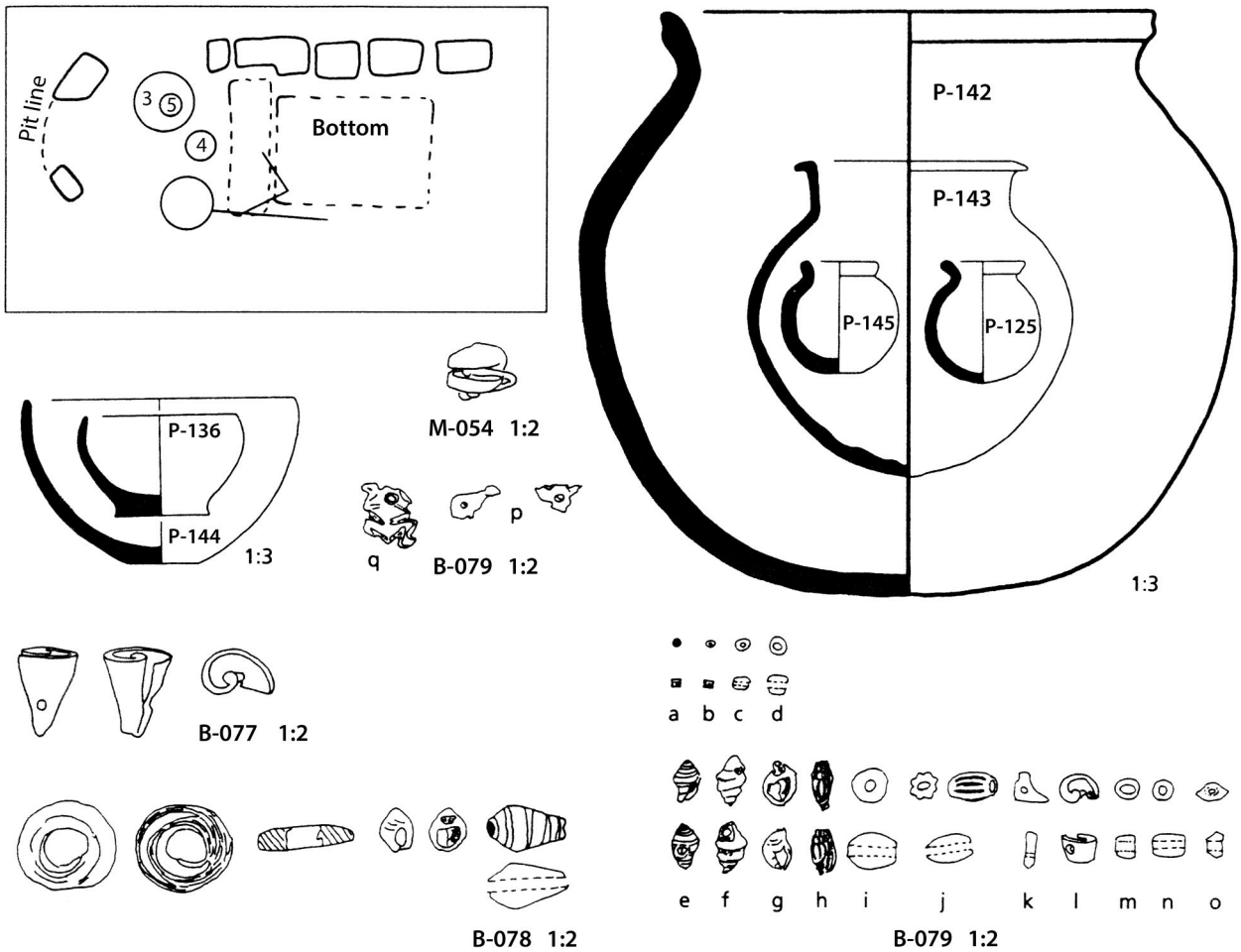


FIGURE 6.32. Burial 27. Scale of burial plan 1:20. Selection of beads shown. *Illustration prepared by Barbara Stuart.*

FIGURE 6.33. Burial 27. Looking east.
Photograph by Hans Curvers/Glenn Schwartz.

Burial 28, 29/132-077 (Figure 6.34)

Level 2
Age Child
Sex Unknown
Type VII

Description: Skeletal remains were not found in this tomb of mudbricks on edge (Figure 2.159), which remained partly unexcavated in a test trench balk on the northernmost excavated extent of area 13. The dimensions of the burial as well as its ceramic contents suggest that it belonged to a child (see Orientation and Arrangement of Body section).

Grave goods:

P-217 Jar
P-218 Jar
P-219 Bowl
P-220 Spouted jar
P-221 Bowl
P-222 Miniature goblet
P-223 Miniature goblet
P-224 Bowl

Burial 29, 29/132-078 (Figure 6.35)

Level 2
Age 3–5 years
Sex Unknown
Type VII

Description: The narrow space between two opposed mudbricks on edge held the skeleton of a young child. Although the skeletal material was very badly preserved, the position of the body could be determined as contracted, on the right side with tightly

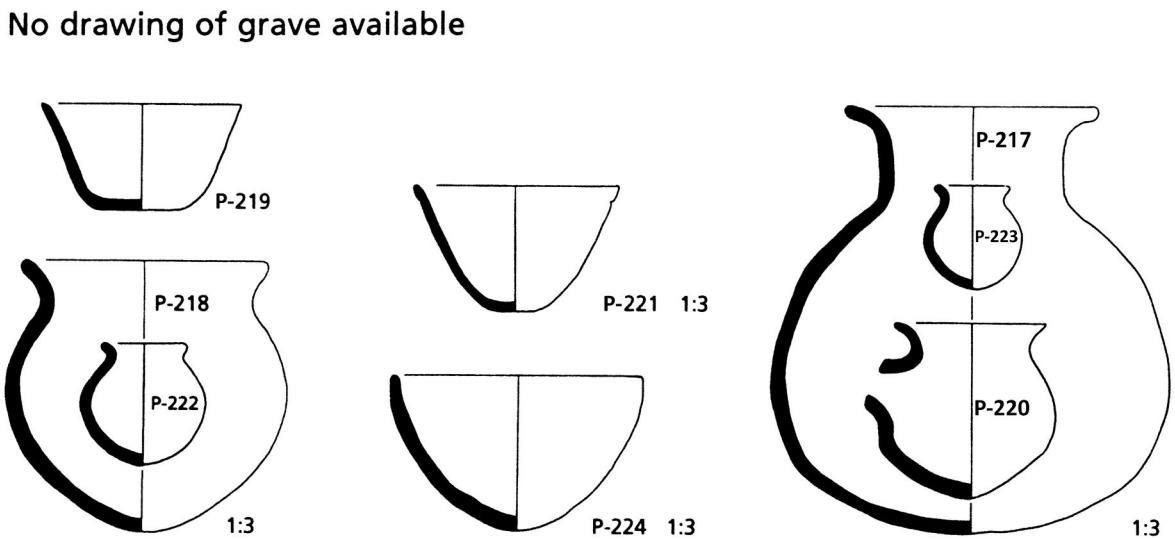
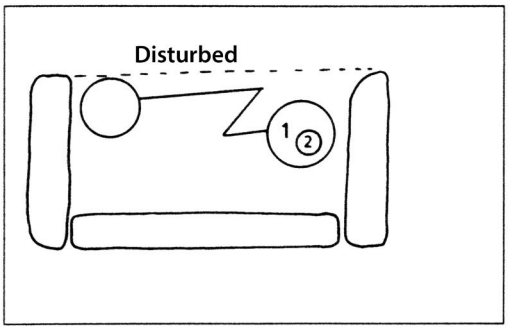


FIGURE 6.34. Burial 28. *Illustration prepared by Barbara Stuart.*



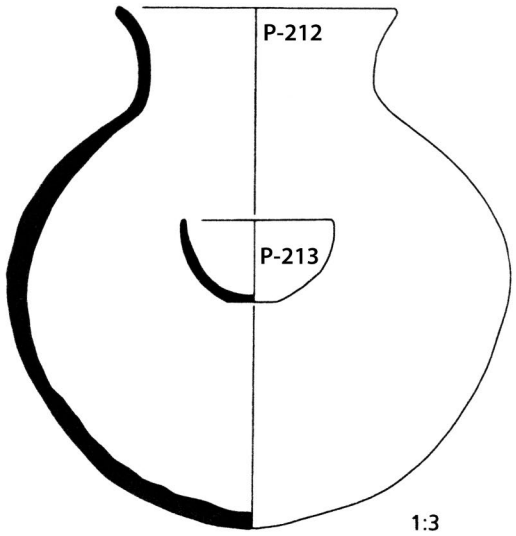


FIGURE 6.35. Burial 29. Scale of burial plan 1:20. *Illustration prepared by Barbara Stuart.*

flexed legs, facing south. The only truly well preserved bones were those of one foot, over which a ceramic vessel had been placed (P-212). The jar itself held a miniature bowl (P-213).

Remains of the side walls of the tomb may still be in the excavation baulks on either side of the tomb interior. Many large brick fragments lying on top of the skeleton were probably the remains of a (horizontal) cover. For location see Figure 2.159.

Grave goods:		**Position of grave goods:**
P-212	Jar	On foot
P-213	Miniature bowl	Inside P-212

Burial 30, 42/90-011 (Figures 6.36, 6.37)

Level 2
Age 3–5 years
Sex Unknown
Type VI

Description: Five mudbricks on edge covered the lower legs and feet of a child's skeleton. The young child had been buried in a contracted position on the right side, facing southeast. The legs were tightly flexed, but the arms only slightly bent with the hands positioned near the knees.

Traces of reed matting were observed in the vicinity of the skeleton. Probably the bricks had not been placed directly on top of the dead child's legs but were originally resting on a structure of perishable material, which may have covered the entire body.

A multitude of vessels and beads was found on and around the skeleton, as well as a toggle pin and a collection of shells. The beads were lying near the neck and wrist, indicating the child had been wearing a necklace and bracelet at the moment of burial. The toggle pin—found on the chest—probably held together the clothing or the burial shroud.

The grave was found in level 2, area 26 and had been dug into level 3 remains (cf. Figures 2.146, 2.159). A selection of the objects and ceramic vessels of this burial was published by Curvers and Schwartz (1990: 14, figure 16).

Grave goods:		**Position of grave goods:**
B-005	30 beads	Around the neck
B-010	11 beads, 1 pendant	Near the left wrist
I-006	57 snail shells	Inside P-019
M-016	Toggle pin fragment	On the chest
P-009	Bowl	Inside P-010
P-010	Jar	Near the head
P-011	Bowl	Inside P-018
P-018	Jar	Near the head
P-019	Jar	Near the head
P-020	Miniature Jar	Near the head
P-021	Miniature goblet	Near the head
P-022	Bi-mouth vessel	Near the head
P-023	Bowl	Near the head
P-024	Bowl	Near the head

Burial 31, 42/90–021 (Figures 6.38, 6.39)

Level 2
Age Child
Sex Unknown
Type VI

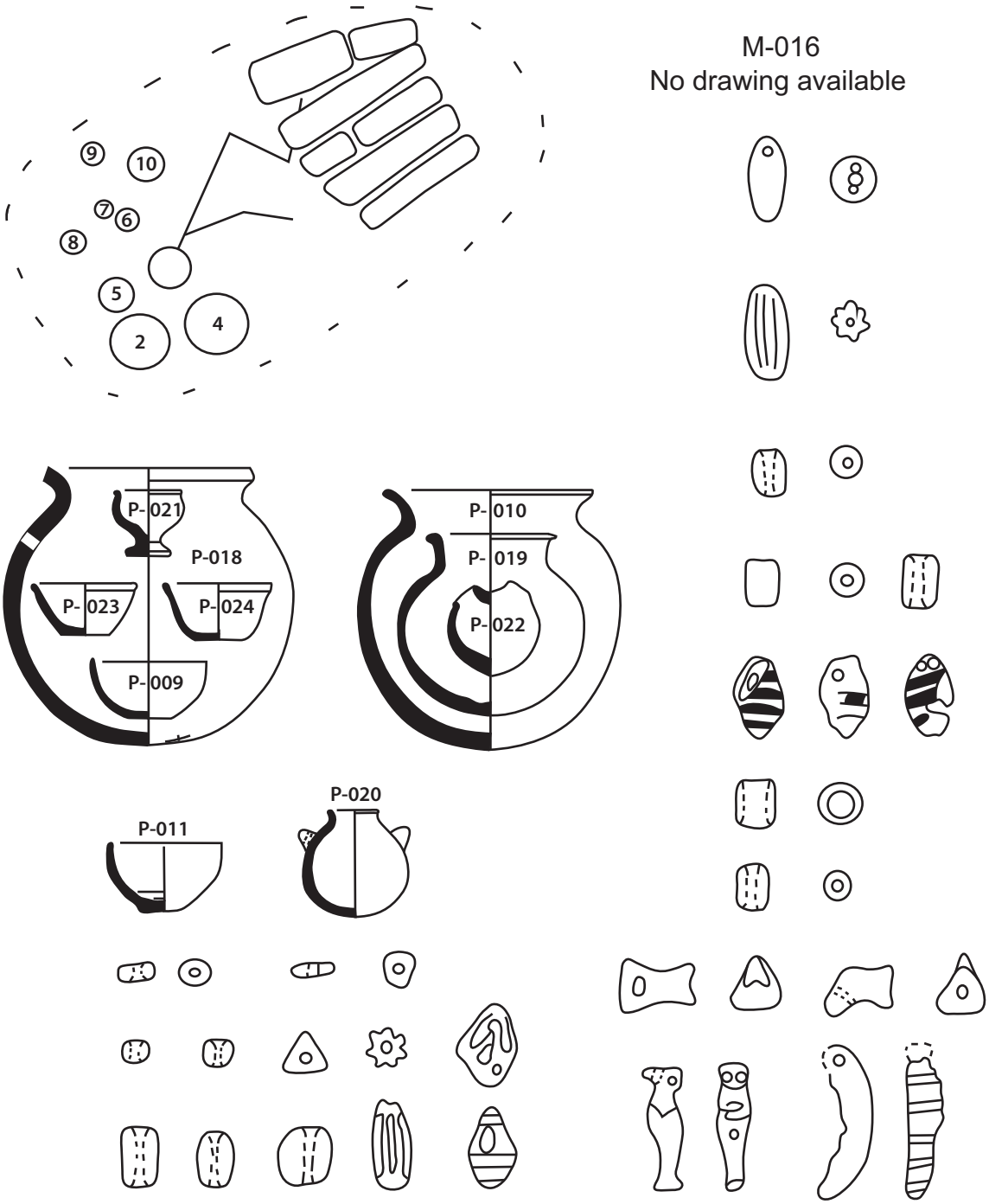


FIGURE 6.36. Burial 30. Scale of burial plan 1:20. Selection of B-005 and B-010 beads shown (for dimensions, see Chapter 5). For vessel sizes, see rim diameter data in catalogue. *Illustration prepared by Barbara Stuart*.

Description: A simple pit contained a small jar (P-015) and a few scraps of bone. Part of the burial remained unexcavated in the south balk of excavation unit 42/90. The grave, found in level 2, area 26, cut level 3, platform 44F (cf. Figures 2.147, 2.159), and was itself disturbed by a late burial.

Grave goods:		**Position of grave goods:**
P-015	Jar	Center of pit

FIGURE 6.37. Burial 30. Looking northwest. *Photograph by Hans Curvers/Glenn Schwartz.*

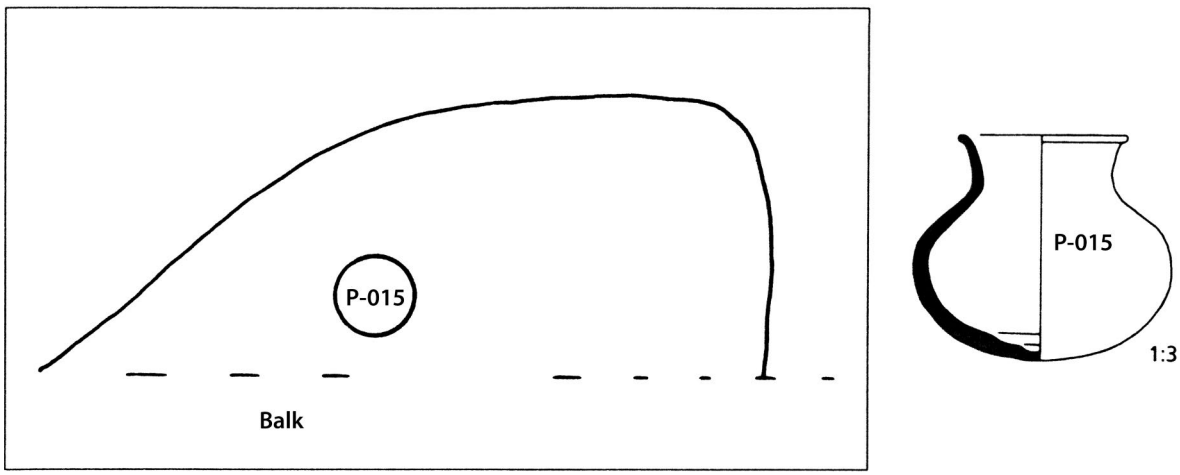


FIGURE 6.38. Burial 31. Scale of burial plan 1:20. *Illustration prepared by Barbara Stuart.*

FIGURE 6.39. Burial 31. Looking west. *Photograph by Hans Curvers/ Glenn Schwartz.*

Burial 32, 42/96–035 (Figures 6.40, 6.41)

Level 2
Age 16–32 months
Sex Unknown
Type VII

Description: A mudbrick tomb contained the skeleton of a young child surrounded by vessels and beads. The child had been buried in a contracted position on the left side, facing northwest. The legs were slightly flexed, both femora lying at a 90-degree angle to the vertebral column. The right upper arm was positioned over the rib cage, the lower arm stretched out and parallel to the thighs. The left arm was tightly flexed, the left hand lying near the face.

A total of 373 beads and pendants were found, mainly near arms and neck. Seven vessels were positioned at the feet and around the head and upper body.

The tomb, consisting of mudbricks on edge, had three extra bricks added to the northeast side, and the cover consisted of at least six bricks on edge. This burial was found in level 2, area 26 and had been dug into level 3 architecture 36/37 (cf. Figures 2.146, 2.159). (For a detailed description of the beads, and their meaning and function, see Dunham 1994.)

Grave goods:		**Position of grave goods:**
B-074	82 beads, two pendants	Near the stomach
B-075	269 beads and pendants	Around the neck
B-076	22 shell and stone beads and pendants	Near arm
P-127	Miniature goblet	Behind the back
P-128	Bowl	Inside P-133
P-129	Miniature goblet	Near the head
P-130	Miniature goblet	Near the head
P-131	Jar	Behind the shoulders
P-132	Jar	At the feet
P-133	Jar	At the feet

Burial 33, 42/108–021 (Figures 6.42, 6.43)

Level 2
Age 6–12 months
Sex Unknown
Type VII

Description: A rectangular mudbrick feature held some scraps of bone and two ceramic vessels. The brick structure consisted of one course of horizontally placed bricks measuring roughly 1.2 m by 1.2 m. These bricks are interpreted as the lowest course of a mudbrick box of which the superstructure had been destroyed.

The burial was found in the debris of level 2, area 27 (cf. Figure 2.159), fill accumulated inside the abandoned Round Building. A photograph of the grave was published by Curvers and Schwartz (1990:13, figure 13).

Grave goods:

P-041 Goblet
P-042 Jar

South of this structure, another rectangular mudbrick feature (27A) with similar dimensions was found. Although the similarity of the structure might suggest that it once held a burial as well, there are several factors that argue against this identification:

> It was preserved to a height of four mudbrick courses, making the circumstances much better suited for preservation of the contents than that of the eroded structure of adjacent burial 33, yet it still was bereft of bone material and objects.
>
> The center of the structure consisted of extremely dense, hard bricky material, while the fill of a grave usually consists of a layer of mudbrick fragments covering soft fill containing the bones.

This feature has, therefore, not been incorporated into the burial catalogue.

Burial 34, 42/114–127 (Figure 6.44)

Level 2
Age 10–12 years
Sex Unknown
Type VI

Description: Some bone fragments and (incomplete) elements of the permanent dentition were found in a layer of mudbricks and debris east of level 2 area 6 (cf. Figure 2.159). Two ceramic vessels (P-072 and P-073) were located in the vicinity, but remains of a permanent grave construction or a grave pit were not recognized. Considering the position of the vessels and the fact that small- to medium-sized complete vessels at Tell al-Raqa'i are predominantly found in graves, this pair was probably part of the mortuary furnishing. The ceramics suggest a level 2 date for the burial.

Burial 35, 48/90-007 (Figure 6.45)

Level 2
Age Child
Sex Unknown
Type VII

Description: Scraps of bone were found atop a rectangular structure of horizontally placed bricks. The superstructure of the tomb had probably been destroyed by erosion (the burial lies directly beneath topsoil) or

FIGURE 6.40. Burial 32. Scale of burial plan 1:20. Selection of beads shown. Scale of vessels 1:3. *Illustration prepared by Barbara Stuart.*

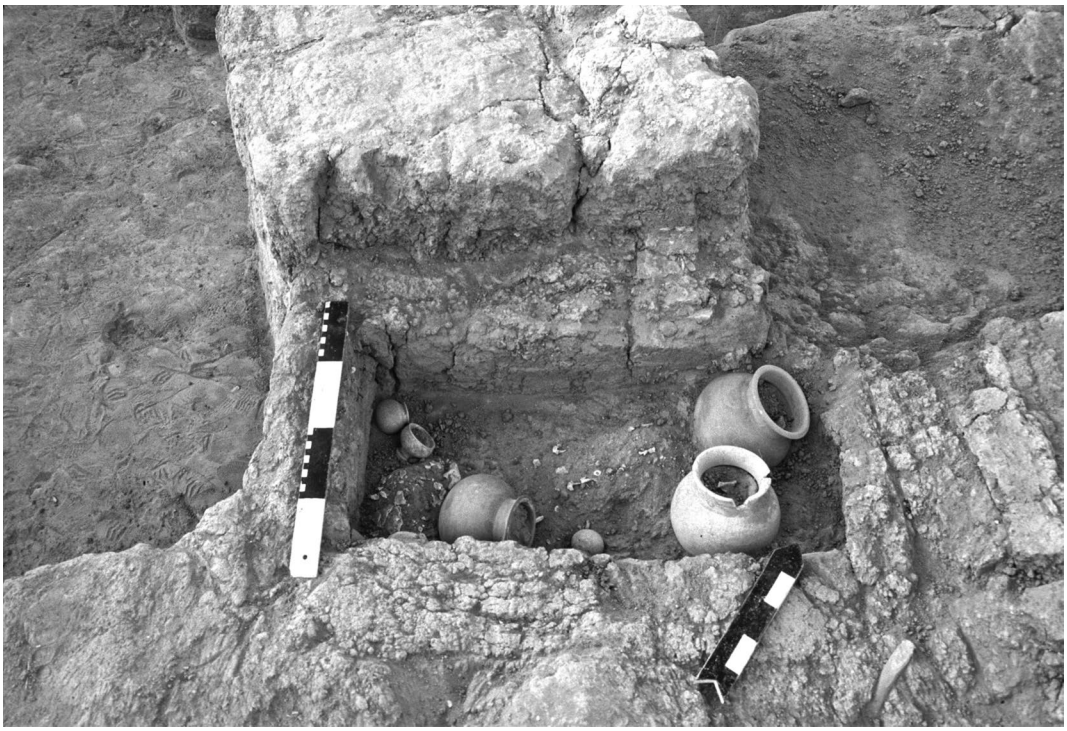


FIGURE 6.41. Burial 32. Looking southwest. *Photograph by Hans Curvers/Glenn Schwartz.*

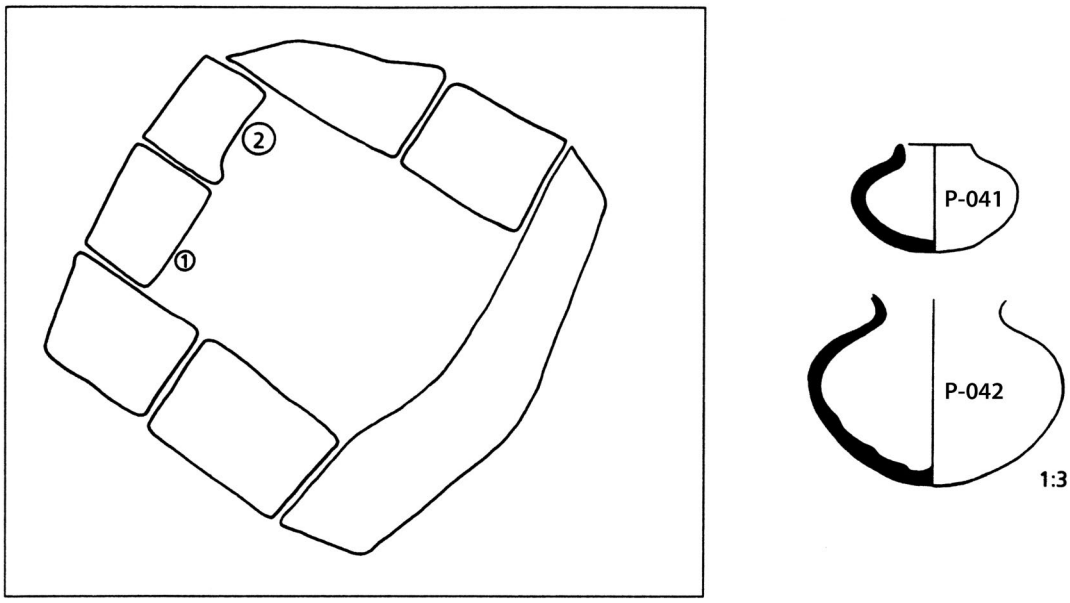


FIGURE 6.42. Burial 33. Scale of burial plan 1:20. *Illustration prepared by Barbara Stuart.*

by later human activities in the area (Figure 2.159). The ceramic vessels were found in a shallow depression in the brick layer. Photographs of A-001, A-002, and I-004 were published by Curvers and Schwartz (1990:14, figures 14, 15).

Grave goods:

A-001	Stone bovid pendant
A-002	Stone bovid pendant
A-003	Dog pendant of baked clay
B-004	Dark stone bead

FIGURE 6.43. Burial 33. Looking east. *Photograph by Hans Curvers/Glenn Schwartz.*

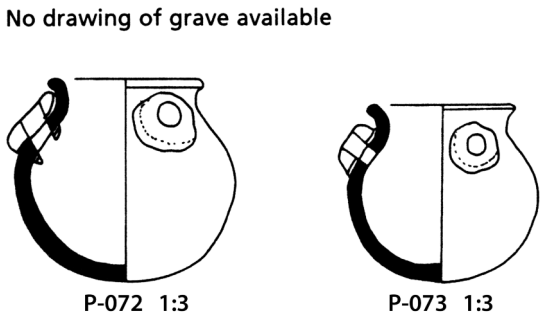


FIGURE 6.44. Burial 34.
Illustration prepared by Barbara Stuart.

B-006	Four stone beads
B-007	Five land-snail beads
I-004	Shell amulet
P-006	Miniature jar
P-007	Jar
P-013	Miniature goblet

Burial 36, 29/114–096 (Figure 6.46)

Level 4
Age 5–8 years
Sex Unknown
Type VI

Description: Skeleton of a child, lying on the right side, facing south. The arms were folded in front of the chest, legs contracted, head pointing west, feet towards the east. The bones were in a poor state of preservation, especially the long bones and cranium. The size of the bones and the presence of both deciduous and permanent elements of dentition indicate the child must have been between 5 and 8 years old at the time of death.

No traces of a permanent grave structure were found around the skeleton. Several mudbrick fragments directly south of the burial were part of the debris. The burial was found in the fill under a thin wall (74B) in level 4 area 74 (Figure 2.73).

Grave goods:	**Position of grave goods:**
P-225 Goblet	In front of forehead

Burial 37, 42/116–056

Level 4
Age 0–6 months
Sex Unknown
Type VI

The skeleton of a young infant was found on the lower floor of level 4 area 62, north of the buttress in the east wall 62B (see Figure 2.72). No burial pit dug from above was identified.

Grave goods: None

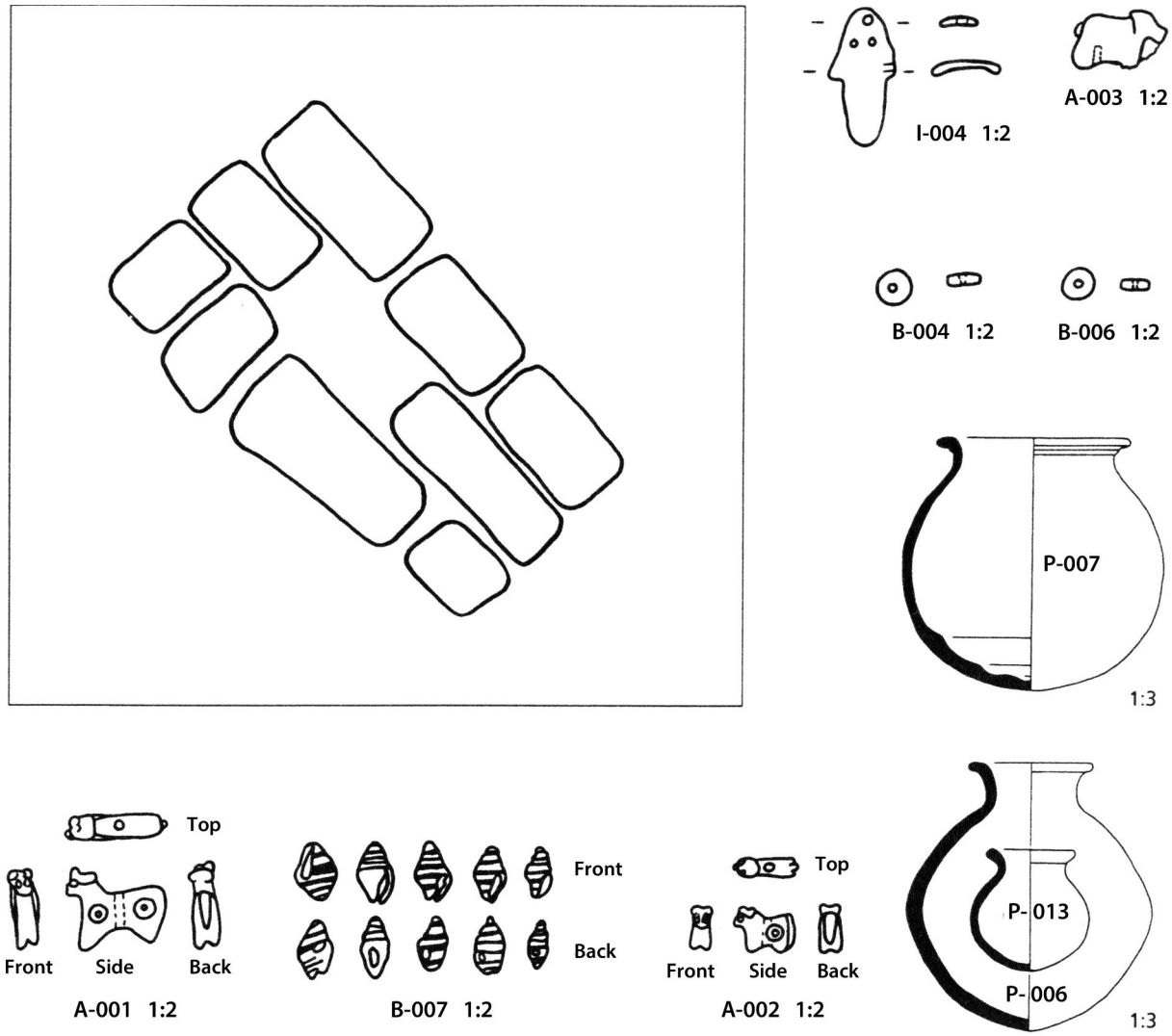
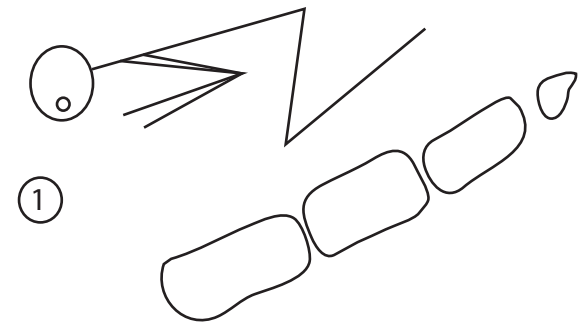


FIGURE 6.45. Burial 35. Scale of burial plan 1:20. *Illustration prepared by Barbara Stuart*.



(*Left*): FIGURE 6.46. Burial 36. Scale of burial plan 1:20. *Illustration prepared by Barbara Stuart*.

DISCUSSION

The following discussion of the Raqa'i burials is organized by individual attributes, although these should not be viewed as independent variables. Attributes include grave construction, contents, indication of social status, orientation, and location. The graves of children and of adults (level 3) are treated separately. (See Tables 6.1–6.6).

Table 6.1. Burials by Level.

Burial #	Burial	Level	Type	Pottery	Beads	Pins	Rings	Spirals	Pendants	Other	Age group
36	29/114-096	4	VI	1							C
37	42/116-056	4	VI								C
1	29/102-034	3	VII	1			1 bn			1 bn awl	A
2	29/102-048	3	VII	2							A
3	29/120-080	3	VII	1							C
4	29/120-524	3	VII		6					1 shell	C
5	29/120-567	3	VI	2		1 bn					A
6	29/126-078	3	VII								C
7	30/96-043	3	VI								C
8	30/108-081	3	VII	2							C
9	30/108-144	3	VI	3							A
10	30/132-011	3	VI	3							A
11	36/102-034	3	VI								C
12	36/120-047	3	VII								C
13	36/120-048	3	VII								C
14	36/120-049	3	VI	1		1 bn					A
15	36/120-062	3	V								C
16	36/120-084	3	VI								C
17	36/126-035	3	VII	2						2 c/br fr	C
18	42/108-037	3	VI	1	9						A
19	42/114-217	3	VI		85	3 c/br				1 shell	A
20	29/114-094	2	VII	2	49						C
21	29/120-022	2	V		8					1 shell	C
22	29/126-043	2	VII	1							C
23	29/126-117	2	VII	1							C
24	29/132-012	2	VII	7	520			2 c/br	6	3 cyl	C
25	29/132-021	2	VII	9	217				3		C
26	29/132-031	2	VII	2	20						C
27	29/132-068	2	VII	6	174			1 c/br			C
28	29/132-077	2	VII	8							C
29	29/132-078	2	VII	2							C
30	42/90-011	2	VI	10	41	1 c/br			1	57 snails	C
31	42/108-037	2	VI	1							C
32	42/96-035	2	VII	7	373				6		C
33	42/108-021	2	VII	2							C
34	42/114-127	2	VI	2							C
35	48/90-007	2	VII	3	10				3	1 shell amulet	C

Note: A = adult; bn = bone; br = bronze; C = child; c/br = copper/bronze; cyl = cylinder; fr = fragment.

Grave Construction

The two burials representing the *Level 4* sample are both child burials in which traces of a permanent structure were not present (although burial 37 might theoretically still yield some material surrounding the grave, since part of it remained unexcavated in the balk).

Level 3 yielded 19 burials, with both adults and children represented. The graves occur in three types: mudbrick "box" tombs (n = 9), pits (n = 9) and one vessel burial.

The construction of the adult graves (n = 8) displays considerable variety, including the following:

TABLE 6.2. Burials by Vessel Shape.

Burial #	Burial	Jar	Pot	Bowl	Goblet	Miniature jar	Miniature bowl	Miniature goblet	Other	Total
1	29/102-034	1								1
2	29/102-048	1		1						2
3	29/120-080	1								1
5	29/120-567	1			1					2
8	30/108-081	1			1					2
9	30/108-144	1			2					3
10	30/132-011	1	1		1					3
14	36/120-049	1								1
17	36/126-035	1		1						2
18	42/108-037			1						1
20	29/114-094	2								2
22	29/126-043					1				1
23	29/126-117							1		1
24	29/132-012	4		3						7
25	29/132-021	3						6		9
26	29/132-031	1				1				2
27	29/132-068	2		1				3		6
28	29/132-077	3		3				2		8
29	29/132-078	1					1			2
30	42/90-011	3		4		1		1	1	10
31	42/90-021	1								1
32	42/96-035	3		1				3		7
33	42/108-021	1			1					2
34	42/114-127					2				2
35	48/90-007	1				1		1		3
36	29/114-096				1					1
Totals		**34**	**1**	**15**	**7**	**6**	**1**	**17**	**1**	**82**

TABLE 6.3. Age by Category of Grave Contents.

	Level 4 children	Level 3 adults	Level 3 children	Level 2 children	Total
Total number of burials	2	8	11	16	37
Burials with objects	1	8	4	16	29
Pottery	1	7	3	15	26
Beads		2	1	9	12
Pins		4	0	1	5
Rings		1	0	0	1
Spirals		0	0	2	2
Pendants		0	0	5	5
Other		1	2	3	6

TABLE 6.4. Level by Grave Type.

	Type V	Type VI	Type VII
Level 4	—	2	—
Level 3	1	9	9
Level 2	1	3	12

TABLE 6.5. Level by Age.

	Children	Adults
Level 4	2	—
Level 3	11	8
Level 2	16	—

One tomb constructed of mudbricks placed both horizontally and vertically (burial 1)
One very deep pit with a chamber closed off by a vaulted mudbrick wall (burial 9)
One pit lined with limestone boulders (burial 5)
One tomb consisting mainly of *in situ* architectural remains (burial 2)
One individual on a floor (burial 18)

The remaining graves are simple pit graves (burials 10, 14, and 19).

The amount of energy expended on constructing these burial containers was relatively small. Burial 2 is at first glance an elaborate structure but *in situ* architectural remains were used to account for three-quarters of the container, reducing construction labor to a minimum. Digging the pit for burial 9 was also a relatively minor task, since the fill it was dug into was extremely soft.

The level 3 children (n = 11) were buried in brick tombs (n = 7), pits (n = 3), and a ceramic vessel. The modes of construction of the tomb burials are summarized in Table 6.7. Details of the construction can be found in the catalogue and in the drawings.

The children's tombs of level 3 are usually built with mudbricks on edge, occasionally with a cover of mudbricks on edge or horizontally placed bricks. Whenever a cover of mudbricks on edge was present, the tomb also had a separate mudbrick floor. During the course of excavation it was difficult to distinguish between the remains of a horizontal cover that had collapsed into the grave, architectural debris that had been used to fill the grave pit, or debris accumulating above the structure in subsequent periods. Therefore, more graves may have been provided with mudbrick covers than suggested here.

The level 2 individuals, all children (n = 16), were buried in pits (n = 3), mudbrick tombs (n = 12), and one vessel. General information on the construction of the graves is summarized in Table 6.8. Further details can be found in the catalogue and in the drawings.

All level 2 mudbrick tombs were constructed of bricks on edge; one of the tombs combined bricks on edge with horizontally laid bricks. More than half of the tombs had separately made floors and/or a cover consisting of bricks on edge.

TABLE 6.6. Age by Grave Type.

	Type V	Type VI	Type VII
Level 4 children	—	2	—
Level 3 adults	—	6	2
Level 3 children	1	3	7
Level 2 children	1	3	12

GRAVE GOODS

The Tell al-Raqa'i grave goods included ceramic vessels and personal ornaments. Apart from a few bone awls, no tools and weapons were included. None of the grave goods were made of precious metals, stones, or other rare and/or luxury materials.

Pottery: Many questions surround the presence of ceramic vessels in graves. Were they made for the occasion or taken from the collection of household items? Did the vessels belong to the deceased or were they owned by people attending the funeral? Did they contain food or drink intended for consumption in an after-life, or had they been used in a funerary meal?

Actual food remains were not recovered from any of the vessels. The shells found in P-019, burial 30 (cf. Schwartz and Curvers 1990:14 and Curvers and Schwartz 1992:401, note 7) are marine shells from either the Persian Gulf or the Red Sea and would have reached Tell al-Raqa'i for purposes other than consumption. Since they were un-pierced and thus not used for personal adornment, they may have had a symbolic meaning or functioned in a ritual.

TABLE 6.7. Construction of Level 3 Tombs Containing Children.

Burial #	Burial	Box: mudbricks on edge	Box: horizontal mudbricks	Cover: mudbricks on edge	Cover: horizontal mudbricks	Bottom: horizontal mudbricks
3	29/120-080	x		x		x
4	29/120-524	x		x		x
6	29/126-078	x			x	
8	30/108-081	x				
12	36/120-047	x				
13	36/120-048	x				
17	36/126-035		x			

TABLE 6.8. Construction of Level 2 Tombs.

Burial #	Burial	Box: mudbricks on edge	Box: horizontal mudbricks	Cover: mudbricks on edge	Bottom: horizontal mudbricks
20	29/114-094	x			
22	29/126-043	x			
23	29/126-117	x		x	x
24	29/132-012	x		x	x
25	29/132-021	x	x	x	
26	29/132-031	x			x
27	29/132-068	x			x
28	29/132-077	x			
29	29/132-078	x			
32	42/96-035	x			

Note: Missing data = 2 (burials 33 and 35 were incompletely preserved).

TABLE 6.9. Level 3 Adults: Relations among Age, Sex, Grave Type, and Grave Goods.

Burial #	Burial	Age (years)	Sex	Grave type	Pottery	Beads	Other ornaments
1	29/102-034	17–25	F	VII	1		Bone awl and ring
2	29/102-048	20–34	F	VII	2		
5	29/120-567	25–35	?	VI	2		Bone pin
9	30/108-144	25–35	?	VI	3		
10	30/132-011	25–35	?	VI	3		
14	36/120-049	55–64	M	VI	1		Bone toggle pin
18	42/108-037	?	M	VI	1	9	
19	42/114-217	30–50	F	VI		85	3 toggle pins copper/bronze

Small vessels found inside larger containers provide indirect evidence for the presence of food (in both levels 3 and 2). The smaller vessel, meant to eat or drink from, would have rested or floated on the contents of the larger vessel. After evaporation or decay of the contents, the smaller vessel would be found resting on the bottom of the larger container.

The types of pottery retrieved from the burials, including the miniature vessels, are in no respect different from vessels found in all other contexts. However, the vessels may still have been made for the occasion. With the exception of P-068 (burial 1), which was repaired in antiquity, the vessels placed in the graves were complete and undamaged at the moment of interment.

Miniature vessels were frequently deposited in the graves of children in level 2 (see Table 6.2). These small vessels may have been meant to eat or drink from (see above); they may also have been toys or functioned in a funerary ritual.

Vessels were usually placed near the head, occasionally at the feet or behind the shoulders. Whether the arrangement of the pottery in the grave was random or governed by a fixed set of rules, religious or otherwise, is difficult to determine. The pottery that was found arranged around the head or near the hands and arms could have contained food for the deceased, its position facilitating "consumption." Any pottery found at the feet and behind the body could be related to the activities and/or participants in the funerary ritual.

Personal ornaments: The most common objects in this category were beads, pendants, and pins. Beads mainly derived from the level 2 graves. Originally components of bracelets and necklaces, they were usually found on or near the hands, arms, neck, and head. Bronze or bone pins were used for fastening the clothes of the deceased or the burial shroud. Such pins were found in five graves, four of which contained adult individuals.

Each of the level 3 adult burials contained one or more objects. There is no obvious patterning visible in the different aspects of the burials (see Table 6.9). Although the grave constructions display some variety, this variety is not matched by the quantity or quality of the grave goods. All but one of these graves contained one to three ceramic vessels, and bronze or bone pins were present in four of them (see below). While beads

TABLE 6.10. Level 3 Children: Age versus Presence/Absence of Grave Goods.

Burial #	Burial	Age in months	Pottery	Beads	Pins	Rings	Spirals	Pendants	Other
3	29/120-080	12–16	1						
4	29/120-524	4–9		6					1 shell
6	29/126-078	0–1							
7	30/96-043	12–24							
8	30/108-081	66–84	2						
11	36/102-034	84–108							
12	36/120-047	0–2							
13	36/120-048	0–1							
15	36/120-062	9.5 lunar							
16	36/120-084	9.5 lunar							
17	36/126-035	36–60	2						2 c/br fr

Note: bn = bone; c/br = copper/bronze; cyl = cylinder; fr = fragment.

TABLE 6.11. Level 2 Children: Grave Goods in Relation to Age.

Burial #	Burial	Age in months	Pottery	Beads	Pins	Rings	Spirals	Pendants	Other
20	29/114-094	36–60	2	49					
21	29/120-022	0–2		8					
22	29/126-043	2–6	1						
23	29/126-117	4–6	1						
24	29/132-012	36–60	7	520			2 c/br	6	3 cyl
25	29/132-021	8–16	9	217				3	
26	29/132-031	24-48	2	20					
27	29/132-068	24–48	6	174			1 c/br		
29	29/132-078	36–60	2						
30	42/90-011	36–60	10	41	1 c/br			1	57 snails
32	42/96-035	16–32	7	373				6	
33	42/108-021	6–12	2						
34	42/114-127	120–144	2						

Notes: Missing data = 3. c/br = copper/bronze; cyl = cylinder.

were found frequently in level 3 child burials, they were found in only two of the adult graves. Both in ancient and modern times, the presence of beads in graves seems to be associated with the interment of children (cf. the Post–Level 1 Burials section above).

Grave goods were found in four of the level 3 child graves (burials 3, 4, 8, and 17), all of which were brick tombs provided with brick floors and covers (Table 6.10). The quantity of the level 3 grave goods sharply contrasts with that of the level 2 sample (see below): while the level 2 burials (n = 16) yielded a total of 1,385 beads and 63 ceramic vessels, the level 3 child burials (n = 11) contained five beads, one shell, two scraps of bronze, and five ceramic vessels in total.

Our data indicate that age was a major factor in determining the presence or absence of grave goods in the child burials of level 3. Two age groups can be distinguished, neonates (n = 5) and older children (n = 6). The neonates (stillborn?) were buried without grave goods. Their low social status would necessitate little energy expenditure upon death (Hole 1989:178; Tainter 1978: 106). Children from the older age group were either buried with a small set of grave goods or nothing at all. Reasons for this differential mortuary treatment could include factors such as the wealth and social status of the family, sex and age of the child, and circumstances surrounding or preceding death. Isolation of the pertinent variables in these cases is not possible at this point, since the differences within the sample are marginal.

The *level 2* child burials (see below) contained grave goods in varying quantities (Table 6.11). Some graves included only a few ceramic vessels and/or

beads, while five children were interred with large quantities of goods. In these five well-furnished graves, the number of beads ranged from 42 to 518, and each grave contained 6 to 10 ceramic vessels. These five burials contained a combined total of 1,307 beads and 39 ceramic vessels, a remarkable quantity considering the total of 1,385 beads and 63 ceramic vessels for the entire level 2 sample.

There appears to be no consistent relation between the quantity of grave goods and the nature of grave construction in level 2. Mudbrick tombs contained both large and small sets of grave goods, and one of the wealthiest graves (burial 30) was a simple pit with five mudbricks at the foot end.

The differential distribution of grave goods relative to age noted for level 3 appears to be replicated in level 2. Children younger than 1 year (average) were buried with a small set of grave goods, while older children could be accompanied by either a small or a large set. As in the level 3 settlement at Raqa'i, the social status of the individual and his or her family, and the wealth of the family, may have been reflected in the mortuary treatment (see above).

Age, provided the child was older than 1 year, does not appear to have been a relevant factor. Because the sex of children is difficult to establish, the significance of sex in differential mortuary treatment is unknown.

The large sets of grave goods in the level 2 burials mainly consist of ceramic vessels, beads, and pendants. In Mesopotamia, beads were worn by children in order to ward off or expel evil spirits causing disease (Dunham 1994). Such an evil spirit was the lion-headed demon Lamashtu, who attacked pregnant women, babies, and small infants; her existence in myth is a reflection of their vulnerability. Rituals performed against Lamashtu employed stones, shells, and amulets in the form of such entities as dogs, snakes, boats, and shoes (Dunham 1994; Stol 1983:95), and similar items were frequently found in the Tell al-Raqa'i level 2 graves (cf. burial 32).

Young children are subject to a variety of diseases, especially gastro-intestinal illnesses, respiratory diseases, and diarrheal infections (Mosley and Lincoln 1984:119). Breastfeeding will give the child some immunological protection. The subsequent period of weaning, however, is one in which the child is especially vulnerable, still acquiring a natural immunity of its own. Under-nutrition or even malnutrition will add to this vulnerability. Most children in "developing" countries suffer either under-nutrition or malnutrition at some time during their first 5 years of life (Mosley and Lincoln 1984:174).

The location of Tell al-Raqa'i in the urban hinterland in marginal ecological circumstances may warrant this analogy with the nutritional circumstances in some present-day developing countries (Wirth 1971: 70, 116). Moreover, the desolate status of the level 2 village compared to the level 3 layout might suggest relatively poor conditions for its inhabitants.

Babylonian letters and contracts (Stol 1983:87) indicate that children were usually breastfed for a period of 2 to 3 years. Thus, the period of vulnerability would have been roughly between 2 and 6 years (the age at which the child is supposed to have acquired a natural immunity of its own). The relatively high mortality in the Tell al-Raqa'i level 2 sample in this age group may indicate that a similar period of breastfeeding was practiced here.

The increase in the number of child burials could also be the reflection of a new era; an era in which changes in settlement patterns and the use of amulets fit into general trends towards increased urbanization. Young children now occupied a more solid position, reflected by rituals performed on them in sickness and after death.

Given these data, albeit from much later periods in Mesopotamian history, one might hypothesize that the presence of large sets of beads and pendants in some of the level 2 graves reflects the use of apotropaic figurines or of rituals performed in order to cure a sick child. In the case of children who were not cured, they would be buried adorned with the beads and amulets. For the children buried without beads (but sometimes with many vessels, indicating the family burying the child was by no means poor), death may have come suddenly; beads and amulets warding off evil spirits would have been of no use.

SOCIAL STRATIFICATION

Some degree of differentiation exists in every society, resulting from varying personal abilities and achievements. Hereditary status or wealth differentiation may be reflected by varying mortuary treatment of children, whose talents or achievements would not yet be significant or evident. The degree to which such status or wealth stratification is institutionalized is in turn a measure of the size and complexity of a social system.

Ascertaining the degree of differentiation in a mortuary population can be done by measuring the

amount of energy expended on the mortuary treatment. Energy expenditure is manifested by variables like grave size, grave construction techniques, and amount and quality of grave goods. Variables not reflected in the archaeological record include such factors as the number of people attending the funeral and the scale of a funerary meal or other rituals carried out in honor of the dead. Such elements reflect the social position occupied by the deceased in life (Parker Pearson 1982; Ucko 1969).

The *level 2* burials display a considerable range in the quantity and quality of grave goods (cf. Grave Goods section above). Given our interpretation of certain beads and pendants as amulets, one might question the extent to which the differential distribution of such ornaments represents differences in apotropaic or therapeutic practices, rather than social status or circumstances surrounding death. Some families at Tell al-Raqa'i may not have had the means to acquire the paraphernalia required to perform these rituals, and such poverty would be reflected in mortuary treatment. Status might also be indicated by the quantity of ceramic vessels present, or by the quantity of personal ornaments of a non-ritual use (non-amuletic beads, copper/bronze spirals, etc.).

Indications of social stratification at Tell al-Raqa'i in the *level 3* period are particularly difficult to identify. Neither the adults' nor the children's grave goods display a significant variety in either quantity or quality. All adults were buried with some grave goods, regardless of grave type, age, or sex, and there appears to be no correlation between the amount of energy expended on the construction of their graves and the quantity or quality of the grave goods buried with them.

The presence or absence of grave goods in the level 3 child burials appears to be an age-related phenomenon (cf. Grave Goods section): the graves of neonates were devoid of grave goods, while four of the other graves contained one or two ceramic vessels and/or personal ornaments. Grave goods were only found in brick tombs.

Orientation and Arrangement of Body

In Tables 6.12 through 6.15, orientation of the body is indicated by points of the modern compass, with the following additional variables:

L = on the left side
R = on the right side
B = on the back
C = in a contracted position
E = in an extended position

In the *level 3* period, the inhabitants of Tell al-Raqa'i had a preference for burying their dead in the fetal position (i.e., with contracted limbs, hands in front of the chest or the face) with a slight preference for arrangement of the body on the left side. Burial along a north–south axis was avoided. Instead, the body was aligned on a west to east or northwest to southeast orientation, with the head in the west or the northwest. One individual (burial 10) was interred with a different orientation and position: extended on his/her back with the head pointing northeast. This individual and the child of burial 6 are the only persons

Table 6.12. Level 4 Children: Orientation and Arrangement.

Burial #	Burial	Age in months	Sex	Position: L/R/B	Position: C/E	Orientation atlas-sacrum	Facing
36	29/114-096	60–96	?	R	C	W–E	S
37	42/116-056	0–6	?	?	?	?	?

Table 6.13. Level 3 Adults: Orientation and Arrangement.

Burial #	Burial	Age in years	Sex	Position L/R/B	Position C/E	Orientation atlas-sacrum	Facing
1	29/102-034	17–25	F	L	C	NW–SE	NE
2	29/102-048	20–34	F	L	C	SW–NE	NW
5	29/120-567	25–35	?	L	C	W–E	N
9	30/108-144	25–35	?	R	C	W–E	S
10	30/132-011	25–35	?	B	E	NE–SW	SE
14	36/120-049	55–64	M	L	C	W–E	N
18	42/108-037	?	M	R	C	W–E	S
19	42/114-217	30–50	F	?	?	?	?

TABLE 6.14. Level 3 Children: Orientation and Arrangement.

Burial #	Burial	Age in months	Position L/R/B	Position C/E	Orientation atlas-sacrum	Facing
3	29/120-080	12–16	R	C	NW–SE	SW
4	29/120-524	4–9	R	C	NW–SE	SW
6	29/126-078	0–1	L	C	E–W	S
7	30/96-043	12–24	?	?	?	?
8	30/108-081	66–84	L	C	W–E	N
11	36/102-034	84–108	?	?	?	?
12	36/120-047	0–2	R	C	W–E	S
13	36/120-048	0–1	?	?	(Tomb NW–SE)	?
15	36/120-062	9.5 lunar	?	?	?	?
16	36/120-084	9.5 lunar	R	E	SW–NE	SE
17	36/126-035	36–60	?	?	(Tomb W–E)	?

TABLE 6.15. Level 2 Children: Orientation and Arrangement.

Burial #	Burial	Age in months	Position L/R/B	Position C/E	Orientation atlas-sacrum	Facing
20	29/114-094	36–60	R	C	W–E	S
21	29/120-022	0–2	?	?	?	?
22	29/126-043	2–6	L	C	NW–SE	NE
23	29/126-117	4–6	R	C	NW–SE	SW
24	29/132-012	36–60	R	C	W–E	S
25	29/132-021	8–16	L	?	W–E	N
26	29/132-031	24-48	R	C	W–E	S
27	29/132-068	24–48	L	C	W–E	N
28	29/132-077	?	?	?	(Tomb W–E)	?
29	29/132-078	36–60	R	C	W–E	S
30	42/90-011	36–60	R	C	SW–NE	SE
31	42/90-021	?	?	?	(Pit SW–NE)	?
32	42/96-035	16–32	L	C	SW–NE	NW
33	42/108-021	6–12	?	?	(Tomb NW–SE)	?
34	42/114-127	120–144	?	?	?	?
35	48/90-007	?	?	?	(Tomb NW–SE)	?

at Tell al-Raqa'i buried with the head pointing east. In the adult burial sample, there is no obvious correlation between age and/or sex and the position and direction of the body.

In the *level 2* period (Table 6.15), the children were buried in the fetal position without a preference for a particular side. The preferred orientation is west to east (n = 7); also attested are northwest to southeast (n = 4) and southwest to northeast (n = 3). Burial along a north–south axis was avoided. There was no obvious relationship between the side on which the child was buried and the direction the body was facing. Nor was there a correlation between the age of the child and the position and direction of the burial.

LOCATION OF BURIALS

The burials of the *level 3* period do not exhibit a spatial concentration to the same degree as those of level 2 (see below). In a period in which the mound appears densely inhabited, the dead were buried wherever suitable space—that is, avoiding proximity to living quarters—was available. One pattern observed is the concentration of two or three burials in an area such as level 3, areas 49, 66, and the adjacent 25, 62, and 59. Although the burials from level 3, area 66 and adjacent area 25 were both adult females and the individuals buried in area 49 were newborn infants, there is no other evidence to support the existence of separate

burial areas for adults and children. The dead were buried in uninhabited places, resulting in the occurrence of many intramural burials.[1]

In the *level 2* period, the children were buried on the outskirts of the settlement, apparently as far away from inhabited areas as possible. A concentration of 10 burials was found in level 2 areas 13 and 15 in the northwest. Four burials were relatively close together in level 2, area 26, and the two remaining burials were in separate locations in the south. Burial of adult individuals must have taken place outside the mound (on the practice of separating adults and children in death, see Hole 1989).

Although the level 2 village consisted of only a few extant architectural units, its sample of child burials is significantly larger than that of level 3. Various explanations for this pattern could be offered, such as the erosion and disappearance of a large percentage of the level 2 architecture, higher fertility and mortality of the population during the level 2 period (assuming levels 2 and 3 were roughly equivalent in length of occupation), or the use of the mound for burial by a nomadic population in the level 2 period. Such a nomadic component could either have had its temporary base in the Tell al-Raqa'i vicinity or have visited the mound seasonally (e.g., at harvest time). Like the sedentary population, they would have buried their children at the mound while the adults had their last resting place elsewhere.

Mortuary Samples

In addition to Tell al-Raqa'i, burials from the mid–third millennium BCE have been excavated at a number of middle Khabur and neighboring sites.

The excavators of *Tell Abu Hujeira* unearthed a series of 16 child burials (seven jar burials and nine mudbrick boxes).

The cooking ware jar burials contained newborn individuals; five of these burials were found under the floors of (inhabited?) rooms. Two other jars were situated outside the contemporary architectural remains but well within the settlement. Apart from a single bead, no grave goods were found in any of the jars.

The mudbrick boxes (N = 9) were located in the vicinity of architectural remains but always outside the actual living quarters. They contained the skeletons of children, all buried in the fetal position, either on the left or the right side. The orientation of these tombs was east–west, with the head pointing west.

The mudbrick tomb constructions resemble a few of the simple tombs of Tell al-Raqa'i, such as burials 22, 25, and 26. Some of the objects found in the Abu Hujeira tombs also resemble the contents of Raqa'i level 2 tombs, such as the beads and amulets in the shape of birds, fish, a bull, and sheep.

At *Tell Abu Hafur*, seven graves from the mid–third millennium were found in area A (Kolinski and Lawecka 1992). Three of these graves were infant jar burials, found under the earthen floors of rooms within the settlement. The kitchen ware jars contained skeletal remains of newborns, without grave goods. One of the jars was placed in a pit that was subsequently covered by mudbricks, while another jar had been closed by a thin layer of clay. Contents and position of these burials are similar to the Tell al-Raqa'i burial 15.

Three of the graves were mudbrick tombs, two of which held the remains of young children (the third was partly destroyed and contained no skeletal remains). The children had been buried in a contracted position, on the right side facing south–southwest. Both graves have a north–northwest to south–southeast orientation. Only one of the tombs contained grave goods, consisting of three vessels, a necklace composed of black, round beads, pierced shells and bone plaques, and two bracelets—one on each hand—composed of small bone beads, one bigger frit bead, and a mollusk shell. Some of the shell beads (Kolinski and Lawecka 1992: figure 24:12) bear a strong resemblance to those found in Tell al-Raqa'i burial 25.

The one adult individual found at this site was buried in a contracted position in a square pit that was covered by at least one course of mudbricks. One ceramic vessel, two bone pins, and possibly two spindle whorls accompanied the deceased. This grave can be compared to Raqa'i burials 5 and 14, both burials containing an adult individual accompanied by one or two vessels and a bone pin.

At *Tell Knedig*, 20 burials dating to the first half of the third millennium were found (Klengel-Brandt, Kulemann-Ossen, and Martin 2005). As at Raqa'i, three types of burial container had been used; jars (N = 4), mudbrick tombs (N = 7) and simple pits (N = 10). The jars and mudbrick tombs contained children and infants, while the simple pits exclusively held adult burials. As far as could be discerned the dead had been buried in a contracted position, lying on the side, without a strict preference for one particular orientation. Seven of the burials had an east–west orientation with the head in the west, while four other individuals had

been buried with a northwest to southeast orientation, head towards the northwest. Not all individuals were accompanied by grave goods; five were devoid of any objects. All except one burial—in which only four beads were found—held one or more ceramic vessels.

One burial has been reported from *Tell Mulla Matar*. Behind a retaining wall dated to the Early Bronze period, a round-bottomed burial jar was found, containing the remains of a very young infant (Sürenhagen 1990:141), comparable to Tell al-Raqa'i jar burials 15 and 21.

Tell Rad Shaqrah yielded seven third-millennium burials originating from building levels dated to the Early Dynastic II and III periods.

Four shallow pits contained the remains of adult individuals (Bielinski 1992:80) accompanied by beads, pottery, and bronze pins. The richest burial contained six ceramic vessels and one bronze knife. All four individuals were buried in a contracted position, aligned on an east–west axis, facing north.

Of the three child burials found at Tell Rad Shaqrah only two were well-preserved. One child had been buried in a box made of mudbricks on edge (cf. Raqa'i burials 22 and 29), accompanied by a small globular Metallic Ware jar (Bielinski 1992:83). The other child had been interred in a small but deep stone-lined pit covered with a large limestone slab (Bielinski 1992:85). This child was between 5 and 6 years old, wore bronze earrings, a necklace, and a bracelet of hundreds of frit and stone beads. Six ceramic vessels were also found in the tomb. Burial in a completely stone-lined container is not attested elsewhere for the third-millennium middle Khabur. Burial 5 at Raqa'i, an adult grave, was lined by limestone boulders on only one side.

At *Tell Melebiya*, nine burials were excavated, seven of which were assigned to Early Dynastic II/level 3 (= Raqa'i 3, but see below) and two (2440 and 2494) to Early Dynastic III (= Raqa'i 2, approximately). The interred individuals were exclusively children, as was the case in Raqa'i level 2. All of the Melebiya graves are said to have been found under the floors of private houses (Lebeau 1993:229).

Among these nine burials were three simple pits. A copper pin was included in one of these burials (2209), while each of the other two (491 and 492) contained two or three ceramic vessels (Lebeau 1993:230). While these three burials are assigned by Lebeau to Melebiya level 3 (= Raqa'i 3), the pottery of burial 492 (including a collared rim jar and a flat-based flaring-walled goblet) and perhaps also burial 491 is comparable to that of Raqa'i 2. These graves can be compared to Tell al-Raqa'i burials 32 and 34. At Tell al-Raqa'i, one copper/bronze pin was found in a level 2 child burial, together with 10 vessels, 42 beads, and 57 snails (see burial 30).

Five mudbrick tombs were uncovered at Tell Melebiya. Two of these (2241 and 2243) had a vaulted mudbrick cover, two (495 and 2440) were covered by horizontally placed bricks or half bricks and one (2232) was closed by large stones. Of these tomb-building methods, only the second has parallels at Tell al-Raqa'i. The stone-covered tomb contained the remains of a young infant accompanied by four ceramic vessels, one copper pin, and six beads, contents that can be compared with those of Tell al-Raqa'i level 2, burial 30, as noted above. The two tombs with a vaulted mudbrick cover (2241 and 2243) had a substructure of horizontally laid bricks, a construction method perhaps attested in Raqa'i level 2 burials, 33 and 35, although only one course of mudbricks was preserved of the latter two structures. However, their proximity to the edge of the tell makes it likely that the superstructures were completely eroded or even robbed.

The two Melebiya vaulted tombs display a significant difference in their contents. While one contained the bones of a young infant and three ceramic vessels, the other yielded a much richer variety of objects. The reason for this discrepancy could be the age difference of the buried children; judging from the published drawings the richer and larger tomb seems to have contained an older child. Alternatively, there may have been a difference in the social status of the two individuals.

Of the remaining two mudbrick tombs, one (495, Melebiya level 3) was covered by a horizontally placed mudbrick, while the other (2440, Melebiya level 2) was covered by a row of half-bricks. Horizontal covers were found on Tell al-Raqa'i burials 6 (level 3) and 22 (level 2). The manner in which the cover of Melebiya tomb 2440 (Lebeau 1993:241) was applied resembles that of Raqa'i, level 2, burial 23, dating to the same period as well as having an equally small amount of grave goods. Tomb 2494 did not contain any bone material or objects and will therefore not be considered in this comparison.

At *Tell Mashnaqa*, a mudbrick tomb contained the remains of a young child. The child was buried lying on the left side in a contracted position. Interred with the child were two miniature ceramic vessels lying in front of the face (Monchambert 1985:229). This burial, contemporaneous with Raqa'i level 3 (niveau 2, chan-

tier A) can be compared to Raqa'i, Level 3, burials 8 and 17, both mudbrick tombs containing the remains of a buried child and two vessels.

The *Tell 'Atij* burial sample displays great similarity to that of Tell al-Raqa'i. On the main tell, three mudbrick tombs were excavated. One of these tombs (D13A3) yielded a dozen ceramic vessels, among which were some Metallic Ware vessels and others comparable to Raqa'i level 2 pottery, but no skeleton (Fortin 1988a:148). This feature may have been a storage facility rather than a grave, or perhaps the bones received secondary treatment in another location. Of the remaining two graves, one (E16A8) contained three ceramic vessels comparable to those of Raqa'i level 3, while no information is given about method of construction of the tomb or age of the buried individual. The third tomb (D13A15) belongs to an infant buried with three ceramic vessels, a necklace of white beads, and a shell pendant in the shape of a bull. Shell pendants were found in several of the richer tombs from the Raqa'i level 2 period (see also grave G2 from Abu Hafur north of Hasseke, dating to a Raqa'i level 2 time period; Kolinski and Lawecka 1992).

At the 'Atij secondary tell, a dozen graves were installed during the third millennium (Fortin 1994:379). At the time, the area was not inhabited, so we can speak of a true cemetery. The mudbrick tombs were close together, stretched out in a long line. Most of the burials were oriented north–northwest to south–southeast, some almost north–south, an orientation that was avoided at Raqa'i. The containers were made of sun-dried mudbricks, either set on edge or placed in a vertical position. Some had a horizontal mudbrick cover. The tombs contained primary inhumations of people buried in the fetal position. The grave goods consisted of ceramic vessels, necklaces, and bracelets with beads made of semi-precious stone or even metal (Fortin 1988b:113). Many of the ceramic vessels were miniature vases (Fortin 1988b: figure 25). As at Tell al-Raqa'i, smaller vessels were sometimes placed inside larger ones (Fortin 1990b). The ceramic vessels found in these tombs generally parallel those of Raqa'i level 2, indicating a post–Ninevite 5 time frame for these burials (contra Fortin's identification of the graves as "Ninevite 5").

When compared to the Tell al-Raqa'i sample, the burials on the 'Atij secondary tell bear a close resemblance to a number of the level 2 graves, with similar ceramic vessels and personal ornaments. Still, the average number of ceramic vessels is larger at the 'Atij secondary tell, as is the number of personal ornaments made of materials such as semi-precious stone and metal. While there is at least one burial in the secondary tell of 'Atij of a "young adolescent" (Fortin 1990a: 246), there may have been a preponderance of child graves as at Raqa'i 2, particularly if the presence of miniature pottery is an indication of the age of the buried individual. The absence of specific age information prohibits a definitive conclusion on this matter.

Middle Khabur Graves: General Comments

The inhabitants of the Middle Khabur region in the mid–third millennium practiced primary inhumation and took special care when constructing burial containers and selecting grave goods. Mudbrick tombs and pit graves were the favorite types of burial and remained so throughout the mid–third millennium.

Interment of children most often took place in tombs made of mudbricks on edge. These burial containers were constructed for the occasion in the debris of uninhabited areas in the settlement, or, as in the case of 'Atij, on a separate burial ground. Occasionally, children were buried in ceramic vessels, especially the very young, or in simple pits (in one case, a stone-lined pit). At Tell al-Raqa'i, there seems to have been a tendency to bury very young children with few or no grave goods. Whether this pattern holds true for the entire region cannot be determined until more detailed information concerning the age of buried children becomes available.

Information concerning the burial of adults is scarce. The adult individuals found at Tell Rad Shaqrah and Tell Knedig were buried in simple pits, and those from Tell al-Raqa'i level 3 were interred either in a pit (n = 6) or a brick tomb (n = 2). The complete absence of adult burials from level 2 at Raqa'i indicates a change in burial customs after the level 3 period. Presumably, adults were buried elsewhere, perhaps in a cemetery at some distance from the mound. A separate location for child burials is probably also indicated by the evidence from the secondary tell at 'Atij as well as at Abu Hujeira north of Hasseke, primarily from a Raqa'i 2 time frame.

Ceramic vessels and personal ornaments such as beads, pendants, and bronze pins were the most common grave goods. Except for some bone awls found in adult burials at Tell al-Raqa'i and the bronze knife from Rad Shaqrah, tools and weapons were not included in

the burials. The chronological pattern of grave wealth observed at Raqa'i, where the level 2 burials are significantly richer than those of level 3, is not as obvious elsewhere in the middle Khabur Region. At present, this situation may be attributed to the small size of the available samples and to uncertainties about the relative dating of the tombs.

Burial in the fetal position was preferred at all sites. At Tell al-Raqa'i, Tell Abu Hujeira, Tell Knedig, and Rad Shaqrah, alignment of the body on an east–west axis was preferred and a north–south axis avoided. At Tell 'Atij, there seems to have been no "taboo" concerning burial with a north–south alignment, especially on the secondary tell.

Some burial samples are too small to detect a preference for a specific type of burial container. At Tell al-Raqa'i, Tell Abu Hafur, Tell Knedig, and Rad Shaqrah, pits, jars, and mudbrick tombs were in fashion at the same time. Jar burials always contain the remains of neonates, an indication for a different status of the newly born (stillborn?), while adults were usually buried in pits.

Mortuary Evidence from Northern Mesopotamia

When considering early-middle third-millennium BCE burial data from elsewhere in northern Mesopotamia, it should be noted that the excavation reports frequently suffer from an absence of reliable data on many aspects of mortuary treatment, age, and sex. A comparison with the mortuary data from Tell al-Raqa'i and other middle Khabur sites, therefore, can only be of a tentative quality.

Throughout northern Mesopotamia various methods were employed for disposal of the deceased, usually with a slight preference for one particular kind of mortuary treatment per site or region. At Tell Kutan in the Eski Mosul region of northern Iraq (roughly contemporary with Tell al-Raqa'i level 3 and earlier), both adults and children were buried in jars carefully sawn in two to permit the body to enter (Forest 1987:194). At Tell Chagar Bazar pit burials were most commonly used for the disposal of the dead. In the middle Khabur region, mudbrick tombs were preferred for the burial of children and simple pits for adults.

Tell Chagar Bazar in the upper Khabur yielded the largest burial sample from the mid-third millennium in this region (Mallowan 1936; 1937). In the period comprising Chagar Bazar levels 5–2 (of which levels 5–4 are Ninevite 5 in date and contemporary to some degree with Tell al-Raqa'i levels 5–3, and levels 3–2 are contemporaneous with Tell al-Raqa'i level 2 and later) both adults and children were buried in simple pits in a slightly flexed position, with an east–west or west–east orientation (no preference) and accompanied by some grave goods. Jar burials were also found (Mallowan 1936:17) but generally must have been without any accompanying objects since they do not reappear in the catalogue of the burials. Only two jar burials are cited in the catalogue, both of infants buried in level 2. One jar burial was associated with a ceramic vessel (found in the jar?), and the other with two vessels and a copper dagger. Compared with the jar burials in the middle Khabur region, this is an unusual find and does not support a hypothesis that infants were not considered worth significant energy expenditure.

A cemetery was identified on the eastern edge of the site in Chagar Bazar level 5, including the pit graves of six adults and one child. The child burial (G71) had richer grave goods than several adults, suggestive of high social status (and perhaps explaining its presence in an area otherwise reserved for adults). In succeeding levels, all graves were found within the settlement itself in areas of domestic architecture. Seven of the nine Chagar Bazar level 4 graves (Mallowan 1936:18; 1937: 124) were adult burials, and the remaining two were of infants buried without grave goods. All but one of these were buried with a selection of objects such as vessels (1–5 per grave), a necklace, two pendants, three toggle pins (all from the same grave), and a stamp seal. The presence of adults in the burial sample, as well as the quantity and quality of the objects they were buried with is consistent with the pattern found at Tell al-Raqa'i level 3.

As at Tell al-Raqa'i, the post–Ninevite 5 period at Chagar Bazar shows a drastic reduction in the number of adult burials found on the tell. Of the 45 burials found in these levels (level 3: N = 26 and level 2: N = 19), only nine were adults, the remainder consisting of children (N = 23) and infants (N = 13). In level 3 (all simple pit burials), only one of the eight infants was buried with grave goods (two ceramic vessels), thus displaying a pattern of age differentiation similar to that at Tell al-Raqa'i. Four of the 11 children and five of seven adults were buried with one to three ceramic vessels, a picture consistent with the modest quantities of grave goods in Raqa'i level 3. Chagar Bazar 2, including one child and one infant buried in a mudbrick box, two infants in a jar, and other individuals buried in simple pits, displays a similar pattern. An exception, however,

is the treatment of infants: all five were buried with one to three ceramic vessels, and one had some frit beads. Four out of 11 children had associated grave goods consisting of one to six ceramic vessels, one silver pendant, and some frit beads. Of the two adults, one was buried with three ceramic vessels (of which one was a miniature vessel).

Burial Location

As in the middle Khabur area, burial in contemporary sites in northern Syria and northern Mesopotamia usually took place in vacant spaces amidst the (contemporary?) habitation areas. Excavators frequently use the term "intramural" when the location of the graves is discussed, or mention that the burials "had been dug below the floors of houses" (Mallowan 1936: 17; 1937:116). The author assumes that unless explicitly stated (and proven) otherwise, burial in vacant dwellings is meant (see also Valentini 2011:277). These areas could be temporarily out of use (cf. Tell al-Raqa'i burial 15) or abandoned permanently. An exception to the pattern is the cemetery of Chagar Bazar level 5 (cf. also the 'Atij secondary tell in the middle Khabur).

The separation of adults and children in death observed in Tell al-Raqa'i level 2 and perhaps attested in contemporaneous contexts from 'Atij, Abu Hujeira, and Chagar Bazar 3–2 (see above) is not corroborated by the 35 burials found in the Lower Town South phases 4–7 at Tell Leilan in this period, although it may be noted that the majority of the graves (26 of 35) are of children and neonates (Weiss 1990:204). The paucity of graves from pre-Sargonic period Tell Brak is a curiosity.

Grave Construction

Burial in simple pits was particularly favored at Chagar Bazar, Germayir (Mallowan 1937), Tell Billa Ninevite 5 levels (Schwartz 1986:47), and at Nuzi (test pit L4, burials 7, 11; Starr 1939:31). These pits contained the remains of adult individuals and associated grave goods. The construction and the contents of the Nuzi burials can be compared to Tell al-Raqa'i burials 14 and 19 as well as to Leilan IIIa, stratum 36, burial 2 (Schwartz 1982:31 and 1988:15) and the burials "en pleine terre" from Tell Kutan (Forest 1987:192). Type VII mudbrick tombs from the mid-third millennium with a structure similar to those at Tell al-Raqa'i are found primarily in tells in the middle Khabur region itself (see Mortuary Samples section above), with examples also attested from Abu Hafur and Abu Hujeira in the upper Khabur region north of Hasseke (Kolinski and Lawecka 1992).

The architecture of Tell al-Raqa'i burial 9, a shaft-grave from level 3, can be compared to a late Ninevite 5 period (= Raqa'i 3) grave found at Tell Thuwaij (Numoto 1996:83). At the north side of a deep pit, a small oval room had been dug out. In this burial chamber the skeleton of an adult individual was found, lying on the left side in a contracted position. The body was oriented east–west with the head in the east, facing south. With the deceased two ceramic vessels were interred: a Ninevite 5 excised bowl with a small cup placed inside.

The grave construction of Tell al-Raqa'i burial 30 (level 2), consisting of an elliptical pit with traces of reed matting and mudbricks at the foot end, has a parallel at Tell Leilan; in period IIIc, stratum 19 (roughly equivalent to late Raqa'i 4), a pit burial with partial brick covering and a mat shroud was found (Schwartz 1982:37 and 1988:22). Other parallels for this kind of burial were found in Ninevite 5 contexts at Tell Mohammed Arab in the Eski Mosul region, burial 54V:23 (Roaf 1983:74) and at Tell Chagar Bazar, burial G65 from level 4 (Mallowan 1936:58).

Orientation of the Body

Generally, the dead were buried in the fetal position, i.e., with legs flexed, arms bent at the elbow, and hands in front of the face or chest. Orientation of the grave either corresponds to the orientation of the architectural remains the grave was found in or to the cardinal points of the compass, sometimes with a preference for one particular direction. At Tell Chagar Bazar, all individuals were buried in the fetal position. There was no fixed rule for the direction of the head and therefore no preference for burial on the left or the right side. Mallowan mentions that "the orientation of the grave nearly always corresponded with the line of the room walls above" (Mallowan 1937:118). Still it is remarkable that the burials from levels 5 and 4 were all oriented strictly west–east with the head in the west. At Tell Germayir, burial took place "beneath the floors of private houses" (Mallowan 1937:124). The orientation of the body, buried in a fetal position, corresponds with the layout of the architecture and could be along a north–south or an east–west axis, with a slight preference for orientation in an east–west direction with the head in the west. At Tell Karrana 3 in northern Iraq (post-Uruk, early Ninevite 5 date), the children buried in grave pits were invariably lying on the right side in an east–west orientation. Their bodies were buried in the fetal position with the head in the east, facing north (Stein in Wilhelm and Zaccagnini 1993:203–206). At

Tell Arbit, the two burials from the Ninevite 5 period were both oriented east–west with the head in the west (Mallowan 1937:126). At Tell Leilan, the body of burial 1 in stratum 19 was buried in the fetal position with a north–south orientation. The deceased was buried lying on the right side with the head in the north, facing west (Schwartz 1988:23). Burial 2 from stratum 36 has a west–east orientation. The head is in the west and the deceased was buried in the fetal position on the left side, facing north (Schwartz 1988:15).

Grave Goods

Although many individuals, especially the newly born, were buried without accompanying grave goods, it was more common in northern Syria and northern Mesopotamia during the mid-third millennium to include some objects in the grave. Suitable object categories were ceramic vessels, personal ornaments, and occasionally small weapons and tools. The quality and quantity of the grave goods from burials at one site can display significant variation from one grave to another.

Ceramic vessels form the most common category of (surviving) grave goods in these two northern regions. Their number per grave generally ranges from 1 to 36 (Leilan IIIc, stratum 19, burial 1: Schwartz 1982: 37 and 1988:22), but in one case, over 100 were found (Kelly-Buccellati 1990). Usually between one and four vessels were included in the grave goods (cf. Forest 1987:194; Mallowan 1936 and 1937; Roaf 1983:74). Miniature vessels are very common in children's graves in the middle Khabur region (cf. Mortuary Samples section) as well as at Abu Hujeira in the upper Khabur (Martin and Wartke 1993/4:212), at Chagar Bazar 3–2 (Mallowan 1936:55–57) and in the Ninevite 5 levels at Tell Mohammed Arab (Roaf 1983:83–94) and Tell Kutan (Forest 1987:194) in the Eski Mosul region. Small vessels, sometimes even large sets, are often found inside larger vessels, as in Tell al-Raqa'i (cf. Grave Goods section), Tell Leilan, period III (Schwartz 1982: 37 and 1988:22), Tell Mohammed Arab, Ninevite 5 (Roaf 1983: 74), and Tell Thuwaij, Ninevite 5 contexts in Eski Mosul (Numoto 1996).

Beads, pendants, and copper/bronze pins are found in many burials from the mid-third millennium. The dead were frequently buried wearing necklaces and bracelets consisting of beads made of carnelian, frit, faience, and shells (Mallowan 1936 and 1937; Roaf 1983:74 and 83–94; Schwartz 1982 and 1988). Ornaments made of precious metals were rarely found in burials in this region and period. One silver bead was retrieved from Tell Mohammed Arab (burial 54V:23, Roaf 1983:74), and more recently at Tell Jikan a golden earring was found together with some cylinder seals in a Ninevite 5 burial, a unique find so far (Bolt and Green 2003:524). Adult individuals, and occasionally children, were frequently buried in clothing or a shroud that was closed at the shoulder by a copper/bronze pin. Such pins were found in several graves at Tell Chagar Bazar 5–3 (Mallowan 1936:57), Tell Arbit (Mallowan 1937:117), Tell Mohammed Arab (Roaf 1983:74), Tell Leilan, and Tell Billa (Schwartz 1986:49). The pins are usually found on or near the shoulder of the grave occupant.

At Tell Chagar Bazar, levels 5–2, the quantity and quality of the objects accompanying the dead display great variety, both between members of the same age group and between members of different age groups. Although most children are buried with one or two ceramic vessels, a few of them were provided with grave goods matching those found in some of the richest graves of adult individuals. This phenomenon indicates the existence of a social system in which social status, and therefore inequality, was hereditary (Brown 1981:25).

Although the graves from Germayir in the upper Khabur (Mallowan 1937:124–126), primarily pit inhumations, are largely contemporary with Raqa'i, level 2, their modest grave goods are reminiscent of Raqa'i, level 3. At Tell Arbit in the upper Khabur (Mallowan 1937), two adult burials were found, also dating to the period of Raqa'i level 2. The grave goods buried with one of the two individuals stand in sharp contrast to those of Germayir. The interred individual, whose body lay in a mudbrick-vaulted grave, was accompanied by six ceramic vessels, various copper objects, beads, and a cylinder seal. The other burial was not so well provided and only contained four ceramic vessels. This difference in grave goods could mark a difference in status during life, of which the copper dagger and adze in particular could be symbolic.

CATALOGUE OF BURIAL POTTERY IN CHAPTER 6 FIGURES

Figure 6.1. Burial 1

P-068. Raq 89. Burial 1, Level 3, area 66. 29/102-034. Medium Simple Ware, light yellow exterior, pink/brown core and interior, wheelmade. Lime plaster repair around neck on two areas that had been broken. Rim diameter 14.5 cm.

Figure 6.2. Burial 2

P-074. Raq 89. Burial 2, Level 3, area 25. 29/102-048. Medium Simple Ware, light yellow, fine sand, wheelmade.

P-075. Raq 89. Burial 2, Level 3, area 25. 29/102-048. Fine Simple Ware, exterior light yellow to light pink, interior light pink, fine and medium lime, wheelmade. Rim diameter 10.7 cm.

Figure 6.4. Burial 3

P-086. Raq 92. Burial 3. Level 3, area 60. 29/120-080. Fine Simple Ware, light yellow, no visible inclusions, wheelmade. Rim diameter 10 cm.

Figure 6.7. Burial 5

P-208. Raq 92. Burial 5. Level 3. 29/120-567. Medium Simple Ware, light yellow, fine sand, incised potmark ("x") on base. Rim diameter 16.3 cm.

P-209. Raq 92. Burial 5. Level 3. 29/120-567. Fine Simple Ware, light yellow-green, no visible inclusions. Rim diameter 9.7 cm.

Figure 6.9. Burial 8

P-119. Raq 90. Burial 8. Level 3, area 62, phases a–b. 30/108-081. Fine Simple Ware, light whitish-yellow, no visible inclusions, wheelmade. Rim diameter 9.3 cm.

P-120. Raq 90. Burial 8. Level 3, area 62, phases a–b. 30/108-081. Fine Simple Ware, light yellow, no visible inclusions, incised, wheelmade. Rim diameter 6.1 cm. Figure 4.35, Chapter 4.

Figure 6.10. Burial 9

P-138. Raq 90. Burial 9, Level 3, area 62. 30/108-144. Fine Simple Ware, light greenish-gray, fine lime, wheelmade. Rim diameter 7.5 cm.

P-139. Raq 90. Burial 9, Level 3, area 62. 30/108-144. Medium Simple Ware, light yellow to light yellow-brown, fine and medium lime, wheelmade. Rim diameter 13.9 cm.

P-147. Raq 90. Burial 9, Level 3, area 62. 30/108-144. Fine Simple Ware, light yellow, no visible inclusions, wheelmade. Rim diameter 5.4 cm.

Figure 6.12. Burial 10

P-037. Raq 88. Burial 10. Level 3, area 11. 30/132-011. Fine Simple Ware, light yellow, fine sand, no visible inclusions, wheelmade. Rim diameter 7.3 cm.

P-038. Raq 88. Burial 10. Level 3, area 11. 30/132-011. Fine Simple Ware, light yellow, fine sand, wheelmade. Rim diameter 9.8 cm.

Figure 6.14. Burial 14

P-050. Burial 14. Level 3. 36/120-049. Medium Simple Ware. Light yellow, medium vegetal inclusions, fine sand. Rim diameter 20 cm.

Figure 6.17. Burial 17

P-214. Burial 17. Level 3. 36/126-035. Fine Simple Ware, light yellow, fine lime inclusions. Rim diameter 11.5 cm.

P-215. Burial 17. Level 3. 36/126-035. Fine Simple Ware, pink/orange, fine lime inclusions. Rim diameter 8 cm.

Figure 6.18. Burial 18

P-067. Burial 18. Raq 89. Level 3, area 47, phase b. 42/108-037. Medium Simple Ware, light yellow, rim mended in antiquity with lime plaster, wheelmade. Rim diameter 23.5 cm.

Figure 6.20. Burial 20

P-201. Raq 91. Burial 20. Level 2. Dug into level 3 area 15. 1352:11. 29/114-094. Medium Simple Ware, light yellow, fine sand. Rim diameter 14.3 cm.

P-211. Raq 91. Burial 20. Level 2. 29/114-094. No further data available.

Figure 6.22. Burial 22

P-063. Raq 89. Burial 22. Level 2, area 10. 29/126-043. Fine Simple Ware, light yellow, fine sand, wheelmade. Rim diameter 4.2 cm.

Figure 6.24. Burial 23

P-109. Raq 90. Burial 23. Level 2, area 15. 29/126-117. Fine Simple Ware, light brownish-pink, fine sand, wheelmade. Rim diameter 3.3 cm.

Figure 6.26. Burial 24

P-103. Raq 89. Burial 24. Level 2, area 13. 29/132-012. Vegetal-tempered Ware, light yellow exterior, vegetal inclusions, wheelmade. Rim diameter 17.2 cm.

P-084. Raq 89. Burial 24. Level 2, area 13. 29/132-012. Fine Simple Ware, light yellow, fine sand, wheelmade. Rim diameter 10.2 cm.

P-099. Raq 89. Burial 24. Level 2, area 13. 29/132-012. Fine Simple Ware, black burnished exterior, no

visible inclusions, rim slightly warped, wheelmade. Rim diameter 4.9 cm.

P-104. Raq 89. Burial 24. Level 2, area 13. 29/132-012. Fine Simple Ware, light yellow except darker greenish-gray at exterior base (from stacking in kiln?), fine sand, wheelmade. Rim diameter 10.9 cm.

P-102. Raq 89. Burial 24. Level 2, area 13. 29/132-012. Fine Simple Ware, brownish-pink, fine sand, wheelmade. Rim diameter 7.8 cm.

P-100. Raq 89. Burial 24. Level 2, area 13. 29/132-012. Fine Simple Ware, light yellow, fine sand, no visible inclusions, wheelmade. Rim diameter 11.1 cm.

P-101. Raq 89. Burial 24. Level 2, area 13. 29/132-012. Fine Simple Ware, light pink exterior, fine sand, wheelmade. Rim diameter 8.9 cm.

Figure 6.27. Burial 25

P-106. Raq 89. Burial 25. Level 2, area 13. 29/132-021. Fine Simple Ware, light yellow, fine sand, wheelmade. Rim diameter 11.3 cm.

P-098. Raq 89. Burial 25. Level 2, area 13. 29/132-021. Fine Simple Ware, reddish-pink wash with areas of dark brown-purple/violet on exterior/interior, light yellow fabric beneath, no visible inclusions, wheelmade. Rim diameter 7.1 cm.

P-097. Raq 89. Burial 25. Level 2, area 13. 29/132-021. Fine Simple Ware, light yellow, no visible inclusions, fine sand, wheelmade. Rim diameter 3.15 cm.

P-105. Raq 89. Burial 25. Level 2, area 13. 29/132-021. Medium Simple Ware, light yellow exterior, fine sand, wheelmade. Rim diameter 10.1 cm.

P-096. Raq 89. Burial 25. Level 2, area 13. 29/132-021. Medium Simple Ware, light yellow, fine sand, incised, handmade. Rim diameter 4.3 cm.

P-093. Raq 89. Burial 25. Level 2, area 13. 29/132-021. Fine Simple Ware, light yellow, no visible inclusions, base lopsided due to large lump of clay on bottom, wheelmade. Rim diameter 4.7 cm.

P-092. Raq 89. Burial 25. Level 2, area 13. 29/132-021. Fine Simple Ware, light pinkish-brown, no visible inclusions, no visible inclusions, string-cut base, thumb marks along body, wheelmade. Rim diameter 5.3 cm. Figure 4.42, Chapter 4.

P-095. Raq 89. Burial 25. Level 2, area 13. 29/132-021. Fine Simple Ware, light yellow, no visible inclusions, string-cut base, finger impressions above base, rim warped, wheelmade. Rim diameter 5.1 cm. Figure 4.41, Chapter 4.

P-094. Raq 89. Burial 25. Level 2, area 13. 29/132-021. Fine Simple Ware, light yellow, no visible inclusions, string-cut base, wheelmade. Rim diameter 4.5 cm.

Figure 6.29. Burial 26

P-113. Raq 90. Burial 26. Level 2, area 13. 29/132-031. Medium Simple Ware, light yellow, fine sand, wheelmade. Rim diameter 16.3 cm.

P-112. Raq 90. Burial 26. Level 2, area 13. 29/132-031. Fine Simple Ware, light yellow, fine sand, wheelmade. Rim diameter 3.8 cm.

Figure 6.32. Burial 27

P-144. Raq 90. Burial 27. Level 2, area 13. 29/132-068. Fine Simple Ware, exterior light yellow in band 2.5 cm below rim, otherwise light pink, fine sand and lime, wheelmade. Rim diameter 11 cm.

P-136. Raq 90. Burial 27. Level 2, area 13. 29/132-068. Fine Simple Ware, light yellow, fine sand, string-cut base, wheelmade. Rim diameter 6.2 cm.

P-142. Raq 90. Burial 27. Level 2, area 13. 29/132-068. Medium Simple Ware, brownish-pink, vegetal inclusions, medium lime, fine and medium white sand, wheelmade. Rim diameter 19.7 cm.

P-143. Raq 90. Burial 27. Level 2, area 13. 29/132-068. Fine Simple Ware (Imitation Metallic Ware), exterior brown slip/wash, interior dark gray, brown core, fine sand, wheelmade. Rim diameter 9.2 cm.

P-145. Raq 90. Burial 27. Level 2, area 13. 29/132-068. Medium Simple Ware, light yellow, no visible inclusions, wheelmade. Rim diameter 3.2 cm.

P-125. Raq 90. Burial 27. Level 2, area 13. 29/132-068. Fine Simple Ware, light yellow, no visible inclusions, wheelmade. Rim diameter 3.3 cm.

Figure 6.34. Burial 28

P-219. Raq 93. Burial 28. Level 2. 29/132-077. Fine Simple Ware, light yellow, fine lime inclusions. Rim diameter 8 cm.

P-218. Raq 93. Burial 28. Level 2. 29/132-077. Medium Simple Ware, light yellow, fine lime inclusions. Rim diameter 9.5 cm.

P-222. Raq 93. Burial 28. Level 2. 29/132-077. Fine Simple Ware, light yellow, fine lime inclusions. Rim diameter 3.4 cm.

P-221. Raq 93. Burial 28. Level 2. 29/132-077. Metallic Ware, brown, no visible inclusions. Rim diameter 8 cm.

P-224. Raq 93. Burial 28. Level 2. 29/132-077. Medium Simple Ware, light yellow, fine lime inclusions. Rim diameter 10 cm.

P-217. Raq 93. Burial 28. Level 2. 29/132-077. Medium Simple Ware, light yellow, fine lime inclusions. Rim diameter 10 cm.

P-223. Raq 93. Burial 28. Level 2. 29/132-077. Fine Simple Ware, light yellow, fine calcite inclusions. Rim diameter 3 cm.

P-220. Raq 93. Burial 28. Level 2. 29/132-077. Fine Simple Ware, light yellow, fine calcite inclusions. Spout closed with gypsum. Rim diameter 6 cm.

Figure 6.35. Burial 29

P-213. Raq 93. Burial 29. Level 2. 29/132-078. Fine Simple Ware, light yellow, fine sand/lime inclusions. Rim diameter 5.8 cm.

P-212. Raq 93. Burial 29. Level 2. 29/132-078. Fine Simple Ware, light yellow, fine lime inclusions. Rim diameter 11 cm.

Figure 6.36. Burial 30

P-018. Raq 87. Burial 30. Level 2, area 26. 42/90-011. Medium Simple Ware, light yellow, vegetal inclusions, fine sand, exterior scraped, two holes on opposite sides, incised X near bottom, rim finished on wheel. Rim diameter 13.7 cm.

P-021. Raq 87. Burial 30. Level 2, area 26. 42/90-011. Fine Simple Ware, light yellow, no visible inclusions, string-cut base, wheelmade. Rim diameter 4.5 cm.

P-023. Raq 87. Burial 30. Level 2, area 26. 42/90-011. Fine Simple Ware (Imitation Metallic Ware), orange-red with dark areas, fine sand, wheelmade. Rim diameter 7.1 cm.

P-024. Raq 87. Burial 30. Level 2, area 26. 42/90-011. Fine Simple Ware (Imitation Metallic Ware), orange-red with dark areas near rim, fine sand, scraped, wheelmade. Rim diameter 7.25 cm.

P-009. Raq 87. Burial 30. Level 2, area 26. 42/90-11. Fine Simple Ware, light green, fine sand. Rim diameter 7.7 cm.

P-010. Raq 87. Burial 30. Level 2, area 26. 42/90-011. Medium Simple Ware, exterior/interior light yellow, light pink core, fine sand and lime. Rim diameter 14.3 cm.

P-019. Raq 87. Burial 30. Level 2, area 26. 42/90-011. Metallic Ware, exterior and rim interior with bands/zones of black on brown-red ground, interior dark brown below neck, striations horizontally/spirally on exterior body, fine sand, smooth, wheelmade. Rim diameter 8.9 cm. Figure 4.45, Chapter 4.

P-022. Raq 87. Burial 30. Level 2, area 26. 42/90-011. Fine Simple Ware, light yellow, lime inclusions, some vegetal temper, handmade.

P-011. Raq 87. Burial 30. Level 2, area 26. 42/90-011. Fine Simple Ware, light yellow upper exterior, elsewhere pink-brown, fine sand and lime. Rim diameter 7.8 cm.

P-020. Raq 87. Burial 30. Level 2, area 26. 42/90-011. Fine Simple Ware, light yellow, lime inclusions, two pierced lugs, handmade. Rim diameter 3.5 cm. Figure 4.43, Chapter 4.

Figure 6.38. Burial 31

P-015. Raq 87. Burial 31. Level 2, area 26. 42/90-021. Fine Simple Ware, exterior light yellow (slip), interior/core brown/pink, lime inclusions, smoothed, wheelmade. Rim diameter 6.6 cm. Figure 4.44, Chapter 4.

Figure 6.40. Burial 32

P-132. Raq 90. Burial 32. Level 2, area 26. 42/96-035. Medium Simple Ware, light yellow, fine sand, wheelmade. Rim diameter 11 cm.

P-129. Raq 90. Burial 32. Level 2, area 26. 42/96-035. Fine Simple Ware, light yellow, no visible inclusions, string-cut base, wheelmade. Rim diameter 5.75 cm.

P-127. Raq 90. Burial 32. Level 2, area 26. 42/96-035. Fine Simple Ware, light yellow, no visible inclusions, wheelmade. Rim diameter 3.3 cm.

P-130. Raq 90. Burial 32. Level 2, area 26. 42/96-035. Fine Simple Ware, light yellow, no visible inclusions, wheelmade. Rim diameter 3.6 cm.

P-133. Raq 90. Burial 32. Level 2, area 26. 42/96-035. (Imitation?) Metallic Ware, exterior light brown/orange and dark brown, light brown/tan circular zone around base, interior light brownish-yellow, no visible inclusions, exterior lightly burnished below neck, wheelmade. Rim diameter 12.2 cm.

P-131. Raq 90. Burial 32. Level 2, area 26. 42/96-035. Fine Simple Ware (Imitation Metallic), exterior dark brown to black, interior brown, no visible inclusions, wheelmade. Rim diameter 9.4 cm.

P-128. Raq 90. Burial 32. Level 2, area 26. 42/96-035. Fine Simple Ware, light yellow exterior, fine sand, wheelmade. Rim diameter 7.4 cm.

Figure 6.42. Burial 33

P-041. Raq 88. Burial 33. Level 2, area 27. 42/108-021. Medium Simple Ware, light yellow/light green, medium and fine lime inclusions, handmade. Rim diameter 3 cm.

P-042. Raq 88. Burial 33. Level 2, area 27. 42/108-021. Fine Simple Ware, light yellow, fine lime inclusions, wheelmade.

Figure 6.44. Burial 34

P-072. Raq 89. Burial 34. Level 2. Above level 4, area 6, under topsoil. 42/114-127. Fine Simple Ware, light yellow, fine sand, applied spout, wheelmade. Rim diameter 6.1 cm.

P-073. Raq 89. Burial 34. Level 2. Above level 4, area 6, under topsoil. 42/114-127. Fine Simple Ware, light yellow, applied spout, no visible inclusions, wheelmade. Rim diameter 5.9 cm.

Figure 6.45. Burial 35

P-007. Raq 87. Burial 35. Level 2. 48/90-007. Fine Simple Ware, no visible inclusions, wheelmade. Rim diameter 8 cm.

P-006. Raq 87. Burial 35. Level 2. 48/90-007. Fine Simple Ware, light yellow, no visible inclusions, wheelmade. Rim diameter 5 cm.

P-013. Raq 87. Burial 35. Level 2. 48/90-007. Fine Simple Ware, light yellow, no visible inclusions, wheelmade. Rim diameter 3.5 cm.

Figure 6.46. Burial 36

P-225. Raq 92. Burial 36. Level 4. 29/114-96. Fine Simple Ware, exterior light yellow, interior/core pink/orange, fine lime inclusions. Rim diameter 9.5 cm. No drawing available.

NOTE

[1] See also Valentini (2011) on the occurrence of burials within the settlement and the habit of burying the dead above and inside abandoned buildings.

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Chapter 7

Technological and Functional Analysis of the Chipped Stone Artifacts Discovered at Tell al-Raqa'i

Jacques Chabot

Within the framework of the excavations of the site of Tell al-Raqa'i directed by Glenn Schwartz and Hans Curvers, 1,974 flint artifacts were found. This material includes a great quantity of *débitage*, cores, and tools made from both flakes and blades. Most of the blades were made with a special knapping technique involving the application of pressure with a lever and can be understood as "Canaanean blades."[1] The presence of such blades and two *chaînes opératoires* on the site corresponds exactly to the patterns that we have already observed on several sites of northern Mesopotamia in our previous analyses of the material from 'Atij, Gudeda, Mozan, Nustell, and Telul eth-Thalathat (in association with Y. Nishiaki) or in study of smaller samples from Bderi, Kashkashok, and Kutan (in association with P. Anderson) and Leilan (in association with A. van Gijn and P. Anderson).

Regrettably, stone tools post-dating the Paleolithic have long been neglected by scholars, despite the fact that they provide important testimonies on the daily activities of site inhabitants. As our research has already demonstrated, they are an indispensable clue for all archaeologists interested in the evolution of technology (Chabot and Pelegrin 2012), domestic and agricultural activities, and the complex distribution networks that emerged at this time.

In this chapter we present, stage by stage, the results of the various technological analyses that we conducted on the corpus of lithics from Tell al-Raqa'i (Table 7.1) in order to understand its "life": raw material supplies, techniques used to knap both flakes and blades (technology), transformation of the blanks into tools (typology), and discovery of these tools' functions (use-wear analyses). The stratigraphic and spatial analysis will be the subject of a forthcoming article to be prepared in association with G. Schwartz.

Raw Material

At the moment, there is regrettably no reliable chemical analysis to determine the origin of artifacts made of flint.[2] It is only with macroscopic observations, involving analysis of the cortical spots, color, and texture of the stone, that we can obtain information on how the ancients obtained their flint supply. Using such techniques, we can determine whether people derived their raw material from a streambed (secondary source) or if they derived it directly from a deposit (primary source). This issue is important for ascertaining the complex networks of exchange between villages that could be several hundreds of kilometers distant from each other.

Table 7.2 displays the results of our analysis of the cortical spots on cores. One can observe that the majority of the cores from Raqa'i still carry raw layers of chalky cortex (77 of the 109 complete and fragmentary cores). This pattern is not surprising if we consider the

Table 7.1. Inventory of Lithic Material.

	Débitage	Flake tools	Blade tools	Cores	Total
Number	1,496	85	284	109	1,974
%	75.8	4.3	14.4	5.5	100

type of non-elaborated *débitage* of which they were the object (opportunistic domestic flaking, see below). More important still is the proportion of cores having undergone transport by water. Indeed, 69% experienced a long transport and 23% a limited transport, while only 6 (8%) seem to derive from a primary source. Although this information concerns only the domestic flake industry, it shows us that for this *chaîne opératoire* (tools on flakes), the ancients invested very little research in order to get their raw material and were content to "pick" small blocks in the Khabur River and surrounding wadis.

Tables 7.3 and 7.4 present the intersection of data (grain of the flint vs. color) concerning the raw material of the flake operating process: entire and complete cores and proximal and entire flakes. Gray colors dominate both cores and flakes: 89% of the cores are gray and 81% of the flakes. The fine- and medium-grain examples dominate, while very fine and coarse grain specimens are rare. This result corresponds exactly to the model that we obtained in our studies of other collections in the Khabur valley (Chabot 1998, 2002). Furthermore, field surveys conducted in 1995 allowed us to verify that the large proportion of good quality flint is not attributable to a selective choice by the ancient people but is the result of the type of raw material found in quantity in the bed of the Khabur (Chabot 1998, 2002). The gray flint with fine and medium grain accounts, respectively, for 43% and 39% of the cores (i.e., 82% of the cores) and for 35% and 27% of the flakes (62%). Further, 10% of the flakes are of brown or beige tints in fine grain and 5% with medium grain, while no brown core with medium grain was found on the site and eight brown cores (10%) were in fine grain.

Table 7.5 presents the results of the analysis of the raw material of the blades. The fine grain material dominates with a proportion of 67% as opposed to 24% for the medium grain and even lower values for very fine or coarse grain. This is interesting because experiments involving the manufacture of long blades demonstrated that the ideal raw material to use is flint that is neither too fine nor too coarse. As for the flakes, gray is the most common color (62%), but other colors are also represented, such as gray with "ribbons" (1.3%), light gray (19%) and pink-gray (12.7%). It is important to note that gray accounted for 44% of the flake "assemblage" but only 26% of the blades.

All these variations, together with the absence of cores, show that blades were produced outside the village of Raqa'i with a raw material that was not found locally. Indeed, although some classes of flint are alike for flakes and blades (e.g., fine grain flint), raw blocks of large dimensions are totally absent in northeastern Syria, and such blocks were indispensable to make blank blades like those present at Raqa'i. Archaeological excavations and surveys have shown that the pink-gray flint of very good quality characteristic of many Canaanean blades found in northern Mesopotamia is

TABLE 7.2. Study of Cortex (Crust) on Cores.

	Cores with patina cortex	Cores with mid-patina cortex	Cores with chalky cortex	Total
Cores with cortex	53	18	6	77
Relative frequency (%)	68.8	23.4	7.8	100

TABLE 7.3. Raw Material of Entire and Complete Cores.

Cores	Very fine grain	Fine grain	Medium grain	Coarse grain	Total (%)
Gray	0	12	18	3	33 (39)
Dark gray	0	18	6	0	24 (29)
Light gray	0	6	9	3	18 (21)
Pink-gray	0	0	0	0	0
Brown	0	5	0	0	5 (6)
Dark Brown	0	2	0	0	2 (2)
Light brown	0	1	0	0	1 (1)
Beige	0	0	0	1	1 (1)
White	0	0	0	0	0
Black	0	0	0	0	0
Pink	0	0	0	0	0
Red	0	0	0	0	0

Table 7.4. Raw Material of Proximal and Entire Flakes.

Flakes	Very fine grain	Fine grain	Medium grain	Coarse grain	Total (%)
Gray	26	99	93	26	244 (44.1)
Gray with ribbons	0	1	1	0	2 (0.4)
Dark gray	28	73	16	4	121 (21.9)
Dark gray with ribbons	0	2	0	0	2 (0.4)
Light gray	0	16	37	20	73 (13.2)
Pink gray	0	0	2	1	3 (0.5)
Gray-beige	0	1	0	0	1 (0.2)
Translucent gray	0	1	0	0	1 (0.2)
Brown	12	34	9	1	56 (10.1)
Brown with ribbons	0	1	0	0	1 (0.2)
Dark brown	3	3	1	0	7 (1.3)
Light brown	1	8	5	0	14 (2.5)
Brown-red	2	3	0	0	5 (0.9)
Beige	0	7	10	1	18 (3.3)
White	0	0	1	0	1 (0.2)
Black	2	0	0	0	2 (0.4)
Pink	0	0	0	0	0
Red	0	0	2	0	2 (0.4)
Total (%)	**74 (13)**	**249 (45)**	**177 (32)**	**53 (10)**	**553 (100)**

Table 7.5. Raw Material of Complete and Entire Blades.

	Very fine grain	Fine grain	Medium grain	Coarse grain	Total (%)
Gray	0	40	13	6	59 (25.9)
Gray with ribbons	0	3	0	0	3 (1.3)
Translucent gray	0	1	0	0	1 (0.4)
Dark gray	1	3	1	0	5 (2.2)
Light gray	0	16	20	8	44 (19.3)
Pink-gray	0	27	2	0	29 (12.7)
Brown	1	11	1	2	15 (6.6)
Translucent brown	0	0	1	0	1 (0.4)
Pink-brown	0	1	0	0	1 (0.4)
Dark brown	0	1	0	0	1 (0.4)
Light brown	1	4	2	0	7 (3.1)
Beige	0	44	7	1	52 (22.8)
White	0	1	5	2	8 (3.5)
Black	0	0	0	0	0
Pink	0	0	2	0	2 (0.9)
Red	0	0	0	0	0
Total (%)	**3 (1.3)**	**152 (66.7)**	**54 (23.7)**	**19 (8.3)**	**228 (100)**

only present in large raw blocks in the Bingöl region of southeastern Turkey (Chabot 1998, 2002). It is not surprising, therefore, that Canaanean workshops were only discovered in Turkey and not in Syro-Mesopotamia (Behm-Blancke 1992; Rosen 1997). As a result, there is good reason to think that most of the raw material used for the Raqa'i blades comes from the Bingöl region. Another type of flint that is an integral part of the same phenomenon is the beige variety, representing 3.3% of the flakes and 22.8% of the blades at Raqa'i.

In general, Canaanean blades already known from this cultural context are usually made with fine grain flint of beige, gray, or pink-gray colors (Chabot 1998,

2002). The raw material of the flints of Tell al-Raqa'i is very typical of the previously attested patterns for this area. This is true for both types of *débitage*, flakes and blades.

TECHNOLOGY

Once the raw materials were obtained, blanks were produced. Technological analysis, including experimental analysis, informs us about the knowledge and ability of the flint knappers. Every technique (direct percussion, indirect percussion, pressure techniques) produces its own scars on the blanks (type of butt, impact point, more or less prominent bulb, etc.; for details see Chabot 2002; Chabot and Pelegrin 2012). By comparing the scars on tools produced in modern experiments with those on archaeological tools, we may diagnose the techniques used by the ancient flint knappers.

FLAKES

Since flake knapping took place at Tell al-Raqa'i, it is not surprising that *débitage* products of this operating process are more common than those associated with the imported blades. A total of 109 cores (31 complete and 78 fragmentary) (Table 7.6), 333 complete flakes, and 964 fragmentary flakes were discovered in the various levels of the site.

As noted above, all the cores are flake cores and show no real shaping (Figure 7.1). One can understand this as an opportunistic type of flaking, because the knapper decided on how and where to apply a given blow of the hammer only according to the result obtained after the previous one. As flakes were removed, a new striking platform was chosen according to the new morphology of the core (multipolar *débitage*). The striking platforms and the butts are almost always cortical or plain. This method of knapping without a predetermined strategy quickly exhausts the cores and uses them inefficiently, with few products obtained per core,[3] contrary to the Canaanean technique discussed below.

The presence of this method is confirmed by examination of the numerous flakes detached from these cores (Figure 7.2). Indeed, the great majority of these possess a plain or cortical butt, a well-marked and tangible impact point without lip, a large prominent bulb, bulb scars (*esquillement du bulbe*), and fine "mustache"-like scars around the bulb. Some flakes made on fine and very fine grain flint present very marked ripples. Although the presence of cones provides good evidence of this technique, they are rather rare in this collection.

Tables 7.7 and 7.8 present the inventory of the complete (i.e., with the possibility of a small and insignificant break) and entire (i.e., totally intact)

TABLE 7.6. Inventory of Raqa'i Cores.

	Entire cores	Fragmentary cores	Total
Number	31	78	109
%	28.4%	71.6%	100

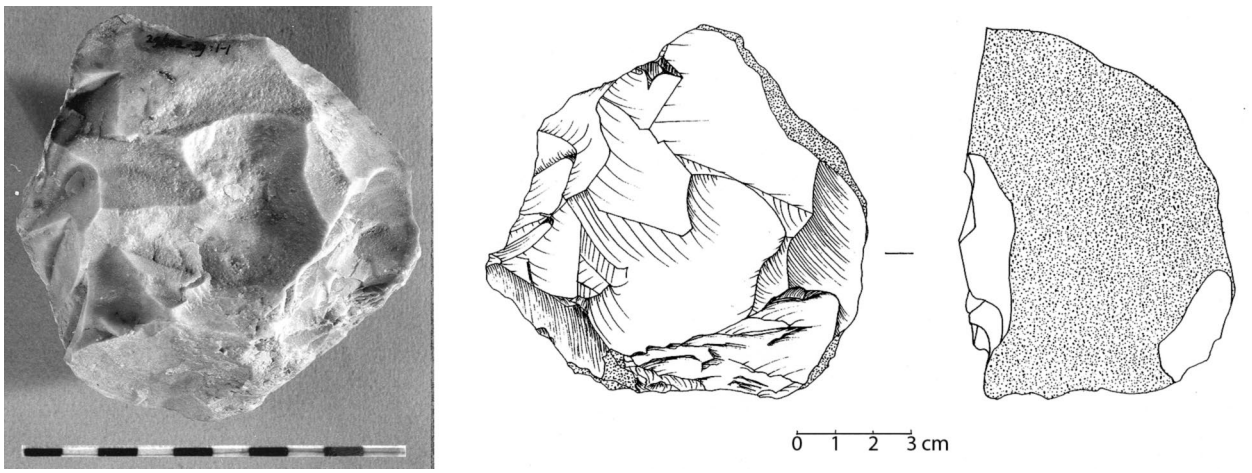


FIGURE 7.1. Flake core (S1577). *Photograph by Jean-Denis Strich. Illustration prepared by Julie Leclerc.*

débitage products. According to the importance of the cortical spot observed on the artifacts, we can distinguish three types of flakes corresponding to phases of knapping:

Cortex removal flakes (first phase of débitage).

Entire or proximal flakes on which cortex is present on at least 50% of the surface. These flakes were obtained in the initial phase of the knapping of a given core.

Flakes of the second phase of débitage.

Entire or proximal flakes for which cortex is present on less than half of the surface. These flakes were obtained in the intermediate phase of the knapping of a given core.

Flakes of the third phase of débitage.

Entire or proximal flakes that do not present any cortex, or only a cortical butt. This type of flake derives from the heart of the core.

The study of the butts of the flakes is also very revealing of the knapping technique employed. Figure 7.3 presents the proportions of the different types of butts identified at Raqa'i. In this figure, one observes that 94% of the butts are plain (26%) or cortical (68%). In this type of *débitage*, such varieties of butts are characteristic of a non-elaborate knapping method. Furthermore, our observations revealed that in most cases, flakes presenting a faceted butt are, in reality, slightly damaged plain butts. In every case, the observable technical scars on flakes showing a prepared butt are the same as for the flakes with plain or cortical ones: no morphological difference on the proximal parts of these objects was observed. The advantage in number of flakes with plain and cortical butts tends to demonstrate the absence of any formal preparation of the striking platforms on the cores. This is also confirmed on the cores by the presence of secant and multidirectional striking platforms.

This knapping method for flakes, common in this cultural context, is known under the name of *ad hoc débitage* (Rosen 1997), because it indicates a non-elaborated work. These kinds of tools were designed to be used for a very limited period of time—perhaps for a specific job that only took a few minutes[4]—and then

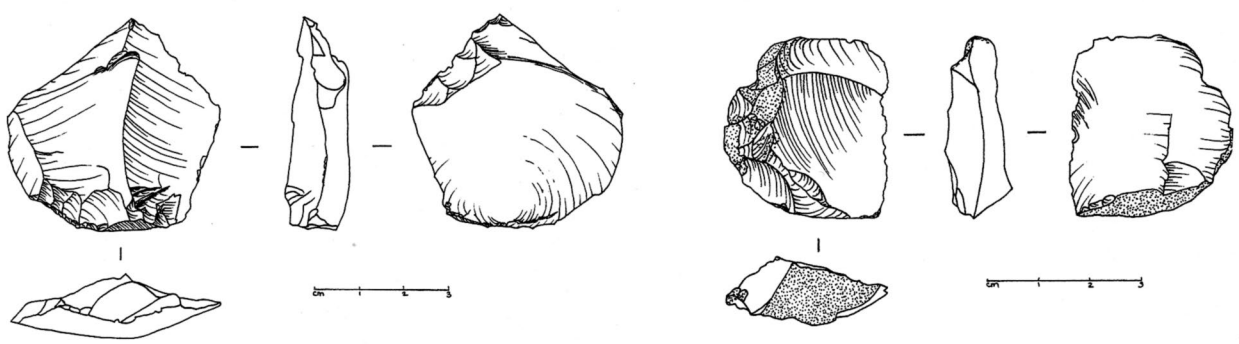


FIGURE 7.2. Flakes with fine teeth (S1833, S1816). *Illustration prepared by Julie Leclerc.*

TABLE 7.7. Inventory of Flake *Débitage* Products.

	1st phase	2nd phase	3rd phase	Proximal flakes	Rejuvenation core flakes	First flakes	Micro-flakes ("esquilles")	Total
Number	126	104	36	191	3	11	53	333
Proportion of total number of flint artifacts (%)	6.4	5.3	1.8	9.7	0.2	0.6	2.7	26.6

TABLE 7.8. Inventory of Fragmentary *Débitage* Products.

	Fragmentary flakes	Raw blocks	Micro-fragments	Burned fragments	Total
Number	566	1	273	124	964
Proportion of total number of flint artifacts (%)	28.7	0.1	13.8	6.3	48.9

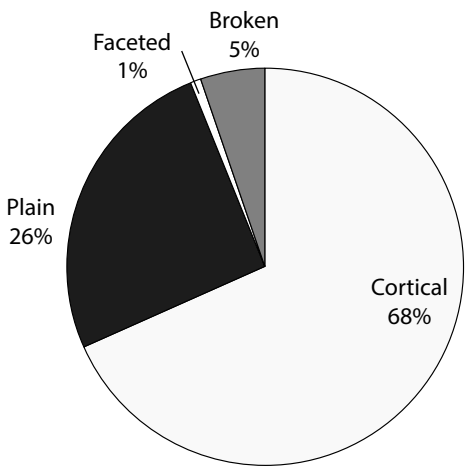


FIGURE 7.3. Types of butts identified on the flakes from Raqa'i. *Illustration prepared by Jacques Chabot*.

the flake was discarded.[5] With respect to this subject, Coqueugniot pointed out that the presence of numerous unretouched domestic flakes should not automatically be interpreted as waste:

> Les produits bruts de débitage ne doivent pas être considérés nécessairement comme des déchets de taille (comme on en trouve en abondance près des lieux de débitage du silex). Au contraire, beaucoup d'entre eux ont été utilisés tels quels, sans retouche particulière. Il s'agit donc d'outils *a posteriori* ainsi que le confirment les traces d'usure observées sur plusieurs de ces pièces qui ont été soumises à une analyse tracéologique, les pièces dépourvues de traces d'usure devant être des pièces neuves gardées en réserve plutôt que des pièces rejetées. Ainsi, lors du débitage des nucléus, un certain nombre d'éclats et de lames de formes et de tailles adaptées auraient été sélectionnés et rapportés dans les maisons soit pour y être utilisés tels quels, soit pour y être transformés en outils *stricto sensu* (artifacts dont la forme finale résulte de retouches) (Coqueugniot 1991).

Therefore, once transported to the site, the small stony blocks were knapped in a semi-improvised way. The purpose of this work seems to have been to obtain flakes of various forms and dimensions that could eventually be transformed in tools by retouches or by using their cutting edges without transformation. Presumably these flakes were useful tools for various short-term domestic tasks that are yet to be determined. The large number of these artifacts found at Raqa'i indicates that they must have played a role of some importance. On the other hand, the characteristics presented by these flakes reveal that the knappers had limited knowledge of flint knapping. Nevertheless, it is possible that the inhabitants of Raqa'i were more skillful than demonstrated by this industry. Indeed, *ad hoc* tools were certainly convenient for the functions they had to fill. Why should the Raqa'i inhabitants have spent much time producing tools intended for a restricted use?

It is interesting to note that at Hassek Höyük, one of the rare loci from Syro-Mesopotamia and southeastern Anatolia known to be the site of Canaanean blade manufacture, excavations identified the same kind of *ad hoc* flake industry as at Raqa'i and other sites of the Khabur valley (Coqueugniot and Geyer 1994). Therefore, in this settlement, both specialized blades and domestic flakes were crafted. This probably means that different people living in the same village were involved in two completely different flint tool industries. At Hassek at least, we have evidence of the "cohabitation" of advanced techniques and very simple ones. It is thus possible to envisage that in Raqa'i, as in many other nearby villages, both techniques were known. For some reason, only flakes were made there, and the inhabitants probably had to purchase their blades via a specialized network. The latter situation is likely to have prevailed because the local raw material did not allow for the production of long regular Canaanean blades, given the absence of large blocks.

Curiously, although these domestic flakes were found in great quantity on almost all the third-millennium sites of this region, this industry has never been the subject of special study by archaeologists working in Syro-Mesopotamia or southeastern Anatolia. In most cases, excavation reports mention the presence of domestic flakes but avoid any in-depth analysis. In some cases, the objects were simply discarded.

BLADES

Contrary to what was observed for the flakes, the blades of Raqa'i were discovered outside their context of fabrication: only intensively used segments of blades were found[6] and rarely complete ones. In some cases, the retouch practiced on numerous pieces destroyed the scars of manufacture so important for ascertaining the knapping techniques.[7]

Apart from some rare sections of blades that do not seem to have been used, the Raqa'i collection does

not include any raw products or blade cores. For this industry, therefore, we only have evidence of the phase of the operating process concerned with tool utilization. Despite this fact, it is possible, thanks to meticulous examination of the blades, to draw inferences concerning their technique of manufacture.

Even though it is not possible to identify them all formally, the majority of the blades of Raqa'i belong to the "family" of Canaanean blades. This designation was coined by the French archaeologist Neuville when he discovered such blades in a Palestinian cave in 1930 (Neuville 1930a, 1930b). Regrettably, this term has since been used to describe any regular blade discovered in Chalcolithic or Early Bronze Age levels in Near Eastern sites. Indeed, Coqueugniot and Geyer have pointed out that researchers have overused the term "Canaanean" to such a point that the expression is virtually meaningless (Coqueugniot and Geyer 1994). This confusion is attributable to the fact that the numerous proposed definitions referred to diverse morphological characteristics as well as such variables as function (presence of a sheen), chronological context, and imported character (Anderson and Inizan 1994).

In this study, we employ the morpho-technological definition formulated by Anderson and Inizan (1994), which avoids confusion because it describes the Canaanean blade precisely as a particular type of blade produced by the application of a special technique. This technique, recently rediscovered thanks to the experimental research of J. Pelegrin (CNRS-France), entailed manufacturing blades using pressure *débitage* with a long lever. First, the flint knapper immobilizes the voluminous, specially prepared core,[8] and then rests a wooden point made of antler or copper, fixed on a long wooden control lever, against its pressure platform. The multiplication of the initial force obtained from the lever system allows the knapper to exert pressure from the point onto the core that is so strong that long regular blades are extracted from it.[9] At present, we are not aware of the date of the first appearance of this knapping technique, but in the Near East systematic long lever pressure is first attested in the Chalcolithic of southeastern Turkey (e.g., Hassek Höyük).[10]

Potentially Observable Scars on Blades Produced by Pressure with a Lever (According to Experiments by J. Pelegrin)

A. Proximal end

- Dihedral or faceted butt narrower than the body of the blade
- Crack in the butt behind the impact point
- Well-marked impact point and/or lip
- Prominent, high and brief bulb (the inferior face of the blade becomes smooth and flat at once after the extinction of the bulb)

B. Mesial and mesial-distal end

- Great regularity of the edges and arris
- Straight profile (the blade is flat in the mesial part)
- Rather thin in general[11]
- Curvature pronounced in the distal extremity; both width and thickness tend to decrease (curvature often begins only from the last third of the blade)

Discussion

In light of these old and new data, we suggest that the following elements be considered as Canaanean characteristics: blades or sections of blades with regular and parallel edges and arris, a straight profile (curved in the distal part), a light section (rather thin but nevertheless sturdy), and a dihedral or faceted butt (plain is also possible). Such characteristics observed on several artifacts from the same context are the proof that these blades were obtained by the technique of pressure with a long lever.

As noted above, Raqa'i exhibits a pattern observed at several other contemporaneous villages—blades are exclusively removed from cores according to a special technique. These blades were the subject of intentional fragmentation to allow their hafting by means of an adhesive: bitumen. Therefore, the majority of collected blades are mesial sections. To a smaller extent, we also discovered proximal sections and some rare distal ones. Furthermore, these almost absent distal sections, combined with the fact that high skill is required to break the blades with precision, persuade us that these were probably fragmented by the same specialists who made them in the Canaanean workshops. Further, the fact that almost all the raw blades reached the sites in the form of segments demonstrates that they were probably all intended to be used in the same way, in the context of standardized tools.

Our observations of the technical characteristics of the Raqa'i lithic assemblage are based on tools that had seen considerable use. It would have been preferable to base such analysis on, for example, complete and unused blades found in a knapping workshop or funeral deposit. However, this problem, as well as the absence of cores, does not present sufficient obstacles to the identification of the knapping techniques used

to produce these impressive blades. On the contrary, thanks to the quality of this *débitage* and to the large quantity of specimens collected by the excavations, we can assert that the series of blades of Raqa'i is very representative of the socioeconomic context from which it results.

It is the proximal ends of a blade that bear the majority of the technological information permitting the identification of flaking technique used, because it is this part of the artifact that experienced "shock" during knapping. Mesial sections, which form the great majority of the collection, can also, when sufficiently long, be indicators of a recognizable technique.

It is therefore possible to identify the technique used through the presence of a limited number of proximal parts, despite the absence of cores, which are not required for this stage of research. Indeed, there are three technological criteria which, if they are present on the same blade, will allow us to recognize the pressure with a lever technique. These three criteria are: regularity of edges and arris, straight profile, and light weight.[12] It is impossible to observe these criteria on a blade produced with a "punch," i.e., with indirect percussion.

Knapping Techniques

Within the framework of this technological analysis, we carefully observed every blade. The technological attributes of every artifact were noted in order to recognize the technique used in its knapping. For this technological examination, we classified the blades in five groups: blades made by pressure with a lever, blades probably produced by pressure with a lever, blades produced with the "punch" technique, blades probably produced with the "punch" technique, and blades for which the technique of manufacture was not recognized. Table 7.9 presents the results of this typology. Even though at first sight the total number of blades associated with a particular technique may seem low, it is important to mention that our analytical method proceeds with great caution, so that blades that are classified in a particular category display no ambiguity. For example, the numerous mesial parts measuring less than 5 cm in length are not used to infer production technique. Further, it is important to point out that the purpose of such analysis is not to determine the technique employed to manufacture every specimen in the assemblage, but to identify the techniques generally in use in that assemblage.

*Pressure with a Lever (*Figures 7.4—7.11*)*

Figures 7.4 to 7.11 present blades from Raqa'i made by pressure with a lever. One can observe the great regularity of edges and arris (Figures 7.4, 7.7–7.10), dihedral butts on proximal sections (Figures 7.4–7.6), and high, pronounced, and short bulbs, as well as marked impact points (Figures 7.4 and 7.7). Moreover, the type of impact point and the cracking of the butt observed indicate that the Raqa'i blades were produced by the Canaanean technique using a copper point. Finally, the profiles of the blades display the straight character of these, with curvature in the end of the mesial part for the better-preserved sections.

Figures 7.12 and 7.13 present a study of the dimensions of blades produced by pressure with a lever. Width and thickness of these are the only technological measures that we have, because their length, due to their systematic fragmentation, does not inform us about the knapping technique itself.

With respect to the width of these blades, considerable standardization is observed: a normal curve sharply dominated by dimensions between 25 to 30 mm. Indeed, 20 of the 29 sections possess this width (average = 27 mm). As for the thickness of the blades, the Canaanean implements from Raqa'i again show a normal distribution but with more values registered above the 7-mm average. Nonetheless, 21 of the 29 blades have a thickness between 5 and 7 mm, also evincing great regularity in the production of standardized products.

*Indirect Percussion ("Punch") (*Figures 7.14–7.18*)*

We have already seen that 19 blade sections from Raqa'i and possibly 34 others were obtained by indirect percussion. The raw material on which these blades were shaped is similar to that of segments associated the technique entailing pressure with a lever. Therefore, it is likely that many of the blades made by indi-

TABLE 7.9. Knapping Techniques Identified for Blades.

	Blades made with "pressure with a lever" technique	Blades probably made with "pressure with a lever" technique	Blades made with "punch" technique	Blades probably made with "punch" technique	Knapping technique not identified	Total
Number	29	64	19	34	88	234
%	12.4	27.4	8.1	14.5	37.6	100

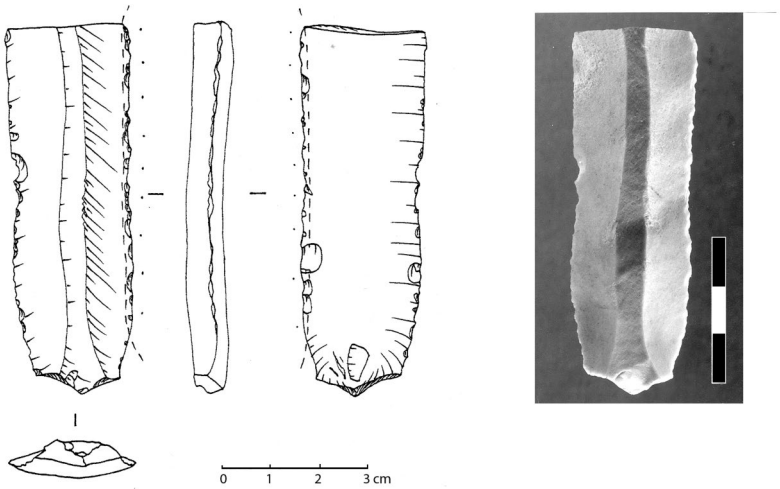


FIGURE 7.4. Proximal element of a glossed blade made by pressure with a lever (S12). *Photograph by Jean-Denis Strich. Illustration prepared by Julie Leclerc.*

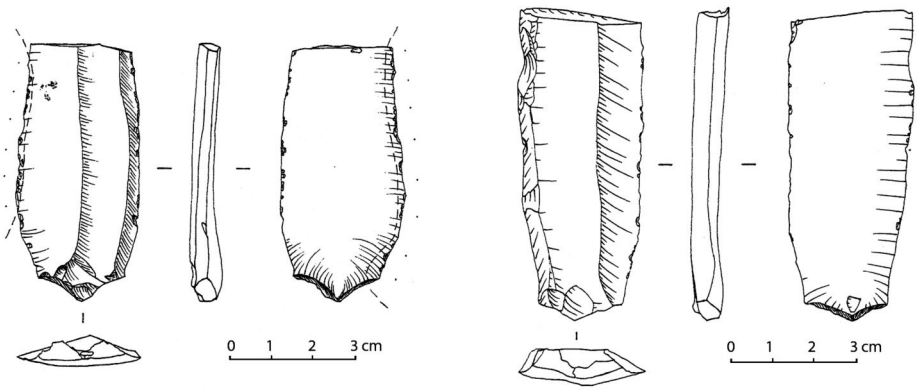


FIGURE 7.5. Proximal elements of blades made by pressure with a lever (S1712-glossed, S126). *Illustration prepared by Julie Leclerc.*

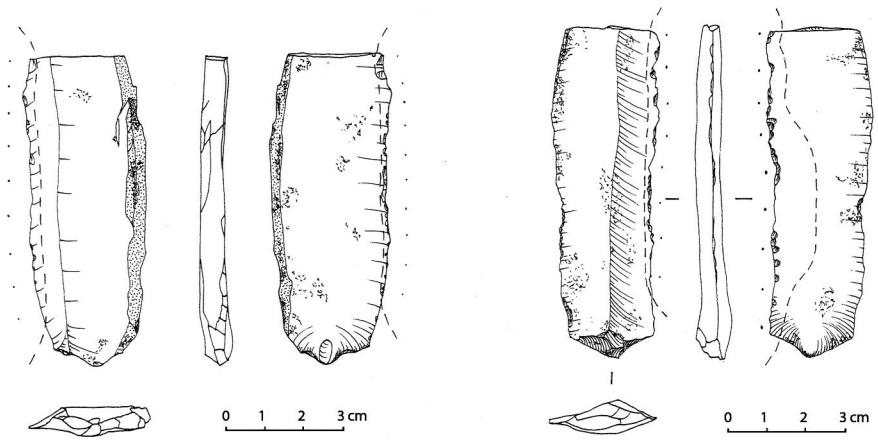


FIGURE 7.6. Proximal elements of glossed blades made by pressure with a lever (S10, S1582). *Illustration prepared by Julie Leclerc.*

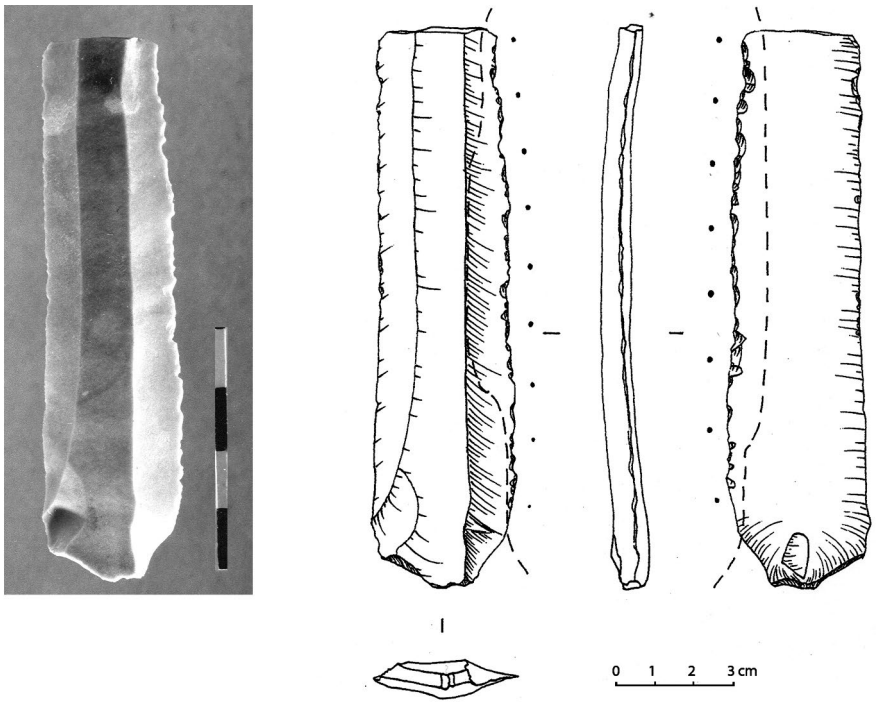


FIGURE 7.7. Proximal element of a blade made by pressure with a lever (S1584). *Photograph by Jean-Denis Strich. Illustration prepared by Julie Leclerc.*

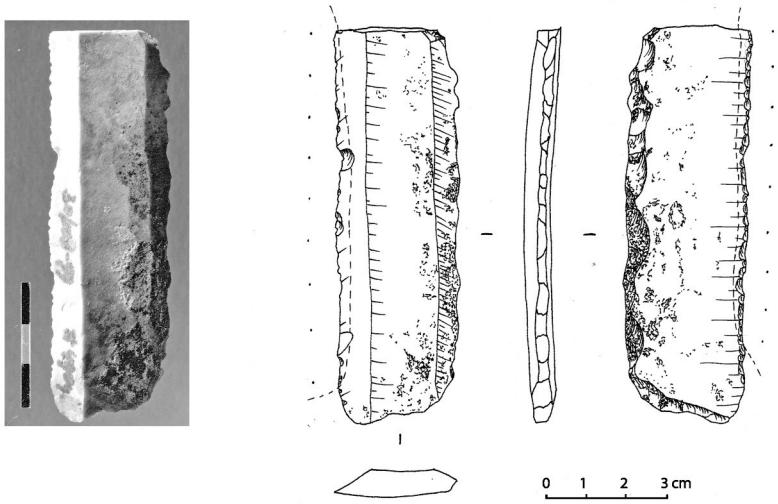


FIGURE 7.8. Mesial element of a glossed blade made by pressure with a lever (S5). *Photograph by Jean-Denis Strich. Illustration prepared by Julie Leclerc.*

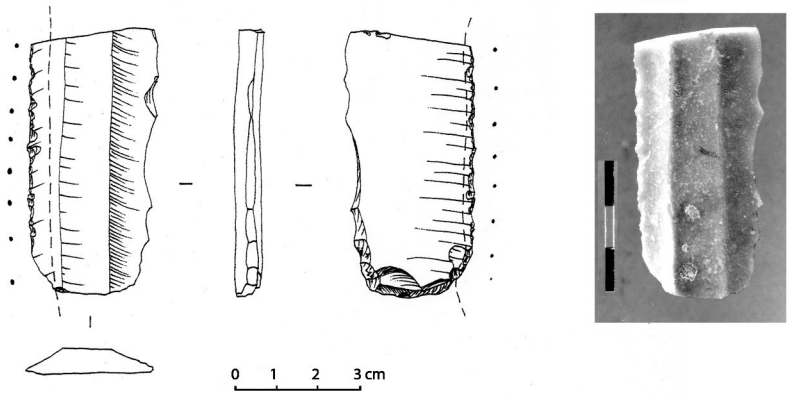


FIGURE 7.9. Mesial element of a glossed blade made by pressure with a lever (S1620). *Photograph by Jean-Denis Strich. Illustration prepared by Julie Leclerc.*

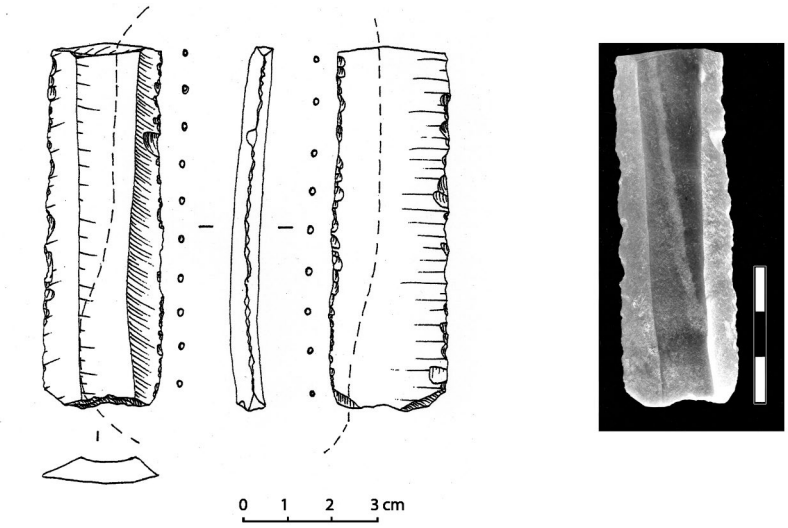


FIGURE 7.10. Mesial element of a glossed blade made by pressure with a lever (S1619). *Photograph by Jean-Denis Strich. Illustration prepared by Julie Leclerc*

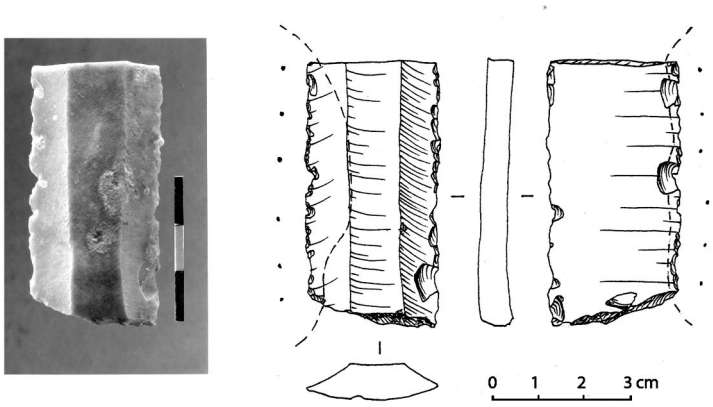


FIGURE 7.11. Mesial element of a glossed blade made by pressure with a lever (S1624). *Photograph by Jean-Denis Strich. Illustration prepared by Julie Leclerc.*

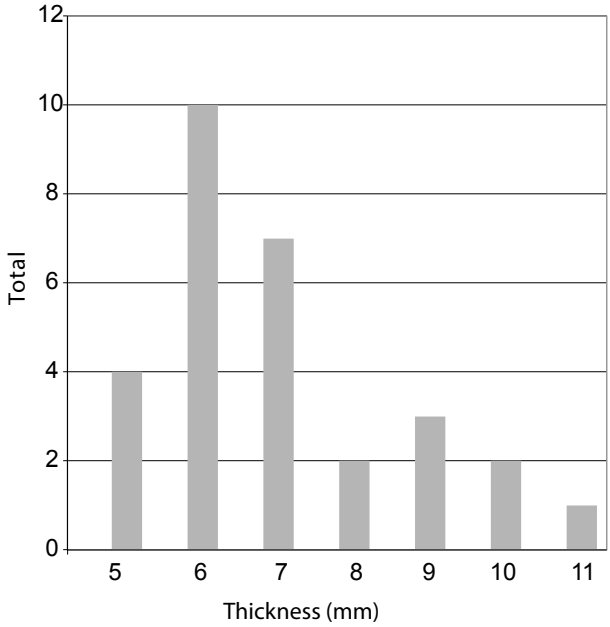


FIGURE 7.12. Study of width of blade segments knapped by pressure with a lever (n = 29, average = 26.9 mm). *Illustration prepared by Jacques Chabot.*

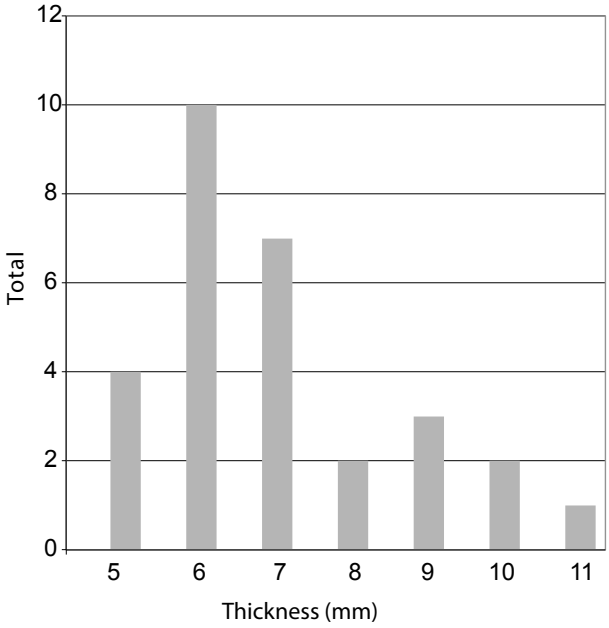


FIGURE 7.13. Study of thickness of blade segments knapped by pressure with a lever (n = 29, average = 7 mm). *Illustration prepared by Jacques Chabot.*

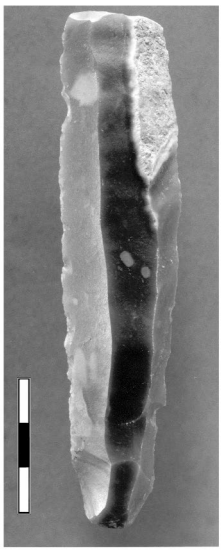


FIGURE 7.14. Proximal element of blade with a natural back made by indirect percussion (S4). *Photograph by Jean-Denis Strich. Illustration prepared by Julie Leclerc.*

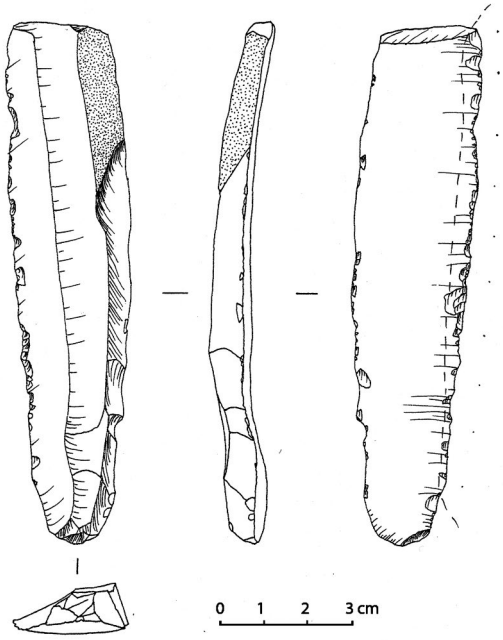
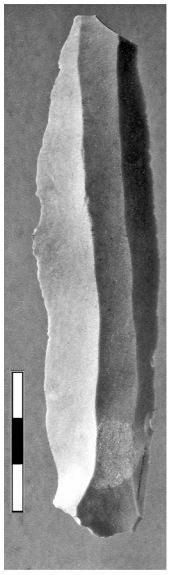
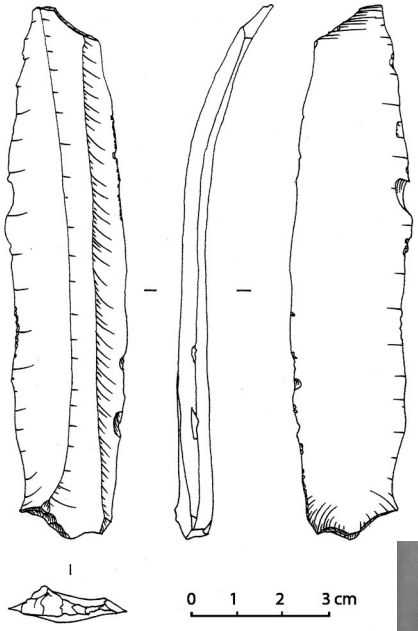
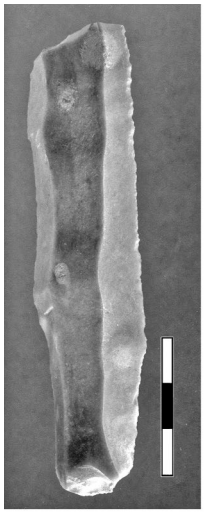


FIGURE 7.15. Almost complete blade made by indirect percussion (S124). *Photograph by Jean-Denis Strich. Illustration prepared by Julie Leclerc.*







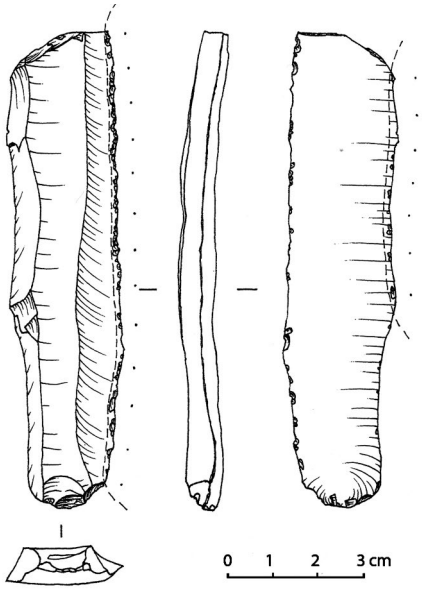


FIGURE 7.16. Proximal/mesial element of a blade made by indirect percussion (S1945). *Photograph by Jean-Denis Strich. Illustration prepared by Julie Leclerc.*

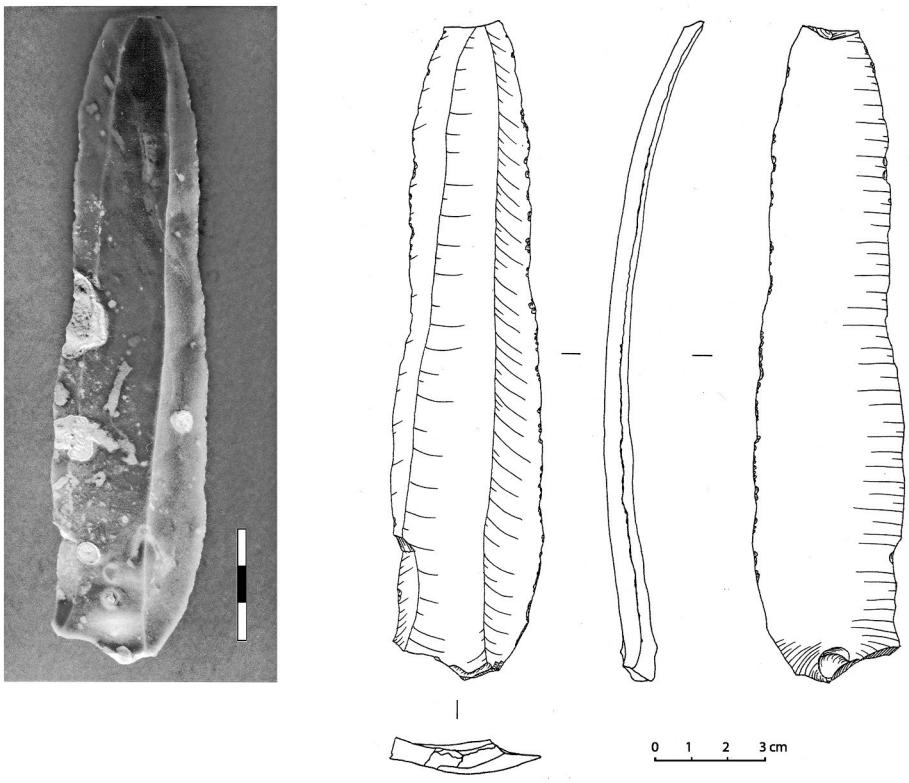


FIGURE 7.17. Blade made by indirect percussion (S1).
Photograph by Jean-Denis Strich. Illustration prepared by Julie Leclerc.

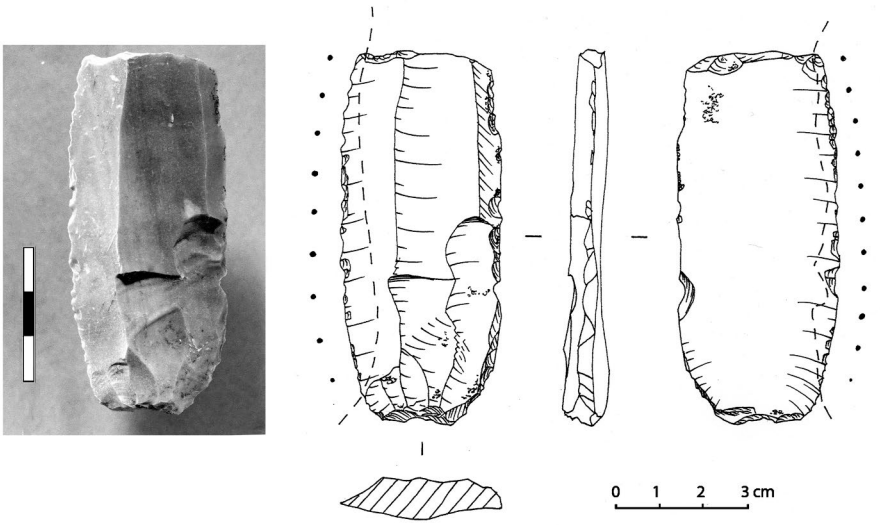


FIGURE 7.18. Mesial part of a blade made by indirect percussion (S11)
(see also the use-wear traces of this blade in Figure 7.30).
Photograph by Jean-Denis Strich. Illustration prepared by Julie Leclerc.

rect percussion are shaping products from the preparation of Canaanean cores. But, like the blades whose knapping technique was not discernible, the "punch" blades, even though they concern the preparation of cores, were sent to villages where robust flint blades were used for agricultural tasks. Like the Canaanean elements, these blades were intensively used, as evinced by the intense gloss on their cutting edges as well as traces of the bitumen used to haft them in the wooden part of the composite tool.

Figures 7.14–7.18 illustrate some examples of the products of this *débitage* identified at Raqa'i. We see on these specimens that edges and arris are much less regular than on the previous examples. In general, the butts are plain, relatively wide, and thick; the bulbs are wide and stretched; the profile is sharply bent in a bow-like shape; the section is often heavy on the longer blades; and we can see the presence of fine wrinkles on the interior surface. The latter provide evidence of an unstable system of immobilizing of the core.

Figures 7.19 and 7.20 present the widths and thicknesses of blades included in this technical group. In both cases, the curves are more dispersed than was the case with the technique involving pressure with a lever. It is necessary to say, in this case, that our small sample size (19 objects) does not lend itself to a clear result. The blades of Raqa'i that were produced by indirect percussion have an average width of almost 29 mm (vs. 27 mm for pressure with a lever), but 9 of the 19 specimens are between 22 and 27 mm width. Moreover, the 5 objects with a width greater than 33 mm move the average slightly to the right. In general, we can see that blades made by the "punch" technique are somewhat wider than those produced by pressure with a lever and that more variation and less standardization were characteristic of this technique. On the other hand, the thickness of these same blades does not display a normal distribution. Average thickness is 8.4 mm. Furthermore, 10 of the 19 blades are between 6 and 8 mm thick (for the pressure technique, the majority were between 5 and 7 mm), but again variations can be observed since 7 blade sections are 10 mm or more in width. It is clear that blades made by indirect percussion are sturdier and present more variations in their dimensions than those obtained by pressure with a lever.

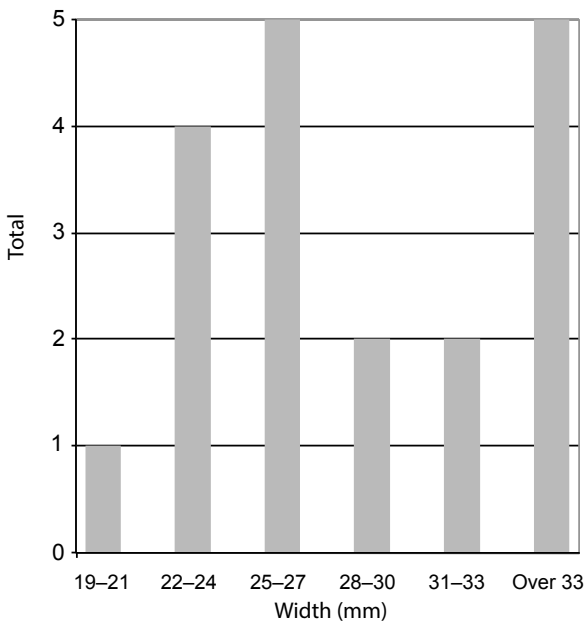


FIGURE 7.19. Study of width of the blades made by indirect percussion (n = 19, average = 28.8 mm). *Illustration prepared by Jacques Chabot.*

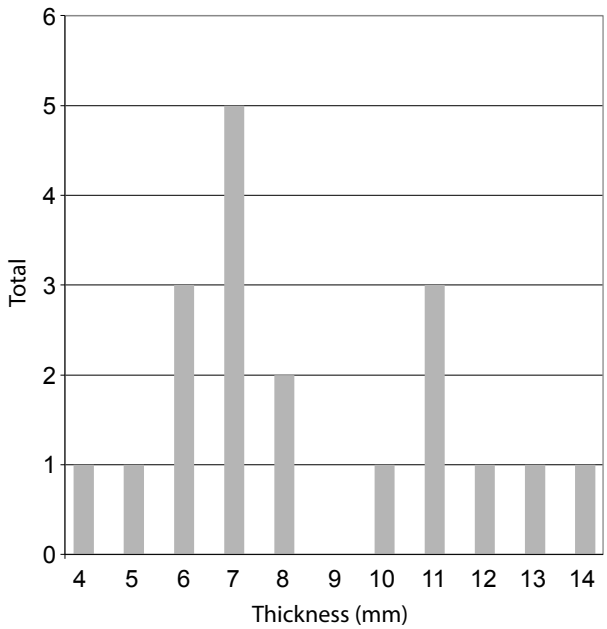


FIGURE 7.20. Study of thickness of blades made by indirect percussion (n = 19, average = 8.4 mm). *Illustration prepared by Jacques Chabot.*

Indefinite Technique

The category "indefinite technique," with a total of 88 blades, includes those blades whose manufacturing technique cannot be ascertained with satisfactory precision. The group is divided into two subcategories:

A. Sections of blades showing great regularity that are too short to classify

   Although they exhibit regularity in edges and arris, a light section, and a rectilinear profile, the blades of this subcategory are too short (length below 5 cm and absence of butt) to be formally associated with a knapping technique. It is impossible to verify if the regularity continued for a greater extent of the blade. Even though these sections probably derive from long Canaanean blades, their intentional fragmentation in small sections does not allow us to identify them as Canaanean blades.

B. Sections of blades for which the technique of knapping is unknown

   This category includes objects with characteristics of both techniques used to produce long regular blades, precluding their inclusion in one category or the other. For example, several blades have slightly irregular edges and arris but a straight profile. Others display a slight convexity on the interior surface in a place where no impurity is visible in the raw material but have regular edges. This type of section may have been manufactured by either the "punch" or pressure with a lever technique.

Summary of the Technology of the Blades of Raqa'i

Even though we were not able to identify the blade production technique in every case, primarily because of artifact fragmentation, the knapping technique used for several specimens has been identified. These were made according to one or the other of the two techniques used to produce large regular blades: indirect percussion and the recently "rediscovered" pressure with a long lever.

The imported raw flint and the absence of *débitage* activities in the village related to blades, with no cores or blanks attested, demonstrate that the blades were imported. Blades produced by indirect percussion formed a part of the stage of shaping or of the last stage of exhaustion of the voluminous Canaanean cores.

As noted above, the fact that the Canaanean blades, with evidence of a pronounced technical expertise, were sent to villages together with less regular blades made with the punch technique and then used in the same way side by side in a composite tool demonstrates that their appearance was not considered of great importance. More than anything else, they were tools intended for intensive use.

Concerning the Canaanean technique observed at Raqa'i, it is important to note that this kind of elaborated *débitage* yielding very standardized products is similar to that attested in numerous sites of the Khabur valley and in almost all northern Mesopotamian sites in the Early Bronze Age. Nevertheless, very few Canaanean workshops are known. This material, produced by specialists, was manufactured according to techniques that constitute a highlight in the manufacture of flint tools: the use of a long lever armed with a copper or antler point allowing the application of pressure from 200 to 300 kg on the edge of an immobilized core.

TYPOLOGY

Typology consists of grouping together the tools[13] exhibiting a similar morphology and in producing statistics informing us about the degree of standardization and the occurrence of the defined types. For my research on the Protohistoric lithics of the Near East, I do not use the classical categories of the Paleolithic. Instead, I built a new system influenced by the old prehistoric periods but adapted to the more recent context and its technological approach (Chabot 1998, 2002).

On the other hand, typology is a classification made with the aim of better understanding a collection under examination. This means that such analysis must only concentrate on the observation of morphological criteria. These criteria do not supply any information concerning the function of the tool in question. It is only during the functional analysis, which consists of experimental tests and meticulous observations, that it will be revealed whether retouched tools were really used. So, even though the morphology of such artifacts does not show to the naked eye any alteration on the cutting edge, it is possible that some of them, first classified among the *débitage* products, were used for a very short period of time. Therefore, it is important to keep in mind that any flint implement found in this context is a possible ancient tool.

Furthermore, it is necessary indeed to be aware that such classification, so useful for the archaeologist,

is artificial. Indeed, these defined types did not correspond inevitably to a reality for the people who made and used the tools. Moreover, it is very possible to imagine that two artifacts classified in the same morphological category had different functions.

Table 7.10 presents the inventory of the tool types identified at Raqa'i. A total of 376 tools were found. In this group, tools on blades dominate, representing 77% of all tools. If one excludes tools with fine teeth (7%)[14] (Figure 7.2) and retouched flakes (13%) (Figure 7.21), all the other types of tools on flakes (notches, microliths, hammers, sharp implements [Figure 7.22], and points [Figure 7.23]) represent a small proportion. Further, 282 of the 288 tools on blades are glossed elements. This type of tool, whose function will be discussed below, represents 75% of the entire corpus. From Figure 7.24, which illustrates the proportions of the various types of tools at Raqa'i, it is evident that the glossed blades predominate, followed by tools with fine teeth and retouched tools. Obsidian is very rare at Raqa'i: six artifacts were identified, including 2 retouched flakes (partial retouches), 2 bladelets, 1 flake with fine teeth, and 1 raw flake.

Even though the glossed blades are grouped in their own category, they show considerable morphological variation. Some blades have two sharp edges, sometimes both exhibiting sheen, others have a natural back, and others have a retouched back. In the latter category, the blade was retouched made in order to facilitate its hafting. We distinguished 16 subcategories of glossed implements. Table 7.11 lists the inventory for every category, and Figure 7.25 represents these in their respective proportions.[15]

TABLE 7.10. Inventory of Tool Types Identified at Raqa'i.

	Tools on flakes	Tools on blades	Total
Notches	5	0	5
Fine teeth	27	1	28
Microblades	0	2	2
Hammer	1 (fragment)	—	1
Glossed	2	282	284
Sharp pointed	1	0	1
Retouched	50	3	53
Points	2	0	2
Total	**88**	**288**	**376**

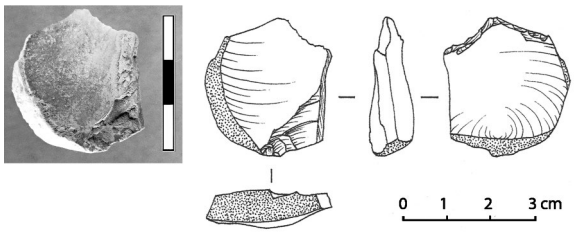


FIGURE 7.22. Flake with a broken sharp end (S1618). *Photograph by Jean-Denis Strich. Illustration prepared by Julie Leclerc.*

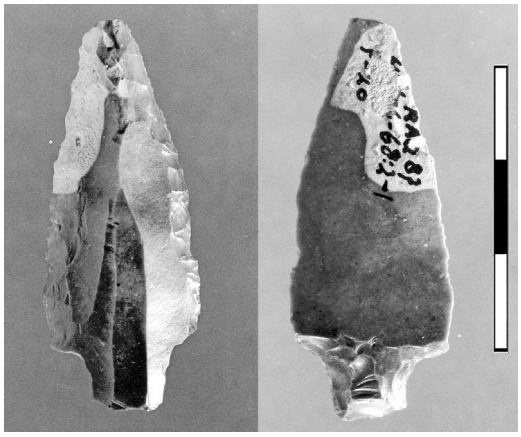


FIGURE 7.23. Point (S1605). *Photograph by Jean-Denis Strich.*

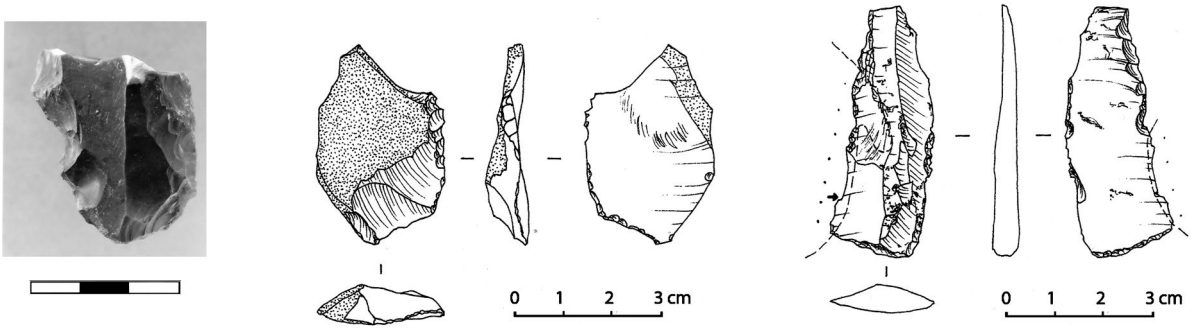


FIGURE 7.21. Retouched flakes (S1773, S1597, S1896). *Photograph by Jean-Denis Strich. Illustration prepared by Julie Leclerc.*

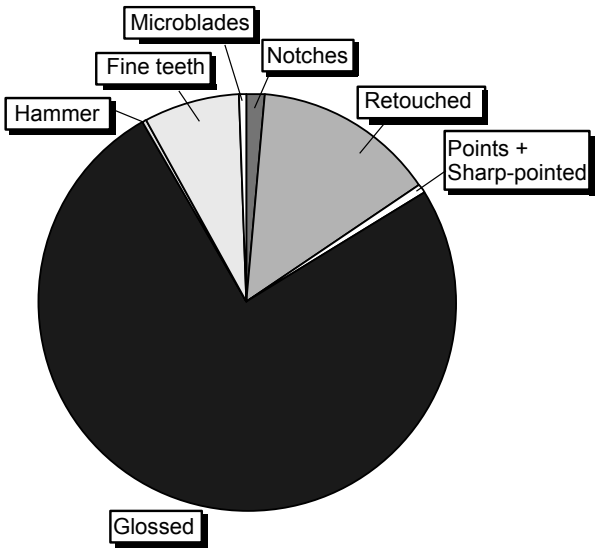


FIGURE 7.24. Proportion of flint tools identified at Raqa'i. *Illustration prepared by Jacques Chabot.*

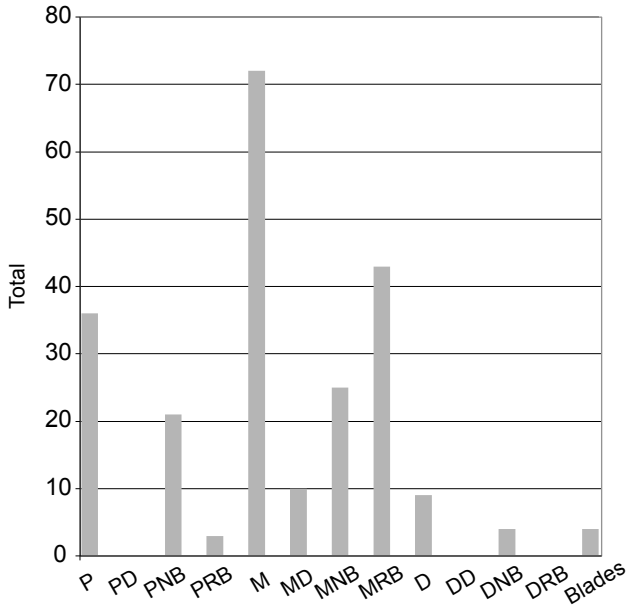


FIGURE 7.25. Subtypes of glossed elements present at Raqa'i. *Illustration prepared by Jacques Chabot.*

TABLE 7.11. Inventory of Glossed Blade Subtypes from Raqa'i.

Subtypes	Number	%
P: Proximal end glossed segments (two cutting edges, single gloss)	36	12.7
PD: Proximal end segments with double gloss (two cutting edges, double gloss)	0	0.0
PNB: Proximal end segments with a natural back (one cutting edge, single gloss) (Figures 7.4 and 7.11)	21	7.4
PRB: Proximal end segments with retouched back (one cutting edge, single gloss)	3	1.1
M: Mesial segments	72	25.4
MD: Mesial segment with double gloss	10	3.5
MNB: Mesial segments with natural back (Figure 7.19)	25	8.8
MRB: Mesial segments with retouched back	43	15.1
D: Distal end segments	9	3.2
DD: Distal end segments with double gloss	0	0.0
DNB: Distal end segments with natural back	4	1.4
DRB: Distal end segments with retouched back	0	0.0
Blades: Glossed entire blades	4	1.4
Bladelets: Glossed bladelets	4	1.4
Flakes: Glossed flakes	2	0.7
F: Fragments of glossed elements	51	18.0
Total	**284**	**100**

We note the quantity of mesial segments (53% opposed to 21% for proximal and 4.6% for distal). This is explained by the fact that a cut-up blade will yield a proximal and a distal end and three or four mesial sections. Thus, as noted above, the people of Raqa'i were in search of flat sections, which is why the proximal parts with a prominent bulb and the curved distal parts were discarded. It is normal, as these are very effective tools, to find primarily the parts of the blades that were more capable of working adequately. Subcategories "P" (Figures 7.4, 7.6, 7.7), "M" (Figures 7.8–7.11, 7.18) and "D" represent sections of blades with two cutting edges, one of which was used. In total, these subcategories constitute an impressive proportion of 41%. On the other hand, subcategories "PRB" (Figure 7.5), "MRB," and "DRB" are sections of blades that originally had two

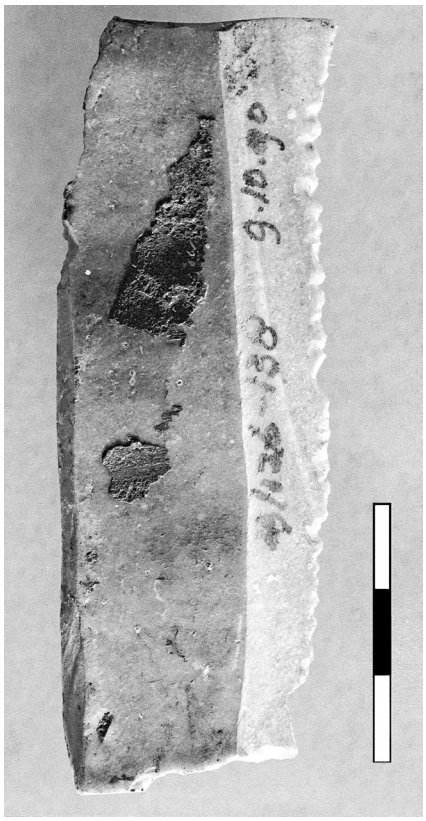


FIGURE 7.26. Mesial part of a resharpened blade with a natural back (S1942). *Photograph by Jean-Denis Strich.*

sharp edges. One of the sharp edges was destroyed by hafting retouches made to immerse this segment in bitumen in order to adhere it to the wooden part of the composite tool. Thus, at Raqa'i, 57% of the glossed sections were used on only one of their cutting edges, even though they could have been very easily turned in order to use both cutting edges. The proportion of the sections that were turned ("PD," "MD," "DD") is only 3.5% (10 elements). We shall study the function of these glossed blades in the following section, but it is important to emphasize that the people of Raqa'i preferred to resharpen their blades (see Figure 7.26) while the latter were hafted, rather than detach them from the bitumen in order to use the other cutting edge. Similarly, they did not hesitate to destroy one of the two sharp edges to make a retouched back in order to better haft the blades.

FUNCTIONAL ANALYSIS

As with the technological analysis, the functional analysis contains both an experimental and a comparative component. Tools made from the same raw material as the archaeological artifacts have been subjected to various experiments. For example, tools were used to work bone for one hour, then a similar tool was used to work bone for two hours, and another for 3 hours. The same kinds of experiments were made for working of wood, stone, and for cutting plants (e.g., for harvesting, threshing, cutting reeds). Every type of work leaves a different kind of mark on the lithic tool, and observation with a high magnification metallographic microscope permits documentation of the different kinds of activity. In this way, a library of functional images of experimental tools is accumulated. For example, in the images derived from microscopic examination, it is possible to search for evidence of scars of use recorded on a tool made from fine-grain flint that was used for 6 hours of harvesting. Additionally, when possible we conduct ethnoarchaeological studies with people using flint tools in the present day, submitting these ethnographical artifacts to use-wear analysis.

FUNCTIONAL ANALYSIS OF NON-GLOSSED TOOLS

Apart from the functional analyses conducted by A. van Gijn[16] on the flakes of Tell Leilan, no exhaustive functional analysis at high magnification of the numerous flint flakes from the Early Bronze Age of the Near East has been conducted. It seems that the flakes' lack of standardization often persuaded archaeologists that these were objects of no interest, with only the "beautiful" blades being kept.

Within the framework of our research on the lithic material of 'Atij and Gudeda (Chabot 1998, 2002), we tried in vain to determine the function of the domestic flakes that form the majority of these collections. Therefore, we submitted a sample of these flakes to microscopic analysis to observe the traces that they still bore. Even though these flakes often present slightly retouched areas to the bare eye and sometimes display irregular fine teeth, possibly attributable to their use, we were not capable of observing significant traces of use.

However, this does not mean that these objects were not used, but that they were used only sparingly or that they were used to work a material that failed to leave traces. By definition, these *ad hoc* tools would have been designed for work of a few minutes, even seconds, and then discarded. Our use-wear observations tend to confirm the hypothesis of a very limited use.

The domestic flakes of Raqa'i are part of the same problem that we hope to solve in the near future with

a more systematic program of experiments adapted to this material.[17] This will not be an easy task, if one considers the rare traces present on the tools. It is to be hoped that the spatial analysis of the lithics to be conducted with G. Schwartz will reveal patterns of distribution relevant to the use of the domestic tools. As with the blades, these objects were discovered *in situ* in areas of activity as well as in levels of abandonment.

Functional Analysis of Glossed Tools

Published functional studies of Canaanean blades are extremely rare. Nevertheless, this dearth of detailed studies has not prevented archaeologists from designating Canaanean blades discovered within their excavations as "sickle elements" (Coqueugniot 1991).

Skakun's discoveries concerning the Varna culture in Bulgaria (Skakun 1993) and Anderson's (Anderson and Inizan 1994) observations on the flints of Megiddo, Amuq, Kutan, and Kashkashok have been useful in this regard. Also useful have been descriptions of ethnographic and experimental threshing sledge elements, while the study of flints from the Khabur valley in Syria allowed for the clarification of the function of this type of artifact. Indeed, after agricultural experiments had been conducted and experimental blades compared by use-wear analysis to the archaeological material, it was demonstrated that these objects were not sickles but were probably threshing sledge elements.

The threshing sledge, also called *tribulum* (Figure 7.27), consists of a long sled of oblong wood with sharp-edged elements such flint blades or flakes or basalt fragments inserted. It is still used today in several Mediterranean countries (Anderson and Inizan 1994). Moreover, as Kardulias and Yerkes have pointed out, the use of the threshing sledge from the Neolithic until the present day in the Near East demonstrates the efficiency of this composite tool (Kardulias and Yerkes 1996). Anderson and Inizan made a complete description of the way the threshing sledge was used:

> The threshing sledge has two essential functions, the threshing of grains and the chopping of straw. It works generally on a large circular area on a hard-packed surface. The cut stalks are spread on the area in a thick layer. One or two animals pull the instrument on which the driver stands or sits with stones ballasting him, with the load of large stones or of persons on board being variable. The *tribulum* turns in a circle on the area over several days, with threshing provided by the animals crushing the grains, the weight of the instrument, and the action of the saw

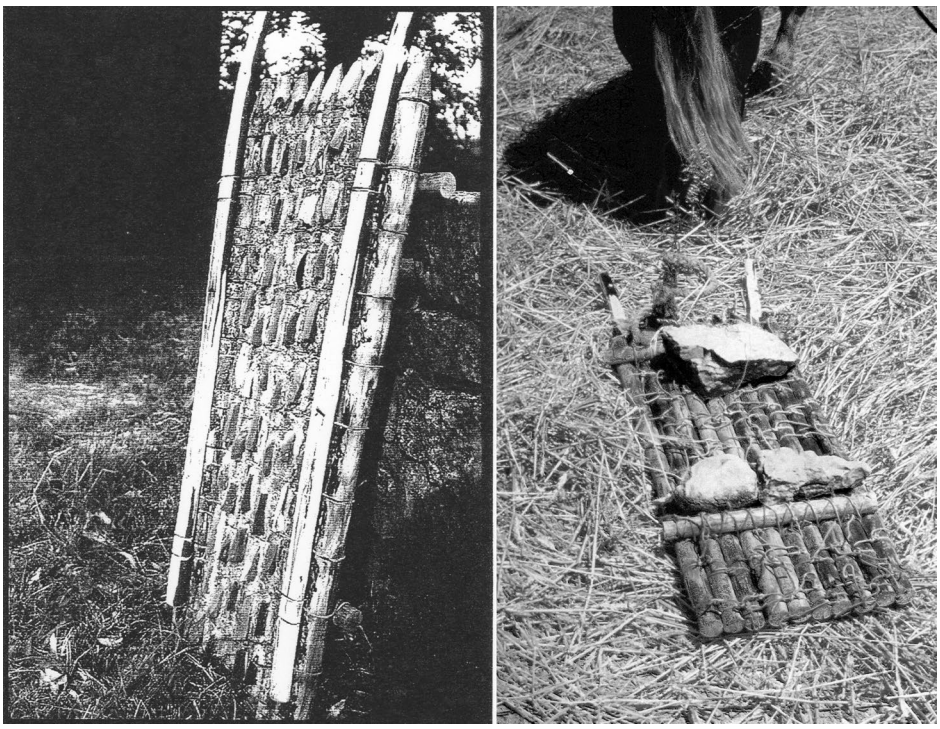


Figure 7.27. One of experimental threshing sledges used in experimental program directed by Dr. P. Anderson (CNRS, France). *Photograph by Patricia Anderson*.

> of the flint teeth. Then comes the chopped straw.... Winnowing allows the separation of the grain from the envelopes and from the straw and dust (translated from Anderson and Inizan 1994).[18]

DESCRIPTION OF TYPES OF SHEEN CREATED DURING PLANT PROCESSING

The presence or absence of specific characteristics caused by a type of tool use allows for the recognition of the function of a given flint tool. As noted above, these characteristics can be recognized initially through experimental tests. Below is a description of the typical scars observed on flints used for plant processing. These microscopic characteristics can only be observed through high magnification traceology (100X to 500X). A gloss seen with the naked eye allows for the assignment of a tool to its typological category, after which microscopic analysis permits the recognition of function through different sheen types.

Cutting Reeds

Cutting reeds with a flint knife leaves the most brilliant micropolish, with a glazed and marbled aspect much less uniform than the sheen on flint used to harvest crops. Variations in the microrelief of the flint are evinced by significant contrasts and an alternation between white and dark areas. The three-dimensional aspect displayed by a tool used to cut reeds is caused by the relatively hard nature of this plant, which consequently does not infiltrate into all the corners of the stone. The absence of sediments, since reeds grow in water, is evident in the lack of striae in the microwear traces. The end of the glossed zone, distant from the active part or cutting edge, will tend to be abrupt without gradation.

Harvesting (Figure 7.28)

Harvest produces a sheen slightly less brilliant than the cutting of reeds. Since the harvested plants are softer, there is a better adhesion of the plant material to the stone and a more uniform aspect to the gloss; there are no contrasted zones, a flat and less three-dimensional aspect, and the presence of white layers occupying all the active parts of the tool. The small black spheres occasionally in evidence are the rare parts of the flint, represented by small cavities, that were untouched by the polishing process. The presence of sediments on the stalks of the harvested plants is responsible for parallel striae that form with reference to the curved gesture of the harvester and the position of the blade in the shaft of the sickle.

Threshing and Chopping Straw (Figure 7.29)

Sheen generated by threshing grain and chopping straw has a flat white appearance. In this case, black spots of different dimensions, in the form of comets, are not attributable to parts of the flint untouched by the process of polish. Instead, it is a matter of abrasion that occurs during the "violent" threshing work, involving friction caused by the pressure put on the *tribulum*, the flint elements, and the ground. Comets are all oriented in the same direction: the head of the comet represents the leading part in front and the tail is the back part. Consequently, the observation of these comets,

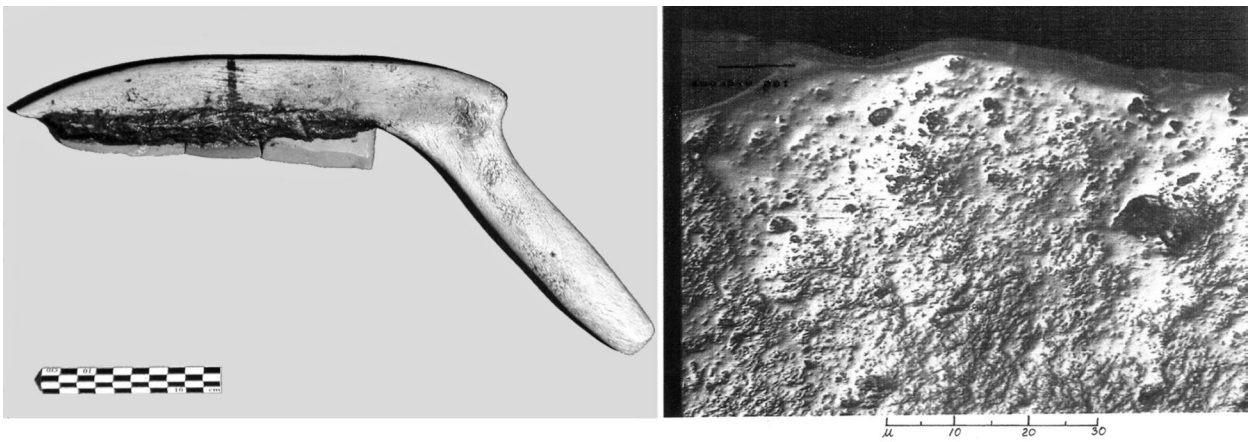


FIGURE 7.28. An experimental sickle and typical microwear found on its flint elements (magnification 100X). *Photograph on left by Jean-Denis Strich. Photograph on right by Jacques Chabot.*

which represent small fractions of the polish that broke loose during the work, allows us to determine the direction of the work undertaken by every blade. Their longitudinal orientation gives evidence of the continuous movement of the threshing sledge dragged repeatedly over a hard-packed surface. Irregular non-oriented scratches appear frequently in this orderly and repetitive landscape, caused by sediments like sand and small pebbles from the ground that scratch the surface of the object during the work.

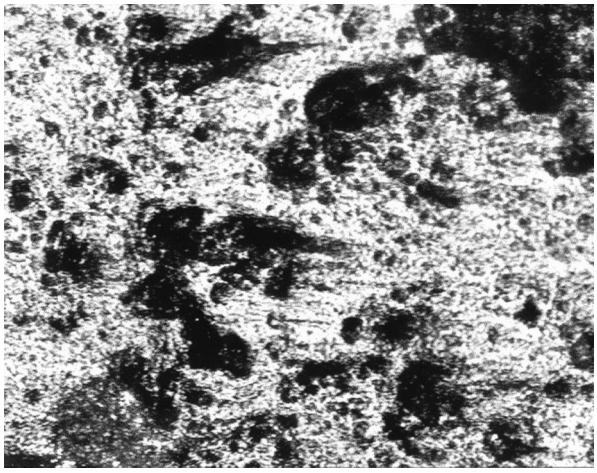


FIGURE 7.29. Typical microwear found on threshing element. This photograph was taken from an ethnographic flint element from a tribulum of the modern village of Karanovo in Bulgaria (magnification 100X). *Photograph by Maria Gurova*.

RESULTS

Most of the Raqa'i blades were very extensively used. Therefore, the majority of these tools exhibit very marked microtraces. Five examples reproduced here (Figures 7.30–7.34) are very representative of the glossed blades collected on Early Bronze Age sites of this region.

It is evident that the microtraces observed on these objects resemble those recorded for the threshing sledge more than any other type. The examination of each parameter confirms this observation: the sheen of a white checkmate color on these examples is much less brilliant than that found on blades used for harvesting, especially those used for cutting reeds, the abundance of comets is oriented in the same direction, non-oriented scratches are common, and there is an absence of striae. The structure of the polish is open, showing an alternation of pale and dark zones, but the dark zones—as well as the comets—have had their polish removed, showing the flint itself, due to the abrasion of the work conducted.

However, Raqa'i displays a major difference from the other sites of northern Mesopotamia studied thus far. At least four small non-Canaanean blades (too fragmentary to identify their technique of manufacture, Figures 7.35–7.36) present microtraces of a double use. Therefore, it is possible to observe a mixture of attributes; abraded surfaces resulting from use in a tool like the threshing sledge are present, but soft attributes

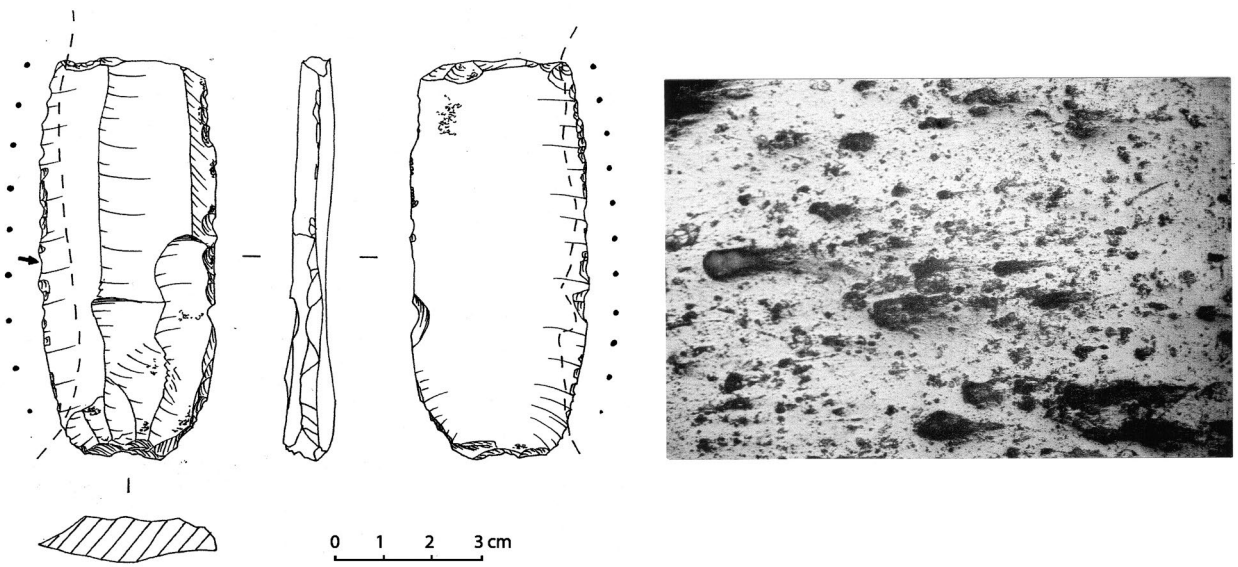


FIGURE 7.30. Use-wear traces observed on blade specimens from Raqa'i showing evidence of utilization in a threshing sledge (S11) (magnification 100X). *Photograph by Jacques Chabot. Illustration prepared by Julie Leclerc.*

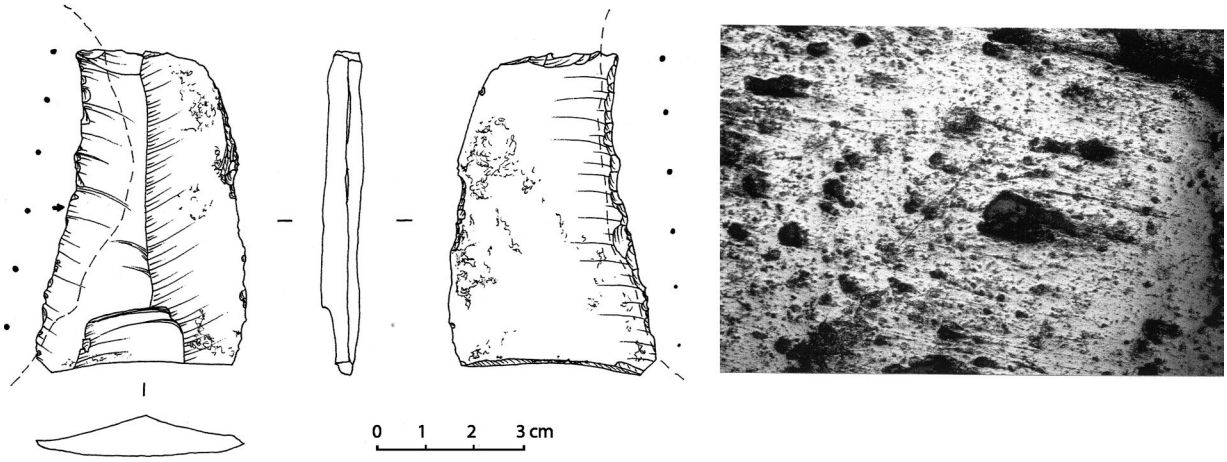


FIGURE 7.31. Use-wear traces observed on blade specimens from Raqa'i showing evidence of utilization in a threshing sledge (S1704) (magnification 100X). *Photograph by Jacques Chabot. Illustration prepared by Julie Leclerc.*

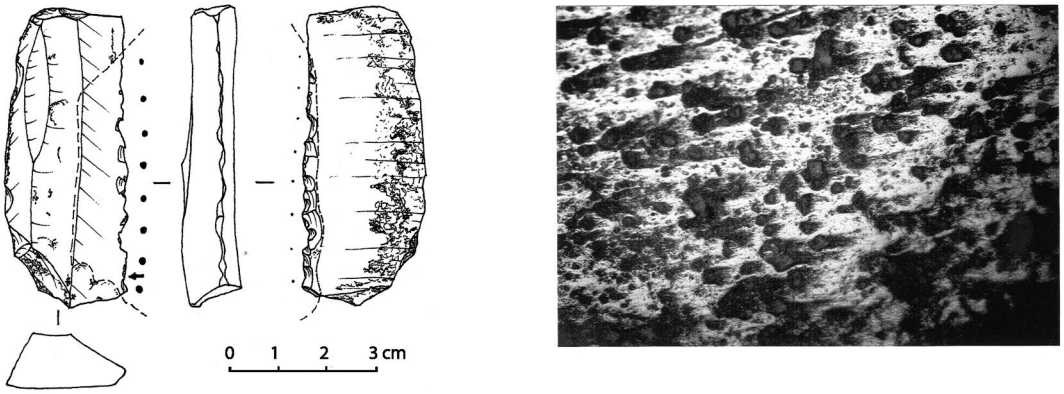


FIGURE 7.32. Use-wear traces observed on blade specimens from Raqa'i showing evidence of utilization in a threshing sledge (S1694) (magnification 100X). *Photograph by Jacques Chabot. Illustration prepared by Julie Leclerc.*

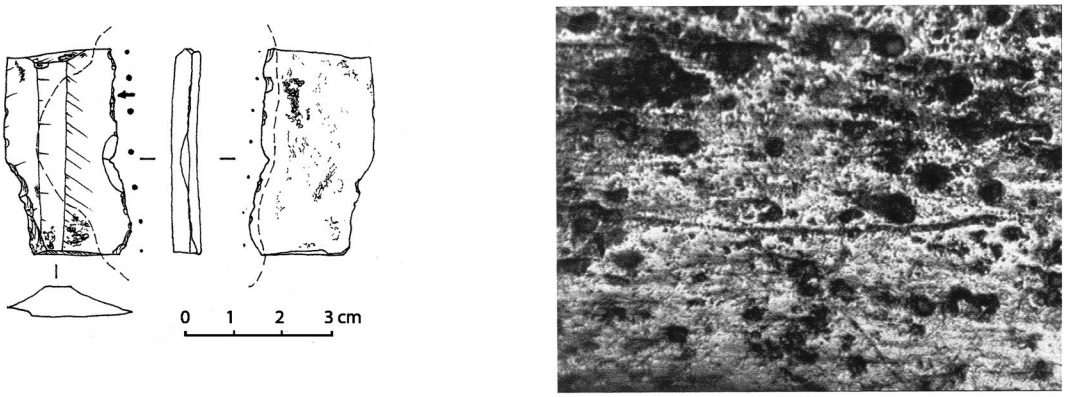


FIGURE 7.33. Use-wear traces observed on blade specimens from Raqa'i showing evidence of utilization in a threshing sledge (S1706) (magnification 100X). *Photograph by Jacques Chabot.*

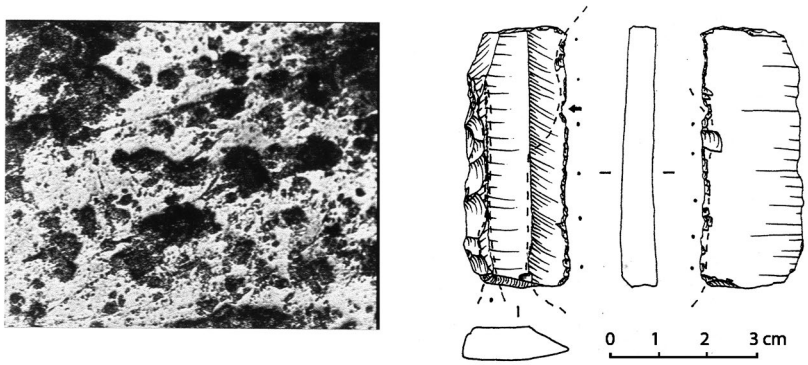


FIGURE 7.34. Use-wear traces observed on blade specimens from Raqa'i showing evidence of utilization in a threshing sledge (S1617) (magnification 100X). *Photograph by Jacques Chabot. Illustration prepared by Julie Leclerc.*

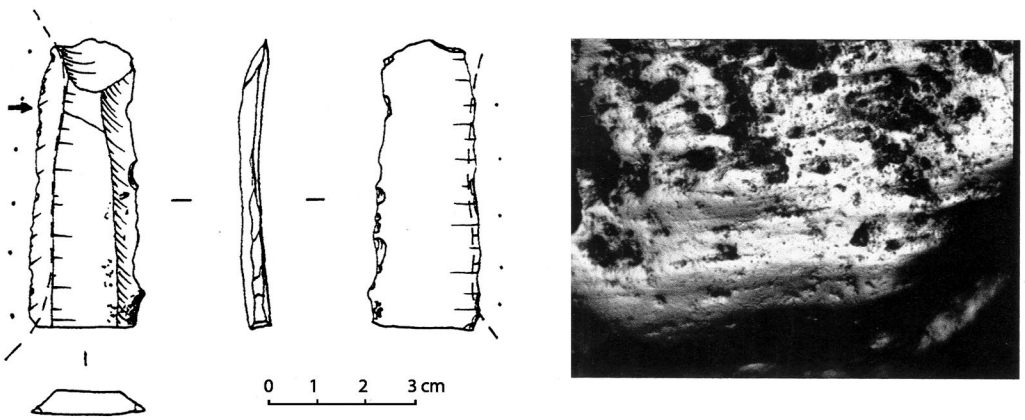


FIGURE 7.35. Use-wear traces observed on blade specimens from Raqa'i showing evidence of a double utilization (S1603) (magnification: 100X). *Photograph by Jacques Chabot. Illustration prepared by Julie Leclerc.*

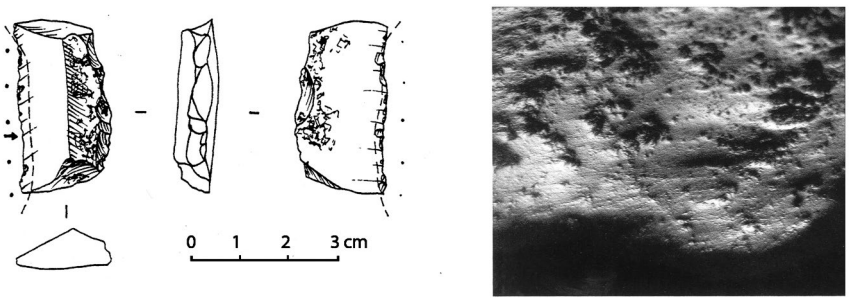


FIGURE 7.36. Use-wear traces observed on blade specimens from Raqa'i showing evidence of a double utilization (S1602) (magnification: 100X). *Photograph by Jacques Chabot.*

(polished and striae) resulting from harvesting are also evident. Thus, for the first time, flint harvesting tools are identified for protohistoric northern Mesopotamia. It is worth emphasizing that although they are flint blades, they are not of the Canaanean type. Further, it seems that after their use as sickles, these blades were recycled to be employed in a composite tool that left abrasion traces similar to those of a threshing sledge.

SELECTED ELEMENTS OF COMPARISON

As we have frequently observed, the collection of flint artifacts recovered at Raqa'i is very representative of lithic assemblages from northern Mesopotamia in the Early Bronze Age. To illustrate this, I provide some comparisons with the most important collection (4,000 flint objects) found in the region and for which we also

conducted an in-depth study: the lithics of Tell ʼAtij, 2 km downstream from Raqaʼi and occupied concurrently for some three centuries.[19] Since the lithics from ʼAtij and Raqaʼi were subjected to the same analyses, it is a simple matter to compare the tools from these two ancient villages. Our comparisons will concern only the blade industry, because the operating process concerned with the making of flakes in this context are identical everywhere and show no originality.

First of all, as noted above, at Raqaʼi we have identified examples of imported flint that are characteristic of Canaanean specialized *débitage*, made of fine-grained flint with gray, pink-gray, or beige-brown colors. These types of imported flint were also present at ʼAtij: 61 (21%) blades segments are fine-grain gray, 19 (6%) pinkish-gray, and 108 (37%) beige-brown. At Raqaʼi, these types of raw material are present in respective proportions of 18%, 12%, and 24%. Besides some variations in proportions, these blades made according to the same techniques on an imported material occupy proportions of 64% in ʼAtij and 54% at Raqaʼi. It is very possible that these blades were originally produced in the same workshops in the Bingöl region in Turkey. Moreover, the network of distribution of the blades seems to have been so vast that no consecutive section of blade has ever been found on the same site, since the manufactured blade segments were sent "at random" to diverse settlements (Anderson and Chabot 2001; Chabot 1998, 2002). This seems to demonstrate that the sections of blades derived from the same workshops and were distributed in the agricultural villages of northern Mesopotamia.

At ʼAtij, the two manufacturing techniques used to produce long regular blades—part of the Canaanean method—were also identified: indirect percussion and pressure with a lever. Reviewing the dimensions of the manufactured products, we find that the blades fabricated by pressure with a lever at ʼAtij have an average of 28 mm width and 8 mm thickness, almost identical to the dimensions at Raqaʼi, 27 mm width and 8 mm thickness. Such nearly identical measurements indicate that these artifacts probably derived from the same workshop, with the same raw material, the same technical process, and products with identical dimensions. When the blades from ʼAtij were compared to those from other sites in the region, similar results were obtained (Chabot 1998, 2002; Chabot and Eid 2007, 2010).

For the typology of the tools, results registered at ʼAtij include 4.5% notches, 11.6% fine teeth, 1.5% sharp elements, 15.3% retouched, 0.7% varia (one burin and two hammers), and 66.3% glossed elements (65.3% on blades). One can observe high proportions of glossed elements at both Raqaʼi (75.5%) and ʼAtij. Imported agricultural tools seem to play a very important role at both sites, while locally shaped tools made from flakes occupy a much less important place: 1.3% notches, 7.2% fine teeth, and 14.1% retouched at Raqaʼi.

Also relevant to the glossed blades, at ʼAtij mesial sections were privileged with regard to proximal extremities, which carry the bulb, and bent distal extremities. Thus, 13.5% of glossed blades at ʼAtij are proximal ends and 5.2% are distal, as opposed to 71.3% mesial parts, out of a total of 268 glossed elements. In Raqaʼi, proportions are 21.2% proximal, 4.6% distal, and 52.8% mesial. The bulbs on proximal ends seem to have concerned the people at Raqaʼi less than at ʼAtij, judging from the extant samples. On this subject, it is surprising to note that at Raqaʼi as many as 284 glossed elements were identified on fewer than 2,000 flint objects, and at ʼAtij 268 glossed blades were identified in a corpus of ca. 4,000 flints. If the intensity of agricultural work is related to the quantity of tools associated with such practices, we can conclude that agricultural activity was intense on both sites.

With respect to the typology of the blades, at ʼAtij, 147 glossed elements were found (55% of the total of flint objects). Of this total, only 24 blades had been "returned" and used on both sharp edges (9% of glossed elements used bilaterally at ʼAtij as opposed to a weak 3.5% for Raqaʼi). If one adds to this total the 54 blades with retouched backs at ʼAtij, entailing intentional destruction of one of the two sharp edges, one concludes that 65.3% of the blades with double sharp edges were not returned in order to use their second cutting edge (57% at Raqaʼi). In both villages, people preferred to use only one edge and even sometimes to destroy the other edge in order to fix the blade firmly in the wooden part of the composite tool. In cases where both sharp edges were kept, sometimes the blade covered with bitumen was cleaned and then the previously unused edge was employed. In the majority of cases, a single sharp edge was used even if the section originally had two edges. Once it was worn out, this sharp edge was resharpened while in situ in the threshing sledge.

From a functional point of view, the glossed blades from ʼAtij and other complete and fragmentary collections studied from this time and region exhibit the same types of microtraces as those observed on the

flints from Raqa'i, consisting of an intense and very abraded polish with numerous well-directed comets. What is unusual at Raqa'i is the presence of four small sections of blades exhibiting evidence of double use, first in a sickle and then in a threshing sledge. This phenomenon has not been observed elsewhere in Bronze Age northern Mesopotamia, a fact that led several researchers to question whether sickles were used in this period or if they were made of a material other than flint (Anderson and Chabot 2001; Anderson, Chabot, and van Gijn 2004). The tools in question show that at least at Raqa'i some sickles were made of flint.

DISCUSSION

It is clear from the data presented that the lithics from Tell al-Raqa'i are well within the tradition already known for Early Bronze Age northern Mesopotamia. This tradition consists of two components: a local and non-elaborated flake operating process in which all the elements were controlled by the occupants of the village, and a specialized imported blade industry completely dependent on a distribution network of finished products that were intensively used in rural settlements.

These tools obviously played an important role in the daily activities of the Raqa'i village. If the planned spatial analysis is conducted, it will allow the acquisition of greater detail on the articulation of these activities. It is clear that people were knapping flint at Raqa'i, even though it is evident that they were not specialists and probably spent minimal time on lithic tool production. Since the exact function of the flake tools is unknown to us at the moment, it is impossible to understand their precise role, but the time spent to prepare them implies that the tools possessed a certain utility.

In contrast, the specialized function identified for the long blades reveals the existence of a complex distribution network of Anatolian origin, producing particular tools intended for export. Our data indicate that Canaanean blades played no part in the harvest but in the processing of harvested grains. Results from the functional analysis of both punch and Canaanean blades from Raqa'i reveal that these very specialized tools were used only over a few weeks per year to treat harvested plants on specially prepared areas.

These technical innovations in knapping standardized blades are an important testimony to the technological evolution of this society, in which an increasing number of new tasks required specialized craftsmen. Societies developing from the humble rural villages of the Neolithic were transformed gradually into more complex cultures based on the production of surplus. The appearance of Canaanean blades dedicated to very specialized agricultural tasks, as well as the flint-knapper specialists based on villages where a rare raw material allowed specialized production, constitutes an unmistakable mark of this cultural specialization that began in Chalcolithic times and developed more systematically in the Ninevite 5/Early Bronze Age period.

At this time, we see commercial developments in which the harvest was systematically exploited with the aim of a strategic storage and redistribution process. Therefore, the cultivation of barley and wheat, the harvest, the threshing and chopping of straw with a threshing sledge armed with robust blades, winnowing, and storing in specially conceived silos form the various stages of the specialized treatment which took place at Raqa'i about 5,000 years ago.

One of the major contributions of this kind of research is the formal identification, for the first time, of flint sickle elements from Early Bronze northern Mesopotamia. What remains mysterious is the rarity of these tools. Considering the absence of such objects in other northern Mesopotamian assemblages and their scarcity at Raqa'i (4 tools), it is possible to think that harvest was conducted by tearing with the hand or with another type of tool as yet undocumented (e.g., a bronze sickle that would have been recycled).

ACKNOWLEDGMENTS

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NOTES

[1] See definition in Anderson, Chabot, and van Gijn (2004).
[2] However, chemical analysis yields very good results for obsidian artifacts (Chabot et al. 2001).
[3] Since the raw blocks were easy to find in the Khabur River, this flint "waste" was probably of little concern to the inhabitants of Raqa'i.
[4] The pale use-wear traces observed on these objects demonstrate this fact well; perhaps the flakes were used for working a material that does not leave use-wear traces on flint, or they were used for a very brief task.
[5] To determine the function of ad hoc tools from Neolithic to Bronze Age sites in Europe, the Near East and the Caucasus, we are currently (Chabot et al. 2014) performing a program of experimentation at our laboratory (Laval University, Québec) on chert/flint and obsidian flakes.
[6] This intentional fragmentation of blades is attested by the great quantity of segments. In fact, these systematic fractures are so numerous that it is impossible to think that they could have been made by accident. This conclusion is also supported by the bitumen residues observed at both ends of many blades. Such sections of blades surely had this morphology when they were used. Furthermore, microscopic observation of the gloss present on the artifacts allows us to distinguish between intentional and accidental fractures: an intentional fracture shows a gloss that is "gently biting" the section of the blade, while the accidental fracture (ancient or recent) stops abruptly and has no evidence of bitumen on the blade section. Further, the intentional aspect of the fracture is confirmed by the fact that the fractures are always made on a strong, medial part of the blade and never at points where the blade is fragile.
[7] For example, many dihedral butts are impossible to "read," due to the modifications performed on them. Some were thinned while others were crushed or even removed.
[8] The core is shaped by hard hammer direct percussion and indirect percussion.
[9] J. Pelegrin is the only technologist able to reproduce those blades. In order to appreciate the complexity of this method, it is possible to see him make Canaanean blades in a film released by CNRS (France) and CELAT (Laval University, Québec, Canada) (see Anderson et al. 2001).
[10] However, recent research has shown that this technique was known and used in both Neolithic Armenia (Chabot and Pelegrin 2012) and Turkey (Altinbilek-Algül et al. 2012).
[11] Through the use of pressure *débitage* with a long lever, it is possible to obtain blades that are long (often approximately 30 cm), wide (between 2.2 and 7 cm), and thick.
[12] Pelegrin in Chabot (2002).
[13] The tools consist of flakes or blades that have been retouched or which show traces of use (gloss) or hafting (bitumen).
[14] Tools with fine teeth are flakes without shaping retouch on their cutting edges but with fine teeth probably formed during the use of their raw cutting edges. It is this retouch which permits classification of these artifacts as tools.
[15] On the drawings of glossed elements, the brilliance of the gloss is represented by small circles, while its extent on the object is represented by dotted lines. Glue residue (bitumen) is indicated by darkened areas. Figure 7.9 shows an element whose gloss is evident in the image.
[16] Leiden University, the Netherlands.
[17] This experimental program began in October 2012 at the use-wear lab at Laval University.
[18] Once chopped, straw could be used to feed animals as well as in mudbricks.
[19] Excavations on this site were conducted between 1986 and 1993 by a mission from Laval University, Québec, directed by Prof. Michel Fortin.

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Chapter 8

The Analysis of Metal Artifacts from Tell al-Raqa'i

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Introduction

Most analyzed metallurgical finds from Upper Mesopotamia derive from major urban sites such as Tell Brak and Tell Mozan (see e.g., Northover 2001a, 2001b; de Ryck, Adriaens, and Adams 2003, 2005); little is known about the metallurgy in rural sites. The investigation of the metallurgical inventory from Tell al-Raqa'i, therefore, provides us with new information about metals and alloys in use within a small community and also about possible metallurgical activities, enabling comparison to similar evidence from urban centers.

The quantity of metal artifacts or fragments of artifacts found at Tell al-Raqa'i is relatively small, considering that they stem from five full seasons of excavation (1986–1990) as well as shorter-term operations in 1991–1993, and that excavated contexts were almost entirely screened. Only 90 metal artifacts were registered (compare Dunham, Chapter 5), of which 25 derived from Hellenistic layers, recent Islamic burials, or topsoil. Additionally, several finds were discovered with layers of uncertain date, either close to the surface or, especially for some iron artifacts, intrusive from the post-Bronze Age occupation or the Islamic burials (n = 17). Of the remaining 48 third-millennium examples, the majority were small fragments whose original shape and function were impossible to determine. Most of the more complete and identifiable artifacts were copper-base pins (n = 8), usually toggle pins. An additional four examples are copper-base spirals, of which three derived from burials of children in Level 2.

Twelve samples consisting of very small fragments, some derived from larger objects and some only from fragments, had been selected previously for metallographic and elemental analysis at the University of Pennsylvania's Museum Applied Science Center for Archaeology (MASCA) in Philadelphia, Pennsylvania. This research was conducted under the direction of Vincent C. Pigott (then a senior research scientist), with Stuart J. Fleming (scientific director, MASCA), and the late Charles P. Swann (Bartol Research Institute, University of Delaware) undertaking the PIXE (proton-induced x-ray emission) analysis, and Samuel K. Nash (research associate), the metallography. Most recently EPMA-WDS analysis (electron probe microanalysis-wavelength dispersive spectrometry) and its interpretation were conducted by doctoral candidate Kristina A. Franke at the Wolfson Archaeological Science Laboratories, UCL Institute of Archaeology, London.

The finds selected for analysis included several copper-base pin and rod fragments, a rod-like fragment consisting of lead, one possible ingot fragment or casting debris, some possible scrap metal, and an iron ring fragment. In the text to follow, all analyzed artifacts are referred to by their laboratory number, and a reference table showing the original Raqa'i find numbers is given below (Table 8.1).

Artifacts

The majority of the analyzed finds are rod fragments (M01, M07, M18, M21) and pin fragments (M16, M45, M48, M49), the most frequently encountered groups among third-millennium metal finds in Upper Mesopotamia. Most of them are circular in cross-section; an exception is the square rod fragment M21. Identification of the original shape of M17 is slightly difficult. The artifact shows a fist-like–shaped end

TABLE 8.1. List of Analyzed Artifacts from Tell al-Raqa'i.

Find #	Laboratory #	Artifact	Metal	Major components	Minor components	Acquired working technique	Level	Context	Approximate date BCE/period
Raq 87 M-001	M01	Rod fragment (bent)	Copper	Cu		Fully annealed	Level 3	Temple fill area 21	ca. 2600
Raq 87 M-007	M07	Rod fragment	Arsenical copper	Cu, As	Fe, S	Cold worked after annealing	Above level 3 under topsoil	Living area (?) above level 3 area 20	3rd millennium/ late level 3?
Raq 87 M-008	M08	Flat fragment (scrap metal?)	Arsenical copper	Cu, As	Sn, Fe, Sb	Heavily deformed, cold worked after annealing	Above level 3 under topsoil	Living area (?) above level 3 area 20	3rd millennium/ late level 3?
Raq 87 M-014	M14	Amorphous lump, ingot fragment/ casting waste	Arsenical copper	Cu, As	Fe, Sn	As cast	Level 3	Industrial area room 42, on floor	ca. 2600
Raq 86 M-015	M15	Ring fragment	Iron	Fe		Cold worked, drawn (?)	Above level 3 under topsoil	Living area (?) above level 3 areas 1–2	recent (Islamic?)
Raq 87 M-016	M16	Rod fragment (toggle pin)	Arsenical-antimonial copper	Cu, Sb, As	Fe, S, Ag, Ni	Cold worked and final annealing	Level 2	Burial 30	ca. 2500
Raq 86 M-0017	M17	Artifact with rod-like extension (pin fragment?)	Lead	Pb	As	Deformed	Above level 2 under topsoil	Step trench 42/116 above level 2 area 4	3rd millennium/ possible level 2 or historic?
Raq 86 M-0018	M18	Rod fragment	Copper	Cu	Fe, S, Ni, As	Cold worked and annealed	Possible mix of level 4 and later	Step trench 42/116 above level 4 area 8	3rd millennium/ possible level 4
Raq 86 M-0021	M21	Rod fragment	Arsenical copper	Cu, As	Fe, Sb, S, Pb, Ni	Heavily deformed (hammering)	Above level 3 under topsoil	Living area (?) above level 3 area 18	3rd millennium/ late level 3
Raq 90 M-045	M45	Toggle pin	Copper	Cu	Fe, As	Cold worked and annealed	Level 3	Burial 19	ca. 2600
Raq 90 M-048	M48	Toggle pin	Arsenical copper	Cu, As	Fe, Sn	Cold worked and annealed	Level 4 (level 3?)	Room 6 (burial 19?)	ca. 2700 (ca. 2600?)
Raq 90 M-049	M49	Tapered pin	Bronze	Cu, Sn	As	Deformed after annealing	Level 4 (level 3?)	Room 6 (burial 19?)	ca. 2700 (ca. 2600?)

worked on a rod-like extension and may well also be a pin fragment. In contrast, M14 can be described as a semi-circular lump and may be either an ingot fragment or casting debris. Similarly, the rather flat artifact M08, which is slightly oval in cross-section, does not show any artifact-related shape and might be best described as scrap metal. M15 describes a ring fragment.

Four of these finds (M01, M14, M16, M45) derive from the well-stratified, third-millennium levels 3 and 2, dated to ca. 2600 and 2500 BCE, respectively. The youngest of these artifacts, the fragment from toggle pin M16, was found with the skeleton of a child (burial 30) dating to level 2 (see Chapter 5, Bronze Objects, no. 27). A fragment from a second toggle pin, M45, was likewise discovered within a burial, but one that was intrusive from level 3 into level 4 of the Round Building (room 6, burial 19) dating from ca. 2600 BCE (see Chapter 5, Bronze Objects, no. 48). The contemporary rod and ingot fragments M01 and M14, both also deriving from level 3, were, in contrast, contextualized with the living and industrial areas (temple fill and room 42; see Chapter 5, Bronze Objects, nos. 15 and 25).

However, the majority of the analyzed artifacts were excavated among mixed third-millennium BCE contexts, and a precise dating, therefore, is impossible. The pin fragments M48 and M49 both derived from debris in room 6 of the Round Building. Due to their find spot, they may either date to the earlier level 4 (ca. 2700 BCE) or, like M45, may belong to burial 19 of level 3, which is located near their find spot (see Chapter 5, Bronze Objects, nos. 50–51). All additional artifacts either derived from contexts described as "above level 3 under top soil" within the living area (M07, M08, M15, M21; see Chapter 5, Bronze Objects, nos. 14, 19, and 20, and Iron Objects, no. 6) or from the step trench 42/116 situated at the southern slope of the tell (M17, M18; see Chapter 5, Lead Objects, no. 1, and Bronze Objects, no. 11). These items are roughly dated to the third millennium BCE except for sample M15 (see below); no analytical evidence suggestive of a Hellenistic or Islamic origin (Level 1 and post-level 1) was detected.

Most analyzed artifacts consist of copper-base metal. Exceptions are M17, which consists of lead, and the iron ring fragment M15. Despite the find location of M15, above areas 1 and 2 of level 3, a recent, possible Islamic date is suggested for the artifact following microscopic and elemental analyses.

Analytical Methods

The investigation of the 12 metal specimens from Tell al-Raqa'i pursued two primary objectives. First, it aimed at characterization of the elemental composition of each artifact, including major, minor, and trace elements, to distinguish among different alloys when present and to group artifacts of different possible origins. Second, it undertook the examination of applied metalworking techniques to identify the level of skill.

To identify the elemental composition, two methods, PIXE analysis and EPMA-WDS analysis, were applied. All samples were studied as metallographic cross-sections, allowing a single sample to be analyzed metallographically (etched and unetched), and by PIXE and EPMA, with minimal sample loss (Henderson 2000:17; Swann and Fleming 1986; Swann, Fleming, and Jaksic 1992:499).

PIXE analysis uses a proton beam causing an electron vacancy in one of the atom's inner shells and the emission of characteristic x-rays when this vacancy is being filled by an electron from a higher shell. For element identification and quantification, the characteristic x-rays are recorded using an energy dispersive detector (PIXE-EDS). The major advantage of PIXE is the low detection limit, especially for light elements (0.5–5 ppm, depending on the element; Pollard, Batt, Stern, and Young 2007:117), and consequently the ability to detect trace elements within analyzed samples. The instrument is capable of analyzing an area of ca. 4 mm^2 to a depth of ca. 10 μm. In this study the Bartol PIXE Facility was calibrated using a wide variety of copper alloy standards available through the BNF Metals Technology Center (Wantage, England) and the National Institute of Standards and Technology (NIST) (Gaithersburg, Maryland). (For a detailed description of the employed PIXE method, see e.g., Swann and Fleming 1986, 1988, 1990; Swann, Fleming, and Jaksic 1992.)

PIXE bulk analysis was undertaken on specimens M01, M07, M08, M14, M16, M18, M21, M45, M48, and M49. Because of the general composition of the iron ring M15 and the lead fragment M17, this method was not applied to these two artifacts, since their elemental composition was thought to be of no particular relevance.

EPMA-WDS analysis operates on a very similar principle, creating the inner shell vacancies through incoming primary electrons instead of protons. For element identification and quantification, the characteristic x-rays are recorded using a wavelength-dispersive

spectrometer (EPMA-WDS). In contrast to PIXE, the electron microprobe is less sensitive for some elements but can focus on areas as small as a few micrometers in diameter, and the WDS has a much higher spectral resolution, resulting in fewer line-overlap problems compared to EDS analysis. In addition to bulk analysis, the EPMA-WDS method was also used to analyze different inclusions such as sulfides, intermetallic compounds, or metallic particles, which were too small to be analyzed separately by PIXE.

For this study, a JEOL 8100 Superprobe was used, operating with an accelerating voltage of 20 kV. For area analysis, spot analysis of the matrix, and analysis of metallic inclusions and intermetallic compounds, an absorbed electron current of 50 nA was used. A lower absorbed electron current of 15 nA was found to be more suitable for lighter inclusions such as sulfides. Detection limits were about 200–700 ppm, depending on the element. For bulk analysis, an average of 10 areas of 1000 μm^2 each were analyzed for each sample, and mean values of area analyses were calculated to account for potential heterogeneity of the samples. Spot analysis covers an area of less than 10 μm^2 to a depth of ca. 3 µm, and an average of three spots was analyzed per sample. The measured intensity was quantified against pure or binary compounds using JEOL's ZAF correction method. Area analyses were carried out for all listed specimens; spot analyses were employed for all artifacts except for the iron fragment M15.

In addition to the archaeological samples, several certified reference materials were analyzed by EPMA (Table 8.2); a comparison of measured values to certified values shows the general reliability of the EPMA data for most elements detected, including iron at concentrations as low as 0.4 wt%. Precision testing showed good to medium results for all elements except manganese and sulfur. Poor precision was also detected for lead with reference material CURM 42.23-2, CURM 50.04-1 and CURM 50.04-4, arsenic with reference material CURM 42.23-2 and CURM 50.04-1, antimony with reference material CURM 42.23-2, and aluminum with reference material CURM 71.32-4. These low precision values are possibly due to the heterogeneity of the reference materials and the chosen testing method, where a sequence of 10 different areas within the samples was analyzed.

Most elements reported were detected by both PIXE and EPMA and, in general, the data are very consistent between the two methods. Major systematic differences were found only for iron and sulfur, where EPMA results for most samples were about twice as high as PIXE levels. EPMA data for arsenic, and partly tin, content were on average higher than PIXE results (Table 8.3). In contrast, copper and antimony values reported by EPMA analyses are nearly always higher than those reported by PIXE.

Other discrepancies occurred for sample M14, with considerably higher arsenic and nickel values, and for sample M16 with remarkably lower silver levels in the EPMA data. At present, we cannot comment further on the discrepancy between the EPMA and PIXE data in our samples. Possible reasons include heterogeneity of the sample material, visible in the optical microscopy, as well as calibration differences and the differences between EDS and WDS analysis. In this chapter, we refer to EPMA data throughout in the text, while reporting both EPMA and PIXE in Table 8.3.

Metallography was undertaken to investigate the applied working techniques of all 12 artifacts, using mounted, polished, and etched cross-sections. Additionally, a longitudinal sample of the iron ring fragment M15 (M15A) was examined. Along with hardness and grain size, possible methods of working and shaping the copper-base metal were identified. All copper-base samples were etched for metallographic analysis using $K_2Cr_2O_7$ + $EthFeCl_3$; the iron ring fragment M15 and the lead artifact M17 were etched with 4% Nital followed by Marshall's Reagent. A detailed description of the metallographic results is given in the Appendix.

Additionally, the identification of possible different origins of the material was explored by the lead isotope analysis of two finds (M14, M16) undertaken previously at the National Institute of Standards and Technology (NIST) in Gaithersburg, Maryland (Yener et al. 1991:566, 575); the results are included herein.

Analytical Results

The compositional results indicated that 10 of the investigated artifacts from Tell al-Raqa'i are copper-base metal. They are divisible by their elemental content into three major groups: almost pure copper artifacts, arsenical and arsenical antimonial copper, and true tin-bronze. Additional metals are represented by the pin fragment M17 that is of lead, and the ring fragment M15, worked from nearly pure iron (see group 4).

All compositional results are given in Table 8.3 and are presented as normalized weight percent data with measured chloride and oxygen to denote the state of corrosion.

Table 8.2. EPMA-WDS Data in Comparison to Certified Values of Four Different Reference Materials, with All Elements Normalized to 100 wt%.

	Cu	As	Zn	Fe	Ni	Sb	Sn	Pb	Bi	S	Mn	Si	Al	P	Ag	Cl	O
CURM 42.23-2	74.4	0.17	22.13	0.35	0.17	0.36	1.63	0.58	0.03	0.05	0.02	0.02	0.01	0.13	n.s.	n.s.	n.s.
EPMA average	74.0	0.16	22.68	0.44	0.20	0.35	1.56	0.36	n.d.	0.10	0.02	n.a.	n.d.	n.a.	n.d.	n.d.	0.12
Accuracy (δ abs.)	0.41	0.01	−0.55	−0.09	−0.03	0.01	0.07	0.22	0.03	−0.05	0.00		0.01				
Precision (cv)	0.39	23.21	1.03	10.42	7.80	26.81	13.30	28.47		27.16	47.19						
CURM 50.01-4	74.1	0.22	1.17	0.24	2.24	0.59	9.45	11.74	0.03	0.11	0.02	0.01	0.02	0.11	n.s.	n.s.	n.s.
EPMA average	73.8	0.21	1.25	0.27	2.43	0.67	9.63	11.51	n.d.	0.19	0.03	n.a.	n.d.	n.a.	n.d.	0.03	n.d.
Accuracy (δ abs.)	0.34	0.01	−0.08	−0.03	−0.19	−0.08	−0.18	0.23	0.03	−0.08	−0.01		0.02				
Precision (cv)	4.01	15.55	5.73	8.03	4.35	9.77	3.68	26.12		40.72	42.87						
CURM 50.04-4	76.0	0.06	0.66	0.10	1.10	0.50	11.29	9.93	0.10	0.14	0.03	0.01	0.01	0.03	n.s.	n.s.	n.s.
EPMA average	76.0	0.06	0.75	0.14	1.21	0.54	11.67	9.22	n.d.	0.27	0.05	n.a.	n.d.	n.a.	n.d.	0.02	n.d.
Accuracy (δ abs.)	−0.05	0.00	−0.09	−0.04	−0.11	−0.04	−0.38	0.71	0.10	−0.13	−0.02		0.01				
Precision (cv)	2.80	53.96	9.44	6.57	3.79	11.22	5.31	25.29		33.59	66.50						
CURM 71.32-4	80.7	0.25	6.53	0.35	0.70	0.26	6.47	4.44	0.05	0.08	0.05	0.02	0.12	0.02	n.s.	n.s.	n.s.
EPMA average	80.2	0.23	6.78	0.45	0.78	0.23	6.55	4.34	0.02	0.18	0.08	n.a.	0.08	n.a.	0.03	n.d.	0.02
Accuracy (δ abs.)	0.49	0.02	−0.25	−0.10	−0.08	0.03	−0.08	0.10	0.03	−0.10	−0.03		0.04				
Precision (cv)	1.00	20.97	1.09	8.21	2.09	15.40	5.08	15.30	105.0	47.29	35.10		21.15		15.93		

Notes: Accuracy was tested by averaging 10 bulk analyses in different areas of each reference material in comparison to certified values performed during the same day. Precision gives the coefficient of variation (in %) for each compound after 10 consecutive EPMA bulk analyses in different areas of each reference material performed on same day. n.a. = not analyzed; n.d. = not detected; n.s.=not stated.

Group 1: Almost Pure Copper (M01, M18, M45)

The first group comprises almost pure copper artifacts, of which M01 is the purest with 99.8 wt% Cu. Interestingly, specimen M01 contains ca. 0.1 wt% bismuth but little else, according to the spot analysis, together with numerous cuprite particles (Cu_2O) along the grain boundaries (Table 8.4, Figure 8.1). Bismuth is often found along grain boundaries (Junk 2003:29–31) and negatively influences the cold-working properties of metal, making it brittle. The microstructure of this rod fragment reveals annealing twins, and thus the worked copper appears to have been left in the annealed state without further cold working. With regard to its bismuth content, we suggest that the artifact was not worked further after final annealing due to its probable brittle nature.

All further elements within specimen M01 such as arsenic, nickel, tin, silver, lead and sulfur were detected only in traces of about 100 to 300 ppm within PIXE analysis. Despite the good results for antimony and iron with the reference material, these elements were

TABLE 8.3. EPMA-WDS (Gray) and PIXE-EDS Data of Bulk Analysis with All Elements Normalized to 100 wt%.

		Cu	As	Ni	Fe	Sb	Sn	Ag	Pb	Bi	S	Te	Cl	O
M14	WDS	95.9	3.15	0.07	0.61	0.05	0.11	0.06	0.04	n.d.	0.04	n.d.	n.d.	n.d.
	PiXE	97.3	2.12	0.03	0.30	0.05	≤ 0.09	0.06	≤ 0.06	n.d.	0.02	n.d.	n.d.	n.d.
M08	WDS	96.1	2.24	bdl	0.56	0.28	0.59	0.04	0.07	n.d.	0.04	n.d.	n.d.	n.d.
	PiXE	96.5	2.03	≤ 0.03	0.29	0.37	0.59	0.05	0.08	n.d.	0.04	n.d.	n.d.	n.d.
M07	WDS	95.3	2.32	0.03	1.94	bdl	bdl	0.04	bdl	n.d.	0.33	n.d.	n.d.	n.d.
	PiXE	96.5	2.10	≤ 0.04	1.01	≤ 0.03	≤ 0.02	0.04	≤ 0.06	n.d.	0.17	n.d.	n.d.	n.d.
M48	WDS	97.1	1.48	0.05	0.90	bdl	0.32	0.04	0.03	n.d.	0.04	n.d.	n.d.	n.d.
	PiXE	97.8	1.30	≤ 0.04	0.48	≤ 0.05	0.24	≤ 0.02	0.06	n.d.	0.01	n.d.	n.d.	n.d.
M16	WDS	95.8	1.22	0.11	0.78	1.46	n.d.	0.16	bdl	n.d.	0.40	n.d.	n.d.	n.d.
	PiXE	96.5	1.03	0.10	0.38	1.52	≤ 0.03	0.23	≤ 0.04	n.d.	0.17	n.d.	n.d.	n.d.
M21	WDS	97.0	1.01	0.09	1.03	0.37	n.d.	0.05	0.13	n.d.	0.28	n.d.	n.d.	n.d.
	PiXE	97.6	0.94	0.11	0.54	0.47	≤ 0.02	0.08	0.13	n.d.	0.15	n.d.	n.d.	n.d.
M45	WDS	98.9	0.33	bdl	0.60	bdl	n.d.	0.06	n.d.	n.d.	bdl	n.d.	bdl	n.d.
	PiXE	99.2	≤ 0.32	≤ 0.03	0.28	0.03	0.02	0.05	0.04	n.d.	0.02	n.d.	n.d.	n.d.
M18	WDS	96.5	0.27	0.50	1.53	0.08	n.d.	0.03	0.04	n.d.	1.06	n.d.	n.d.	n.d.
	PiXE	98.0	0.26	0.50	0.71	≤ 0.09	≤ 0.03	≤ 0.02	0.08	n.d.	0.31	n.d.	n.d.	n.d.
M49	WDS	96.9	0.14	0.03	0.05	n.d.	2.72	0.05	n.d.	n.d.	0.04	n.d.	bdl	0.02
	PiXE	97.3	≤ 0.16	≤ 0.02	0.07	≤ 0.05	2.22	0.05	0.05	n.d.	0.09	n.d.	n.d.	n.d.
M01	WDS	99.8	bdl	bdl	n.d.	n.d.	n.d.	0.03	bdl	n.d.	bdl	n.d.	n.d.	0.1
	PiXE	99.7	0.01	0.03	0.07	0.04	0.02	0.02	0.04	n.d.	0.03	n.d.	n.d.	n.d.
M17	WDS	n.d.	1.32	n.d.	n.d.	n.d.	n.d.	n.d.	96.5	0.05	n.d.	0.07	n.a.	2.0
M15	WDS	0.03	0.14	0.02	99.5	n.d.	bdl	0.05	0.05	0.07	bdl	n.d.	n.a.	bdl

Notes: Zn was not found at level in excess of PIXE detection limits of ca. 0.57 wt% and in excess of EPMA detection limits of ca. 0.7 wt%. Cl was not detected at levels in excess of 0.055% by PIXE analysis. bdl = below detection limit; n.d. = not detected.

TABLE 8.4. EPMA-WDS Data of Spot Analysis Group 1: Almost Pure Copper, Samples M01, M18, and M45, with All Elements Normalized to 100 wt%.

		Cu	As	Ni	Fe	Co	Sb	Sn	Ag	Pb	Bi	S	Se	Te	O
M01	Cu matrix	99.8	bdl	n.d.	n.d.	n.d.	n.d.	bdl	0.02	bdl	0.08	n.d.	n.d.	n.d.	0.1
	Cuprite	93.6	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	bdl	0.08	0.05	n.d.	n.d.	6.2
M18	Cu matrix	97.9	0.33	0.50	0.97	n.d.	0.09	n.d.	n.d.	0.05	n.d.	n.d.	n.d.	n.d.	0.1
	Cu – S – Fe	65.6	0.04	0.05	9.40	0.14	n.d.	0.06	n.d.	n.d.	bdl	23.7	0.55	bdl	0.5
M45	Cu matrix	99.1	0.37	bdl	0.41	n.d.	n.d.	n.d.	n.d.	0.02	n.d.	bdl	n.d.	n.d.	0.1
	Cu – S	63.8	0.03	n.d.	0.06	n.d.	n.d.	n.d.	bdl	n.d.	n.d.	12.5	22.2	0.19	1.2

Note: bdl = below detection limit; n.d. = not detected.

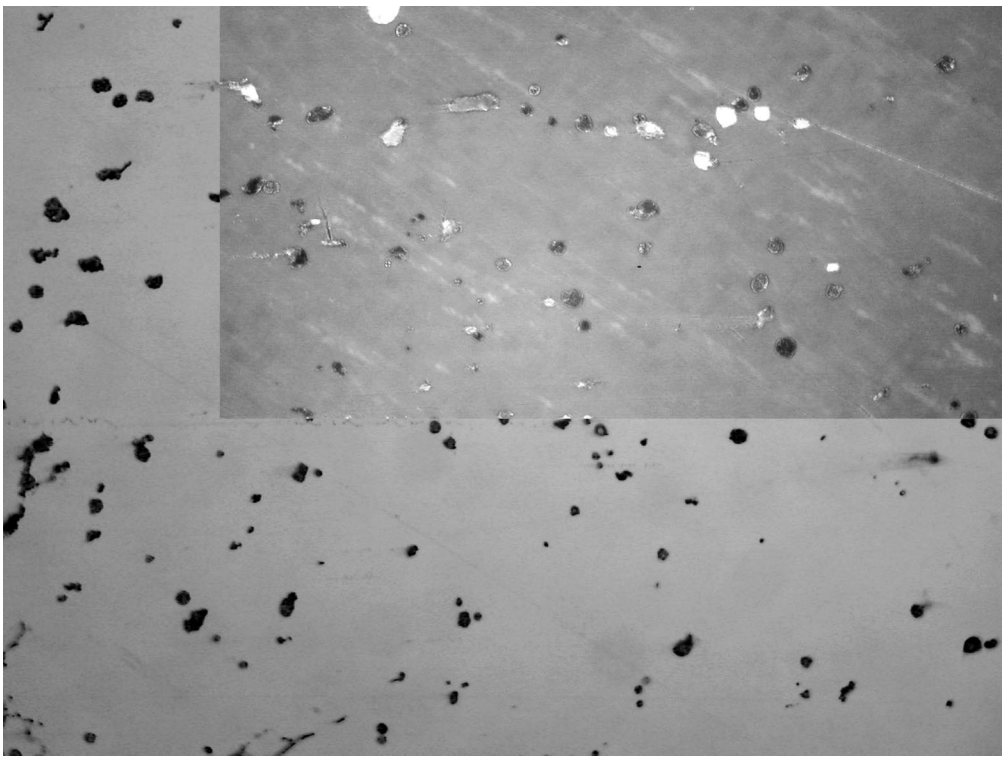

Figure 8.1. Optical microscopic image of sample M01 showing cuprite (Cu_2O) along the grain boundaries, visible as dark gray particles, changing to bright/light gray with the use of crossed polarized light (upper right corner); magnification 500X. *Photograph by Kristina Franke*.

not recognized by WDS but only by PIXE bulk analysis (Sb ca. 400 ppm; Fe ca. 700 ppm) (Table 8.3).

The bulk analyses of M18 and M45 show small levels of arsenic (As ca. 0.3 wt%) within both specimens. Such small levels of arsenic are normally considered to derive from the original ore source and were most likely not deliberately added to the copper (compare group 2).

Additionally, the rod fragment M18 shows elevated amounts of nickel (Ni ca. 0.5 wt%). These might separate M18 from all further analyzed artifacts, all containing ≤1100 ppm nickel, since this element is often suggested to be specific for certain ore sources. Other elements such as silver or lead were only detected in traces, if at all.

Frequently found inclusions are copper sulfides (M45) and copper-iron sulfides (M18) (Table 8.4). These appear as blue-gray, prill-shaped particles within the pink copper matrix (Figure 8.2) and form during the smelting or co-smelting of sulfidic ores. While the copper sulfide particles within specimen M45 are only loosely spread within the matrix, specimen M18 shows a dense concentration of large and small copper-iron sulfide inclusions (Figure 8.2). These high concentrations are also indicated by the high sulfur content within the bulk analysis (Table 8.3). Both kinds of sulfides show elevated amounts of selenium (M18 Se ca. 0.6 wt%; M45 Se ca. 22 wt%) and, in the case of M45, also of tellurium (Te ca. 0.2 wt%). Selenium and tellurium are frequently found within sulfides, and their ratio to each other may be related to the specific ore source (see Discussion section below). Further, the lower amounts of sulfides within specimen M45 can be associated with higher concentrations of selenium and tellurium within the single particles. This reflects the preferred oxidation of sulfur during the smelt, consequently increasing the concentration of selenium and tellurium within the remaining sulfides (Rehren 1991; Rehren and Northover 1991).

In contrast, metallic iron particles, present in both samples, are an indicator that strong reducing prevailed during smelting (Rothenberg 1990:76). However, both oxidizing and reducing conditions can appear during the same smelt at different locations and different stages. In addition, sample M18 shows discrete metallic lead particles within the copper matrix and redeposited

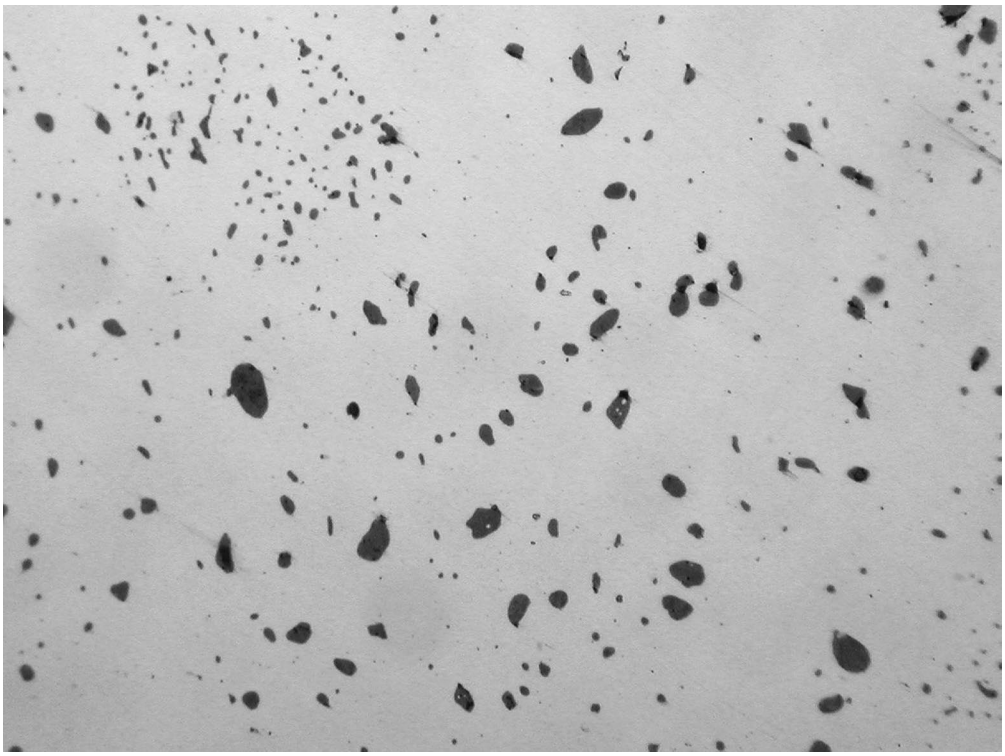

FIGURE 8.2. Optical microscopic image of sample M18, showing small and large copper-iron sulfide particles (dark gray) that are tightly spread within the copper matrix (light gray); magnification 500X. *Photograph by Kristina Franke.*

silver within the corrosion. Both metals may well derive from the original ore source, and while the lead segregated from the copper matrix due to its limited solubility within copper, the redeposited silver particles give evidence for the originally dissolved metal within the copper matrix (Scott 1991:125, 129). All detected metallic components were too small to be analyzed accurately and, therefore, are not listed in Table 8.4.

GROUP 2: ARSENICAL AND ARSENICAL ANTIMONIAL COPPER (M07, M08, M14, M16, M21, M48)

The second group can be described as arsenical copper and is the largest group within the sample set from Tell al-Raqa'i, represented by six artifacts. The analyzed specimens show on average ca. 96 wt% copper and about 1–2 wt% arsenic within the bulk analyses (Table 8.3). The only exception is the possible ingot fragment or casting debris M14, containing ca. 3 wt% As presumably reflecting its unprocessed state. These results are not unusual, since metallurgical studies from various Mesopotamian sites have shown the common use of arsenical copper during the entire third millennium BCE (compare, e.g., de Ryck, Adriaens, and Adams 2005). Copper artifacts with arsenic content of <2 wt% As (M16, M21, M48) are normally not considered to be deliberate alloys, since such low amounts of arsenic do not significantly improve the quality of copper in terms of, for example, hardness and durability (Budd and Ottaway 1991; Northover 1989). However, due to the levels of >2 wt% As within M07, M08, and M14, these artifacts could be seen as deliberate arsenical copper alloys, although further analytical evidence would be required to evaluate this proposition.

In addition, bulk analyses show tin and antimony content within most samples in this group, with antimony particularly high for specimen M16 (Sb 1.5 wt%). When present in moderate amounts, both elements have a hardening effect on copper similar to that of arsenic (Merkl 2010:19; Moorey 1994:241, 252). Despite its low arsenic content, it may be suggested that

the toggle pin fragment M16 was of a comparable quality to the medium arsenic-containing artifacts M07 and M08, due to its high level of antimony. This may also include M48, due to its additional low tin content of ca. 0.3 wt%. This is not true for specimen M21, without sufficient antimony or tin levels (Tables 8.3, 8.5).

As presented for the almost pure copper artifacts (group 1), copper-iron sulfides were identified within all arsenical copper specimens, which also contain elevated amounts of selenium (Se ca. 1–10 wt%) and tellurium (Te ca. 0.1–0.2 wt%). Additionally, the sulfide particles within the samples M08, M14, and M48 show magnetite (Fe_3O_4) as a discrete phase (Table 8.5), indicating the ongoing oxidation of iron from the sulfide inclusions. Copper sulfides were only detected within sample M14, again containing significant amounts of selenium (Se ca. 3.4 wt%) and tellurium (Te 0.3 wt%) (Table 8.5).

Additional inclusions are discrete metallic lead (M08, M14, M21) and silver-lead (M14) particles. Redeposited silver, antimony, and/or lead were also detected within the corrosion layer of most arsenical copper samples (M07, M14, M21, M48), indicating that the listed metals were originally dissolved within the copper matrix. The metallic iron inclusions detected within most arsenical copper samples (M07, M08, M14, M48) again give evidence that strong reducing conditions prevailed during the smelt (compare group 1). Most of the detected iron and lead inclusions were too small to be measured accurately and, therefore, are not listed in Table 8.5.

In addition to M14, all arsenical samples show annealing twins and display evidence for cold working, while elongated sulfide stringers detected in M08, M16, M21, and M48 support evidence of further hammering. Whereas most specimens derive from pin or rod fragments, the shape of M08 is not identifiable. However, its microstructure clearly indicates a working sequence of annealing followed by cold working, as shown by bent annealing twins (Figure 8.3, right). Consequently, it can be suggested that M08 was worked to shape. M21 is the only square-shaped rod fragment whose microstructure reveals a distinctive deformation cross resulting from cold working the metal into its square shape (Figure 8.4).

The only as-cast structure appears within the possible ingot fragment or casting splatter M14 (Figure 8.5), with casting porosity visible in the center of the specimen. The sample shows well-developed copper dendrites, and the individual copper grains show different zones of arsenic content, increasing from the

Table 8.5. EPMA-WDS Data of Spot Analysis Group 2: Arsenical and Arsenical Antimonial Copper, Samples M07, M08, M14, M16, M21, and M48, with All Elements Normalized to 100 wt%.

		Cu	As	Ni	Fe	Co	Sb	Sn	Ag	Pb	Bi	S	Se	Te	O
Cu – As matrix	M07	95.9	2.56	n.d.	1.30	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.2
	M08	96.2	2.47	n.d.	0.42	n.d.	0.28	0.59	n.d.	0.04	n.d.	n.d.	n.d.	n.d.	n.a.
	M14	95.6	3.67	0.06	0.51	n.d.	0.08	0.07	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	M16	96.2	1.33	0.09	0.50	n.d.	1.61	n.d.	0.11	n.d.	n.d.	n.d.	n.d.	n.d.	0.2
	M21	97.4	1.03	0.08	0.88	n.d.	0.38	n.d.	n.d.	0.09	n.d.	n.d.	n.d.	n.d.	0.2
	M48	97.1	1.52	0.05	0.81	n.d.	n.d.	0.31	n.d.	0.03	n.d.	n.d.	n.d.	n.d.	0.1
Cu – S – Fe	M07	64.7	0.32	n.d.	10.03	0.04	n.d.	n.d.	n.d.	0.04	0.07	22.38	1.68	0.12	0.6
	M08	72.5	0.31	n.d.	6.74	n.d.	n.d.	0.11	n.d.	1.13	0.03	18.38	0.82	n.d.	n.a.
	M16	65.1	0.12	n.d.	8.66	n.d.	n.d.	n.d.	n.d.	0.05	n.d.	23.34	1.38	n.d.	1.3
	M21	65.8	0.08	n.d.	8.89	n.d.	n.d.	n.d.	n.d.	0.59	0.07	23.16	0.85	n.d.	0.6
	M48	69.0	n.d.	n.d.	6.2	n.d.	n.d.	0.04	n.d.	0.13	n.d.	13.32	9.77	0.1	1.4
Cu – S – Fe with magnetite (Fe_3O_4) as a discrete phase	M08	63.5	0.29	n.d.	16.25	0.03	n.d.	0.08	n.d.	0.33	0.06	18.56	0.88	n.d.	n.a.
	M14	55.9	n.d.	0.03	21.03	n.d.	n.d.	0.06	n.d.	n.d.	n.d.	15.18	3.13	0.15	4.5
	M48	44.7	n.d.	0.03	31.95	n.d.	n.d.	0.07	n.d.	0.12	n.d.	5.52	4.36	0.06	13.2
Cu – S	M14	76.9	0.38	n.d.	0.61	n.d.	n.d.	0.04	n.d.	0.10	0.05	18.02	3.4	0.28	0.2
Metallic Fe (partly rust FeO(OH))	M08	4.20	0.10	n.d.	71.7	0.14	n.d.	n.d.	0.03	0.08	n.d.	0.13	n.d.	n.d.	23.6
	M48	7.00	0.03	n.d.	72.4	n.d.	n.d.	n.d.	n.d.	0.04	n.d.	n.d.	n.d.	n.d.	20.4
Metallic Ag–Pb	M14	11.00	0.93	0.06	1.54	n.d.	n.d.	0.64	52.8	30.9	1.55	n.d.	n.d.	0.05	0.5

Note: n.a.=not analyzed; n.d. = not detected.

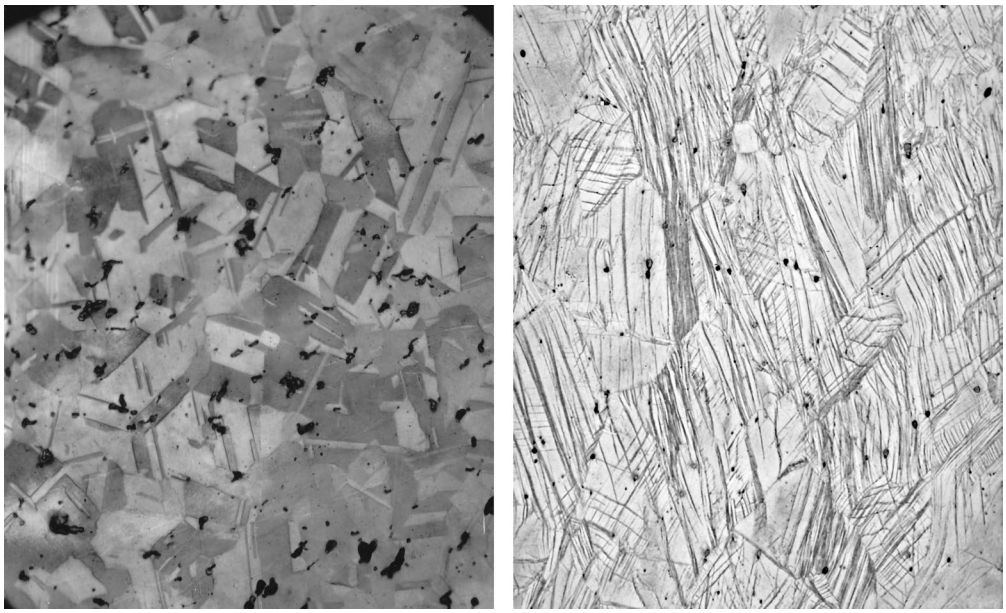

FIGURE 8.3. Photomicrographs showing annealing twins. Left: Sample M16 showing annealing twins as final stage of annealing without subsequent cold working. Right: Sample M08 showing bent annealing twins as evidence of final cold working after annealing. Photomicrographs of etched samples magnification 400X. *Photographs by Samuel Nash*.

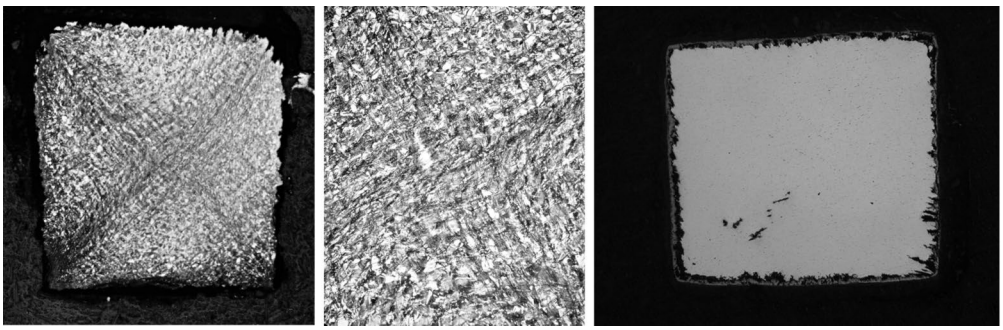

FIGURE 8.4. Photomicrograph of sample M21 (etched) showing a deformation cross formed during the shaping of the square rod (left and middle) and its approximate squarish shape (right); magnifications from left to right 25X; 100X; 35X. *Photographs by Samuel Nash* (left, middle) and *Kristina Franke* (right).

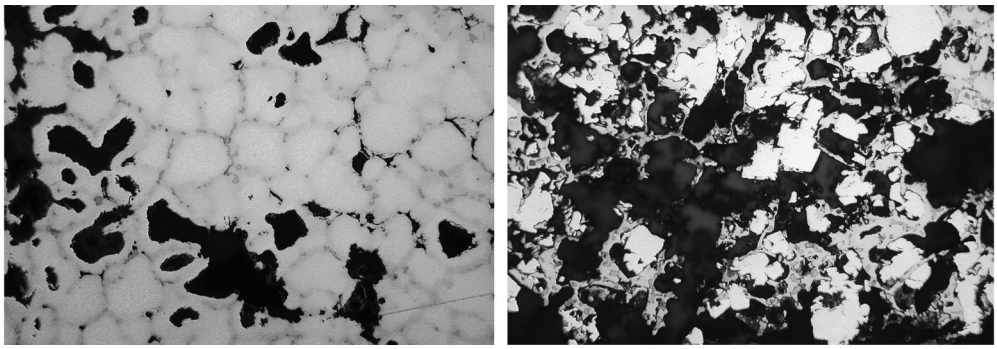

FIGURE 8.5. Photomicrographs of sample M14. Left: as-cast structure with copper dendrites (light gray) and intermetallic Cu-As along grain boundaries (dark gray); magnification 200X. Right: Grids of intermetallic Cu-As with vaguely square redeposited copper grains partly replacing original copper dendrites; magnification 100X. *Photographs by Kristina Franke*.

grain core to the grain boundary. Along the grain boundaries, intermetallic copper-arsenic compounds containing up to 29 wt% arsenic (Cu_3As) were formed, possibly due to quick cooling conditions. Within the corrosion layer and in the area of casting porosity, grids of these intermetallic compounds are preserved, showing the original shape of the now-corroded copper dendrites. The latter are in some areas replaced by redeposited and vaguely square copper grains (Figure 8.5).

Group 3: Tin-Bronze (M49)

The third group is represented by only one tin-bronze artifact, M49, containing about 97 wt% copper and nearly 3 wt% tin (Tables 8.3 and 8.6). Artifacts with tin content above 2 wt% Sn are often assumed to be true alloys, since copper ore sources normally do not exceed these amounts (see e.g., Alimov et al. 1998:165; Stech 1999:62), and, consequently, tin has to be added to the melt to reach such high levels. Furthermore, tin levels above 2 wt% already improve the quality of copper significantly in terms of hardness and durability (Budd and Ottaway 1991). Therefore, the pin fragment M49 can be considered to be a true tin-bronze alloy with a low tin content.

In contrast to the arsenical copper specimens (group 2), sample M49 hardly shows any significant components beside ca. 1000—2000 ppm arsenic and traces of nickel (Ni 300 ppm) and silver (Ag 500 ppm) according to the bulk analysis (Table 8.3). As with most Raqa'i samples studied, copper sulfide inclusions and metallic iron, the latter in its oxidized state, were detected in this specimen (Table 8.6).

Optical microscopy shows a very well-worked metal artifact. The pin fragment is almost perfectly round in circumference and shows a seam running from its center to the surface of the preserved, uncorroded metal (Figure 8.6). This specific feature gives reason to suggest that the pin was shaped by folding the metal back on itself. Furthermore, elongated copper sulfides indicate hammering of the artifact (Figure 8.7), and bent annealing twins show that cold working was the last working step (Figure 8.8).

Table 8.6. EPMA-WDS Data of Spot Analysis Group 3: Tin-Bronze, Sample M49, with All Elements Normalized to 100 wt%.

M49	Cu	As	Ni	Fe	Co	Sb	Sn	Ag	Pb	Bi	S	Se	Te	O
Cu – Sn – matrix	97.0	0.21	0.02	bdl	n.d.	n.d.	2.50	bdl	n.d.	0.02	bdl	n.d.	n.d.	0.2
Cu – S	83.1	n.d.	n.d.	0.03	n.d.	n.d.	0.55	0.05	0.02	0.04	10.77	4.90	0.04	0.5
Metallic Fe (rust FeO(OH))	8.50	0.08	n.d.	63.1	0.18	n.d.	1.80	n.d.	0.03	n.d.	0.24	0.04	0.06	25.8
Sn – oxides (SnO)	11.20	0.01	n.d.	0.27	0.05	0.15	64.5	n.d.	n.d.	n.d.	0.06	0.31	0.54	22.9

Note: bdl = below detection level; n.d. = not detected.

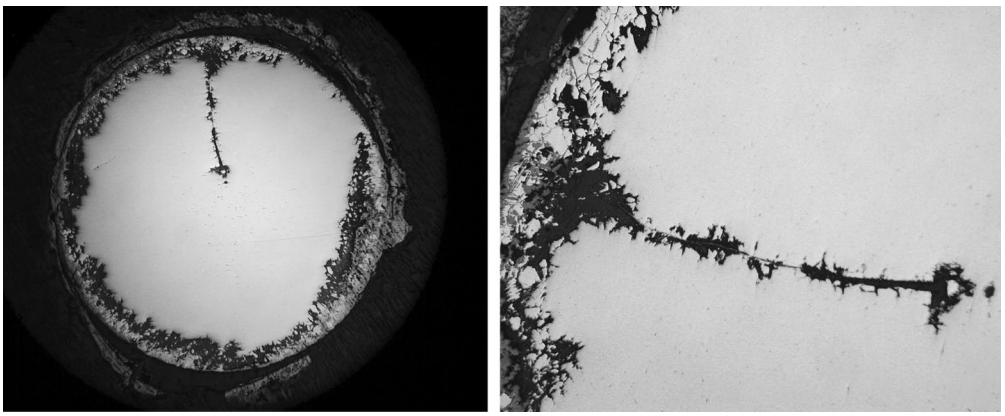

Figure 8.6. Photomicrograph of sample M49, showing its round circumference and a seam running towards the center of the artifact; left: magnification 40X; right: magnification 100X. *Photographs by Kristina Franke.*

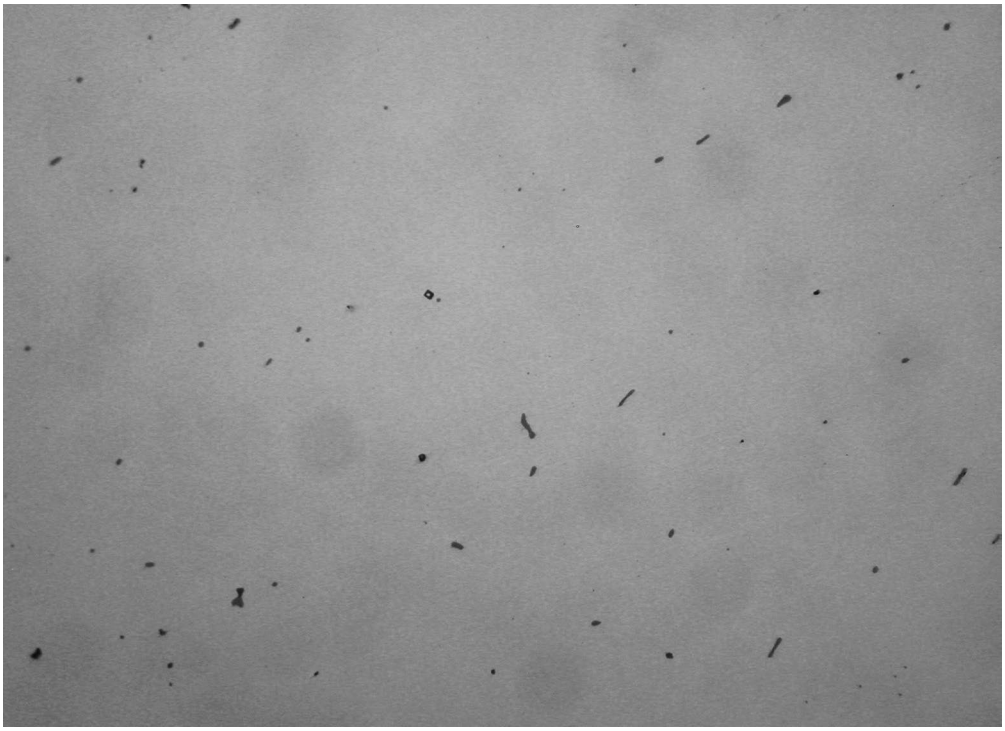

FIGURE 8.7 Photomicrograph of sample M49, showing elongated copper sulfides; magnification 200X. *Photograph by Kristina Frank*e.

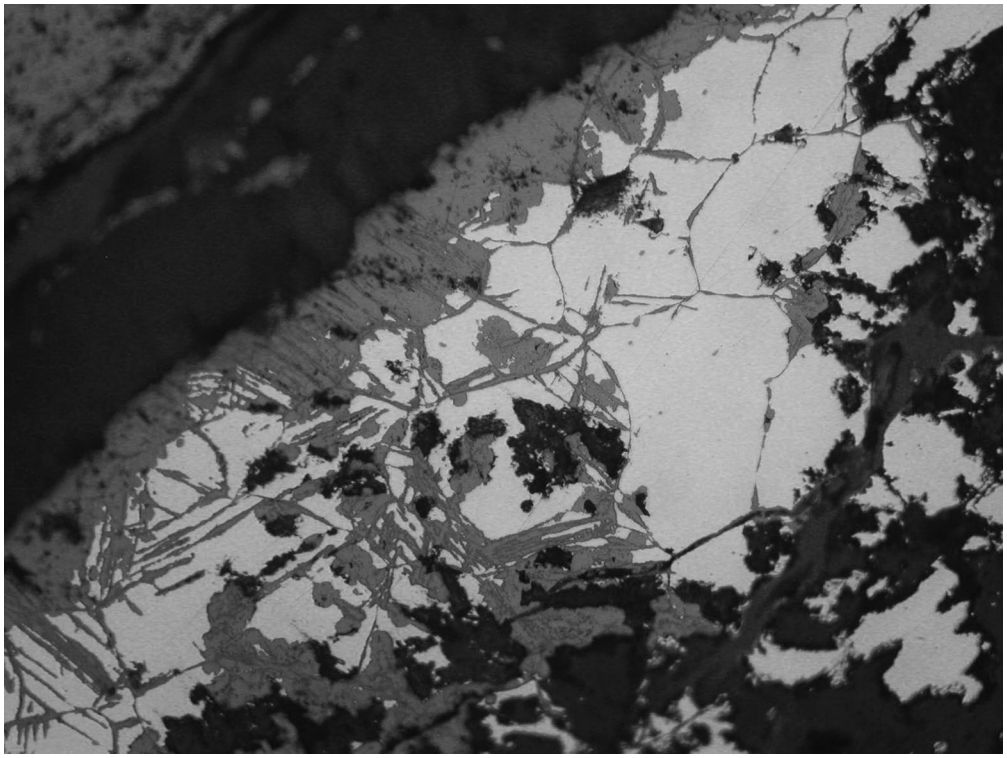

FIGURE 8.8. Photomicrograph of sample M49, showing annealing twins within the corrosion layer; magnification 500X. *Photograph by Kristina Franke.*

Group 4: Miscellaneous Artifacts (M15, M17)

The last group comprises two analytically different finds, the lead artifact M17 and the iron ring M15. M17 consists of a lead-base metal (Pb ca. 97 wt%) with minor amounts of arsenic (As ca. 1 wt%) and bismuth (Bi ca. 0.1 wt%) (Table 8.3) and traces of tin and tellurium (Sn and Te ca. 200 ppm) (Table 8.7). Additionally, inter-metallic copper-arsenic compounds (Cu_3As) were detected within this sample containing minor amounts of selenium (Se ca. 1000 ppm) and traces of manganese (Mn ca. 200 ppm). The arsenic and bismuth content imply that this pin was worked from so-called "soft lead," which could have occurred as a by-product of cupellation. The process of cupellation, which results in the extraction of silver, is documented as early as the fourth millennium BCE in upper Mesopotamia (Pernicka, Rehren, and Schmitt-Strecker 1998).

Specimen M15 consists of nearly pure iron (Fe ca. 99 wt%) and shows hardly any inclusions, and in particular, only very few slag inclusions (Tables 8.3 and 8.7; Figure 8.9). The purity of the metal gives reason to suggest that this artifact is of a more recent date and that it originally derived from the Islamic cemetery located on top of the tell. A second indicator of a more recent date is the high manganese content (Mn ca. 0.4 wt%) (Table 8.7) combined with traces of sulfur (S ca. 200 ppm), both of which probably combined to form manganese sulfide inclusions (MnS). These regularly occur in modern iron objects and derive from sulfur-rich coke used in their production. Moreover, the nearly perfectly round shape of the artifact can be attributed to a modern production method where the iron is

Table 8.7. EPMA-WDS Data of Spot Analysis Group 4: Miscellaneous Artifacts, Sample M17 and M15, with All Elements Normalized to 100 wt%.

		Cu	As	Ni	Fe	Co	Sb	Sn	Ag	Pb	Bi	Te	S	Se	Mn	O
M17	Pb matrix	n.d.	0.03	0.01	0.03	0.04	n.d.	0.02	n.d.	98.8	0.16	0.02	n.d.	n.d.	0.01	0.9
	Cu – As	60.0	31.25	0.01	n.d.	n.d.	n.d.	n.d.	0.03	8.10	n.d.	n.d.	n.d.	0.12	0.02	0.4
M15	Fe matrix	0.03	0.14	0.02	98.8	0.22	n.d.	0.01	0.05	0.05	0.07	n.d.	0.02	n.d.	0.43	0.2

Note: n.d. = not detected.

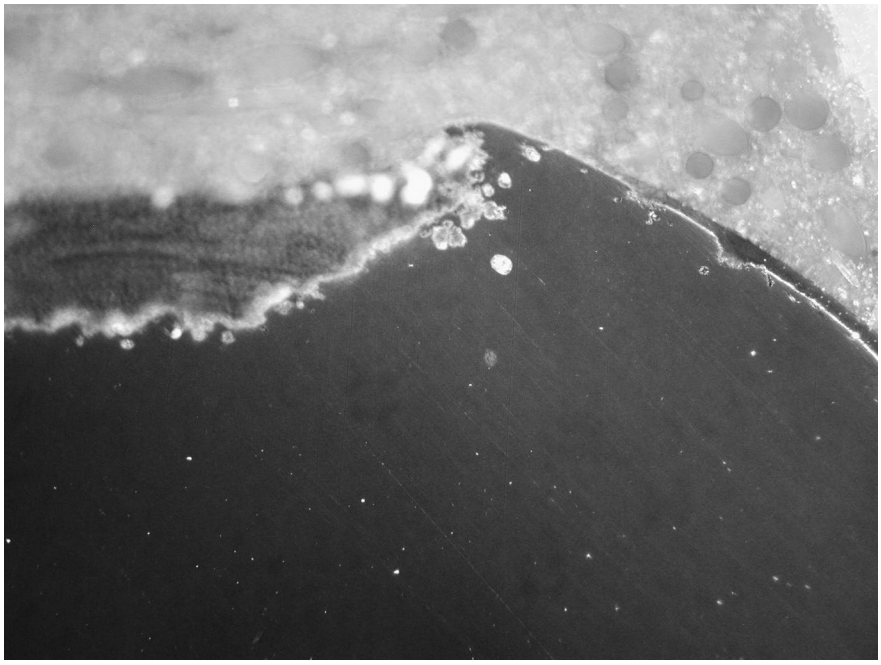

Figure 8.9. Photomicrograph of sample M15, showing very few slag inclusions as bright spots under crossed polarized light; magnification 200X. *Photograph by Kristina Franke.*

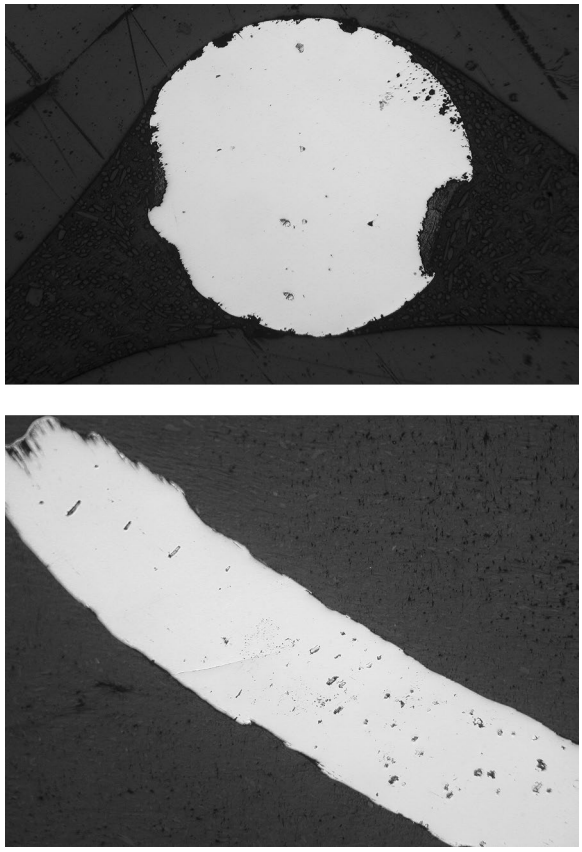

FIGURE 8.10. Photomicrograph of sample M15, showing the regular shape of the artifact in cross-section along its width (top) and its length (bottom); magnification 50X. *Photographs by Kristina Franke.*

drawn through a perforated plate (Figure 8.10). Due to its recent date, no spot analysis of inclusions was undertaken for specimen M15.

DISCUSSION

The analysis of the metallurgical inventory from Tell al-Raqa'i (n = 12) identified four different kinds of metals in use at the site during the first half of the third millennium BCE: pure or almost pure copper (n = 3), arsenical or arsenical-antimonial copper (n = 6), tin-bronze (n = 1), and lead (n = 1).[1] The coexistence of different metals is not unusual for upper Mesopotamia during this period and is known from a number of sites. Among the different kinds of metal in use, arsenical copper is the most frequent "copper alloy" within the metallurgical inventory, not only at large Near Eastern sites (Muhly 1997:8) but also at the rural site Tell al-Raqa'i, where out of 10 analyzed copper artifacts, 6 appear to contain more than 1 wt% arsenic (Table 8.3). The earliest Near Eastern tin-bronzes occur in the third millennium BCE (Helwing 2009:211–212; Nezafati, Pernicka, and Momenzadeh 2011:211–213), and one such sample was identified among the analyzed metal artifacts from Tell al-Raqa'i. In the following discussion we review the evidence for the potential production of these types of alloys at Tell al-Raqa'i, the possibility of the selective use of the different metals found on-site, and their possible sources.

SMALL-SCALE METALLURGY

Possibly as a result of the lack of ore deposits within the geographical region of Mesopotamia, there is currently no evidence for the processing and smelting of ores in ancient Mesopotamia, and it seems likely that only smelted metal was being imported (Moorey 1994). Archaeological evidence for workshops processing such half-finished products is rare in upper Mesopotamia. Only two examples within the Jezirah are known, both deriving from Tell Beydar and dating to the second half of the third millennium BCE (Pruß 2008:17; Tonussi 2007). More often, technical ceramics (e.g., crucibles) attest to the metalworking on sites; ingot fragments or casting waste may also indirectly link to metal processing. However, the latter may also have been stored for the value of the metal itself and, therefore, are a weak link to actual metal production.

The only evidence for possible copper-working activities at Tell al-Raqa'i derives from the casting waste or ingot fragment M14. The as-cast structure of M14 leaves no doubt as to the unprocessed state of the metal and, thus, the artifact is probably linked to some kind of on-site metallurgical activity. Its find location is interesting, since it was discovered on the floor of area 42, phase a, level 3, in the southeast "industrial" area with mudbrick platforms, ovens, and drains. Unfortunately, no further evidence for metallurgical activities was recognized within this context. However, we must consider that low-temperature processes might not necessarily leave traces in the archaeological record. Depending on the nature of the processed material, melting does not automatically involve the production of slag, and artifacts may be cast in ephemeral sand molds. The most commonly preserved finds indicating metallurgical workshops within the archaeological record are crucible fragments or hearth-like installations. The latter are easily misjudged as domestic hearths, while the amount of crucible fragments resulting from small-

scale production might be very small. Additionally, the find location area 42 was disturbed by later intrusions and, therefore, possible metallurgical remains may have been lost during antiquity. On the other hand, it cannot be excluded that raw metal such as M14 was valued and, therefore, kept for future use.

Arsenical Copper

Arsenical copper is probably the most commonly used metal in the Near East from the fourth to the second millennium BCE (Golden, Levy, and Hauptmann 2001; Muhly 1993–1997; Rehren, Hess, and Philip 1997; Shalev and Northover 1993). The ingot fragment or casting waste M14 contains medium levels of arsenic (As ca. 3 wt%), and therefore may have been the same type of raw material used for the arsenical copper artifacts excavated at Tell al-Raqa'i. The melting and casting of arsenical copper may include the loss of minor amounts of arsenic by oxidation (Junk 2003:21). Consequently, the arsenic content within an artifact produced from a copper with about 3 wt% As could be reduced during melting and especially casting to about 2 wt%. Theoretically, this could relate at Tell al-Raqa'i to the pin and rod fragments M07 and M08 (As ca. 2.3 wt%). However, it is not possible to convincingly link these three artifacts either chronologically or analytically. M14 stems from a secure level 3 context within the so-called industrial area, while M07 and M08 were found within uncertain layers in the living area, only roughly dated to the third millennium BCE. Further, M07 contains more than three times the amount of iron than M14, which compositionally separates the two samples. However, minor levels of antimony and tin present within M08 could have entered the metal with the addition of impure copper scrap metal (Table 8.5). Thus, it is unlikely that the pin fragment M07 was made from metal such as that of M14, while it may have been the case for the rod fragment M08. However, primary raw arsenical copper of similar quality to M14 could have been the original source for both artifacts.

In addition, the appearance of low to medium arsenic content within the analyzed copper artifacts poses the question of whether ancient metalworkers deliberately chose to use the properties that arsenical copper offered. The most frequently discussed advantages of arsenical copper over pure copper are hardness along with ductility (Ottaway 1994:130–132).[2] Experimental studies by Budd and Ottaway concluded that an arsenic content of 2–6 wt% gave the best results for both; quantities below 2 wt% did not produce an efficient hardness, while contents higher than 6 wt% led to substantial brittleness (Budd and Ottaway 1991). Thus, the presence of arsenical copper with ca. 2–6 wt% arsenic could suggest deliberate selection of arsenical copper for its improved properties. At Tell al-Raqa'i, this may be indicated by the three artifacts M07, M08, and M14. Additionally, the analysis revealed copper artifacts with arsenic levels below 2 wt%, which, on the other hand, contain relevant amounts of antimony and tin (Table 8.5). Both elements have similar hardening effects on copper and contribute positively to the existing arsenic content (Merkl 2010:21). Consequently, the artifacts M16 (As ca. 1.2 wt%; Sb ca. 1.5 wt%), M48 (As ca. 1.5 wt%; Sn ca. 0.3 wt%), and perhaps even M21 (As ca. 1 wt%; Sb ca. 0.4 wt%), may have been of a similar quality as the arsenical copper specimens M07 and M08. It is possible that the arsenical or arsenical-antimonial copper reached the site as half-finished products, perhaps in the form of ingots. The choice of metal at Raqa'i was probably related not only to costs in relation to quality but to the availability of different qualities of metal or to what might have been the most popular alloy at that time. That arsenical copper was indeed a rather commonly used metal during the entire third millennium BCE was demonstrated previously at the Jeziran urban sites of Tell Mozan and Tell Beydar, among others (de Ryck, Adriaens, and Adams 2005).

Thus, it is difficult to demonstrate the deliberate use of such arsenical copper at Tell al-Raqa'i. Even though arsenic and tin similarly improve the quality of copper, tin has an advanced effect on its hardness and strength, while arsenic gives better results for malleability (Northover 1989:113). The knowledge of these specific qualities could result in the different treatment of particular metals or, moreover, in the production of specific artifacts from either bronze or arsenical copper. Arsenical copper, given its malleability, for example, might have been more frequently hammered and annealed than tin-bronzes, while artifacts requiring more strength such as weapons or tools may have been worked from tin-bronze. At Tell al-Raqa'i, all arsenical copper artifacts except M14 give evidence of partial or even heavy deformation from working, and, in most cases, a sequence of cold working and annealing was applied. However, this is also true for the singular tin-bronze M49. In addition, the variety of artifact types discovered at and analyzed

from Tell al-Raqa'i is mainly limited to pins and rod fragments, without any apparent selection of alloy type for specific artifacts. Therefore, it is impossible to identify a deliberate choice of one or another metal for the production of different artifacts such as durable tools versus decorative items. Finally, the metallurgical inventory analyzed from Tell al-Raqa'i does not span a long chronological sequence covering different kinds of metals in use or the replacement of pure copper by, for example, arsenical copper. This could imply the deliberate use of a metal with enhanced properties (Table 8.1). On the other hand, the contemporary appearance of pure or almost pure copper artifacts and arsenical copper artifacts does not rule out the knowledge and use of the improved qualities of arsenical copper. Analytical studies from urban sites in Upper Mesopotamia such as Tell Brak and Tell Mozan show the continued use of pure or almost pure copper during the third and even the second millennium BCE (de Ryck, Adriaens, and Adams 2005). Even though the dominance of arsenical and arsenical-antimonial copper within the sample set from Tell al-Raqa'i may suggest the deliberate use of copper alloys with enhanced qualities, there is no possibility of proving this. This is due, not only to the small sample size, but also to the nature of the metallurgical inventory on the site itself.

On Recycling

From the first discovery of various metals' (s)melting properties, these materials were probably recycled. Ancient metalworkers might have valued the possibility of recycling as a specific property of metal in contrast to stone and clay. Therefore, the often sparse evidence of metal artifacts may not only be due to the archaeological record itself but may also indirectly show intense recycling activities (Wengrow 2011:138). Additionally, metal-bearing ore deposits are completely absent in the geographical region of Mesopotamia; as a result, recycling may have had an added importance for inhabitants there. Since both jewelry and implements were made from metal during the third millennium BCE, their increasing use in daily life offered a greater opportunity for recycling damaged objects. However, other reasons may be relevant when discussing recycling, especially with respect to the reuse of tin-bronzes.

Some of the Tell al-Raqa'i arsenical copper artifacts show low tin levels. Such metal artifacts with combined arsenic and low tin contents are often suggested to be products of recycling. De Ryck, Adriaens, and Adams (2005:263, 267) consider, for example, low tin-bronzes with intermediate arsenic levels from Tell Beydar dating to the second half of the third millennium BCE to be recycled. These authors do not discuss the analytical data that led to their conclusion. However, they may have considered that recycling is revealed by a relationship between the replacement of high arsenic-copper with tin-bronze and the contemporary increase in low tin/intermediate arsenic artifacts within the analyzed metallurgical inventory from Tell Beydar (compare also Pigott, Rogers, and Nash 2003:165). At Tell al-Raqa'i, two samples, M08 and M48, show a comparable pattern, with about 0.3–0.6 wt% Sn and ca. 1.5–2.2 wt% As. However, due to the small sample size (n = 10) and the limited chronological sequence at the site itself, a comparison between different tin and arsenic amounts in the metallurgical inventory like that undertaken for Tell Beydar is not possible.

Another possible way to identify recycling may be the combination of compositional and metallographic analyses. The process of re-melting copper under mildly oxidizing conditions causes a loss not only of iron but also of sulfur, among other elements (e.g., arsenic, tin, antimony) (Northover 2001a:256). Thus, the presence of iron-rich sulfide inclusions in copper artifacts seems to contraindicate the remelting of the metal. The sulfur content of M08 and M48 is below 500 ppm, at the lower limit in comparison to most other samples. The same is true for the iron content, but this is still relatively high at ca. 0.6 and 0.9 wt% Fe in the copper matrix. Metallographic analysis shows a low-to-medium concentration of metallic iron particles and a medium to high concentration of copper-iron-sulfides for both samples. Thus, while the presence of low concentrations of tin in the alloy could be due to recycling of mixed scrap metals, the presence of relatively high iron levels in both the copper matrix and the sulfide inclusions points to a metal that was not re-melted.

A further important question with regard to recycling is its purpose. One possibility is that recycling was primarily intended to upgrade the copper by adding scraps of tin-bronze to improve the properties of the metal. Another possibility is that different copper-base metals were melted together randomly during recycling. This difference is rather important since it could provide information about the value of tin or arsenical copper to ancient societies. The deliberate choice of adding tin-containing scrap metal to a recycling charge would not only suggest a metallurgical

understanding of the effect of such recycling but also that scrap metal was of high value and to be kept and used for specific re-melts.

Tin-Bronze

The advent of tin-bronze metallurgy in the Near East dates to the early third millennium BCE and later (Helwing 2009:211; Nezafati, Pernicka, and Momenzadeh 2011:211). Tin-bronzes never replace arsenical copper entirely but are used with increasing frequency during the second half of the third millennium BCE in Mesopotamia (Muhly 1980–1983:353–354, 1997:10; Nezafati, Pernicka, and Momenzadeh 2011:211; Ryck, Adriaens, and Adams 2005). In the Near East, where tin sources are rare, the value of tin was presumably high and its possible significance as a symbol of status and wealth has been suggested (Pigott 1999:83; Stech 1999:67; Stech and Pigott 1986; Weeks 2003).

The toggle pin M49 is the only tin-bronze artifact from Raqa'i. It contains nearly 3 wt% Sn, with only a minor amount of arsenic (ca. 0.1 wt% As). A major question within the broader discussion of tin-bronze is the minimum level of tin necessary for the definition of bronze as a true alloy. Here, the opinion among scholars varies between tin amounts of 0.5 wt% (Cleuziou and Berthoud 1982:15) to 2 wt% (Stech 1999:62) or even up to 4–5 wt% Sn (Muhly 1973:244). There may well be no general answer to that question, and the quantity of tin that defines true bronze may vary for different locations and periods (Cleuziou and Berthoud 1982:15). This relates to factors such as the metal source, the alloying technique, and metallurgical knowledge. However, textual sources from Mesopotamia indicate that alloys with tin contents of less than 3 wt% were common during the third millennium BCE (Moorey 1994:252). Analysis of tin-bronze artifacts from Tell Beydar and Tell Mozan likewise provide evidence for the use of tin-bronzes with low tin contents (ca. 3–5 wt% Sn), but also of intermediate tin-bronzes (ca. 6–10 wt% Sn) (de Ryck, Adriaens, and Adams 2005: figure 3). A general difference between these bronzes and the single pin from Tell al-Raqa'i is their arsenic content. While the low tin-bronze M49 only shows minor amounts of arsenic (ca. 0.1 wt% As) the low tin-bronzes at Tell Beydar and Tell Mozan contain medium amounts of arsenic (ca. 1–2 wt% As), and only the intermediate tin-bronzes show consistently low arsenic levels of < 1 wt% As (de Ryck, Adriaens, and Adams 2005: figure 3). This is important because artifacts with higher arsenic levels combined with a low tin content are comparable in quality to the intermediate bronzes with low arsenic values. Arsenic content of 2–6 wt% As increases the hardness of copper along with its durability. Low tin content improves the copper's quality in a similar way (Moorey 1994:253; Ottaway 1994:138–9) but creates an even harder but slightly less ductile metal (Merkl 2010:21; Stech 1999: 62).[3] Additional arsenic content within tin-bronzes contributes to the enhanced quality of the copper in terms of hardness and malleability. Consequently, the artifacts from Tell Beydar consisted of a metal that was probably stronger and more ductile than that of the toggle pin from Tell al-Raqa'i.

However, the effect of hardening a copper metal by adding 3 wt% tin is not required functionally for a decorative item such as a toggle pin. Thus, non-technological factors in the selection of tin-bronze for the artifact such as the coloration or upgrading of the final value of the artifact may have contributed to the choice of alloy. Nevertheless, due to the singularity of the bronze artifact at Tell al-Raqa'i, it is not possible to unambiguously decide whether M49 was a true alloy, a product of recycling, or even the smelting of a mixed copper-tin ore. However, in relation to the aforementioned textual evidence and to similar finds from the nearby sites of Tell Beydar and Tell Mozan, it may be suggested that low tin-bronzes like M49 were being deliberately produced among other metals within Upper Mesopotamia during the third millennium BCE.

Sourcing the Ores and Metal

Lead Isotope Analysis

Due to the general lack of ore deposits within upper Mesopotamia, one must consider the geographical origin of the metal used at Tell al-Raqa'i. For upper Mesopotamian sites, trade relations are often suggested with Anatolia due to its geographical proximity and typological comparanda within the archaeological record (compare e.g., Dunham, Chapter 5; Kelly-Buccellati 1990; Montero Fenollós 1999). A frequently used analytical method for provenance studies is the determination of lead isotope ratios and the comparison of isotopic fingerprints of the analyzed metal with those of possible ore sources (Begemann and Schmitt-Strecker 2009; Brill and Wampler 1967; Gale, Stos-Gale, and Gilmore 1985; Sayre et al. 1992). Lead isotope analysis was conducted on two Raqa'i samples, M14 and M16, at the National

Institute of Standards and Technology (NIST) in Gaithersburg, Maryland (Yener et al. 1991:566, 575). The results showed a comparability of the lead isotope ratio of the artifacts M14 and M16 to the isotopic fingerprints of two ore samples deriving from mines near Esendemirtepe villages located in southeastern Anatolia (ca. 75 km northwest of Adana). These are AON 411, a galena-barite ore sample from Çiftenhan/Çiftenhan-Muradiye and AON1001, a galena ore sample from Esendemirtepe/Başmakçı (Yener et al. 1991:561, 566, 577). However, these samples are from lead and not copper ores, and Yener and colleagues state: "The ores will have to be characterized more fully, however, before this similarity can be quantitatively evaluated" (Yener et al. 1991:566). A compositional analysis of these ore samples has not been published, and thus no further elemental comparison between the ores and the Tell al-Raqa'i samples can be undertaken at this time.

SELENIUM AND TELLURIUM AS SIGNIFICANT TRACE ELEMENTS

In the analytical program at the UCL Institute of Archaeology, the Tell al-Raqa'i samples were grouped by the selenium and tellurium content of their sulfide inclusions. Both elements frequently appear as trace impurities along with sulfur, and their ratio to each other has previously been suggested as diagnostic for different ore types (see Rehren 1991; Rehren and Northover 1991). During smelting, selenium and tellurium concentrate within sulfide inclusions that form within the smelted copper metal. The loss of sulfur under oxidizing conditions (e.g., during remelting of copper for casting) does not cause a similar decrease in selenium and tellurium content. Instead, such a loss increases the selenium and tellurium levels within the remaining sulfide inclusions, while the ratio between selenium and tellurium remains stable (Rehren 1991:240; Rehren and Northover 1991: 221). Therefore, selenium and tellurium content may yield information about the possible use of different ore sources from which ancient copper was smelted.

The plotting of the selenium and tellurium content of the Tell al-Raqa'i samples demonstrates two possible relationships (Figure 8.11). The first possibility links the arsenical antimonial copper artifact M16 and the copper pin M18 to M49 and M48 and perhaps additionally to M45. However, this result contradicts the possible isotopic relation between samples M14

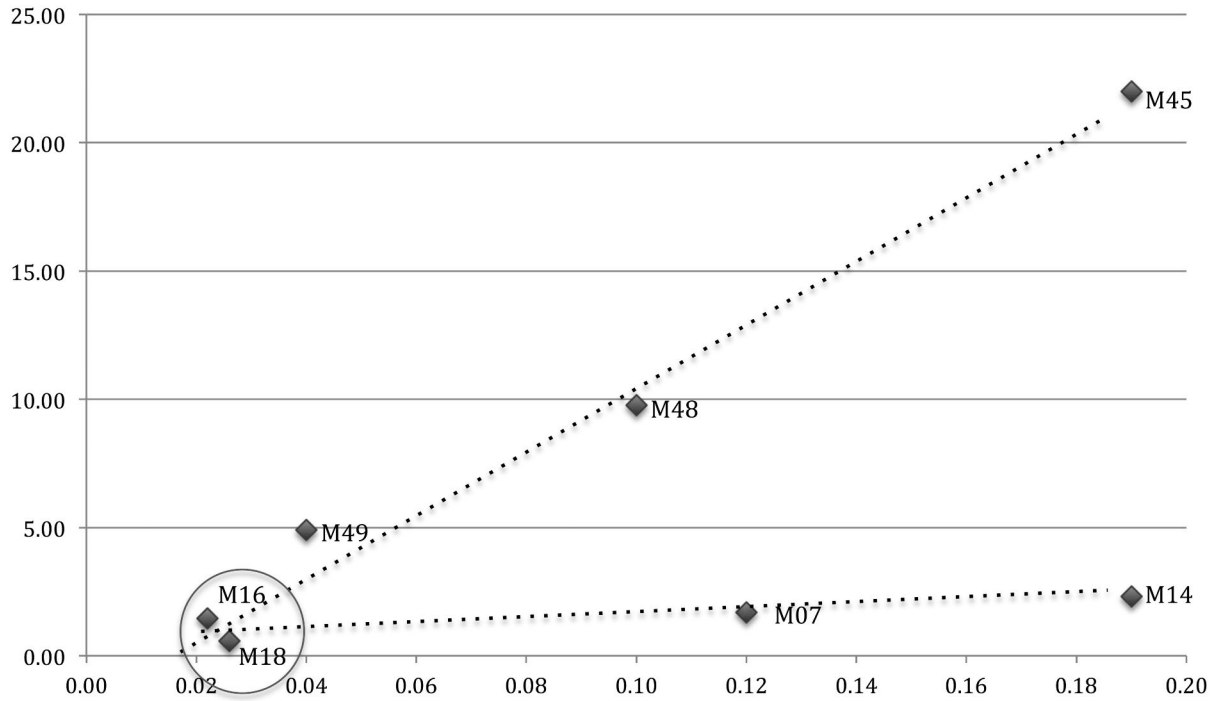

FIGURE 8.11. Plotting of selenium and tellurium content of nine copper artifacts from Tell al-Raqa'i showing two possible relationships. *Illustration prepared by Kristina Franke.*

and M16. The second possibility relates M16 and M18 to the arsenic-containing samples M07 and M14, entailing the separation of the copper pin M45, the arsenical copper M48, and the tin-bronze M49. Interestingly, these three artifacts may originally have derived from burial 19 (see Artifacts section in this chapter), but no significant compositional relation can be attested for these samples (cf. Table 8.3). The uniqueness of the single tin-bronze artifact within the analyzed metallurgical inventory from Tell al-Raqa'i could indicate that this item was imported as a finished product. Therefore, its metal may not derive from the same copper source as the metal possibly cast and worked on site, which could explain its different selenium/tellurium ratio in comparison to samples M07 and M14. However, the detected tellurium levels within the sulfides of samples M16 and M18 are within the detection limit. Their relation to the remaining artifacts with respect to the ratio between selenium and tellurium should not be overstated. Further, the relatively high nickel content within rod fragment M18 may separate the find from the other copper artifacts presented here. Due to the small sample of artifacts containing selenium and tellurium within their sulfides (n = 9), the differences noted are not very clear, and the suggested results are only tentative.

Concluding Observations

In summary, the analyzed metallurgical inventory from Tell al-Raqa'i (n = 12) gives evidence for the use of metals with different qualities during the first half of the third millennium BCE, including nearly pure copper, arsenical and arsenical-antimonial copper, tin-bronze, and lead. While pure copper still remained in use (n = 3), the most frequently employed metal was arsenical or arsenical-antimonial copper (n = 6). The coexistence of both kinds of copper is not exceptional and is verified at various Early Bronze Age sites in the Near East as, for example, at Tell Brak (Northover 2001a) and Tell Beydar in the Jezirah (Northover 2001b), and at Tepecik (Anatolia) (Çukur and Kunç 1989) and Tell esh-Shuna (Jordan) (Philip and Rehren 1996).

The as-cast structure of the ingot fragment or casting waste M14, which contains ca. 3 wt% arsenic, could suggest on-site metallurgical activity. This assumption is further supported by the find location of M14. The contextualized open space and mudbrick platforms within this industrial area form an appropriate environment for small-scale metallurgical activities through isolation of the hazards of melting and casting from the living area.

No indication exists for the production of tin-bronze on site, and only one such artifact (M49) was identified during the analysis. M49 joins the list of the Near East's early tin-bronze artifacts that date to the first half of the third millennium BCE. However, the limited number of tin-bronzes that do occur within the third-millennium BCE metal inventory is apparent throughout Mesopotamia, which is possibly due not only to the restricted tin resources but also to the association of tin and social status. Therefore, the appearance of a single bronze artifact within the archaeological record of a rural site like Tell al-Raqa'i is not surprising, but it confirms that the inhabitants of rural sites also had access to such possibly high-value artifacts.

Furthermore, artifacts with low tin levels (n = 2) may be the product of recycling. However, conclusive answers on whether such tin contents derived from recycling processes, the intentional addition of tin, or from the original copper source cannot be provided at this time. The geological source of the metals used at Tell al-Raqa'i may possibly lie in southeastern Anatolia, since two Raqa'i artifacts show lead isotope ratios compatible with ores in the region of Esendemirtepe. These results are tentative; only further characterization of the ore sources in Anatolia and the analysis of additional metal artifacts from Tell al-Raqa'i might offer more information on the original source of the metal.

Appendix: Analyzed Tell al-Raqa'i Artifacts

Note: Analysis was performed on small fragments from the following artifacts.

M01* (*Raq 87 M-001, *Figures 8.12, 8.13)*
Artifact: Curved rod fragment
Archaeological context: 29/108-005:1; room fill, area 21 ("temple")
Period: Level 3
Date: ca. 2600 BCE
Measurements: L. ca. 2 cm; Th. ca. 0.3 cm
Sampling location: Cross-section taken from one broken end of rod.
Chemical composition: Near-pure copper (Cu ca. 99.8 wt%)
Acquired working technique: Fully annealed

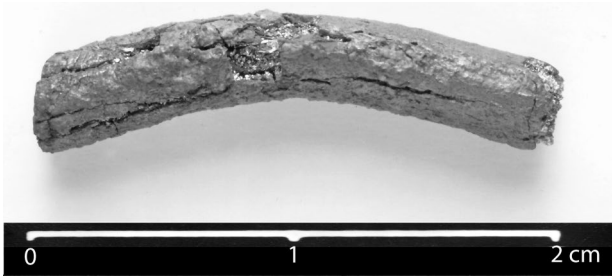

FIGURE 8.12. Curved rod fragment M01. *Photograph by Samuel Nash.*

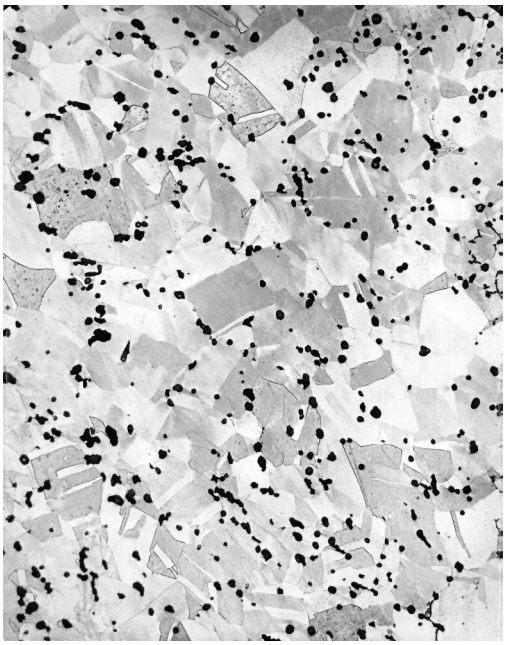

FIGURE 8.13. Microstructure M01, etched with $K_2Cr_2O_7$ + $EthFeCl_3$; magnification 200X. *Photograph by Samuel Nash.*

Metallography: This copper-base rod fragment is slightly bent and broken at both ends. In cross-section it is irregular but roughly circular. Very little corrosion crust remains, but there is extensive heavy intergranular corrosion that penetrates well into the specimen's interior. The aftereffects of applied stress and corrosion are prevalent: they acted to cause grain boundary separation and simultaneously provided openings in which redeposited copper can be seen. Inclusions are typically spheroidal, fairly numerous, and gray colored under bright field illumination. They appear ruby red under polarized light and are therefore identified as cuprite (Cu_20). Numerous annealing twins are visible. Most of the specimen has a grain size between ASTM 5 and 6; the outermost region has a significantly larger grain size. Essentially unalloyed copper left in the annealed state, this artifact would have been quite soft and easy to bend.

M07 (Raq 87 M-007, *Figures 8.14, 8.15)*

Artifact: Rod fragment

Archaeological context: 36/114-022:7; debris above level 3, room 20

Period: Late level 3? (likely to be of uncertain level)

Date: Third millennium BCE

Measurements: L. ca. 3.5 cm; Th. ca. 0.2 cm

Sampling location: Cross-section taken from one broken end of rod

Chemical composition: Arsenical copper (As ca. 2.3 wt%)

Acquired working technique: Final cold working after annealing

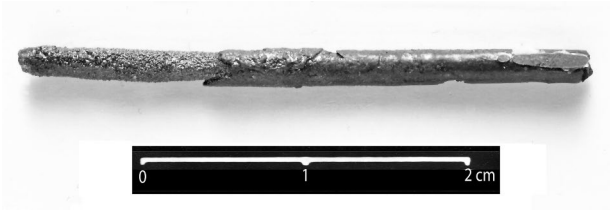

FIGURE 8.14. Rod fragment M07. *Photograph by Samuel Nash.*

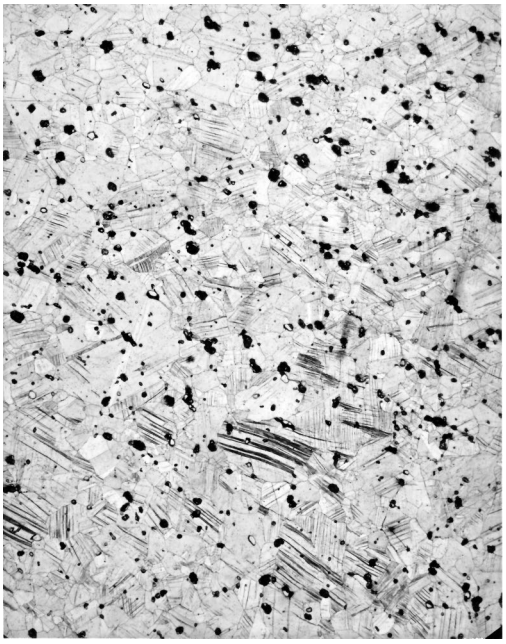

FIGURE 8.15. Microstructure M07, etched with $K_2Cr_2O_7$ + $EthFeCl_3$; magnification 200X. *Photograph by Samuel Nash.*

Metallography: This artifact is a straight rod fragment broken at both ends. Its cross-section is small and roughly circular. The moderately thick corrosion crust contains numerous islands of redeposited copper. There is an extensive distribution of moderate-sized gray inclusions that are sufficiently elongated to indicate a preferred direction of deformation. The inclusions are black under polarized light—typically a sulfide. They are partly elongated indicating deformation. Further small inclusions appear light gray under bright field illumination and are metallic iron particles. Grain size is approximately ASTM 6. In the process of shaping the rod it was subjected to a sequence of annealing and cold working. The metal was left in the cold-worked state. Annealing twins are present and some appear bent as a result of the cold working. Grains all contain extensive strain markings, also a result of final stage of cold working the metal. Leaving this copper alloy in the cold-worked state would mean the metal was harder and tougher than if it had been left in the annealed state.

M08 (Raq 87 M-008, *Figures 8.16, 8.17)*

Artifact: Flat metal fragment (scrap metal?)

Archaeological context: 36/114-022:7; debris above level 3, room 20

Period: late level 3? (likely to be of uncertain level)

Date: third millennium BCE

Measurements: L. ca. 3.9 cm; W. ca. 0.3–1.0; Th. ca. 0.5 cm

Sampling location: Adjacent to the butt end

Chemical composition: Arsenical copper (As ca. 2.2 wt%)

Acquired working technique: Final cold working after annealing (work hardening)

Metallography: This arsenical copper artifact is flat and narrows at one end. Its endings are irregular and seem to be broken off. The cross-section of the artifact is roughly rectangular with two non-linear seams. It is best described as a piece of scrap metal that had previously been worked. However, this artifact does not have an identifiable shape. The external corrosion crust is thin and contains islands of redeposited copper. There are numerous small- to moderate-sized, aligned but sometimes fragmented, inclusions that are uniformly distributed throughout the metal. They are sufficiently elongated to indicate a preferred direction of deformation. Under polarized light, they appear as black sulfides. Light gray inclusions under bright field illumination are metallic iron particles. The microstructure can be described as coarse-grained with an ASTM 3. The metal is in a heavily deformed cold-worked state with numerous deformation marks and significant grain distortion. The presence of annealing twins indicates that prior to cold working, the metal had been heated at least once to facilitate further shaping. The presence of bent twins indicates that annealing took place prior to the final cold working.

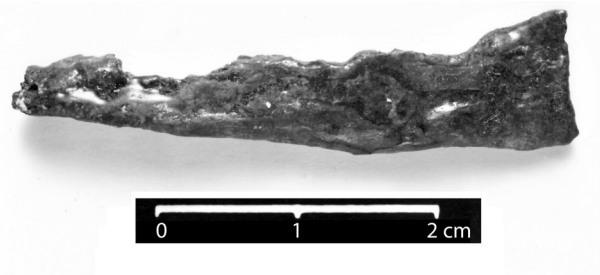

Figure 8.16. Metal fragment M08. *Photograph by Samuel Nash.*

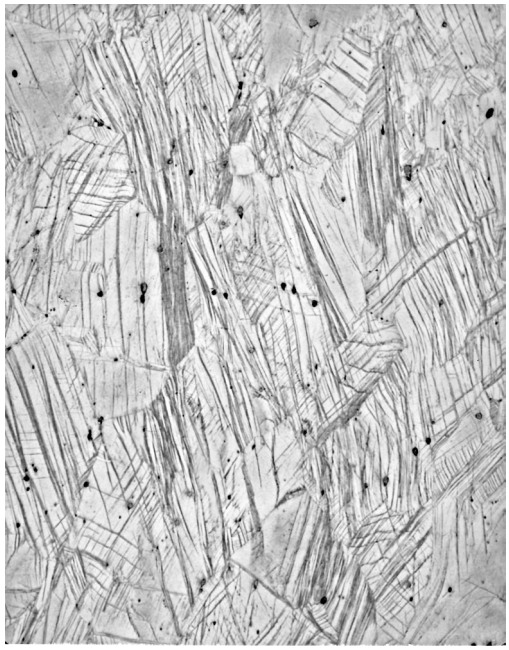

Figure 8.17. Microstructure M08, etched with $K_2Cr_2O_7$ + $EthFeCl_3$; magnification 400X. *Photograph by Samuel Nash.*

M14 (Raq 87 M-014, *Figures 8.18, 8.19)*

Artifact: Amorphous lump (ingot fragment/casting waste?)

Archaeological context: 48/90-021:1; on floor of room 42, phase a
Date: ca. 2600 BCE
Period: Level 3
Measurements: L. ca. 2.2 cm; W. ca. 1.5 cm; Th. ca. 0.8 cm
Sampling location: Random section (inserted)
Chemical composition: Arsenical copper (As ca. 3.2 wt%)
Acquired working technique: As cast
Metallography: This artifact is a large, irregularly shaped lump. The microstructure is best described as "as cast, dendritic"—thus, a metal that cooled from the molten state with no further working or annealing in evidence. The dendrites etch dark, and the interdendritic material is segregated with respect to arsenic. The outer crust of variable thickness consists of re-deposited copper in a corrosion-product matrix. In terms of corrosion, the structure observed indicates that, in some areas, the dendrites themselves are the metal that is being corroded away, leaving a network of the interdendritic material. This is the converse of what is usually observed. There are significant numbers of redeposited copper "grains" in the cavities left by the corrosion of the dendrites. The interdendritic material is light with numerous blue-gray inclusions (sulfides) and some shrinkage porosity. Light gray inclusions are either metallic lead or metallic iron. This artifact could indicate the presence of some kind of on-site metal processing such as the melting and casting of raw copper.

FIGURE 8.18. Casting waste/ingot fragment M14. *Photograph by Samuel Nash.*

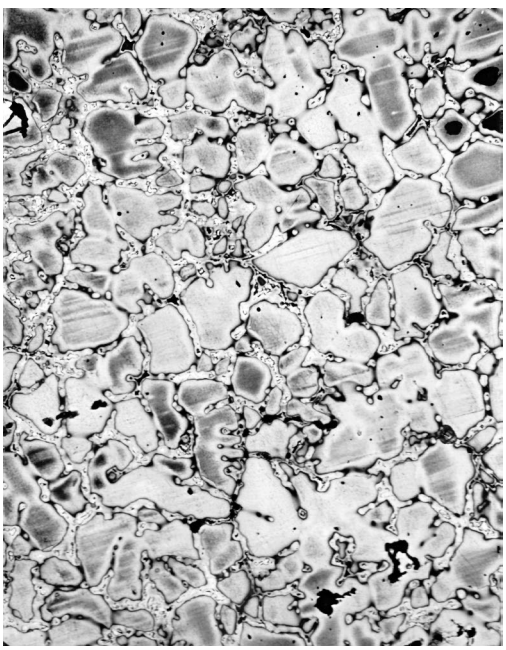

FIGURE 8.19. Microstructure M14, etched with $K_2Cr_2O_7$ + $EthFeCl_3$; magnification 100X. *Photograph by Samuel Nash.*

M15 (Raq 86 M-0015, *Figures 8.20, 8.21)*
Artifact: Ring fragment
Archaeological context: 36/120-012:1; debris above doorway between rooms 1 and 2, level 3.
Period: Third millennium BCE or later (Islamic period most likely)
Date: Third millennium BCE or later (Islamic period most likely)
Measurements: L. ca. 1.5 cm; W. ca. 0.8 cm; Th. 0.2 cm
Sampling location: Cross-section (M15) and longitudinal section (M15A) taken from one broken end
Chemical composition: Near-pure iron (Fe 99.5 wt%)
Acquired working technique: Cold working
Metallography: To the naked eye, this fragment has a small diameter, is thin-walled, appears silvery, and has a dimpled surface. The latter is the result of electrolytic cleaning that effectively removed any adhering surface corrosion layer. The cross-section is approximately circular, apart from areas damaged by corrosion and several surface indentations. The microstructure of the cross-section has a mottled appearance; even at a magnification of 600X, it looks featureless and a typical grain structure is not visible. When a longitudinal section is examined, however, it immediately becomes clear that the ring had been cold worked 80–90%, giving the metal a filamentary structure so fine that grains as such are no longer visible. The extent of cold working is also manifested in the micro-

Figure 8.20. Iron ring fragment M15. *Photograph by Samuel Nash.*

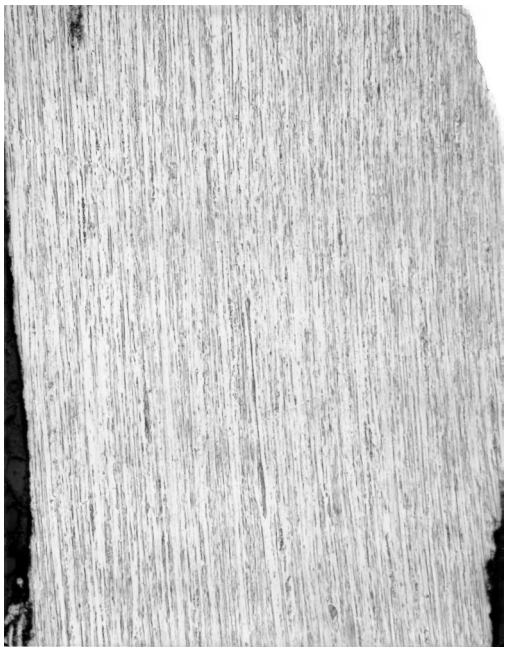

Figure 8.21. Microstructure M15A (longitudinal section), etched with 4% Nital; magnification 200X. *Photograph by Samuel Nash.*

hardness of the relatively soft iron—VHN 248 (average of five impressions)—a level equivalent to 245 IS, that of a normalized eutectoid carbon steel. Such extreme cold working can serve no practical purpose and must therefore be considered an anomaly. Its featureless appearance and, most of all, the missing slag inclusions, which are normally abundantly present within prehistoric iron, attest to the recent nature of the artifact.

M16 (Raq 87 M-016, *Figures 8.22, 8.23)*
Artifact: Rod fragment (from the shaft of a toggle pin)
Archaeological context: 42/90-011:14; burial 30
Period: Level 2
Date: ca. 2500 BCE
Measurements: L. ca. 2.8 cm; Th. ca. 0.2 cm
Sampling location: Cross-section taken from one broken end of rod
Chemical composition: Arsenical-antimonial copper (As 1.2 wt%; Sb 1.5 wt%)
Acquired working technique: Cold worked and final annealing
Metallography: This mixed-alloy artifact is a fragment of a toggle pin rod broken at both ends that is roughly circular in cross-section. It contains a sharp, triangular notch that is filled with what appears to be wood. The microstructure exhibits a grain size of ASTM 5 and contains a high density of moderate-size, blue-gray inclusions (sulfides), primarily intergranular in location and elongated in shape. The grains are not equiaxed but have a

Figure 8.22. Rod fragment M16. *Photograph by Samuel Nash.*

Figure 8.23. Microstructure M16, etched with $K_2Cr_2O_7$ + $EthFeCl_3$; magnification 200X. *Photograph by Samuel Nash.*

low aspect ratio. The microstructure contains numerous annealing twins indicative of a final annealing that followed a stage of cold working the metal. The alloying ingredients could have made this artifact relatively hard and tough. A final cold working would have enhanced these properties.

M17 (Raq 86 M-0017, *Figures 8.24, 8.25)*

Artifact: fragment from M17, artifact with rod-like extension (pin fragment?)

Archaeological context: 42/116-019:3; step trench (close to surface), above level 2, area 4

Period: Possibly level 2, level 1, or post-level 1

Date: Third millennium BCE or later—questionable context/modern?

Measurements: L. ca. 1.2; W. ca. 0.8 cm; Th. ca. 0.5 cm (rod-like extension)

FIGURE 8.24. Artifact fragment M17. *Photograph by Samuel Nash.*

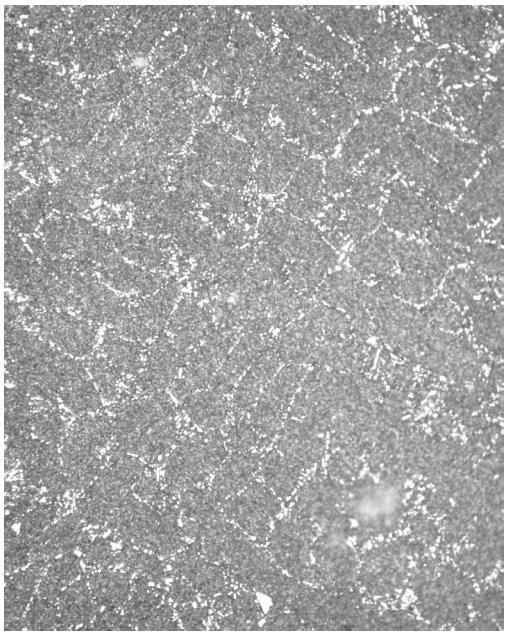

FIGURE 8.25. Microstructure M17, etched with 4% Nital; magnification 400X. *Photograph by Samuel Nash.*

Sampling location: Random cut

Chemical composition: Arsenical lead (Pb 96.5 wt%; As 1.3 wt%)

Metallography: This artifact appears to consist of a fist-like end attached to a rod circular in cross-section. The artifact is soft, probably a multicomponent lead alloy. The otherwise nondescript artifact, covered with a dark patina and ceramic particles, reveals a silvery metal underneath when scratched with a fingernail—a good indication that the metal is lead. In the as-polished condition, the section exhibits a two-phase structure. The continuous matrix phase is the grayest; the disconnected second phase appears as white. The microstructure comprises small, dark gray, lead-rich dendrites, starkly outlined by silvery interdendritic particles having the shape of needles, prisms, and globules. Both of the latter features are consistent with the primary or divorced eutectic intermediate phases that are commonly observed in lead-base alloys. This artifact is enigmatic but appears to have been made into a fist-like shape and may be the decorative head of a pin.

M18 (Raq 86 M-0018, *Figures 8.26, 8.27)*

Artifact: Fragment from rod M18

Archaeological context: 42/116-034:3; step trench, below topsoil, above level 4, area 8

Period: Level 4 or later (likely to be of uncertain level)

Date: Third millennium BCE?

Measurements: L. ca. 11.5 cm; Th. ca. 0.2—0.8 cm

Sampling location: From mid-specimen

Chemical composition: Near-pure copper (Cu ca. 96.5 wt%)

Acquired working technique: Cold worked with a final annealing

Metallography: This rod originally had an approximately rectangular cross-section of ca. 0.4 cm by 0.8 cm. Its ends are intact but highly corroded. The corrosion crust is very thick on one side, consisting of many layers. In the layer next to the remaining metal there are many fine grains of redeposited copper. In the next outer layer of the corrosion crust there are also grains of redeposited copper, less numerous but considerably larger in size. Three-quarters of the microstructure of this cross-section are corrosion product, while the rest is an extremely fine-grained (ASTM 9–10) annealed copper with many annealing twins observable, indicative of a final annealing that followed a stage

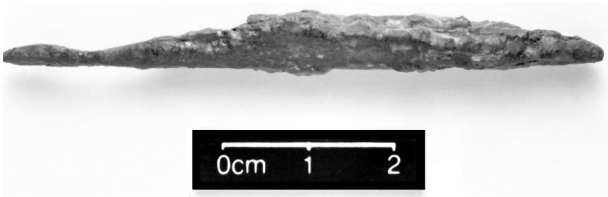

Figure 8.26. Rod fragment M18.
Photograph by Samuel Nash.

Figure 8.28. Rod fragments M21.
Photograph by Samuel Nash.

Figure 8.27. Microstructure M18, etched with $K_2Cr_2O_7$ + $EthFeCl_3$; magnification 400X.
Photograph by Samuel Nash.

Figure 8.29. Microstructure M21, etched with $K_2Cr_2O_7$ + $EthFeCl_3$; magnification 400X.
Photograph by Samuel Nash.

of cold working the metal. Numerous inclusions are distributed throughout the microstructure. They are blue-gray under bright field, black under polarized light, and identified as sulfides. They fall into two size ranges. The large examples are similar in size to the grains, and there are also florets of small examples in many locations. There is no evidence of inclusion deformation.

M21 (Raq 86 M-0021, *Figures 8.28, 8.29)*

Artifact: Fragments from rod M21 (n=2)

Archaeological context: 30/114-027:1; debris above level 3, room 18

Period: Above level 3, area 18 under topsoil (likely to be of uncertain level)

Date: Third millennium BCE

Measurements: L. ca. 2.5 cm (1); ca. 1.4 cm (2); W. ca. 0.2 cm; Th. ca. 0.2 cm

Sampling location: From broken end

Chemical composition: Arsenical copper (As ca. 1.0 wt%)

Acquired working techniques: Heavily deformed by cold working; possibly hammered

Metallography: This arsenical copper artifact consists of two straight bar fragments of which one end of the larger fragment has a chisel shape; the smaller fragment's shape is uncertain. The cross-section of the bar fragments is approximately square and in a highly deformed state. In the microstructure the grains are not equiaxed, but most have aspect ratios less than 2:1. A distinct deformation cross can be observed that results from high friction at the

interface between the artifact and the tool (or anvil) during the process of cold working the bar into its rectangular shape. Very high inclusion contents that individually are colored gray in bright field, black under polarized light, and identified as sulfides. Their shape varies from round to elongated, the latter also indicating the deformation of the bar. Absence of fragmentation suggests hot working at an early stage of deformation, and the artifact might have been squeezed into its final shape. That would account for cross-slip being so exaggerated.

M45 (Raq 90 M-045, *Figures 8.30, 8.31)*
Artifact: Fragment from toggle pin M45
Archaeological context: 42/114-217; burial 19, intrusive into room 6 of level 4 Round Building
Period: Level 3
Date: ca. 2600 BCE

FIGURE 8.30. Toggle pin M45.
Photograph by Samuel Nash.

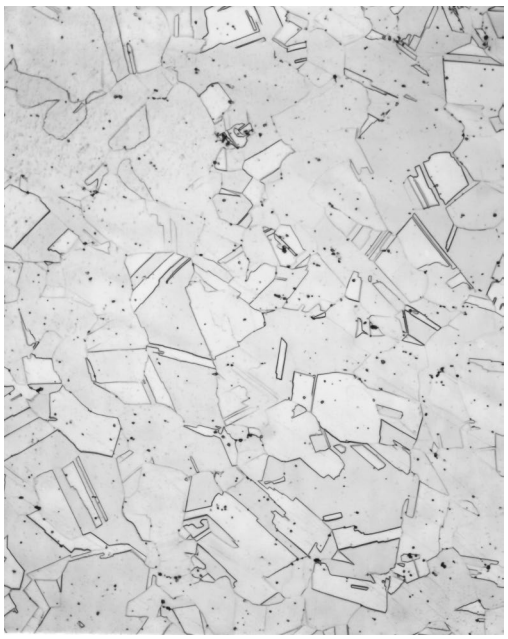

FIGURE 8.31. Microstructure M45, etched with $K_2Cr_2O_7$ + $EthFeCl_3$; magnification 200X.
Photograph by Samuel Nash.

Measurements: L. ca. 7.8 cm; W. ca. 0.9 (shaft); Th. ca. 0.4 cm
Sampling location: One at each end
Chemical composition: Near-pure copper (Cu ca. 98.9 wt%)
Acquired working technique: Annealed
Metallography: This toggle pin is broken on both ends and neither its head nor its pointed end is preserved. The original cross-section of this pin end is oval. There is a moderately thick corrosion crust present but there are no grains of redeposited copper visible. The microstructure exhibits a grain size approximately ASTM 3–3.5. The metal has been cold worked then annealed with a high density of large annealing twins apparent. There are a few to a moderate number of fine inclusions well distributed across the field of which some are elongated. The inclusions are duplex in phase-some gray, but most black under light field; all black under polarized light and are identified as sulfides.

M48 (Raq 90 M-048, *Figures 8.32, 8.33)*
Artifact: Fragment from toggle pin M48
Archaeological context: 42/114-223; level 4, room 6, Round Building, near intrusive burial 19 (originally from burial 19?)
Period: Level 4 (Level 3?)
Date: ca. 2700 BCE (ca. 2600 BCE ?)
Measurements: L. ca. 15 cm; W. ca. 1.2 cm; Th. ca. 0.5 cm
Sampling location: Small tip end
Chemical composition: Arsenical copper (As ca. 1.5 wt%)
Acquired working technique: Annealed after prior cold working
Metallography: This toggle pin is broken on both ends, and neither its head nor its pointed end is preserved. It has an approximately circular cross-section. The sample exhibits significant surface corrosion, but no intergranular or transcrystalline corrosion penetration. Redeposited silver is visible within the corrosion zone. There is extensive deformation of grains with large annealing twins from prior cold working. The grains are not equiaxed, but their aspect ratio is not more than 2:1. Grain size is approximately ASTM 3. Numerous small inclusions are seen scattered across the sample; they are dark gray under bright field, black under polarized light and are identified as sulfides.

Figure 8.32. Toggle pin M48.
Photograph by Samuel Nash.

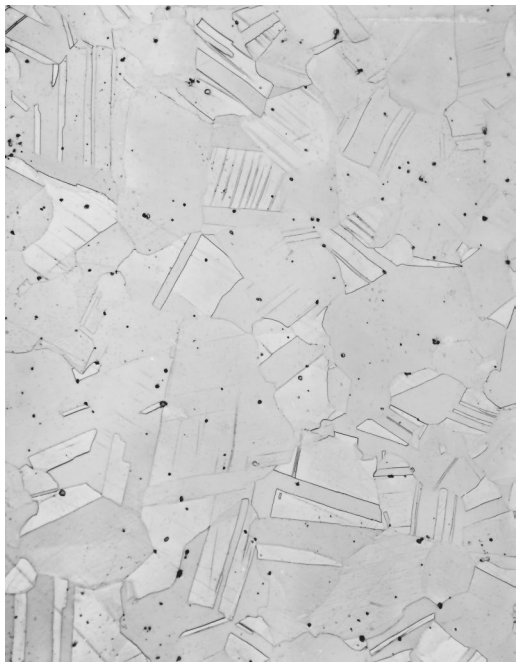

Figure 8.33. Microstructure M48, etched with $K_2Cr_2O_7$ + $EthFeCl_3$; magnification 100X.
Photograph by Samuel Nash.

M49 (Raq 90 M-049, *Figures 8.34, 8.35)*
Artifact: Fragment from tapered pin M49
Archaeological context: 42/114-223; level 4, room 6, Round Building, near intrusive burial 19 (originally from burial 19?)
Period: Level 4 (Level 3?)
Date: ca. 2700 BCE (ca. 2600 BCE ?)
Measurements: L. ca. 18.8 cm (original total L. ca. 23.7 cm); W. ca. 1.4 cm; Th. ca. 0.5 cm
Sampling location: From mid-specimen
Chemical composition: Tin-bronze (Sn ca. 2.7 wt%)
Acquired working technique: Final cold working after annealing (work hardening)
Metallography: This tin-bronze artifact is a tapered pin with two broken ends. This pin has an irregular but nearly circular cross-section. The examined cross-section contained a seam from the surface to nearly the center of the section, as though the metal had been folded back on itself, perhaps to form the pin shaft. The sample exhibits little surface corrosion, and intergranular or corrosion penetration along the seam. Grains of redeposited copper and redeposited silver are visible; the latter are blue-silver accumulations within the corrosion zone under bright field light. The grains are very irregularly shaped, but most contain no deformation marks. Grain size is approximately ASTM 3. There are a moderate number of small inclusions distributed throughout the sample of which most are elongated. The inclusions are duplex or single phase gray; all look black under polarized light and are identified as sulfides. There are bent annealing twins as the result of final cold working.

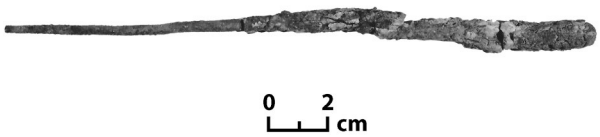

Figure 8.34. Tapered pin M49.
Photograph by Samuel Nash.

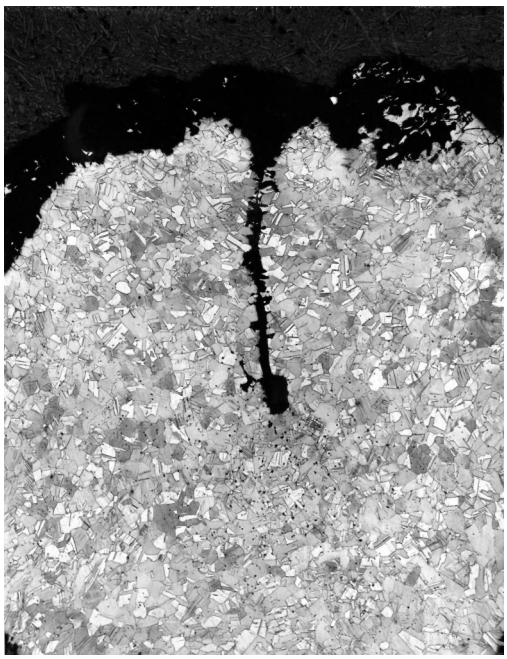

Figure 8.35. Microstructure M49, etched with $K_2Cr_2O_7$ + $EthFeCl_3$; magnification 35X.
Photograph by Samuel Nash.

NOTES

[1] The iron ring M15 was identified as a recent iron product, possibly originally deriving from the recent graves, and therefore is not discussed here.

[2] Further advantages of arsenical copper are the effect of inverse segregation, the accumulation of arsenic-rich layers on the surface giving the artifact a shiny silver coloration (Northover 1989:115), and a reduced melting point for copper with an arsenic content >7 wt% As. Neither inverse segregation nor high arsenic content has been detected among the arsenical copper artifacts from Tell al-Raqa'i.

[3] Northover points out that only an arsenic content of about 4 wt% and higher provides good results for combined strength and toughness comparable to those of medium tin-bronze, and that the hardening effect of tin on copper is generally greater (Northover 1989:113, figures 13.3–13.4).

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Chapter 9

The Plant Husbandry of Tell al-Raqa'i[1]

Willem van Zeist

Results of the examination of plant remains retrieved from occupation deposits at Tell al-Raqa'i are discussed in this chapter. In dryland sites like Raqa'i, seeds, fruits, and other vegetal remains are preserved in a carbonized condition. If a non-carbonized seed is found, it is usually suspected to be a (sub-)recent intrusion, which in most cases can actually be proven. White ash layers, consisting of silica skeletons of stems, awns, and other parts of cereals and/or wild grasses, are not reported for Raqa'i but have been for other Near Eastern sites. In this report, no attention is paid to possible imprints of seeds, straw, and chaff in pottery, burnt clay, or mudbrick, since experience has shown that in the presence of appreciable quantities of charred material, imprints rarely provide new information.

During the field campaigns, soil samples were secured by the excavators for palaeobotanical examination. In the field, charred plant remains were recovered from the soil by means of manual water separation. The volumes of soil floated ranged from 10 to 60 liters, usually 10–15 liters (one *zambil* or basketful), but the sample volume was not always recorded. The flotation residues were submitted to the present author for laboratory analysis by Dr. H.H. Curvers. A first inspection showed that many flotation residues were very small and almost devoid of identifiable plant remains. For practical reasons, a selection of samples to be examined was made. This selection was determined by two factors: (1) a significant quantity of seeds was to be expected, and (2) as far as possible, each of the occupation levels (see below) should be represented by a satisfactory number of samples. The second condition led to inclusion of a few "second-choice" samples in Table 9.2, where Raqa'i botanical data are presented.

One could argue that a selection of samples relatively rich in plant remains gives a distorted and/or incomplete picture, as "no seeds" is also a result, whatever its meaning. This argument should be taken seriously if the samples can clearly be related to a particular type of human activity such as storage, food preparation, and crop processing. However, all Raqa'i samples are from deposits of "occupational fill," and the botanical contents are assumed to be of mixed origin.

The samples examined are listed in Table 9.1. In addition to the sample designations and levels to which the samples are attributed, the contexts from which the samples were secured and the location within the site are given. The occupation levels are characterized and dated as follows:

Level 2: Final Bronze Age occupation, ca. 2500 BCE

Level 3: Intensive occupation and use of Round Building, interpreted as containing silos, ca. 2600 BCE

Level 4: Construction of Round Building, ca. 2700 BCE

Level 5: Undisturbed remains of the original settlement with "grill" architecture, ca. 2800 BCE

The plant remains are presented in Table 9.2. As for the sequence of the plant taxa in that table, the following should be mentioned. First, in the upper part of the table, cereals, pulses, fruits, and safflower (*Carthamus*) are listed. The wild plant taxa, starting with *Aegilops*, are arranged according to family, first Poaceae (grasses) and Fabaceae (pea family), and thereupon other families in alphabetical order.

The aims of the archaeobotanical examination can be defined as follows:

What information does the plant record provide on crop-plant cultivation at the site, and particularly for cereals? This question is of special interest in light of the hypothesis that Raqa'i was a specialized grain-producing site (Curvers and Schwartz 1990; Schwartz and Curvers 1992). Are there indications of surplus production?

What can be said about the weeds in the fields of the Raqa'i farmers?

What can be said about the vegetation in the vicinity of the site and about the impact of humans and domestic animals on the environment?

With respect to the potential of the Raqa'i area for plant cultivation, it should be remarked that the present-day mean annual precipitation of about 250 mm is rather marginal for rain-fed agriculture (Figure 9.1). Raqa'i lies at the southern limit of dryland cultivation (Wilkinson 1990: figure 1). Precipitation shows considerable annual fluctuation; in years when rainfall is well below average, yields are meager or a complete failure without application of additional watering of the fields (irrigation). Moreover, the upland soils in the Raqa'i area are gypsiferous and for that reason not particularly suited to agriculture. The alluvial river valley soils comprise much better arable land that, moreover, could easily be irrigated. However, in the Raqa'i area, the valley is only a few hundred meters wide and hence the irrigable acreage was of rather limited extent.

The natural vegetation of the Raqa'i uplands is *Artemisia*-dominated steppe rich in species (plant communities of the *Artemisietea herbae-albae mesopotamica*; cf. Frey and Kürschner 1991: figure 58). The valley floor of the Khabur River, on which Raqa'i is situated, was naturally covered by poplar-tamarisk (*Populus euphratica-Tamarix*) forest. Reed (*Phragmites australis*) and other herbaceous marsh plants, such as sedges, were found in the riverine forest.

Regarding the ecology of the plant taxa attested for Raqa'i—the kind of locality(ies) in which a plant grows—the flora works of Post and Dinsmore (1932), Mouterde (1966–1983), and Davis (1965–1988) have been consulted (e.g., in the next section). Plant nomenclature (scientific names of the plant taxa) follows Neef, Cappers, and Bekker (2012). In this paper, the term "seeds" has been used somewhat loosely and may as well denote "fruits" in a plant anatomical sense.

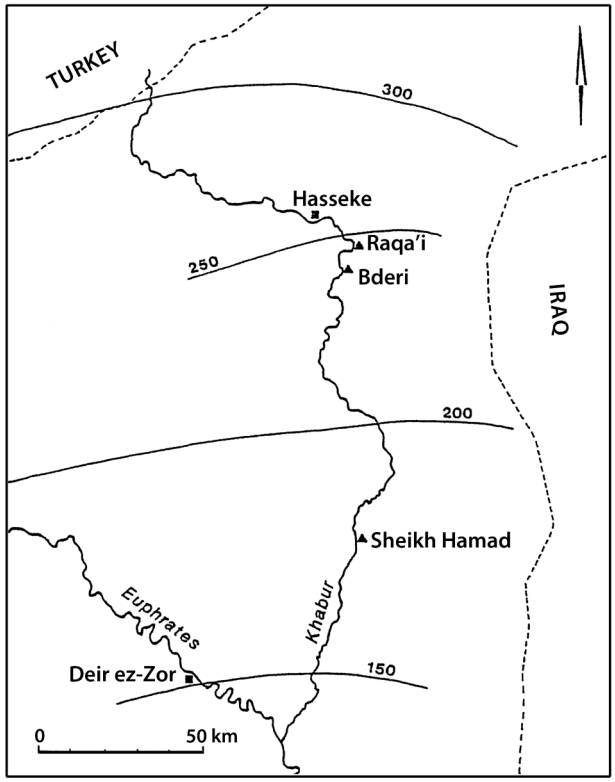

FIGURE 9.1. Location of Raqa'i. The 200- and 300-mm isohyets are drawn after Alex's (1984) map of mean annual precipitation in the Middle East. The 150- and 200-mm isohyets are based on the mean annual precipitation of 155 mm recorded for Deir ez-Zor and of 284 mm recorded for Hasseke, respectively. Precipitation data derived from Alex (1985). *Illustration prepared by Willem van Zeist*.

COMMENTS ON PLANT REMAINS (TABLE 9.3)

Almost all seed and fruit types determined for Raqa'i have been described and illustrated in other papers on archaeological plant remains from Near Eastern sites published by the current author and collaborators. In this section, some additional comments of special relevance to the Raqa'i material are made. For the wild plant taxa, the same order as in Table 9.2 is retained. For many of the Raqa'i floral remains, reference is made to illustrations in the archaeobotanical literature.

Table 9.1. Samples from Raqa'i Examined for Plant Remains and Listed in Table 9.2.

#	Designation	Level	Context and area
1	30/120-008 1	2	Ash layer near ovens, room fill, area 8
2	36/114-019 2	2	Open area 19
3	36/114-022 2	2	Same as # 2
4	36/114-022 6	2	Same as # 2
5	36/114-022 8	2	Same as # 2
6	30/114-043 2	2/3	Fill, above area 17 (level 3 designation)
7	30/120-013 1	2/3	Ashy top of oven 4H (level 3 designation), assigned to phase d of oven, either late level 3 or level 2
8	30/120-021 3	2/3	Contents of oven 4H (see # 7)
9	42/116-013 4	3	Open area 49
10	29/102-049 2	3	Room fill, area 66
11	29/108-022 1	3	Ashy soil in upper room fill, temple area, area 22/3 phase c
12	29/108-028 1	3	Ashy room fill, temple area, area 22 phase c
13	29/108-039 1	3	Contents oven 62D, open area 62, temple area
14	30/102-038 1	3	Room fill, area 25
15	30/108-023 4	3	Ash lens in fill, temple area, open area 24
16	30/120-025 1	3	Contents oven 3B, open area 3
17	30/126-030 1	3	Ash pit 7H, courtyard area 7, phase d
18	30/126-030 2	3	Same as # 17
19	36/108-010	3	Ashy soil layer, Round Building, phase b, area 47
20	36/108-010 1	3	Same as # 19
21	36/114-026 1	3	Ash layer in room fill, area 20
22	42/84-037 3	3	Mudbricks/ash spot, working area, area 78
23	42/96-018 2	3	Ashy soil in probe, alley outside Round Building, area 38
24	42/102-016 6	3	Ash lens in front of oven 87B, Round Building, phase b, area 87
25	42/102-027 2	3	Ash lens, alley area outside Round Building, area 38
26	42/108-053 1	3	Ashy contents oven 47A, area 47, Round Building, phase a
27	48/108-018 1	3/4	Ashy fill over level 4, area 23
28	30/120-035 3	3/4	Ashy upper fill in silo level 4 area 58 = level 3 area 4, phase c
29	30/120-044 2	3/4	Ashy lower fill in silo level 4 area 58 = level 3 area 4, phases a–b
30	42/114-047 1	4	Ashy layers, area 13, phase d
31	36/120-176 1	4	Gray-brown soil, deep sounding, area 101 phase a
32	36/120-182 1	4	Shallow ash spot, deep sounding, area 87 phase a
33	36/120-203	4	Deep sounding, removal of walls, area 112 phase a
34	42/114-089 1	4	Ashy soil in room fill, area 15, phase c, Round Building
35	42/114-138 2	4	Lower ashy room fill, Round Building, area 9, phase b
36	42/116-064 1	4(?)	Soil layer southwest of Round Building, possibly mixed with post-level 4 contexts, area 30
37	36/120-192	4	Ash spots with oven fragments, area 112, phase a
38	42/116-071 1	4	Fill between two walls, area 34
39	60/120-024 1	4	Ashy soil from bin, area 42, phase b
40	42/116-073 1	4	Soil layer near wall, area 35
41	42/114-277 1	5	Ashy fill of grill, area 1
42	36/120-217 1	5	Black ash layer, deep sounding, area 19, phase c
43	36/120-231 1	5	Ashy deposit against wall, deep sounding, area 20, phase c
44	36/120-241 1	5	Ashy deposit against wall, deep sounding, area 20, phase b
45	42/114-304 1	5	Ashy fill of grill building, area 4
46	36/120-272 1	5	Ashy soil north of grill building 4, deep sounding, area 19, phase b

TABLE 9.2. Numbers of Floral Remains in Samples from Raqa'i.

Sample numbers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Level	2	2	2	2	2	2/3	2/3	2/3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Checked volume	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	5/8	1/7	1/1	1/1	2/3	1/1	1/1	1/1	1/1
Hordeum vulgare ssp. *distichon* – gk	15	23	7	2	9	4	7	16	20	47	37	10	28	10	8	5	40	68	105	13	12	4	17
Triticum monococcum ssp. *monococcum* – gk	-	-	-	-	1	-	-	-	-	-	-	2	-	-	-	-	-	-	-	2	-	2	-
Triticum turgidum ssp. *dicoccum*– gk	-	-	3	3	-	-	1	2	3	-	2	-	-	1	-	-	-	1	5	-	1	-	-
Triticum durum/aestivum– gk	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	8	2	-	4	-	-	-	-
Triticum – gk	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
Hordeum vulgare ssp. *distichon* – rf	6	26	4	2	-	14	-	52	25	77	25	4	3	110	8	34	144	23	135	28	3	1	1
Triticum – rachis fr. (spikelet fork)	1	5	3	3	5	-	5	6	3	60	6	2	2	200	13	-	6	-	11	1	2	2	-
Triticum – rachis fr. (glume base)	1	11	30	28	21	4	7	10	8	59	9	1	5	410	103	2	11	-	44	8	3	2	-
Triticum – spikelet	-	-	-	-	-	-	-	-	-			-	-	14	-	4	-	-	-	-	-	-	-
Triticum aestivum/durum– rachis fr.	-	-	-	-	-	-	-	-	3	32	-	-	-	-	-	8	7	-	-	-	-	-	-
Cerealia/aegilops – grain kernel (g)	0.13	0.22	0.15	0.05	-	+	0.07	0.06	0.08	0.36	0.44	0.79	0.17	0.08	0.06	0.05	0.04	0.14	0.53	0.21	0.01	0.08	0.17
Poaceae – culm	-	-	-	-	-	-	-	4	7	160	3	8	1	90	-	3	64	16	21	1	1	-	-
Lathyrus sativus– seed	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-
Lens – seed	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Pisum – seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fabaceae – seed	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Vitis – seed	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Capparis – seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Carthamus cf. *tinctorius* – fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Aegilops– grain kernels	15	2	2	6	2	2	5	6	4	3	2	60	-	-	5	1	11	14	114	28	4	3	15
Aegilops– rachis fr. (spikelet fork)	-	1	1	1	-	5	3	1	1	8	1	40	-	4	2	-	8	2	63	17	1	3	7
Aegilops – rachis fr. (glume base)	2	11	5	3	3	3	1	2	2	8	-	37	-	3	-	2	6	5	41	17	-	-	-
Aeluropus– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-
Avena– fruit	-	-	-	-	-	-	-	1	-	-	2	19	-	-	-	-	-	-	1	-	-	-	1
Bromus danthoniae type– fruit	-	1	-	2	-	-	-	-	4	-	6	-	-	-	-	10	-	8	1	-	-	1	-
Bromus sterilis type– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	8	-	-	-	-	-
Echinaria– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eremopyrum– fruit	4	3	1	-	-	-	2	3	4	11	2	4	-	1	-	5	18	11	48	1	-	1	3
Hordeum – fruit	-	-	-	2	-	3	-	-	-	-	-	2	-	-	76	4	61	31	-	-	-	-	2
Lolium perenne/rigidum– fruit	18	26	8	6	5	1	12	18	55	1	90	13	47	-	2	29	136	72	8	7	15	1	34
Phalaris– fruit	1	-	-	-	1	-	-	4	-	-	1	8	-	-	-	3	5	10	-	-	1	-	3
Trachynia distachya– fruit	28	9	3	1	2	-	2	1	-	-	2	12	6	-	4	1	32	57	4	-	4	-	92
Poaceae (whole specimens)– fruit	5	-	4	2	6	8	-	17	6	1	1	21	10	1	42	8	43	12	40	2	5	-	10
Poaceae (fragments)– fruit	++	+	+	+	-	+	+	++	+	+	+	++	++	-	++	+	++	++	+	-	+	-	++
Alhagi – seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Astragalus – seed	11	23	6	1	1	5	1	9	-	2	4	63	2	48	8	8	55	10	101	10	8	-	3
Medicago radiata – seed	8	-	-	-	1	-	3	3	3	2	5	1	1	3	1	1	13	6	1	3	2	-	1
Medicago – seed	4	7	3	-	1	1	-	26	20	-	7	14	-	4	5	78	84	70	4	-	5	1	4
Melilotus – seed	-	-	-	-	-	1	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prosopis – seed	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	6	-	-
Trigonella astroites type – seed	305	190	47	3	1	280	29	115	160	240	85	67	19	220	260	365	745	485	2330	150	41	24	120
Vicia – seed	3	-	1	-	-	1	-	5	9	3	5	1	5	20	4	8	6	1	1	-	1	-	-
Fabaceae – seed	15	5	11	2	-	-	-	117	9	27	7	-	9	17	18	37	30	33	150	3	8	-	-
Arnebia decumbens– fruit	1	1	2	-	-	2	3	2	-	-	-	-	1	10	-	50	1	7	1	-	-	-	1
Heliotropium– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-
Lithospermum tenuiflorum– fruit	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boraginaceae– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gypsophila – seed	-	-	-	-	-	-	-	4	1	-	-	-	-	-	-	7	5	-	4	-	-	-	1
Silene – seed	-	-	-	-	-	-	-	5	2	-	-	-	-	1	2	4	18	4	6	-	-	-	-
Vaccaria – seed	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Atriplex– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Atriplex– perianth	-	-	-	-	-	-	-	-	-	-	1	-	-	3	-	-	-	-	-	-	-	-	-

TABLE 9.2, *continued*.

Sample numbers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Level	2	2	2	2	2	2/3	2/3	2/3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Checked volume	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	5/8	1/7	1/1	1/1	2/3	1/1	1/1	1/1	1/1
Salsola laricina type– fruit	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-
Suaeda– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chenopodiaceae– fruit	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Helianthemum– fruit	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	5	2	1	-	-
Anthemis type– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Artemisia– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Centaurea– fruit (small)	-	7	2	-	-	-	-	2	-	-	-	-	-	14	4	42	6	4	8	-	-	-	-
Centaurea– fruit (medium)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rhagadiolus– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	3	-	-	-	-	1
cf. *Descurainia* – seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-	-	-	-	-
Euclidium – seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lepidium type – seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Malcolmia type – seed	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neslia paniculata– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Cruciferae – seed	1	-	-	-	-	1	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-
Carex cf. *divisa*– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	1	5	-	1	3	1	2	-	-	-
Scirpus maritimus– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scirpus setaceus– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Scirpus– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Andrachne – seed	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	1
Erodium – seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nepeta– fruit	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	1	4	-	-	1	-	-
Teucrium– fruit	2	-	1	2	2	1	-	5	-	27	1	1	2	2	2	6	-	9	7	2	4	1	1
Ziziphora– fruit	2	1	-	-	-	-	1	-	1	6	2	-	-	-	-	-	-	-	-	-	2	-	1
Labiatae– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Bellevalia – seed	-	-	-	-	-	-	-	-	1	1	1	-	-	3	1	-	6	2	-	-	-	-	-
cf. *Ornithogalum* – seed	-	1	1	-	4	1	-	-	1	1	-	1	4	3	-	3	2	1	-	-	1	-	-
Liliaceae – seed	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malva – seed	8	2	1	-	2	4	2	11	3	-	2	7	-	14	46	7	36	16	3	-	-	4	4
Fumaria – seed	-	-	-	-	-	-	-	3	-	-	-	-	-	1	-	-	-	-	-	-	2	-	-
Glaucium – seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-
Papaver – seed	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Plantago psyllium type – seed	-	2	-	1	-	-	-	4	-	-	-	1	-	2	-	5	5	2	-	-	-	-	-
Polygonum corrigioloides– fruit	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-
Rumex pulcher– fruit	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Androsace maxima – seed	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Adonis – seed	-	-	-	-	-	-	-	-	1	-	-	-	-	2	-	-	-	-	-	-	-	-	-
Reseda alba type – seed	-	-	-	-	-	-	-	8	-	1	-	-	-	1	1	3	8	3	-	-	-	-	-
Crucianella– fruit	1	-	-	-	-	-	1	8	2	30	1	-	1	1	4	5	2	3	6	1	1	-	-
Galium– fruit	4	3	-	1	-	4	1	3	3	1	1	-	1	20	1	3	10	7	6	-	2	1	-
Verbascum – seed	-	1	-	-	-	-	-	-	-	-	-	-	-	2	-	1	-	-	-	-	1	-	-
Verbascum– fruit	1	-	1	1	1	-	-	1	-	1	-	-	1	2	-	-	-	-	14	8	1	-	1
Veronica persica type – seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thymelaea – seed	2	2	-	-	-	-	-	-	-	5	-	-	-	-	1	-	1	3	4	-	6	-	-
Bupleurum subovatum type– fruit	-	-	-	-	-	-	-	10	1	-	7	1	-	-	3	2	17	11	2	-	-	-	-
Torilis type – fruit	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-
Valerianella coronata type – seed	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	2	-	-	1	-	-
Valerianella vesicaria type– seed	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Peganum harmala – seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mouse/rat – droppings	1	-	-	-	-	-	-	4	-	-	-	2	-	1	-	21	-	-	-	-	1	1	6
Sheep/goat– droppings	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-

Notes: Unless otherwise indicated, seeds or fruits (grains) are listed here. Sample numbers refer to Table 9.1, in which designations and contexts of samples are presented. Cereal/*aegilops* grain fragments in grams. Grass grain fragments: + present; ++ fairly numerous. Abbreviations used: gk = grain kernel; rf = rachis fragment.

Continued on the next page

TABLE 9.2. Numbers of Floral Remains in Samples from Raqa'i (*continued*).

Sample numbers	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
Level	3	3	3	3/4	3/4	3/4	4	4	4	4	4	4	4	4	4	4	4	5	5	5	5	5	5
Checked volume	1/1	1/1	1/1	1/1	1/1	1/1	2/3	1/2	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/5	1/1	1/2	1/2	1/1	1/1
Hordeum vulgare ssp. *distichon* – gk	3	8	1	12	16	60	29	105	5	15	32	197	4	3	8	2	13	13	13	-	11	4	11
Triticum monococcum ssp. *monococcum* – gk	-	-	-	-	-	1	-	2	-	-	-	1	-	-	-	-	-	1	-	-	-	1	-
Triticum turgidum ssp. *dicoccum*– gk	-	-	-	-	-	-	5	11	-	8	1	2	-	1	4	-	1	3	1	-	1	-	1
Triticum durum/aestivum– gk	-	-	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Triticum – gk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hordeum vulgare ssp. *distichon* – rf	1	19	-	4	40	165	160	12	14	4	55	215	-	1	-	1	-	2	5	-	-	-	1
Triticum – rachis fr. (spikelet fork)	-	-	-	-	1	2	14	5	1	3	2	1	1	-	1	-	-	1	-	-	4	-	-
Triticum – rachis fr. (glume base)	3	1	-	5	9	2	31	10	1	4	26	8	6	-	2	-	4	3	2	1	1	-	1
Triticum – spikelet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Triticum aestivum/durum– rachis fr.	-	-	-	-	-	4	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Cerealia/aegilops – grain kernel (g)	0.04	0.11	-	0.12	0.26	0.27	0.32	0.70	0.07	0.21	0.14	0.76	0.07	0.05	0.13	0.02	0.15	0.20	0.68	0.05	0.17	0.07	0.15
Poaceae – culm	-	3	-	-	7	54	42	35	5	1	1	105	-	-	-	-	1	1	1	-	-	-	1
Lathyrus sativus– seed	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lens – seed	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pisum – seed	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fabaceae – seed	-	1	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Vitis – seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Capparis – seed	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carthamus cf. *tinctorius* – fruit	-	-	-	-	-	-	-	-	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aegilops– grain kernels	1	10	-	4	5	6	20	45	7	7	4	135	5	3	1	1	8	-	92	1	16	2	1
Aegilops– rachis fr. (spikelet fork)	-	4	-	11	1	1	8	95	13	2	4	23	1	3	1	1	1	2	44	-	7	1	-
Aegilops – rachis fr. (glume base)	-	4	1	-	3	4	9	110	43	4	8	22	3	5	-	-	1	-	45	1	6	2	-
Aeluropus– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1100	-	-	1
Avena– fruit	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromus danthoniae type– fruit	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromus sterilis type– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Echinaria– fruit	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eremopyrum– fruit	1	1	-	-	3	3	15	7	5	13	3	67	3	1	2	1	1	1	32	-	11	2	5
Hordeum – fruit	-	1	-	-	1	-	-	-	4	-	1	8	-	-	-	2	-	-	-	-	-	-	-
Lolium perenne/rigidum– fruit	-	27	-	1	1	2	-	3	1	3	5	-	-	-	-	-	2	-	1	1	-	1	-
Phalaris– fruit	-	5	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	12	-	-
Trachynia distachya– fruit	-	8	-	-	-	-	8	1	-	-	5	5	-	-	-	2	2	-	-	-	3	-	-
Poaceae (whole specimens)– fruit	1	11	1	10	3	-	26	7	1	13	8	40	-	2	-	-	4	47	5	-	3	4	3
Poaceae (fragments)– fruit	+	++	-	-	-	-	+	+	+	+	+	+	-	-	-	-	+	+	+	+	+	-	+
Alhagi – seed	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Astragalus – seed	6	2	4	-	47	1	22	7	3	86	58	27	5	29	2	-	2	112	7	1	38	5	3
Medicago radiata – seed	-	6	1	-	4	-	1	2	-	6	-	5	-	3	-	-	-	2	3	-	1	-	-
Medicago – seed	-	17	-	3	4	-	-	2	4	1	2	-	-	-	-	-	-	-	-	3	2	-	-
Melilotus – seed	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	1	-	-	-	-
Prosopis – seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Trigonella astroites type – seed	200	1260	100	4	340	14	180	110	24	235	430	700	23	178	8	5	6	820	50	4	108	174	2
Vicia – seed	-	9	-	4	4	-	-	-	-	-	1	27	-	-	-	1	-	-	-	-	-	-	1
Fabaceae – seed	7	10	20	-	6	-	2	-	9	51	51	-	7	15	3	-	4	62	7	-	-	10	-
Arnebia decumbens– fruit	-	-	-	-	-	-	-	-	4	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Heliotropium– fruit	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Lithospermum tenuiflorum– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boraginaceae– fruit	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gypsophila – seed	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	4	-	-
Silene – seed	1	1	-	1	1	1	-	1	-	-	2	12	-	1	-	-	-	-	-	-	3	-	-
Vaccaria – seed	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Atriplex– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-
Atriplex– perianth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 9.2, *continued*.

Sample numbers	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
Level	3	3	3	3/4	3/4	3/4	4	4	4	4	4	4	4	4	4	4	4	5	5	5	5	5	5
Checked volume	1/1	1/1	1/1	1/1	1/1	1/1	2/3	1/2	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/5	1/1	1/2	1/2	1/1	1/1
Salsola laricina type– fruit	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Suaeda– fruit	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chenopodiaceae– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Helianthemum– fruit	-	-	-	-	-	-	-	13	1	7	5	1	-	-	-	-	-	-	-	-	12	-	11
Anthemis type– fruit	-	-	1	-	-	-	-	1	-	1	-	-	-	-	1	-	-	-	-	-	4	-	-
Artemisia– fruit	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	4	-	-	-
Centaurea– fruit (small)	-	-	1	-	-	-	7	4	1	-	2	15	-	-	1	-	1	-	-	-	-	-	-
Centaurea– fruit (medium)	-	-	-	-	-	-	-	-	65	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Rhagadiolus– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cf. *Descurainia* – seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Euclidium – seed	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lepidium type – seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malcolmia type – seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neslia paniculata– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cruciferae – seed	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Carex cf. *divisa*– fruit	-	-	1	-	-	-	-	-	1	8	-	-	-	-	-	-	2	-	1	-	-	-	-
Scirpus maritimus– fruit	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scirpus setaceus– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scirpus– fruit	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Andrachne – seed	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Erodium – seed	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nepeta– fruit	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Teucrium– fruit	-	-	-	-	1	2	3	1	1	37	4	4	-	-	1	-	1	-	-	1	1	-	-
Ziziphora– fruit	-	-	-	-	2	-	2	-	-	-	1	3	-	-	-	-	-	-	-	-	-	3	-
Labiatae– fruit	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Bellevalia – seed	-	1	-	1	-	-	-	1	7	-	-	-	1	-	-	-	-	-	-	-	-	-	-
cf. *Ornithogalum* – seed	-	1	-	3	1	-	-	-	-	-	-	1	2	-	-	-	-	-	-	-	1	-	-
Liliaceae – seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malva – seed	4	2	1	39	2	1	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1	-	-
Fumaria – seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glaucium – seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Papaver – seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Plantago psyllium type – seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polygonum corrigioloides– fruit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Rumex pulcher– fruit	-	1	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Androsace maxima – seed	1	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-
Adonis – seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reseda alba type – seed	-	-	-	-	-	-	-	-	-	1	-	2	-	-	-	-	-	-	-	-	-	-	-
Crucianella– fruit	2	-	2	-	19	1	2	1	1	-	7	6	1	-	-	1	1	1	-	-	-	1	-
Galium– fruit	1	-	-	36	3	-	1	2	-	1	1	6	1	-	2	1	3	-	-	-	3	-	-
Verbascum – seed	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	1	-	-	-	-	1	-
Verbascum– fruit	-	-	-	-	-	2	-	-	-	1	-	-	-	-	-	-	1	1	-	-	-	-	-
Veronica persica type – seed	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thymelaea – seed	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Bupleurum subovatum type– fruit	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	1	-	-
Torilis type – fruit	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Valerianella coronata type – seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Valerianella vesicaria type– seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Peganum harmala – seed	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Mouse/rat – droppings	-	-	-	2	-	3	-	1	-	-	-	3	-	-	-	-	1	1	-	-	-	-	1
Sheep/goat– droppings	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

Notes: Unless otherwise indicated, seeds or fruits (grains) are listed here. Sample numbers refer to Table 9.1, in which designations and contexts of samples are presented. Cereal/*aegilops* grain fragments in grams. Grass grain fragments: + present; ++ fairly numerous. Abbreviations used: gk = grain kernel; rf = rachis fragment.

TABLE 9.3. Latin and English Names of Plant Taxa Mentioned.

Adonis	Pheasant's eye
Aegilops	Goat's-face grass
Aeluropus	(Grass family)
Alhagi	Camelthorn
Amaranthus	Amaranth
Andrachne	(Spurge family)
Androsace maxima	Androsace
Anthemis	Chamomile
Arnebia decumbens	Prophet-flower
Artemisia	Wormwood
Astragalus	Milkvetch
Atriplex	Orache
Avena	Oat
Bellevalia	(Lily family)
Boraginaceae	Borage family
Bromus danthoniae	Brome grass
Bromus sterilis	Barren brome
Bupleurum subovatum	Hare's ear
Capparis spinosa	Caper
Carex divisa/sp.	Sedge
Carthamus tinctorius	Safflower
Caryophyllaceae	Pink family
Centaurea	Star-thistle
Cephalaria syriaca	Syrian scabious
Chenopodiaceae	Goosefoot family
Cistaceae	Rock-rose family
Compositae (Asteraceae)	Daisy family
Coronilla	Scorpion vetch
Crucianella	Crosswort
Cruciferae (Brassicaceae)	Cabbage family
Cynodon dactylon	Bernuda grass
Cyperaceae	Sedge family
Descurainia	Flixweed
Echinaria	Bur grass
Eremopyrum	(Grass family)
Erodium	Storksbill
Euclidium	(Cabbage family)
Euphorbiaceae	Spurge family
Fumaria	Fumatory
Galium	Bedstraw
Glaucium	Horned-poppy
Gramineae (Poaceae)	Grass family
Gypsophila	Gypsophila
Helianthemum	Rock-rose
Heliotropium	Heliotrope
Hordeum (wild)	Barley
Hordeum distichum	Two-rowed barley
Labiatae (Lamiaceae)	Labiate family
Lathyrus aphaca	Yellow vetchling
Lathyrus cicera	Dwarf chickling
Lathyrus sativus	Grass pea
Leguminosae (Fabaceae)	Pea family
Lens culinaris	Lentil
Lepidium	Pepperwort
Liliaceae	Lily family
Lithospermum tenuiflorum	Gromwell
Lolium perenne/rigidum	Rye-grass
Malcolmia	(Cabbage family)
Malva	Mallow
Malvaceae	Mallow family
Medicago radiata	Ray-podded medick
Medicago sp.	Medick
Melilotus	Melilot
Nepeta	Catmint
Neslia paniculata	Ball mustard
Ornithogalum	Star of Bethlehem
Papaver	Poppy
Papaveraceae	Poppy family
Peganum harmala	Common peganum
Phalaris	Canary grass
Phragmites australis	Reed
Pisum sativum	Field pea
Plantaginaceae	Plantain family
Plantago psyllium	Branched plantain
Polygonaceae	Dock family
Polygonum corrigioloides	Knotweed
Populus euphratica	Poplar
Prosopis	(Pea family)
Ranunculaceae	Buttercup family
Reseda alba	White mignonette
Resedaceae	Mignonette family
Rhagadiolus	(Daisy family)
Rubiaceae	Bedstraw family
Rumex pulcher/sp.	Dock
Salsola laricina	Saltwort
Scirpus maritimus	Sea club-rush
Scirpus setaceus	Bristle club-rush
Scirpus sp.	Bulrush
Scrophulariaceae	Figwort family
Setaria	Bristle-grass

TABLE 9.3, *continued.*

Silene	Catchfly
Suaeda	Seablite
Tamarix	Tamarisk
Teucrium	Germander
Thymelaea	Thymelaea
Thymelaeaceae	Daphne family
Torilis	Hedge parsley
Trachynia distachya	False brome
Trigonella astroites	Trigonel
Triticum aestivum	Bread wheat
Triticum dicoccum	Emmer wheat
Triticum durum	Hard wheat
Triticum monococcum	Einkorn wheat
Umbelliferae (Apiaceae)	Carrot family
Vaccaria pyramidata	Cowherb
Valerianaceae	Valerian family
Valerianella coronata	Crowned cornsalad
Valerianella vesicaria	Bladder-fruited cornsalad
Verbascum	Mullein
Veronica persica	Common field speedwell
Vicia	Vetch
Vitis vinifera	Grape vine
Ziziphora	Ziziphora
Zygophyllaceae	Caltrop family

Note: "New" family names appear in parentheses.

CEREALS

Wheat (*Triticum*)

Most *Triticum* remains consist of hulled wheat. In hulled or glume wheats, the grains are not released in threshing, and a special treatment is required to free the kernels from the stiff enveloping chaff. Both emmer wheat (*T. turgidum* ssp. *dicoccon*) and einkorn wheat (*T. monococcum* ssp. *monococcum*) are represented. In some instances, it was difficult to distinguish between the grains of emmer and einkorn wheat. Hulled wheat grains of uncertain species are listed here as emmer wheat (*T. turgidum* ssp. *dicoccon*). The uncertainty in differentiating between the two hulled wheat species was caused by (1) deformation of the grains due to carbonization, and (2) the possible presence of one-seeded emmer wheat grains, which may be difficult to distinguish from einkorn wheat kernels. In this connection, it should be remembered that emmer wheat grains are characterized by a flat, longitudinally straight ventral side, whereas in einkorn wheat the ventral side is distinctly curved in the lateral view. Emmer wheat grains from one-seeded spikelets (usually the terminal spikelet of an ear) likewise show a curved ventral side. In spite of some identification problems, it is clear that emmer wheat grains are considerably (4 to 5 times) more frequent than those of einkorn wheat. Measurements were not taken because of deformation and other damage rendering almost all hulled wheat grains unsuitable for the purpose.

Much more frequent than the grains are the spikelet forks and glume bases of hulled wheat, the residues of kernel dehusking prior to food preparation. In principle, typical einkorn wheat spikelet forks can be distinguished from those of emmer wheat by their slenderness, which finds expression in the width measured across the disarticulation scar. However, in charred archaeological material, it is not possible to draw a sharp dividing line between the two glume wheats on the basis of the width of the spikelet forks (for a more detailed discussion, see van Zeist and Bakker-Heeres 1982 (1985):193–196). For 75 spikelet forks from sample 30/102-038 (no. 14, Figure 9.2), the width has been determined: 1.76 (1.2–2.2) mm. The frequency distribution of these measurements does not provide a clue for differentiating between einkorn and emmer wheat.

In addition to the glume wheats, free-threshing wheat is represented at Raqa'i. In cases of fairly poor preservation, distinguishing between kernels of emmer wheat and free-threshing wheat may be difficult. The identification of the Raqa'i grains is supported by rachis

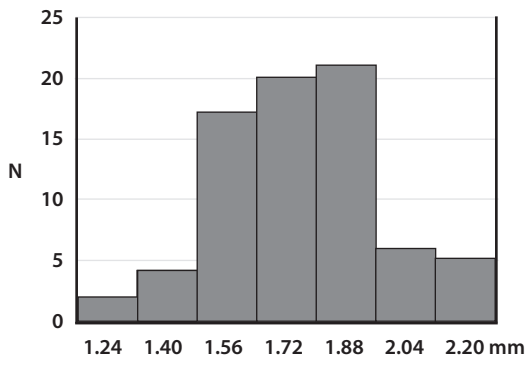

FIGURE 9.2. Frequency distribution of the width of *Triticum* spikelet forks from sample no. 14 (30/102-038). *Illustration prepared by Willem van Zeist.*

internode remains that are clearly of free-threshing wheat (see also van Zeist and Bakker-Heeres 1982 (1985): figure 16). As discussed in previous papers (e.g., van Zeist and Bakker-Heeres 1982 (1985): 196–200), the grains and internodes of free-threshing wheat could be of hard wheat (*Triticum turgidum* ssp. *durum*) as well as of bread wheat (*T. aestivum* ssp. *aestivum*). The charred remains do not allow a distinction between the two naked wheat taxa, which have different ecological requirements. Durum wheats are well adapted to the Mediterranean-type climate with mild, rainy winters and warm, dry summers, whereas aestivum wheats are widely grown in the more continental areas of western Asia and in temperate central and western Europe (Zohary 1971). On ecological grounds, hard wheat would be the most likely candidate at Raqa'i.

Barley (*Hordeum*)

Barley remains are much more numerous than those of wheat (see also Table 9.5). All barley grains are of the hulled type. Most of the grains had more or less seriously been affected by the charring. Fairly well-preserved specimens with straight, symmetrical kernels indicate that two-rowed barley (*Hordeum vulgare* ssp. *distichon*) was grown at Raqa'i. The identification of two-rowed barley is confirmed by the rachis internode remains. A characteristic feature of these internode remains are the basal, stalk-like parts of the sterile, lateral spikelets. In this connection, it may be remembered that in barley, each rachis internode bears three one-flowered spikelets, and that in the two-rowed form, only the median spikelet develops a grain, the lateral ones being sterile. Because of poor preservation, most of the grains were not suitable for measurement. Thus, in the sample that yielded the largest number of barley grains (no. 35: 42/114-138), hardly any kernel was in reasonably good shape. From two samples, a small number of kernels were measured (Table 9.4). The nearest site for comparison is mid–late third millennium BCE Selenkahiye on the north Syrian Euphrates, which yielded some large barley deposits. Surprisingly, the mean dimensions of the Raqa'i barley grains are slightly larger than those from Selenkahiye (van Zeist and Bakker-Heeres 1985 (1988): table 11), the average length of which varies from 5.18 to 5.71 mm.

However, it should be noted that the Raqa'i grains measured may give a distorted picture. In general, the barley grains are quite variable in size, and, in addition to well-developed, fairly large specimens, small and slender kernels that are probably under-developed also occur. Should these small kernels be considered as "tail grain," separated from the prime grain through sieving, or do they testify to poor harvests?

TABLE 9.4. Dimensions in Millimeters and Index Values of *Hordeum* Grains.

		L	B	T	L/B	T/B
36/108-010	Min.	4.7	2.1	1.4	183	69
n = 12	Mean	6.01	2.89	2.15	213	76
	Max.	6.7	3.4	2.7	285	85
36/120-176	Min.	5.4	1.9	1.2	200	61
n = 11	Mean	5.85	2.60	1.91	228	73
	Max.	6.5	3.0	2.2	283	81

Notes: L = length; B = breadth; T = thickness.

In addition to the grains and spike remains of cereals, culm remains were found, sometimes in appreciable numbers. By far the majority of the culm remains consist of sturdy culm nodes, but culm bases with the remains of lateral roots were also observed. In principle, the culm remains could be of wheat as well as of barley. However, since the greatest numbers of culm nodes were counted in samples comparatively rich in barley internodes and grains, it is likely that the culm remains are predominantly of barley.

PULSE CROPS

Only a small number of pulse seeds were found. The wedge-shaped *Lathyrus* seeds have been attributed to cultivated *Lathyrus sativus* (grass pea), but it cannot be excluded that they are of the wild *L. cicera*. The identification of field pea (*Pisum sativum*) is somewhat uncertain, since, in the two pea-like seeds, ca. 3.5 mm long, the characteristic hilum was not preserved.

FRUIT TREES

Vitis: The two *Vitis* seeds, with short stalks, are of the wild grape, which does not necessarily imply that the berries were collected in the wild (see Discussion section, Cultivated Plants).

Capparis (Van Zeist and Bakker-Heeres 1982 (1985): figure 24:1): Pickled in vinegar, salt, or oil, the flower buds of *Capparis spinosa*, a spiny shrub, are used as a condiment, but this practice would not have left behind any seeds. The fruits of capers are reported to be eaten fresh, and they may also have been consumed in a pickled condition.

Wild Plants

A great number of seeds of wild plant taxa identified from Raqa'i have been described and illustrated in previous papers. Below, some additional comments of relevance to the Raqa'i material are made.

Aegilops (Poaceae). In almost all samples, grain and/or spikelet remains of goat beard (*Aegilops*) were found (cf. van Zeist and Bakker-Heeres 1985 (1988): figure 5), in some samples in appreciable numbers. The grains show a large variation in shape and size, and the spikelet bases and glume remains also suggest that various *Aegilops* species are involved. Large-sized grains and spikelet bases point to *Aegilops crassa*, a common weed in cornfields.

Aeluropus (Poaceae). Sample 36/120-231 (no. 43) yielded a very large number of tiny grass grains, 0.6–0.8 mm long, which are attributed to *Aeluropus*. The flat grains are obovate in outline, the elliptic radicle shield extends over about half of the grain, and the hilum is punctiform. Because the characteristic features of *Aeluropus* are scarcely observable in the charred grains, no drawing of this seed type has been made. Two species come into consideration, viz. *Aeluropus littoralis* and *A. lagopoides*. *Aeluropus* is reported for arid, salt-impregnated soils in coastal areas as well as in the interior; it also occurs in marshes drying out in the summer and in abandoned cultivated fields (see also Bor 1968).

Andrachne (Euphorbiaceae). Semi-circular, wedge-shaped seeds with a finely reticulate surface. Greatest diameter is 0.7–1.0 mm. Shape and surface structure of the Raqa'i seeds conform to those of *Andrachne* cf. *telephioides*, a species found, among other contexts, in fallow fields. Modern seeds measure ca. 1.2 mm.

Atriplex (Chenopodiaceae). A few seeds in sample 36/120-231. Fruiting perianths (two bracts enclosing a fruit) of a chenopodiaceous species have with some reserve been attributed to *Atriplex*. No modern fruiting bracts exactly matching the charred specimens were found.

Centaurea (Asteraceae). Two types of *Centaurea* fruits distinguished by size were recovered. Twenty small-sized *Centaurea* fruits from sample 30/120-025 (no. 16) measure 1.51 (1.3–1.7) × 0.69 (0.6–0.8) mm. This type (van Zeist and Bakker-Heeres 1985 (1988): figure 2:6) is represented in a fair number of samples. The medium-sized type is almost confined to a single sample (no. 32: 36/120-182), in which it was found in an appreciable numbers (Figure 9.3; for other plant illustrations, see Figure 9.4). Thirteen medium-sized specimens measure 3.21 (3.0–3.5) × 1.43 (1.3–1.7) mm. In addition to the fruits, a fairly large number of flower-head remains were recovered from the same sample (Figure 9.3). That the flower heads are of the same species as the medium-sized *Centaurea* fruits is demonstrated by the fact that the holes in the flat receptacle are of the same diameter as the bases of the fruits. The flower heads are in the stage when the mature seeds had fallen out.

Galium (Rubiaceae). As usual, the *Galium* fruits show a fairly great variation in size, suggesting that more than one species is involved. The largest dimensions of the Raqa'i seeds vary from 0.9 to 2.7 mm.

Malva (Malvaceae). Seeds of a part of the outer seed wall had been preserved that point to *Malva sylvestris* or *M. nicaeensis*, both species of fields, waste places, and roadsides. One seed has been attributed to *M. aegyptica*.

Polygonum corrigioloides (Polygonaceae). In previous publications, this type is indicated as *Polygonum venantianum* type, an identification based on Mouterde's flora of Lebanon and Syria (Mouterde 1966, vol. 1:401).

Reseda alba type (Resedaceae). This reniform seed type, the surface of which is densely covered with tiny papillae arranged in concentric rows, has been described as *Cleome* (van Zeist et al. 1984 (1986); van Zeist and Bakker-Heeres 1985 (1988)). However, after some deliberation, the author arrived at the conclusion that *Reseda alba* is more likely. The charred seeds, with a maximum diameter of ca. 0.8 mm, are smaller than modern *Reseda alba* seeds, measuring 1.2–1.4 mm. *Reseda alba* is found in disturbed habitats such as fields and roadsides.

Teucrium (Lamiaceae). The charred fruits show the closest resemblance to those of *Teucrium polium*, a perennial plant of dry places, steppes, and field margins. For 18 specimens from sample 33 (36/120-203), the dimensions have been determined: 1.55 (1.4–1.7) × 1.05 (1.0–1.1) mm; 100 L/B index: 148 (133–167).

Trachynia distachya (Poaceae). This type has been described for Selenkahiye as Gramineae type C (van Zeist and Bakker-Heeres 1985 (1988): figure 7:1–3). *Trachynia distachya* (synonym: *Brachypodium distachyum*) is a constituent of steppe vegetation and is found in cultivated fields and waste places.

Trigonella astroites type (Fabaceae). This leguminous seed type, which is extremely numerous at Raqa'i, is somewhat variable in size and shape. In addition to typical *Trigonella astroites*-type seeds (van Zeist and

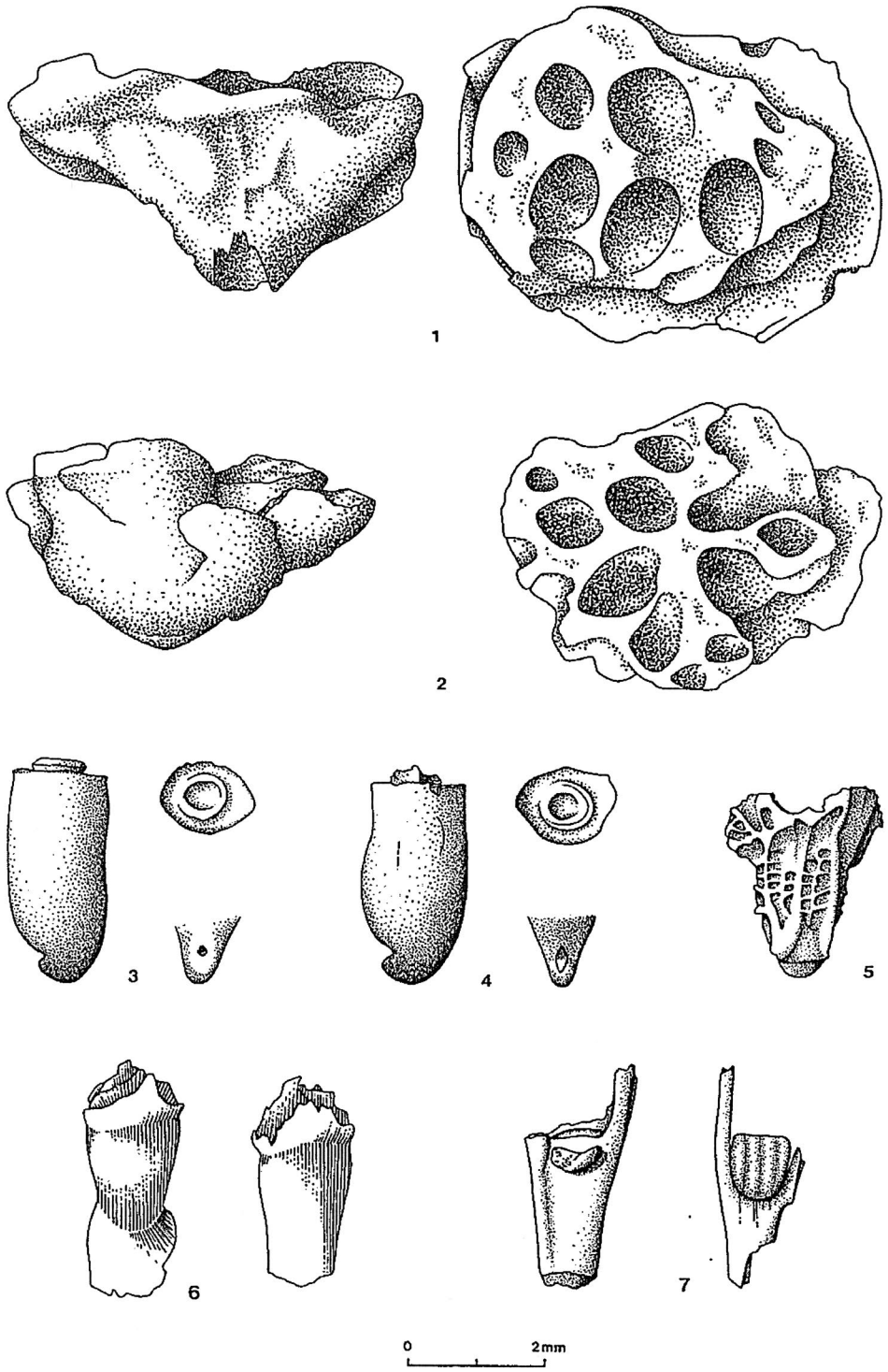

FIGURE 9.3. (1, 2) *Centaurea*, flower heads (no. 32, 36/120-182). (3, 4) *Centaurea*, seeds (no. 32, 36/120-182). (5) *Atriplex*, fruiting bract (no. 14, 30/102-038). (6) *Triticum durum/aestivum*, rachis internodes (no. 10, 29/102-049). (7) *Hordeum distichum*, rachis internodes (no. 19; 36/108-010). *IIlustration prepared by Miriam A. Weijns.*

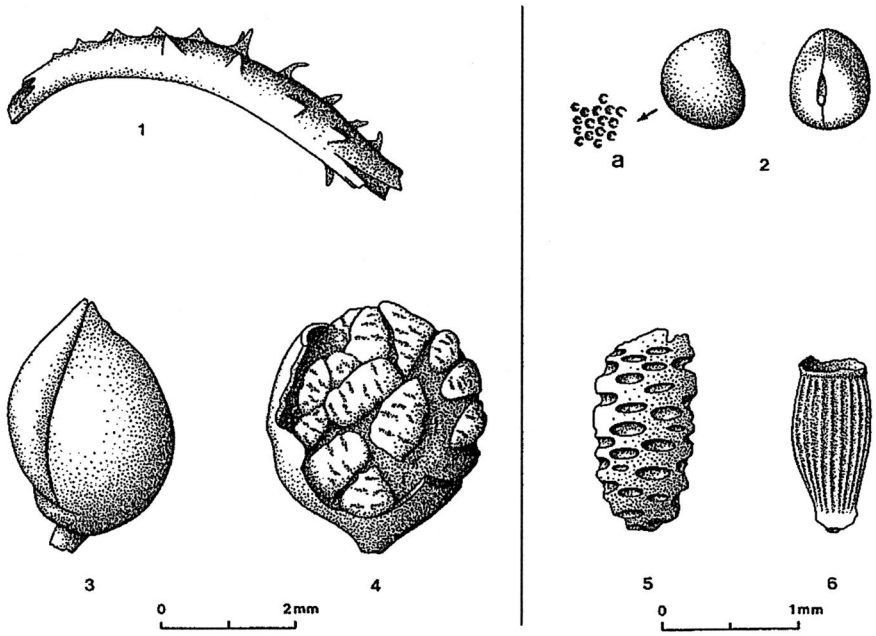

FIGURE 9.4. (1) *Rhagadiolus* (no. 18, 30/126-030). (2) *Andrachne* (no. 10, 29/102-049), the finely reticulate surface structure is shown in 2a. (3) *Verbascum*, seed capsule (no. 19, 36/108-010). (4) *Verbascum*, seeds in capsule (no. 19, 36/108-010). (5) *Verbascum*, seed (no. 35, 42/114-138). (6) *Anthemis* type (no. 31, 36/120-176). *Illustration prepared by Miriam A. Weijns.*

Bakker-Heeres 1982 (1985): figure 28:2, 3), more baculiform seeds without a distinct tuberculate surface structure occur. Several *Trigonella* species may be included in this seed type. *Trigonella astroites* itself occurs in steppe vegetation as well as on cultivated land.

Verbascum (Scrophulariaceae). Of this taxon, seed capsules as well as loose seeds were recovered. The capsule listed for Selenkahiye (van Zeist and Bakker-Heeres 1985 (1988): figure 6:9) as *Scrophularia* should also be attributed to *Verbascum*.

Vicia (Fabaceae). In addition to unquestionable *Vicia* (vetch) seeds, specimens were found reminiscent of *Lathyrus aphaca*. The seeds in question are relatively large (at least 2.8 mm) and elliptical in outline. No hilum to confirm the identification has been preserved, and in the pertinent samples no clear dividing line between *Vicia* and *Lathyrus*-type seeds could be drawn. For this reason, the possible *Lathyrus aphaca*–type seeds are included in the *Vicia* type.

DISCUSSION

CULTIVATED PLANTS

The cereals grown at Raqa'i (see Cereals section above) included emmer wheat, einkorn wheat, free-threshing hard wheat or bread wheat, and hulled, two-rowed barley. Leguminous crop plants (lentil, field pea, grass pea) are so scarcely represented that it is doubtful that they were locally cultivated. It is true that cereals seem to have a better chance of being preserved in a carbonized state than pulses, but experience has shown that if pulses played a role of some significance, they are present in an appreciable quantity in at least one or two samples. It looks as though pulses were a rather scarce commodity at Raqa'i. Fruits of the wild grapevine could have been collected in the nearby Khabur valley, but it is also possible that the seeds recovered are of grapes or raisins (dried grapes) obtained through trade. Various studies (cf. Hopf 1962) have demonstrated that in archaeological (early historical) material, the shape of the seeds, viz. slender with a long stalk or rather squat with a short stalk, is not a valid criterion in distinguishing between wild and domestic grape. It appears that for thousands of years no selection for the slender seeds characteristic of modern cultivated grapes took place. As a matter of fact, there may be no relation between quality of the fruit flesh and seed morphology.

The cereals demonstrated for Raqa'i give occasion to the following speculations. A starting point is the Round Building of levels 4 and 3, which has been interpreted as, at least partly, a large (grain) storage facility

containing vaulted silos. It is suggested that Raqa'i formed part of a network of agricultural sites producing grain for the provisioning of urban centers (Curvers and Schwartz 1990; Schwartz and Curvers 1992). One might also suggest that surplus grain was grown as food for pack animals on caravan routes. Does the archaeobotanical record provide indications of a surplus production of any kind of cereal? In itself, the quantity and composition of the charred cereal remains at Raqa'i give no clue as to whether the crop was locally consumed or (in part) traded. However, a comparison between occupation levels could be informative in this respect.

In Table 9.5, for each of the occupation levels the mean numbers of grains and other cereal remains calculated per 10 samples are shown. One may wonder to what extent the data presented in this table are biased by the fact that variations in sample volumes could not be taken into account, because the amount of soil treated is often unknown. Moreover, a few samples very rich in plant remains were examined only in part, and the raw counts have not been converted to obtain total numbers for the whole of the sample. It is assumed here that these factors do not seriously affect the comparison between levels. Very probably, inequalities in sample size have largely been smoothed out in combining the samples per level.

From Table 9.5, it appears that level 5 is comparatively poor in plant remains. Numbers of cereal remains are markedly lower than in the succeeding levels. Lower charred seed densities in basal occupation levels have been recorded for other sites, too, such as Ramad, Aswad, and Ghoraife in the Damascus basin (van Zeist and Bakker-Heeres 1982 (1985)). Could it be that in the early stages of habitation, the accumulation of occupational soil was faster than in later stages, and/or could habitation have been less dense in the early stages of the site, thus producing less botanical waste?

Levels 3 and 4 differ from level 5 not only by the much greater numbers of cereal remains but also by the ratios between barley and wheat grains, which in levels 3 and 4 are more than twice as high as in level 5 (Table 9.5). Thus, it looks as if during the period covered by levels 3 and 4, the acreage grown with barley had increased considerably. It is tempting to interpret this as evidence of surplus production of barley destined for other than local consumption. In the early stages of the occupation (level 5), cereals were grown exclusively for the Raqa'i inhabitants (subsistence economy), whereas the archaeobotanical record of levels 3 and 4 might testify to cash crop production. Following the above reasoning, in the final stages of the Bronze Age occupation (level 2), a return to a subsistence economy is suggested by the barley/wheat ratio. In conclusion, the cereal remains could be adduced to support the hypothesis that during the period represented by levels 4 and 3, the period of the Round Building, Raqa'i functioned as a grain-producing site within a larger economic and political system.

Why was barley grown as a surplus crop? Wheat would have been more obvious, since it is more highly valued as human food. The answer may be that the only possibility of increasing the cereal-grain production was by extending the grain-growing acreage to the upland, outside the narrow river valley. Here, under wholly rain-fed conditions and on gypsiferous soil, only barley could have been cultivated profitably. Barley makes lower demands upon soil and climate than wheat.

It appears that in level 5, the quantity of cereal-crop processing remains relative to those of cereal grains are much lower than in the other levels, which finds expression in the spikelet fork/grain and rachis internode/grain ratios presented in Table 9.5. As for the barley rachis internodes, one could imagine that threshing was carried out in the fields, at some distance from the site. However, the dehusking of glume wheat (emmer and einkorn wheat) was a typical household activity conducted on a piecemeal basis in or near the kitchen. In refuse deposits, spikelet remains of glume wheats usually outnumber the grains by far. May we perhaps assume that the locations of the level 5 samples were at some distance from food-preparation activity areas? Admittedly, explanations for the scarcity of cereal-processing waste in level 5 are far from satisfactory, and we are still in the dark about the real cause.

Free-threshing wheat (hard wheat/bread wheat) has not been demonstrated for level 5. This could be due to the low numbers of cereal remains recovered from the basal levels, but it is also possible that at first the Raqa'i inhabitants were unacquainted with free-threshing wheat and that they became familiar with this species through trade contacts, for instance, with southern Mesopotamia where it was widely grown under irrigation agriculture.

It is likely that, in addition to the food plants mentioned above, *Carthamus* was cultivated at Raqa'i. In this connection, the following should be noted. The site of Tell Hammam et-Turkman, located on the Balikh in northern Syria, provided evidence of the culti-

Table 9.5. Numbers of Cereal Plant Remains per 10 Samples (Threshing Remains Also Calculated; Wild Plants Not Included).

		Level	2	2/3	3	3/4	4	5
		Number of samples	5	3	18	3	11	6
Hordeum vulgare ssp. *distichon*	2-row barley (hulled)	Grain kernels	112	90	242	293	375	87
Hordeum vulgare ssp. *distichon*	2-row barley (hulled)	Rachis fragments	76	220	356	697	420	13
Triticum	Einkorn/emmer	Grain kernels	14	10	11	3	33	13
Triticum	Einkorn/emmer	Rachis nodes	126	73	357 (132)	37	67	15
Triticum durum/aestivum	Bread/hard wheat	Grain kernels	2	3	8	7	1	0
Triticum aestivum/durum	Bread/hard wheat	Rachis fragments	0	0	28	13	1	0
Poaceae	Grasses	Culms	0	13	210	203	173	5
Hordeum/triticum	Barley/wheat	Grain kernels	7	7	13	29	11	7
Triticum (hulled)	Einkorn/emmer	Rachis nodes/grain kernels	9	7	34 (13)	11	2	1
Hordeum vulgare ssp. *distichon*	2-row barley (hulled)	Rachis nodes/grain kernels	1	2	1	2	1	0

vation of safflower, *Carthamus tinctorius*, as a dye plant. A sample dated to ca. 2500 BCE yielded flowerhead remains of this species, in addition to a few fruits (van Zeist and Waterbolk-van Rooijen 1992). From the *Carthamus* flower heads, safflower carmine, a red dye widely used to dye textiles, is extracted. Fourteen *Carthamus* fruits retrieved from sample no. 32 (36/120-182; level 4) conform to the Hammam et-Turkman seeds, so that it is very likely that the Raqa'i specimens are also of safflower. For Raqa'i, there is no firm evidence of the use of safflower as a dye plant. In principle, the species could have been cultivated for its oleaginous fruits, for which it is almost exclusively grown at present (Knowles 1979). However, in view of the Hammam evidence, it is tempting to assume that at Raqa'i, too, safflower was grown as a dye plant.

Arable Weeds

Information on the vegetation of traditionally cultivated fields of the recent past is essential in reconstructing the ancient segetal flora on the basis of archaeological plant remains. In this connection, mention should be made of Jansen's (1986) study of the vegetation of arable fields in the Hasseke province of northeastern Syria, in a zone north of Raqa'i. Climatic conditions there, with a mean annual precipitation of 300–450 mm, are more suitable for rain-fed agriculture than in the Raqa'i area, and the same applies to soil conditions. Nevertheless, Jansen's study is of major interest for interpreting the Raqa'i archaeobotanical data.

In interpreting the Raqa'i plant record in terms of vegetation of the past, one is faced with the usual problems. A great number of charred seeds cannot be identified to the species level, and no ecological conclusions can be drawn from seed types that may include species from different habitats. Various taxa attested for Raqa'i could represent field weeds as well as species of steppe vegetation. Moreover, one and the same species may be found in arable fields as well as in the natural steppe.

Another handicap is the fact that in the occupational soil of refuse deposits, from which (almost) all Raqa'i botanical samples were taken, plant remains of diverse origins are usually found together. As in many other Near Eastern sites, waste products of the threshing and cleaning of cereal crops are found in appreciable numbers at Raqa'i (see Cultivated Plants section). For that reason, many of the non-crop plant seeds may have been from weeds that grew in the cereal fields concerned and which had been harvested together with the crop. In this connection, it should be mentioned that the cereal culm (stem) remains point to harvesting low on the straw (see Harvesting section). Substantial numbers of seeds may have been brought to the site in dung fuel (Bottema 1984; Miller and Smart 1984). The collecting of firewood may also have contributed to the "seed rain" on the site.

In theory, remains of unprocessed crop supplies, unmixed with plant debris of other origin, should provide reliable information on the ancient field weed flora. This ideal situation is only rarely encountered. In archaeobotanical practice, one usually has to be content with deposits of cereal grain supplies from which not all weed seeds had been removed in crop cleaning. Even this situation is not applicable at Raqa'i. On first impression it appeared that sample 35 (42/114-138),

from inside the Round Building, could be of special interest with regard to the field weed flora. About equal numbers of grains and rachis internodes of barley and a great number of culm nodes make one wonder whether the sample may consist of the remains of an unprocessed barley crop. However, the numbers of *Aegilops* grains and spikelet remains and of *Trigonella astroites* seeds seem far too great to correspond to about 200 barley grains, so that it is unlikely that the sample is made up of the remains of a pure, unprocessed crop supply, that is, a supply not mixed with seeds resulting from some other (crop-cleaning) activity. Therefore, only along indirect lines can the field weed flora of Bronze Age Raqa'i be established. "Indirect" means comparison of the Raqa'i data with the present-day segetal flora and with the information obtained from other Bronze Age sites.

As has been mentioned above, the segetal species recorded for the Hasseke Province (Jansen 1986: tables I and II) are a good frame of reference in interpreting the Raqa'i archaeobotanical data. Some of the taxa not listed by Jansen are reported as weeds of (fallow) fields in the flora works of Turkey and Syria, such as *Glaucium* (*corniculatum*), *Plantago psyllium*, and *Thymelaea* (*pubescens*). Bronze Age levels at Selenkahiye and Hammam et-Turkman, both in northern Syria in the same climatic zone as Raqa'i, yielded charred remains of barley supplies. Fair numbers of arable weed seeds retrieved from these cereal grain deposits inform us on the arable weed flora. In addition, a comparison of the floral remains of Selenkahiye with those of nearby epipalaeolithic Mureybit on the opposite side of the Euphrates is thought to provide information on the Bronze Age field weed flora. The starting point in this approach is the assumption that the plant taxa recorded for Mureybit are predominantly of the upland steppe and of the river valley vegetation. Plant taxa not present or only poorly (in low percentages) attested at Mureybit but fairly common to very common at Selenkahiye are interpreted to be of the synanthropic flora. For further details the reader is referred to van Zeist (1993), where the Bronze Age field weed flora of northern Syria is discussed. The modern segetal flora of northeastern Syria and information on arable weeds inferred from other sites suggest that most of the non-crop plant taxa attested for Raqa'i could have occurred as field weeds.

Grasses and leguminous species must have played a prominent part in the Raqa'i segetal flora. Of the grasses various *Aegilops* species should be mentioned, among which are *Aegilops crassa*, *Lolium (rigidum)*, *Eremopyrum bonaepartis*, and *Trachynia distachya*. As for leguminous taxa, the predominant role of *Trigonella astroites* is characteristic of Raqa'i. Other Bronze Age sites yielded much more modest numbers of seeds of this species. Many *Astragalus* species form part of steppe and desert-steppe vegetations, and seeds of this taxon could have been brought to the site with firewood. On the other hand, milk-vetch species are also reported as field weeds in northeastern Syria, such as *Astragalus cruciatus* and *A. guttatus* (Jansen 1986). *Medicago* is well represented at Raqa'i, but *Melilotus*, common at Selenkahiye and Hammam et-Turkman, must have been rare in the Raqa'i fields. *Coronilla (scorpioides)* is conspicuously absent in the Raqa'i plant record, although this is one of the species most frequently observed in segetal communities in the Hasseke Province (Jansen 1986: table 11). In general, it should be noted that a great number of segetal species reported by Jansen (1986) for northeastern Syria are not represented at Raqa'i. This could in part be due to poor chances of various seed types becoming preserved in a carbonized state, but, on the other hand, one may safely assume that the Bronze Age field weed flora was not wholly comparable with the modern (of traditionally cultivated fields). It is very likely that various species did not establish themselves in the arable fields until more recent times. For instance, *Cephalaria syriaca*, a very noxious field weed in the Near East, is only rarely represented in the archaeobotanical record of the region.

EXPLOITATION OF THE RIVER VALLEY

As has already been mentioned, at Bronze Age Raqa'i, climatic conditions must have been marginal for rainfed agriculture. This raises the question of whether some kind of irrigation was applied, compensating for insufficient precipitation in dry years. In Bronze Age times, irrigation was possible in the river valley only, not on the plateau outside the valley. The Khabur River is fed by a series of karst springs that guaranteed a steady flow of water. Irrigation could have been carried out fairly easily by damming the river and diverting the water over the fields. Moreover, the alluvial valley soils are better suited for arable farming than the gypsiferous upland soils. Since the river valley near Raqa'i is narrow, good-quality farming land must have been of rather modest extent. For that reason, one may assume that the valley floor was intensively used for plant cultivation. Surprisingly, the Raqa'i plant record

does not provide evidence of irrigation farming. In fact, none of the weeds mentioned by Zohary (1973: 643–644) from periodically irrigated fields has been identified at Raqa'i. This does not yet imply that irrigation was not practiced; it may just not find expression in the Raqa'i seed record.

Botanical evidence of the exploitation of the river valley for the collecting of firewood and bedding material and for grazing is rather meager. *Carex* (sedge) seeds were more than occasionally found; *Scirpus* (bulrush) is represented by one seed in each of three samples; and *Rumex pulcher* (a species of dock) is found in damp places but also in disturbed habitats. It cannot be ruled out that some of the culm remains retrieved (Table 9.2) are of *Phragmites australis* (reed). Sedge, bulrush, and reed could have been used for bedding. Seeds of marsh plants could have reached the site in the intestines of livestock that grazed on the herbaceous valley vegetation. Charcoal from sample 32 (36/120-182; level 4) was identified as that of *Populus* (poplar) and *Tamarix* (tamarisk), both natural constituents of river valley vegetation. Tamarisk wood is fair evidence of firewood collecting, but the poplar wood could originally have been utilized as building timber.

Harvesting

The presence, with more than a few occasional seeds, of rather low-growing (10–50 cm high) field weeds is assumed to indicate that the cereal crop was cut low on the straw. Several of the (potential) field weeds attested for Raqa'i comply with these requirements, including *Eremopyrum*, *Phalaris*, *Trigonella astroites*, *Medicago*, *Malva*, and *Crucianella*. Harvesting ears and straw together by sickle-reaping is a fast method, but it has the disadvantage that many weed seeds become mixed with the cereal crop, necessitating thorough cleaning. The presence of appreciable quantities of field weed seeds is not absolute proof of reaping low on the straw. Large quantities of field weed seeds could have been brought to the site in other ways, such as in dung fuel.

For Raqa'i, there is additional evidence of harvesting ears and straw together. Several samples yielded comparatively large numbers of culm nodes relative to the numbers of cereal grains, suggesting that the ears were harvested on the straw. Culm bases with the remains of lateral roots indicate that some of the plants were uprooted, which is not unusual when cutting low on the straw with a sickle. In sickle-reaping, some stems of the bundle held in the (left) hand may not be cut through, particularly if the sickle becomes blunt, and these are subsequently uprooted when the harvested bundle is taken up and laid aside. In conclusion, there are clear indications that at Raqa'i grain was reaped low on the straw, although other harvesting methods may likewise have been used.

Some Final Considerations

The contents of some of the samples ask, as it were, for further commentary. Could samples with a deviating floral record, that is to say, clearly different from the usual pattern of the Raqa'i samples, provide additional information on plant husbandry practices? For example, as has been discussed in the Arable Weeds section, the relatively great numbers of rachis internodes and culm nodes in sample 42/114-138 (no. 35) makes one wonder whether the sample represented an unthreshed barley crop.

The exceptionally large number of grains of the wild grass *Aeluropus* in sample 36/120-231 (no. 43) suggests that some quantity of this grass had been brought to the site. However, what does it mean? It may be excluded that the tiny grass seeds, 0.6–0.8 mm large, had been gathered for human consumption. Hay collecting, even at present, is not done in a steppe environment. Moreover, this low, creeping grass hardly lends itself to being cut with a sickle or knife, but in Iraq *Aeluropus lagopoides* is reported to be a valuable grazing plant. Could a handful of this grass have been used to light a fire? It is certainly an intriguing find, but a satisfactory explanation cannot (yet) be presented.

Sample 36/120-182 (no. 32), with the *Carthamus* (safflower) seeds, yielded a fair number of fruits and flower-head remains of a *Centaurea* species with medium-sized seeds. Only one other fruit of this *Centaurea* type was found, whereas the small-sized *Centaurea* fruit type is regularly represented at Raqa'i. Is the combination of *Carthamus* and *Centaurea* a curious coincidence, or could it be that the *Centaurea* species concerned occurred as a weed in the safflower field? One could speculate that the *Centaurea* species mimics safflower to some extent. It goes without saying that speculations of this kind should be taken with due reserve because, as with all other Raqa'i samples, the plant remains of sample 36/120-182, taken from a shallow ash pit, are of mixed origin.

The archaeobotanical record of Raqa'i distinguishes itself particularly from that of Bronze Age Selenkahiye and Hammam et-Turkman by the very high

Trigonella astroites proportions, but there are additional differences. When compared to the other two sites, Raqa'i shows comparatively high mean frequencies for *Lolium*, *Astragalus*, *Medicago*, *Teucrium*, and *Crucianella*. Absent or very poorly represented at Raqa'i are *Coronilla*, *Melilotus*, *Polygonum*, and *Rumex* (van Zeist 1993: table 4). One wonders to what extent the differences in the field-weed flora reflect differences in soil conditions, viz. gypsiferous soils in the Raqa'i area and predominantly calcareous soils at Selenkahiye and Hammam. As a cautionary note, it should be mentioned that at pre–Bronze Age Hammam et-Turkman (Neolithic, Halaf, Ubaid), *Lolium* did play a prominent role (van Zeist 1999: table 19.2).

NOTE

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Chapter 10

The Animal Remains from Tell al-Raqa'i[1]

Scott J. Rufolo

Compared to the other excavated small sites in the middle Khabur salvage area, Tell al-Raqa'i produced an animal bone assemblage of substantial size, thereby providing a valuable source of zooarchaeological information for the first half of the third millennium BCE. This chapter presents an overview of these data, underpinning a zooarchaeological analysis primarily oriented toward addressing the nature of the animal-based economy at Tell al-Raqa'i as a means of refining our understanding of the role held by this ancient village in the shifting regional settlement patterns and unfolding urbanization that occurred during its lifetime. The preceding chapters of this volume document an impressive body of archaeological detail that is available for Raqa'i thanks to the extensive, well-planned investigation of the site. Against the backdrop of this wealth of information, the zooarchaeological evidence contributes a greater resolution regarding the relationship of Raqa'i with its neighboring communities and sharpens our focus from the broader perspective centered on one of the most prominent issues in the archaeology of Syria, namely the rapid emergence of cities across the northern Khabur Basin during the Early Bronze Age (3000–2000 BCE).

Raqa'i was occupied for some 400 years from approximately the 29th to 25th centuries (the Early Jezirah 1 to Early Jezirah 3a periods of the local Early Bronze Age chronology established by Pfälzner [1998] and Lebeau [2000] for the Syrian Jezirah[2]). The largest sample of animal remains recovered from the site was found in sediments that accumulated during the middle of the Early Bronze Age (the Early Jezirah 2 period, ca. 2600 BCE). The mid-third millennium corresponds to the phase of urban coalescence in the northern reaches of the Khabur's drainage network, during the so-called "Second Urban Revolution" (see Chapter 1, this volume). The faunal material from the site thus provides a record that encompasses the time frame from pre-urban organization through the transition to a city-centered socioeconomic system, with significant documentation of the formative urban period, and thereby affords a valuable window into the function of the middle Khabur region with regard to the urban process of the third millennium in northern Mesopotamia.

Founded early in the third millennium, most of the occupation of Raqa'i occurred during the Ninevite 5 period. The Ninevite 5 era has received significant academic attention because the development of multiple urban centers in the upper Khabur region and elsewhere around 2600 BCE must have been anchored in the changing social relations evolving during the initial centuries of the Early Bronze Age (Forest 2003; Schwartz 1987, 2003). The specific part held by Raqa'i in this process of sociocultural evolution has been an important aspect of the discussion concerning this site from early on in its history of excavation. Whether limited or extensive, it is now generally assumed that the role of Tell al-Raqa'i and other settlements of the middle Khabur River involved an increasingly specialized pastoral economy (Fortin 1998, 2000; Hole 1999; McCorriston 1995, 1998; Zeder 1998b, 2003). The detailed zooarchaeological analysis included in this chapter permits a more rigorous examination of the pastoral practices of the ancient population based at Raqa'i than has been undertaken to date, additionally considering other aspects of the broader subsistence economy such as

general animal husbandry and the procurement of wild species, employing the faunal data to detect the signatures of increasing socioeconomic complexity that archaeological animal remains are so well suited to capture.

The analysis of zooarchaeological data from Mesopotamian contexts to specifically document shifts in economic strategies, differentiation in social constructions of rank and status, and increasing levels of political organization began in the 1980s with works such as those of Mudar (1982), Stein (1987, 1988, 1989), and Wattenmaker (1987a, 1987b). At the same time, Zeder (1984, 1988) was applying similar research protocols to explore the faunal assemblage from the Iranian site of Tal e-Malyan, which involves tens of thousands of specimens recovered from strata spanning the fourth through the second millennia BCE. Her subsequent Malyan monograph (Zeder 1991) highlighted the considerable potential of zooarchaeology as an interpretive tool and provided an overview of essential analytical techniques; these have since been refined and expanded to glean anthropological insights from animal remains excavated in the Near East.

Previous Zooarchaeological Work and the Present Research

The faunal material accumulated during the excavation of Tell al-Raqa'i is now housed at the Smithsonian Institution.[3] The Raqa'i specimens were subjected to a preliminary round of analysis whose results were first described in two unpublished reports (Rufolo 1995; Zeder 1996) representing the first step in a two-stage procedure for processing faunal samples developed for use in the National Museum of Natural History (NMNH)'s Zooarchaeology Laboratory (Seger et al. 1990:24–30; Zeder and Arter 1994). This initial phase of examination is designed to provide a basic set of summary data that paints a comparatively broad picture of animal resource use in a relatively quick fashion. The early profile was built using all remains recovered from contexts both confirmed and strongly suspected to represent Early Bronze Age deposits, the easily identifiable specimens assigned to the most specific taxonomic categories possible (sheep, pig, fox, etc.), whereas the more difficult to identify and highly fragmented specimens were tagged with broader designations (bovid, canid, gastropod, reptile, large mammal, etc.). Material was counted and weighed by taxon, but more detailed data such as skeletal element, element completeness, measurements, bone surface modifications, and so on were not collected. The first round of results was published and discussed by Zeder (Zeder 1998a, 2003).

Zeder's (1994, 1995, 1998b) earlier research with other Khabur basin zooarchaeological assemblages collected from 11 sites, of which the 20 represented occupation phases fall into a long time span roughly dating 7000–1500 BCE, was conducted as part of the Yale Khabur Basin Project (Hole 2002–2003). These sites, scattered across the Khabur Triangle in the north as well as the middle course of the Khabur River to the south (Figure 10.1), provided faunal data that documents a shift in subsistence strategy occurring sometime between the end of the fourth millennium and the middle of the third. This involved the abandonment of a mixed, more closely balanced reliance on wild and domestic resources to an animal-based economy focused almost exclusively on husbanded species, primarily sheep and goat. Relatively few sites from the middle Khabur region were included, however, and no assemblages dating to the first half of the Early Bronze Age and associated with the Ninevite 5 cultural sphere were represented. With the completion of the first-stage analysis of the Raqa'i faunal remains, accomplished in conjunction with preliminary processing of material from three additional Early Bronze Age sites of the middle Khabur ('Atij, Gudeda, Ziyadeh) dating within the range of 2850–2250 BCE and thus also representing the Ninevite 5 period (and beyond), this temporal hole was filled. The opening centuries of the third millennium witnessed a gradual decline in the proportion of wild animal species comprising the diet of the middle Khabur region's inhabitants (Zeder 1998a), a trend seen both in considering all four sites in comparison with one another over time as well as within the assemblages from the larger, multilayer sites of Tell 'Atij and Tell al-Raqa'i. The dominance of the caprine species (sheep and goat) seems to come at the expense of the pig, as suid remains essentially vanished altogether in the latest levels of both Raqa'i and 'Atij.

Zeder (2003) ties the data from the preliminary analysis of the Raqa'i faunal material to a regional economic restructuring in the Khabur River basin over the course of the early to mid-third millennium BCE that was indirectly associated with the growth of cities in the Khabur Triangle at this time at sites such as Tell Brak, Tell Leilan, and Tell Mozan. Along the middle Khabur and the steppes stretching to the west, the transformation of a broad-based strategy involving

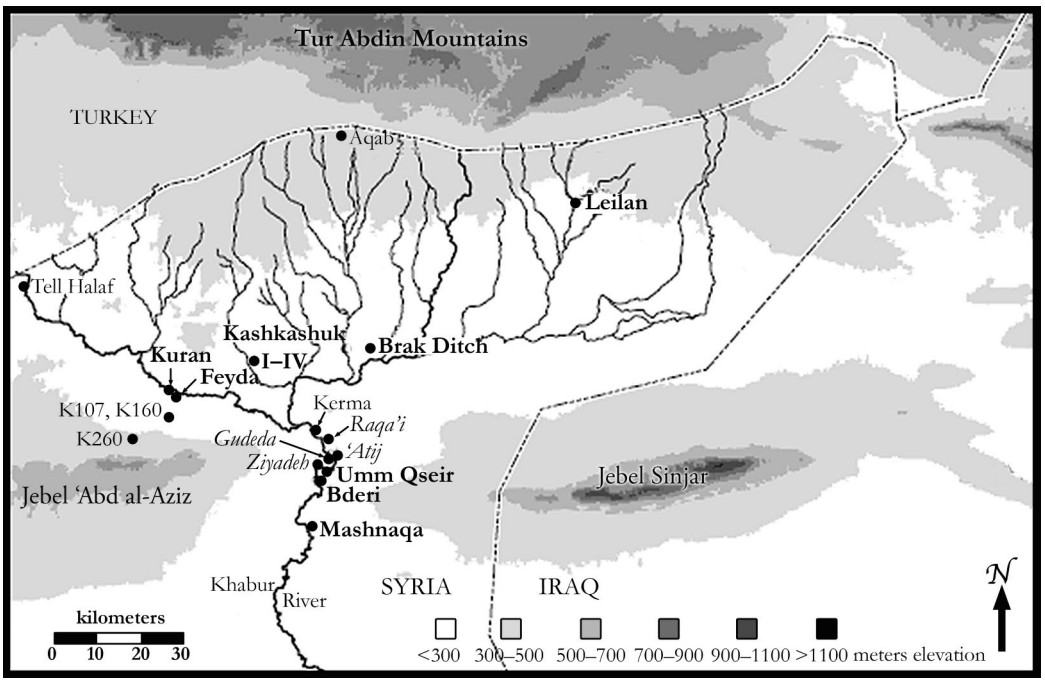


FIGURE 10.1. Map of northeastern Syria showing Khabur River drainage basin and locations of sites sampled by the Yale Khabur Basin Project. Faunal remains from site names listed in boldface were treated in Zeder (1995) and those in italics in Zeder (1998a). *Illustration prepared by Scott Rufolo.*

both domestic and wild fauna into a specialized economic system strongly focused on sheep and goat is interpreted as a signal of increasing local social complexity and economic specialization. In this view, the riverside communities evolved a delimited subsistence system that cultivated a discrete set of practices over the Early Jezirah 1 and 2 periods, eventually operating as one cog in an increasingly differentiated regional economy. The economic activity of the villages along the river bank articulated with that of the more mobile groups of the nearby steppe—another cog of the regional economy—whose presence has been inferred from archaeological survey (Hole 2002; Kouchoukos 1998). Each of these broader communities, sedentary village-dwellers and nomadic pastoralists, diverged in food production practices from what was initially—at the beginning of the Early Bronze Age—a more uniform society in economic terms. This divergence involved complementary economic profiles, however, and the two communities thus became separate corporate groups centered on distinct agricultural and pastoral production strategies tailored to maximize the potential for trade with one another.

These two cogs were linked through a formalized exchange network that balanced the needs of both, functioning together as a larger economic entity that only in the second half of the third millennium would be fully drawn into the urbanized sphere of the northern basin following the emergence of the large cities of the Khabur Triangle.

Zeder's scenario corresponds well with the dominant trend in the botanical data that indicates an increasing emphasis on barley at Raqa'i and nearby sites along the river during the first half of the Early Bronze Age (see Chapter 9 of this volume as well as McCorriston 1995, 1998; McCorriston and Weisberg 2002; Van Zeist 1999, 2003). Since this grain often is used to fodder animals, its greater representation might be a correlate of the rise in sheep and goat numbers in the faunal data. Considering the archaeobiological evidence in conjunction with survey data from the western steppe of the Khabur basin and—in the case of the most recent work—satellite imagery of the Khabur Triangle, Kouchoukos (1998), Hole (1999), and Wossink (2009: 111–114) also favor the notion of a localized agro-pastoral system uniting the riverbank settlements and the communities of the open steppe. The specific mechanics of the animal-based economic relationship between the settled population of sites such as Tell al-Raqa'i and the presumably more fluid habitation of the terrain

south and west of the Jebel ʿAbd al-ʿAziz could not be apprehended with the data from the preliminary faunal analysis, however. As a result, many questions were left open, such as which goods were being produced and exchanged by the two groups, how much interaction existed between the middle Khabur sites and settlements to the north, and how these economic relationships developed over time. Did the occupants of Raqa'i provide grain and other agricultural products to the steppe communities who then supplied the riverside sites with pastoral resources such as meat or wool? Did sites such as Raqa'i and 'Atij—both outfitted with ample storage, processing, and craft facilities considering their size—instead primarily afford non-agricultural goods and services to the pastoralists? Were activities at the settlements along the river, agro-pastoral or otherwise, principally oriented toward trade or tribute with external polities to the north or south? The second phase of zooarchaeological research with the Raqa'i faunal material was undertaken to better evaluate such questions.

The animal remains from Tell al-Raqa'i, along with the Early Bronze Age faunal assemblages from the other Khabur basin sites of 'Atij, Gudeda, Leilan, and Ziyadeh, were examined in greater detail as part of the core research for a recently completed doctoral dissertation (Rufolo 2011). Specimens were subjected to a more time-consuming process in which only material from secure archaeological contexts was selected and identified with greater taxonomic precision where possible. Additionally, numerous categories of data related to skeletal morphology, fragment size and completeness, and bone surface modifications such as tool marks were encoded.

Questions of Subsistence Strategy and Social Complexity

The line of zooarchaeological inquiry into socioeconomic complexity in the ancient Near East developed in the 1980s ultimately owes much of its theoretical grounding to the works of Johnson and Wright (Johnson 1973, 1978; Wright 1969, 1984; Wright and Johnson 1975). These two authors explored pre-state social complexity and the evolution of primitive state-level society using the fourth millennium BCE archaeology of Iraq and Iran, developing a functional definition of the early state based on economic specialization and information processing. Much zooarchaeological research in Near Eastern archaeology is now focused on dissecting the available faunal data for correlates that reflect the status differentiation, economic integration, and subsistence specialization indicative of these dimensions of urbanization and state function. Considering the history and archaeology of Tell al-Raqa'i, an examination of its faunal assemblage from a similar perspective is desirable, as seeking such signatures of specialized agro-pastoral strategies and increasing social complexity holds great promise for helping to resolve the nature of the site's socioeconomic function and potential role in the regional urbanization of the Early Bronze Age.

To improve our understanding of the middle Khabur settlements, the second round of faunal analysis is geared towards handling the following issues:

Confirmation of previously recognized trends: Are the decrease in wild species, increasing proportions of caprines, and elimination of pig from the diet as detected by Zeder (1998a) just as pronounced in the second-stage analysis results? Do more subtle trends in species abundance present themselves?

Nature of pastoral strategies: For what purpose were sheep and goat flocks being maintained (wool production, meat yield, mixed strategy, etc.)? Is there evidence of sheep having been husbanded differently than goats? Did an evolution in pastoral practice take place towards an increasingly specialized system? Were cattle also being raised in a specialized fashion?

Signatures of greater social complexity: Do other aspects of the faunal data (butchery patterns, spatially differentiated distributions of taxa within the site, age profiles for wild species indicating highly organized hunting, etc.) point to developing status-based social hierarchies, centralized control of animal-derived resources, or additional economic specialization?

In a recent treatment considering similar zooarchaeological matters as those involved with Raqa'i, Bartosiewicz (2010) examines a broader range of faunal data than had previously been presented (Bartosiewicz 1998; Bökönyi 1983) for the Late Chalcolithic period VII (3800–3350 BCE, LC 3–4) and VI A (3350–3000 BCE, LC 5) occupations of Arslantepe in the upper Euphrates basin of eastern Turkey. Like Raqa'i and the other Early Bronze Age sites of the middle Khabur, the archaeological features of Arslantepe signal growing craft specialization and an increased capacity for the storage of goods, accompanied by material culture correlates of heightened social complexity (D'Anna 2010; Frangipane 1997, 2007). Increased social complexity at Arslantepe, marked by centralized control of the production and distribution of goods, is documented in

the zooarchaeological statistics through an increase in sheep and goat representation, decline in the proportion of pig, and a much greater predominance of sheep over goats (Bartosiewicz 2010; Frangipane and Siracusano 1998). These are all read as indications of a developing specialized pastoralism focused on sheep and practiced at the community level, replacing a more diverse household-centered economy in which pigs played an important role. Supporting this interpretation, the wild component shifts its emphasis from large-sized woodland game animals to a narrower range of small prey. This likely reflects the deterioration of a less integrated economy founded in individual households regularly supplementing their diet through the informal hunting of various game animals; the developing corporate focus on pastoral domesticates signified that common grassland taxa easily caught by individuals moving with caprine herds across the steppe became a more frequent component of the wild fare. Accompanying these abundance shifts among the utilized species is some minor variation in the types of animals, their age, and the quality of meat cuts provided by certain domesticates in relation to context, with public areas and elite residences having slightly different faunal characteristics than non-elite residential quarters.

Arslantepe is a much larger site than Raqa'i, but it nonetheless provides a valuable general reference in considering the Raqa'i faunal data given its development of socioeconomic complexity. It has also been argued that pastoral specialization and centralized animal husbandry were significant factors in connecting Arslantepe with other regions (Palumbi 2010), with Arslantepe possibly acting as a gateway community funneling the flow of goods from points farther south into the central Anatolian highlands (Burney 1993). Such a role as a gateway point for commercial traffic has also been considered a possibility for Raqa'i (Curvers and Schwartz 1990:22). If Raqa'i also came to be involved in an expanding local economic network with a significant pastoral component, particularly if the Early Bronze Age sites of the central Khabur Basin represent communities of a small-scale chiefdom or network of chiefdoms participating in a grain-based staple finance system as has been suggested by Schwartz (Schwartz 1994a, 1994b; Schwartz and Curvers 1992), it is reasonable to expect that features similar to those of Arslantepe's animal bone data will be present in the faunal assemblage.

The faunal patterns from Raqa'i should facilitate a more decisive assessment of the multiple models and possible scenarios that have been offered to explain the presence of the middle Khabur sites. In addition to the ideas already mentioned, alternate scenarios include the establishment of the middle Khabur sites as part of a small-scale colonial endeavor of a southern urban power such as Mari (Fortin 1996, 1997, 2000, 2001), the organization of the settlements not as colonies under direct control but as mercantile ventures involving both foreign commercial agents and local peoples (Hayden 1994; Margueron 1991, 2000; McCorriston 1995, 1997), sites such as Raqa'i being the residences for semi-nomadic people who occupied the riverbank seasonally and were not drawn into the urbanization process (Hole 1999; Kouchoukos 1998), and villages permanently inhabited by groups related to nearby steppe populations that formed an economic entity tied to a localized trade network and to the regional economy via riverine traffic (Pfälzner 2002, 2008; Thomas 2010:151; Wossink 2009). These different interpretations and speculations are explored in considerable detail in the final chapter (Chapter 11) using the totality of evidence from Raqa'i and other Khabur Basin excavation projects to assess the strengths and weaknesses; the particular insights offered by the zooarchaeological data to this discussion are highlighted here. The faunal data from Raqa'i alone cannot provide conclusive support for one theory over another, but it will provide an additional avenue for better evaluating the degree of likelihood for the basic economic arrangements inherent to each.

Zooarchaeological Analysis

Taphonomic and Methodological Concerns

The depositional history of Tell al-Raqa'i appears to have followed the general processes of accumulation that influence the development of tell sites in the arid regions of the Middle East, processes which from a taphonomic perspective are relatively conducive to the preservation of faunal material in comparison to other archaeological environments (Gé et al. 1993:151; Gilbert 1979:22; Rosen 1986:117–118). The Raqa'i assemblage was processed to the second stage of analysis as part of a comparative exercise involving three other middle Khabur sites. Such an examination required the employment of several statistical checks and indices to gauge the effects of pre- and post-depositional factors that may have biased the Raqa'i data (Rufolo 2011:246–273). The results signal that no unusual depositional forces

were in play at the site and that the common taphonomic processes that alter discarded animal bone had only a limited influence. A brief summary of the indicators that led to this conclusion is included here in order to place the Raqa'i material into its taphonomic context and to facilitate comparison of the Raqa'i data to information recorded for other sites.

Of the faunal specimens recovered during excavation and shipped to the Smithsonian Institution for analysis[4], a total of 10,852 were considered for the second round of examination. Screening was employed at Raqa'i for most contexts, although systematic screening was not undertaken for the excavation of level 2. Sediments from levels 5, 4, and most of 3 were routinely passed dry through a mesh with 1-cm openings during all seasons, although a select set of sediments underwent a double screening process during the 1991–1993 excavation seasons. This more rigorous screening was part of a projected test to determine how much more information could be obtained through a very thorough recovery process, the dry-screened material from the first pass subsequently being subjected to wet-screening using a 0.5-cm mesh. The double-screened faunal material was not labeled according to the standard system of excavation units, however, and contains a significant volume of small and fragmentary specimens. It was not included in the analysis, since the results would not be comparable to those obtained from the other excavated material.

The ratio of first to second phalanges for the most commonly occurring taxon in an assemblage is often used as an index of recovery bias. This is due to the fact that these equally compact bones of the toe, which differ in size and articulate in life, do not correspond with an economically valuable cut of meat and were therefore unlikely to have been disarticulated or intentionally damaged during butchery. The degree to which the smaller second phalanx is underrepresented in comparison to the larger first signals the extent to which smaller bones may have been missed during the screening process. For the caprine material from the Raqa'i assemblage, this ratio is 1.0:1.0 when calculated using both the NISP (number of identified specimens) and the MNE (minimum number of whole elements) counts for the first and second phalanges,[5] suggesting that the differential loss of smaller bones and bone fragments in comparison to larger ones was negligible as the ratio is generally 4:1 or higher for unscreened materials. There was insufficient material for meaningfully calculating the ratios per level, so the effect on material from level 2 as a result of not having screened deposits for that stratum cannot be evaluated, but the faunal sample from level 2 is very small in comparison with those from the underlying stratigraphic units and is therefore not amenable to comparison with levels 3 and 4 in the first place.

The state of preservation of the Raqa'i specimens is good overall, with very little of the analyzed material exhibiting signs of heavy or even moderate degradation. Two specimens were noted to possess friable surfaces likely resulting from being water-logged at some point; otherwise, the only severe damage observed occurred on a few specimens that were struck by excavator's tools. Most specimens show little sign of surface deterioration other than occasional small fractures, mild flaking of the outer layers of the bone, and rare examples of root etching. The degree of fragmentation for the assemblage is indicated in Table 10.1, which presents average fragment weights as well as the proportions of the total specimen count falling into element completeness estimates. The completeness categories represent the estimated portion of the original whole skeletal element (cervical vertebra, humerus, femur, etc.) preserved by a specimen, that is, 100% means that essentially the complete, unbroken bone is present, 50–75% means that the specimen is a fragment of an element missing a quarter to a half of its initial total size. Just over 50% of the specimens of the Raqa'i assemblage are present in half or less of their original state, a figure that seems typical for a Near Eastern site based on the few studies that report such data. A more focused measure of fragmentation is gained by comparing the counts of first phalanx, second phalanx, and calcaneus specimens—all representing elements of the foot characterized by compact extremities connected by a more fragile shaft—with the total number of articular ends still present on these specimens (Table 10.2). As each specimen would bear components of both articular surfaces if the total length were preserved, a ratio of end portions to total specimen count of two to one indicates little to no fragmentation at all (meaning all specimens are largely complete and possess both distal and proximal ends). The Raqa'i values are fairly high, suggesting that the assemblage has suffered from relatively weak to moderate forces of breakage.

Additional confirmation that the Raqa'i material has not been strongly affected by natural taphonomic agents is found in considering patterns of fragmentation in relation to bone density. Beginning with the

works of Brain (1967, 1969, 1976), recognition of the fact that bone density greatly mediates the survival rate of skeletal elements has been used to assess the contribution of general taphonomic processes to the composition of an assemblage and to aid identification of signatures of human or carnivore activity. Following Brain's example, the numbers of caprine specimens from the Raqa'i assemblage representing certain key elements are listed in Table 10.3, arranged in order of decreasing structural density from top to bottom, along with the mean fragment weight for each element. A linear regression run on the NISP counts per element against average bone density figures indicates that correlation between the two is weak ($r = 0.53$, $r^2 = 0.28$), density accounting for less than 30% of the variation in element frequency. It is expected that bone density and element counts would be much more strongly correlated if abiotic taphonomic factors had greatly altered the composition of the death assemblage. It can also be seen in the data of Table 10.3 that the average fragment size per element does not decrease uniformly in relation to the corresponding bone densities, further evidencing the limited effects of general fragmentation processes on the studied assemblages. Using a more recent method (Stiner 1991, 2002) for assessing correlation that is based on more precisely calculated density profiles derived through photon densiometry, similar results were obtained for the Raqa'i material (Rufolo 2011:260–262), strengthening the case that trends in the zooarchaeological data based on the relative abundances of various skeletal element categories and the taxonomic identifications assigned to them are valid indications of patterns of ancient human activity rather than post-depositional forces of erosion.

TABLE 10.1. Average Fragment Weights for Raqa'i Faunal Assemblage and Proportions of Estimated Element Completeness for Specimens of Identifiable Material.

Raqa'i summary fragmentation values	
Average fragment weight	
Total analyzed assemblage	3.1 g
Identifiable material[a]	6.2 g
Unidentifiable material[b]	1.6 g
Element completeness	
100%	9.1%
75%+	28.7%
50–75%	6.26%
25–50%	10.9%
<25%	43.1%
?	2.0%

[a] Specimens that could be identified to a useful taxonomic level.

[b] Specimens too poorly preserved to be identified beyond general taxonomic categories.

TABLE 10.2. Ratios Derived from Raqa'i Caprine Data of Number of Persevered Articular Ends to Total Number of Specimens for Three Key Skeletal Elements Whose Degree of Integrity Reflects Intensity of Fragmentation Experienced by an Assemblage.

Raqa'i fragmentation indices	
First phalanx	
Number of articular ends	136
Specimen count	83
Articular ends/count	1.64
Second phalanx	
Number of articular ends	57
Specimen count	29
Articular ends/count	1.97
Calcaneus	
Number of articular ends	55
Specimen count	38
Articular ends/count	1.45

Remaining obstacles to the interpretation of the faunal data due to pre-depositional biasing factors such as certain human behaviors (use of bone as tools, thermal alteration of bone during cooking) and the scavenging of bones by dogs following butchery and food preparation have also been examined (Rufolo 2011: 264–270). It was found that such taphonomic processes had little influence upon the assemblage and neither significantly affected the identifiability of remains nor appreciably skewed element frequencies and taxonomic abundances. The size of the Raqa'i sample is also sufficiently large to assume that species diversity and richness are accurately represented by the assemblage. A simple graph may be constructed to assess whether enough specimens were collected to track most of the animal taxa utilized by the ancient inhabitants of the site by plotting the cumulative number of genera represented by the specimens unearthed over the course of the excavation on a season-by-season basis (Figure 10.2). The x-axis records the total assemblage size as it accrued during each year of excavation, and the cumulative total number of unique genera present in the identifiable material is shown on the y-axis. As more and more animal bone specimens are recovered, the chance of finding the remains of less common species

increases until all but the most rare have been encountered. The curve begins to level out with the 1989 season, after which the addition of over 1,000 specimens identifiable to the order level or lower only raised the total number of genera by four, all of which were uncommon species represented only by a single specimen. This indicates that all of the major taxa reared or hunted in the past—as well as many minor ones—have likely been captured in the data; only species whose occurrence in the death assemblage was rare possibly remained unaccounted for.

TABLE 10.3. Raqa'i Caprine Specimen Counts and Average Fragment Weights by Bone Density Values for Certain Skeletal Elements.

Element	NISP	Mean weight (g)	Bone density (g/ml)[a]
Mandible	113	4.8	1.67
Innominate	72	3.3	1.62
Radius (proximal)	34	9.4	1.60
Ulna (proximal)	25	3.9	1.60
Scapula	58	6.2	1.58
Humerus (distal)	29	7.4	1.58
Tibia (distal)	20	10.8	1.52
Femur (proximal)	13	3.3	1.43
Astragalus	28	3.8	1.41
Calcaneus	40	4.9	1.41
Tarsals (remaining)	6	2.3	1.41
Radius (distal)	13	7.8	1.37
Tibia (proximal)	10	10.9	1.36
Carpals	9	1.0	1.35
Metacarpal (proximal)	46	7.8	1.32
Metatarsal (proximal)	43	5.3	1.32
Metacarpal (distal)	32	7.9	1.27
Metatarsal (distal)	21	5.7	1.27
Horn core	34	5.9	1.20
Femur (distal)	12	7.8	1.16
Humerus (proximal)	10	6.2	.85
Patella	7	2.1	.76

[a] Bone density figures taken from Binford and Bertram (1977).

Finally, it should be mentioned that NISP is utilized as the basic count statistic for taxonomic identifications. As most recently overviewed by Lyman (Lyman 2008:27–82, 266–267), the number of identified specimens provides the most useful and versatile base unit for zooarchaeological quantification along with its less-often cited partner, the number of unidentified specimens (NUSP). For the Raqa'i analysis, NISP equals the number of specimens among the material preserved well enough to be identified to a specific element of the skeleton (mandible, humerus, metacarpal, etc.) and assigned to a useful taxonomic category, generally family level or lower. NUSP counts represent the more fragmentary specimens that could only be identified to broad element categories (cranial, long bone, etc.) and higher-level taxonomic units (large-sized mammal, artiodactyl, etc.) that encompass several possible species. NISP plus NUSP equals the total number of analyzed specimens (NSP) processed during the second-stage examination. Figures derived from the NISP counts have been used in certain cases where greater statistical rigor is necessary (NISP data lack statistical independence and therefore are not suitable for certain tests and evaluations). The two derived values employed in this study are the minimum number of elements (MNE) and the minimum number of individuals (MNI).

MNE is defined simply as the most numerous part or region (proximal end, mandibular symphysis, etc.) of a particular skeletal element as recorded for a certain taxon. No attempt was made to assess fragment overlap or enumerate important osteological landmarks as in the detailed portion codes used by some authors (Dobney and Rielly 1988; Stiner 2002:appendix). The MNI values were calculated based on the

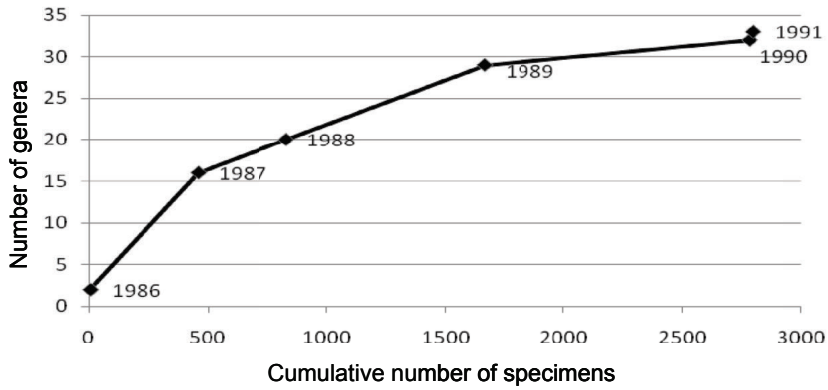


FIGURE 10.2. Plot of cumulative number of unique genera identified per season at Raqa'i as a function of cumulative sample size. *Illustration prepared by Scott Rufolo.*

most frequently occurring skeletal element for a taxon as determined by the MNE counts. The smallest number of individual animals necessary to account for the selected element total, taking into consideration the symmetry (left or right limb), singularity (in the case of some bones, such as the atlas, each animal has only one), and/or fusion state, was recorded as the MNI. For detailed evaluations of the strengths and weaknesses of these zooarchaeological measures, see Grayson (1984) and Lyman (1994, 2008).

Sample Selection and Breakdown

To ensure the selection of archaeologically secure material for the detailed analytical protocol of the second-stage analysis, a system of prioritization based on archaeological context was developed. A set of codes was established in order to isolate those specimens originating from deposits least likely to contain remains from modern or mixed periods. The codes are organized into eight blocks of four-digit sequences, sometimes supplemented with an alphabetic designation attached to the end, each block containing contexts regarded as being of equal archaeological reliability. Contexts included in the first block, whose codes all begin with the number one, are essentially certain to contain ancient material dating to a particular period, each successive block representing less secure provenience circumstances. The coding system is outlined in full in Rufolo (2011:appendix A). Examples of the general types of archaeological provenience subsumed by each code block are given in Table 10.4. Priority status was accorded to only those specimens recovered from contexts falling into the first four code blocks; specimens assigned a context code beginning with 5 or higher were not included in the analysis.

Table 10.5 presents the breakdown of the prioritized specimens by level. Of the 10,582 recovered specimens, 9,584 or 88% were selected for analysis. Within the prioritized material, a small number of specimens could not be located at the time analysis began,[6] so the prioritized numbers were slightly reduced to produce the figures for the analyzed assemblage. This analyzed material may then be divided among those specimens well-enough preserved to be identified to a useful taxonomic level and therefore recorded in detail to obtain measurements and other data on individual specimens, and those whose state of preservation was insufficient to permit highly specific taxonomic identification and thus did not warrant recording more than basic information such as total number and weight. Specimens attributed with uncertainty in the field notes to specific levels are listed in the table in rows with a question mark following the level number; these remains came from certain loci that were described as most likely belonging to a particular level, but the excavator could not positively relate the deposit to exposed areas of confirmed stratigraphic position. All such material has been excluded from the analysis so that the final prioritized, periodized, and analyzed assemblage for Raqa'i is the sum of the specimen counts for all loci attributed with certainty by the project directors to third-millennium BCE contexts, totaling 8,802 specimens. These are examined as four subassemblages representing the four individual Early Bronze Age levels (2, 3, 4, and 5) and also considered in

Table 10.4. General Description of Context Categories Used to Determine Sample Priority for Second-Stage Analysis of Raqa'i Animal Bone Assemblage.

Context code block[a]	Priority	Context types
1000s (primary)	Yes	Surface remains and distinct occupation debris (floors, courtyard surfaces, etc.)
2000s (secondary)	Yes	Contained, discrete units (pits, middens, jars, burials, etc.)
3000s (tertiary)	Yes	Contexts sealed by mudbrick collapse
4000s (quaternary)	Yes	General room fills and deposits associated with intact architecture
5000s	No	Construction fill, mudbrick collapse
6000s	No	Unstratified and non-cultural deposits (backdirt, animal burrow, natural deposition unassociated with architecture, etc.)
7000s	No	Known modern features
8000s	No	Unknown or uncertain context

[a] The terms primary, secondary, and so on used in reference to the priority codes that signal material suitable for the second-stage analysis refer to their sequence within this coding system; the archaeological proveniences subsumed within each code block do not necessarily correspond to meanings of these terms in Schiffer's (1972) description of refuse categories and systemic context.

TABLE 10.5. Distribution of Recovered Faunal Remains for Tell al-Raqa'i by Level and Sample Type as Determined by Context Coding and Identifiability of Material.

Level	NSP	Prioritized specimens	Analyzed specimens	Recorded in detail (NISP)[a]	Detail (weight)	Recorded in bulk (NUSP)	Bulk (weight)
post-1	260	250 (96.2%)	250 (96.2%)	153 (58.9%) [61.2%]	349.6	97 (37.3%) [38.8%]	70.6
1	2	0	0	0		0	
1?	10	10 (100.0%)	9 (90.0%)	3 (30.0%) [33.0%]	7.2	6 (60.0%) [66.0%]	30.8
2	224	217 (96.9%)	194 (86.6%)	45 (20.1%) [23.2%]	190.0	149 (66.5%) [76.8%]	223.4
2?	989	59 (6.0%)	58 (5.9%)	11 (1.1%) [19.0%]	35.6	47 (4.8%) [81.0%]	27.7
3	3,191	3,132 (98.2%)	3,113 (97.6%)	849 (26.6%) [27.3%]	4,218.9	2,264 (71.0%) [72.7%]	3,083.5
3?	596	596 (100.0%)	578 (97.0%)	31 (5.2%) [5.4%]	75.0	547 (91.8%) [94.6%]	393.9
4	4,252	4,046 (95.2%)	4,018 (94.5%)	1,479 (34.8%) [36.8%]	9,582.1	2,539 (59.7%) [63.2%]	4,480.5
4?	22	3 (13.6%)	3 (13.6%)	1 (4.6%) [33.3%]	3.6	2 (9.1%) [66.7%]	8.3
3+4	677	634 (93.7%)	631 (93.2%)	205 (30.3%) [32.5%]	1,557.4	426 (62.9%) [67.5%]	815.6
5	197	195 (99.0%)	195 (99.0%)	85 (43.2%) [43.6%]	952.4	110 (55.8%) [56.4%]	379.0
2+3	671	671 (100.0%)	635 (94.6%)	124 (18.5%) [19.5%]	629.7	511 (76.2%) [80.5%]	645.4
2+3?	1	1 (100.0%)	1 (100.0%)	0		1 (100.0%) [100.0%]	.5
2+4	12	10 (83.3%)	9 (75.0%)	6 (50.0%) [66.7%]	22.6	3 (25.0%) [33.3%]	27.9
2+3+4	2	2 (100.0%)	2 (100.0%)	0		2 (100.0%) [100.0%]	1.8
4+5	5	5 (100.0%)	5 (100.0%)	4 (80.0%) [80.0%]	58.1	1 (20.0%) [20.0%]	2.4
2–5 Total[b]	9,231	8,912 (96.5%)	8,802 (95.4%)	2,797 (30.3%) [31.8%]	17,211.2	6,005 (65.1%) [68.2%]	9,659.5
?	2,592	704 (27.2%)	683 (26.4%)	135 (5.2%) [19.8%]	405.6	548 (21.1%) [80.2%]	546.3

Notes: Percentages given in parentheses are in reference to total amount of recovered material for a level (NSP) reported in second column; those presented in square brackets represent proportions of total number of analyzed specimens (reported in fourth column) for a particular level either recorded in detail (NISP) or recorded in bulk (NUSP). All weights are in grams.

[a] Specimens recorded in detail largely represent remains that could be identified to fairly narrow taxonomic categories, and numbers are thus reported in this column as NISP counts. A small amount of specimens tallied here as NISP, however, are not actually identified to a specific enough taxonomic level to warrant this designation. This material consists of bone that could only be assigned to a broad category such as large mammal, long bone fragment, but which nonetheless was recorded in greater detail than most of the unidentifiable material. This is due to the fact that such fragments exhibit surface modifications like cut marks that required recording additional information for the database. In this chapter, all the tables, charts and graphs reporting taxonomic identifications exclude these few specimens that are the exception from NISP totals, counting them instead with the unidentifiable material.

[b] This row includes all specimens obtained from EBA contexts of certain origin in terms of level (2, 3, 4, 5, 2+3, 3+4, 2+3+4, and 4+5) and reports totals for analyzed assemblage whose faunal data are reported in this chapter.

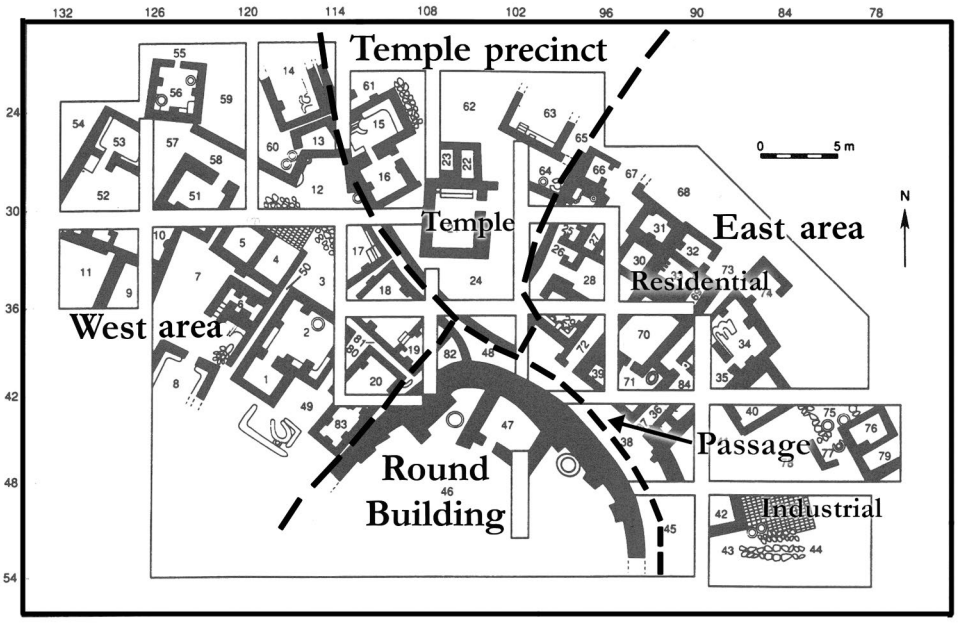


FIGURE 10.3. Plan of Raqa'i level 3 indicating sectors used for faunal analysis. *Illustration prepared by Scott Rufolo*.

total as a combined assemblage for the entire site. Only the remains assigned to a single level in Table 10.5 are analyzed when treating a particular occupation phase; material from mixed Early Bronze Age contexts (levels 2+3, 3+4, etc.) is only included when considering the faunal assemblage as a whole (levels 2–5 combined). Details concerning the basic site stratigraphy and descriptions of the levels are provided in Chapter 2 of this volume. Dates for the levels may be found in endnote 2. Levels 2 and 5 supplied fewer than 200 periodized and analyzed specimens each, so the faunal analysis focuses primarily on the much larger samples from levels 3 and 4.

As a result of the fairly large surface area over which the architectural features of levels 3 and 4 were exposed, it is possible to consider dividing the faunal remains from Raqa'i for each of these levels according to certain areas. For level 3, this translates into recognition of subassemblages for each of the functional zones originally distinguished by Schwartz and Klucas (1998), with the addition of an additional sector here called the "passage" (Figure 10.3). The basic statistics for these faunal subassemblages are shown in the upper part of Table 10.6 and the sectors they represent may be understood according to the buildings and artifacts found therein as discussed in Chapter 3. The passage is a street that snakes around the eastern side of the Round Building to the northwest and separates the temple precinct and eastern sectors from the Round Building itself. This area is taken as a separate sector here as it is possible that this passageway may have been used for small-scale dumping of household rubbish and food waste.

Level 4 may also be divided into distinct areas that may relate to different functional uses of space (see Chapter 2 for further details and discussion of individual areas). These are listed in the lower portion of Table 10.6 and were initially determined using published descriptions of the level 4 layout (Schwartz 1994b:23–24; Schwartz and Curvers 1993/1994:249–251) in conjunction with details concerning excavation loci recorded in the Raqa'i project database. These different recovery areas include:

Round Building: The Round Building in level 4 was preserved to a height of 3 m, containing platforms, grain storage facilities, and an area with ovens. Contexts from within the building yielded a surprisingly large number of faunal specimens in comparison with those of other sectors, both the sectors of level 4 as well as those in the succeeding level 3.

Exterior Round Building (*east*): A number of loci from contexts immediately surrounding the Round Building also supplied faunal remains. Those from the excavated areas to the north and east (areas 81, 82, 83, and 104) are listed separately in Table 10.6 (outside RB (N) = outside Round Building to the north, etc.) but these four areas have been combined for analysis to increase sample size and are designated as "exterior RB

TABLE 10.6. Number of Analyzed Specimens by Sector for Tell al-Raqa'i Level 3 (Upper Section of Table) and Level 4 (Lower Section).

Sector	Recorded in detail		Recorded in bulk		Total assemblage	
	NISP	Weight	NUSP	Weight	NSP	Weight
Level 3						
West area	278	1,287.3	696	917.5	974	2,204.8
Temple compound	127	741.8	626	504.5	753	1,246.3
Passage	120	755.6	345	618.1	465	1,373.7
Round Building	51	251.9	95	139.3	146	391.2
East residential	188	865.4	380	677.0	568	1,542.4
East industrial	85	316.9	122	227.1	207	544.0
Level 4						
NW silo complex	53	291.6	87	178.4	140	470.0
Outside silo complex	291	2,553.5	519	1,257.1	810	3,810.6
Exterior RB (west)	344	2,845.1	606	1,435.5	950	4,280.6
Outside RB (N)	68	583.0	76	228.5	144	811.5
Outside RB (NE)	7	23.9	35	43.1	42	67.0
Exterior RB (east)	75	606.9	111	271.6	186	878.5
Round Building	1,060	6,130.1	1,818	2,760.7	2,878	8,890.8
Above RB			4	12.7	4	12.7

Notes: These counts represent the final prioritized and periodized assemblage selected for examination. All weights are in grams.

(east)" in the tables and figures. The relatively limited extent of excavation adjacent to the Round Building in level 4 prevents a good understanding of the nature of the architectural features uncovered, so it is not clear what purpose the structures to the north and east served. The four specimens recovered from material lying above the level 4 Round Building but clearly not part of level 3 have been excluded.

Exterior Round Building (*west*): A series of six storage chambers with associated small rooms was uncovered to the northwest of the Round Building in level 4, located below the silos of the level 3 west area. Faunal material from these six units—which also likely served as grain silos with access from the top via a set of limestone slabs to the southwest that formed a stairway—and the nearby spaces immediately south and north (all together comprising specimens from areas 51-3, 59, 65, 66, 68, 99, and 100) are recorded under the row title "NW silo complex" in Table 10.6. To the immediate south of the silo facility, a small building with plastered walls and floor outfitted with benches and a basin was discovered. This building abutted a series of rooms located to the east and farther south, stretching along the southwestern perimeter of the Round Building, several of which yielded animal bone remains. This faunal material is included under the designation "Outside silo complex" in Table 10.6 (representing areas 30-6, 41, 42, 47, 50, 60-4, 111, 112, and 114). For the purposes of analysis, specimens from within and around the silo complex have been combined (as enumerated in the "Exterior RB (west)" row of the table). Data for material recovered from within silos 56–58, which could not be reliably assigned to either level 3 or level 4, were not included in the figures for this sector.

Turning now to the breakdown by context codes (Table 10.7), it is clear from the percentages in the final column that the Raqa'i assemblage derives almost completely from quaternary priority contexts. With material from all Early Bronze Age strata combined, specimens from contexts assigned priority 4 codes represent over 93% of the assemblage. This picture changes little when examining the distribution on a per level basis, the proportion of material from quaternary contexts ranging from a low of 85% in level 3 to a high of 98% in level 4. As level 3 was excavated over a greater areal extent, uncovering more coherent architectural remains, it makes sense that this level would exhibit a (slightly) higher percentage of primary and secondary contexts. These mostly represent deposits from directly above or within floors, pits, ovens, and basins scattered throughout the industrial and residential areas, but overall are still a small component of the assemblage. The quaternary contexts encompass all the general room fills and accumulations around architectural features that developed during use of the various spaces of a level, denser concentrations of animal bone

Table 10.7. Specimen Counts by Context Code and Level for Prioritized and Analyzed Assemblage for Tell al-Raqa'i.

	Level 2	Level 3	Level 4	Level 5	TOTAL (2–5)[a]
Priority 1 codes					
1111 (Floor, interior)		36 (1.16%)	31 (0.77%)	8 (4.10%)	82 (0.93%)
1123 (Occupation level, exterior)		45 (1.45%)	27 (0.67%)	4 (2.05%)	78 (0.89%)
1311 (Bench surface)	8 (4.12%)				8 (0.09%)
Primary TOTAL	**8 (4.12%)**	**81 (2.61%)**	**58 (1.44%)**	**12 (6.15%)**	**168 (1.91%)**
Priority 2 codes					
2111 (Pit fill, unlined pit)		178 (5.72%)			181 (2.06%)
2140E (Bin/basin fill)			1 (0.02%)		1 (0.01%)
2142E (Plaster-lined basin/bin fill)	14 (7.22%)				14 (0.16%)
2216 (Human burial)	4 (2.06%)	22 (0.71%)			26 (0.30%)
2240 (Fireplace/hearth contents)		11 (0.35%)			11 (0.12%)
2260 (Oven contents)		181 (5.81%)	14 (0.35%)	1 (0.51%)	211 (2.40%)
Secondary TOTAL	**18 (9.28%)**	**392 (12.59%)**	**15 (0.37%)**	**1 (0.51%)**	**444 (5.04%)**
Priority 3 codes					
3112A (Collapse, interior)		3 (0.10%)			3 (0.03%)
3132A (Collapse, location unknown)			4 (0.10%)		4 (0.05%)
Tertiary TOTAL		**3 (0.10%)**	**4 (0.10%)**		**7 (0.08%)**
Priority 4 codes					
4110 (Room fill, general)	67 (34.54%)	856 (27.50%)	2,810 (69.94%)	32 (16.41%)	4,019 (45.66%)
4115 (Room fill, brick/ash inclusions)		17 (0.55%)			17 (0.19%)
4230 (Deposit bordering exterior surface of wall)	96 (49.48%)	1,578 (50.69%)	1,057 (26.31%)	118 (60.51%)	3,075 (34.94%)
4250 (Deposit immediately above or surrounding poorly preserved architecture)	5 (2.58%)	186 (5.97%)	74 (1.84%)	32 (16.41%)	1,072 (12.18%)
Quaternary TOTAL	**168 (86.60%)**	**2,637 (84.71%)**	**3,941 (98.09%)**	**182 (93.33%)**	**8,183 (92.97%)**

Note: Percentages shown are proportions of total analyzed material per level represented by each context code.

[a] Counts in last column do not necessarily equal sums across rows of first four columns as the total assemblage includes material from EBA contexts not assigned to a single level (level 2+3, 3+4, etc., counts of Table 10.5).

likely indicating those areas generally used for disposal of light household refuse. The preponderance of material from quaternary contexts and the rather small sample sizes from most areas prevents a rigorous spatial analysis from being performed, but the faunal material will be considered by area in some instances where the data may be hinting at real differences between sectors. Considering the specialized nature of the Round Building and its history of interior remodeling—as well as the fact that excavation of its level 4 incarnation generated such a sizeable number of faunal specimens—the quaternary deposits from this structure should probably be regarded as material that was brought in as leveling and fill for altering the building's layout during use and perhaps also as deposits accumulated in unused spaces as the level 4 Round Building was nearing the end of its life. As such, faunal data from this structure may be a less reliable record of level 4 dietary habits than other deposits categorized with quaternary priority codes.

The Faunal Data

With the outline of the different divisions of the Raqa'i assemblage by level and area now in place, the discussion may direct itself toward a dissection of the faunal data generated for these various groupings. The first aspect to be considered is that of the basic taxonomic diversity and abundance represented by the Raqa'i material, followed by a brief treatment of the metric data as it relates to detecting the possible presence of wild forms among the domestic specimens. Mortality profiles are presented next as a means of assessing herd management practices and the evolution of specialized

pastoralism. The final data set to be discussed is the anatomical coding that permits the construction of body part profiles, most valuable for tracking potential differences in butchery and the distribution of meat cuts.

Taxonomic Identifications and Abundance Data. Tables 10.8 to 10.14 and Figures 10.6 to 10.14 summarize the identifications and taxonomic proportions for the Raqa'i assemblage. It has already been pointed out that levels 2 and 5 possess a much smaller number of specimens in comparison with levels 3 and 4, this sample size disparity requiring that data for the earliest and latest occupation phases be interpreted with caution. These more poorly documented levels are nonetheless represented by nearly 200 specimens each, a low but not completely insignificant count which still permits inclusion in charts with a diachronic focus; however, it must be kept in mind that while the relative proportions of the major taxa for levels 2 and 5 probably approach the actual past relationship, the minor species for these levels are undoubtedly underrepresented. The faunal material from level 4 seems to have been in a somewhat better state of preservation than other levels, as over 36% of the assemblage from this level was identifiable, whereas the comparable Figure for level 3 is 27%. This slight difference is likely due to the fact that much of the level 4 material derives from a single structure, the Round Building, where a restricted set of activities took place. In contrast, the level 3 remains come from deposits representing multiple domestic, manufacturing, storage, and perhaps ritual contexts and therefore were subjected to a broader range of activities and human traffic patterns. An examination of the skeletal completeness data for specimens of several taxa from levels 3 and 4 confirmed that material from level 4 exhibits a greater overall proportion of skeletal elements present in three-quarters or more of their original form (Rufolo 2011:446–448). The differences are not so large, however, as to suspect that the data between levels are not comparable. Nor do any of the taxa show a marked deviation from the patterns of the others, so the introduction of any biases in terms of identifiability due to preservation state is likely minimal.

As will become apparent in the treatment of the skeletal measurements below, the Raqa'i assemblage, although of good size and general physical condition for an Early Bronze Age middle Khabur site, did not furnish a significant set of skeletal elements for any of the pri-

TABLE 10.8. Taxonomic Breakdown of Unidentifiable Analyzed Assemblage by Level for Tell al-Raqa'i.

	Level 2			Level 3			Level 4			Level 5			TOTAL (2–5)[a]		
	NUSP	%	Weight	NUSP	%	Weight	NUSP	%	Weight	NUSP	%	Weight	NUSP	%	Weight
Small mammal				7	.31	2.4	17	.66	7.9				28	.46	11.9
Medium mammal	104	69.80	125.0	1,650	72.56	1,757.4	2,061	80.57	2,950.4	93	81.58	178.0	4,606	76.16	5,841.5
Large mammal	40	26.85	92.1	235	10.33	1,082.4	189	7.39	1,207.5	16	14.04	260.6	592	9.79	3,210.1
Medium artiodactyl	4	2.68	4.8	175	7.70	209.3	182	7.11	308.7	4	3.51	9.4	441	7.29	621.3
Large artiodactyl															
Medium bovid				3	0.13	2.3	7	0.27	12.6				12	0.20	18.2
Bird							1	0.04	1.7				1	0.02	1.7
Fish				6	0.26	0.2							6	0.10	0.2
Mollusk							6	0.23	0.2				11	0.18	0.4
Unknown	1	.59	1.5	198	8.71	52.7	95	3.71	57.5	1	0.88	0.3	351	5.80	146.2
Total unidentifiable	149	76.80	223.4	2,274	73.05	3,106.7	2,558	63.66	4,546.5	114	58.46	448.3	6,048	68.71	9,851.5

Notes: Percentages given are in reference to total number of unidentifiable specimens recovered and analyzed per level except for those in final row of table, which record proportions of unidentifiable fragments for entire recovered assemblage (unidentifiable plus identifiable material) belonging to each level. All weights are in grams.

[a] Counts in last column do not necessarily equal sums across rows of first four columns as the total assemblage includes material from EBA contexts not assigned to a single level (level 2+3, 3+4, etc.. counts of Table 10.5).

mary domestic or wild taxa to permit detailed metric and morphological investigations, even for the caprine species. Therefore, much of the gazelle, equid, and large bovid specimens are listed in the tables and discussed in the text as *Gazella* sp., *Equus* sp., and *Bos* sp. respectively. It is probable, however, that goitered gazelle (*Gazella subgutturosa*), onager (*Equus hemionus*), and cattle (*Bos primigenius* f. dom. *taurus*) are represented by these specimens, since these are the species of these genera considered most likely to have been present based on zoogeography (Kock 2008; Uerpmann 1987) and material from contemporaneous archaeological sites of the region (Vila 1998). Furthermore, there were too few specimens that could be reliably sexed and so no sex ratios are presented for any species.

In considering the frequencies of smaller wild taxa, the mollusk component should essentially be disregarded. The specimens reported here represent bivalve and gastropod shells and shell fragments that were not detected and removed during excavation for analysis by an archaeomalacologist. These were subsequently added to the mollusk material set aside earlier, which has been examined by Reese (2005) and Çakırlar (2008). The gastropod and bivalve species utilized at Raqa'i likely made an insignificant contribution to the diet, if any at all, as they represent small-sized animals that yield little meat. Numerous specimens, including both terrestrial and marine types, bear perforations and worn surfaces indicating they had served as personal ornamentation or as tools. Examples of shell beads are also present among the mollusk assemblage, components of the burial goods found in Early Bronze Age graves.

Statistics for the specimens that are too fragmentary to be given precise taxonomic designations are presented in Table 10.8, categorized into general groupings based on broad biological affiliation (mammal, bovid, bird, etc.) and adult size ranges. Identifications and totals for the more well-preserved material are provided in Table 10.9 as NISP counts and in Table 10.10 as MNI counts. Considered in its entirety, the Raqa'i assemblage is clearly dominated by specimens from domestic taxa, which comprise 79% of the material. At 21%, the proportion of wild taxa is comparatively minor but certainly not negligible, although it drops to 17% if the mollusk shells are excluded from the count of wild species. The composition of the domestic taxa (Figure 10.4) is clearly dominated by caprines, which represent nearly three-quarters of the specimens, signaling a strong reliance on sheep and goat. With 20% of the total, the contribution of pig material to the domestic suite is considerable overall, placing cattle in a distant third at nearly 6%. The sheep-to-goat ratio for the total Raqa'i assemblage is 2.2:1.0.

Of the wild taxa (Figure 10.5), gazelle specimens form the largest component, their numbers nearly rivaled by those of the smaller mammalian and non-mammalian species accounted for in the Other category. As already noted, this apparently large proportion of non-ungulate taxa is inflated by the mollusk material, which is mostly composed of freshwater bivalve and gastropod species too small to likely have been a common

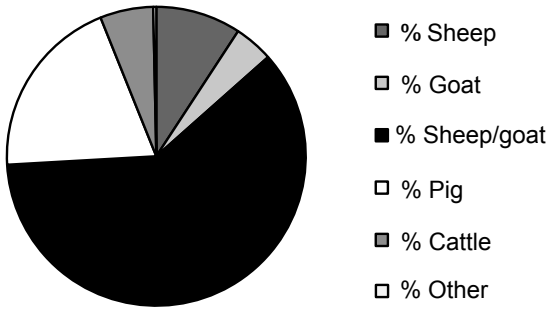


Figure 10.4. Taxonomic breakdown of domestic species recorded for the identifiable faunal remains from Raqa'i levels 2–5 (total NISP = 2,104; actual percentages = 9.22% for sheep, 4.23% for goat, 60.65% for sheep/goat, 19.82% for pig, 5.75% for cattle, and 0.33% for other (= dog). *Illustration prepared by Scott Rufolo*.

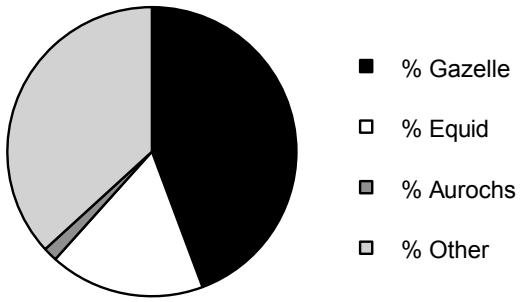


Figure 10.5. Taxonomic breakdown of wild species recorded for identifiable faunal remains from Raqa'i levels 2–5 (total NISP = 571; actual percentages = 44.31% for gazelle, 17.34% for equid, 1.58% for aurochs, and 36.78% for other (= deer, fox, mustelid, rodent, hare, bird, reptile, fish, mollusk). *Illustration prepared by Scott Rufolo*.

TABLE 10.9. Taxonomic Breakdown of Total Identifiable Analyzed Assemblage by Level for Tell al-Raqa'i.

	Level 2			Level 3			Level 4			Level 5			TOTAL (2-5)[a]		
	NISP	%	Weight	NISP	%	Weight	NISP	%	Weight	NISP	%	Weight	NISP	%	Weight
Sheep															
Ovis orientalis f. dom. *aries*	6	13.33	18.7	57	6.79	274.7	96	6.57	753.4	2	2.47	23.4	194	7.04	1,248.9
Goat															
Capra aegagrus f. dom. *hircus*				29	3.46	116.9	50	3.42	281.1	1	1.23	4.4	89	3.23	456.6
Sheep/goat	23	51.11	88.5	462	55.07	1,746.5	603	41.30	2,882.5	36	44.44	196.1	1,276	46.33	5,528.6
Caprine (Total)	29	64.44	107.2	548	65.32	2,138.1	749	51.30	3,917.0	39	48.15	223.9	1,559	56.61	7,234.1
Pig															
Sus scrofa f. dom. *domesticus*				14	1.67	30.7	371	25.41	2,524.9	25	30.86	278.7	417	15.14	2,934.2
Cattle															
Bos primigenius f. dom. *taurus*				11	1.31	200.1	15	1.03	252.3	3	3.70	39.8	31	1.13	505.8
Dog															
Canis lupus f. dom. *familiaris*	1	2.22	1.7	1	0.12	1.5	4	0.27	14.0				7	0.25	22.4
Bos sp.[b]	2	4.44	12.0	35	4.17	301.3	35	2.40	820.3	2	2.47	12.4	90	3.27	1,469.3
Canis sp.[c]				1	0.12	10.7	78	5.34	296.6				79	2.88	307.3
Gazelle															
Gazella sp.	6	13.33	15.1	90	10.73	440.4	92	6.31	714.7	4	4.94	69.9	253	9.19	1,560.0
Cervid							1	0.07	8.3				3	0.11	20.6
Aurochs															
Bos primigenius							1	0.07	3.2				9	0.33	242.2
Equus sp.	2	4.44	29.6	46	5.48	900.4	32	2.19	809.8	8	9.88	258.4	99	3.59	2,287.7
Red fox															
Vulpes vulpes				1	0.12	1.5	1	0.07	2.9				2	0.07	4.4
Fox															
Vulpes sp.				2	0.24	1.8	1	0.07	3.0				4	0.15	8.8
Least weasel															
Mustela nivalis				5	0.60	1.0							5	0.18	1.0
Bandicoot rat															
Nesokia indica				1	0.12	0.1							1	0.04	0.1
Field mouse															
Mus sp.							8	0.55	0.8				8	0.29	0.8
Indian gerbil															
Tatera indica				5	0.60	0.2							5	0.18	0.2
Crested porcupine															
Hystrix indica				4	0.48	77.8	1	0.07	16.1				6	0.22	108.9
Rat															

Continued

Table 10.9, *continued.*

	Level 2			Level 3			Level 4			Level 5			TOTAL (2-5)[a]		
	NISP	%	Weight	NISP	%	Weight	NISP	%	Weight	NISP	%	Weight	NISP	%	Weight
Rattus sp.							1	0.07	0.4				1	0.04	0.4
Sand rat															
Psammomys obesus				5	0.60	0.1							5	0.18	0.1
Rodent				1	0.12	0.2	9	0.62	1.7				11	0.40	2.2
Hare															
Lepus capensis							1	0.07	0.5				1	0.04	0.5
Buzzard															
Buteo buteo				1	0.12	0.9	2	0.14	1.5				3	0.11	2.4
Crane															
Grus grus							6	0.41	15.6				6	0.22	15.6
Dove															
Columba sp.							3	0.21	0.5				3	0.11	0.5
Eagle															
Aquila sp.													1	0.04	10.6
Great bustard															
Otis tarda				1	0.12	1.0							1	0.04	1.0
Grey goose															
Anser sp.							1	0.07	4.6				1	0.04	4.6
Wheatear															
Oenanthe sp.								0.07	0.1				1	0.04	0.1
Otid							1	0.07	1.2				1	0.04	1.2
Medium bird	1	2.22	2.2	5	0.60	4.9	1	0.07	1.9				7	0.25	9.0
Large bird							1	0.07	1.7				2	0.07	2.3
Bird				1	0.12	1.5	2	0.14	3.3				3	0.11	4.8
Desert monitor															
Varanus griseus				1	0.12	0.8	1	0.07	1.6				2	0.07	2.4
Caspian turtle															
Mauremys caspica				1	0.12	1.7							3	0.11	6.2
Pond turtle															
Emys orbicularis				1	0.12	0.3							1	0.04	0.3
Softshelled turtle															
Rafetus euphraticus				2	0.24	1.1							2	0.07	1.1
Spur-thighed tortoise															
Testudo graeca				1	0.12	1.3							1	0.04	1.3
Lizard				3	0.36	1.7							3	0.11	1.7

Continued following page

Table 10.9. Taxonomic Breakdown of Total Identifiable Analyzed Assemblage by Level for Tell al-Raqa'i (*continued*).

	Level 2			Level 3			Level 4			Level 5			TOTAL (2-5)[a]		
	NISP	%	Weight	NISP	%	Weight	NISP	%	Weight	NISP	%	Weight	NISP	%	Weight
Chelonian				1	0.12	0.6							1	0.04	0.6
Himri barbel															
Barbus luteus							2	0.14	1.3				2	0.07	1.3
Stoney barbel															
Barbus subquincunciatus													1	0.04	0.4
Barbel															
Barbus sp.				1	0.12	0.1							1	0.04	0.1
Cyprinid				4	0.48	2.4	2	0.14	0.7				7	0.25	3.3
Medium fish				2	0.24	0.2							2	0.07	0.2
Fish				5	0.60	1.5	3	0.21	0.7				12	0.44	3.0
Freshwater crab															
Potamon sp.				1	0.12	0.6							1	0.04	0.6
Corbicula fluminalis													1	0.04	0.9
Potomida littoralis				1	0.12	4.0							2	0.07	14.1
Elongate river mussel															
Unio elongatulus				2	0.24	7.9	1	0.07	8.9				3	0.11	16.8
Tigris river mussel															
Unio tigridis	3	6.67	21.7	2	0.24	14.2	8	0.55	33.7				19	0.69	96.6
River mussel															
Unio sp.				6	0.72	17.1	5	0.34	19.7				12	0.44	41.5
Melanopsis nodosa				1	0.12	0.3							1	0.04	0.3
Melanopsis praemorsa	1	2.22	0.5										1	0.04	0.5
Cardiid							1	0.07	4.0				1	0.04	4.0
Ostreid (fossil)							1	0.07	0.8				2	0.07	1.8
Bivalve				13	1.55	20.7	10	0.68	22.4				26	0.94	46.1
Gastropod				13	1.55	5.0	8	0.55	5.4			—	22	0.80	11.0
Total identifiable	**45**	**23.20**	**190**	**839**	**26.95**	**4,195.7**	**1,460**	**36.34**	**9,516.1**	**81**	**41.54**	**883.1**	**2,754**	**31.29**	**17,019.2**

Notes: Percentages given are in reference to total number of identifiable specimens recovered and analyzed per level except for those in final row of table, which record proportions of identifiable fragments for entire recovered assemblage (unidentifiable plus identifiable material) belonging to each level. All weights are in grams.

[a] Counts in last column do not necessarily equal sums across rows of first four columns as total assemblage includes material from EBA contexts not assigned to a single level (the level 2+3, 3+4, etc. counts of Table 10.5).

[b] All Bos sp. material has been treated as cattle in charts and graphs as explained in text.

[c] Specimens identified as Canis sp. may be either domestic dog or wild jackal and as such have not been included in either domestic or wild counts in figures.

Table 10.10. MNI Counts for Prioritized, Identified Assemblage of Tell al-Raqa'i.

	Most frequent element	MNI
Caprine	Cranium (right maxillary)	49
Sheep	Calcaneus (proximal)	13
Goat	Horn core (left)	9
Pig	Hemimandible (right)	15
Cattle	Hemimandible (right)	6
Dog	Maxilla (left)	1
Gazelle	Radius (proximal)	10
Equid	Astragalus	4
Aurochs	Axis (cranial)	1
Fox	Radius (proximal)	2
Least weasel	Humerus (left)	1
Field mouse	Femur (distal)	3
Rat	Femur (proximal)	1
Fat sand rat	Hemimandible (left)	1
Indian gerbil	Hemimandible (right)	1
Short-tailed bandicoot rat	Femur (proximal)	1
Porcupine	Radius (proximal)	1
Hare	Metatarsal V (proximal)	1
Bird	Various by taxon	8
Chelonian	Various by taxon	4
Varanid	Vertebra (cervical)	1
Fish	Pharyngeal	2
Bivalve	Shell	40
Gastropod	Shell	2

component of the ancient diet. With the mollusk specimens excluded, the Other category drops from 36 to 25%, leaving gazelle specimens in the top spot at 53% of the wild component of the assemblage. Gazelle and, to a lesser extent, onager were therefore the primary wild game utilized at Raqa'i, with the occasional deer, turtle, waterfowl, and small mammals such as the hare, fox, and perhaps even the porcupine sometimes finding their way onto the dinner plate. In such small quantities, it is difficult to assess the potential contribution of the smaller wild forms to the subsistence economy, since they may have been used for food, as material resources such as pelts, shell, and feathers, or simply be present as commensals or elements of the nearby riverine fauna that died on site.

A plot of the domestic versus wild proportions by level (Figure 10.6) indicates that reliance on domestic animals was relatively stable over time, the percentage of wild forms increasing somewhat from level 3 onwards. An additional drop in the domestic proportion with level 2 likely signals a continued decrease in the abundance of domestic taxa consumed at the site, but the magnitude of the change may be somewhat less than indicated due to the small number of specimens recovered from this latest Early Bronze Age occupation. A pronounced trend within the domestic taxa is observable when the husbanded species are considered in isolation by level (Figure 10.7). Over time, the proportion of caprines increases dramatically, most markedly between levels 4 and 3, primarily at the expense of the pig. The amount of pig remains in level 3 is much diminished in comparison to the earlier levels (2% in level 3 versus 25-30% of the identifiable assemblage in levels 4–5), and the taxon has vanished in level 2 (although it is probable that the limited archaeological sample for this level has prevented the detection of the small number of pigs likely still maintained at the site). The proportion of cattle remains fairly constant from level to level. The ratio of sheep to goat also changes little over time. This measure could be determined for levels 5, 4, and 3, and is essentially the same for all three occupation stages (2.0:1.0 for level 5, 1.9:1.0 for level 4, and 2.0:1.0 for level 3).The breakdown of wild categories by level (Figure 10.8) also indicates a relatively steady distribution over time, save for level 5. No material from smaller-sized taxa was present among the 12 specimens identifiable as wild species from this level, more likely a result of the small sample size and restricted nature of excavation of level 5 than a true absence in the past, so the apparent preponderance of equid material cannot be trusted as a genuine reflection of ancient subsistence practice.

Exploration of the taxonomic breakdown within levels by specific areas will begin with level 3, since this phase of the site's occupation is better understood in terms of spatial divisions. Tables 10.11 to 10.13 contain the taxonomic frequencies for the unidentifiable and identifiable components of the faunal subassemblages for the six sectors of level 3 outlined earlier. Figure 10.9 graphically summarizes the proportions of domestic taxa for each of the sectors. From this graph, it is immediately apparent that the Round Building presents a very different faunal signature from the other sectors, with the pig remains from level 3 seemingly concentrated in the deposits of this structure. The Round Building yielded the smallest assemblage of all the level 3 sectors, however, and with only 51 specimens identified to genus, the proportion of suid remains is misleadingly inflated and may even be the result of just a few well-preserved individuals. Otherwise, the remaining sectors are all fairly comparable in their overall representation

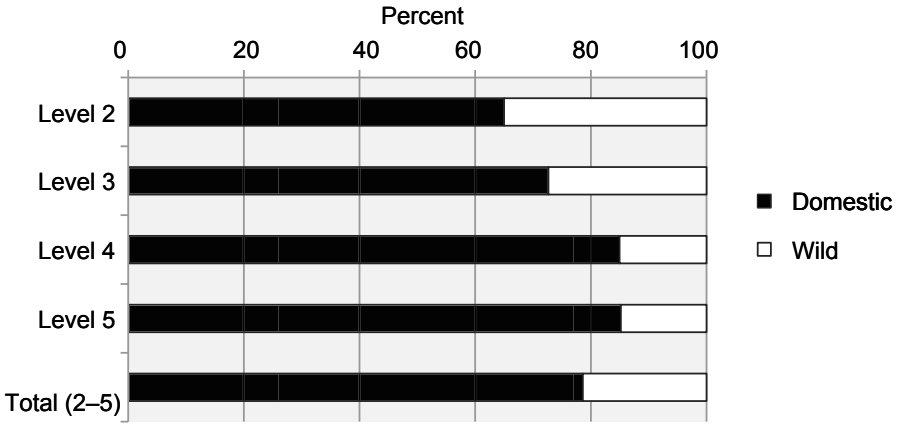


FIGURE 10.6. Proportions of domestic versus wild taxa by level for identifiable material of Raqa'i faunal assemblage (NISP = 2,675). *Illustration prepared by Scott Rufolo.*

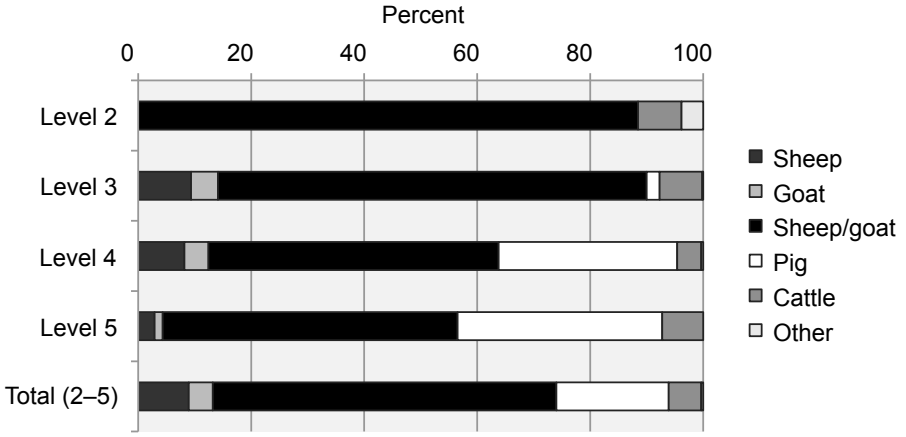


FIGURE 10.7. Breakdown of domestic species by level for Raqa'i (total NISP = 2,104; NISP per level = 32 for level 2, 609 for level 3, 1,174 for level 4, 69 for level 5). *Illustration prepared by Scott Rufolo.*

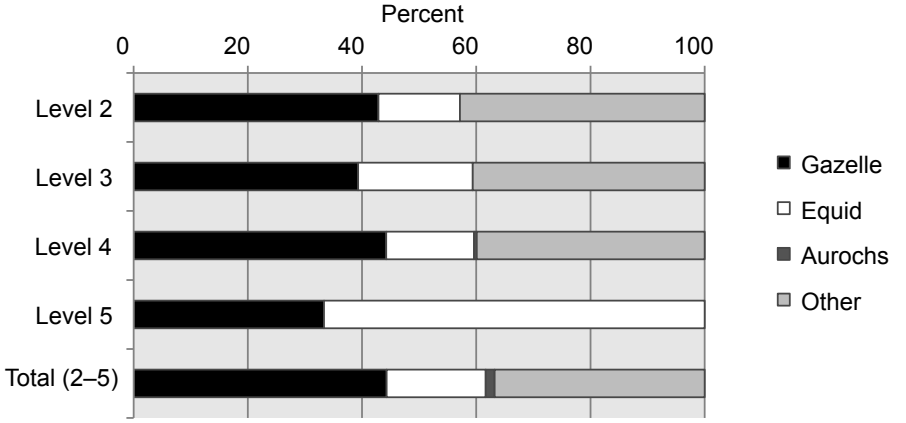


FIGURE 10.8. Breakdown of wild species by level for Raqa'i (total NISP = 571; NISP per level = 14 for level 2, 229 for level 3, 108 for level 4, 12 for level 5). *Illustration prepared by Scott Rufolo.*

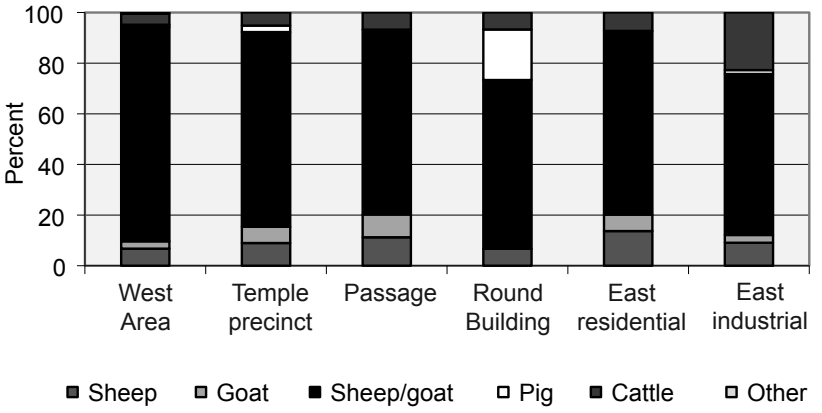


FIGURE 10.9. Proportions of domestic taxa for identified assemblage from Raqa'i level 3 by sector (total NISP = 609; NISP per sector = 207 for west area, 78 for temple precinct, 89 for passage, 45 for Round Building, 124 for east residential, 66 for east industrial). *Illustration prepared by Scott Rufolo.*

of the husbanded animals. The domestic quarters of Raqa'i, the west area and east residential sectors, are very similar in their profiles (the west area actually contains a small proportion, less than 1%, of pig remains, but this is too small to show clearly on the graph), this similarity also expressed in the fact that the diverse, smaller wild taxa are concentrated in these areas.

Figure 10.10 displays the breakdown of the wild categories for the level 3 sectors. Again, the Round Building is anomalous, but this is most likely more representative of the small sample size than anything else. It does seem probable, however, that the relatively sparse amount of faunal material recovered from the structure—and the divergent zooarchaeological profile

TABLE 10.11. Taxonomic Breakdown of Unidentifiable Analyzed Assemblage by Sector for Tell al-Raqa'i Level 3.

	NUSP	%	Weight	NUSP	%	Weight	NUSP	%	Weight
	West area			*Temple compound*			*Passage*		
Small mammal	1	0.14	0.7	3	0.48	0.4	1	0.29	0.1
Medium mammal	564	80.69	491.1	363	57.80	321.4	247	71.18	310.3
Large mammal	59	8.44	339.5	20	3.18	110.3	70	20.17	273.8
Medium artiodactyl	46	6.58	81.0	83	13.22	50.5	19	5.48	23.7
Large artiodactyl									
Medium bovid				1	0.16	0.6	2	.58	1.7
Bird									
Fish	1	0.14	0.1	5	0.80	0.1			
Mollusk									
Unknown	28	4.01	10.6	153	24.36	24.6	8	2.31	10.2
Total unidentifiable	699	71.77	923.0	628	83.40	507.9	347	74.62	619.8
	Round Building			*East residential*			*East industrial*		
Small mammal				2	0.52	1.2			
Medium mammal	77	81.05	83.0	292	76.64	371.4	107	86.29	176.6
Large mammal	13	8.90	52.5	62	16.27	256.4	11	8.87	49.9
Medium artiodactyl	5	3.42	3.8	20	5.25	44.7	2	1.61	5.6
Large artiodactyl									
Medium bovid									
Bird									
Fish									
Mollusk									
Unknown				5	1.31	6.7	4	3.23	0.6
Total unidentifiable	95	65.07	139.3	381	67.08	680.4	124	59.90	236.3

Notes: Percentages given are in reference to total number of unidentifiable specimens recovered and analyzed per sector except for those in rows of table marked Total unidentifiable, which record proportions of unidentifiable fragments for entire recovered assemblage (unidentifiable plus identifiable material) belonging to each sector. All weights are in grams.

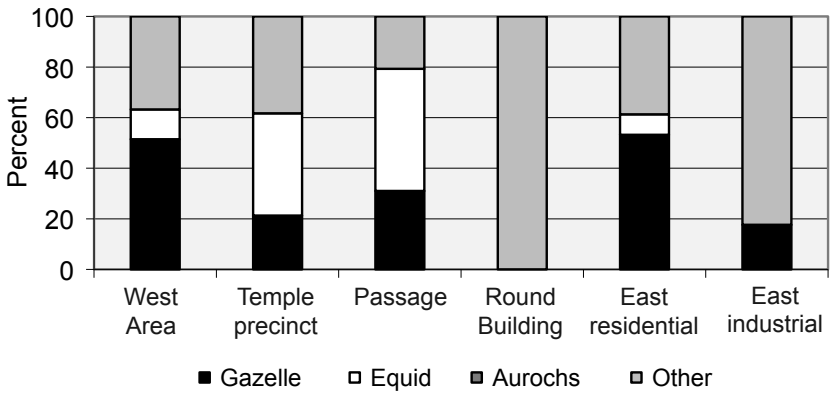


FIGURE 10.10. Proportions of wild taxa for identified assemblage from Raqa'i level 3 by sector (total NISP = 229; NISP per sector = 68 for west area, 47 for temple precinct, 29 for passage, 6 for Round Building, 62 for east residential, 17 for east industrial). *Illustration prepared by Scott Rufolo.*

that results from this fact—is in itself a signal of the unique set of activities that took place there in comparison with the other sectors. What was recovered from the Round Building was likely animal bone fragments from refuse deposited in nearby areas, drawn in inadvertently by movement into a building whose activity was focused on purposes other than butchery, animal food preparation, or animal food consumption. The west area and east residential remains again present similar profiles. Considering the specific taxa listed in Tables 10.12 and 10.13, for these areas, however, one notes that reptile remains, almost exclusively from chelonians (turtles and tortoises), occur only in the east residential sector, albeit in small numbers. It seems clear from the nature and diversity of the faunal material in the domestic quarters that these were areas where food preparation, consumption, and disposal of household refuse was concentrated to a certain degree. Other than the lack of reptile material in the west area—the significance of which, if any, is unknown—there does not seem to have been much difference in the diets between the occupants of the two residential sectors.

The larger proportion of equid remains in the temple compound and passage sectors seems striking, but it may be due to random factors relating to a combination of the somewhat smaller sample sizes and

TABLE 10.12. Taxonomic Breakdown of Identifiable Analyzed Assemblage for West Area, Temple Compound and Passage Sectors of Tell al-Raqa'i Level 3.

	West area			Temple compound			Passage		
	NISP	%	Weight	NISP	%	Weight	NISP	%	Weight
Sheep: *Ovis orientalis* f. dom. aries	14	5.09	58.3	7	5.60	9.9	10	8.47	65.1
Goat: *Capra aegagrus* f. dom. *hircus*	6	2.18	14.5	5	4.00	22.8	8	6.78	44.7
Sheep/goat	175	63.64	577.7	60	48.00	198.2	65	55.08	231.1
Caprine (total)	195	70.91	650.5	72	57.60	230.9	83	70.34	340.9
Pig: *Sus scrofa* f. dom. *domesticus*	2	0.73	13.2	2	1.60	2.8			
Cattle: *Bos primigenius* f. dom. *taurus*	3	1.09	42.6				3	2.54	58.7
Dog: *Canis lupus* f. dom. *familiaris*	1	0.36	1.5						
Bos sp.[a]	6	2.18	118.1				3	2.54	23
Gazelle: *Gazella* sp.	35	12.73	176.7	10	8.00	44.2	9	7.63	68.3
Equus sp.	8	2.91	177.6	19	15.20	397.9	14	11.86	259.0
Red fox: *Vulpes vulpes*	1	0.36	1.5						
Least weasel: *Mustela nivalis*	1	0.36	0.9	4	3.20	0.1			
Crested porcupine: *Hystrix indica*	2	0.73	57.0	1	0.80	18.9	1	0.85	1.9
Great bustard: *Otis tarda*	1	0.36	1.0						
Medium bird	2	0.73	2.1				1	0.85	0.4
Barbel: *Barbus* sp.							1	0.85	0.1
Medium fish	2	0.73	0.2						
Fish	3	1.09	0.5				2	1.69	1.0
Freshwater crab: *Potamon* sp.							1	0.85	0.6
Potomida littoralis	1	0.36	4.0						
Elongate river mussel: *Unio elongatulus*	2	0.73	7.9						
Tigris River mussel: *Unio tigridis*	2	0.73	14.2						
River mussel: *Unio* sp.	2	0.73	7.3	4	3.20	9.8			
Melanopsis nodosa				1	0.80	0.3			
Bivalve	4	1.45	4.5	2	1.60	2.0			
Gastropod	2	0.73	0.5	6	4.80	2.3			
Total identifiable	275	28.23	1,281.8	125	16.60	738.4	118	25.38	753.9

Notes: Percentages given are in reference to total number of identifiable specimens recovered and analyzed per sector except for those in final row of table, which record proportions of identifiable fragments for entire recovered assemblage (unidentifiable plus identifiable material) belonging to each sector. All weights are in grams.

[a] All *Bos* sp. material has been treated as cattle in charts and graphs as explained in text.

greater durability of the larger, more massive bones of onagers; the total number of identifiable specimens from the other sectors of level 3 are also comparably small, however, and were presumably subject to a similar set of post-depositional influences, so it may indeed be a signal of a different pattern of consumption or food use in these areas. As with the material from the Round Building, it is the fact that the non-residential areas have a different faunal signature that is important. This may be the result of the faunal remains in these portions of the site being deposited in a more random and haphazard fashion due to these sectors being devoted to specific types of non-domestic activity that did not usually directly involve the preparation of animal parts, or there may have been a very specific set of activities that generated a pattern of disposal different from that of general household operations. The temple building contained a space that appears to have been affected by periodic burning (Schwartz 2000), perhaps an area for ritual offerings, so it is tempting to consider the possibility that the equid material from the temple compound could represent the remains of

Table 10.13. Taxonomic Breakdown of Identifiable Analyzed Assemblage for Round Building, East Residential, and East Industrial Sectors of Tell al-Raqa'i Level 3.

	Round Building			East residential			East industrial		
	NISP	%	Weight	NISP	%	Weight	NISP	%	Weight
Sheep: *Ovis orientalis* f. dom. *aries*	3	5.88	41.3	17	9.09	82.0	6	7.23	18.1
Goat: *Capra aegagrus* f. dom. *hircus*				8	4.28	31.2	2	2.41	3.7
Sheep/goat	30	58.82	172.1	90	48.13	397.1	42	50.60	170.3
Caprine (Total)	33	64.71	213.4	115	61.50	510.3	50	60.24	192.1
Pig: *Sus scrofa* f. dom. *domesticus*	9	17.65	14.1				1	1.20	0.6
Cattle: *Bos primigenius* f. dom. *taurus*	2	3.92	21.0	2	1.07	72.9	1	1.20	4.9
Dog: *Canis lupus* f. dom. *familiaris*									
Bos sp.[a]	1	1.96	1.4	7	3.74	43.8	14	16.87	85.8
Canis sp.[b]				1	.53	10.7			
Gazelle: *Gazella* sp.				33	17.65	146.9	3	3.61	4.3
Equus sp.				5	2.67	65.9			
Fox: *Vulpes* sp.							2	2.41	1.8
Bandicoot rat: *Nesokia indica*				1	0.53	0.1			
Indian gerbil: *Tatera indica*	3	5.88	0.1	2	1.07	0.1			
Sand rat: *Psammomys obesus*				5	2.67	0.1			
Rodent				1	0.53	0.2			
Buzzard: *Buteo buteo*				1	0.53	0.9			
Medium bird	1	1.96	1.0				1	1.20	1.4
Bird				1	0.53	1.5			
Desert monitor: *Varanus griseus*				1	0.53	0.8			
Caspian turtle: *Mauremys caspica*				1	0.53	1.7			
Pond turtle: *Emys orbicularis*				1	0.53	0.3			
Softshelled turtle: *Rafetus euphraticus*				2	1.07	1.1			
Spur-thighed tortoise: *Testudo graeca*				1	0.53	1.3			
Lizard				3	1.60	1.7			
Chelonian				1	0.53	0.6			
Cyprinid							4	4.82	2.4
Bivalve				1	0.53	0.3	6	7.23	13.9
Gastropod	2	3.92	0.9	2	1.07	0.8	1	1.20	0.5
Total identifiable	51	34.93	251.9	187	32.92	862.0	83	40.10	307.7

Notes: Percentages given are in reference to total number of identifiable specimens recovered and analyzed per sector except for those in final row of table, which record proportions of identifiable fragments for entire recovered assemblage (unidentifiable plus identifiable material) belonging to each sector. All weights are in grams.

[a] All *Bos* sp. material has been treated as cattle in charts and graphs as explained in text.

[b] Specimens identified as Canis sp. may be either domestic dog or wild jackal and as such have not been included in either domestic or wild counts in figures.

TABLE 10.14. Taxonomic Breakdown of Unidentifiable Analyzed Assemblage by Sector for Tell al-Raqa'i Level 4.

	Exterior RB (W)			Round Building			Exterior RB (E)		
	NUSP	%	Weight	NUSP	%	Weight	NUSP	%	Weight
Small mammal	4	0.65	2.9	13	0.72	5.0			
Medium mammal	426	69.04	805.9	1,533	84.51	1,945.9	91	81.98	166.0
Large mammal	80	12.97	495.5	93	5.13	608.4	14	12.61	95.9
Medium artiodactyl	74	11.99	144.5	99	5.46	149	6	5.41	9.7
Large artiodactyl									
Medium bovid	4	0.65	9.8	3	0.17	2.8			
Bird	1	0.16	1.7						
Fish									
Mollusk				6	0.33	0.2			
Unknown	28	4.54	27.7	67	3.69	29.8			
Total unidentifiable	617	64.95	1,488.0	1,814	63.45	2,741.1	111	59.68	271.6

Notes: Percentages given are in reference to total number of unidentifiable specimens recovered and analyzed per sector except for those in final row of table, which record proportions of unidentifiable fragments for entire recovered assemblage (unidentifiable plus identifiable material) belonging to each sector. All weights are in grams.

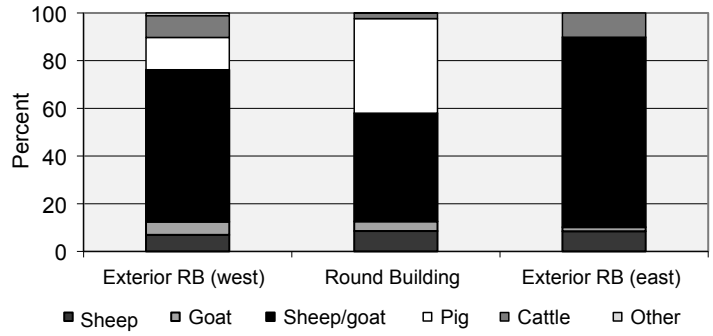


FIGURE 10.11. Proportions of domestic taxa for identified assemblage from Raqa'i level 4 by sector (total NISP = 1,174; NISP per sector = 273 for exterior Round Building (west), 842 for Round Building, 59 for exterior Round Building east). *Illustration prepared by Scott Rufolo.*

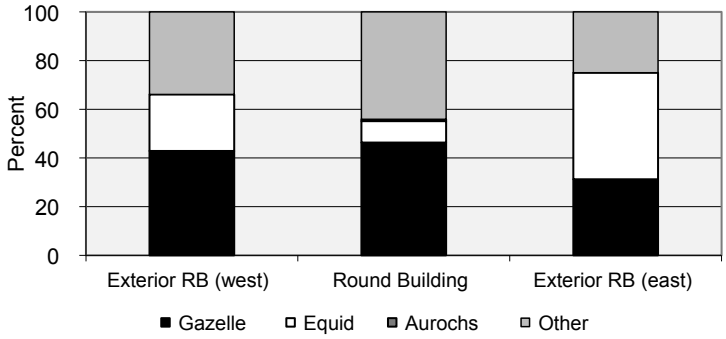


FIGURE 10.12. Proportions of wild taxa for identified assemblage from Raqa'i level 4 by sector (total NISP = 207; NISP per sector = 56 for exterior Round Building (west), 136 for Round Building, 15 for exterior Round Building east). *Illustration prepared by Scott Rufolo.*

some sacred practice, perhaps sacrificial meals rendered to an ancient deity or just a culturally-dictated preference for equid flesh among religious personnel. However, a larger sample size would be needed to properly evaluate this hypothetical scenario. The presence of numerous and extensively burned bones among the equid material would lend credence to the notion of their use in cultic activity, if such activity involved ritual use of fire, but none of the equid specimens show any evidence of burning. Pfälzner (2001: 309) argues that what has been called the Raqa'i temple is actually the central building of a privileged household compound. In either case, perhaps the excess equid material signals the greater use of onager as a dietary status marker, a suggestion that has been offered to explain the observation that cattle remains are more common in temple rooms and elite contexts at Arslantepe (Bartosiewicz 2010).

The taxonomic breakdown for the three sectors of Raqa'i level 4 is presented in Tables 10.14 and 10.15. Graphs of the proportions of the various domestic and wild categories are shown in Figures 10.11 and 10.12. As before, the Round Building is characterized by its own distinct profile, most obvious for the wild taxa for which the other two sectors are more similar to one another than was the case for the domestic taxa. The

Table 10.15. Taxonomic Breakdown of Identifiable Analyzed Assemblage by Sector for Tell al-Raqa'i Level 4.

	Exterior RB (west)			Round Building			Exterior RB (east)		
	NISP	%	Weight	NISP	%	Weight	NISP	%	Weight
Sheep: *Ovis orientalis* f. dom. *aries*	19	5.71	199.7	72	6.89	528.3	5	6.67	25.4
Goat: *Capra* aegagrus f. dom. *hircus*	15	4.50	114.6	34	3.25	163.1	1	1.33	3.4
Sheep/goat	174	52.25	943.9	377	36.08	1,692.4	47	62.67	227.7
Caprine (total)	208	62.46	1,258.2	483	46.22	2,383.8	53	70.67	256.5
Pig: *Sus scrofa* f. dom. *domesticus*	37	11.11	221.0	334	31.96	2,303.9			
Cattle: *Bos primigenius* f. dom. *taurus*	8	2.40	182.8	7	0.67	69.5			
Dog: *Canis lupus* f. dom. *familiaris*	3	0.90	5.8	1	0.10	8.2			
Bos sp.[a]	17	5.11	503.6	12	1.15	178.4	6	8.00	138.3
Canis sp.[b]	4	1.20	32.0	74	7.08	264.6			
Gazelle: *Gazella* sp.	24	7.21	157.4	63	6.03	494.7	5	6.67	62.6
Cervid				1	0.10	8.3			
Aurochs: *Bos primigenius*				1	0.10	3.2			
Equus sp.	13	3.90	394.6	12	1.15	286.0	7	9.33	129.2
Red fox: *Vulpes vulpes*				1	0.10	2.9			
Fox: *Vulpes* sp.							1	1.33	3.0
Field mouse:*Mus* sp.				8	0.77	0.8			
Crested porcupine: *Hystrix indica*							1	1.33	16.1
Rat: *Rattus* sp.				1	0.10	0.4			
Rodent				8	0.77	1.5			
Hare: *Lepus capensis*	1	0.30	0.5						
Buzzard: *Buteo buteo*	1		0.7						
Dove: *Columba* sp.				3	0.29	0.5			
Grey goose: *Anser* sp.	1	0.30	4.6						
Wheatear:*Oenanthe* sp.				1	0.10	0.1			
Otid				1	0.10	1.2			
Medium bird				1	0.10	1.9			
Large bird	1	0.30	1.7						
Bird				2	0.19	3.3			
Desert monitor: *Varanus griseus*	1	0.30	1.6						
Himri barbel: *Barbus barbus*				2	0.19	1.3			
Cyprinid				2	0.19	0.7			
Fish				2	0.19	0.3	1	1.33	0.4
Elongate river mussel: *Unio elongatulus*				1	0.10	8.9			
Tigris River mussel: *Unio tigridis*	5	1.50	16.7	2	0.19	7.7			
River mussel: *Unio* sp.	2	0.60	3.0	3	0.29	16.7			
Cardiid				1	0.10	4.0			
Ostreid (fossil)							1	1.33	0.8
Bivalve	4	1.20	6.2	6	0.57	16.2			
Gastropod	3	0.90	2.2	5	0.48	3.2			
Total identifiable	333	35.05	2,792.6	1,045	36.55	6,088.6	75	40.32	606.9

Notes: Percentages given are in reference to total number of identifiable specimens recovered and analyzed per sector except for those in final row of table, which record proportions of identifiable fragments for entire recovered assemblage (unidentifiable plus identifiable material) belonging to each sector. All weights are in grams.

[a] All *Bos* sp. material has been treated as cattle in charts and graphs as explained in text.

[b] Specimens identified as *Canis* sp. may be either domestic dog or wild jackal and as such have not been included in either domestic or wild counts in figures.

subassemblage from the Round Building is much larger than those of the other two areas, however, and, as mentioned earlier, most of it probably represents fill deposits brought into the building over the course of its use rather than remains generated by specific activities within the building. As such, it would seem that

the Round Building specimens provide the average profile for level 4, for it is with such large sample sizes that the full range of taxa and more accurate proportional representation is achieved. The nature of the exterior contexts immediately surrounding the Round Building is unknown, but it appears that these and those of the silo complex are more akin to the specialized activity areas of level 3. While some domestic units were uncovered in level 4 to the north and west of the Round Building, no complete houses were excavated and no useable grouping of faunal data from a residential quarter is possible for the level. Without such information, and with disparate sample sizes, it is not possible to profitably compare the three sectors of level 4 with each other or to individual level 3 sectors.

Metric Assessments. Measurements pertaining to base dimensions as well as specific morphological features of the skeleton are often diagnostic, aiding in the discrimination of closely-related species. In particular, a sufficiently large corpus of metric data may be used to isolate wild relatives of the domestic taxa. Unfortunately, the number and range of key measurements that could be recorded for the Raqa'i material are too limited to support a detailed consideration for any one species or taxonomic group. The small set of measurements that could be taken is presented at the end of this chapter as an appendix. For certain domestic taxa, a few types of skeletal element are present with counts in excess of 10 specimens that individually preserve the appropriate contact points for standard measurements, and these will be treated briefly here. Measurements are presented visually in the main body of the text as graphs; the tables in the accompanying appendix should be consulted for the individual values.

For the *sheep* material, the metacarpal, astragalus, calcaneus, and first phalanx are elements represented by 10–20 specimens each that afforded varying suites of metric data. With 19 measurable specimens, the first phalanges provide the largest sample. A histogram for the greatest distal breadth figures for this element is shown in Figure 10.13. A normal distribution appears to be developing for the larger range of measurements, isolated from a single smaller specimen that is not so different in size that it may be considered a true outlier (it falls within a distance of 1 quartile range below the lowest defining boundary of the interquartile range on a box-and-whisker plot, which is not shown). Since the overall range is similar to that reported for domestic sheep by Buitenhuis (1988), Cavallo (2000), Doll (2010), and Kussinger (1988), it may be a matter of several male specimens and one female, a possible indication of a culling pattern targeting younger adult males (the proximal end of the first phalanx fuses by 18 months of age, and nearly all of these specimens are fused). Measurements from 15 astragali also exhibit an emerging bimodality likely due to sexual dimorphism (Figure 10.14). The dimensions of the astragali, as well as those recorded for the metacarpals and the calcaneus, all fall within the range of expected values for domestic sheep, as do the withers heights estimated from 11 of the calcanei, which range from 59.8 to 75.6 cm using the conversion factors of Von den Driesch and Boessneck (1974). Eighteen *goat* first phalanges were also preserved well enough to provide measurements, which are presented as a box-and-whisker plot (Figure 10.15) as this manner of displaying the data highlights the presence of one outlier of significantly greater size. The values mostly cluster together at the lower end of the range of measurements for the greatest distal breadth, but in addition to the outlier there is a tail comprised of a few larger specimens. The isolated large specimen is not quite as large as the smallest of the wild goat phalanges whose dimensions are given by Vila (1998), however, so it is likely not an example of the wild goat but rather a particularly robust domestic male. Withers heights could be calculated from two goat metacarpals, 57.1 cm and 64.9 cm, well within the ranges estimated for domestic goats from other Syrian archaeological assemblages by both Vila (1998) and Doll (2010).

Only a very small set of measurements is available for the remaining primary domestic taxa. Despite the lack of data for a metric assessment, some *Bos* material from Raqa'i was well-enough preserved to permit positive identification as unmistakably being from *cattle* or *aurochs* simply from a visual inspection of morphological traits and general size alone, the bones of the wild aurochs being much more massive. These and other *Bos* specimens yielded just a few isolated dimensions for a narrow range of elements. All of the remaining large bovid specimens have been tagged with the identification of *Bos* sp., although they conform to the expected size range of cattle, but technically could contain some examples of young or very small aurochs or even the wisent. All *Bos* sp. material has been counted as domestic cattle in the taxonomic abundance analysis. The *pig* remains also provided few measurements. Two humeri with distal breadths of 32.61 mm and 34.37 mm, and a single lower adult third molar measuring 33.78 mm in mesio-distal crown length, signal the domestic status of the pigs. These dimensions are

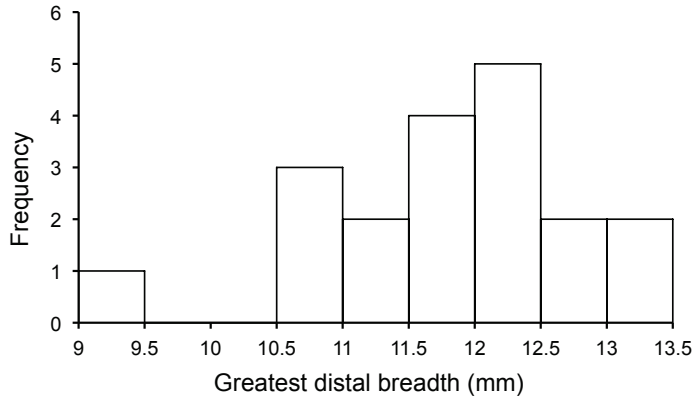


FIGURE 10.13. Histogram of greatest distal breadth measurements for 19 sheep first phalanges from assemblage of identified remains from Tell al-Raqa'i (levels 2–5). *Illustration prepared by Scott Rufolo.*

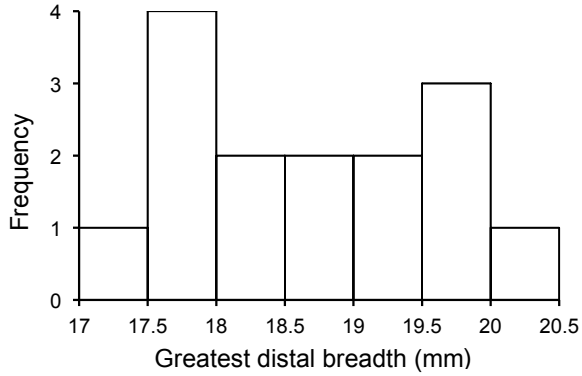


FIGURE 10.14. Histogram of greatest distal breadth measurements for 15 sheep astragali from assemblage of identified remains from Tell al-Raqa'i (levels 2–5). *Illustration prepared by Scott Rufolo.*

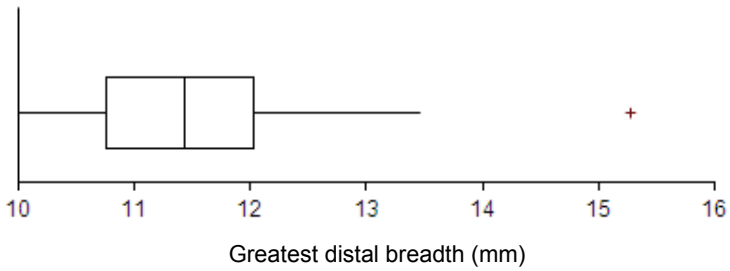


FIGURE 10.15. Box-and-whisker plot for greatest distal breadth measurements from 18 goat first phalanges from assemblage of identified remains from Tell al-Raqa'i (levels 2–5). Cross-shaped marker indicates single large specimen that falls beyond one inter-quartile distance from core specimens comprising the values enclosed by box. *Illustration prepared by Scott Rufolo.*

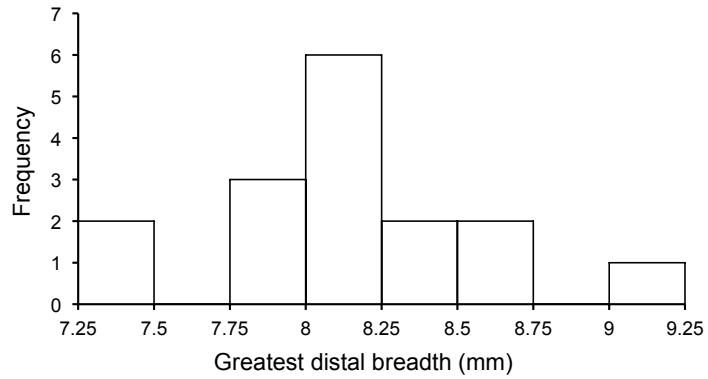


FIGURE 10.16. Histogram of greatest distal breadth measurements for 16 gazelle first phalanges from assemblage of identified remains from Tell al-Raqa'i (levels 2–5). *Illustration prepared by Scott Rufolo.*

comparable to those reported for Chalcolithic and Early Bronze Age domestic pig remains discussed for various Anatolian and Syrian sites by Buitenhuis (1988) and Vila (1998).

For the two most common wild taxa, an insufficient number of measurements is once again the case, thus preventing a detailed metric assessment. Sixteen *gazelle* phalanges did provide greatest distal breadth

measurements, which are summarized as a histogram in Figure 10.16. They appear to represent a single, normal distribution pattern, suggesting the presence of only one species, presumably the goitered gazelle (*Gazella subgutturosa*), although there is significant size overlap among the relevant gazelle species. Two horn core specimens in the Raqa'i assemblage, however, exhibit traits of the other possible gazelle types: one bears the single, deep groove commonly seen in *Gazella gazella* and the other has the shape profile characteristically found most often in *Gazella dorcas*. As there are only two such cases and the reliability of these features in their identification is suspect given the fragmentary nature of the specimens, they have not been identified as different species in the tables and figures. All the available evidence for third-millennium BCE Syria indicates that the mountain gazelle (*G. gazella*) and dorcas gazelle (*G. dorcas*) were rarely present in the Khabur region, if at all, and it is therefore assumed that all the gazelle material represents *G. subgutturosa*. As gazelle horn cores were used as tools and perhaps also had some sort of cultural significance (Cavallo 2000:64; Moorey 1999), the horn cores of other species may have entered the assemblage via trade. The few post-cranial measurements recorded for the *equid* material are not amenable to a metric analysis. One set of maxillary teeth from a single animal is available, with the occlusal ridge patterns for these four specimens shown in Figure 10.17. The shape and length of the protocones (10.41–13.43 mm), lack of any pli caballine folds, and the range of the protocone/occlusal length index (0.41–0.58) are all consistent with onager (Zeder 1986).

Mortality Profiles and Survivorship Curves. An adequately large sample of specimens that could be aged was available to enable survivorship curves to be plotted for the sheep, goat, pig, cattle, and gazelle material. The methods used for assembling the data and the construction of the curves are described in Rufolo (Rufolo 2011:309–318), following the conventions of Silver (1970), Grant (1982), Zeder (2006), and Munro et al. (2009). Figure 10.18 traces the general caprine survivorship curve based on long bone specimens identified as sheep, goat, or sheep/goat. The differential recovery of smaller unfused epiphyses for elements in age groups C and D (covering 12–30 months of age) compared with those of age group B (6–12 months) has produced a substantial kink in the fusion-based curve. The impossible rise to 90% survivorship after an initial drop to 60% by the age of 1 year is due to the nature of the elements contained in age group B—pelvis, scapula, and distal humerus. These bones are large and, in the case of the pelvis and distal humerus, the unfused components are bigger and more robust in comparison to those of many of the elements present in age groups C and D. In particular, group C is comprised of the phalanges, whose unfused epiphyses and even fused, complete specimens are significantly smaller than those of group B. The sharp drop at the beginning of the curve based

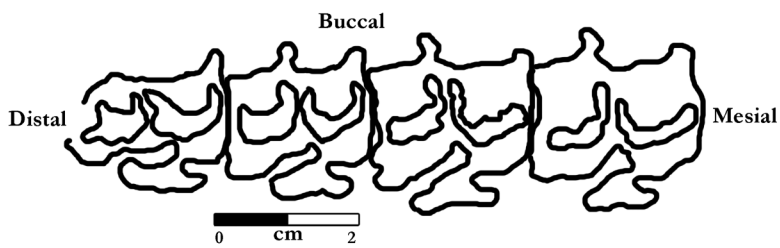


FIGURE 10.17. Occlusal ridge patterns of four equid teeth from Tell al-Raqa'i (specimens RQ90-1800-30/108-118-2964 to 2967, representing upper fourth premolar 4 and first through third molars, from an exterior Round Building context of level 4). *Illustration prepared by Scott Rufolo.*

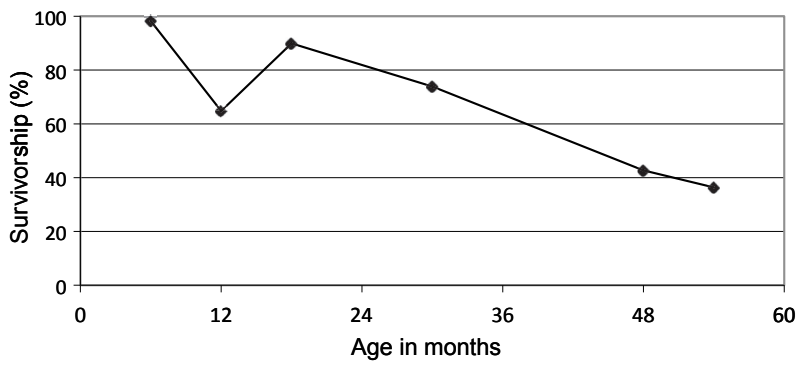


FIGURE 10.18. Survivorship curve based on caprine limb bone fusion data for 426 specimens from Tell al-Raqa'i (identified assemblage, levels 2–5 combined). *Illustration prepared by Scott Rufolo.*

on long bone fusion is thus likely more reflective of the actual survivorship pattern, and the subsequent part of the profile may be understood as documenting a steady but fairly gradual decline in survivorship over the ages of 1 to 4 years without providing definite percentages. This pattern suggests the removal of juvenile animals from the herds and is echoed in the mortality profiles constructed using age at death as indicated by the dental wear for caprines (Figure 10.19) and the associated survivorship curve generated from the mortality data (Figure 10.20). There is a clear spike in the mortality plot in the age range of 0–6 months, followed by a strong, continued focus of the slaughter of animals between 1 and 4 years of age, concentrated on members of the herd that have achieved the prime age range of 12–24 months during which meat quality and yield is high. The killing of very young animals, though noticeable, is not as pronounced as is generally predicted by the models put forward for the maximization of milk production where it is envisioned that up to 60% of the herd is culled before the animals reach their first year, mostly young males (Payne 1973; Vigne and Helmer

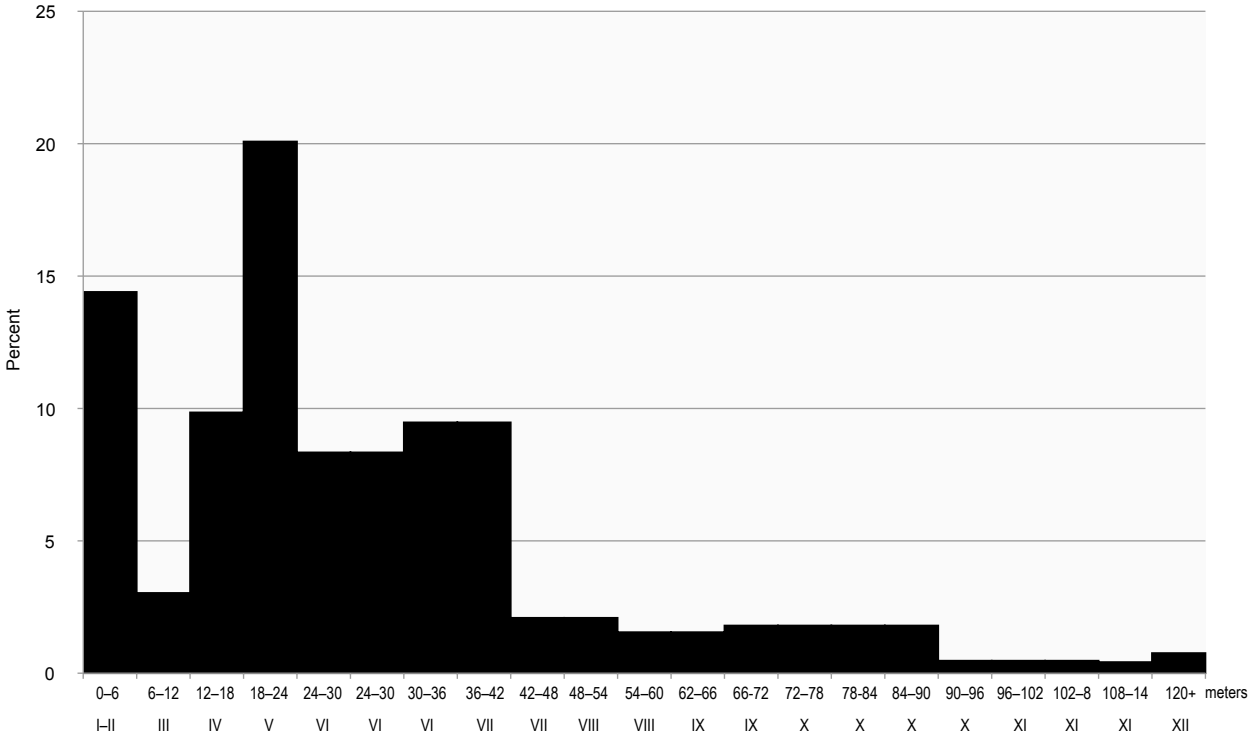
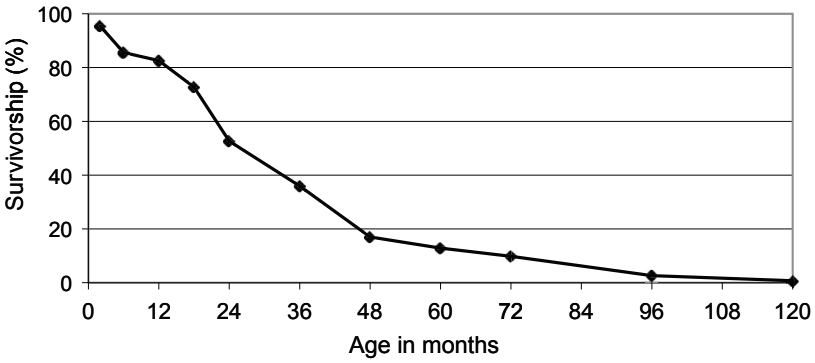


FIGURE 10.19. Mortality profile based on caprine dentition for Tell al-Raqa'i (identified assemblage, levels 2–5 combined, 44 mandibles) presented as a histogram with age groups partitioned into bins of 6-month intervals. Age in months is shown on x-axis, mortality (percentage of theoretically reconstructed original herd that is dead by end of age range in question) is plotted along y-axis. *Illustration prepared by Scott Rufolo*.

FIGURE 10.20. Survivorship curve based on caprine dentition for Tell al-Raqa'i (identified assemblage, levels 2–5 combined, 44 mandibles) as based on age at death data presented in Figure 10.19. *Illustration prepared by Scott Rufolo*.



2007). The minor emphasis on infants, coupled with the fact that around 10% of the herd is still alive at 7 years, may be a signature of mixed, small-scale dairying and procurement of wool in relatively equal measures within a principal focus on obtaining meat. Separate curves produced for the caprine remains from levels 3 and 4 are nearly identical; the pattern for both levels matching that of the assemblage considered for the site as a whole. Unfortunately, neither level 2 nor level 5 yielded a large enough sample of ageable caprine elements to reconstruct culling patterns for these occupation phases.

Considering the sheep and goat limb bone material separately, differences in the management of these two species are apparent. The sheep survivorship curve (Figure 10.21) mimics that of the combined caprine assemblage in its basic shape, but, at just over 60%, a higher percentage of animals remaining at the age of 4 years is indicated. The drop to zero survivorship for the final age group is a result of the fact that age group F/G is represented only by the proximal humerus, and no specimens of this element preserving the proximal end were identified as sheep. In contrast to the sheep profile, the goat survivorship curve (Figure 10.22) displays a different pattern. Although both age groups B and F/G for the goat material are not represented by any specimens that could be assessed, the goat curve suggests that there was higher survivorship for animals below the age of 1 year and definitely signals a greater loss of animals between 2 and 4 years of age in comparison with the sheep (around 40% of goats from a particular birth cohort reaching the age of 4 years). These differences in the curves likely capture the fact that goats were being used primarily for their meat, and sheep were the focus of management strategies

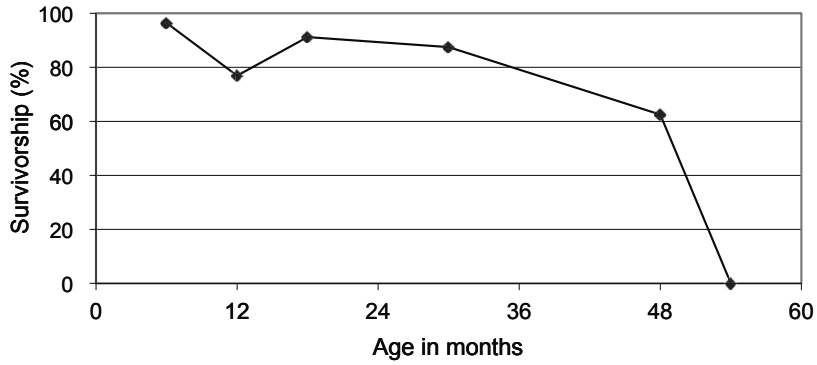


FIGURE 10.21. Survivorship curve based on sheep limb bone fusion data for 137 specimens from Tell al-Raqa'i (identified assemblage, levels 2–5 combined). *Illustration prepared by Scott Rufolo.*

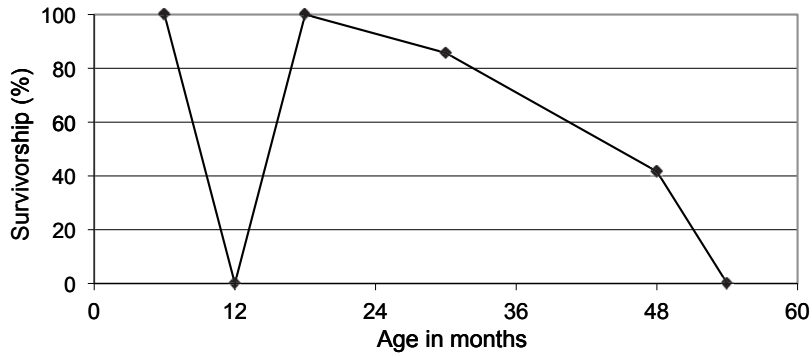


FIGURE 10.22. Survivorship curve based on goat limb bone fusion data for 58 specimens from Tell al-Raqa'i (identified assemblage, levels 2–5 combined). *Illustration prepared by Scott Rufolo.*

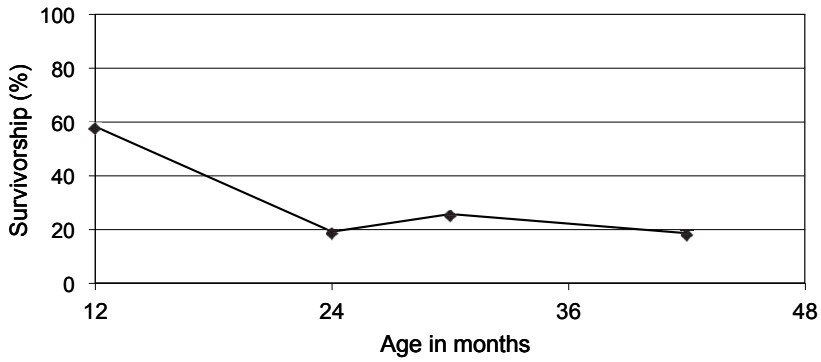


FIGURE 10.23. Survivorship curves based on fusion data for 61 pig specimens from identified assemblage of level 4 at Tell al-Raqa'i. *Illustration prepared by Scott Rufolo.*

seeking to take greater advantage of secondary products in addition to providing a source of meat.

Although based on more limited samples, the survivorship signatures for the pig and cattle remains prove instructive. They are very different indeed from those of the sheep and goat. Only level 4 provided a sufficient number of suid specimens to chart survivorship for pigs (Figure 10.23). The profile indicates that pigs were generally slaughtered when young, about 50% of animals culled before the first year of age and less than 20% of a birth cohort surviving beyond 2 years of age. Pigs were not maintained in particularly large numbers, but the small herds managed by residents of Raqa'i during the occupation of level 4 must have provided a ready source of meat, with only a small number of breeding adults required to be kept alive on a long-term basis. Cattle, on the other hand, were kept alive in much greater proportions beyond 2 years of age (Figure 10.24). Cattle fusion data do not extend beyond 48 months, but with over 80% survivorship at this point, it is clear that cattle were raised into adulthood before slaughter. Whether this was to ensure a greater caloric value, since cattle generally reach their peak of meat yield at about 4 years of age (Zeder 1991:40-41), or to provide a small set of animals for use in traction and/or as a source of milk cannot be evaluated.

A final survivorship curve could also be produced for the gazelles, based on long bone fusion data (Figure 10.25). The decline in survivorship over the first 2 years of life is sharp, standing at 55% for the 24-month mark. This may indicate that gazelle hunting targeted young animals with some intensity, or it may be a signal of mass kills occasionally carried out by hunting parties from Raqa'i. With gazelle long bone fusion data not capable of aging specimens beyond 2 years of age, the demographic profile is not extensive enough to reach a definitive conclusion.

Body Part Profiles. The body part representations documented for various taxa and according to differing anatomical partitionings are illustrated in Figures 10.26 to 10.35. The proportions of the three most basic anatomical regions for both the medium- and large-size categories of mammalian taxa (Figure 10.26), whose counts were obtained by combining all mammalian specimens from the unidentified and identified specimens, exhibit a preponderance of limb material in comparison to the standard proportions of a bovid skeleton. This pattern suggests that much of the Raqa'i faunal material is indeed the remains of meals. Muscle tissue is concentrated in areas associated with the upper limb elements, whose disproportionate representation probably results from these meatier components being preferentially brought into domestic areas for preparation and consumption. The proportions for the specific bovid taxa—sheep and goat combined, cattle, and gazelle (Figure 10.27)—similarly

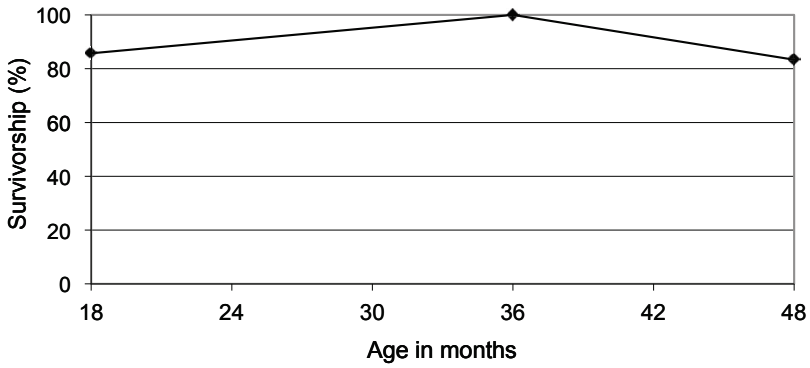


FIGURE 10.24. Survivorship curves based on fusion data for cattle specimens from identified assemblage of Tell al-Raqa'i (levels 2–5 combined, 22 specimens). *Illustration prepared by Scott Rufolo*.

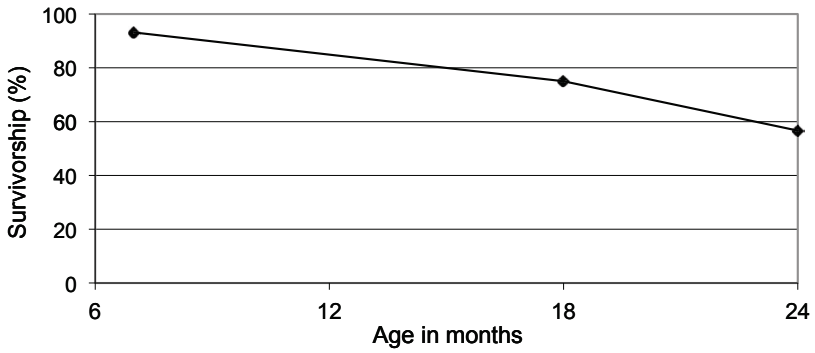


FIGURE 10.25. Survivorship curves based on fusion data for gazelle specimens from identified assemblage of Tell al-Raqa'i (levels 2–5 combined, 106 specimens). *Illustration prepared by Scott Rufolo*.

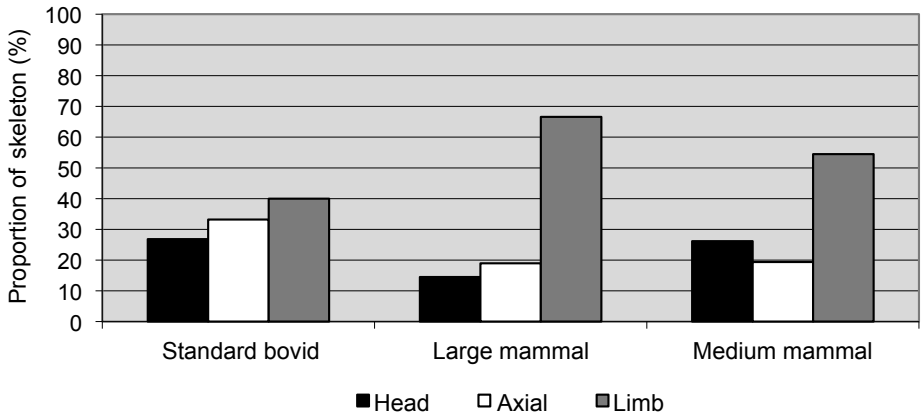


FIGURE 10.26. Body part profiles based on three basic anatomical regions for all large and medium mammal specimens for entire analyzed Raqa'i assemblage (levels 2–5). *Illustration prepared by Scott Rufolo.*

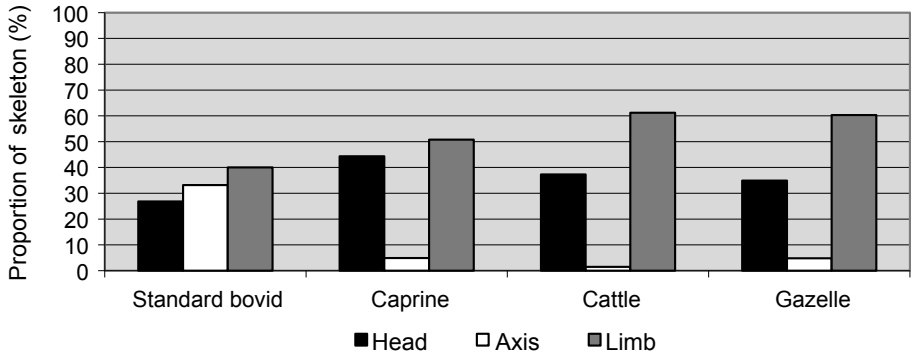


FIGURE 10.27. Body part profiles based on three basic anatomical regions for caprine, cattle, and gazelle specimens from identifiable material (levels 2–5). *Illustration prepared by Scott Rufolo.*

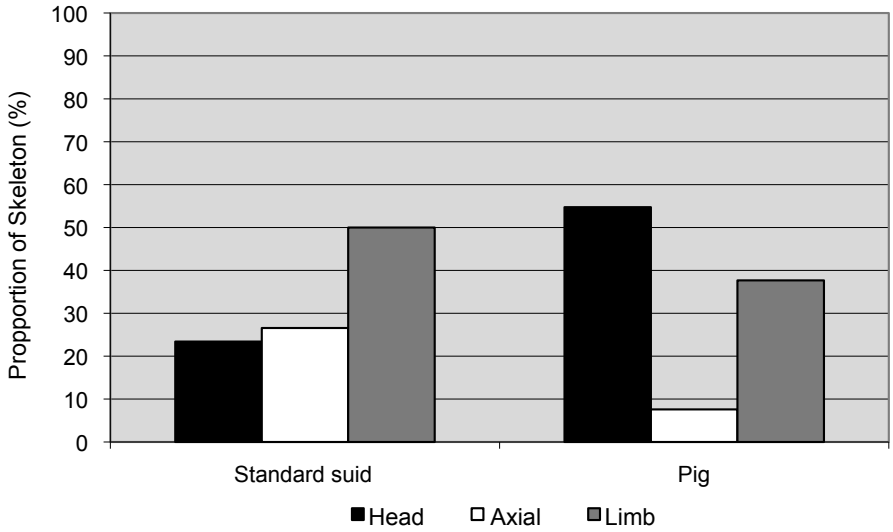


FIGURE 10.28. Body part profiles based on three basic anatomical regions for pig specimens from identifiable material of Tell al-Raqa'i (levels 2–5). *Illustration prepared by Scott Rufolo.*

present distributions with limb components overrepresented in relation to the standard profile and overshadowing the head elements, whose abundance is somewhat inflated as a statistical artifact resulting from the difficulty of identifying axial material to species. Vertebrae and rib fragments are categorized simply as representing medium- or large-sized mammals much more frequently, their absence depressing the axial proportion and thereby artificially elevating the representation of cranial elements. Cranial and axial material was clearly present at the site in fairly significant quantities judging from the size-based profiles in Figure 10.26, however. This all suggests that at Raqa'i the full spectrum of bovid taxa were most commonly slaughtered and butchered outside of the central living and activity areas uncovered during the excavation, limiting the number of less meaty elements that made their way into the interior of the settlement. However, dressing of the carcasses probably took place on or near the site, permitting the less de-

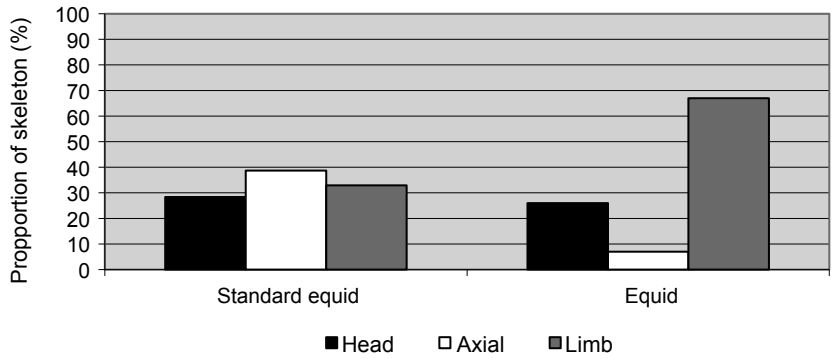


FIGURE 10.29. Body part profiles based on three basic anatomical regions for equid specimens from identifiable material of Tell al-Raqa'i (levels 2–5). *Illustration prepared by Scott Rufolo*.

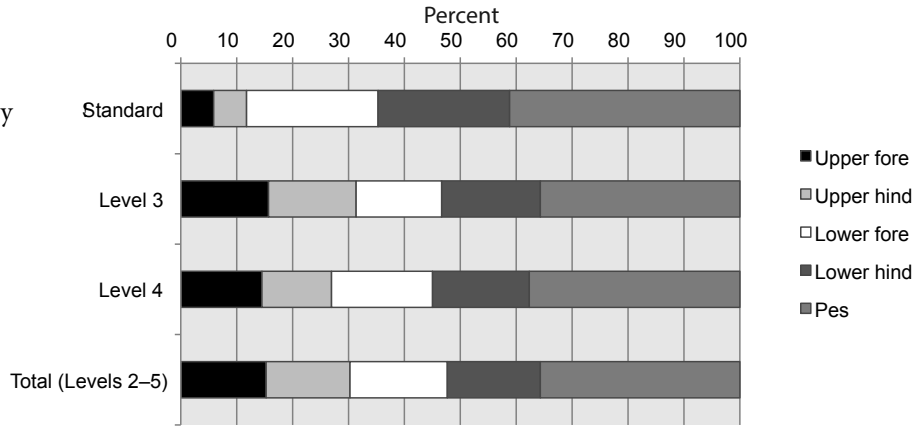


FIGURE 10.30. Limb category part profiles for all caprine specimens from identified assemblage by level for Tell al-Raqa'i. *Illustration prepared by Scott Rufolo*.

sirable components discarded during the butchery process to accumulate in smaller quantities throughout the settlement.

The suid profile (Figure 10.28) is different from that of the bovids, recording a disproportionate amount of cranial material in relation to the standard anatomical distribution and an underrepresentation of limb components. Considering the durable nature of suid cranial elements, which are thick and quite robust in comparison to those of caprines and gazelle, the teeth and heavy skulls survived to a greater extent than other material. Coupled with the less identifiable nature of axial components, this drove representation of the limbs downward. The suid profile is therefore probably closer to that of the standard than would seem from the graph. This indicates that pigs were probably routinely slaughtered within the settlement and commonly in domestic areas, with elements from all anatomical regions discarded on-site. The equid body part profile (Figure 10.29), on the other hand, is dominated by limb elements, and both the cranial and axial anatomical regions are underrepresented. This is the expected signature for a large wild animal such as the onager, which was probably butchered in whole or in part where it was hunted in order to avoid transporting large carcasses back to the settlement. Only the meat-bearing limb components would therefore enter the village with any great frequency.

These conclusions are supported in the breakdown of the limb region into smaller anatomical components. Shown in Figure 10.30 for the caprine material of the total identified assemblage as well as for levels 3 and 4 separately, it can be seen that the upper components of both the fore and hind limbs, which bear a large amount of flesh, are significantly overrepresented. This pattern holds true for the other bovid species (Figure 10.31) and for the equid material as well (Figure 10.32), although for cattle, gazelle, and onager the elements of the foot (the *Pes* category on the graphs) are slightly more abundant in comparison to the standard proportions. As the bones of the feet are numerous and compact, it is expected that differential survival may elevate their representation slightly, but this should affect the caprine remains as well. The sheep and goat profiles for all level groupings exhibit foot bone percentages less than the value for the standard, however. This may indicate that cattle, gazelle, and equid shoulders and haunches were more commonly butchered on-site, with the undesirable feet discarded nearby, and that the caprines were generally dismembered farther away and processed into more compact cuts. Considering the fact that the non-caprine ungulates were less significant components of the diet,

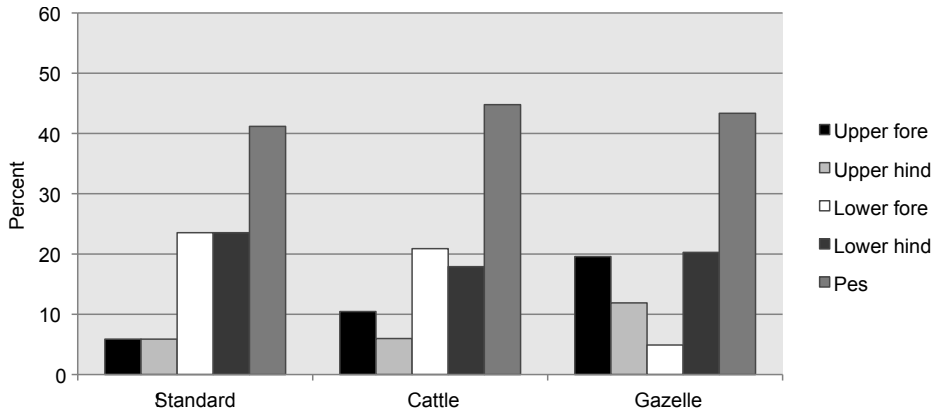


FIGURE 10.31. Limb category part profiles for all cattle and gazelle specimens from identified assemblage for Tell al-Raqa'i (levels 2–5). *Illustration prepared by Scott Rufolo*.

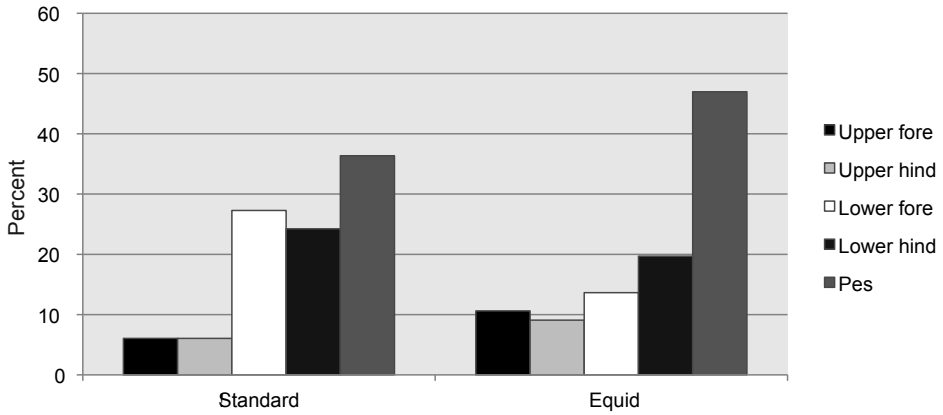


FIGURE 10.32. Limb category part profiles for equid specimens from identified assemblage for Tell al-Raqa'i (levels 2–5). *Illustration prepared by Scott Rufolo*.

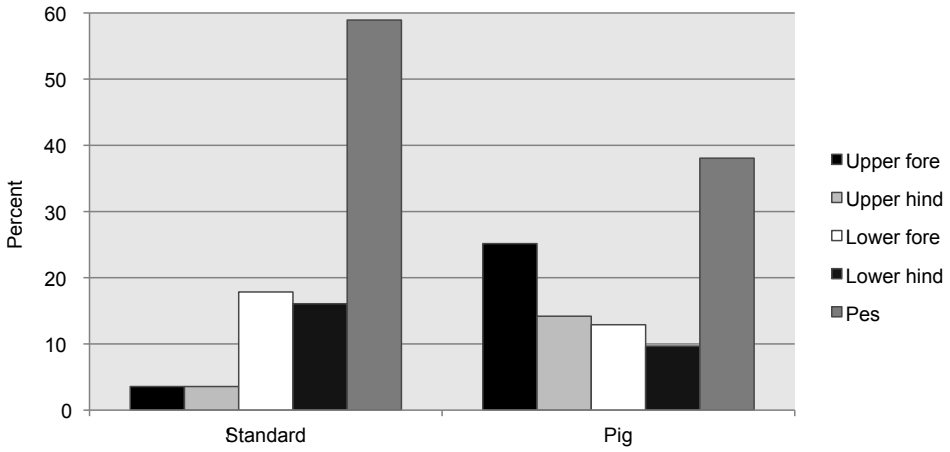


FIGURE 10.33. Limb category part profiles for pig specimens from identified assemblage for Tell al-Raqa'i (levels 2–5). *Illustration prepared by Scott Rufolo*.

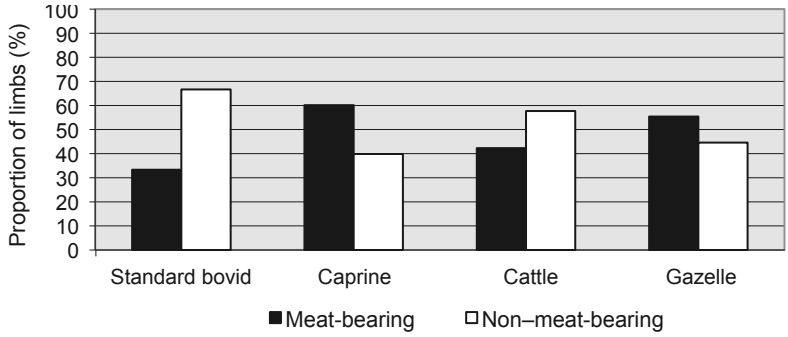


FIGURE 10.34. Limb element proportions based on relative meat yield for specimens of bovid taxa from identified assemblage as a whole for Tell al-Raqa'i. Meat-bearing bones are scapula, humerus, radius, ulna, pelvis, femur, and tibia; non–meat-bearing bones are metapodials and phalanges. *Illustration prepared by Scott Rufolo.*

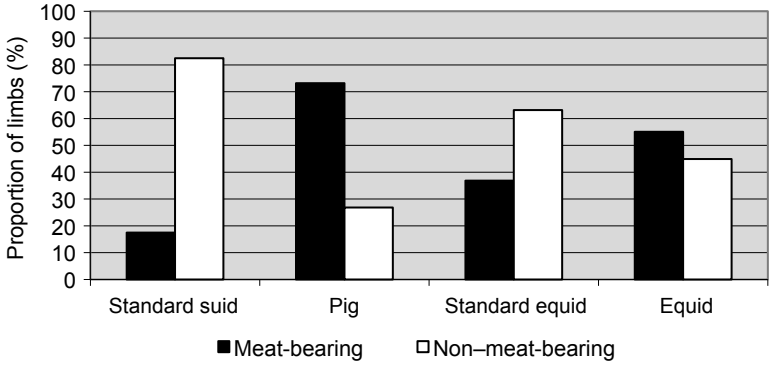


FIGURE 10.35. Limb element proportions based on relative meat yield for suid and equid specimens from identified assemblage as a whole for Tell al-Raqa'i. Meat-bearing bones are scapula, humerus, radius, ulna, pelvis, femur, and tibia; non–meat-bearing bones are metapodials and phalanges. *Illustration prepared by Scott Rufolo.*

their relatively infrequent slaughter may have been less formalized and conducted on a more random and opportunistic basis. It could have been a matter of individual households handling the butchery of cattle, gazelle, and onager, while dedicated butchers dressed caprine carcasses. In the case of the pigs (Figure 10.33), the limb region distribution also displays a pronounced overrepresentation of the meatier upper fore- and hind-limb areas, but with all the lower portions of the limb distinctly underrepresented. If pigs were raised by individual households and killed as needed on or near the site—a practice suggested by the full carcass profile for suid material including cranial components in greater proportion than limb elements—it might be expected that the limb regions would have a distribution closer to that of the standard. Perhaps a more consistent disposal method was used for unwanted pig parts since their slaughter and butchery was a more regular practice. Carcass waste generated regularly within the community from the slaughter of pigs may have been transported to a peripheral or offsite area, or involved feeding the offal to dogs whose chewing and ingestion of bone would have reduced the number of surviving lower limb elements.

The last set of body part profiles (Figures 10.34 and 10.35), which groups the limb elements more precisely into meat-bearing and non–meat-bearing components, shows that elements supporting large amounts of muscle tissue dominate for all taxa except the cattle. In comparison to the smaller species, this is probably due to the fact that the heavy and robust metapodial bones of cattle persist longer in an intact state once discarded when compared to the analogous bones of pigs and the medium-sized bovids. The fact that the equid profile does not follow this pattern lends support to the interpretation that cattle were butchered close to the site while the onager carcasses received preliminary preparation in the field, where most of the non-meaty segments were generally left. The greater representation of lower limb components for the equids, discussed earlier as a signal of their butchery on-site, would thus be the result of the disarticulation of the limb elements by individual Raqa'i households rather than a specialized preparation of cuts delivered from the field or of the whole carcass on-site.

Butchery Marks. To close the data presentation, a final brief mention will be made of the damage recorded for certain specimens that was caused by contact with tools during the butchery of carcasses. Such marks were observed on only a small percentage of specimens (Table 10.16), numbering only 104 among the 2,754 specimens that comprise the identifiable material. Butchery scars occur on the elements of the larger taxa generally expected to be part of the human diet, additionally being present on one dog, one porcupine, and one bird specimen. The distribution of cut marks by element is broken down for certain species in Tables 10.17 to 10.19. The number of cut marks recorded for

TABLE 10.16. Specimen Counts by Taxon for Material Evidencing Butchery Marks for Assemblage from Tell al-Raqa'i Recorded in Detail, Including Both Identified and Unidentified Specimens (Levels 2–5).

	NSP unmarked	NSP marked	% Marked[a]
Medium mammal	21	11	34.38
Large mammal	4	6	60.00
Sheep	178	16	8.25
Goat	83	6	6.74
Sheep/goat	1236	40	3.13
Caprine (total)	1497	62	3.98
Pig	409	8	1.92
Cattle	118	3	2.48
Dog	6	1	14.29
Gazelle	233	20	7.91
Aurochs	8	1	11.11
Equid	92	7	7.07
Porcupine	6	1	14.29
Crane	8	1	11.11
Total[b]	2676	121	4.33

a Percentages in the final column represent proportions of elements belonging to each taxon that bear marks from contact with a tool.
b Figures listed in bottom row are for entire assemblage recorded in detail.

TABLE 10.17. Distribution of Butchery Marks on Caprine Material by Skeletal Element for the Total Identified Assemblage from Tell al-Raqa'i (Levels 2–5).

	NISP unmarked	NISP marked	% Marked	Mark type(s)
Mandible (horizontal ramus)	63	1	1.56	Cut
Atlas	8	3	27.27	Cut
Scapula (proximal)	48	2	4.00	Cut, slice
Scapula (column)	52	3	5.45	Cut
Humerus (proximal)	20	2	9.09	Cut
Humerus (central shaft)	44	1	2.22	Cut
Humerus (distal)	45	3	6.25	Cut
Radius (proximal)	62	12	16.22	Cut, hack
Radius (central shaft)	71	3	4.05	Cut
Radius (distal)	54	1	1.82	Clean cut
Ulna (proximal)	20	6	23.08	Cut
Metacarpal III–IV (proximal)	46	3	6.12	Cut, slice
Metacarpal III–IV (central shaft)	66	1	1.49	Cut
Metacarpal III–IV (distal)	29	2	6.45	Cut
Ilium	27	1	3.57	Cut
Pubis	16	1	5.88	Cut
Femur (proximal)	21	2	8.70	Cut
Femur (distal)	22	1	4.35	Cut
Tibia (proximal)	30	1	3.23	Cut
Tibia (distal)	38	2	5.00	Cut
Astragalus	22	6	21.43	Cut, shave, cleave
Calcaneus	38	2	5.00	Cut
Metatarsal III–IV (proximal)	47	1	2.08	Cut
Metatarsal III–IV (distal)	23	1	4.17	Cut
1st phalanx (proximal)	64	1	1.54	Cut

TABLE 10.18. Distribution of Butchery Marks on Pig Material by Skeletal Element for the Total Identified Assemblage from Tell al-Raqa'i (Levels 2–5).

	NISP unmarked	NISP marked	% Marked	Mark type(s)
Atlas	2	1	33.33	Cut
Scapula (column)	16	1	5.88	Cut
Humerus (central shaft)	19	1	5.00	Cut
Humerus (distal)	19	1	5.00	Hack
Radius (proximal)	4	1	20.00	Cut
Pelvis	6	1	14.29	Cut
Metatarsals (proximal)	14	2	12.50	Cut, hack, slice

TABLE 10.19. Distribution of Butchery Marks on Gazelle Material by Skeletal Element for the Total Identified Assemblage from Tell al-Raqa'i (Levels 2–5).

	NISP unmarked	NISP marked	% Marked	Mark type(s)
Horn core	17	1	5.56	Cut?[a]
Atlas	2	3	60.00	Cut, hack
Rib (shaft)	0	1	100.00	Cut
Scapula (proximal)	8	3	27.27	Cut
Humerus (distal)	10	2	16.67	Cut
Radius (proximal)	9	5	35.71	Cut
Femur (proximal)	7	1	12.50	Cut
Femur (central shaft)	4	1	20.00	Cut
Calcaneus	6	1	14.29	Cut
Metatarsal III–IV (proximal)	11	1	8.33	Cut?[a]
Metatarsal III–IV (central shaft)	11	1	8.33	Cut

[a] Butchery mark noted for specimen during processing but detailed information was accidentally not recorded, so it is not known for certain which type of mark is present.

all taxa is too small to permit a detailed consideration of their placement and orientation or of possible spatial or diachronic differences, but the locations and relative frequencies that are available present a picture of standard butchery practice for the removal of the meat-bearing portions of a skeleton.

Interpretation and Conclusions

Economic Use of Animals at Raqa'i

The preceding survey of the zooarchaeological data now available for Raqa'i furnishes a more complete picture of the animal-based economy than hitherto available. In general, the patterns of taxonomic abundance confirm the trends observed in the first-stage analysis of the Raqa'i material (Zeder 1996, 1998b). A considerable drop in the proportion of pig from level 4 to level 3 is indicated in the second-stage data, accompanied by a dramatic rise in caprine representation. The transition is somewhat abrupt, however, proceeding slowly over the early years of the site's occupation (levels 4 and 5) and then shifting more decisively in level 3 from a generalized subsistence strategy of greater variety to one more focused on sheep and goat as the primary source of animal-derived protein. As in fourth millennium BCE Arslantepe (Bartosiewicz 2010), this is probably a signal of decreasing household-level management of the animal-based economy, with a prominence of pigs, to a more standardized community-based system of procurement emphasizing caprines. The strong representation of caprine limb components, and particularly the meaty sections, in comparison with the body part profiles for other species that show larger proportions of foot elements that carry little flesh, even suggests that residents of Raqa'i were regularly obtaining animals from neighboring pastoralists, at least in small numbers. These would most likely have been delivered on the hoof and then most frequently butchered near the site, perhaps by designated butchers from the settlement.

Unlike the Arslantepe data, however, the information for the Raqa'i faunal assemblage does not hint at the evolution of an encompassing specialized pastoralism widely practiced by the residents of the site. Generally more suited to a broad economic focus and the production of pastoral goods, sheep tend to be raised in substantially greater numbers than goats in societies heavily invested in extracting fibers for textile production or maximizing milk yield as part of a highly specialized pastoral system (Redding 1984, 1992). In such a specialized strategy, caprine flocks tend to be maintained with sheep to goat ratios of 6.0:1.0 or higher. The Raqa'i figures are essentially identical for all levels, never exceeding 2.0:1.0, while goat remains decline steadily over time in the Arslantepe material (Bartosiewicz 2010:122–123) to produce ratios of over 4.0:1.0 for some contexts. The caprine survivorship curves for Raqa'i nonetheless document an economically diversified animal husbandry with a certain degree of specialized focus. The site's residents appear to have strategically managed sheep in a low-intensity fashion, relatively small herds culled with a loose focus on young animals to provide a steady supply of secondary products, most likely milk but probably also securing wool to some extent. However, the evidence indicates the presence of a pastoralism whose practice did not appreciably evolve during the heart of the Ninevite 5 period and was mainly centered on the local needs of the community, as supposed through participation in a small regional trade network. Supporting this interpretation is the consistently low sheep-to-goat ratio at the site, as well as the unchanging survivorship profiles for caprines from level 4 to level 3 showing elements of a mixed subsistence strategy whose principal focus remained the offtake of meat. The culling signature of the caprine mortality profiles—particularly that for goats—includes a distinct but not especially concentrated focus on animals between 1 and 2 years of age, which is probably the result of young males being removed for slaughter from herds maintained by nearby pastoral populations, with their meat offered in exchange for other goods. In this scenario, the minor emphasis on sheep by the inhabitants of Raqa'i could be explained as a means of generating dairy products as a source of goods to be traded for meat, probably mostly goat, and other items.

Although difficult to judge because of the varying sample sizes, the patterns of taxonomic abundance for the different sectors of level 3 do not reveal any obvious differences that might be related to social status or a system of highly specialized, spatially segregated activities. There is some hint of minor variations between domestic and non-domestic contexts, but they do not appear to have been pronounced. Social distinctions were not strongly expressed in the faunal remains, nor does the signature of economic specialization extend beyond caprine husbandry. Reliance on wild species, although fairly low, remains an appreciable presence whose contribution does not diminish over time, perhaps even increasing slightly. Both larger game such as gazelle, onager, aurochs, and deer as well as smaller fare

such as fish and birds continue to be used as supplements to the diet, a sign that household-level economic diversity did not diminish. Rather, a small-scale pastoral specialization geared principally towards meeting the needs of the community for dairy products developed, one whose small surplus would have been sufficient to fuel exchange with steppe-based pastoralists. This trade relationship brought in a steady supply of meat, and likely permitted the redirection of time formerly spent raising pigs and caring for larger caprine herds into efforts involved in crop production, processing, and craft activities at the site.

CONCLUSION

In terms of the descriptive models developed to explain the function of Raqa'i and the other middle Khabur sites, the faunal data from this one site strongly favor the idea of an indigenous process of increasing social complexity driven largely by factors internal to the middle Khabur basin. The Raqa'i material does not contain signals of large-scale, focused economic specialization with regard to pastoral production or other aspects of the animal economy, making the scenarios concerning colonization and early incorporation into a broad regional economy unlikely. In particular, the survivorship curves and body part profiles do not contain the classic patterns that would be associated with a closely managed and surplus-oriented pastoral production of a distinctly high volume intended to supply nascent cities with wool or meat. Nevertheless, the data do capture a significant reorientation of the subsistence economy beginning around 2600 BCE, standing in contrast to both the earlier general pattern within the Khabur basin of a varied, more balanced usage of wild and domestic resources during the fifth and fourth millennia *and* the previous strategies practiced at Raqa'i during the occupations of levels 5 and 4. The inhabitants transitioned from a more diverse range of domestic stock to a strong emphasis on just sheep and goat in level 3, a move that represents an overall subsistence strategy evolving towards greater specialization and economic interdependence on a regional scale. Increasingly sophisticated management of animal herds developed over time at Raqa'i, supporting the population of the settlement through supplying dietary needs and facilitating access to a diversifying economic environment. The "low-intensity" pastoral specialization described in the preceding discussion stands as a sign of more complex socioeconomic involvement between Raqa'i and its neighbors—both immediate and further afield—just not one in which a narrowly focused set of pastoral activities was undertaken in order to produce one primary commodity whose exchange tapped directly into the emerging urban sphere to the north.

The zooarchaeological profile suggests that Raqa'i was pulled into a more integrated but still predominantly localized economic system during the level 3 occupation period, one centered on the communities of the river bank and the adjacent western steppe. Other studies of smaller faunal assemblages from middle Khabur sites with deposits dating to ca. 2800–2500 BCE (Early Jezirah 1–Early Jezirah 3a) such as Knedig (Vila 1997, 2005) and Mulla Matar (Vila 1996, 1998) also report a lack of evidence for highly developed economic specialization involving animal species, and the contemporaneous material from the nearby Tell 'Atij processed in association with the Raqa'i analysis (Rufolo 2011:338–392)—although exhibiting data patterns suggesting the emergence of a pastoral economy more developed around wool production during the Early Jezirah 2 period (ca. 2600 BCE)—ultimately reveals no signs of an extensive pastoral specialization and additionally suggests a characteristic subsistence strategy distinct from that of Raqa'i. It may be that the middle Khabur sites were initially founded by various groups to take advantage of opportunities for trade afforded by river-borne traffic and to provide services to merchants and others traveling along the Khabur, each maintaining its own set of subsistence practices as suiting the lifestyles tailored to the specific set of agricultural products and industrial activities undertaken by its inhabitants. These various economic activities would have funneled trade goods from the emerging urban centers of the north to peoples of the steppe and communities farther south, initially stimulating the development of a localized economy tying the riverside settlements into a more complex socioeconomic relationship with pastoralists to the west, only later becoming more intimately connected with the urban polities of the northern Khabur basin once these had solidified their immediate economic and political domains.

APPENDIX: METRIC DATA

Tables 10.20 through 10.41 in this appendix are arranged by skeletal element and hold the measurements that could be reliably recorded for the Raqa'i animal bone assemblage. They are presented in rough

Table 10.20. Measurements for Horn Core Specimens.

Specimen	Taxon	Excavation unit	Level	Measurements in millimeters (horn core)								
				40	41	42	43	44	45	46	47	48
2612[Y]	Goat	30/126-009	2/3		20.61	15.71*						
0336	Gazelle	36/120-106	4									20.70
1020	Gazelle	48/108-060	4	96.11	33.23	24.87						
1616	Gazelle	42/114-272	5	81.22	31.70	21.21	112.00	104.20				
2086	Gazelle	42/90-010	3				166.00*	147.00*	156.50*			
2422	Gazelle	30/114-043	3							80.50	29.43	20.18
2999	Gazelle	42/114-190	4							89.00	32.31	23.08

Notes: Measurements follow: 40 = basal circumference (right or side unknown); 41 = greatest diameter of base (right or side unknown); 42 = least diameter of base (right or side unknown); 43 = length along keel or front margin (right or side unknown); 44 = length along lateral or exterior curve (right or side unknown); 45 = length along medial or interior curve (right or side unknown); 46 = basal circumference (left); 47 = greatest diameter of base (left); 48 = least diameter of base (left).
* Estimate.

Table 10.21. Measurements for Tooth Specimens.

Specimen	Taxon	Tooth type	Excavation unit	Level	Measurements in millimeters (teeth)					
					1	2	3	4	5	6
1058	Pig	PLM3	48/108-094	4	33.78					
2214	*Equus* sp.	PUP34	42/96-042	3/4	26.20	27.82	11.81	24.44		
2964	*Equus* sp.	PUP4	30/108-118	4	25.41	24.11	10.41	23.97		
2965	*Equus* sp.	PUM1	30/108-118	4	22.96	24.07	12.69	23.04		
2966	*Equus* sp.	PUM2	30/108-118	4	21.11	21.38	11.93	20.29		
2967	*Equus* sp.	PUM3	30/108-118	4	23.22	23.57	13.43	24.61		

Notes: Measurements follow: 1 = occlusal length of crown (bovids, equids)/cervical length of crown (suids); 2 = occlusal width of crown (bovids)/distance from exterior buccal border of protoconid to exterior lingual border of metaconid (equid lower dentition)/buccal length of crown (equid upper dentition)/cervical length of crown (suids); 3 = height of crown along buccal side (bovids)/distance from exterior lingual border of metastylid to farthest point on exterior buccal border of hypoconid (equid lower dentition)/greatest mesio-distal length of protocone (equid upper dentition); 4 = distance from exterior mesial border of metaconid to exterior distal-most point of metastylid border (equid lower dentition)/occlusal length of enamel ridges (equid upper dentition); 5 = greatest length of entoflexid along exterior border (equids); 6 = occlusal length of enamel ridges (equid lower dentition). Tooth type is coded as per following examples: PLM3 = permanent, lower third molar; DUP23 = deciduous upper second or third premolar.

Table 10.22. Measurements for Atlas Specimens.

Specimen	Taxon	Excavation unit	Level	Measurements in millimeters (atlas)									
				1	2	3	4	5	6	7	8	9	10
1901	Pig	42/102-094	4		44.07	54.85	47.63	30.12		40.31	22.66	22.11	9.35
0323	Gazelle	36/102-026	2/3				37.81				16.38	18.79	12.10
2072	Gazelle	42/102-019	3			45.51	40.09	43.90			16.96		

Notes: Measurements follow: 1 = greatest breadth across wings; 2 = greatest length; 3 = greatest breadth of cranial articular surface; 4 = greatest breadth of caudal articular surface; 5 = greatest length between articular surfaces; 6 = length of dorsal arch; 7 = height; 8 = greatest breadth of the caudal channel; 9 = height of caudal channel; 10 = height of ventral arch.

Table 10.23. Measurements for Axis Specimens.

Specimen	Taxon	Excavation unit	Level	Measurements in millimeters (axis)									
				1	2	3	4	5	6	7	8	9	10
1330	Gazelle	42/114-114	4			35.85						16.24	
2667	Gazelle	30/126-073	4				25.34						11.02

Notes: Measurements follow: 1 = length of corpus without *dens*; 2 = greatest length of arch including caudal articular process; 3 = greatest breadth of cranial articular surface; 4 = greatest breadth across caudal articular processes; 5 = breadth across the transverse process; 6 = smallest breadth; 7 = greatest height; 8 = length of corpus with *dens*; 9 = breadth of *dens;* 10 = greatest breadth of caudal articular surface.

TABLE 10.24. Measurements for Thoracic Vertebra Specimens.

Specimen	Taxon	Excavation unit	Level	Measurements in millimeters(thoracic vertebra)									
				1	2	3	4	5	6	7	8	9	10
2682	*Equus* sp.	42/90-010	3						37.42		31.18		

Notes: Measurements follow: 1 = physiological length from centers of articular surfaces; 2 = greatest length from furthest extent of cranial articular processes to caudal articular processes; 3 = greatest breadth across cranial articular processes; 4 = greatest breadth across caudal articular processes; 5 = greatest breadth across transverse processes; 6 = greatest breadth of cranial articular surface; 7 = greatest breadth of caudal articular surface; 8 = greatest height of cranial articular surface; 9 = greatest height of caudal articular surface; 10 = height.

TABLE 10.25. Measurements for Scapula Specimens.

Specimen	Taxon	Excavation unit	Level	Measurements in millimeters (scapula)									
				1	2	3	4	5	6	7	8	9	10
1196	Pig	42/114-136	4	19.67	28.80	24.45	19.40	16.63					
1219	Pig	42/114-198	4	18.32	31.57	24.51	20.41	24.26					
1725	Pig	42/102-143	4	11.74									
0853	Gazelle	42/114-138	4		29.69	22.37	22.60						
1452	Gazelle	42/114-112	4	16.71	27.73	21.70	18.97	21.02					
1778	Gazelle	42/102-129	3/4		27.78	22.00	22.33						
2706	Gazelle	29/102-059	3/4	16.22	29.01	23.07							
2923	Gazelle	30/126-073	4	19.69	30.69	25.98	21.84	23.46					

Notes: Measurements follow: 1 = smallest length of neck; 2 = greatest length of glenoid process; 3 = length of articular surface; 4 = breadth of articular surface; 5 = height of neck; 6 = height along the spine; 7 = diagonal height measured from most distal point of scapula to the thoracic angle; 8 = greatest dorsal length; 9 = greatest length (birds); 10 = greatest cranial diagonal (birds).

TABLE 10.26. Measurements for Humerus Specimens.

Specimen	Taxon	Excavation unit	Level	Measurements in millimeters (humerus)				
				1	2	3	4	5
0899	Sheep	42/114-244	4				31.57	30.23
1415	Sheep	42/120-025	3/4				29.53	28.39
2080	Sheep	48/108-022	3/4				30.70	30.50*
2090	Sheep	42/96-017	3					28.53
2692	Sheep	29/114-023	2/3					29.61
2768	Sheep	29/120-049	2/3				31.98	31.58
0860	Pig	42/114-138	4			10.55		
0920	Pig	42/114-198	4					
1498	Pig	42/114-227	4			8.32		33.77
1499	Pig	42/114-227	4			8.48		
1631	Pig	42/108-058	4			13.75		
1723	Pig	42/102-143	4			11.16		
1802Y	Pig	42/102-143	4			8.59		
1889	Pig	42/102-094	4			15.65		
1899Y	Pig	42/102-094	4			14.35	34.37	
1994Y	Pig	42/102-051	4				32.61	
0227	Gazelle	36/114-033	3	32.41				
1868	Gazelle	42/102-125	4				26.93	
2063	Gazelle	42/102-051	4				28.09	25.63
2276	Gazelle	30/108-052	3				23.80	22.92
2913	Gazelle	30/108-128	4					26.63
2922	Gazelle	30/126-073	4		37.71		25.31	24.02
0982	Red fox	36/120-054	3				16.16	
2846	Euphrates softshell turtle	30/96-080	3			4.50		

Notes: Measurements follow: 1 = greatest breadth of the proximal end; 2 = depth of the proximal end; 3 = smallest breadth of diaphysis; 4 = greatest breadth of distal end; 5 = greatest breadth of trochlea.
* Estimate.

Table 10.27. Measurements for Radius Specimens.

Specimen	Taxon	Excavation unit	Level	Measurements in millimeters (radius)									
				1	2	3	4	5	6	7	8	9	10
0319	Sheep	36/102-026	2/3	28.39	25.68								
0350	Sheep	36/120-104	4	29.15	26.11								
0514	Sheep	36/120-045	3	36.76									
0877	Sheep	42/114-166	4	29.82	26.59	15.06	40.05	27.12	23.21	154.70			
0938	Sheep	42/114-107	4					33.02	31.30				
1335	Sheep	42/114-032	3					27.95	24.72				
1388	Sheep	42/114-198	4	33.38	30.23	16.54	43.50	31.19	23.91	178.00			
1777	Sheep	42/102-134	4	31.36	31.38								
1872	Sheep	42/102-118	4	31.38	28.33	15.79	39.40						
2370	Sheep	30/108-023	3						25.57				
2505	Sheep	30/120-042	3/4	33.33	29.48								
2866	Sheep	30/96-068	3						31.06				
0317	Goat	36/102-033	3	25.78	22.94								
2371	Goat	30/108-023	3						22.86				
2491	Goat	30/120-042	3/4	34.65	32.63	20.53	53.77						
2546	Goat	30/126-077	4						29.08				
2725	Goat	29/126-050	3	32.53	29.00								
0542	*Bos* sp.	36/102-019	2/3		65.70								
1252Y	Pig	42/114-198	4	24.52	13.47			27.65		110.00	98.20	92.79	
1384	Pig	42/116-072	4	23.26									
0420	Gazelle	36/120-120	4	26.00	25.45								
0596	Gazelle	36/120-175	4	24.04									
0802	Gazelle	42/114-208	4	24.94									
1455Y	Gazelle	42/108-069	4	22.31	21.49	11.77	32.94						
2415	Gazelle	30/108-099	4	25.79	23.88								
2484 Y	Gazelle	30/120-044	3/4	22.65	20.45	11.99	32.61						
2551	Gazelle	30/120-045	3/4	22.94	21.39	14.05	35.26						
0221	*Equus* sp.	38/108-008	3	68.31	63.38								
1173	Common crane	42/114-110	4				12.27						

Notes: Measurements follow: 1 = greatest breadth of the proximal end; 2 = greatest breadth of proximal articular surface; 3 = smallest breadth of diaphysis; 4 = smallest circumference of diaphysis; 5 = greatest breadth of distal end; 6 = greatest breadth of distal articular surface; 7 = greatest length; 8 = greatest length in absence of distal epiphysis; 9 = greatest length in absence of both epiphyses; 10 = length of lateral side.

Table 10.28. Measurements for Ulna Specimens.

Specimen	Taxon	Excavation unit	Level	Measurements in millimeters (ulna)											
				1	2	3	4	5	6	7	8	9	10	11	12
0110Y	Sheep	42/120-005	3	17.60		21.84									
0878	Sheep	42/114-166	4	18.48	24.34	21.24	37.03								
0961	Sheep	42/114-137	4	17.79		22.63	38.04								
1389	Sheep	42/114-198	4			22.70	43.60								
1873	Sheep	42/102-118	4	19.93											
2703	Sheep	29/126-040	2/3	18.15		23.47									
2859	Sheep	30/96-068	3	20.44	26.57	23.01	41.97								
0970	Pig	42/114-137	4	12.33		15.90									
1597	Pig	42/114-240	4	20.44											
1608	Pig	42/114-259	5	19.61	33.48	27.32									
1629	Pig	42/108-058	4	17.95											

Continued on next page

TABLE 10.28. Measurements for Ulna Specimens (*continued*).

Specimen	Taxon	Excavation unit	Level	Measurements in millimeters (ulna)											
				1	2	3	4	5	6	7	8	9	10	11	12
1655Y	Pig	42/102-202	4	15.71	24.80	19.15									
2485Y	Gazelle	30/120-044	3/4		19.10	15.90									
2700	Gazelle	29/126-085	3	13.36	20.37	16.13	35.31								
1659	Common buzzard	42/102-202	4										13.01		
2088	Common buzzard	42/90-010	3				16.10								
1172	Common crane	42/114-110	4												15.11

Notes: Measurements follow: 1 = greatest breadth across coronoid process; 2 = smallest depth across *processus anconaeus*; 3 = smallest depth of olecranon process; 4 = length of olecranon; 5 = greatest length; 6 = greatest length in absence of epiphyses; 7 = greatest length of ulna fused to radius (radio-ulna); 8 = greatest lateral length of ulna fused to radius; 9 = greatest diagonal of proximal end; 10 = greatest breadth of proximal end; 11 = greatest breadth of corpus; 12 = greatest diagonal of distal end.

TABLE 10.29. Measurements for Carpal Specimens.

Specimen	Taxon	Carpal	Excavation unit	Level	Measurements in millimeters (carpals)		
					1	2	3
0322	*Bos* sp.	Fourth	36/102-026	2/3	31.29	31.09	23.54
0840	*Bos* sp.	Fourth	42/114-167	4		37.26	
1329	*Bos* sp.	Ulnar	42/114-073	4	36.01	28.42	
1773N	*Bos* sp.	First	48/90-011	3	26.78	22.88	17.53
1774N	*Bos* sp.	Ulnar	48/90-011	3	20.57	19.85	19.84
1816Y	Pig	Radial	42/102-143	4	15.30	9.25	8.44
1817	Pig	Third	42/102-143	4	14.56	14.02	12.80
0294	*Equus* sp.	Third	36/102-045	3		38.74	
1203	*Equus* sp.	Radial	42/114-072	4			24.83
2325	*Equus* sp.	Radial	30/108-030	3	24.83	24.85	22.98

Notes: Measurements follow: 1 = greatest length or depth; 2 = greatest breadth; 3 = greatest height.

TABLE 10.30. Measurements for Metacarpal Specimens.

Specimen	Taxon	Metacarpal	Excavation unit	Level	Measurements in millimeters (metacarpal)							
					1	2	3	4	5	6	7	8
0202	Sheep	III–IV	36/96-035	3					28.36	19.03	12.18	
0377	Sheep	III–IV	36/120-083	4							10.50	
0384	Sheep	III–IV	36/120-104	4					23.79	16.80	10.56	
0672	Sheep	III–IV	48/108-081	4	24.31	16.36	14.96	44.00	27.15	16.89	11.22	136.14
0941	Sheep	III–IV	42/114-103	4					26.96		11.66*	
1340	Sheep	III–IV	42/114-136	4					25.91		11.85	
1395	Sheep	III–IV	42/114-198	4					25.54	16.67	11.99	
1651	Sheep	III–IV	42/102-202	4					26.29	18.45	11.44	
1654	Sheep	III–IV	42/102-202	4			15.27	45.38	28.72	17.76	12.10	148.50
1677	Sheep	III–IV	42/102-144	4					27.74	18.14	12.31	
1922	Sheep	III–IV	42/102-094	4					27.52	16.66		
2151	Sheep	III–IV	42/96-005	2						17.59	10.95	
1131	Goat	III–IV	42/114-109	4	20.71	15.12	12.97	38.03	24.39	15.52	8.35	99.22
1524	Goat	III–IV	42/114-270	4	23.70	16.68*	14.11	39.58	26.93		8.98	112.82
2620	*Bos* sp.	III–IV	30/126-014	3	64.05	39.08						
0738	Pig	III	42/108-044	3/4	18.99	15.66	11.94	32.90				
0969	Pig	IV	42/114-137	4	14.48	12.11	10.35	29.30				
0974	Pig	III	42/114-136	4	18.74	13.92	12.05	30.32				
0979	Pig	III	48/108-126	4	19.64	16.23	10.77	32.28				

* Estimate.

Continued

Table 10.30, *continued.*

Specimen	Taxon	Metacarpal	Excavation unit	Level	Measurements in millimeters (metacarpal)							
					1	2	3	4	5	6	7	8
1039	Pig	II	48/108-067	4	4.83	7.71						
1555	Pig	III	42/114-136	4			11.87	32.91				
1638	Pig	III	42/108-069	4	18.16	15.11	10.51	32.55	15.30	13.08	10.31	62.16
1803	Pig	III	42/102-143	4	15.41	13.27	9.52	26.89				
1804	Pig	IV	42/102-143	4	14.60	12.58	8.82	27.51				
1831Y	Pig	II	42/102-143	4	4.06	6.54	3.26	12.42				
1905	Pig	III	42/102-094	4	20.80	17.21	17.52	35.77	13.88			
1906	Pig	II	42/102-094	4	6.53	6.46	5.53	23.71				
1930	Pig	IV	42/102-094	4			11.93	32.33	16.41	15.76	10.98	
2053	Pig	IV	42/108-078	4					15.23	14.17	10.27	
0975	Pig	V	42/114-136	4	6.18	8.59	5.18	18.40	11.92	12.35	7.75	
0505	Gazelle	III–IV	36/102-026	2/3					17.80	14.13	10.79	
0548	Gazelle	III–IV	36/102-045	3					18.92		10.65	
2372	Gazelle	III–IV	30/108-023	3					18.63	13.66	9.61	
1171	Common Crane	Carpometacarpus	42/114-110	4	94.71		19.69	12.87				

Notes: Measurements follow: 1 = greatest breadth of proximal end; 2 = greatest depth of proximal end; 3 = smallest breadth of diaphysis; 4 = smallest circumference of diaphysis; 5 = greatest breadth of distal end; 6 = greatest depth of distal end; 7 = smallest depth of distal end; 8 = greatest length.

Table 10.31. Measurements for Pelvis Specimens.

Specimen	Taxon	Excavation unit	Level	Measurements in millimeters (pelvis)						
				1	2	3	4	5	6	7
1537	Pig	42/114-277	5			29.79	8.58	5.88		
0569	*Equus* sp.	36/120-077	4	59.98	54.74	47.76		9.83		

Notes: Measurements follow: 1 = length of acetabulum including lip; 2 = length of acetabulum on rim; 3 = height of acetabulum; 4 = thickness of acetabular rim; 5 = thickness of acetabular body; 6 = Smallest height of iliac shaft; 7 = length of symphysis.

Table 10.32. Measurements for Femur Specimens.

Specimen	Taxon	Excavation unit	Level	Measurements in millimeters (femur)								
				1	2	3	4	5	6	7	8	9
1353	*Bos* sp.	42/114-081	4		49.86							
0489Y	Pig	48/108-126	4			16.11	53.28					
0870Y	Pig	42/114-138	4			15.69	55.25					
0884	Pig	42/114-138	4		21.45							
0885	Pig	42/114-138	4					37.08	18.29			
1497Y	Pig	42/114-227	4			8.82	28.05					
1813 Y	Pig	42/102-143	4			10.12	30.25					
0862	Gazelle	42/114-137	4					30.79	19.14			
1662	Gazelle	42/102-202	4	39.86	16.60	13.91	43.19	30.25	17.36	154.90		
2493	Gazelle	30/120-044	3/4			14.58	44.27	31.82		153.30		
2746	Gazelle	29/126-077	4		16.40							
2899	Gazelle	30/126-076	4/5		17.67							
1122	Red fox	42/114-077	4					20.36				

Notes: Measurements follow: 1 = breadth of proximal end; 2 = depth of femoral head; 3 = smallest breadth of diaphysis; 4 = smallest circumference of diaphysis; 5 = breadth of distal end; 6 = breadth of *trochlea patellarus*; 7 = greatest length; 8 = greatest length measured from femoral head; 9 = greatest length in absence of epiphyses.

TABLE 10.33. Measurements for Patella Specimens.

Specimen	Taxon	Excavation unit	Level	Measurements in millimeters (patella)	
				1	2
2489	Gazelle	30/120-044	3/4	23.48	19.50
0222	Equus sp.	38/108-008	3	56.63	

Notes: Measurements follow: 1 = greatest length/height; 2 = greatest breadth.

TABLE 10.34. Measurements for Tibia Specimens.

Specimen	Taxon	Excavation unit	Level	Measurements in millimeters (tibia)							
				1	2	3	4	5	6	7	8
0058	Sheep	42/102-018	3				28.71				
0364	Sheep	36/120-077	4				29.39				
0638	Sheep	48/108-081	4				25.34				
0730	Sheep	42/108-038	3				29.17				
0801	Sheep	42/114-208	4				28.60				
1187	Sheep	42/114-115	4				29.28	21.42			
2516	Sheep	30/120-035	3/4				25.92				
0332	Goat	36/96-031	3				28.10	24.52			
1447	Goat	42/114-136	4		14.93	44.85	25.26	19.92			
2196	Goat	42/96-029	3				22.71				
2832	Goat	30/96-083	3				24.18	18.91			
1096	Pig	48/108-027	3/4		15.65	45.45					
1314Y	Pig	42/114-017	3		6.05	18.75					
1814Y	Pig	42/102-143	4			9.66	29.85				
1819	Pig	42/102-143	4		22.20						
1594	Gazelle	42/114-246	4				21.77				
2387	Gazelle	30/108-023	3				22.39				
2552	Gazelle	30/120-045	3/4				25.11				
2737	Gazelle	29/126-112	3/4				20.22	18.03			
0832	Dog	42/114-178	4		9.84	30.28					

Notes: Measurements follow: 1 = greatest breadth of the proximal end; 2 = smallest depth of diaphysis; 3 = smallest circumference of diaphysis; 4 = greatest breadth of distal end; 5 = greatest depth of distal end; 6 = greatest length; 7 = greatest length in absence of proximal epiphysis; 8 = greatest length in absence of both epiphyses.

TABLE 10.35. Measurements for Astragalus Specimens.

Specimen	Taxon	Excavation unit	Level	Measurements in millimeters (astragalus)									
				1	2	3	4	5	6	7	8	9	10
0365	Sheep	36/120-077	4			16.36		18.51*					
0511	Sheep	36/114-035	3	27.45				17.24					
0817	Sheep	42/114-209	4	28.83	27.92	16.29	16.34	17.60	19.48				
0960	Sheep	42/114-136	4	29.20	27.27	16.36	16.93	17.94	19.73				
1060	Sheep	48/108-131	4	30.10	29.24	16.90	17.42	19.05	21.18				
1341	Sheep	42/114-136	4	29.67	27.72	17.46	17.28	17.95	20.70				
1372	Sheep	42/120-034	2	26.41	27.07	15.69	15.77	17.68	18.03				
2126	Sheep	42/96-018	3	31.23	30.15	18.08		19.75					
2237	Sheep	42/96-029	3	29.78	29.51	17.12	17.43	19.76	21.32				
2298	Sheep	30/108-127	4	30.11	30.69	18.78		20.09					
2397	Sheep	30/114-047	3	29.18	28.29	16.94		18.31					
2515	Sheep	30/120-035	3/4	28.72		16.67		18.69*					
2699	Sheep	29/126-087	4	29.79	29.21	17.74		19.28	20.89				
2766	Sheep	29/120-049	2/3	29.10	28.92	17.12		19.90					
2790	Sheep	29/126-042	3					18.18					

Continued

Table 10.35, *continued.*

Specimen	Taxon	Excavation unit	Level	Measurements in millimeters (astragalus)									
				1	2	3	4	5	6	7	8	9	10
0291	Goat	36/102-045	3						19.51				
0333	Goat	36/96-031	3	27.04	25.29	14.42	14.85	16.61	17.07				
0334	Goat	36/96-031	3	26.65	26.14	14.84	15.52	17.31	17.95				
2578	Goat	30/126-032	3	28.33	27.33	14.76		17.99					
2694	Goat	29/114-023	2/3	25.62	24.33	14.45		17.10					
1820	Pig	42/102-143	4		25.04	14.73	14.90		14.86				
0545	Gazelle	36/102-019	2/3	23.67	22.06		12.57		13.21				
0869	Gazelle	42/114-138	4	26.00	24.00	14.89	14.74	15.56	17.83				
1633	Gazelle	42/108-055	4	23.59	22.23	13.99	13.84		14.62				
1861	Gazelle	42/102-125	4	24.58	23.29	14.33	123.86	14.69	16.37				
2083	Gazelle	48/108-041	4	25.67	23.88	14.49	15.27*	15.70	16.41				
2106	Gazelle	42/96-005	2	25.67	23.39	15.96	14.12	14.40	16.80				
2490	Gazelle	30/120-044	3/4	25.30	23.57	14.34	15.05	14.47	14.88				
0014	*Equus* sp.	42/108-075	4							54.10	48.18	40.08	53.04
0446	*Equus* sp.	48/108-093	4								53.23	45.90	
0770	*Equus* sp.	42/108-044	3/4							54.20	49.57	39.64	51.79
2697	*Equus* sp.	29/108-026	3							53.96			55.00

Notes: Measurements follow: 1 = greatest lateral length; 2 = greatest medial length; 3 = greatest lateral depth 4 = greatest medial depth; 5 = greatest breadth of distal end; 6 = greatest breadth of proximal end; 7 = greatest length; 8 = greatest breadth; 9 = greatest breadth of distal articular surface; 10 = length of medial part of *trochlea tali*.
* Estimate.

Table 10.36. Measurements for Calcaneus Specimens.

Specimen	Taxon	Excavation unit	Level	Measurements in millimeters (calcaneus)				
				1	2	3	4	5
0069Y	Sheep	42/84-003	3			23.45		54.71
0245	Sheep	36/114-032	3	66.32	21.37	25.52		
0887	Sheep	42/114-138	4	64.74	21.13	24.91		
1197	Sheep	42/114-136	4	56.28	20.62	22.07		
1351Y	Sheep	42/114-093	4		21.17	26.27		
1519	Sheep	42/114-237	4	64.65		25.02		
1636Y	Sheep	42/108-069	4		19.93	22.00		48.23
1857Y	Sheep	42/102-118	4			21.32		
2159	Sheep	42/84-005	3	57.83	22.47	23.05		
2200	Sheep	42/96-027	3	55.97	22.85	23.00		
2236	Sheep	42/96-029	3	52.48	16.06	21.31		
2513	Sheep	30/120-035	3/4	54.89				
2514Y	Sheep	30/120-035	3/4		19.75	23.66		52.53
2659	Sheep	30/126-058	4	62.96	22.68	24.87		
2681	Sheep	42/90-010	3	60.21		25.01*		
2771	Sheep	29/120-049	2/3	53.99	20.21	22.04		
1409	Goat	42/114-198	4	53.92	21.23	21.10		
2903	*Bos* sp.	30/126-074	4			53.91		
0274	Gazelle	36/96-007	3	49.98	15.76	20.05		
0697	Gazelle	36/120-120	4	56.74	16.37	20.17		
1046	Gazelle	60/120-028	4			22.27		
1663	Gazelle	42/102-202	4	53.77	17.96	21.43		
2174Y	Gazelle	42/84-005	3					44.87
2753	Gazelle	29/120-076	2/3	50.63		20.48		

Notes: Measurements follow: 1 = greatest length; 2 = greatest breadth; 3 = greatest lateral depth; 4 = greatest depth of the tuberosity; 5 = greatest length in absence of epiphyses.
* Estimate.

TABLE 10.37. Measurements for Tarsal Specimens.

Specimen	Taxon	Tarsal	Excavation unit	Level	Measurements in millimeters (tarsals)		
					1	2	3
1818[N]	Pig	Central	42/102-143	4	17.09	10.06	9.87
1931	Pig	Third	42/102-094	4	12.96	14.06	11.31
0252	Gazelle	Central–fourth	36/96-007	3	19.68	19.18	17.25
0502	*Equus* sp.	Central	36/102-026	2/3	33.29	42.26	17.00
1419	*Equus* sp.	Central	42/120-068	4		37.87	
2803	*Equus* sp.	Third	29/132-047	3		38.70	

Notes: Measurements follow: 1 = greatest length or depth; 2 = greatest breadth; 3 = greatest height.

TABLE 10.38. Measurements for Metatarsal III–IV Specimens.

Specimen	Taxon	Metatarsal	Excavation unit	Level	Measurements in millimeters (metatarsal)									
					1	2	3	4	5	6	7	8	9	10
1014	Sheep	III-IV	48/108-094	4								22.44	15.31	9.56
2263	Sheep	III-IV	42/84-022	3								24.08	15.62	10.56
2011	Goat	III-IV	42/102-046	4							23.68	14.75	8.31	
2391	Goat	III-IV	30/108-023	3							25.98	17.57	10.14	
0490	Pig	III	48/108-126	4	15.64	19.31								
0491	Pig	IV	48/108-126	4	14.36	20.30	20.53	10.94	32.39					
0939	Pig	III	42/114-107	4	15.97									
0958	Pig	III	42/114-136	4	14.06	17.62	17.65	9.68	27.71	13.71	14.63	10.56	70.47	68.88
0978	Pig	II	42/114-110	4	4.20	6.39	6.66							
1141	Pig	IV	42/114-109	4				10.94	32.39					
1181	Pig	II	48/108-126	4	3.90	6.25	6.22							
1220	Pig	III	42/114-198	4	15.47	19.35	19.60	10.66	30.05	15.26	15.39	10.72	74.05	73.40
1444	Pig	IV	42/114-136	4	13.13	18.00	18.23	10.29	29.76	15.00	15.88	10.10		
1553	Pig	IV	42/114-136	4				10.48	29.63					
1554	Pig	III	42/114-136	4				10.44	29.58					
1670	Pig	III	42/102-202	4	13.39	18.78	18.74	10.12	29.28	13.70	15.34	10.24	71.07	68.67
1904	Pig	III	42/102-094	4	16.53		10.90	33.43						
737	Gazelle	III-IV	42/108-044	3/4						18.72				
854	Gazelle	III-IV	42/114-138	4						19.26	14.82	9.81		
925	Gazelle	III-IV	42/114-198	4						20.38	14.67	9.50		
1450	Gazelle	III-IV	42/114-112	4	18.58	21.59	21.23							
1661	Gazelle	III-IV	42/102-202	4						19.58	14.79	9.83		
2483	Gazelle	III-IV	30/120-044	3/4	18.60	21.47	21.12	9.39	38.98					
2727	Gazelle	III-IV	29/126-087	4						24.41	15.78	9.63		
2759	Gazelle	III-IV	29/126-040	2/3						19.32	15.47	10.25		
2812	Gazelle	III-IV	29/132-023	2	17.58	19.37	19.51							
0875	Common crane	Tarsometacarpus	42/114-166	4				16.72						

Notes: Measurements follow: 1 = greatest breadth of proximal end; 2 = greatest depth of proximal end; 3 = greatest diagonal of proximal end; 4 = smallest breadth of diaphysis; 5 = smallest circumference of diaphysis; 6 = greatest breadth of distal end; 6 = greatest depth of distal end; 8 = smallest depth of distal end; 9 = greatest length; 10 = length excepting caudal projection off proximal end.

Table 10.39. Measurements for First Phalanx Specimens.

Specimen	Taxon	Excavation unit	Level	Measurements in millimeters (first phalanx)						
				1	2	3	4	5	6	7
0028	Sheep	42/114-255	4	35.00	11.78	9.23	12.07			
0067[Y]	Sheep	42/114-059	4	39.97	12.46	9.28	11.17			
0282	Sheep	36/90-007	3	37.78	14.39	12.29	13.36			
0320	Sheep	36/102-026	2/3		13.99	10.37				
0774	Sheep	42/114-190	4	39.77	13.38	10.07	11.86			
0866[Y]	Sheep	42/114-138	4		12.23					
0889	Sheep	42/114-136	4	37.11	12.27	9.78	11.70			
1414	Sheep	42/120-025	3/4	36.23	11.61*	8.51	10.61			
1429	Sheep	42/114-198	4	38.88	12.84	10.55	12.99			
1556	Sheep	42/114-136	4	37.82	12.83	10.04	12.08*			
1632	Sheep	42/108-055	4	39.16	12.23		11.35			
1855	Sheep	42/102-126	4	38.43	12.95	9.65	12.89			
2182	Sheep	42/84-008	3			8.52				
2246	Sheep	42/96-036	3	40.23	13.92	9.33	12.49			
2476	Sheep	30/120-044	3/4	38.83	12.80	9.99	12.30			
2477	Sheep	30/120-044	3/4			10.61	12.37			
2492	Sheep	30/120-042	3/4			8.66	11.58			
2539	Sheep	30/120-017	2/3	33.14	11.32	8.97				
2603	Sheep	30/126-009	2/3	35.64	11.44	8.24	10.71			
2613	Sheep	30/126-009	2/3	35.20	11.73	8.84	10.96			
2693	Sheep	29/114-023	2/3	41.82	14.20	10.97	13.29			
2801	Sheep	29/126-046	3			8.19	9.30			
2917	Sheep	30/126-066	3	37.19	12.48	10.06	11.79			
2968	Sheep	30/108-063	3	34.64		9.12				
0307	Goat	36/102-018	2/3	35.35	11.15	8.66				
0327	Goat	36/102-048	3	37.31	11.72	9.17	11.32			
0423	Goat	36/120-096	4	35.42	12.30	8.77	10.17			
0656	Goat	48/108-108	4	34.93	11.54	8.75	11.74			
0879	Goat	42/114-167	4	43.41	13.75	11.20	13.46			
0880	Goat	42/114-167	4	41.36	13.80	11.18	12.97			
0968	Goat	42/114-137	4			8.52	10.78			
1040	Goat	60/120-038	5		13.56	11.08	11.69			
1079	Goat	48/108-138	4		14.39					
1080	Goat	48/108-138	4	35.83	10.82	8.81	10.52			
1109	Goat	36/120-120	4	34.94		9.29	10.24			
1133	Goat	42/114-109	4	34.94	11.21	9.78	11.07			
1134	Goat	42/114-109	4	37.05	11.61	10.10	11.10			
1135	Goat	42/114-109	4	35.27	11.74	9.77	11.00			
1136	Goat	42/114-109	4		11.51					
1428	Goat	42/114-198	4	38.46	13.58	12.23	12.75			
1745	Goat	42/102-147	4	34.97	11.97	10.38	11.55			
2025	Goat	42/102-043	3/4			9.62				
2231	Goat	42/96-040	3/4	45.34	15.45	13.28	15.26			
2254	Goat	48/90-009	3	36.88	12.21	9.58	11.97			
2704	Goat	29/126-040	2/3	37.04	11.49	9.14	11.60			
2710	Goat	29/108-028	3	34.24	10.70	8.35	10.00			

Continued on next page

TABLE 10.39. Measurements for First Phalanx Specimens (*continued*).

Specimen	Taxon	Excavation unit	Level	Measurements in millimeters (first phalanx)						
				1	2	3	4	5	6	7
0466	*Bos* sp.	60/120-038	5-7	56.57	25.67	21.87				
2780	*Bos* sp.	29/120-043	2/3	57.01	29.40	23.26	25.97			
0971[Y]	Pig	42/114-137	4			10.47	12.44			
1457[Y]	Pig	42/108-058	4			11.47	13.07			
1732[Y]	Pig	42/102-143	4			8.36	9.93			
1733[Y]	Pig	42/102-143	4			9.66	11.81			
1805[Y]	Pig	42/102-143	4			9.71	11.24			
1806[Y]	Pig	42/102-143	4		8.55	9.99				
1902[Y]	Pig	42/102-094	4			12.59				
1936[Y]	Pig	42/102-094	4			12.79	15.42			
1937[Y]	Pig	42/102-094	4			12.36				
1938[Y]	Pig	42/102-094	4			11.76	14.60			
1939[Y]	Pig	42/102-094	4			13.28	15.21			
1940[Y]	Pig	42/102-094	4				17.61			
0276	Gazelle	36/96-007	3	38.15	9.14	6.60	7.87			
0277	Gazelle	36/96-007	3	37.95	9.10	6.33	7.96			
0278	Gazelle	36/96-007	3	35.45	9.91	6.99	8.27			
0279	Gazelle	36/96-007	3	38.46	9.10	6.30	8.03			
0280	Gazelle	36/96-007	3	35.79	9.55	6.67	7.83			
2091	Gazelle	42/102-202	4				8.21			
2094	Gazelle	42/102-202	4			6.40	8.28			
2487	Gazelle	30/120-044	3/4	35.89	10.27	7.05	8.68			
2556	Gazelle	30/120-056	4	38.63	11.91	8.07				
2563	Gazelle	30/126-050	3	38.65	9.25	6.42	8.01			
2564	Gazelle	30/126-050	3	39.75	8.88	6.62	8.21			
2584	Gazelle	30/126-036	3	35.91	9.80	7.26	8.19			
2658	Gazelle	30/126-058	4			5.73	7.42			
2805	Gazelle	29/132-047	3	36.64	9.58	7.26	8.14			
2813	Gazelle	29/132-023	2	36.24	10.59	7.08	8.56			
2874	Gazelle	30/96-074	3	36.30	10.95	6.99	9.00			
2970	Gazelle	30/108-069	3			6.44	7.47			
0305	*Equus* sp.	36/102-033	3				33.97			33.97
0659	*Equus* sp.	48/108-077	4	77.89	43.20	25.17	36.76		33.09	32.71
1104	*Equus* sp.	36/120-227	5	74.61	38.56	24.05	32.59	37.08	26.95	30.45
1363	*Equus* sp.	42/114-310	5		42.28			39.63	30.99	
2314	*Equus* sp.	30/108-023	3	74.50	42.35	25.37	33.93	39.24	30.48	32.88

Notes: Measurements follow: 1 = greatest length; 2 = greatest breadth of proximal end; 3 = smallest breadth of diaphysis; 4 = greatest breadth of distal end; 5 = breadth of proximal articular surface; 6 = greatest depth of proximal end; 7 = breadth of distal articular surface.
* Estimate.

Table 10.40. Measurements for Second Phalanx Specimens.

Specimen	Taxon	Excavation unit	Level	Measurements in millimeters (second phalanx)						
				1	2	3	4	5	6	7
0518	Sheep	36/102-045	3	24.22	13.03	10.06	10.99			
0881	Sheep	42/114-170	4	23.99	11.76	8.52	9.61			
1202	Sheep	42/114-069	4		13.13	9.18	9.98			
1465	Sheep	42/108-061	4	23.28	11.76	8.03	9.05			
1466	Sheep	42/108-061	4	24.12	11.46	8.30	9.50			
1949	Sheep	42/102-094	4	25.51	12.31	8.32	10.50			
2107	Sheep	42/96-005	2	24.91	11.76	8.48	9.61			
2367	Sheep	42/90-014	3		12.76	9.67				
2510	Sheep	30/120-033	3		11.56	8.48				
2587	Sheep	30/126-035	3	25.38	13.93	9.85	10.25			
0244	Goat	38/108-008	3	22.29	12.81	9.53	9.50			
0500	Goat	36/120-027	3	28.90	15.34	11.25	12.01			
0882	Goat	42/114-170	4	24.75	13.11	9.95	10.32			
1137	Goat	42/114-109	4	23.79	11.44	8.37	9.64			
1349	Goat	42/114-081	4	22.51	11.04	7.45	8.07			
1209	*Bos* sp.	42/114-180	3/4		28.06					
0972	Pig	42/114-137	4			11.31	12.89			
1730Y	Pig	42/102-143	4			4.16	4.67			
1734Y	Pig	42/102-143	4		11.60	9.76	10.24			
1903	Pig	42/102-094	4	21.46	13.51	11.47	11.55			
0091	Gazelle	48/90-007	2	19.79	7.90	5.38				
2092	Gazelle	42/102-202	4	20.62	8.53	5.79	7.47			
2095	Gazelle	42/102-202	4	21.30	5.59	7.38	21.37			
2565	Gazelle	30/126-050	3	21.37	8.52	6.23	7.61			
2716	Gazelle	29/120-074	2/3	20.45	7.77	5.82	7.43			
2326	*Equus* sp.	30/108-030	3	35.16	36.91	33.17	35.51			
2884	*Equus* sp.	30/96-079	3	37.30	41.31	36.30	39.40	38.62		
2891	*Equus* sp.	29/102-039	3	38.10	42.63	38.85	40.64	40.29	26.64	
2901	*Equus* sp.	30/126-076	4/5	40.90	37.55	32.54	35.66	36.15	25.80	

Notes: Measurements follow: 1 = greatest length; 2 = greatest breadth of proximal end; 3 = smallest breadth of diaphysis; 4 = greatest breadth of distal end; 5 = breadth of proximal articular surface; 6 = greatest depth of proximal end; 7 = breadth of distal articular surface.

Table 10.41. Measurements for Third Phalanx Specimens.

Specimen	Taxon	Excavation unit	Level	Measurements in millimeters (third phalanx)					
				1	2	3	4	5	6
2157	Sheep	42/84-005	3	23.67					
2360	Sheep	42/90-012	3	37.08	12.52				
0111	Goat	42/120-005	3			15.61			
1138	Goat	42/114-109	4	28.12		14.13			
1139	Goat	42/114-109	4	28.46	22.24	14.61			
1140	Goat	42/114-109	4	28.15	22.26	14.62			
1425	Goat	42/114-198	4	29.96					
1002	Pig	48/108-041	4	25.07	24.59	15.13			
0070	Gazelle	42/84-011	3	23.89	17.58	12.55			
0251	Gazelle	36/96-007	3	29.21	22.61	15.03			
2093	Gazelle	42/102-202	4	23.97	18.81	12.64			

Notes: Measurements follow: 1 = greatest length; 2 = length of dorsal surface; 3 = height measured at extensor process; 4 = length of articular surface; 5 = breadth of articular surface; 6 = greatest breadth.

anatomical progression from cranial elements through the vertebrae to the appendicular skeleton, first the forelimbs and then those of the hind quarters. Each table provides a key to the measurement numbers, which largely correspond to those of Von den Driesch (1976). Additions to her system are few and the descriptions accompanying each table should make clear the dimension being recorded. Specimen numbers followed by a superscript "Y" represent material from a young, generally subadult animal, and those marked by a superscript "N" represent neonatal specimens. Measurements tagged with an asterisk are estimated. All measurements are in millimeters.

NOTES

[1] Analysis of the Raqa'i faunal assemblage was undertaken as part of a doctoral research program completed at Johns Hopkins University under the direction of Glenn M. Schwartz, and with Melinda A. Zeder of the National Museum of Natural History (NMNH; Smithsonian Institution) serving as research supervisor for the processing of specimens. I am deeply grateful to both for their guidance and training, and particularly wish to thank Glenn for entrusting me with the zooarchaeological analysis and Mindy—who had originally prepared a manuscript for this volume based solely on the results of the first-stage examination—for graciously permitting me to author this chapter based on the updated data obtained through my dissertation research. Canan Çakırlar (now with the Groningen Institute of Archaeology of the University of Groningen) assisted with the identification of mollusk material, and Storrs Olson (curator emeritus with the Division of Birds of the NMNH's Department of Vertebrate Zoology) provided advice concerning the identification of avian remains. Thanks are also due to the two anonymous reviewers, whose comments—along with the editorial changes and suggestions made by Glenn Schwartz—greatly improved this chapter. The research reported here was supported in part by a Smithsonian Institution Predoctoral Fellowship.

[2] A recent revision of the Early Jezirah regional dating scheme has been published as part of the ARCANE Project sponsored by the European Science Foundation (Lebeau 2011). This updated periodization will likely become the accepted standard for the Early Bronze Age of the Khabur Basin, since it is the product of a thorough evaluation of the available ceramic sequences, artifact inventories, relevant architectural evolution, and associated radiocarbon dates by a variety of specialists. Only approximate estimates of absolute dates can be proposed, but the occupation of Raqa'i can be dated as follows: level 5 = early/middle Early Jezirah 1 (ca. 2800 BCE); level 4 = later Early Jezirah 1/early Early Jezirah 2 (ca. 2700 BCE); level 3 = Early Jezirah 2 (ca. 2600 BCE); level 2 = Early Jezirah 3a (ca. 2500 BCE).

[3] The material is in the care of the Program in Human Ecology and Archaeobiology of the Department of Anthropology, National Museum of Natural History, Washington, DC.

[4] Analysis of the Raqa'i faunal assemblage was conducted at the Zooarchaeology Laboratory of the National Museum of Natural History (Smithsonian Institution) using the osteological reference collections of the Archaeobiology Program as well as those of the Department of Vertebrate Zoology. Mollusk specimens were examined with the aid of the comparative collections of the Department of Invertebrate Zoology and the identifications confirmed with Canan Çakırlar, an archaeomalacologist specializing in the mollusk fauna of Turkey and Syria who was at the time a postdoctoral fellow of the Zooarchaeology Laboratory.

[5] Based on 16 specimens. The longer and slightly less dense first phalanx may be more susceptible to fragmentation than the more compact second, so the ratio based on the MNE numbers is likely a more accurate measure, although in this case the results are the same. The calculation of NISP and MNE values is explained later in the text.

[6] These "missing" specimens may actually be the result of mistaken counts or data entry errors when the material was first processed during the first-stage analysis, although it is probable that a few specimens were lost or misplaced during rebagging following the preliminary examination.

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Chapter 11

Discussion and Conclusions[1]

Glenn M. Schwartz

The results from Tell al-Raqa'i provide a corpus of archaeological data about a village community from the centuries immediately prior to and during the advent of urbanization in the upper Khabur region. In levels 4 and 3, we have obtained a large sample of a village with its extant structures and associated finds. These results allow us to evaluate some of the questions discussed in Chapter 1 with respect to the nature of small, rural sites in a period of emerging urbanism.

Contrary to expectations of a socially and economically "homogeneous" community, Raqa'i contained evidence of differentiation. Spatially, for example, one can discern distinct neighborhoods, especially in level 3. The West area with its two-room houses, the Temple precinct, the East area with multiroom houses, the "industrial" area in the southeast, and the Round Building are indicative of diverse activities and, perhaps, social or economic groups localized in different parts of the site. One may infer cultic activities associated with the temple, grain storage and processing in the Round Building, domestic life outside those structures, and craft production activities (e.g., metallurgy; see Chapter 8) in the southeast.

This architectural differentiation is correlated with artifact distribution. In level 3, the West and Temple areas have a larger share of metal objects and fine or elaborately decorated pottery (Metallic Ware, Ninevite 5 incised vessels) than other zones, while the Southeastern area demonstrates an abundance of Cooking Ware sherds. In level 4, the Round Building and South areas are distinguished from other zones by the predominance of Cooking Ware and paucity of Fine Simple Ware. Sealings mainly derive from the Round Building, while tokens were found in the North.

While such spatial differentiation is apparent at the neighborhood scale, a similar pattern is not apparent at the smaller scale of the individual house (particularly in level 3, with its large sample). Ovens, fireplaces, lime-plastered installations, and other domestic features (and, one assumes, their related activities) were situated in a variety of locations inside rooms and were not relegated to specific parts of the house, contrary to the pattern observed in Neolithic Çatalhöyük, for example (Hodder 2006).

Economic specialization at Raqa'i is especially indicated by the ecofactual results. As Van Zeist shows (Chapter 9), there is a significant shift from a diversified set of plant species in level 5 to a concentration on barley in levels 4–3. Similarly, Rufolo (Chapter 10) observes a trend away from exploitation of a broad array of wild and domestic species toward a specialized focus on sheep and goat pastoralism. While the significance of these changes remains to be fully explicated (see below), they represent a major economic departure from the preceding periods.

Growing evidence of economic specialization is also indicated by craft production data. In the pottery assemblage, the percentages of handmade cooking ware sherds decline from levels 5 to 2, while medium and fine wares produced with the aid of a potter's wheel increase. Although it is unclear whether the wheelmade vessels were made on-site, their presence demonstrates the Raqa'i inhabitants' increasing dependence on products manufactured by specialists (Wattenmaker 1998). Likewise, the abundance of Canaanean blades reveals that the villagers acquired a significant component of their lithic toolkit from specialists based elsewhere, perhaps as far away as southeastern Anatolia. On the other hand, the distribution of

spindle whorls, bone awls, and bone needles throughout the site suggests that textiles were produced by individual households rather than specialized workshops.

Possible evidence of social differentiation is indicated by spatial patterning of artifactual distribution and in burials, although this is relatively understated. In level 3, indications are of a greater abundance of higher-status artifacts in the western and temple areas, including Metallic Ware sherds, Fine Simple Ware sherds, bronze objects, and sealings. Yet while the two-room houses in the west might be hypothesized as higher-status domiciles, their construction methods and materials (e.g., lime plaster) are not dissimilar to those of the east, nor is there a significant difference in the faunal assemblages of east and west. Stuart (Chapter 6) observes that status distinctions might be discernible in the level 2 child burials but comments that such differentiation is not easily inferred from the level 3 sample. Grave good differentiation by age, on the other hand, is clear in both levels, with a distinction between children older than 1 year and younger infants. One may also note the presence of a tin-bronze toggle pin (Raq 90 M-049) from level 3 or 4, understood to represent a high status object in contrast to the usual arsenical copper artifacts (see Chapter 8).

Although the role of gender in the life of the Raqa'i villagers is an issue of considerable interest, particularly with respect to changing social positions during the emergence of societal complexity, evaluating this issue poses challenges (Hendon 2007). It would be useful to determine whether gendered divisions of labor existed and how they were organized spatially, for example, but one is compelled to assume such divisions of labor a priori using textual evidence from distant regions like southern Mesopotamia. If textile production was a female activity, as proposed for Mesopotamia, then it can be observed that spindle whorls and bone awls were distributed throughout the level 3 settlement, without obvious restrictions to particular zones or rooms. While the relative social status of men and women might be studied through burial data, the small corpus of sexable skeletons from level 3 (three women, two men) makes it difficult to come to any definitive conclusions. One can observe, at least, that both sexes were interred with similar objects, including pottery, toggle pins, and beads. The bone awl found with the female in burial 1 might signify an association with textile production, but one hesitates to offer such interpretations on the basis of such a minimal sample.

A striking characteristic of the results from the Raqa'i excavations is the relatively low artifact density. Compared to other sites, especially large ones, Raqa'i yielded relatively little artifactual and ecofactual material.[2] The minimal attestation of such material from the earliest phase, level 5, is particularly clear. As discussed in Chapter 4, it is possible that this pattern is at least partly due to the absence of residual artifacts and ecofacts from earlier levels, since level 5 is the first occupation on the site. But such an argument cannot apply to later levels. Since the materials from Raqa'i were almost exclusively from secondary contexts at best, it is possible that the inhabitants possessed and made use of many more material objects than is apparent from the excavations, but the consistently minimal number suggests otherwise. One might interpret this paucity of artifactual and ecofactual material as evidence of the inhabitants' relative lack of material things, that is, "poverty," compared to "richer" sites like Tell Brak that teem with material remains. Alternatively, the inhabitants may have shared the practice of keeping their immediate environs relatively free of trash. One could also propose that the relative paucity of materials was due to seasonal occupation, in which a segment or the entirety of the population moved elsewhere to pasture their herd animals for part of the year, although there are arguments against such a seasonal interpretation (see Chapter 3). It is also conceivable that the low density of artifactual material reflected an intentional effort on the part of the inhabitants to limit social distinctions between individuals (Pollock, Bernbeck, and Abdi 2010), but the level 3 differentiation between the western two-room houses and the eastern multiroom units suggests that differentiation did exist. Likewise, in a more limited fashion, we can discern evidence of differentiation in the distribution of artifact types in the different "neighborhoods" of the site.

Although the relationship between sites like Raqa'i and larger centers elsewhere can be debated (see below), we can certainly observe that the lifestyle maintained by its inhabitants was not a seamless continuation from that of villagers in prior eras. The specialized focus on barley and on sheep/goat pastoralism are the clearest pieces of evidence indicating that major change had occurred in the lives of the people living in this small community. Similarly, personal ornaments in the Raqa'i burials as well as other artifacts exhibit stylistic similarities to comparable objects found in larger centers, indicating substantial communication

between residents of such centers and smaller sites in the region.

The evidence from Raqa'i indicates that while other pursuits may also have been significant, agriculture was certainly an important, if not the most important, activity in the community. The frequent recovery of flint Canaanean blades, interpreted as threshing sledge elements made by specialists elsewhere, indicates that threshing activities were common. The rarity of sickle blades (although present to a small degree) is curious and may indicate alternate methods of harvesting, but it is probably unwise to conclude that the Raqa'i inhabitants did not cultivate and harvest their own crops, given the archaeobotanical results presented by van Zeist (Chapter 9). Presumably the frequency of storage emplacements interpreted as granaries in levels 5–3 likewise signals the importance of agricultural pursuits. Whether the Raqa'i residents conducted irrigation agriculture, dry farming, or a combination of the two is not certain, but van Zeist's data show little evidence for the practice of irrigation, a conclusion mirrored by Joy McCorriston's results (1998).

It is likely that pastoral herding of sheep, goat, and other animals was also important in the lives of the Raqa'i villagers. Whether the village inhabitants included groups who moved with their flocks to distant locations seasonally, or whether the villagers were in economic contact with other groups of mobile herders, as has been discussed (see below), are possibilities that require further consideration. Textile production, particularly of wool garments, must have taken place on the site, given the recovery of spindle whorls.

Evidence of ritual and of the religious life and beliefs of the Raqa'i inhabitants might be derived from a variety of sources. The small temple of level 3, centrally located and restricted behind its enclosure wall, attests to ritual activities beyond the domestic sphere. Its location in the site center indicates its significance to the community as a whole, yet its enclosure wall indicates a degree of restriction or control of access (Moore 1996, 2004; Peltenburg 2007/2008). The open area 24 inside the temple enclosure could have accommodated a reasonable proportion of the site inhabitants, but the small temple itself was clearly not meant to host more than a few individuals. No obvious religious features are apparent in the houses, but the predominance of animal and human figurines throughout the site must be relevant. Although their precise function is difficult to demonstrate, it is not unlikely that the figurines were used for apotropaic rituals (Petty 2006). Likewise, the use of beads of different shapes and sizes in the graves of children has been interpreted as evidence of apotropaic activities (Dunham 1993).

The mortuary evidence also affords a useful window into the worldviews and *habitus* of the people at Raqa'i. In levels 5 and 4, there is a near or complete absence of evidence for burials, indicating a separation between the world of the ancestors or deceased relatives and the living community. There is a pronounced change in level 3, when the Raqa'i denizens maintained a close connection to their dead, who were often buried below room floors or in open areas near houses. Yet it must be the case that not all Raqa'i 3 residents were buried on-site, since the restricted number of burials (only 19) is unlikely to represent the entire population of the village, small as that probably was. Still to be elucidated are the special characteristics that set apart those whose remains were kept within the community after death. A final change occurs in the level 2 occupation, which only has evidence of the burial of children, primarily interred in mudbrick tombs situated on the edges of the site. Given the fragmentary and minimal architectural evidence, it is not at all certain that the children buried in the level 2 graves had lived in the community, and one might propose that they derived from groups based elsewhere or from mobile populations (but note the restriction of the graves to the site edges, which may imply the existence of architecture in the site center that has since disappeared). In any case, the adults associated with those children were treated in a different way and were located in a different place after they died, indicating a significant distinction in the treatment and conceptualization of adult as opposed to subadult dead. In all the burials in the third millennium levels, only a single individual was placed in the grave, implying that identification and association with a larger group, whether defined by kinship or other criteria, was not viewed as of primary importance in death.

Apart from general trends that can be understood as characteristic of the third millennium community at Raqa'i, there are important diachronic changes that can be observed. The character of each level differs from the next in substantial ways. Level 5 is particularly characterized by grill architecture, which is rare or absent in the succeeding levels. Level 4, which sees the construction of the Round Building with its silos, platforms, and other units, exhibits a new community plan organized radially around the Round Building, with houses and storage structures in the belt of densely

packed structures encircling it. In level 3, a similar village plan is evident, but a number of significant innovations appear, including two-room houses, a temple or shrine inside its own "precinct," burned clay fireplaces, and the practice of burying (some of) the dead within or outside the houses. Level 2 presents a far less congested community (unless traces of additional architecture have completely vanished), no large-scale storage facilities, no large, thick-walled ovens as in levels 5–3, and a distribution of child burials on the fringes of the site.

EARLY THIRD-MILLENNIUM SITES IN THE MIDDLE KHABUR REGION

The results from Raqa'i and other middle Khabur contemporaneous small sites of the early third millennium BCE have engendered debate and discussion especially because of three factors: (1) the appearance of numerous small sites along the river after a period of sparse habitation, (2) the prevalence of grain storage emplacements at many of those sites, and (3) an economic shift from a broad-based subsistence agriculture to a specialized focus on barley and sheep/goat exploitation. This volume adds further data to consider in the interpretation of these sites, but it does not provide any "smoking gun" to conclusively demonstrate that one hypothesis is preferable to another. In this chapter, I review the evidence for the three factors noted above and the varying hypotheses proposed, noting new evidence from Raqa'i as relevant.

The results of survey (Monchambert 1984) and excavation have indicated that the middle Khabur salvage region had only minimal occupation in the fourth millennium BCE but experienced an explosion of settlement in the third millennium. For the fourth millennium, survey detected evidence of possible habitation at only four or five sites (Mulla Matar, Ziyadeh, Fleti North, Umm Qseir, and Mashnaqa), a modest level of occupation also confirmed by excavation.[3] In contrast, Monchambert estimated 17 (or 22) sites to have third millennium occupation, and excavations have confirmed substantial early third millennium occupation at Rad Shaqrah (Bielinski 1993), Mulla Matar (Sürenhagen 1990), Kerma (Saghie 1991), Raqa'i, Gudeda (Fortin 1993), 'Atij (Fortin 1993), Tuneinir (Fuller and Fuller 1994), Ziyadeh (Buccellati, Buia, and Reimer 1991; Hole 1999), Melebiya (Lebeau 1993), Bderi (Pfälzner 1990, 2001), Knedig (Klengel-Brandt, Kulemann-Ossen, and Martin 2005), and Mashnaqa (Monchambert 1987).

Excavation at a number of the early third-millennium (Early Jezirah 1–2) sites revealed a prominence and centrality of storage architecture interpreted as granaries or grain silos. These were particularly salient at Kerma, Raqa'i, and Atij, three adjacent sites on the east bank of the Khabur, each spaced ca. 2 km from the next.[4] At Raqa'i in level 5, grill architecture of a type often understood to be associated with grain storage was commonly encountered, while level 4 yielded apparent grain silos within the Round Building and outside it to the northwest. Large mudbrick platforms and mudbrick ovens are associated with the silos, perhaps for drying and parching grain prior to long-term storage (Hillman 1985:12; Schwartz 1994). While there were no obvious silos in the level 3 Round Building, the reconstruction of the edifice in level 3, its mudbrick platform 88B, and its mudbrick ovens indicate a continuity of function. Further, the re-use of several of the level 4 silos in the northwest part of the site (level 3, areas 4–6) implies a continued attention to grain storage.

The excavations at Kerma, upstream from Raqa'i, exposed a central storage unit with adjacent rooms for processing; the discovery of abundant carbonized wheat and barley found in situ in this facility affirms its identification as a structure used for storing and processing cereals (McCorriston 1995; Saghieh 1991). No domestic architecture was reported from the site. At 'Atij, downstream from Raqa'i, many spaces in a diversity of levels were identified as grain silos due to their lack of doors, evidence of vaulted roofs, and lime-plastered interiors. The excavator, Michel Fortin (1990a), concluded that there was almost no evidence for domestic architecture at 'Atij.

On the west bank of the Khabur, a large storage emplacement was also identified at Knedig (Klengel-Brandt, Kulemann-Ossen, and Martin 2005), which has a set of similar-sized squarish cubicles in a building set apart from the rest of the community in the site center (Complex A). Carbonized grain was found in situ, and no domestic features were attested. Also on the west bank, grill architecture and adjacent doorless structures have been identified as probable storage facilities at Ziyadeh (Hole 1999).

The identification of the Kerma, Raqa'i, Knedig, and Ziyadeh examples as storage emplacements seems relatively secure. For 'Atij, Pfälzner (2001) has proposed that some spaces in the central part of the main mound at 'Atij were used for domestic purposes but agrees that granaries were located on the north and south. At 'Atij, structures were identified as silos particularly if they

were lime-plastered, which is the reverse of the interpretation conducted at Raqa'i: there, the domestic architecture was usually lime-plastered, while the silos were mud-plastered or without plaster. Whether the 'Atij inhabitants prepared silos in a different fashion than those of Raqa'i or the use of lime plaster is not an appropriate diagnostic of storage at 'Atij remains to be determined.

Most of the attested granary examples have evidence of a defensible, protected space for the stored materials. At Raqa'i, the thick walls of the Round Building and its single narrow entryway ensured against easy pilfering. The 'Atij main tell, which includes silos and, perhaps, domestic structures, is itself encircled by an impressively tall mudbrick enclosure wall, and Kerma is likewise said to be circumvallated. At Knedig, Complex 1 is separated from the domestic structures to its west by a dividing wall.

In addition to the sites already mentioned, diverse types of architecture have been identified at the small contemporaneous middle Khabur communities of Mulla Matar (Sürenhagen 1990), Rad Shaqrah (Bielinski 1993), and Mashnaqa (Beyer 1995), including enclosure walls and glacis constructions at the former two sites. It may be that these sites also had large facilities for grain storage and processing, as has been suggested for Mashnaqa, but further excavation would be necessary to confirm or reject such a hypothesis. Small samples of contemporaneous occupations have also been excavated at Tuneinir (Fuller and Fuller 1991), Bderi, at ca. 6 ha, the largest of the middle Khabur third millennium sites (Pfälzner 1986–1987), and Melebiya (levels 3–4) (Lebeau 1993).

Ecofactual data provide the third important variable in our understanding of the middle Khabur settlements. In his archaeobotanical study of the Raqa'i remains (Chapter 9), Van Zeist observes important changes in the botanical remains collected from level 5, levels 4 and 3, and level 2. The plant remains from level 5 were remarkably few and included a diversity of cereals, including wheat (emmer, einkorn, and free-threshing hard wheat or bread wheat) and two-rowed barley. In contrast, the botanical material from levels 4 and 3—the period of the Round Building and the brick silos—was much more numerous and had a high ratio of barley to wheat, implying surplus production of barley. In level 2, the emphasis on barley disappears and a return to a subsistence economy is indicated. A similar shift from a self-sufficient, broad-based agricultural regime to a specialized concentration on barley is also attested at 'Atij (McCorriston 1998). This apparent intensification and specialization of grain production is mirrored by the diachronic patterns in architecture: at both 'Atij and Raqa'i, the earliest levels contained grill architecture, perhaps associated with smaller-scale, subsistence level storage, as in the Neolithic (Hole 1991), while larger, centralized storage emplacements like the Raqa'i Round Building are constructed in later levels, when a specialized focus on barley becomes evident.

The shift from a broad-based subsistence strategy to a specialized economy is also reflected in the faunal material analyzed by Rufolo (Chapter 9). In his data, a diverse assemblage of domestic and wild species in the earlier levels at Raqa'i is gradually replaced by an ever-narrowing focus on sheep and goat. Contrary to the archaeobotanical results, there is no return to a diversified subsistence economy in level 2; instead, the emphasis on caprines is maintained. The same general pattern is observed by Rufolo (2011) in the data from 'Atij, Ziyadeh, and Gudeda.

Since the middle Khabur sites are located in what is today an agriculturally marginal location, below the 250-mm isohyet, the question has arisen as to whether irrigation was practiced by the ancient inhabitants. As van Zeist (Chapter 9) observes, irrigation could have been conducted by damming the river and distributing the water over the river valley, whose soils are superior to those of higher terrain.[5] But the archaeobotanical results detailed by van Zeist indicate that irrigation was not a major practice, given the relatively rare presence of weed species associated with that endeavor. The results from 'Atij, Kerma, Ziyadeh, and Bderi (van Zeist 2008) are similar, with little or no evidence of floodplain cultivation or weeds associated with irrigation.

If irrigation was not practiced, dry farming would have been required. Current assessments of the climate of the early third millennium indicate the existence of a wet period subsequent to the aridification episode of the late fourth millennium (Hole 1999; Wossink 2009). In such a case, the amount of precipitation in the early third millennium Khabur may have been sufficient (or more than sufficient) for tenable agricultural harvests produced without irrigation. It is possible that these unusually wet conditions encouraged settlement of what had been an uninvitingly dry river valley in the fourth millennium, accounting for the remarkable increase in settlement in Early Jezirah 1.

"Export" Hypotheses

The discovery of a string of small sites with granaries along the middle Khabur that appeared in the early

third millennium has provoked a set of hypotheses to explain this phenomenon. The first proposal derived from the excavators of 'Atij and Raqa'i, who posited that the storage capacities of the excavated silos indicated a collection of grain in excess of the needs of the local inhabitants (Fortin 1990a; Schwartz 1994; Schwartz and Curvers 1992). Assuming the presence of a surplus, Curvers, Schwartz, and Fortin hypothesized that the middle Khabur focus on grain storage and processing was conducted under the supervision of elites at larger centers elsewhere, in a system of staple finance (Earle and D'Altroy 1982). Staple finance, identifiable in "chiefdoms" or other middle-range societies and early states, involves the mobilization of staples from the general population, the bulk storage of such staples, and their use to feed individuals performing services for the elite (D'Altroy and Earle 1985; Polanyi 1968). D'Altroy and Earle proposed that large-scale centralized storage of staples in the archaeological record can often be interpreted as a material correlate of staple finance. It was also argued that evidence for a centralized administration of the grain storage and processing facilities in the middle Khabur includes seal impressions on clay, clay tokens, and cylinder seals (see Chapter 5, this volume; Fortin 1990a; Sürenhagen 1990:abb. 28, 29). Numerical notation tablets have been retrieved from Raqa'i level 2 (see above), 'Atij (Fortin 1990a:figure 20), and Bderi (Pfälzner 1990:77); however, all three appear to derive from Early Jezirah 3a contexts, subsequent to the period with the greatest evidence of bulk grain storage specialization (see also examples from Tell Brak, from contexts earlier in the third millennium [Matthews 2003:107–108, 118–120], and from Tell Kashkashok III [Suleiman 2002]).

If the staple finance interpretation of the middle Khabur sites is correct, Raqa'i and its associates could provide examples of what Brian Hayden (1994:202) has termed "investment colonies." Such communities are established by elites in order to maximize agricultural surpluses through the appropriation and exploitation of undeveloped territory (cf. also Schwartz 1994:29, 33 n. 9, 11; Schwartz and Curvers 1992:419 n. 63). For the external areas associated with and provisioned by the middle Khabur grain storage/processing sites, several suggestions were made. The nearest candidates suggested were the large centers of the upper Khabur triangle such as Tell Brak (Weiss 1992:93). While it may be difficult to imagine large communities in the "breadbasket" of the upper Khabur turning to the agriculturally marginal middle Khabur for grain surpluses, the latter region may have been attractive as relatively virgin and unclaimed territory available for exploitation.[6] McCorriston (1994), for example, has proposed that increasing population and land use in a system utilizing alternate fallow had taken up the available land in the upper Khabur by the early third millennium. She discusses the proliferation of small sites in the middle Khabur as "extensification" to new, undeveloped areas.

Another possibility that was suggested for a large site associated with the middle Khabur villages was Mari on the Euphrates to the south. Although a far distance from the middle Khabur, Mari is understood to have been established as a large center at the beginning of the third millennium and experienced endemic problems with agricultural self-sufficiency. Early second millennium texts document the shipment of grain from the upper Khabur to Mari (Archi 1985:68; Durand 1990:86; Finet 1969, 1983; Lebeau 1990:247; Margueron 1991, 2004). They also provide evidence for the efforts by the Mari central authority to expand agricultural land in the marginal zone of Qattunan on the lower Khabur to increase the palace's supply of grain (Reculeau 2010).

A related question was whether the surplus grain processed and stored in the middle Khabur sites was locally grown or imported from elsewhere. Rather than functioning as repositories for the (ostensibly) mediocre harvests of the middle Khabur, the middle Khabur communities could have been intermediary collection points for grain cultivated in the fertile upper Khabur, to be sent downstream to Mari by boat (Curvers and Schwartz 1990:22; Fortin 1988:170). Hole (1999), however, cast doubt on this proposal, arguing that the transport costs, involving overland as well as waterborne transport, would have been too high.[7] Indeed, the current archaeobotanical evidence indicates that local cultivation was important in the middle Khabur sites (Fortin and Cooper 1994:44; McCorriston 1998; van Zeist, Chapter 9, this volume). Similarly, it would have made more sense to collect the grain from the upper Khabur plains in one or two entrepots on the middle Khabur than in a string of small sites, which would be more difficult to defend.[8]

On the other hand, possible evidence for the import of grain may derive from canonical correspondence analysis of plant remains from a variety of Syrian sites conducted by Alexia Smith (2005). In her study, she found the grain from Tell Kerma to be very similar to that of Tell Brak in the upper Khabur but not comparable to grain from the nearby sites of Raqa'i

and 'Atij. Since the grain from Kerma derived from a granary, while that from Raqa'i and 'Atij was collected from midden deposits, it could be suggested that the stored grain at Kerma originated from the upper Khabur, while grain produced locally at Raqa'i and 'Atij derived from dung fuel and had been used for foddering animals. Admittedly, this is a highly speculative proposal, but the difference between the Kerma samples and those of Raqa'i and 'Atij requires explanation.

Providing possible support to the export hypotheses are the archaeobotanical results from Raqa'i. Given the high ratios of barley in levels 4–3, it is tempting, as van Zeist (Chapter 9) remarks, "to interpret this as evidence of surplus production of barley destined for other than local consumption." Van Zeist observes that barley would make sense as a surplus cereal crop in this region, since it is more adaptable to relatively dry, marginal conditions than wheat.

These "export" hypotheses seek to explain the unusual character of the middle Khabur settlements, with their emphasis on large-scale storage, rapid proliferation in Early Jezirah 1, and shift to a specialized farming and animal economy. They require the existence of relatively large-scale political organizations ("chiefdoms" or the like) and their involvement and interest in the middle Khabur sites. Perhaps a rough comparison can be made with the late third millennium rural sites near Umma in southern Mesopotamia documented in the textual sources (Steinkeller 2007), although these were part of an economic and political organization vastly larger in scale and complexity than any in the Early Jezirah 1–2 Khabur. Rural sites in the vicinity of the city of Umma were small, specialized agricultural communities serving as grain processing and grain storage centers. Consisting of a grain silo, threshing floor, houses for the silo's personnel, and occasionally a small temple, the villages sent grain by boat to Umma and other large centers, keeping the remainder for local consumption.

The "export" hypotheses, invoking connections to larger scale political organizations or communities, are also influenced by what is understood as the relative sophistication of some of the village architecture. The silos in the Raqa'i level 4 Round Building with their vaulted buttresses and ceilings, integrated with the thick enclosure wall of the building, may imply specialized architects or construction personnel.

When considering the viability of the export models, it is important to consider two bodies of data that appeared subsequent to the models' initial promulgation that affect them significantly. One is provided by the analysis of archaeobotanical and faunal data, suggesting that the specialized economic strategies evident in the sites only gradually displaced subsistence strategies that were originally localized and diversified in character. The original settlers were practicing a self-sufficient subsistence economy based on both wild and domesticated species and only later did they focus on barley and caprines. If this interpretation is correct, it is unlikely that the small sites in the region were *originally* established by authorities from elsewhere for economic purposes.

Second, the likelihood that the middle Khabur sites were controlled or managed by a single external authority or polity is diminished by what we can now see as the variability of those sites. While many of them have large-scale storage features, the architecture differs from site to site. The Raqa'i Round Building, the Knedig storage facility, the 'Atij granaries, and the Ziyadeh structures all differ from one another in significant ways, as noted above.[9]

Additional critiques have been offered. One perspective holds that the grain surplus assumed by the export hypotheses was either not as substantial as claimed or was totally nonexistent. While accepting that the middle Khabur sites featured storage in excess of the needs of the village residents, Frank Hole (1991, 1999) has maintained that the scale of the stored grain would have been less than Schwartz (1994) proposed. He questions the figures provided by Schwartz (1994) to estimate the number of people required to produce the grain, the amount of farmland each person had to cultivate, and the amount of farmland available. Hole posits that available land for cultivation around Raqa'i was around 47 ha, much less than the 60–250 ha needed to produce the 150 cubic meters of grain Schwartz (1994) estimated for Raqa'i level 4, and that the higher land beyond the river was problematic for dry farming due to its shallow soil and rocky slopes.

Estimating the ancient population, the amount of grain storable in the silos, and the amount of available arable land depend on a multitude of factors, all of which are subject to uncertainty, so that arguments can be made for or against any number of interpretations, depending on which numbers are employed (Schwartz 1994:25–28). With respect to the extent of available farmland, McCorriston (1998:50) has raised the possibility that the poorer quality soils on the steppe beyond the river valley were cultivated, a suggestion inspired by the focus on barley, which would fare better than

other cereals in such conditions (see also Colledge 2003:416; van Zeist 2008). Likewise, van Zeist (1999) infers an expansion of farming to higher areas farther from the river in Raqa'i in levels 4–3, given changes in weed species.

Going further than Hole, Pfälzner (2002) doubts the existence of any significant surplus in the middle Khabur granaries and proposes that they served only the needs of their host communities. For Raqa'i, Pfälzner points out that Schwartz's (1994) estimates of the silo capacities when filled to the brim could be inflated (as Schwartz 1994 also noted), since it is unlikely that the silos were always full, and that Raqa'i level 3 was probably much larger in antiquity (almost double) than in its current form, due to erosion. Thus, the excavated silos could have been responsible for supplying a larger population at Raqa'i than Schwartz (1994) estimated.

In this author's opinion, it is unlikely that Raqa'i level 3 was as large as Pfälzner reconstructs, since it had to be smaller than the level 4 occupation below it as the mound rose higher, and the level 3 settlement was also restricted by the proximity of the river to the south (which may have experienced a higher water level in this period; see Hole 1999). The northern edges of the site are clearly indicated by the retaining walls 14L, 56H, 61B, 67B, and 68A. Allowing for the completion of the Round Building and architecture to its west, south, and east, we might arrive at an estimate of ca. 0.21 ha (see Chapter 3).

Even if the site was significantly larger in antiquity, one could also argue that it could have contained, not only more houses, but more silos. Further, Pfälzner's estimate of the site population can be called into question: he identifies the temple (area 21) as a house, assigning a family to it, as well as the very small areas 76/77 in the southeast "industrial" zone,[10] which inflates his estimation of the site population. Also inflating his estimate is the assumption that structures as small as house 2 (areas 20/83, 11.5 square meters) housed a family of five to six persons, as Wossink has noted (2009:58).

Regardless of how one estimates the population and storage capacities at Raqa'i, if one hypothesizes that the middle Khabur storage facilities served only as communal granaries, one still needs to account for the prevalence of storage architecture and the modest amount of domestic architecture at 'Atij, a possible comparable situation at Kerma, and a central storage structure at Knedig that is contemporaneous with houses possessing their own storage emplacements.[11]

Finally, there is skepticism on the association of tokens, seals, sealings, and numerical tablets with central authorities. Hole (1991, 1999) suggested that they were used for documenting exchange of goods with mobile pastoralists, while Pfälzner (2002) posited they were employed for household accounting. While it is true that tokens, seals, and sealings (as noted above, the tablets appear to post-date the period of the storage facilities) are not *necessarily* associated with centralized administration, they very often are, particularly in the fourth and third millennia. Likewise, the discovery of tokens or sealings in houses in Early Jezirah 3 Bderi or Melebiya (Pfälzner 2002) does not mean that they were only associated with private households, given the blurring of "private" and "public" in Mesopotamian contexts. In the Uruk period, there is ample evidence linking tokens to public institutions and large houses (e.g., at Habuba Kabira) (Schmandt-Besserat 1992:93).

ALTERNATIVE HYPOTHESES

In addition to critiquing specifics of the export hypotheses, Hole, Pfälzner, and others have put forward alternatives. In his work, Frank Hole (1991, 1999) argues that the scale of storage was not as high as Schwartz proposed but that a certain amount of surplus is nevertheless implied. He has proposed that the extra grain was used to feed persons and animals involved in a mobile lifestyle focused on sheep/goat pastoralism. In particular, he suggests that mobile pastoralists whose "primary sites" were on the steppe to the west were associated with the farming villages on the Khabur, receiving grain surpluses in return for pastoralist products. Eventually the agricultural potential of sites in the west was harnessed and the sites developed into the large circular *Kranzhügel* of the mid-third millennium, after which the pastoralists outgrew their need for the middle Khabur farmers' products (see Lyonnet 2004 for a similar proposal).

Hole's proposal supplies a viable alternative to the problems of the export hypotheses, postulating communities of farmers on the middle Khabur whose grain surpluses helped sustain mobile groups active west of the Khabur who were "tethered" to the sedentary sites. As is often the case, the existence of mobile groups associated with the sedentary sites is based on archaeologically invisible evidence, there being few clear material residues of such populations. An indirect indication of such groups was inferred from the

large number of small Early Jezirah 1–2 sites on the steppe west of the middle Khabur detected in the West Jezirah survey detailed in the doctoral dissertation of Nicholas Kouchoukos (1998), suggested to be associated with mobile pastoralist populations. Such an interpretation is compelling, although evidence for the date of these sites (e.g., pottery illustrations) was not provided in Kouchoukos' study.

A problem with Hole's and Kouchoukos' proposal, as Hole himself mentions, is that many of the relevant middle Khabur sites are on the east bank of the river, an unlikely spot for settlements intended to serve groups active in the western steppe.[12] There is also some confusion about the nature of the proposed relationship between the middle Khabur villagers and mobile pastoralists that they are presumed to be dealing with. In some scenarios, the pastoralists are part-time occupants of the villages, moving to the steppe seasonally; in others, the pastoralists are not inhabitants of the middle Khabur sites but exchange goods with them and at times pose a threat to them, requiring the defensive walls that the sites display (Hole 1999).[13] It should also be noted that urban planning and a non-specialized faunal assemblage from early levels at Chuera have cast doubt on the association of *Kranzhügel* sites with mobile pastoralists (Meyer 2010; Smith, Wilkinson and Lawrence 2014:163).

A similar focus on pastoralism and mobile populations is offered by McCorriston (1994, 1995, 1998) and others (Fortin and Cooper 1994:44; Schwartz 1994:31; Wright 1989:600) in a model that reconstructs a strategy of indirect storage (Halstead 1993) in the middle Khabur. Noting the preeminence of barley in the middle Khabur archaeobotanical assemblages and its applicability for animal fodder, McCorriston proposes that surplus barley was employed to feed herds of sheep and goat. According to her model, the local inhabitants engaged in a specialized pastoralism devoted especially to wool production in which animals were fed surplus grain during the dry season, when pasture was unavailable. The wool would have been provided to developing urban and state polities interested in wool as an economic resource.[14] In this sense, this hypothesis is an "export" hypothesis, but it is wool that is exported, not grain: indirect storage converts perishable foodstuffs like grain into a longer-lasting livestock resource. The possibility of a production of grain surplus for feeding animals is also raised by van Zeist (Chapter 9), but for pack animals. Like the staple finance hypothesis, the indirect storage model emphasizes the development of specialized economies connected to regional and even inter-regional networks of distribution.

This hypothesis is creative in looking beyond purely human consumption of surplus grain and in its successful inclusion of the specialization in barley and sheep/goat indicated by the ecofactual remains. A weakness is the assumption that a prevalence of barley necessarily implies the feeding of animals, since barley is also the common staple food for humans in Mesopotamia and Syria in the Bronze Age, to judge from texts and archaeobotanical evidence. As van Zeist notes, barley is easier to grow than wheat in agriculturally marginal locations.

Like Hole's hypothesis, there is no direct evidence to substantiate McCorriston's proposal. However, analysis of plant microfossils from dental calculus sampled from five human teeth at Tell al-Raqa'i may provide some support (Henry and Piperno 2008). According to analysis of the teeth, cereals made up only a small portion of the diet of the sampled persons. Such a conclusion might support the export hypotheses, with stored grain sent either to people or animals elsewhere.[15] It also appears to contradict Pfälzner's contention that the middle Khabur storage facilities served as communal granaries. One might suggest that the middle Khabur silos did not contain cereals, but this is contradicted by the results from Kerma. At present, it is difficult to evaluate the significance of this study, given the relatively small sample and the possible contextual problems.

In her review of the middle Khabur phenomenon, Zeder (1998, 2003) adopts a similar perspective to McCorriston's, focusing as well on sheep/goat pastoralism. She proposes that the local inhabitants shifted from a broad-based subsistence strategy exploiting a wide range of domestic and wild species to involvement in a specialized regional, urbanized economy in which sheep/goat products from herds on the steppe were provided to the developing centers of the upper Khabur. In discussing Zeder's interpretations, Kouchoukos (1998) objects that the middle Khabur sites declined just at the point that urban life in the upper Khabur blossomed, in Early Jezirah 3, making a link between urbanization and the middle Khabur storage sites unlikely. It could be noted, however, that it is now clear that at least two major sites to the north of the middle Khabur, Leilan and Chuera, expanded to urban proportions in Early Jezirah 2 (Meyer 2010; Weiss et al. 1993), and it could well be that processes leading to urbanization and increased demand for pastoral products began before that period.

Mention should also be made of Rufolo's analysis of the Raqa'i faunal material (Chapter 10) and his conclusion that there is no evidence for "a closely managed and surplus-oriented pastoral production of a distinctly high volume intended to supply nascent cities with wool or meat." While acknowledging the validity of his analyses, it is important to note that the animal bones found in the middle Khabur villages are not necessarily directly reflective of inter-regional economic trends. If, for example, large herds of sheep and goat were exploited by mobile populations in the steppe in order to provide wool and other animal products to larger centers in the upper Khabur, as proposed by McCorriston, such a pattern might not necessarily be evident in the animal bone debris of the middle Khabur sedentary villages. If the village occupants were primarily focused on providing grain to herders or to their animals (or to other people), they may have raised animals solely for their own subsistence needs and may not have left any faunal evidence relevant to the larger-scale animal economy.

Moving beyond the emphasis on feeding animals, one might posit that excess grain was intended for the local populace in case of bad harvests (cf. Hole 1999:278). In the marginal environment of the middle Khabur, where rainfall agriculture was dependent on a minimal amount of precipitation, it might make sense to provide an additional hedge against famine through large-scale storage. Current evidence suggests, however, that the early third millennium was a relatively wet period, so it may be inappropriate to assume that dry farming agriculture in the middle Khabur in that period was especially precarious.

In his study of middle Khabur storage sites, Pfälzner (2002) proposes that the Round Building at Raqa'i (and, presumably, the other granaries) did not contain surpluses intended for people or animals beyond the village housing it. Instead, he argues that the Round Building was a communal storehouse comparable to ethnographic examples from present-day northern Africa. Although this article has a number of omissions,[16] its basic proposal deserves serious consideration. In his study, Pfälzner proposes the existence of three modes of storage, domestic (for an individual household), communal (for an entire village), and redistributive, in which a central authority collects and disburses foodstuffs. He suggests that the middle Khabur sites of Early Jezirah 1–2 were characterized by communal storage, in which the villages used central granaries to store the foodstuffs of all the households, while in Early Jezirah 3 one sees a shift to domestic storage and a consequent disappearance of the central storehouses. Redistribution is visible in the centralized economies of the large urban centers to the north like Chuera and Beydar.

Pfälzner's argument for a "local" use of the storage facilities in the middle Khabur is supported by the variable nature of the storage complexes at the different sites, as noted above, and it has an advantage over Hole's proposal in that it does not rely on the existence of people who left no physical traces. The proposal also is in accord with the relative paucity of storage facilities in the Raqa'i level 3 houses (see Chapter 3). But there are weaknesses that can be identified in Pfälzner's arguments, which are detailed in the following discussion.

First, the methods of estimating site size, population size, storage capacity, spoilage, and the other relevant variables to determine whether or not the silos contained surplus staples are so dependent on different possible figures (Schwartz 1994) that one can make a case for either surplus or self-sufficiency. Second, in his rejection of the possibility of staple finance in the middle Khabur, Pfälzner implies that redistributive economies are only found in full-fledged urban, state societies: his archaeological examples of redistribution derive from Chuera and Beydar in Early Jezirah 3, the period of urbanization and early states. But mobilization and deployment of staples can also be employed by polities smaller and less complex than states. Whether or not one accepts or rejects the chiefdom as a model of socio-political organization (Pauketat 2008; Yoffee 2005), there clearly existed multi-community political organizations smaller than states, and these are likely to have included elites who made use of a strategy of staple finance, as detailed by Earle and D'Altroy. In Early Jezirah 1–2 Tell Brak, for example, evidence exists of administrative technology (clay sealings, cylinder seals, numerical tablets) used by a central organization that is not a state but is larger than the household or local community (Matthews 2003). That such an entity or entities may have included or been connected to the middle Khabur Early Jezirah 1–2 communities needs to be considered.

Further, Pfälzner does not take account of the specialized focus on barley observed in the archaeobotanical evidence, which, according to van Zeist, may lend itself to the reconstruction of a surplus production. Raqa'i and the other sites were not simply "post-Neolithic" villages contentedly pursuing a self-sufficient lifestyle; they had implemented significant changes in-

dicating specialized foci on barley and sheep/goat. This economic shift needs to be included in the explanation of the middle Khabur storage facilities.

Similarly, Pfälzner contends that the unplanned and irregular character of the Raqa'i Round Building with its many rooms of diverse shapes and abutting walls contradicts its interpretation as a storehouse connected with central authorities. Certainly it is true that this building does not compare to the regular, symmetric plans of later storage buildings like the granary at Tell Beydar, but again it is possible that the Round Building and similar facilities were associated with "middle range," pre-state/non-state political organizations. Likewise, the central storage area at Knedig (level XIII), while not as symmetric and simplified as the Beydar building, is distinct from the architecture adjacent to it in its orthogonal and relatively regular plan.

In positing that the Raqa'i Round Building served as a communal storehouse, Pfälzner likens it to ethnographic examples from northern Africa. The *irherm*, a multiroom storage building in Morocco, is the closest comparison, but the similarity of the other north African examples to the middle Khabur storage architecture can be questioned: the middle Khabur complexes involve large-scale architectural units, not separate storerooms as illustrated for most of Pfälzner's north African examples, and the scale of the African units' storage capacities is difficult to ascertain from the published illustrations. One also needs to understand the socio-political and economic context of the African examples—for whom are the stored foodstuffs intended (some or all members of the local community, others elsewhere?), and what is the role of central authorities in the accumulation or consumption of the stored materials?

Pfälzner's interpretation of the Raqa'i Round Building as a communal storehouse overlooks the fact that other activities were transpiring within the building. The silos make up only part of the structure, and even if the rooms with blocked doorways had been converted to storage space, as tentatively hypothesized (Schwartz 1994), there remain additional rooms, mudbrick platforms, and ovens, not to mention a profusion of cooking ware pottery and ground stone tools not obviously relatable to storage alone. Clearly there was more than storage going on here, whether it be processing of grain, cultic activities (Dunham 1993), administrative activities (cf. the scores of sealings in room 14, level 4), or other possibilities.[17] While the suggestion that each household had its own storage space in the Round Building is striking, with a suggested 26 households matching 26 storage spaces, the difference in size, shape, character, and contents of many of the spaces inside the building makes it unlikely that they were all used for storage; for example, the rooms in the western part of the structure with corbelled doorways must have been intended, at least originally, as spaces for uses other than grain storage. As Dunham (Chapter 5) notes, the sealings inside the Round Building mainly derived from the western rooms, not the silos, leading to the suggestion that the western rooms were employed to document and control the materials stored in the silos.

One further issue is the failure of Pfälzner's study to account for the peculiar character of the two-room houses at Raqa'i level 3, interpreting them as nuclear family dwellings. But their unusually small size and rare attestation suggests that Raqa'i level 3 was not a "typical" village, and an understanding of the goings-on in this community must account for this peculiarity.

Finally, while Pfälzner's model for a development from communal storage in Early Jezirah 1–2 to domestic storage in the Early Jezirah 3–4 middle Khabur deserves testing, it must be recalled that it is based on a small sample, largely the evidence from Raqa'i and Bderi. Data from Early Jezirah 1–2 Knedig, for example, do not support such an elegant evolutionary model: in level XIII, a central storehouse coexists with domestic silos and grill buildings at a number of houses.[18]

An additional hypothesis with a very different focus, shifting emphasis away from issues of economy to those of religion and ritual, is presented by Anne Porter (2012:222–227). Citing the centrality of the level 3 temple, the absence of sacred architecture at other middle Khabur sites, and the unusually small two-room houses, Porter advances the intriguing suggestion that the entire site was used for ritual/religious purposes centered on the temple. She raises the possibility that Raqa'i was the site of pilgrimage or for ritual activities involving persons both within and beyond the village, integrating sedentary and mobile populations. In this case, the grain storage and processing facilities in the Round Building and elsewhere may have served for preparation of ritual feasts, the two-room houses would have functioned as "guest houses," and the multiroom dwellings in the east housed the caretakers of the facility. While it is difficult to substantiate this interesting hypothesis, which only applies to Raqa'i level 3, its inclusion of an explanation for the

anomalous two-room houses is attractive, as is its consideration of variables beyond economy and subsistence.

Reviewing the issues and arguments discussed above, a few general conclusions can be offered. To the present author, the export hypotheses are not as compelling as they originally were, given the lack of strong evidence to support colonization, and the significant variability in the storage architecture at the different sites. On the other hand, the "local" hypotheses also have problems, inferring mobile populations that have yet to be documented and proposing an, as yet, tenuous link between the middle Khabur sites and the large *Kranzhügel* to the west. The Raqa'i Round Building, in particular, an impressive construction for such a small community, is not quite explained by such models, nor are the unusually diminutive two-room houses.

Final Comments

Tied to an understanding of the middle Khabur villages is the relatively synchronous disappearance of grain storage architecture and eventually abandonment of the sites. The storage emplacements at Raqa'i and the neighboring villages disappear by Early Jezirah 3a, and the sites themselves soon after. The only substantial attempt to explain this has been offered by Hole (1999) and Kouchoukos (1998). In their argument, they propose that the middle Khabur sites were occupied either by village farmers exchanging goods with mobile pastoralists on the steppe, or by farmers and by pastoralists, with the latter moving seasonally with their herds onto the steppe. Having established small bases in the steppe west of the Khabur, in Early Jezirah 3 the pastoralists became providers of pastoral goods to the growing urban economies of the upper Khabur. They developed larger steppe sites (the *Kranzhügel*) whose populations lived off of pastoral (and to a lesser degree) agricultural products and no longer required the agricultural products of the middle Khabur. While this is a compelling hypothesis, one must still explain why the storage sites were on the opposite bank of the Khabur from the steppe sites documented by Hole and Kouchoukos, and a pastoralist connection to the early *Kranzhügel* can be questioned, as noted above. Another explanatory variable may be a decrease in precipitation, making agriculture in this marginal landscape too risky (Weiss et al. 1993).

It is likely that discussion will continue on the finer points of the different hypotheses to explain the emergence and decline of the middle Khabur third millennium villages. Regardless of which interpretations seem preferable, the results from Raqa'i provide a detailed examination of a rural community in a developing complex society, demonstrating that the emergence of societal complexity involved even the smallest of communities, and that the study of such small communities can provide valuable insights into our understanding of the earliest urban civilizations.

Notes

[1] I am very grateful to Sally Dunham and Jason Ur for their comments and suggestions on this chapter.

[2] This argument is made primarily on the basis of the "impression" of a low artifact density, since no quantitative assessments of excavated soil volumes and number of artifact fragments were produced.

[3] Excavation has confirmed the existence of a fourth-millennium sequence at Mashnaqa (Butterlin 2003), Late Chalcolithic pottery at Umm Qseir (Tsuneki and Miyake 1998), an LC pottery kiln at Bderi (Pfälzner 1990), some LC materials at Mulla Matar (Sürenhagen 1990), beveled rim bowl and other LC sherds in the basal level at Knedig (Klengel-Brandt, Kulemann-Ossen and Martin 2005), and LC strata at Ziyadeh (Hole 1999).

[4] While the storage of grain has been most commonly inferred for the middle Khabur storage features, it must be acknowledged that the structures could have accommodated other kinds of foodstuffs as well, not to mention non-food items.

[5] Note the S-shaped stone cataract spanning the Khabur adjacent to Raqa'i, which recent reconnaissance by H. Kühne (personal communication), given the currently dry state of the river, has revealed to be a human construction. The date of its construction is unknown, however.

[6] Compare the early second-millennium Mari authorities' efforts to expand agriculturally in the marginal zone of Qattunan on the lower Khabur. Reculeau (2010) suggests that fields in the Euphratean core of the polity were already allotted, prompting the authorities' attention to the thinly populated area around Qattunan.

[7] Note, however, that the transport of grain from the upper Khabur to Mari is documented in the early second-millennium Mari archives (Finet 1969, 1983).

[8] One could argue, however, that different large centers in the upper Khabur plains were associated with different small sites along the middle Khabur.

[9] Not only do they differ in the character of the grain storage facilities, but the individual middle Khabur sites ex-

hibit variability in other ways as well. Comparing Raqa'i with Knedig, for example, there is very little use of lime plaster in the houses at Knedig, while it is normal at Raqa'i. Knedig has "Feuerstellen" that consist of localized distributions of ashy material in association with cooking pots, while the Raqa'i "fireplaces" are flat surfaces of burned clay.

[10] Although admittedly these two rooms have lime-plastered floors and walls, characteristic of domestic spaces elsewhere in the site.

[11] While the ceramic analysis at Knedig indicates that the central granary was only in use in the earlier phases of Early Jezirah 1–2 settlement, it appears that the houses and, presumably, their storage facilities, were also in use at that time. As time went on, some of the houses were abandoned, and the size of the village was reduced (Lutz Martin, personal communication).

[12] Hole and Kouchoukos were unable to locate relevant sites on the steppe east of the Khabur, and there are no *Kranzhügel* settlements in that region.

[13] Kouchoukos (1998:421) proposes that the pastoralists acquired grain both by exchange and by coercion.

[14] Similarly, Wossink (2009:117) suggests that the agriculturally marginal middle Khabur and Jebel Abd al-Aziz regions served as "overflow" regions for the upper Khabur, where large-scale pastoralism could be conducted without conflicting with the agricultural zones of the upper Khabur.

[15] The five teeth sampled came from contexts of varying quality, and none derived from a proper burial; instead, they were found together with other ecofactual and artifactual materials in midden and other contexts. The possibility exists, therefore, that some were intrusive and derived from the numerous recent burials that covered the top of the site. Arguing against this is the uniform character of the results, which would be unlikely if they derived from totally different periods.

[16] In discussing the size of the Raqa'i population and the delineation of individual houses, Pfälzner overlooks the treatment of this problem in Schwartz and Klucas (1998) as well as the discussion of many of the relevant issues in Schwartz and Curvers 1993–1994. He also neglects to mention the evidence from Kerma, with grain storage and processing features but no documented domestic architecture, and from Knedig, where a large storage complex and domestic storage emplacements were contemporaneous. In his consideration of the "external" explanatory models, he only considers the suggestion that grain was sent to Mari, neglecting other possibilities proposed such as upper Khabur sites. Finally, he fails to account for the proliferation of sites in the middle Khabur in the early third millennium and the changes that such a development would entail.

[17] If the Round Building served for the storage of foodstuffs from each household, as Pfälzner proposes, it would seem improbable that the owners of the materials stored in area 14 would break the seals of the receptacles and empty their contents in the storage room, rather than bringing the receptacles and their contents to their houses for consumption. It is possible that the sealings in area 14 had been discarded there after their use elsewhere, but it is probably unlikely that such discard would have derived from one of the houses, which were located at some distance from the Round Building interior.

[18] There is some question as to the contemporaneity of all the complexes excavated in Knedig XIII, and the excavators indicate that not all 14 complexes were in use simultaneously (Klengel-Brandt, Kulemann-Ossen, and Martin 2005), but it is unlikely that the central storage unit was abandoned when the houses were in use (L. Martin, personal communication).

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