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The Spatial Structure of Kom el-Hisn: An Old Kingdom Town in the Western Nile Delta, Egypt

by

Anthony J. Cagle

A dissertation submitted in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

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Date: 7 June 2001

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Abstract

The Spatial Structure of Kom el-Hisn: An Old Kingdom Town in the Western Nile Delta, Egypt.

By Anthony J. Cagle

Chairman of the Supervisory Committee: Robert J. Wenke, Professor, Department of Anthropology

The nature of Old Kingdom settlement patterns is poorly understood due to a lack of well-excavated sites of a variety of sizes and locations. Most of our knowledge of Old Kingdom settlement function comes from epigraphic sources and a few excavations of towns located next to and servicing temple and mortuary complexes. Consequently, there is little data regarding the ways in which the bulk of the population interacted economically. Some have suggested that rural towns and villages were largely self-sufficient in basic goods and services, articulating with the central authority through taxes and corvee labor requirements. Others argue that many settlements were directly administered by agents of the king and court and were dependent on and integrated into the national economy. Resolution of this issue has been hampered by a lack of well-excavated settlements of a variety of sizes and spatial distribution. The purpose of this research is to investigate in detail the spatial structure of a single site, Kom el-Hisn, located in the Delta region.

Kom el-Hisn is a large settlement in the western Nile Delta containing substantial Old Kingdom occupations near the surface and above the water table. Since very few Old Kingdom settlements have been excavated in any detail, especially in the Delta, Kom el-Hisn presents a unique opportunity to obtain a statistically valid sample of artifacts in association with intact architecture.

The data for this study is based on excavations from two seasons, 1986 and 1988, which employed randomly placed 2-meter test pits and larger areas cleared and excavated room-by-room. The deposits used in this study were described and interpreted based on strict sedimentological principles rather than the inferred histories of the artifacts contained therein. This allowed spatial variation due to depositional processes to be controlled and differentiated from spatial variation due to functional or

other factors. In addition, I have paid special attention to the artifact classes used in the analysis to ensure that the variation they exhibit is functional.

Most of the excavated areas analyzed are concerned with food storage and preparation. Facilities for large-scale grain storage were found, as well as specialized rooms for cooking and plant and animal processing. In addition, there is a pattern of differential access to cooking fuels (dung vs. various plant matter) that is associated with a specific architectural unit and animal assemblage. The overall structure supports the idea that Kom el-Hisn functioned, at least in part, as a specialized center for cattle production. Some of the population engaged in direct production or acquisition of food resources, presumably on lands belonging to the estate. However, many commodities such as ceramics and stone tools were imported in finished or nearly finished form. Some food animals, such as certain species of fish, also were imported from some distance. The balance of the evidence, however, suggests that Kom el-Hisn was largely self-sufficient in basic goods and services involving subsistence. Kom el-Hisn participated primarily in both regional or statewide economic networks, providing some resources itself, importing others, and exporting at least some of its economic output in the form of cattle (and perhaps sheep/goats) to surrounding areas or to government or religious centers.

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1.0. Introduction.

Egypt has always represented something of a problem for those scholars studying the evolution of complex societies. Rather than large, deeply stratified tell sites such as those found in Mesopotamia, Predynastic and Early Dynastic sites in Egypt tend to be fairly shallow, often below the present water table, and buried by ongoing sediment deposition and later habitations. This is especially true in the Delta where moist conditions and intense agricultural activity make preservation of such sites much more difficult. As recently as 1983 Kemp observed that after over a century of excavation "the archaeological evidence for the nature and distribution of early settlements in Egypt is sparse and unsatisfactory" (Kemp 1983: 96). Consequently, until fairly recently, most of what was known about Predynastic and Old Kingdom demographic and settlement distributions have come mainly from epigraphic sources related to temple and mortuary centers, notably the pyramid and temple complexes around Saqqara and the Giza plateau (e.g., Badawy 1967; Kanawati 1977, 1980; Strudwick 1985).

In the absence of extensive archaeological data on a range of settlements, scholars have relied upon epigraphic sources and limited settlement excavations to build a picture of a largely rural Egypt with little of the highly urbanized character of Mesopotamian city-states. Useful though it may be, epigraphic information is inherently biased and does little to provide a detailed picture of the socioeconomic relationships that existed among the rural settlements that constituted the bulk of the population, and between these settlements and the central government. For example, it is unclear whether and to what degree individual settlements produced all necessary goods and services locally and interacted with the central authority through taxes and tribute only (i.e., they were functionally redundant), or if they were part of a larger regional production and exchange system (i.e., they were functionally interdependent).

Understanding how individual settlements operated within a larger societal context has significance not only for determining the way Old Kingdom Egypt was organized, but also for questions pertaining to the origins of complex society as a whole. Like all complex civilizations, the Egyptian state structure developed out of existing settlement patterns and political and economic systems. The extent to which these pre-existing structures controlled or constrained Egypt's particular evolutionary trajectory has been the subject of much discussion (e.g., Kemp 1977; Trigger 1983, 1993; Wenke 1981, 1989, 1997). The general consensus seems to be that the character of Dynastic Egypt owes its existence to a complex set of factors involving geography, the agricultural potential of the Nile valley, Predynastic political structures, and the general cultural milieu of the Near East.

Early Dynastic and Old Kingdom Egypt presents a contrast in many respects with the better known civilizations of Mesopotamia from this period. Wealth within the latter was distributed among a number of large, fortified urban city-states and among several competing interest groups within each urban center. These urban centers tended to be extremely large compared to other settlements, contained a diverse population from all socioeconomic classes, and interacted with the local populations through a market-based exchange system (Adams 1981; Trigger 1983, 1993).

In contrast, Egypt seems to have maintained more of a rural character with the population distributed among numerous smaller agricultural villages and related to the central authority primarily through taxes and other appropriative measures. Trigger (1993) has referred to this as a 'territorial state' and the relative self-sufficiency of the outlying populations has been echoed by Kemp (1983).

Several other factors also influenced the function and placement of communities. Strudwick (1985) and others (Badawy 1967; Baer 1960; Wilson 1951) indicate that the Egyptian state government was highly centralized at this time, and in fact several inscriptions specifically refer to the king personally directing the settlement of Egypt for reasons of defense, stimulation of trade (both internal and external), and consolidation of power. The instructions of Wahkare Khety III (2070-2040 BC), for example, indicate directed settlement in the eastern Delta to counteract political fragmentation taking place there among rival cities and provinces (Badawy 1967:103-109).

The geomorphology of the Delta also no doubt played some role in settlement placement and function. Recent surveys indicate that Old Kingdom settlements tended to be placed along major waterways, such as primary Nile branches and distributaries, either for irrigation purposes or for ready access to communication and trade. Since greater concentrations of sites have been found nearer the western and eastern margins of the Delta, there is the possibility that the placement of at least some sites had to do with international trade with Syro-Palestine in the east and Libya in the west. In addition, at least one site, Buto, was apparently placed at the then-shoreline of the Mediterranean and functioned as a major port facility.

The idea that Egypt was a 'civilization without cities' (Wilson 1960) has persisted even though a clearer picture of a range of variation in both site size and function has steadily appeared (e.g., Bietak 1979a, Bietak 1979b; Emery, et al. 1979; Hoffman, et al. 1986; Kemp 1977; van den Brink 1987, 1988, 1992; Wegner 1998). In many ways, however, the insistence on comparing Egypt in terms (e.g., city, state, city-state) derived from contemporary or supposedly analogous ancient civilizations such as Mesopotamia, begs the question of what these terms mean and why they should be applied universally. In the absence of a definition fixing the necessary and sufficient conditions for membership in the class, these terms are purely descriptive with little utility apart from the empirical entities from which they were originally derived.

If one adopts a definition of cultural complexity as 'intrasocietal functional differentiation' (Dunnell and Wenke 1979) then it is possible to develop a model of functional complexity at the site level directly from the archaeological record rather than inferring it from purely epigraphic sources. Artifacts directly reflect the activities and behaviors that make up functioning systems and do not contain the rationalizations and interpretive ambiguities inherent in the written word. Describing artifacts in purely functional terms lays the groundwork for defining the range of functions performed at individual settlements and how these settlements interacted to form the larger socio-economic system. Extending these descriptions into the temporal dimension allows archaeologists to differentiate those traits that are adaptive and stable from those that are non-adaptive and transitory. Further, if the units (artifact classes) are derived from formal theory where 'function' is explicitly defined rather than implied as a common sense term, then the mechanisms that affect the distribution of those classes over time and space can be identified and tested against theoretical expectations. Distributions of functional classes reflect, broadly, activity patterns while distributions of stylistic classes tend to reflect interaction frequency (Dunnell 1978b, 1983; Lipo 2000; Lipo and Madsen 2000).

This study focuses on generating a model of functional complexity based on specific *archaeological* units derived from theory, in this case Darwinian evolutionary theory. The applicability of this theory to cultural phenomena in general and to complex societies specifically has been argued by a number of authors (Dunnell 1980; Dunnell and Wenke 1979; Hartung 1976; Jones, et al. 1995; Leonard and Jones 1987; Rindos 1985, 1989). The shift from simple kin-based systems to complex, functionally differentiated societies has been described as a change in the scale at which selection operates, from the individual or family unit in simple societies to the entire socio-economic system in complex societies (Dunnell 1978a; Dunnell and Wenke 1979). Thus, the goal of this study is to model the functional complexity of one component of the Old Kingdom Egyptian socio-economic system, Kom el-Hisn. Building this model from a specific theoretical framework will allow direct comparison to other sites analyzed in similar fashion resulting in theoretically valid comparisons rather than the *ad hoc* variety most often employed in comparative analyses (Wenke 1997).

Kom el-Hisn itself is located near the western edge of the Nile delta approximately midway between Cairo and Alexandria and about 13 km west of the Rosetta branch of the Nile (Figure 1.1). The extinct Canopic branch of the Nile may have been even closer to Kom el-Hisn during its occupation. The site is surrounded by cultivated land and a village has been built on a portion of the site at its southwestern extent. It is composed of primarily Old Kingdom deposits containing substantial domestic architecture along with abundant ceramic, floral and faunal remains (Moens and Wetterstrom 1988, Wenke and Redding 1985, 1986, Wenke et al. 1988a). The occupational deposits are up to 3 meters thick and rest upon a topographic saddle composed of Pleistocene sands and gravels known in Arabic as *gezira*. From textual sources Kom el-Hisn is known since the 5th Dynasty as *im3w* ("Yamu"). It is located in the 3rd Nome of Lower Egypt in which some texts have placed the so-called Estate of the Cattle, though the exact location of this estate is not known. Middle Kingdom descriptions of Kom el-Hisn do, however, indicate Hathor as the principle deity of the city and the remains of a temple to Hathor have been found on the site.

Radiocarbon dates, together with epigraphic finds and artifact styles, indicate that Kom el-Hisn was occupied during Dynasties V and VI (ca. 2500-2290 B.C.) and into the Middle Kingdom (ca. 1890 B.C.; Wenke, et al. 1988a). There are also extensive New Kingdom cemeteries in the northern portion of the site, and it has been suggested that

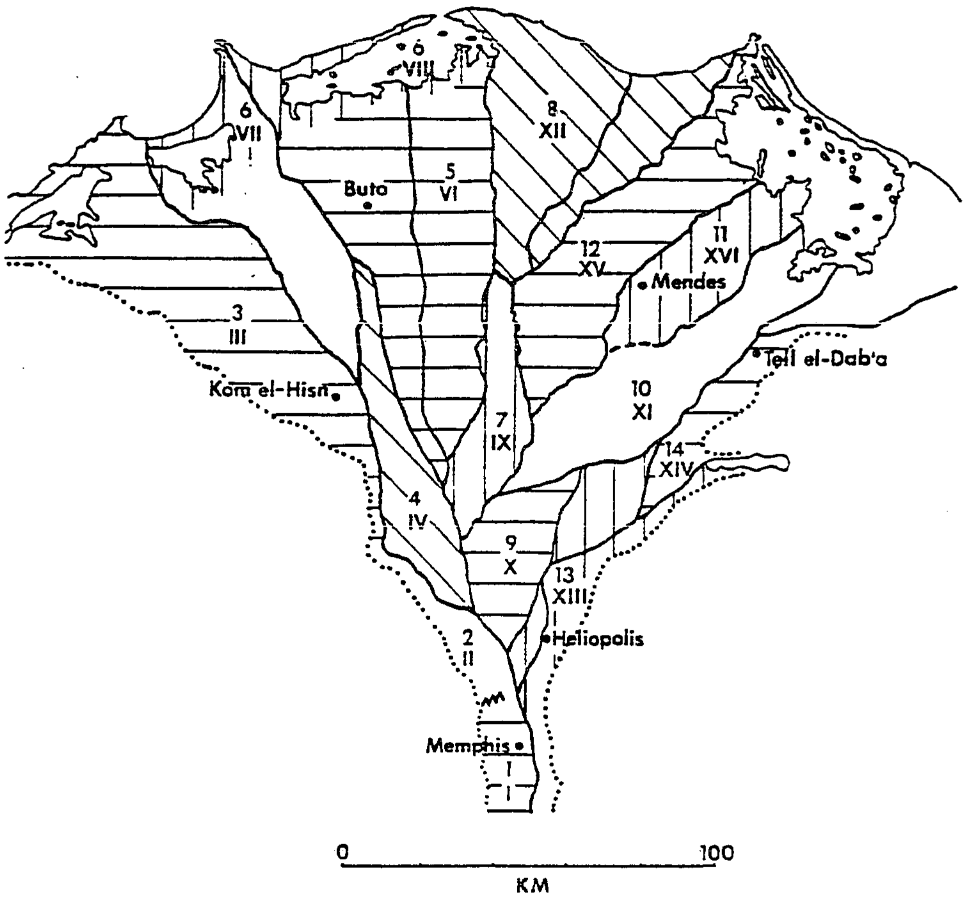

Figure 1.1. Map of the Nile delta showing the location of Kom el-Hisn in relation to other major Old Kingdom sites. Roman numerals indicate Ptolemaic nome reconstructions, earlier ones with Arabic numerals (after Bietak 1975).

some First Intermediate burials are included within the Old Kingdom architecture (Wenke et al. 1988a). Kom el-Hisn was thus occupied during the height of Old Kingdom power and to some extent during the upheavals of the First Intermediate period and the reorganization of the Middle Kingdom.

Before the current research was undertaken only sporadic work had been done at Kom el-Hisn, little of it relating to the Old Kingdom remains. Except for a few minor visits to the site in the late 19th and early 20th centuries (e.g., Petrie 1886; Junker 1928) the only other large-scale excavations were conducted by Hamada and el-Amir (1947) and Hamada and Farid (1947, 1948, 1950) on the primarily New Kingdom and First Intermediate period cemeteries to the north of the site. Hence, until now little apart from epigraphic references was known about Kom el-Hisn.

Previous analyses of some of the material excavated at Kom el-Hisn (principally from the 1984 and 1986 seasons) have tended to support the notion that Kom el-Hisn was at least in part specialized for cattle production. Many of the plant remains recovered come from plants commonly used as animal fodder, together with a lack of cattle bones in the samples analyzed thus far, indicate that cattle production was geared mostly towards export and not local consumption (Moens and Wetterstrom 1988; Wenke et al. 1988a, Redding 1992, ND). Other faunal remains of domestic animals indicate a typical Egyptian diet of pigs and sheep/goat. The age distributions of the samples analyzed thus far indicate a common practice of slaughtering primarily younger animals and older non-milk producing animals. Various fish and fowl were also common, many species of which were available locally. However, one marine species of fish, *Sparus auratus*, seems to have been transported to the site after initial processing (decapitation and possibly drying), presumably from the Mediterranean coast (Redding ND:9).

Most of the ceramics can be identified with typical Egyptian Old Kingdom and Middle Kingdom wares and represent mainly food storage, preparation, and consumption forms; only a small fraction are of decidedly non-local (Lower Egyptian) origin (Wenke et al. 1988a). It is unclear whether the former were manufactured on-site or imported from some distance, since no evidence of ceramic production (kilns, slag, etc.) have been found. However, if such production areas were separated from the main occupation areas they are unlikely to have been found given the sampling methodology.

Thus, Kom el-Hisn represents one of a very few systematically excavated settlement sites in the Delta region with a statistically valid sample of artifactual remains. The overarching problem addressed by this study is how to describe the functional complexity of the site in terms that can be explained by theory and which is also applicable to other sites of varying complexity. I will accomplish this by focussing on two methodological issues crucial for maintaining control over the significance of spatial and temporal patterns. First, the basic units of analysis, artifacts, or in this case artifact types, will be examined for their functional relevance or how well they accord with a theoretically-derived definition of function. Once the bridging arguments between artifact type and functional relevance have been made, the distributions of these artifact types over space and their co-occurrence with other artifact types can be assumed to reflect loci of activities. In part, this is an inductive exercise, since the functional relevance of the resulting types is being tested empirically.

Second, I have paid particular attention to the aggregation units that define the distributions: the deposits in which the artifacts occur. Traditionally, the definition of what constitutes a deposit has been treated rather cursorily during excavation. The excavator provides an interpretation of what a particular stratum represents (e.g., house floor, dump), usually by implicit criteria learned through experience. I have systematized deposit definitions based on strictly geological principles of sediment transport and deposition. The current positions of all artifacts in any site are a product of the last depositional event that moved and deposited them and any post-depositional processes that acted upon them. Consequently, the spatial locus of the artifacts contained therein is a function of depositional processes that acted on all of the included artifacts rather than the inferred histories of individual artifacts. By controlling for the variation due to common depositional processes, other sources of variation can be explained by processes other than depositional ones.

The resulting depositional unit (DU), is defined as a set of particles, including artifacts, that came together by the same set of depositional processes. All DU's of a certain type are assumed to have similar depositional processes. Therefore, the DU is the basic unit that determines how different classes of artifacts are distributed across space and how they are associated with each other via frequencies. Variation *within* a given type of deposit can be expected to result from some factor other than the depositional process itself; for example, different sets of activities. If the artifacts contained therein can be shown to have functional significance, then that variation is assumed to be functional in nature, once random processes have been accounted for.

In Chapter 2 I review the development of Egyptian settlement patterns and settlement structure to provide the context in which the Old Kingdom pattern developed. These preexisting settlement patterns are especially important when the unification process is examined because of the ways a change in the administrative hierarchy may affect the function of preexisting settlements and the placement and functions of new ones. This chapter also provides a more detailed discussion of the previous work conducted at Kom el-Hisn and hypotheses regarding its position in the socio-economic structure of the later Old Kingdom.

Chapter 3 provides the theoretical and methodological justification for the creation of analytic units employed in later analyses. This chapter covers not only the specific issues relating to the current research but also outlines some of the explanations offered by other researchers for the development of Egypt's particular brand of complex society.

Chapter 4 describes the research program that provided the data on which this study relies. It also presents the specifics of how deposit types were derived and the results of testing the resulting deposit classification to ensure that the deposit types reflect analytically useful units. This chapter also analyzes the depositional history of the site and establishes appropriate chronological controls so that temporal and spatial variation can be differentiated.

Chapter 5 contains detailed descriptions of the deposits associated with each excavation unit in the analysis. Each DU in the unit's stratigraphy is described for its overall sedimentary character, particle content, artifact abundance, relation to other deposits in the sequence, and occupation level assignment. At the end of each set of DU descriptions a summary of the depositional history of the excavation unit is provided.

Chapters 6 and 7 contain the statistical analyses that build the model of functional differentiation found within the excavated areas. Chapter 6 discusses the four main types of artifactual data in turn (ceramics, faunal remains, stone tools, and plant remains), the classes used in the analysis, their relevance to an analysis of functional variation, and the distribution of individual artifact types among deposit types. Chapter 7 then examines the spatial distribution of artifact types. The main tool in these analyses is cluster analysis, used to group units with similar distributions of artifacts. The resulting clusters are then analyzed further to determine which artifact types are controlling the clustering routine and the functions that these types represent. Types that vary with other functional data, such as particular types of faunal remains or architectural features, represent loci of activity within specific structures. The result is a map of the site designating discrete functions or sets of functions associated with architectural features.

The final chapter (8) summarizes the results of all analyses and describes the functional layout of Kom el-Hisn. Here, I compare the structure of Kom el-Hisn with other settlement sites in both Old and Middle Kingdom Egypt. This places Kom el-Hisn within the larger context of the Egyptian state structure and allows some conclusions to be drawn as to how Kom el-Hisn functioned within this structure.

2.0. Context and previous research.

The economic and settlement structure in which Kom el-Hisn operated can best be appreciated through an examination of the development of the Egyptian state from the first Neolithic farming villages through to the unification of the Dynastic state ca. 3100 BC. While the record for the late prehistory of Egypt is rather sparse in comparison to its neighbors of Canaan and Mesopotamia, there is sufficient evidence to establish the context in which the Old Kingdom developed. This development process is crucial for understanding those aspects of Egypt's settlement structure that are unique to the area.

2.1 Neolithic and Predynastic antecedents.

The first agricultural communities appear in Egypt in the Fayum depression, a desert oasis approximately 65 km southwest of modern Cairo (Figure 2.1). The earliest sites with secure dates are from the so-called Fayum 'A' sites initially described by Caton-Thompson (1926; Caton-Thompson and Gardner 1934) and by subsequent researchers (Ginter and Kozlowski 1983; Wendorf and Schild 1976; Wenke 1981; Wenke, et al. 1982, 1983, 1988b). The Fayum material consists primarily of scatters of lithic debris, faunal remains, and hearths. Though no secure habitation structures have been discovered to date (Caton-Thompson did note some apparent 'post holes' at Kom W), Caton-Thompson found storage pits with cereal remains preserved in them north of the Fayum lake. Significantly, these pits were located on higher ground away from the main settlement area, perhaps to avoid high lake levels. Radiocarbon dates place the Fayum occupations between about 5230 ± 50 BC and to 4030 ± 90 BC (Hassan 1985; see also Hassan and Robinson 1987).

The diet of the Fayum Neolithic peoples consisted of a wide variety of game animals including fish, hartebeest, gazelle, hare, and others, as well as numerous domesticated cattle, sheep/goat, and pigs (Brewer 1986; Caton-Thompson and Gardner 1934; Gautier 1976). Emmer wheat and 6-, 4-, and 2-rowed barley were also found. This subsistence pattern has much in common with the preceding Epipaleolithic (Qarunian) occupations in the same area, particularly in the abundance of catfish (sp. *Clarias*).

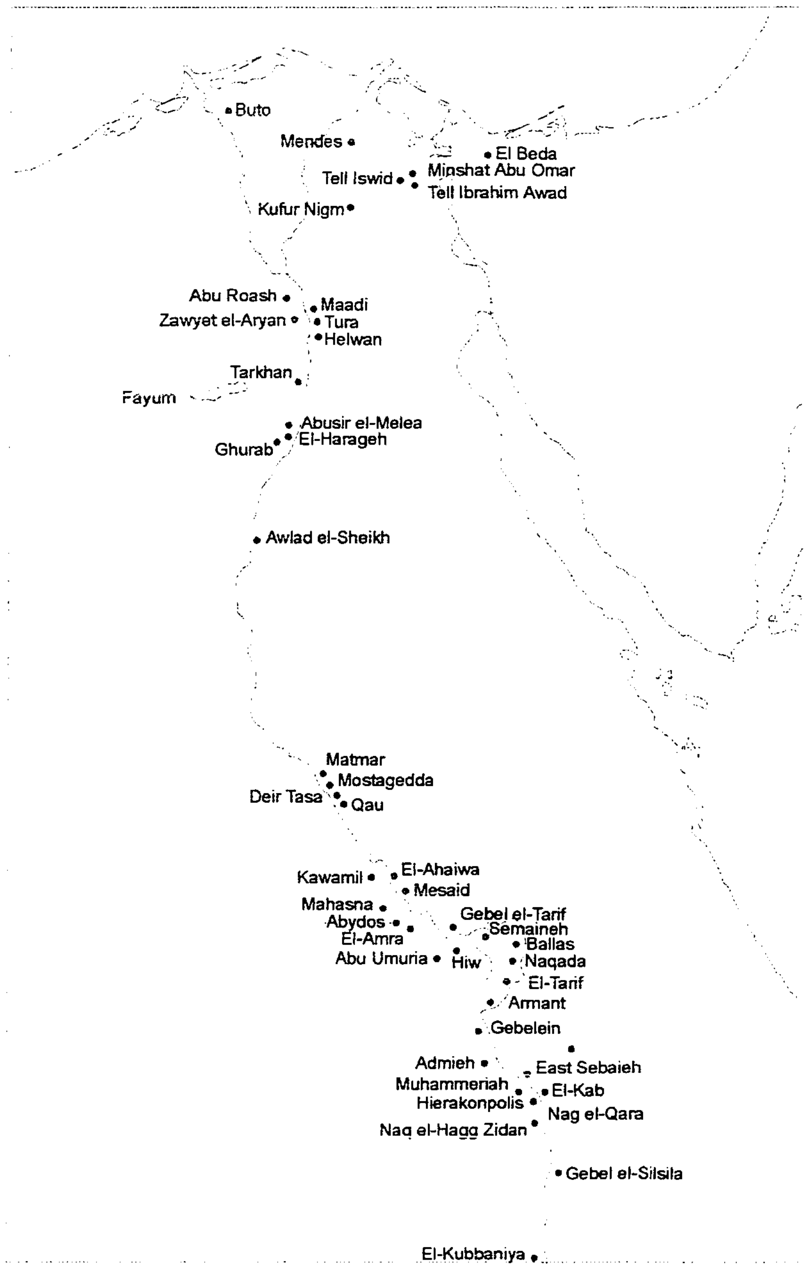

Figure 2.1. Major Predynastic sites. See text for discussion.

The generalized diet and widely scattered settlements, together with the lack of substantial domestic architecture, suggest semi-sedentary, perhaps seasonal occupations revolving around the availability of wild foods with part of the season reserved for collecting cultivated grains. Hassan (1988), however, has suggested that some of the larger settlements (e.g., Kom W and K) may have been occupied year round by a portion of the population. Hassan also has estimated the Fayum neolithic populations to be less than 200 people, possibly as few as 65 (1988:149).

Merimde Beni Salama (Eiwanger 1984, Junker 1929, 1930, 1932, 1933, 1934, 1940; Hawass et al. 1988), located on the western edge of the Delta, is slightly later than the Fayum but overlaps in time with it ranging from approximately 4800-4400 BC (Hassan 1985) and possibly from as early as 5000 BC to as late as 4100 BC (Hassan 1988:151). Compared to the Fayum, Merimde was a large site covering over 180,000 m^2. Though dug in arbitrary levels it is possible to note several changes through time. In earlier levels the settlement consisted of sparsely scattered wind breaks or huts similar to the presumed habitation structures from the Fayum. Hearths were common in these structures, many of which were hollowed out in the middle for a cooking vessel; several large ceramic jars also were found sunk into the ground presumably for water storage.

Later levels provide evidence of denser habitation structures consisting of semi-subterranean adobe huts with others laid out in rows along a possible 'street' or in a double-ring configuration (Vandier 1952:117-119). The structures themselves consisted of walls built up of layers of mud or rough stone blocks plastered with a layer of mud, apparently roofed with some form of thatch, and ranging from 1.5-3.2m in diameter. Some burials were noted within the village itself, though not enough to account for the presumed population, possibly indicating some form of differential status; grave goods, however, were sparse. In terms of subsistence, the earlier layers indicate that the diet was similar to that of the Fayum: hunting, fishing, and some cultivation. Later inhabitants apparently depended more heavily on cultivated grains.

Culturally, there are many similarities between the Fayum and the lower levels at Merimde. Pottery was made of coarse, straw-tempered clay with shapes consisting mostly of bag-shaped jars and shallow flat dishes. Decoration was largely absent except for some red slipping; most had plain rough surfaces. The lithics represent a characteristic Neolithic bifacial flake industry which, apart from the addition of worked tabular slabs, is typologically are very similar to the Nabta-Bir Kiseiba assemblages (Holmes 1989; Wenke et al. 1988b). The two are so similar in lithic content that they have been referred to as the same cultural tradition even with the significant differences in size and apparent density of occupation.

However, it is apparent that in later levels Merimde was a much more substantial and permanent settlement with a great amount of time and labor going into constructing the habitation structures and supporting a much larger population, estimated by Hassan (1988) to have been between 1300 and 2000 people. A greater degree of functional differentiation also may be apparent in the structured layout of the dwellings and the integration of granaries within the village itself.

Also near Cairo is El Omari, a collection of settlements and cemeteries approximately contemporary with the later Merimde levels. The habitations are, again, mostly oval huts although Vandier (1952:156) notes that some may have been semi-subterranean. Some larger areas apparently were enclosed by reed fences suggesting animal pens. Burials were located within the habitation areas, though some used earlier storage pits; all had few grave goods. Both the pottery and lithics are similar to those found at Merimde.

Roughly contemporaneous with these northern sites are a series of occupations in Middle Egypt that form the Badarian (ca. 5000-4000 BC). These sites are known primarily in the area around the Badari district including Matmar and Mostagedda (see Figure 2.1). The Badarian was initially thought to be confined to this area only, but typical Badarian artifacts have been found at Armant, Hierakonpolis, and Wadi Hammamat (Hayes 1965:147; Kantor 1965:4; Trigger 1983:27), thus showing some regional cultural coherence not apparently extant in the Delta at this time. While Badarian sites are most often cemeteries a few settlements have been excavated. At Deir Tasa, Gabra (1930) found a series of habitations similar to those in the Fayum and the earlier levels of Merimde: small huts or windbreaks associated with hearths and storage pits. As Hassan (1988) notes, these storage pits were much larger (up to 2.7m in diameter and up to 3m in depth) than those at either Merimde or the Fayum indicating a greater reliance on agricultural produce.

Badarian ceramics tend to be of higher quality than contemporary northern forms, consisting of simple shapes but with thinner, harder walls, with combed or highly burnished surfaces. Copper and other materials were apparently imported, such as turquoise from the Sinai, and cedar and other woods from Syria (Trigger 1983:29).

Caton-Thompson and Brunton surveyed the entire Badari-Matmar-Mostagedda area and reported up to 40 habitation and 40 cemetery sites. Most of these were similar in structure to Deir Tasa and, with the exception of Hemamiah, all had relatively thin occupation layers, indicating a less sedentary settlement pattern than that at Merimde. In terms of subsistence, the Badarians were relatively more reliant on agriculture and animal husbandry than their northern counterparts, yet wild game is still present in substantial quantities. Functionally, these settlements differ somewhat from the Delta sites in that several contained substantial accumulations of animal dung indicating that domesticated animals were allowed to forage in nearby fields rather than grazed over a wide area. This may, however, be a result of ecological factors (the flood plain is narrower in this section of the river) rather than some cultural difference.

Up to this point, about 4000 BC, there is relatively little in the archaeological record to differentiate the Neolithic people from their late Paleolithic ancestors. They still rely on wild game for a variable part of the diet (a larger part in the Delta and Fayum) and still live in insubstantial, only partially sedentary habitations. However, some intrasite functional differentiation already can be seen, most of which relates to the increasing reliance on agricultural products. Little in the way of social differentiation is discernible either architecturally or in differential burial practices (with the possible exception of Merimde; see also Anderson [1992] for possible evidence of inequalities in Badarian burials). Settlements appear to represent independent, functionally redundant units, with each providing all necessary subsistence activities in and around the main settlement areas.

Substantial changes occur in the 4th millennium which lay the foundations for the early Egyptian state and may indicate the sort of settlement patterns and economic structures that form the basis for the later dynastic pattern. This period traditionally has been delineated into two or three phases, the Amratian-Gerzean or Naqada I, II, and III, the Gerzean roughly coinciding with Naqada II and III.

The Amratian/Naqada I (ca. 4000-3500 BC) is in many ways a continuation of the Badarian. First defined by Petrie at el-Amrah (Petrie 1902) and later refined by Caton-Thompson at Hemamieh (Caton-Thompson 1928), the Amratian is distinguished from the Badarian primarily on the basis of changes in artifacts. The Black-topped red ware so characteristic of the Badarian continues into the Amratian but certain other decorative elements become common. White cross-lined vessels appear, as well as scenes depicting people and animals in naturalistic settings. While some (e.g. Baumgartel 1955) have posited a Mesopotamian influence for these elements, others (e.g., Trigger 1983) suggest that the apparent similarities are far too general to specify such influences.

Recent work in the Ballas area (Hassan 1981) reveals numerous occupations dating to around 3750 BC, some up to 3 ha. in extent. Structural remains are similar to earlier versions (pole-thatch huts), but many are made of blocks of mud and/or stones. All contain hearths and storage pits, some contain burials, and animal pens (indicated by accumulations of dung in restricted areas) are common. Analysis of artifact distributions indicates that these various settlements form a larger community, though this seems to be a cultural affinity rather than a functional one (Hassan 1988:155). Similar settlements composed of roughly circular huts made of mud and rubble were also located by Caton-Thompson at Hemamieh. Thus, although in many ways the Amratian is a continuation of the earlier Badarian, a shift to more substantial domestic architecture is common by at least 3750 BC, and some kind of larger cultural units have formed.

It is during the latter half of the 4th millennium (Gerzean/Naqada II-III) that substantial changes take place both at the site and regional levels. Dwellings at this time shift from insubstantial pole-thatch huts to typical squarish mud-brick buildings common throughout the middle east and SW Asia. Hoffman (1980) found several buildings at Hierakonpolis (Localities 29 and 49A). The house at Location 29 was roughly rectangular (roughly 4 X 3.5m), semi-subterranean (ca. 45-80 cm deep), plastered with mud, and had freestanding walls of mud brick and brick debris. A roof was supported by eight pillars, and the structure itself contained an 'oven', a large storage pot, and a large upright ceramic slab possibly functioning as a heat barrier.

Similar developments occurred in the Delta. Maadi (Menghin and Amer 1932, 1936; Rizkana and Seeher 1984, 1985), near modern Cairo, is a large site, ca. 18 hectares in area, with cultural deposits up to two meters thick and has been dated to the latter part of the Gerzean (ca. 3300-3100 BC). It contains dwellings consisting of oval huts or windbreaks which are concentrated in the center of the site; there are, however, several circular to oval subterranean dwellings dug up to two meters deep with stairways leading down into them. Special storage areas were located on the periphery as in the Fayum and at Merimde. Some of these storage pits were large pottery jars buried up to their necks, many of which contained carbonized grain, while others contained valuables such as basalt vases, and carnelian beads.

Artifactually, the Gerzean reflects a number of internal developments and also clear evidence of influences from outside of Egypt. While the familiar Black-topped red ware and Red Polished wares show considerable continuity with earlier forms, several ceramic forms with no progenitors in Egypt appear. Influence on ceramic form was both ideational and a result of direct importation of finished products. Wavy ledge-handled pots were produced in Egypt but stylistically borrow their design from Early Bronze forms in Canaan (Amiran and Gophna 1992; Gophna 1992; Porat 1989; Trigger 1983). Other pottery was directly imported from Canaan to Egypt such as at, for example, Hierakonpolis (Adams and Friedman 1992), Buto (Kohler 1992; von der Way 1987, 1988, 1992), and Maadi (Porat and Seeher 1988). Egyptian-made pottery has also been found in Canaan at Taur Ikhbeineh (Oren and Yekutieli 1992), 'En Besor Oasis (Gophna 1992), and elsewhere (Redford 1986, 1992). Much of this Gerzean interaction with Early Bronze Canaan resulted from Egyptian-controlled administration and commercial networks in Sinai and southern Canaan in which at least a portion of the inhabitants were Egyptians (Amiran and Gophna 1992; Brandl 1992; Gophna 1992; Porat 1992). There is also some suggestion that Canaanites were in residence at Buto (Pittman 1996:17; von der Way 1987, 1992) similar to the Minoan presence at Tell-el-Daba/Avaris in the 12th Dynasty (Bietak 1995, 1996). These contacts are not necessarily new to the Gerzean but may reflect an elaboration of trade networks that were already in place during the Amration (Moorey 1987, 1990; Schmidt 1992a).

Ceramic production also reveals a certain amount of craft specialization and an increase in the distribution of standard ceramic forms. Earlier ceramics were produced from local clays found along the banks of the Nile (Nile mud). However, many Gerzean forms were produced using clays high in calcium carbonate and which are found in restricted outcrops in the limestone hills bordering the Nile valley (e.g., Qena and Ballas). The wide distribution of standard forms of ledge-handled jars made from these clays indicates mass production at one or a few centers. Though the specific manufacturing sites have not been found, Hoffmann (1980, 1982; Hoffman, et al. 1986) has posited Hierakonpolis as a major ceramic producer for much of Upper Egypt. The supposed introduction at about this time of the slow wheel in manufacture may also be related to increased production (Baumgartel 1970:488; Lucas and Harris 1962:369). However, the possibility of some other functional and/or technological factor involving the use of these clays should not be ruled out (Dunnell and Feathers 1990, Feathers 1990).

Copper implements, both hammered and cast, become much more prominent in the Gerzean. Maadi was engaged in some degree of copper production and may have obtained raw material via the Sinai (Baumgartel 1955:122) though the extent of this production and trade is in question (Rizkana and Seeher 1985). Egyptian-made stone vessels have also been found in Early Bronze age Knossos (Warren 1995) and the Minoans copied Egyptian forms in local stone (Warren and Hankey 1989). Cylinder seals, a distinctly Mesopotamian invention, also find their way to Egypt at this time. As with the pottery, Mesopotamian influence on Egyptian seals took many forms. The earliest seals of Mesopotamian manufacture were found in Gerzean/Naqada IIb graves (Arkell and Ucko 1965:154; Moorey 1987: 37; Podzorski 1988). The idea of marking the clay enclosing jars with seals of some sort as a means of identification and administrative control owes its conception in Egypt directly to Mesopotamia (Pittman 1996:16). Besides the imported seals, Egyptians also copied much of the basic iconography from the Mesopotamian varieties. For example, lions and bulls (not present in earlier Egyptian representations) become common on Egyptian seals and are combined with strictly Egyptian flora and fauna such as the ibis and hyena (Collon 1987,1990; Pittman 1996; Porada 1984; Redford 1992). Both Pittman (1996) and Moorey (1987, 1990) suggest that the earliest imported seals were obtained as status symbols through long-distance trade via Canaan, thus their placement in graves.

The trade in exotic items was probably controlled by a small ruling elite from the few large centers in Upper (Hierakonpolis, Naqada, Abydos) and Lower (Buto, Maadi) Egypt who used these objects as prestige items to demonstrate their wealth and power (Hoffman 1979; Kuhrt 1998; Moorey 1987). Kuhrt (1998:133) suggests that competition for exotic goods and materials may have enhanced the positions of those who controlled the trade routes by which these items entered the country, which could explain the importance of those upper Egyptian settlements lying at the end of wadi routes through the eastern desert (Hierakonpolis, Naqada, and Abydos). Helck (1962) felt that trade with Mesopotamia was mediated by Canaan and the Levant via the Delta. Silver, obtained from Anatolia, was most likely acquired via the Mediterranean in the Delta region, and Redford (1992) notes that the close contact dynastic Egypt maintained with Byblos also probably extended back into the Predynastic. Recent work at Buto shows Predynastic levels containing colored clay cones closely resembling similar cones used on temple facades at Uruk and perhaps imported from there (von der Way 1987, 1988, 1992). Thus, it is entirely possible that foreign influences in the Delta region have been markedly underestimated.

Others favor a more direct sea route around the Arabian peninsula and the Red Sea. It is perhaps not coincidental that the two largest centers in upper Egypt, Naqada and Hierakonpolis, are not only situated at the head of wadis with direct routes through the eastern desert to the Red Sea, but are also positioned to extricate gold from the eastern desert regions, one of Egypt's possible trading products. For example, the Egyptian name for Naqada, opposite Koptos, meant (literally) the 'gold town' and in later times Egyptian gold was distinguished from the Nubian variety by the designation 'Gold from the Desert of Koptos' (Trigger 1983:39).

Overall population may have increased in Gerzean times; certainly specific towns such as Hierakonpolis underwent major demographic changes, but whether this is due to a net increase in the population as a whole or just the growth of some settlements to the detriment of others remains an open question. While regional data is lacking regarding these demographic changes on a large scale, the pattern observed at Hierakonpolis may indicate the sort of overall changes in site function and placement during the Gerzean. In late Amratian - early Gerzean times (ca. 3800-3500 BC) Hoffman, et al. (1986) describe several types of settlements present in the Hierakonpolis region from small herding camps to large habitations covering 7 ha. or more. Both inter- and intrasite differences are noted, including separate habitation, trash disposal, industrial, and mortuary zones within settlements. It is at this time that a division of labor is evidenced by specialized pottery production and other products (ground stone vases, basketry, linens) and an administrative structure to manage the production and distribution of goods.

During the middle/late Gerzean (ca. 3500-3400 BC) Hierakonpolis apparently became the regional capital of an upper Egyptian state or incipient nation-state (Kemp 1989). At this time the regional population, previously scattered among several different kinds of settlements, coalesced into a single settlement centered at Nekhen. Hoffman et al. (1986) suggest this was for defensive purposes. Hierakonpolis at this point resembles the typical urban complex of Mesopotamia with specialized structures for religious activities and what is apparently a fortified enclosure.

It is unclear what sorts of changes took place outside of the central settlement at this time. It seems clear that the entire population did not reside in the main urban complex as, minimally, agricultural activities had to have taken place away from the central urbanized area. T. Eric Peet excavated what is apparently an outlying settlement at Abydos. Peet produced a schematic plan of the site in which some degree of spatial differentiation could be observed within a roughly circular plan (Figure 44 in Hoffman 1979:151; *cf.* Dunnell 1983). Midden was found around the perimeters of the village suggesting perhaps trash dumping, with a grain-parching kiln located in the northeast corner. Just within this perimeter zone were hearths where, it is presumed, food preparation took place. Within the center of the site Peet found what he took to be 'the remains of huts built of wattle and covered with mud' (Peet 1914:2). While the structure of the habitations is largely conjectural (Peet only found a single stratum consisting of mud and artifacts) it still illustrates the degree to which portions of the populace still resided in simple, decidedly non-urban dwellings.

2.2 Predynastic summary.

Several trends took place in the Predynastic that may indicate the structure of the Dynastic Egyptian settlement pattern. In earlier periods (Neolithic and early Predynastic) the overall settlement pattern consisted of numerous, functionally independent farming villages composed of small, light habitation structures, and variably dependent on wild game. The trend over this early period is towards greater internal differentiation within each settlement, as habitation structures become more permanent and perhaps as agriculture becomes a more prominent part of the diet. This is seen, for example, at Merimde where later levels have a more orderly arrangement and the storage pits are separated from the main habitation areas.

There is some degree of cultural interaction between settlements but the nature of this interaction is unclear. Artifactually, this is indicated by the strong similarities in lithic content between the Fayum and Merimde for example, and also by the distribution of certain ceramic wares in the south (Badarian). The layout of settlements may also indicate some kind of cultural homogeneity. Those in the north tend to put storage pits away from the main habitation with burials within the habitation areas, while in the south the layout is reversed. I suspect that these interactions were probably not primarily functional (*sensu* Dunnell 1978c) as the common traits seem to be more stylistic in nature (such as pottery decoration).

Later in the first half of the fourth millennium certain settlements became larger and more functionally diverse both internally and with respect to other settlements. Because of the relative paucity of excavated smaller sites it is difficult to determine overall settlement patters, though Kemp (1977) has suggested that it was a primate distribution with numerous smaller villages up and down the Nile with at least two (and possibly three, including Abydos) large concentrations at Naqada and Hierakonpolis. It is perhaps significant that defensive walls became common at this time indicating some degree of (violent) competition between larger settlements.

In the late Predynastic (Gerzean) interaction became functional in nature in the form of centralized production and distribution of certain necessary goods and services such as ceramics. This may have been the point at which the minimal functional unit changed scale from the individual or kin-group to aggregates of settlements. It is within these larger aggregates that individual settlements are functionally differentiated and must interact in order to survive. Social differentiation is apparent in the disparity in quantity and quality of grave goods and distribution of luxury trade items.

It is within this context that the settlement structures characterizing Old Kingdom Egypt developed. It is clear from the preceding that some degree of functional differentiation had evolved by Early Dynastic times (e.g., Maadi) and that certain fundamental aspects of earlier patterns had changed. While the record for smaller settlements is extremely sparse in relation to the larger central towns, there is evidence that a shift occurred in the placement of many of these smaller agricultural villages during the late Predynastic. As Kemp (1977) notes, in those locations (mostly in upper Egypt) where such smaller sites have been examined in some detail – especially around the Matmar-Etmania area, Naqada, Armant, and Hierakonpolis – a number of smaller settlements along the desert edge were entirely abandoned by the 1st Dynasty. Brunton and Caton-Thompson (1928) interpreted this as a shift to the flood plain proper in order to become more involved in managed flood plain agriculture, though there is little evidence of these valley floor settlements remaining.

Thus, one could argue that the process of unification was less a process of overlaying a state structure on top of existing independent agricultural communities than it was a basic shift in the way in which individual settlements operated and organized around natural flood basins (Butzer 1976). It should be noted, however, that most of the foregoing relies on data gathered in the valley proper, not in the relative *terra incognita* of the Delta.

2.3 Old Kingdom context.

The preceding section indicates that significant changes took place in the functioning of individual settlements in the late Predynastic. The overarching theme of the Predynastic is one of increasing interdependence among settlements, eventually resulting in a centrally controlled state structure. However, the degree to which settlements remained interdependent into the Old Kingdom and beyond is the subject of much speculation (e.g., Bietak 1979b; Kemp 1977; von Pilgrim 1997; Wenke 1997).

The process of unification may help to explain how much of the existing Predynastic settlement structure carried on into the Old Kingdom. The unification myth is a powerful concept in Egyptian mythology. The king lists of the Turin Canon and Manetho both begin with Menes as the first king to unify Upper and Lower Egypt into a single entity. The Abydos king list also begins with Menes and provides only the names of kings who ruled over a united Egypt, omitting those during the Intermediate Periods (Kuhrt 1998:125). In addition, the royal titulary, names, and symbols of the king further strengthened his role as the embodiment of the unified country. The king was often portrayed wearing the combined crowns of Upper (white crown) and Lower (red crown) Egypt, or a crown supplanted with the vulture (Nekhabet) of Upper Egypt and the cobra (Wadjet) of Lower Egypt. The king was also referred to by his *nsw-bity* name, 'King of Upper and Lower Egypt', written using the sedge (Upper Egypt) and the bee (Lower Egypt).

The actual process by which unification took place is unclear. The general unification story, as represented most famously on the Narmer Palette, is of an Upper Egyptian king conquering a unified Lower Egyptian kingdom, thus uniting the two lands. However, as the preceding section has shown, there is little evidence for any sort of united kingdom in the Delta even though some degree of cultural integration was present.

The king lists provide only partial clarification. The list produced by Manetho was probably a reproduction of a New Kingdom (1550-1080 BC) tradition, as were the Turin Canon and Abydos lists (Kuhrt 1998:127). These sources show Menes as the first king of the 1st Dynasty who presumably united the two lands himself. The Palermo stone, however, was composed in the 5th Dynasty (2494-2345 BC) closer to the time these events supposedly took place. This document lists names of kings occurring before the 'unification', suggesting that unification had taken place before Menes and that Menes was simply restoring a divided kingdom. However, yet another list, the 'Saqqara tablet', produced by a scribe of the 19th Dynasty (1306-1185 BC; Kuhrt 1998:127-128) begins with the sixth king of the 1st Dynasty, suggesting that perhaps there was some resistance to the status of the earlier kings.

A general model of the unification process is provided by Kemp (1989) and echoed by Kuhrt (1998). According to this model, a number of 'proto-kingdoms' developed around major centers in Upper Egypt, namely Hierakonpolis, Naqada, and Abydos. These kingdoms competed with other for access to agricultural wealth and exotic foreign goods (from Mesopotamia and also Nubia), and through competition and consolidation a single polity came to control all of Upper Egypt. It was at this time that some form of intrusion into the Delta occurred. The evidence for this 'conquest' of Lower Egypt is largely inferential and based on textual sources and limited excavations in the Delta. There does seem to be a fairly rapid replacement of Lower Egyptian ceramic forms with Upper Egyptian types. However, recent detailed excavations at Buto have shown that Upper Egyptian forms had already begun to filter into the Delta in Naqadan times, with a gradual increase in Upper Egyptian types over time while Lower Egyptian forms gradually disappeared (von der Way 1992).

Consequently, unification might be more properly interpreted as the relatively gradual development of an increasingly homogenous Upper Egyptian kingdom eventually asserting its dominance over the scattered communities of Lower Egypt. In this context, Menes could represent a particularly important figure in a long line of rulers that eventually led to the Egyptian state, and the traditional separation of Upper and Lower Egyptian kingdoms may be a later ideological construction meant to solidify and reinforce the status of the ruler.

Once Egypt was united into a single entity the state rapidly assumed many characteristics that were to survive for almost three millennia. The main occupations at Kom el-Hisn date to the 5th and 6th Dynasties (ca. 2494-2181 BC) and coring suggests that occupation extended back into the 4th Dynasty (2613-2494 BC) as well (Wenke et al. 1988a:13). It was during this time, especially the 4th Dynasty, that many of the monumental funerary and temple complexes in and around Giza were constructed. Thus, Kom el-Hisn was occupied during the height of Old Kingdom prestige and power.

Authority during this period was centered clearly and unambiguously on the king and his immediate family. The concept of royal divinity was perhaps strongest at this time with all power and authority emanating directly from the king (Wilson 1951b:79). The king himself was thought to embody the state, to preserve secular law and order, and maintain *ma'at*, the state of truth, balance, and order. Below the king stood several levels of administration, the officials of which derived all of their authority from their relation to the royal family. Kemp (1983) divided Egyptian society below the royal family into three categories: literate administrators, who drew their authority directly from the king; professional subordinates serving these administrators (artisans, scribes, etc.); and a largely illiterate peasant class (Kemp 1983:81). In many cases the structure and duties of the administrative class are not well attested. In some sense, the number of titles that a person had and the closeness of these titles to the king indicated that person's status within the hierarchy. In many cases, the function of these positions is clear, such as 'state granary official' or 'state treasurer'; in others, the title is more obscure and may represent purely ceremonial offices, such as 'elder of the portal' (Kemp 1983:80). In any case, the acquisition of as many titles as possible as a life goal is indicated by the prominence of titles in the tombs of officials; presumably, the more titles one acquired, the more privileges and wealth one would accrue through income-producing land and other resources that came with the office.

Many of these officials resided at the capital of Memphis, but administrative authority was also dispersed throughout the country. The structure of this administration seems to have commandeered regional administrative units ('nomes') that may have existed for hundreds of years prior to the Dynastic state. A governor was placed in charge of a nome, and managed the affairs of the nome in the name of the king. Whether the governorate was a hereditary position or a revolving post is unknown, but in many cases individual talent seems to have played a role in the offices one could achieve. The autobiography of Weni, an official from the 6th Dynasty, shows the various duties a talented official could accrue over his lifetime. Among other titles, Weni was the 'Warden of Nekhen' (Hierakonpolis), 'Mayor of Nekheb', ' custodian of the storehouse', 'Overseer of the robing room', and eventually the governor of Lower Egypt (Lichtheim 1975:18-19).

Much of this bureaucracy was geared toward the collection of taxes that supported state projects such as tomb and temple construction and the financing of military expeditions. State income was derived from land and other resources (including foreign trade) owned by the king and also from a country-wide tax levy (Kemp 1989:236) that obtained both goods and labor. In return, the government redistributed certain goods and services in the form of food rations and centralized production of many craft goods, such as ceramics. However, while the state certainly had a pervasive influence, private commerce was not unknown. Private land ownership is known from the Old and Middle Kingdoms (Kemp 1983:81; 1989) and Eyre (1987) interprets various tomb paintings as indicative of local markets where various crafts and personal services were exchanged.

Egypt during the Old Kingdom also extended its influence outside of its borders. Mining for turquoise and copper was carried out in the Sinai, and a city was established near Buhen that processed copper and may have acted as a trading outpost for goods arriving from Nubia and sub-Saharan Africa. Operations to the north in Canaan involved the import of timber and other goods from Byblos, and several extensive military campaigns, one involving Weni (above) who led an expedition composed of conscripts from Egypt and Nubia (Aldred 1987:117; Lichtheim 1975:19-20).

Thus, Old Kingdom Egypt is characterized by a strong central government centered on the king and his court, an extensive system of taxation to support state projects, and an administrative class that derived its authority directly from the king but whose loyalties were directed in part at accumulating personal wealth. The bulk of the Egyptian population that supported this state structure is, to some extent, invisible epigraphically, shown only incidentally in tomb paintings and in offering texts performing the work required to support deceased individuals in the afterlife. This population was dispersed throughout the country in a variety of towns and villages of which little is known either textually or archaeologically. The Predynastic sequence shows a trend towards functional interdependence among some of the larger excavated settlements, but the question remains whether this interdependence carried over into the Old Kingdom.

Epigraphic scholars have generally assumed that most rural communities were largely self-sufficient in basic goods and services, yet the immense quantities of apparently highly standardized artifacts (especially ceramics) found in tombs, and the apparent similarity of settlement and mortuary ceramics suggests a high degree of centralization and specialization over craft production. Trigger (1983, 1993) has contrasted the Egyptian state structure with that of contemporary Mesopotamian city-states. Wealth within the latter was distributed among a number of large, fortified urban city-states and among several competing interest groups within each urban center. These urban centers tended to be extremely large compared to other settlements (a primate distribution), contained a diverse population from all socio-economic classes, and interacted with the local populations through a market-based exchange system (Adams 1981).

Contrasted with the city-state structure of Mesopotamia, Trigger defined Egypt as a 'territorial state' in which wealth and power tended to be hierarchically arranged at national, provincial and local levels with the largest centers occupied primarily by administrative officials and the craft specialists that supported them. The bulk of the population was dispersed in smaller communities throughout the territory of the state giving rise to the largely rural character of Egyptian society (Wilson 1960). Rather than a market-based support structure, Trigger argues that the population was related to the central government in an appropriative fashion through rent, taxes, and *corvee* labor requirements while local populations largely supplied their own goods and services through regional markets. Indeed, this scenario has a good deal of textual support. Many texts refer to highly complex censuses for taxation purposes, in some cases (e.g., the Palermo stone [Edwards 1971:38]) making these censuses key events for describing regnal years. Goedicke (1967:56, 72), for example, relates how revenue could be assessed on the basis of "canals, wells, water bags, and trees."

Kemp (1983:81) further argues that the archaeological record suggests a complex and extensive local marketing system that was not controlled solely by a government redistribution system and included local production of copies of exotic foreign goods. State concerns also were not immune to entrepreneurial activities. For example, millions of animals were mummified and offered in cult centers which no doubt provided a need for entire industries devoted to raising and selling sacrificial animals (Brier 1994:213). The cult of Imhotep centered near Saqqara (Figure 2.2) provided a robust business selling mummified animals to visitors as offerings, particularly ibis which were contained in small conical pots. Ray (1976:41) describes a priest named Hor who attempted to regulate the marketing of these ibis mummies since many of them contained only a few bones wrapped in rags to make it look like an ibis. Visitors to the various archaeological sites in modern Egypt can attest to the lure that such tourist dollars offer the local population.

Analyses of the structure of administrative titles and cemeteries indicate that during Early Dynastic and Old Kingdom times there was a high degree of centralization. Various authors (e.g., Kanawati 1977, 1980; Strudwick 1985) have noted an increase in both the number of officials and an apparent devolution of power away from the central authority towards regional powers near the end of the Old Kingdom. This suggests that the unification of the northern and southern kingdoms resulted in a shift of power from the regional authorities (nomes) to a highly centralized administration centered around the king and his immediate family. How this may have affected relations between already existing settlements is unclear since it generally is assumed that the nome, or regional governorate (perhaps defined by natural flood basins), was maintained as the basic economic unit from Predynastic times onward.

Certainly, the central government had a large role in the placement and function of new settlements. Many special-purpose towns are known, several of which (e.g., Buhen) functioned as trading and/or defensive outposts. Other settlements were planned and built for religious and/or funerary purposes, the so-called pyramid towns and "pious foundations." Pious foundations involved a subtle relationship with the central government whereby grants of land were issued for the direct support of cult centers either within the local community or at central temple and funerary complexes and were exempt from taxation and other labor requirements. Tomb inscriptions imply that these

Figure 2.2. Major Old Kingdom sites. See text for discussion.

were especially prominent in the Delta region and as Kemp (1983:111) suggests, may indicate that the Delta had a much closer, less autonomous relationship with the central government than the rest of Egypt. However, Moens and Wetterstrom (1988) note that no direct archaeological evidence for such sites exists, and are thought to exist only through funerary inscriptions. It is also unclear whether the groupings of pious foundations were built around existing settlements and to what degree they were integrated into the local economy.

Many officials or members of the royal family owned private estates from which they derived income, but it is unclear whether these estates were granted by the king for services performed or were established estates prior to the 1st Dynasty. Trigger (1983), in fact, suggests that older Predynastic patterns of land holding were not interfered with by the king. Such private estates were subject to taxation and *corvee* labor requirements and no doubt provided much of the income and work force for various state projects. However, the relationship between the central government and these private estate holders could be fairly complex. For example, many of these estates may have been owned by the office holder rather than as strictly private property. Furthermore, since taxation was so extensive, many of these estates could be converted to pious foundations and therefore exempt from much taxation to the benefit of the owner and his descendants.

Placement of settlements also was determined to a large extent by ecological factors. As noted by Baines and Malek (1980) the nomal structure of Pharaonic times corresponds quite closely with natural flood basins and the location of reconstructed branches of the Nile in the Delta. The underlying geology also plays a significant role in the placement of Delta settlements. Most larger Delta sites are located on topographic rises composed of middle Pleistocene coarse-medium alluvial *gezira* sands. In an extensive survey of part of the northeastern Delta, van den Brink (1987) found these *gezira* deposits to be very important in the location of settlements, positing that they were placed there to avoid high Nile floods but remain as close as possible to agricultural lands. The highest parts of the *gezira* often had cemeteries placed on them while the lower sides were used for habitation. Van den Brink also showed that a majority of settlements were located along waterways. Bietak (1979b:102) also notes that Delta sites tend to be placed along waterways and at the junction points of land routes across the Delta, especially where main roads meet waterways (e.g., Tanis, Mendes).

In sum, the placement of settlements during the Old Kingdom was influenced strongly by topological and ecological factors and existing settlement/economic patterns, but there was also a degree of central planning involving economic/trade and religious factors. Within this context one can define several different kinds of settlements based on their location, architectural structure, and presumed function with the larger society.

The structure and function of settlements differed across several types of settlements, which may be broken down into five basic types (Wenke 1997; Bietak 1979b): the 'capital' city of Memphis; large walled towns functioning as regional centers or as frontier outposts and trading entrepots; temple and pyramid towns; and small provincial villages. Of these, Memphis and the small villages are the most poorly known. While Old Kingdom remains from Memphis are relatively rare due to their being covered by subsequent occupations, corings indicate that Old Kingdom Memphis was a large settlement and may have been functionally distinct from other settlements rather than being simply larger. In later times Memphis functioned as a major administrative and religious center, and its placement was in no small part due to its location at the junction between Upper and Lower Egypt. Van den Brink's (1988) survey of a portion of the eastern Delta located dozens of small settlements, but these have not been excavated extensively.

The remaining larger towns and cities are better known, but again much of the Old Kingdom remains have been covered/destroyed by later occupations or lie well below the current water table. Generally, only portions of any given site have been excavated in any detail so the overall structure within these settlements is not well known. Several features are apparent across some settlement types and some distinctions can be made based on the apparent function of these towns within the overall economic and social system.

A second and third set of settlements consists of large walled towns functioning as either regional centers or as frontier outposts or trading entrepots. Most of these, located primarily in Upper Egypt, are characterized by large, fortified enclosure walls composed of some combination of mud brick and/or stone. These enclosure walls are not usually of strictly geometric pattern (e.g., Hierakonpolis) leading Kemp (1989:138) to suggest that they were not centrally planned constructions, but grew out of local needs and direction such as topography and preexisting settlement structures. Some form of initial pre-planning is in evidence at several sites but it is clear that as the settlements grew in size the enclosure walls were either extended or rebuilt to accommodate the larger populations.

At Edfu (see Figure 2.2) for example (Alliot 1935; Bruyere, et al. 1937), the main settlement area was enclosed by an initial mud brick wall and later a second wall was added encircling the previous wall with habitation structures filling the space between. Outside of these main occupation areas were a cemetery with numerous mud brick mastabas and an ancillary village to the west. Eventually, a second wall was constructed that enclosed this ancillary village as well, the south side of the wall utilizing the earlier mastabas as part of the wall's structure. The situation is much the same at Elephantine (Bietak 1979b:108; Kemp 1977, 1983:99; von Pilgrim 1997) where the main occupation was situated on a granite ridge and enclosed by a mud brick wall which followed the local topography and contained at least one stone-lined gateway. There was also an extramural settlement to the west which was enclosed by a later wall.

Similarly, Ayn Asil in the Dahkla Oasis underwent three major construction phases with the first and last each having its own enclosure wall specifically built for it. In Phase I, a large, approximately square, installation defined by a massive mud brick enclosure wall was constructed, the shape of which Giddy (1987) suggests is a reflection of direct planning by the central administration. After a period of haphazard settlement (Phase II), the whole area was leveled, former occupation structures filled in with rubbish, mud brick rubble, sand and mud brick masonry, and two new enclosure walls built: a smaller one to the north which followed an irregular path (perhaps enclosing previously existing outlying settlements), and a much larger well-built wall (which Giddy again uses to argue for some kind of central planning) around the main settlement area.

The function of these walls seems purely defensive in nature since many are very massive and they tend to be located on the margins of the territory controlled by the Egyptian state. In the Delta such walls are not well attested, though this may be due to the activities of *sebakh* (fertilizer) diggers.

The overall structure of Old Kingdom settlements is difficult to determine since large sections of them are either obscured/destroyed by later occupations, lie well below the water table, or have simply not been excavated to any large extent. Some of the most extensive information on settlement structure come from the pyramid/temple towns of the Middle Kingdom and some from the Old Kingdom. While these, especially the former, are not necessarily directly applicable to other settlement types of Old Kingdom Egypt they do provide some clues.

Three pyramid towns of Old Kingdom vintage serve as starting points. The Neferirkara temple complex at Abusir (Borchardt 1909) consists of an enclosure wall surrounding the temple buildings with the spaces between filled with nine house structures. The houses presumably were the residences and/or administrative offices of the priestly inhabitants who seem to have been resident for only short periods of time, perhaps one month, and had permanent residence elsewhere either in the local area or closer to the central administration. The layout of the rooms indicates that maintenance was not organized (or funded) centrally, but solely through the resources of the temple complex itself. This local support of mortuary temples is also indicated through textual descriptions of priests donating funds to the restoration of temples and other historic monuments.

At Giza, further structuring of the building layout may be seen at the village adjacent to the tomb of queen Khentkawes (Hassan 1943). The village extended in an L-shaped plan east of the tomb and consisted of a series of interlocking rectangular rooms. The way room blocks were laid out seems to suggest that the arrangement was determined more by security and/or privacy considerations rather than ease of access. Room blocks usually consisted of a central room with 2-3 ancillary rooms attached to it. Two of these rooms contained circular grain pits (one had a single pit, another had four), and the southern or back room in each block served as the kitchen area as indicated by ovens and ash deposits.

The Valley Temple of Menkaura (Reisner 1931) demonstrates further the non-planned organic nature of growth in some Old Kingdom settlements. The village itself accreted over time and was built on the rubble of the earlier temple. In some cases, parts of the temple were demolished to create new structures. Grain storage structures were again found in several rooms and were generally clustered towards the north end of the complex. Kemp (1989) suggests that the area still functioned as the center for Menkaura's mortuary cult but that over time the activities tended to become more private and hidden. This *ad hoc* and hidden nature of the settlement also is reflected at the valley temple of Sneferu (4th Dynasty) at Dahshur (Fakhry 1959). In that case, the limestone temple complex within a mud brick wall was gradually filled in with residential structures for approximately 15 households for a population which Kemp (1989) estimates to be about one hundred.

In contrast to the relatively *ad hoc* nature of Old Kingdom pyramid towns are the highly structured urban complexes of the Middle Kingdom (Arnold 1989). The rigid structuring of Middle Kingdom settlement plans appears to reflect the extreme government-centered nature of the Middle Kingdom in general. The most well known of these Middle Kingdom towns is the valley temple complex of Senusret II (Kahun; ancient name: Hetep-Senusret) near Lahun at the entrance to the Fayum Depression (Petrie 1890, 1891; Petrie, et al. 1923; David 1986). This is the largest known of the pyramid towns and large portions have been excavated. The large size combined with textual evidence indicate that Kahun functioned as more than a mortuary complex. Two groups of papyri were found, one group from the temple area having to do with temple functions, and the other within the town proper dealing with the business of the surrounding community. Many of these texts refer to the land holdings and agricultural business of the priests and temple, but it is unknown whether private landowners also did business in the town.

The settlement itself is roughly square (384X335m) and is surrounded by a large wall with an inner wall separating a strip in the west from the main settlement areas (purpose unknown). The layout is strictly orthogonal or grid-like and is divided into room blocks. Each room block consisted of several parts, basically a central residential core surrounded by groups of chambers. The actual functions of these buildings are determined from the excavations themselves and from house models such as those from the Middle Kingdom burial of Meket-ra (Winlock 1955). The main residential unit was composed of a central entrance court or portico leading to the main residential chambers. One ancillary building was a granary; others functioned as cattle sheds, butcheries, bakery-breweries, and weaving and carpentry work areas. Each room block was probably the residence of a single family together with their supporting workers (soldiers, scribes, household servants) which may be why each room block has its own set of granaries instead of a single centralized granary.

Contrary to the Old Kingdom model, Kahun represents direct planning and maintenance by the central authority for a permanent, year-round population. The more self-sufficient nature of the settlement is indicated by the much larger population involved (ca. 3000-5000; Kemp 1989:155), the larger range of activities in evidence, and the fact that the community maintained its own temple separate from the mortuary complex.

Similar arrangements are found at Abydos (Wegner 1998), the pyramid complex of Amenemhat III at Dahshur (Arnold 1980, 1982; Arnold and Stadelman 1977), Abu Ghalib (located a few kilometers NW of Cairo which may be twice the size of Kahun [Larsen 1935]), and Tell el-Daba (Bietak 1979a, 1985, 1995, 1996) in the eastern Delta. All exhibit orthogonal plans oriented along compass points. Abu Ghalib also functioned as a center directing shipments of goods from the Delta to Upper Egypt and as a specialized bead manufacturer.

Other relatively well-known settlements from the Middle Kingdom are the fortified towns and garrisons in Nubia. Buhen (Emery 1963, 1965, Emery, et al. 1979) contains a large heavily fortified inner settlement and an outer, less well fortified area. The inner area, the main fortress, was heavily protected by a large (ca. 9m high, 150X138m) brick wall and contained a temple, garrison buildings, and several blocks of interlocking rooms and workshops as at Kahun. The outer area (ca. 450X150 m) had a much smaller protective wall and, though hardly excavated at all, seems to have been sparsely populated containing at least one cemetery area to the west. A similar arrangement is found at Shalfak (Reisner, et al. 1967) near the Second Cataract.

Middle Kingdom settlements thus appear to have been directly planned and maintained by the central administration in much closer fashion than their Old Kingdom counterparts. However, these are all special-purpose sites with, for the most part, specific functions relating to temple and mortuary complexes or border outposts with military or trade functions.

The Old Kingdom remains at Buhen (Emery 1963), lying north of the Middle Kingdom fortress, consist of several rectangular rooms enclosed within a rough stone wall. The layout of the site is distinctly non-grid like. The site seems to have functioned as a trading outpost and the presence of copper slag and ingot molds suggest ore processing was also carried out (Gayar and Jones 1989). Old Kingdom Buhen also seems to have been directly maintained by the central administration due to the large numbers of seals and papyri directly naming high officials and kings. The occupations also do not appear to have extended beyond the Old Kingdom.

At Hierakonpolis (Fairservis, et al. 1972; Quibell and Green 1902,) the overall pattern of the interior buildings tends to follow that of the enclosure wall, itself composed of several straight sections following an irregular path. In the occupational areas numerous different types of buildings were identified. Domestic buildings were identified by the presence of hearths, ovens, large buried storage pots, and manos and metates (Hoffman 1972). The presence of slag-filled and slab-lined hearths indicate that substantial industrial activities were taking place, the products of which, in certain cases (pottery) were intended for distribution beyond the local area.

The main excavated portions of Ayn Asil pertain to the Phase II occupations. The excavated area is located at the northeast corner of the fortification wall near a gate. The walls of the buildings tend to follow the outline of the enclosure wall. One section was apparently used as a stable identified by a buildup of laminated organic floor materials. Other rooms had hearths, burned faunal remains, and lithic debris; but these remains were generally located in corners of rooms and so insubstantial as to suggest small temporary squatter's camps. Nevertheless, all of the excavated rooms in this area comprise a single set of related habitation structures, though the excavator notes that the specific functions of each room are as yet unknown (Giddy 1987:188). These Phase II occupations tend to reflect a local *ad hoc* use of the space as indicated by numerous renovations and various small, insubstantial occupations within rooms and corridors.

The sequence of habitation at Ayn Asil seems to reflect an initial planned fortified settlement, possibly directed by the central authority (Giddy's Phase I). This was followed by a period of haphazard occupation, renovation, and various processes of drift sand filling parts of the site (Phase II). This may reflect something of an abandonment by the government, which Giddy relates to the sequence of Middle Kingdom Buhen where a permanent community grew up around the fortress during the 13th Dynasty. During the Phase III occupations, the entire Phase II occupations were leveled and a new (largely unexcavated) pre-planned urban complex was built, in some areas using the infilled sand as foundation deposits.

2.4 Summary of architectural development.

During the fourth millennium B.C. the bulk of the Egyptian population lived in small, self-sufficient farming villages composed of small, semi-permanent huts, and were dependent to some degree on agricultural products and domestic animals with some component of wild game and fish. Functional differentiation within and among communities was minor until the Predynastic, though specialized production of some commodities (e.g., Maadi) and trade (e.g., Buto) served to differentiate some communities from each other. Increasing differences in grave goods, especially in Upper Egypt foreshadowed the extensive mortuary cults of the later dynastic state.

With the institution of the central government and the unification of the north and south, some rearrangement of the settlement pattern and intra- and intersite functional differentiation no doubt occurred, though the evidence for this is scarce due to a lack of excavated samples of communities of different sizes. Those Old Kingdom and Middle Kingdom settlements that have been reported have the following general attributes:

1) An enclosure wall, which may be either regular and planned, grow to follow local concerns and topography, or some combination of the two, and may be either purely defensive or perhaps more for internal security.

2) Tightly packed mud brick buildings and streets, often following the contours of the enclosure wall.

3) Functional differentiation of the interior structures, including residential areas, industrial or workshop areas, and temple precincts. These may be separated into distinctly different areas of the site (e.g., Hierakonpolis), or several functions may be grouped into residential blocks, the latter apparently more characteristic of the Middle Kingdom.

The concept of Egypt being a 'civilization without cities' is perhaps misleading given that many of these sites are of substantial size and embody numerous activities within their walls. Still, because of the relative paucity of excavated smaller rural settlements as well as some larger towns -- especially in the Delta -- that are not directly involved in either large mortuary or temple complexes, the overall pattern of settlement structure and function in Old Kingdom Egypt is still largely unknown.

For example, some of the settlements discussed above seem to be relatively self-sufficient in terms of goods and services produced (notably Kahun), but their relationship with the surrounding villages, and the central government, is unclear. Especially at the smaller Old Kingdom sites (e.g., Abusir), where only temporary residence and administrative functions were performed, the residents must have interacted with the local inhabitants in some way. Did they purchase needed goods and services directly? Were products directed there from some central location? Were local lands owned by the priesthood and temple (e.g., Kahun) involved in local trade and exchange networks? Did different pyramid towns have differing degrees of self-reliance? And to what degree were ordinary agricultural villages self-sufficient in basic good and services?

Questions about the *overall* settlement pattern and function of the many and varied settlements in Old Kingdom Egypt must be answered by detailed excavations of many different kinds of sites throughout the Delta and Nile valley, from large urban settings to small agricultural villages. Only by using this kind of holistic regional approach and describing the various functional configurations of individual sites can one then integrate knowledge gained from textual and other sources regarding the various administrative functions of the central administration with purely archaeological information gained from excavation.

2.5 Kom el-Hisn: Context and previous research.

2.5.1 Geographic context.

The site of Kom el-Hisn lies approximately 100 km northwest of Cairo and about 10 km southeast of the village of Dilingat near the western margin of the Delta (see Figure 1.1). The Rosetta branch of the Nile flows approximately 14 km to the south-southeast and several canals lie within a few kilometers of the site. The surrounding area consists of agricultural plots interspersed with small brackish ponds, drainage canals, and swampy areas. Soils tend to be sandy and not particularly productive agriculturally (Wilson 1955) and the overall topography of the region ranges from zero to a few meters above sea level.

Geologically, the basic sedimentary units are Quaternary sands and gravels overlain by Holocene fluvial sediments ('Nile mud'). The main structural feature of Kom el-Hisn is the *gezira* sand on which the cultural deposits rest. Extensive coring of the area in 1984 and 1986 revealed that the *gezira* sands extend in a general north-south direction for about 700 meters long and 400 meters wide (Buck 1990) and at a maximum of 7 meters above sea level (a.s.l.). The deposit consists of well-sorted medium sand with a mean grain size of 1.5-2.5 phi and may be several meters thick. The origin of this *gezira* sand is somewhat controversial and may represent either stabilized sand dunes (Said 1981) or remnants of Pleistocene sands and gravels ('turtlebacks') deposited when sea level was higher (Sandford and Arkell 1939; Ball 1939). Turtlebacks tend to be rare in the western Delta and much more common in the eastern Delta (Said 1981), but Fortau (1915) shows the maximum eastern extent of these deposits passing near Kom el-Hisn. Analysis of the core data collected at Kom el-Hisn may militate in favor of an aeolian origin. The gezira has a very high sand fraction (90-98%; Buck 1990:60) with a very small silt and clay component, and the particle size characteristics are very similar to other known dune deposits found in the Delta. A single radiocarbon date of 11,344 $\pm$ 241 BP (Wenke et al. 1988b) also places this deposit at a time when sea level was low.

The Nile muds that lie atop the *gezira* sand are generally poorly sorted silts and coarse clays with a high organic content and form the agricultural base of the Delta. Presumably, most of the base sediments comprising the cultural deposits consist of transported Nile mud and *gezira* sand (Rosen 1986). The cultural deposits themselves lie stratigraphically in direct contact with the underlying *gezira*. Midden deposits are exposed primarily in the southern part of the site and extend under the agricultural fields to the north and northeast, and to the south are interspersed between layers of Nile mud.

The location of the site is at least partly due to these geologic factors. Recent surveys indicate that Old Kingdom settlements tend to be found along major waterways, such as primary Nile branches and distributaries, either for irrigation purposes or for ready access to communication and trade. While there are only two primary distributaries in the Delta today, as many as nine have been identified to have existed. The largest of the eastern distributaries was the Canopic branch which flowed near Naukratis in the 6th century B.C. and may have existed in Old Kingdom times (Figure 2.3). Egyptian Geological Survey maps and geological profiles show a good correspondence with historical information regarding the Canopic branch. Another smaller distributary, the Alexandria branch, is shown by Toussoun (1922) flowing to the west of Kom el-Hisn along the western margin of the Delta and emptying into Lake Maryut. Since these distributaries migrated over time it is difficult to determine the exact locations of the distributaries at the time of Kom el-Hisn's occupation in the Old Kingdom without extensive coring and dating of the deposits, but it seems clear that at least these two branches and possibly other large canals were within a few kilometers of Kom el-Hisn.

The *gezira* deposit itself also no doubt contributed to the placement of the site. These *gezira* deposits are topographically higher than the surrounding deposits and often represent 'islands' in a sea of Nile mud. As noted in the preceding section, a survey by van den Brink (1987, 1988) of part of the northeastern Delta revealed that these topographic high points were important in the determination of settlement placement, possibly as a refuge from high Nile floods and also perhaps to minimize the agricultural land used for settlement.

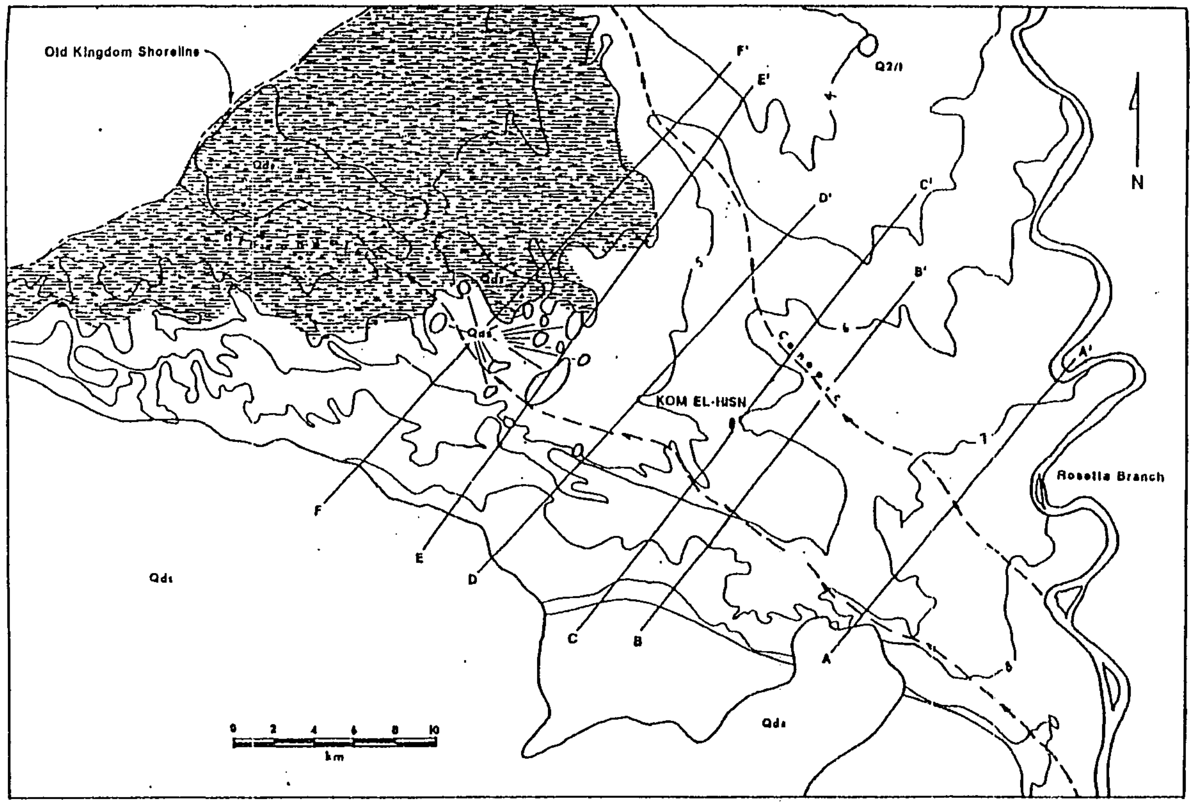

Figure 2.3. Reconstructed landscape of the western Nile Delta during the Old Kingdom. The coastline was perhaps 30-50 km south of its current position and two extinct Nile distributaries passed near Kom el-Hisn, the Canopic and Alexandria branches (Figure 2.2 in Buck 1991:43).

2.5.2 Previous research.

Prior to the current excavations, archaeological work at Kom el-Hisn (reviewed in more detail in Appendix III) has been sporadic and not usually related to the Old Kingdom remains. Petrie (1886) noted the presence of a statue of Ramesses II, and Griffith (1888) produced a plan map that showed a brick enclosure wall with the remains of a pylon at its eastern end and four statues of Ramesses II (see Figure III.2). Griffith's estimate of the size of the site, about a mile by a third of a mile, agrees well with the current estimate allowing for destruction due to the *sebakhin*. Neither the temple complex nor the pylons noted by Griffith are visible today.

The only other extensive excavations were conducted by Hamada, el-Amir, and Farid who excavated almost a thousand burials on the northern gezira portion of the site in the 1940's (Hamada and el-Amir 1947; Hamada and Farid 1947, 1948, 1950). The majority of graves have been dated to the latter part of the First Intermediate period but some Middle Kingdom and New Kingdom burials also were found (Brunton 1947). Many of these graves were simple inhumations with a few pots present but others were relatively rich in contents and construction quality, especially those from the New Kingdom.

The other major monuments of note are the limestone tomb of Khesu-wer, a Middle Kingdom official under Amenemmes (Amenemhat) III (Silverman 1981), and a collection of dressed stones to the far north of the site which have been variously described as a double tomb structure or simply blocks piled from the adjacent fields.

Textually, Kom el-Hisn has been associated with Yamu (*im3w*), the capital of the third nome of Lower Egypt (Griffith 1888:78), and is known from texts since the 5th Dynasty. Inscribed Middle and New Kingdom monuments at Kom el-Hisn associate Yamu with the goddesses Hathor and Sekhmet (Montet 1957; also see Appendix III). This apparent association with cattle may extend further. Cattle form part of the names of four Lower Egyptian nomes and cattle cults were apparently widespread in the Delta (Kees 1961; Montet 1957) and cattle frequently appear crossing Delta marshes in Old Kingdom tomb scenes.

2.5.3 Current research.

The current excavations on which the present research is based were conducted over three seasons, 1984, 1986, and 1988. The main occupation areas are located in the southern portion of the site (Figure 2.4). The majority of the site is covered by a layer of coarse salt-encrusted sediment with abundant ceramics (hereafter, the Upper Pottery Layer or UPL) which is thought to be a lag deposit resulting from *sebakh* digging. Mud brick architecture is found throughout the main midden within a few centimeters of the surface.

Excavation proceeded in two stages. The first stage was carried out in the first two seasons. In 1984 several randomly selected 1 X 2 meter test pits were excavated along with two trenches and another 1 X 2 meter pit that were arbitrarily chosen based on surficial architectural features. Based on the results of these excavations, in 1986 a stratified random sample design was used to excavate a number of 2 X 2 meter pits. In addition, a 72 m^2 trench (the 'block area') was cleared and excavated to reveal architectural relations, and two further step-trenches were excavated to examine topographic features. The purpose of this stage of excavation was to obtain a statistically valid sample of artifactual remains and to clarify the overall structure of the site as far as possible.

In 1988 a third set of excavations was conducted to clear a wider area and expose more architecture. The main portions of this excavation were located adjacent to the block area excavated in 1986 since the architecture in this area was particularly well preserved and close to the surface. Two other areas were also cleared to reveal the architectural features, one a few meters northwest of the main block area (containing Rooms 17 and 20) and another in the far western portion of the site abutting agricultural fields (Rooms 22 and 23). The purpose of this stage of excavation was to clarify the architectural relations found in the previous two seasons and to obtain samples with known architectural contexts.

Published result thus far, mostly from data collected from the 1984 and 1986 seasons (Buck 1990; Moens and Wetterstrom 1988; Wenke, et al. 1988a; Wenke and Redding 1985, 1986), indicate the following. First, the majority of cultural remains are of

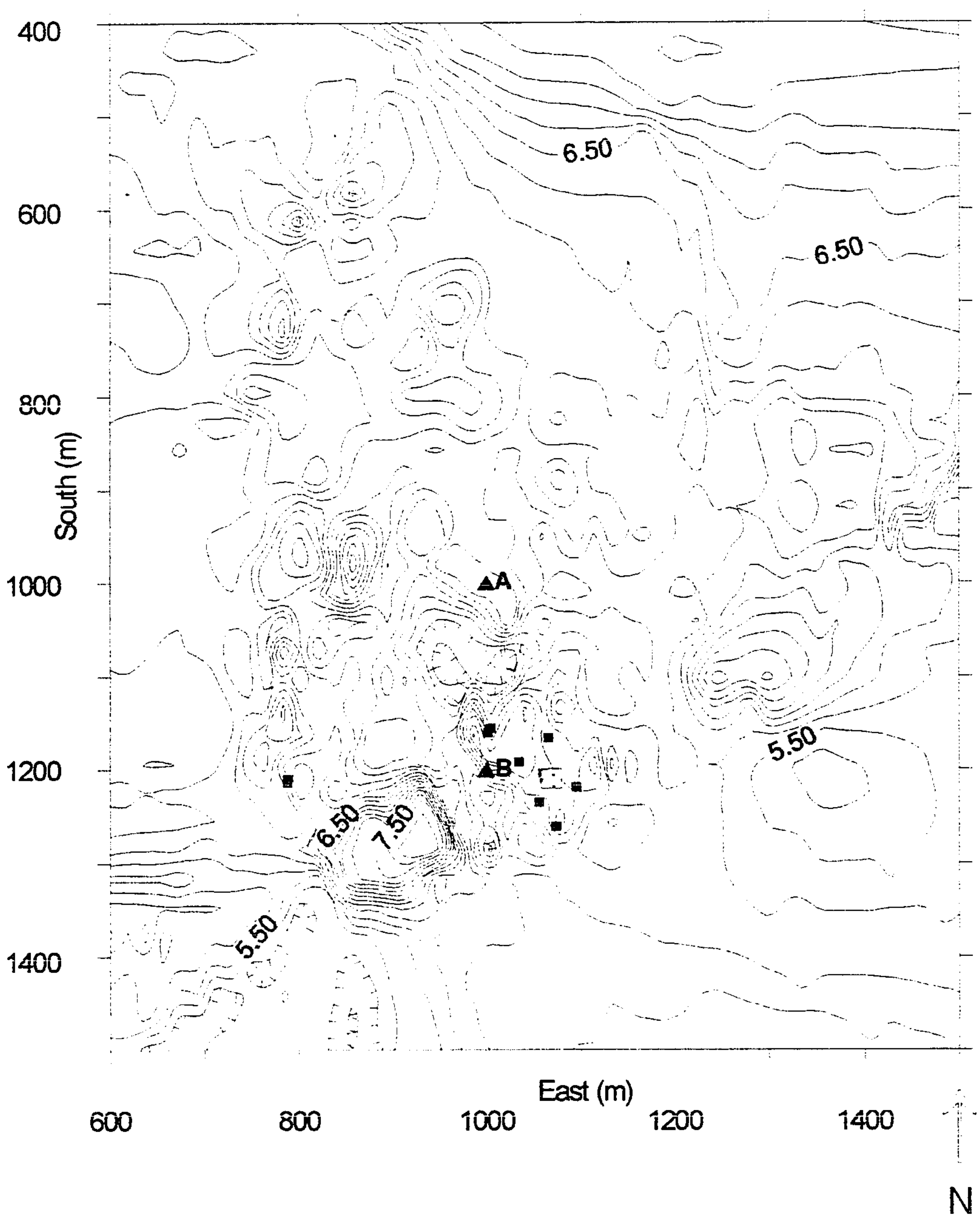

Figure 2.4. Topographic map of Kom el-Hisn showing the location of 1986 and 1988 excavation units. The block area is shaded, baseline datums shown as A and B are shown as triangles. The excavation units are clustered in the main occupation area of the site.

Old Kingdom date and are largely undisturbed by later occupations. A small area of Middle Kingdom remains is located in the southwestern end of the site and two burials thought to be of First Intermediate age are also intrusive into the Old Kingdom architecture. The date of the occupations is based primarily on ceramic types. Most forms are known from other Old Kingdom occupations at Giza, Saqqara, and other Lower Egyptian sites, and specifically represent wares common in Dynasties 5-6. No evidence of ceramic production, such as kilns or slag, has been found. Radiocarbon dates (Wenke et al. 1988a) also correct to Early Dynastic or Old Kingdom times. Epigraphic material came mostly from the Middle Kingdom portions of the site, but several fragments of Old Kingdom date were also found.

Second, the structure of the site indicates mostly domestic architecture extending over at least 900 m^2. No architectural use of stone was found. A large enclosure wall seems to ring at least a portion of the site, evidence for which appears near the modern village in the southwestern end of the site. Wenke et al. (1988a) suggest that an administrative or religious sector was located in this southwestern area, now covered by the modern village. Structurally this would make Kom el-Hisn similar to other Old Kingdom centers where these functions were performed in a restricted, and possibly walled, area of the town. There seem to be at least two major building episodes represented for the Old Kingdom, and probably three. Earlier structures were apparently leveled with rubble before rebuilding rather than utilized in later constructions.

The artifacts analyzed thus far indicate basic domestic activities. Typical 'bread mold' ceramics, fire-blackened (cooking?) jars, and shallow bowls suggest food preparation and storage. The lithic component consisted of almost equal parts of chipped and ground stone tools. The majority of debitage and finished tools were blades and sickle blades, respectively. The character of the blades and the almost complete absence of cores or manufacturing debris indicates that most lithic reduction took place off-site and that either blade blanks or prepared cores were imported into the site. About 15% of the ground stone tools represent grinding implements (manos or metates) and the remainder, with the exception of some flakes of limestone, granite, and alabaster, seem to be reworked pieces of these grinding implements.

Taken together, the vertebrate remains indicate a mixed diet of domestic (sheep/goats, pigs, cattle) and wild (fish, hartebeest) animals. Mammal bone dominates the faunal assemblage numerically (identified specimens), by weight, and by meat yield as part of the diet, but all other major vertebrate classes are present except for amphibians (Redding ND). The majority of the mammalian remains are from sheep/goats and pig. Age and sex distributions, while tentative, indicate that pigs were eaten before maturity while sheep/goats had a bimodal distribution with some individuals killed as juveniles and others in late maturity. The remainder of the vertebrate remains primarily consist of animals present in the surrounding area, such as catfish (*Clarias*), Nile perch (*Lates*), various species of bird (e.g., teal), and game animals such as hartebeest (*Alcelaphus*). Curiously, few remains of domestic waterfowl -- geese and ducks -- which are characteristic of Egyptian villages of all periods, have been found.

Cattle bones are rare in the Kom el-Hisn assemblages and this fact, together with evidence from the botanical remains, suggests that at least one function of Kom el-Hisn was as a specialized cattle producer. The absence of cattle bones implies that cattle, if present, were not eaten on site but exported elsewhere, perhaps to religious or administrative centers. In addition, Moens and Wetterstrom (1988) note that the distributions of four general classes of plant remains -- cereal straw, field weeds, reeds and sedges, and fodder plants -- differ from those at other habitation sites in Egypt. Fodder (e.g., clover, vetch) composes almost 27% of the remains thus far analyzed and suggests that the animals were fed in pens on specially raised crops and only allowed to browse in the open seasonally if at all. Little evidence of sheep/goat dung has been found and it is thus argued that the majority of these remains came from cattle dung used as fuel.

In fact, much of the evidence indicates that Kom el-Hisn may have had strong ties to the central government. The absence of production facilities for basic goods and the similarity of ceramic types to those found in administrative and mortuary contexts at Giza, together with the evidence of specialized cattle production indicate a smaller degree of self-sufficiency than is generally supposed for Old Kingdom Egypt. Whether Kom el-Hisn was initially settled either as a pious foundation, a directly administered arm of the central authority, or if it simply developed that way, is unclear.

Thus, several questions involving the basic function of Kom el-Hisn locally and with respect to the central government remain unanswered. How self-sufficient was Kom el-Hisn in terms of basic subsistence? Was it integrated into the regional economy or distinct from it as a governmental institution? What was the range of activities carried out at the site and how were they organized spatially? Did these functions or their spatial distribution change over time? The somewhat limited extent of the data gathered thus far allow only limited answers to these questions. However, this research should provide the outlines of a basic functional model of Kom el-Hisn's functional complexity that may be compared with other sites.

3.0. Method and Theory

3.1 Overview

Egypt is one example of an apparently obvious case of a highly complex culture that differs in striking ways from other complex early civilizations such as Mesopotamia, yet is still regarded as a classic example of a complex preindustrial civilization. Wilson (1960), for example, noted that Egypt's towns and villages, as then known, did not appear to exhibit the degree of size, density of occupation, and range of non-agricultural activities as their Mesopotamian counterparts, and therefore did not qualify as true 'cities' as in the Mesopotamian model. Sjoberg (1960) however, argued that even though Egypt's city structures differed in many respects from the Mesopotamian model they still were cities in their own right. In any case, since Egypt exhibited all the other hallmarks of complexity -- monumental architecture, administrative hierarchies, specialized craft production, etc. -- the question of whether Egyptian cities were functionally equivalent to the Mesopotamian variety is somewhat moot.

Whether Egypt really was a 'civilization without cities' reflects deeper theoretical issues involving explanation of the initial development of cultural complexity. It also highlights, as Wenke (1997) notes, the typological nature of the comparative method: without a set of theoretically-derived necessary and sufficient conditions to define what "cities", "city-states", and "nation-states" are, comparison becomes a matter of simple (though in many ways useful) description rather than explanation.

Nevertheless, comparing the nature of Egypt's formation into a complex state can be useful for identifying those factors common to the formation of cultural complexity worldwide and those that are highly variable or unique to specific regions or cultures. Trigger, for example, in his review of several complex societies found that there was much less variation in some cultural elements than expected given different ecological settings.

> I expected to discover that, because of ecological constraints, the differences in economic systems would be limited, and there would be more variation in sociopolitical organization, religious beliefs, and art styles. In fact, I have found that a wider variety of economic behavior was associated with early civilizations, the one

> constant being the production of surpluses that the upper classes appropriated through a tributary relationship. Yet I have been able to discover only one basic form of class hierarchy, two general forms of political organization, and a single basic religious paradigm. . .I have documented significant variation from one early civilization to another only in terms of art styles and cultural values. (Trigger 1993:110)

He interpreted this lack of variation as indicating that certain structures were more efficient than other structures and were thus optimized to particular forms.

Trigger's use of the comparative method to highlight particular traits that are potentially adaptive with regards to entire civilizations points the way to the use of Darwinian evolutionary theory to explain such similarities scientifically. However, the atheoretical character of the comparative method limits its utility to simple description and *ad hoc* generalizations of what constitutes "significant differences" rather than providing the necessary framework for any sort of scientific explanation of why those common traits arise. In other words, it frames the general question of cross-cultural similarities and differences but does not provide the appropriate theory (or the units derived from theory) to explain those similarities and differences in a scientific fashion.

Dunnell and Wenke (Dunnell 1978a, 1996; Dunnell and Wenke 1979) have argued that the advent of complex societies represents a change in the scale at which selection operates. In simple societies, the individual or kin-group is the basic functional and reproductive unit and it is on this unit that selection (as differential reproductive success) operates. With occupational specialization and centralized decision-making, the scale moves to that of aggregates of individuals: groups of people who are functionally differentiated but integrated into a larger whole. The functionally integrated group becomes the reproductive unit.

Within this framework, differences between cultures are explained by delineating the specific evolutionary trajectories each has taken. This is accomplished by tracking changing frequencies of functional traits over time and determining what environmental factor(s) is responsible for the changes. In many cases, different cultures will have certain traits and selective factors in common, much as similar bodily structures evolve in different species that have common functional requirements (e.g., wings). It is important to recognize, however, that such similarities are only incidental to an evolutionary explanation, they are not what drives explanation. Since the traits under consideration and the mechanism(s) by which they reproduce themselves are specified by the underlying theory, cross-cultural similarities are explained by default. With the inductive approach used by Trigger (and the comparative method generally), similarities and differences amount to empirical generalizations that must be further explained by some other (usually unspecified) theory. Formal theory is, however, strict about the kinds of units which it can explain, a point clearly made by Lewontin:

> If one simply cannot measure the state variables or the parameters with which the theory is constructed, or if their measurement is so laden with error that no discrimination between alternative hypotheses is possible, the theory becomes a vacuous exercise in formal logic. . .(1974:11)

Consequently, if one is to construct an evolutionary explanation of the development of complexity one must develop units which the theory can explain. Key to a Darwinian explanation is the use of units that affect the Darwinian fitness of the organism, in this case the society. Those forms that affect the Darwinian fitness (i.e., the differential reproductive success) of the population in which they occur are functional (Dunnell 1978c:199), contrasted with those forms that have no detectable selective value termed stylistic. The contrast between style and function is basic to evolutionary explanation since the factors that affect their transmission and distribution are very different.

Stylistic forms are not affected by selection and consequently their spatial and temporal distributions are controlled by the degree and frequency of interaction. Since their distributions are determined by direct interaction, similarities produced are homologous and are explained by processes involving interaction such as descent, trade, invasion, and so forth. Because of this interaction they are the basic units by which "cultures" are defined and their interactions with other "cultures" explained. The creation of stylistic types has been a fairly rigorous process: types are formulated and reformulated until they display the monotonic distributions characteristic of temporal-spatial interactions. The directional characteristics of these distributions over time give rise to the formal seriations and other chronological schemes such as Petrie's Sequence

Dating (Petrie 1900). The formulation of the types themselves tends to be intuitive, but the distributions they are compared against – the test of "historical significance" in American parlance (Krieger 1944; Ford 1954a, 1954b) – provide an empirical performance test of their utility. Larger units based on these types also tend to retain the spatial-temporal contiguities of the original types, giving rise to spatially and temporally distinct units such as phases and cultures (Dunnell 1978c).

Functional units are and have been created differently. The notion of "function" is generally not a specific archaeological concept like historical significance, but a common sense one. Functional classes are defined most often by the similarity of archaeological specimens to modern or ethnographic forms whose use is known. The identification of function is thus a formal process of comparing archaeological to modern or ethnographic forms; no additional testing is generally done and the "functionality" of the resulting type designation is judged by the procedure by which the modern analog was determined. Thus, while stylistic types have been informally defined and then formally tested, the reverse is the case for most functional types. It is only fairly recently that more rigorous methods of determining function (e.g., wear) have been employed, but even so, the traditional designations (e.g., axe, knife) are still widely employed, especially in Egypt.

The distribution of functional types also has a different set of controlling factors from stylistic forms. Since functional forms are controlled by selection and their interaction with the environment, similar forms can arise without any sort of direct interaction among the populations giving rise to analogous similarities which are ostensibly the kinds of similarities of interest to Trigger and others. The environmental interaction of functional types also provides a means for testing their utility: functional classes ought to correlate with other evidence of activities or with environmental variables (Dunnell 1978b:60). This may take the form of covariation among different functional types (e.g., bread molds and oven structures) or the correlation of individual types or suites of types with micro-environmental variables (e.g., sickle blades and agricultural fields). Functional artifact types should translate to larger units much as their stylistic counterparts do: the "site" becomes a set of co-occurring functional types representing intrasocietal functional differentiation. In this light, describing the functional complexity of an individual town or village and its history becomes part of the process of explaining, in evolutionary terms, the history and selective environment of the organism under selection, i.e., the society.

Such an analysis does not necessarily entail simple functionalist explanations since the unique ecological and cultural sequences of each civilization condition and constrain the trajectory that each society follows. This can be appreciated by comparing the basic economic units of Egypt and Mesopotamia. Among early Mesopotamian territorial states and empires, the city constitutes the building block, the 'basic economic unit and primary producer of the culture' (Joffe 1991:35). In contrast, the basic economic unit of Egypt was the *nome*, a distinct province administered to one degree or other by local officials and recognized as individual units by the central government. The nome boundaries apparently did not change significantly from Predynastic times until the medieval period and seem to correspond in large part to natural flood basins (Baines and Malek 1980). This preexisting structure may have contributed to the largely non-urban character of most Egyptian settlements since the relative ecological uniformity of Valley and Delta environments, along with the efficient transportation link that the Nile provided, would afford few advantages for the concentrated and highly diverse urban centers that predominate in Mesopotamia. That Egypt eventually developed more urban settlement patterns along with site placements that bear no apparent relation to ecological factors (e.g., Amarna) serves to militate against simple ecological determinism.

The differing structure of the basic economic unit between the two also forms the basis of their respective settlement pattern structure. In Mesopotamia, rank-size plots of settlement sizes tend towards a log-normal distribution with several large cities surrounded by outlying towns and villages of varying size. Egypt however, until at least well into the Middle Kingdom, seems to have had a settlement distribution that approached a primate distribution with a single large city (Memphis) and numerous smaller towns and villages scattered up and down the Nile and throughout the Delta. This apparent difference is a result of the more rural, non-urban character of Egypt's settlements which, as argued above, may reflect the particular ecological characteristics of the Nile and is the essence for Trigger's (1983, 1993) contrast between the city states of Mesopotamia and the 'territorial state' model of Egypt's state structure.

However, rank-size plots are difficult to interpret in the absence of functional data on individual settlements. Key to such an analysis is defining the appropriate variables in such a way that they are archaeologically measurable and applicable to different regions and cultural contexts. Traditionally, one of the primary goals of urban archaeology is to identify the overall functional complexity of the site as a whole; that is, to determine the range and spatial distribution of functions that were carried out within the settlement. In other settings (particularly open-air sites) intrasite functional analysis has concentrated on various statistical and mapping procedures to locate and define artifact clusters thought to represent sets of specific activities -- the discovery of 'activity areas' (e.g., Carr 1984, 1985; Dacey 1973; Whallon 1973, 1974). In architectural settings where definable structures are present this analysis usually takes the form of identifying the activities carried out within specific architectural features (e.g., Hill 1966, 1970; Lightfoot and Feinman 1982; Longacre 1964).

The major problem in all aspects of intrasite spatial analysis is the dynamic nature of the sedimentation process. Few sites fulfill the Pompeii Premise (Binford 1981) of all artifacts remaining in their original positions of use. That their occurrence is so rare has to do with both the distorting factors of the sedimentation process and with the activities of the human inhabitants: artifacts can be used in more than one location, can be used in different ways in various locations, and the activities performed in one location may change over time. Thus, even if the Pompeii Premise were fulfilled at a particular site, what is eventually discovered by the archaeologist is a synchronic manifestation of a diachronic process of change -- an aspect of the material record that is the main contribution of archaeology to the study of culture.

A great deal of research has taken place to sort out the various factors, both natural and cultural, that distort the original 'pristine' archaeological record and shape the distribution of artifacts into its modern configuration (e.g., Butzer 1982; Schiffer 1972, 1983, 1987; Stein 1987; Stein and Rapp 1985). Generally subsumed under the rubric of 'formation processes' these studies have had as their goal tracing individual artifacts or classes of artifacts through the cultural system to their eventual deposition. The rationale behind this strategy is that if one knows the processes by which an artifact was moved from its primary location of use (or minimally to know if its present location *is* its primary location of use) then one can reconstruct to some degree the original use-position of the artifact, thereby fulfilling the Pompeii Premise analytically rather than physically.

This research program has been invaluable in giving archaeologists a sense of the numerous factors that may be responsible for the spatial distribution of artifacts across a site. Because the distribution of artifacts is one of the primary ways in which the functional configuration of a site is determined, a knowledge of the factors that move artifacts around is of utmost importance. Nevertheless, these studies have been hampered by their reliance on ethnographic analogy and their inconsistency in separating the processes that brought together a deposit as a unit from the life histories of the artifacts contained therein. Since aggregates of artifacts are the basic analytic unit by which the spatial distribution of artifacts is determined (through counts or frequencies of artifact types and the co-occurrence of same) this is not a trivial matter.

The most critical step in this endeavor is the definition of the deposit itself. Particularly in urban settings defining deposits has been a two step process of using visual characteristics to identify depositional units and then interpreting the units in common sense terms. These interpretations have tended to be *ad hoc* and based on colloquial notions of what a particular type of deposit *should* look like as opposed to a set of mutually exclusive and exhaustive conditions defining in theoretical terms how a deposit was created. For example, trash dumps should look something like modern trash dumps, occupation surfaces should look something like modern (generally ethnographic) occupation surfaces, and so forth.

In architectural sites the critical issue has been one of associating particular activities with structures by analyzing the contents of occupation surfaces or living floors that are thought to contain objects and features in their primary use contexts. Other deposits, such as dumps, are assumed to contain remains from a variety of locations and thus are not generally considered to contain information relating to the use location of the artifacts contained therein. However, as several authors (e.g., Binford 1982; Butzer 1982:98-100; Gifford 1978; Hayden and Cannon 1983; Kent 1984, 1999; Rosen 1986, 1989; Schiffer 1987) have noted, numerous processes can move artifacts from their location of use to their eventual point of deposition such as cleaning, trash disposal, reuse of surfaces, and scavenging, along with natural processes such as mass wasting and water flow.

Diehl (1998), for example, has divided these cultural processes into three general classes of behaviors that affect floor deposits: caching, scavenging, and trash disposal. These processes operate to remove items from their original use locations (*de facto* assemblages), and place them into their final archaeological locations. In order to reconstruct the original *de facto* assemblages from the resulting 'disturbed' assemblages one must identify the processes that have affected the original distributions and work backwards to find the original distributions. However, as Diehl notes "there is no unitary body of theory that calibrates the frequencies of different kinds of artifacts with the intensity of curation behavior or the manner of disposal. One must rely on a strategy of generating, *from theory* a set of general conditions that one ought to observe given the assumptions that certain processes affect artifact distributions"(1998:620; emphasis added).

The 'theory' to which Diehl refers has usually been based on ethnoarchaeological studies aimed at determining the ways in which classes of artifacts work their way through the cultural processes of procurement, manufacture, use, maintenance, discard, and incorporation into the archaeological record (Schiffer 1987). The ethnographic observations are then used to determine what particular deposits should look like archaeologically when a set of behaviors acted upon the artifacts contained therein. The expected configuration of artifacts is measured on the diversity of the artifact inventory, its completeness (in terms of whole or reconstructable objects such as ceramic vessels), the nature of the artifacts in terms of their value to the occupants, and their physical characteristics (such as size or weight).

The degree to which the artifacts in a deposit can be reassembled into whole objects, for example, has been used as an indicator that the objects in a deposit have not moved very far from their location of use and presumably use-related breakage (e.g., Cressey, et al. 1982; Nelson 1985). This presumably indicates that there was a short and simple waste stream between use and discard locations in a particular site (Schiffer 1987:286).

Diehl also argues that artifacts that require high manufacturing or maintenance costs will generally not be left behind upon abandonment because of the high cost to replace them. When several of these types of artifacts are found together it indicates either rapid catastrophic abandonment and deposition, or caching behavior. Indeed, Schiffer (1987:89-98) posited numerous factors that determine curate behavior, or the proclivity of the inhabitants to carry off artifacts upon abandonment. These include the rapidity of the abandonment process, whether it was planned or unplanned, ritual abandonment, whether or not a return was anticipated, the length of the habitation, the nature of the artifacts themselves, and the distance to the next habitation.

That these observations have some heuristic value is not in question here; certainly on a broad scale these sorts of analogies have analytic value especially where they can be tested against other sorts of data (for example, textual descriptions or the house models of Middle Kingdom Egypt [Winlock 1955]). However, as with all analogies these definitions have their limitations (Ascher 1961; Gould and Watson 1982; Wylie 1982, 1985), and analogical arguments should be treated as statements of plausibility that require testing by alternate means.

Clearly, one must explain the association of artifacts within a deposit and their location in space with reference to theoretical principles that are not dependent on analogic reasoning. Also, one must separate the interpretations of the life histories of artifacts contained within a deposit from the determination of the depositional event that brought the artifacts together archaeologically. In order to proceed, one must specify the kind of unit one is creating with some sort of theoretical justification. Fortunately, a body of theory has been developed in the geological sciences that deals specifically with the formation of deposits. This research will adapt the geological principles of deposit formation to a cultural context.

3.2 Aggregate units (deposits).

Archaeologists have borrowed concepts from the geological sciences since the two disciplines share many goals (e.g., the study of stratigraphic sequences). However, archaeologists have reinterpreted geological principles to suit the essentially anthropogenic nature of many archaeological deposits. Stein (1987, 1990) has reviewed the similarities and differences between geological and archaeological uses of the concept of the deposit and found several key concepts that have been misunderstood or inappropriately used by archaeologists.

Geologists deal with several different types of units. A basic distinction is that between observable and inferential units. Observable units are based on a description of material referents. These include lithostratigraphic units which are defined on the basis of lithologic characters such as texture, color, and rock type, and biostratigraphic units which are defined on the basis of fossil remains contemporaneous with the formation of the deposit. Since biostratigraphic units are based on different criteria than lithostratigraphic units, the boundaries between the two need not be coincident. Several biostratigraphic units may be contained within a single lithostratigraphic unit and vice versa. Both of these units are largely descriptive; they only characterize the deposit based on its structure and composition.

Other depositional units, such as those dealing with the chronology of deposition (Stein 1987:345-346), such as chronostratigraphic units (all deposits formed in a given span of time), are based on these observable units and are inferential. These units are not descriptive but based on certain geologic principles relating to the process of deposition (e.g., superposition). Other interpretive units may relate to the kind of environment represented by a deposit (e.g., fluvial, marine, etc.).

Several authors have attempted to standardize the process of creating definitions of deposits that are relevant to archaeological analysis. Fedele (1976, 1984), for example, proposed the Elemental Sediment Unit which would be defined by its boundaries and lithologic homogeneity, essentially a lithostratigraphic unit. Harris (1977, 1979) and Schiffer (1987) both propose to define deposits on the basis of the mode of deposition of a given stratum (source, transport mechanism, depositional environment, and post-depositional alterations), with Schiffer tending to rely on the inferred histories of the artifacts within the deposit as the basis of classification. The obvious difficulty, as Schiffer (1987) himself notes, is that a single deposit may contain numerous artifacts with widely different life histories and that this strategy is more properly applied to individual artifacts. Doing so, however, merely reduces the scale at which a deposit is defined (individual artifacts rather than aggregates of artifacts) and does not really address the reasons why the artifacts in a particular deposit came together as they did.

Clearly there are numerous ways in which a deposit can be defined. For the purposes of this research, a deposit is defined following Harris (1977, 1979) as the mode of deposition, in geological terms, that brought the set of sedimentary particles (both natural and artifactual) together. The mode of deposition can be defined broadly as the source, transport mechanism, depositional environment, and post-depositional alterations experienced by the particles making up the deposit. Together these four factors describe the process by which any set of sedimentary particles formed a deposit. This type of definition differs from the sort of behavioral formation processes favored by archaeologists in that it only describes the *last* set of processes that acted on *all* of the particles in a deposit rather than the entire use-lives of artifacts before final deposition.

The rationale behind this is that the current positions of all artifacts in any site are a product of the last depositional event that moved and deposited them, be it the natural flow of water or people depositing trash into a pit. In analytic terms human and natural depositional agents are not qualitatively differentiated since, at base, they both act to move particles from one location to another. Hence, with respect to their spatial location, all particles within a given deposit can be expected to owe their location to a single set of factors. These factors, based as they are on the physical properties of particles and their movement, are grounded in a firm body of theory. Because the location of all of the particles in a deposit defined this way can be assumed to owe their position to the same set of factors, the spatial variation due to the mode of deposition is thus controlled. Consequently, spatial variation *within* a given set of deposit types can be assumed to result from something other than the mode of deposition.

When deposits as analytic units are defined strictly by sedimentary principles, the question then becomes one of explaining non-random variation within a given type of deposit. When the deposit is defined in behavioral terms only, the interpretation is implicit in the definition. For example, the contents of a habitation floor are interpreted by the artifactual content as the 'function' or activities performed in the room. But when the deposit is defined in sedimentary terms interpretation of non-random variation must proceed by analyzing other aspects of the deposit's contents in addition to the characteristics that defined its mode of deposition initially. This does not involve tracing the life histories of artifacts contained therein or attempting to define *de facto* assemblages that act as a yardstick for determining processes that have affected individual artifacts since they were used in their 'primary' position, *á la* Diehl (1998). Rather, behavioral inferences are made only as they relate to the final depositional process that brought the artifacts together as a unit. In most cases, the interpretation may closely approximate traditional interpretations of how a deposit was formed (e.g., 'dumps'). However, since each deposit must be defined in terms of sediment movement nebulous terms such as 'fill' deposits will be absent. Thus, each deposit will have a clearly defined set of attributes upon which the interpretation of its genesis was based.

In this context, many of the characteristics that have been proposed to identify the behavioral factors of deposit formation have some value when expressed as processes that affect the movement of sedimentary particles. Gifford (1978:82-83), for example, related the likelihood of artifacts becoming incorporated into floor sediments to the size of the artifacts (<3 cm) and the permeability and median grain size of the floor sediment itself. Rosen (1986, 1989) expanded these ideas and suggested that 'primary' debris in occupation surfaces may be identified by the grain size distribution of certain sediment categories (such as charcoal). Still, as Diehl (1998) and Schiffer (1987) note, caching of artifacts may enrich the artifact inventories of occupation surfaces, though this should not affect the distribution of microarchaeological remains which are incorporated into the sediment base largely through trampling (also Stein and Teltser 1989).

The strategy of this research is to define deposits on characteristics which identify the source, transport mechanism, depositional environment, and post-depositional alterations that brought together all of the sediment particles as a unit. Thus, each class of deposits can be assumed to have been formed by analytically identical processes, even though the artifacts contained in them may have had radically different life histories. Each class of deposits will then be analyzed for its distribution over space and its association with other deposit classes and architectural features. In this way a general model of the site's depositional history will be constructed.

Following this analysis I investigate the distribution of artifact types within each deposit class. The basic procedure for doing so is basically a statistical one: I will be testing the null hypothesis that a particular class of artifacts is randomly distributed across deposits in a single class. If the null hypothesis is rejected, the significant variation is explained by processes other than those involved in the formation of the deposit. The specific source of this variation is determined in part by the types of artifacts that are varying non-randomly and their contextual associations. It is at this stage where traditional formation process studies will be most useful in interpreting the existing variation.

3.3 Artifact classes

As Dunnell (1983:124) notes, there are two largely contrastive methods of spatial analysis depending on how the assemblages have been described. Analysis of the spatial configuration of artifacts described in functional terms (Dunnell 1978b, 1978c) broadly describes activity patterns, while the same analysis applied to artifacts described in stylistic terms describes patterns of interaction. The latter has often been interpreted as representing 'social structure' (e.g., Hill 1966, 1970; Longacre 1964).

Because of long-standing chronological concerns some notion of 'style' has played a central role in much of 20th century archaeology (e.g., Holmes 1886; Kroeber 1919; Phillips, et al. 1951). Much of the discussion involving style centered around why types created for chronological purposes behaved the way they did. Without any theoretical justification, the monotonic distributions that chronological types display were explained based on common sense notions of popularity. The types used in the construction of chronologies tended to be defined using a mixture of many different attributes – for example, ceramic decoration, temper, and paste – and tinkered with until they displayed the kind of distributions necessary for seriation. Only recently has attention been paid to the theoretical basis for the behavior of stylistic traits and the mechanisms by which they are transmitted (Dunnell 1986, 1996; Dunnell and Beck 1978; Lipo 2000; Lipo and Madsen 2000).

The identification of function has been treated in much the same way. Objects are assigned a functional meaning based on a form of 'functional uniformitarianism' (Dunnell and Beck 1978) in which the relationship between form and function are constant through time. Using this principle, archaeologists have interpreted the function of specific items with reference to ethnographic items of similar form. Though certain rules apply to the linking of ethnographic and archaeological objects (Fritz and Plog 1970), the basic procedure remains the same: applying an English (French, German, etc.) name whose meaning is commonly known to an object or set of similar objects. In this way, the function of an object is 'explained' through common sense notions of the activities a particular set of named objects are involved in.

The concept of function changed somewhat with the work of Semenov (1964) and later workers (Feathers 1985, 1990; Frison 1968; Gould, et al. 1971; White 1969; White and Thomas 1972; Wilmsen 1968). Within this paradigm, function is defined more narrowly as the "relationship that obtains between and object. . .and its environment both natural and artificial" (Dunnell 1978b: 51). Function is placed in an empirical realm by focusing on such attributes as edge damage and wear patterns in addition to gross morphology. Much of this research has focused on tools at a scale lower than the individual object (such as individual edges and instances of wear on stone tools), thus eliminating the problems of alternate uses, multiple uses, and reuse.

In a Darwinian evolutionary context, 'function' has a theoretically defined meaning: forms that have identifiable selective value (Dunnell 1978c). This is contrasted with 'style' which consists of forms that have no identifiable selective value. Functional traits confer a selective advantage on their bearers while stylistic traits are neutral in this respect, either through no detectable change in fitness or through equivalent fitness contributions across their distribution. Ideally, one could distinguish functional traits through engineering analyses of the performance characteristics of alternative configurations (e.g., Feathers 1990). The differential transmission of certain traits through time is explained with reference to variables that describe the selective environment in which the traits are differentially selected for or against. Archaeologists have generally used stochastic processes to model the way neutral traits are distributed through time (Teltser 1995, and recently to test a model of neutral distributions against archaeological samples, Lipo 2000).

Nevertheless, most assemblages, especially in Egypt, are still described in standard generalized type systems originally constructed in the late 19th and early 20th centuries. Often these generalized typologies were created for one use (usually chronological) but put to another when the disciplinary focus changes. This leaves the relationship between the attributes used to define the types and the mechanisms their distributions describe unchanged. Thus, one can easily be left with a set of data in the form of type descriptions that are unsuited for dealing with the proposed problem.

Since the main focus of this research is concerned with functional variation over space and the bulk of the data consists largely of standard Egyptian type descriptions, the central question becomes: to what extent can one expect spatial variation in artifact type frequencies to reflect functional variation? The answer to this question will vary depending on the overall class of artifact (lithics, ceramics, bone, etc.). In some cases (e.g., bone, which can be tied directly to diet) the question is largely moot; in others, it is more complicated.

Ceramic types have been used often to create types sensitive to chronological variation (e.g., Ford 1954a). As noted earlier, these types often contain a variety of attributes that may have either functional (or functionally neutral) or stylistic significance, depending on the nature of the problem for which the types were created. In Egypt, Predynastic pottery was especially important for dating purposes, primarily in tomb and temple contexts though it was also used for deriving later Dynastic Sequence Dates (Petrie 1900). It has long been noted, however, that Dynastic pottery, especially in Early and Old Kingdom times, is much less diverse in both form and decoration than during Predynastic and earlier times. In addition, textual and artistic remains (especially king lists) assumed relatively more importance for constructing chronologies than did ceramics or other types of artifacts, thus lessening the importance of chronological concerns when constructing ceramic typologies. For these and other reasons, as I argue in more detail in Chapter 6, I believe that the ceramic types used at Kom el-Hisn (a typology based largely on the standard typology used for this period) may be assumed in a general sense to be functional rather than stylistic.

Lithics and other stone objects are probably more prone to this type of attribute-mixing than ceramics since the same type descriptions are applied to Dynastic specimens as were used for earlier periods when chronological concerns were paramount. This is not, however, particularly important at Kom el-Hisn as the vast bulk of chipped-stone tools are sickle blades whose function is fairly straightforward to determine given the obvious wear patterns involved and their discovery (elsewhere) in association with whole tools (sickle handles). Other kinds of chipped-stone tools (such as knives and scrapers) are rare and do not provide a large enough sample for distributional studies. Ground stone is more difficult to assess as most of the objects found at Kom el-Hisn are fragmentary and wear patterns have not been studied in any detail. Certain categories, such as manos and metates, are often recognizable in their fragmentary form and have clear functional interpretations (though multiple use and re-use is a problem that can only be addressed through wear studies). Many other objects (e.g., 'pounders') have more obscure functional meaning; as with chipped-stone tools, however, most of these are relatively rare and not used for the quantitative distributional studies presented here.

Thus, even with the relatively generalized typologies employed in the description of Kom el-Hisn artifacts, it appears likely that much of the variation will be functional in nature. My strategy for examining this variation is threefold. First, I will determine if any types are differentially distributed among different deposit types. These will be used to interpret patterns of use and discard. Second, I will use clustering techniques to detect patterns of co-occurrence both among artifact types and within particular structures.

Third, I will apply diversity measures to room assemblages and test them against distributions derived from a repeat-sampling simulation. The goal is to detect non-random distributions of artifacts that describe the functional layout of the site. The patterns described for Kom el-Hisn can then be applied in much the same way to other sites and thus begin to generate more general patterns of functional complexity for this period in Egypt's history.

4.0 Materials and methods.

4.1 Materials

The most recent excavations at Kom el-Hisn were carried out over three seasons, 1984, 1986, and 1988, of which only the latter two are used in this analysis (the 1984 season consisted of only mapping and excavating small test pits). Data from the 1986 season consists of several 2-meter units placed according to a stratified random sample design. In addition, a shallow trench called the 'block area' was also excavated in contiguous 2-meter units covering 72 m^2 (see Figures 4.1 and 4.2). Based on preliminary analyses of the 1986 data three areas were chosen for wider excavation in 1988. The architecture in these areas lies close to the surface and was exposed by scraping off the upper 10-20 cm of upper pottery layer (hereafter, "UPL"), a widespread stratum of salt-encrusted ceramics in a reddish matrix resulting from *sebakhin* digging. Structures identified as such were then excavated as individual rooms and were numbered sequentially. Several of the rooms excavated in 1988 were also partially excavated in 1986 as part of the block area. In these cases, any of the 1986 deposits that correlated with 1988 room structures were added to the 1988 room deposit sequences.

In both seasons, excavation was carried out following natural stratigraphy. The basic unit of excavation was the 'sedimentary unit' or SU. The SU was defined to be a sedimentary structure that differed from the surrounding sediments in compositional characteristics (color, content, structure, texture, etc.) and extent. Ideally, each SU could be considered a separate depositional event; in practice, the excavator often noted that what initially appeared to be separate units were actually variable portions of larger units.

I have chosen to create an additional analytic unit that is a superset of the SU called the 'depositional unit', hereafter referred to as the "DU". The DU represents a larger unit consisting of one or more SU's that together are thought to represent a single depositional event. I defined each DU by studying the excavation notes, profile and plan drawings, and noting the artifact densities for each SU and then lumping together SU's that seemed to be part of larger depositional units. The DU thus represents the basic unit of analysis for this study and all artifacts contained therein are

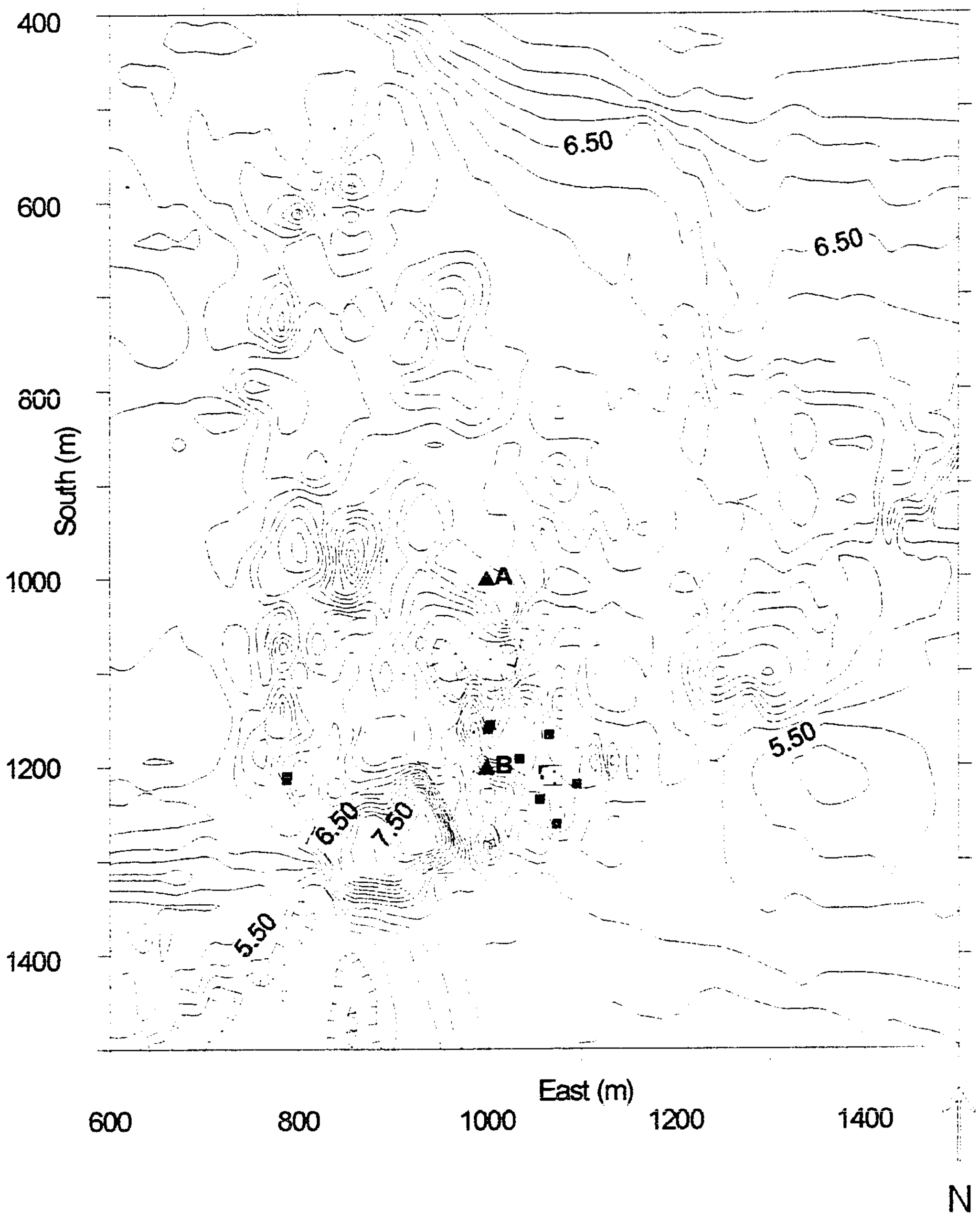

Figure 4.1. Topographic map of Kom el-Hisn showing the location of 1986 and 1988 excavation units. The block area is shaded, baseline datums shown as A and B are shown as triangles. The excavation units are clustered in the main occupation area of the site.

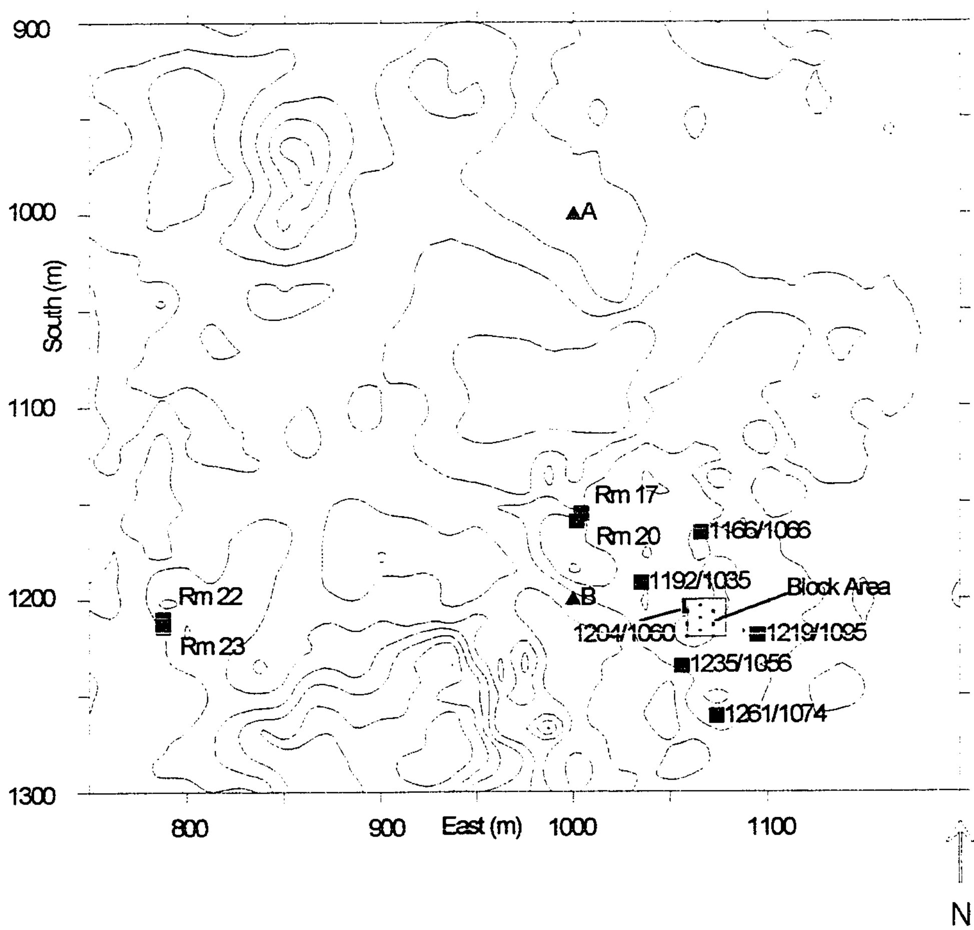

Figure 4.2. Detail of excavation units carried out in 1986 and 1988. Most of the rooms excavated in 1988 are in the block area. The remaining units (labeled with their South/East coordinates) are 2-meter units (symbols not to scale).

assumed to have been deposited by the same processes and owe their contemporary position in space to those processes.

Each DU is part of the stratigraphic profile of an excavation unit and is designated by the coordinates defining the excavation unit in which it occurred, the room number (if applicable), and the DU number. The DU number roughly corresponds to its position in the profile from top to bottom (DU-1 nearer the surface). For 1986 units, the coordinates defining the unit are the southwest corner of the excavation square. For 1988 units (rooms) these coordinates are an arbitrarily chosen datum stake near to and outside of the southwest corner of the room structure. Coordinates are in meters south and east of the origin of the grid system (to the northwest of the site). A typical DU designation will appear thus: 1214/1062r12du01, meaning the unit lies 1214 meters south, 1062 meters east, is designated as Room 12, and DU-1. All 1986 units have as default room '00' and are differentiated by their S/E coordinates.

The volume of each SU was determined by the number of baskets of a predetermined volume that were removed. All material (except where noted by the excavator) was dry screened through approximately 1/4" mesh and all artifacts were removed and bagged separately at the screens. Faunal material (bone and shell) was identified to species or element if possible and weighed. Ceramics were separated first by diagnostic type (rims, bases, etc.) and body sherds, the latter being further sorted by fabric type (Nile A, B, and C) and each fabric type weighed. Diagnostic sherds were sorted by type, a detailed description of which is in Chapter 6. Lithics were weighed in aggregate and then analyzed typologically. In addition, at least one sediment sample and one flotation sample were also excavated and bagged separately.

4.2 Deposit characteristics

The basic unit of analysis used here is the deposit which is defined as a group of sedimentary particles that were brought together by similar processes over a given period of time. The only analytically definable relation that the included particles have with one another is that their final position in space was determined by these processes. These processes may be defined by the source of the individual particles, the mechanism by which the particles were transported to their final location, the type of depositional basin in which they were deposited, and any post-depositional alterations they may have experienced.

I have chosen to use two procedures to classify Kom el-Hisn deposits. First, I devised a paradigmatic classification based on five dimensions that would provide a baseline for comparison. Theoretically, a well-defined paradigmatic classification would separate the deposits unambiguously into different classes representing distinct modes of deposition. However, practical considerations necessitated a simpler grouping scheme that would accommodate the available data. Consequently, the initial paradigmatic classification was used as an initial basis of description and other, more interpretive factors, were then used to arrange the resulting classes into groups that represent general types of deposits such as wall collapse, dumps, etc. The factors used to generate these interpretive groups were based on sedimentary principles such as the orientation of particles and the overall structure of the deposit, not on common sense interpretations of their contents. Thus, the final groups still represent a geological definition of a deposit rather than an anthropological one.

The initial paradigmatic classification is based on that used by Buck (1990) and is composed of five dimensions: structure, texture, dominant large clast, occurrence of mud bricks, and the presence of burning. My dimensions have somewhat different definitions from Buck's because of different research goals and available data. Buck's analysis concentrated on site formation processes and was based on extensive compositional and grain size analyses on a small sample of deposits. My goal is a more general description of the spatial distribution of artifacts across a large number of depositional units with fewer detailed analyses of deposit composition apart from macro-scale properties.

The dimensions are as follows (the number in parentheses after each mode is the numerical code each mode was assigned):

Dimension I: Structure. Defined as the overall patterning of particles within the deposit.

Mode 1 (1): Massive: Homogeneous with respect to spatial orientation.

Mode 2 (2): Horizontal: Stratifications or laminations, indicative of cyclical variations of the same processes.

Mode 3 (3): Vertical: Generally used to define vertically placed courses of mud brick.

Dimension II: Texture. Defined as the predominant particle size, including artifacts.

Mode 1 (1): Coarse: Abundant gravel-sized (4mm) and up.

Mode 2 (2): Fine: Little or no gravel-sized objects.

Dimension III: Dominant large clast type. Only refers to gravel-sized and larger particles.

Mode 1 (0): None.

Mode 2 (1): Bricks, brick fragments, or mottles (decomposed brick).

Mode 3 (2): Ceramics.

Mode 4 (3): Other.

Dimension IV: Brick content.

Mode 1 (0): Absent.

Mode 2 (1): Fragments, mottles, or haphazardly placed whole bricks.

Mode 3 (2): In situ, whole (in situ brick walls).

Dimension V: Evidence of burning.

Mode 1 (0): No burning evident.

Mode 2 (1): Burning evident.

Mode 3 (2): Obviously in situ burning evident (e.g., hearths).

Dimension I, Structure, indicates the transport mechanism. Massive deposits were aggregated by similar processes acting on all size particles rather than cyclical variations indicated by horizontal structure. Vertical structure is used to denote standing mud brick walls.

Dimension II, Texture, also refers to the transport mechanism; specifically this dimension seeks to distinguish deposits by the relative energy of the transport medium. Deposits with large particles have a more competent transport mechanism than deposits with smaller particles; e.g., humans or gravity, as opposed to running water. Post-depositional accretions, such as caliche nodules, are not included. This dimension was difficult to determine in practice without detailed grain size analyses and was not used in the final analysis.

Dimension III, Dominant large clast type, seeks to identify possible sources of larger particles -- for example, bricks or brick fragments as opposed to building stone or ceramics. In most cases this dimension was either ceramics or brick. Since bricks constitute such large individual clasts, the presence of even a few bricks could overwhelm the amounts of any other material. Because of this, where ceramics and bricks were both present in quantity, ceramics were generally chosen to be the dominant clast unless bricks or brick fragments make up a majority of the entire deposit (such as wall collapses).

Dimension IV, Brick content, is used to determine the source of any brick particles present, whether they were deposited by humans directly (as whole, *in situ* bricks) or by some form of natural transport mechanism (wall collapse). This is an additional dimension not used by Buck and was included to specify the presence of bricks or brick pieces when another type of particle (usually ceramics) was designated as the large clast. It also serves to differentiate collapsed walls from *in situ* (standing) brick structures.

Dimension V, Burning, is used to indicate the source of the material (primarily hearths or other cooking features) and to specify whether the burning took place before (Mode 2) or after (Mode 3) deposition. Ash, charcoal, or charred artifacts in an otherwise non-burned matrix indicates pre-depositional burning while matrix that is obviously burned *in situ* (such as a hearth) indicates post-depositional burning.

I determined the value for each dimension by examining the excavator's field description of the deposit and the associated metric measurements of artifact densities (amount per unit volume of sediment). In most cases the appropriate modal value was clear. In others, some judgment was allowed due to either lack of adequate field descriptions or the unanticipated ambiguity of the dimension itself. Texture and dominant large clast type, for example, were difficult to determine without detailed grain size analysis of the sediment samples. Consequently, texture, while noted, was not used in the final set of analyses.

Once modal values were assigned, each deposit was defined by its particular set of values. Thus, a deposit classified as '11212' is Massive (1), Coarse textured (1), with ceramics as the dominant large clast (2), has brick pieces or mottles present (1), and has evidence of in situ burning (2). Using the five dimensions a total of 216 classes are possible. The resulting classification using all five dimensions yielded 40 classes. Dropping texture from the analysis gives 108 possible classes and yielded 27 filled classes. The frequency of filled classes is given in Table 4.1.

The inadequacies of this classification scheme for separating deposits into homogeneous units became apparent when looking at the context and descriptions of the units. For example, both DU-7 in Room 9 (1216/1076r09du07) and DU-7 in Room 2 (1208/1074r02du07) were both classified as 1000 (Massive, No large clast, No bricks, and No burning), but the Room 9 deposit was a large prepared clay floor while the Room 2 deposit was the clay lining for a storage pit. Clearly, these dimensions were inadequate to separate the deposits into classes that represented true depositional units.

Consequently, I used the paradigmatic classification as a reference to create more analytically useful deposit types. The basic criteria I used to determine what type of deposit a particular DU represented came from the paradigmatic class definition and the characteristics of the deposit as gleaned from the excavation notes. The latter criteria included the general shape and context of the deposit (a pit lining is obviously different from a column base), the relation of the deposit to surrounding structures, the orientation of the larger particles contained therein (random orientation indicating rapid dumping for example), and the interpretation given the deposit by the excavator.

In all, I identified twelve general types of deposits that capture enough variation in modes of deposition without creating too many classes for an effective analysis. Most of these are typical kinds of deposits identified by other researchers at tell sites. The deposit types are as follows, in order of abundance:

Wall collapse (WC): There are 41 wall collapse deposits making it the most common deposit type analyzed. Wall collapse deposits generally have low to moderate artifact densities reflecting their source material. The ceramics contained within these deposits are assumed to come from chinking material or incorporated into the deposit either in the collapsing process or due to post-depositional disturbance (such as rodent burrowing). The densities of artifacts should also be comparable to other deposits derived from mud brick walls; t-tests reveal that the densities of all artifact types are

Table 4.1. Frequency of modified deposit types (without Texture dimension).

Class	N	%	Cumm. %
1000	11	6.90	6.90
1001	1	0.60	7.50
1010	7	4.40	11.90
1110	20	12.60	24.50
1111	8	5.00	29.60
1200	23	14.50	44.00
1201	13	8.20	52.20
1202	4	2.50	54.70
1210	17	10.70	65.40
1211	9	5.70	71.10
1212	1	0.60	71.70
1300	1	0.60	72.30
1301	1	0.60	73.00
1302	1	0.60	73.60
1311	1	0.60	74.20
2000	5	3.10	77.40
2001	3	1.90	79.20
2010	1	0.60	79.90
2011	1	0.60	80.50
2110	1	0.60	81.10
2200	4	2.50	83.60
2201	12	7.50	91.20
2210	3	1.90	93.10
2211	3	1.90	95.00
2300	1	0.60	95.60
3110	1	0.60	96.20
3120	6	3.80	100.00

statistically equivalent in all wall-derived deposits (wall collapse, redeposited wall collapse, and intact walls). It is therefore suggested that minimal mixing occurred during transport and deposition of wall material.

Dump (D): Dumps (along with Floors) represent the second largest class of deposits with 25. Dumps are characterized by a massive structure, random orientation of particles, typically sloping away from the point of dumping, and a wide range of particle sizes reflecting relatively rapid deposition by a capable transport mechanism. Depositionally, dumping has the effect of concentrating material from larger areas into a smaller one. Consequently, dumps have high densities of artifacts (they have the highest a mean density of ceramics and Number of Identified Specimens [NISP]) representing the source of the material as debris removed from habitations and concentrated in one spot.

Floor (F): Archaeologists have traditionally been very concerned with the identification of occupation surfaces because the artifacts contained within or lying on the surface are thought to represent the location of use of those artifacts. Several authors have posited characteristics unique to occupation surfaces, relying on depositional structure, relation to architectural components, color, and artifact content. Butzer (1982), for example, notes that house floors often have a laminated structure reflecting a prepared surface or surfaces of fine-grained material on top of a coarser substrate. Bullard (1970) characterized the occupational sequences at Tell Gezer as composed of thin layers of fine-grained particles with small artifacts and other remains pressed into them (see also Rosen 1989). Color has also been used as a criterion for occupation with darker deposits indicating occupational debris, usually reflective of burned/charred organic material incorporated into the matrix (Butzer 1982:88). While it has been noted for some time that artifacts, especially portable ones, may be removed from occupation surfaces through either cleaning or curation (Schiffer 1972, 1987), larger artifacts that are not easily portable (such as large grinding stones) or features (such as storage pits) have also been used to identify house floors. In these cases, the association of the deposit and the artifact/feature is direct and reflects the location of use – the usual interpretation of what constitutes a house floor.

I have found that the overall shape and association of the deposit to surrounding walls and features (such as storage pits) are more indicative of occupation surfaces than many of these characteristics. Where possible, an occupation surface was defined as such when its boundaries corresponded to adjacent walls (usually at the base), was reasonably level, and/or directly associated with obvious occupational features, such as hearths or storage pits. This definition proved to be somewhat problematic in the 2-meter arbitrary units excavated in 1986 where often no walls were present. In these cases I relied on the interpretations supplied by the excavator and the more extensive analyses carried out by Buck (1990). In many cases, these occupation surfaces do not correspond to the usual characteristics described above. For example, of the 25 house floors identified, only 14 have a laminated structure and only 17 have an obvious burned organic content.

Decomposed Wall Collapse (DWC): Deposits of this type were in many cases difficult to classify. They are mostly brown to tan massive deposits with no internal structure, and similar in color to wall collapse material. In many cases, they were in direct contact with similar wall collapse deposits differing from them only in a lack of numerous bricks or brick fragments, often with indistinct boundaries between the two. The context of these deposits suggests several different trajectories for their formation. In some cases, it appears as if a wall had collapsed and remained exposed to the elements for some time allowing water to penetrate and dissolve the individual bricks; this represents an unconformity with overlying deposits. In other cases, standing brick walls did not collapse but partially dissolved in place. In either scenario, these deposits indicate a passage of time that allowed the internal structure to become more homogeneous than simple collapsed walls. In all, 14 of these deposits were recognized.

Upper Pottery Layer (UPL): All 14 of these are surface deposits composed of reddish brown coarse deposits whose primary large clast is pottery. This deposit covers most of the site to a depth of several centimeters (usually about 10) and is thought to represent a lag deposit resulting from *sebakhin* activity. It is unclear whether the contents of these deposits have any particular spatial relation to the underlying structures; this would depend on whether they were sifted in place or in discrete locations and subsequently spreading out through mass wasting or fluvial activity.

Pit (PIT): Pits are a special case of deposit and were labeled as such based on the depositional basin (a pit) rather than the deposit characteristics. A 'pit' was defined as such if it was apparent that it was purposefully excavated or constructed rather than material simply filling a topographic depression. The pits, 11 DU's altogether, were of several types. Two (Room 17, DU-3 and DU-8) were interpreted as hearths since they had an outer structure of fire-hardened clay and contained material burned in situ. Four (representing Room 2, DU's 6, 7, and 8; Room 5, DU's 8, 9 and 11; and Room 13, DU-3) were constructed of mud brick. The pits in Rooms 2 and 5 appeared to be storage pits while that in Room 13 was a larger structure whose function appeared to have been an oven. The remaining pits (Room 1, DU-2 and 1235/1056, DU-2) were shallow excavated pits which may have been dug purposefully for refuse disposal. The contents of all of these pits were somewhat diverse, some representing small dumps, others with redeposited wall collapse, and some that were a part of the structure of the pit itself (particularly Room 2, DU-7 and 8 which were the clay layers lining at the bottom of the pit). Reflecting this diversity of deposits, pits have some of the highest standard deviations in artifact densities.

Redeposited Dump (RD): This type of deposit is dump material that has been transported from its original place of deposition, generally through fluvial action. Most of these deposits were identified by their laminated structure, generally sloping character, and the orientation of the particles (particularly ceramics) which tended to be parallel to bedding planes. The composition of the deposits also tended to be similar to other deposits identified as dumps. In addition, the depositional basins of many were located adjacent to structures in topographic depressions where material is likely to have washed in from adjacent habitation areas (e.g., unit 1204/1060). Compared to *in situ* dumps, artifact densities reflect this movement and consequent sorting: ceramic and lithic densities are lower for redeposited dumps (both heavier objects); *total* bone density is slightly higher for redeposited dumps, but the NISP value -- reflective of generally larger bone fragments -- is lower. There are ten redeposited dumps in this analysis.

Redeposited Wall Collapse (RWC): Nine deposits were identified as redeposited wall collapse on the same basis as redeposited dumps. They were differentiated from basic wall collapse deposits by the more fragmentary nature of the brick pieces which also make up a smaller overall portion of the sediment. Because of this, bricks were not necessarily the dominant large clast. The ranking of artifact distributions follows the same general pattern as that of redeposited dumps: because of the additional sorting of the deposits, all artifact densities are lower than *in situ* wall collapse deposits.

Fluvial (FV): These seven deposits are all characterized by either a laminated structure or structures within the deposit that indicate deposition by running water. They are differentiated from other redeposited deposits in that they are largely devoid of artifactual material making the determination of the source difficult. As a result, they have very low absolute artifact densities and in general have the lowest densities of all deposit types. The exception to this rule is the fairly high density of identified faunal remains. This is explained by the fact that most of the identified bone in these deposits are fish which tend to have small, light bones which are easily transported by running water.

Intact Wall (W): These deposits were defined simply as standing brick walls or any structure that was seemingly intact and composed of mud bricks. Four of the six deposits were true walls and two were either brick-paved platforms or possibly walls which had fallen over largely intact. The densities of artifacts for these structures are close to those of other wall-derived deposits and tend from low to moderate densities. The amount of ceramics is predictably low, but the amount of bone is rather high. In fact, in both density by weight and density by NISP, intact walls have higher average densities than any of the other wall-derived deposits. These NISP counts do not include mollusks which are contained in many bricks and are apparently derived from the sand and gravel (*gezira*) deposits underlying the site.

Burial (BUR): There are only two deposits in this category. The first is an adult burial that was intrusive into the Room 5 deposits (excavated in 1986 in units 1211/1072 and 1213/1072). The second is a child burial that was deposited within a cavity undercutting the north wall of Room 4. No grave goods were recovered with either burial though the adult probably was entombed in a painted plaster coffin (since collapsed) and possibly a whole pot beneath where the skull (not present) would have been. Other burials were excavated but not given an SU. Most of these were infants or newborns. The exception is the mud brick tomb of Room 15. The burial itself from this room was not excavated (only the overlying material) and thus was not classified as a Burial deposit.

Column Base (CB): The only deposit in this category was excavated as part of Room 9 (DU-2). It consisted of three circular irregularly spaced clay structures with a large limestone rock embedded in the center of each.

4.3 Integrity of units.

Even though the deposits were classified on the basis of field-observable characteristics, it remains to be determined whether these deposit categories translate into units that can be differentiated on the basis of artifact content. Artifact densities for all deposit types are shown in Table 4.2. For analytic purposes, some of the deposit types may be combined for comparison with other deposit types, assuming that the movement of certain deposits will not appreciably alter the artifact densities of the deposit. For example, a wall (deposit type W) that falls over and becomes a wall collapse deposit (WC) should still contain the same material as the original wall; if that wall collapse material then slumps downslope into an adjacent depression and becomes redeposited wall collapse (RWC) it should retain the same set of artifacts of the original deposit.

Consequently, I performed several statistical tests to determine the homogeneity of certain deposit types and whether there are, in fact, quantitative differences in artifact densities between them. I have employed one-way analysis of variance using the natural logarithm for the three artifact density measures (ceramics, bone, and lithics) to satisfy the assumption of normality. Two sets of deposits are considered to be possibly equivalent, dumps and wall-derived deposits.

There are four deposits that have mud brick walls as their ultimate source: walls (W), wall collapse (WC), redeposited wall collapse (RWC), and decomposed wall collapse (DWC). During their journey from the original wall, the three wall-derived deposits may gain or lose artifacts depending on the transport mechanism. Running water, for example, is generally not competent enough to carry large ceramic pieces. Thus, redeposited wall collapses (which are most often redeposited in part by running water) are expected to contain fewer large classes of artifacts. Those that are deposited due to gravity or not moved at all (wall collapse and decomposed wall collapse) should contain approximately equal amounts of all artifact types. The figures in Table 4.2 show that the deposits generally conform to expectations. For ceramics, the largest and heaviest artifact type, redeposited wall collapses have the lowest mean densities. The same pattern is observed for lithics, also fairly heavy objects. Bone is more variable which is due in part to its ease of transport and also its susceptibility of

Table 4.2.Artifact Densities within deposit types. 'BONE' refers to bone weight density, while 'NISP' refers to the Number of Identified Specimens.

Deposit Type		Mean	St. Dev	Range
WC (N=41)	CERAM	7.68	7.60	30.53
	BONE	118.95	103.85	490.79
	NISPDENS	7.96	7.25	29.91
	LITHICD	5.75	13.70	82.96
D (N=25)	CERAM	1177.84	5695.11	28513.33
	BONE	336.11	334.21	1217.14
	NISPDENS	20.79	18.71	74.33
	LITHICD	9.85	8.62	26.02
F (N=25)	CERAM	10.67	9.75	36.89
	BONE	115.47	116.87	420.00
	NISPDENS	10.88	14.15	48.15
	LITHICD	7.21	10.43	45.68
DWC (N=14)	CERAM	7.25	14.13	54.92
	BONE	79.20	103.15	331.02
	NISPDENS	5.78	8.63	24.29
	LITHICD	4.29	6.63	24.24
UPL (N=13)	CERAM	24.94	30.36	95.56
	BONE	146.65	166.27	493.33
	NISPDENS	7.85	10.53	26.67
	LITHICD	22.73	24.21	88.89
PIT (N=10)	CERAM	49.00	74.69	240.00
	BONE	480.24	950.59	3020.00
	NISPDENS	73.23	200.66	642.29
	LITHICD	23.42	67.15	214.29
RD (N=10)	CERAM	10.65	6.07	21.12
	BONE	338.51	396.63	1381.43
	NISPDENS	20.46	13.58	43.37
	LITHICD	7.38	7.70	26.42
RWC (N=9)	CERAM	5.00	6.86	15.93
	BONE	87.93	103.82	283.95
	NISPDENS	6.60	7.45	17.99
	LITHICD	3.24	4.67	14.81
FV (N=7)	CERAM	2.07	1.81	4.59
	BONE	34.89	26.89	69.63
	NISPDENS	14.24	33.02	88.89
	LITHICD	0.23	0.62	1.64
Wall (N=7)	CERAM	3.09	4.61	11.67
	BONE	132.17	176.82	509.33
	NISPDENS	8.41	14.43	40.00
	LITHICD	3.85	5.50	13.33
	CERAM	14.99	12.10	17.11
	BONE	175.84	218.76	309.38
	NISPDENS	9.92	10.78	15.25
BUR (N=2)	LITHICD	1.15	1.63	2.30
	CERAM	0.00	.	0.00
	BONE	3783.33	.	0.00
	NISPDENS	33.33	.	0.00
CB (N=1)	LITHICD	33.33	.	0.00

organic decomposition. Note, however, that the density of identified specimens (NISPDENS) – which is largely a function of the size of the specimens – declines with transport.

Similarly, generalized dump deposits are divided into two classes, dumps (D) and redeposited dumps (RD). In the latter case, it is assumed that, due to the relative incompetence of running water, the most common transport agent, compared to the transport mechanism of the original dump deposit (humans), there will be fewer of the larger, heavier macro-artifactual remains (mostly ceramics and lithics) in redeposited dumps. This is, in fact, the case, especially for ceramics: dumps have a mean density of 1177.84 g/m^3 while redeposited dumps contain an average of only 10.65g/m^3 (without the single outlier, Room 17 DU-7, which has a ceramic density of 28,513.33 g/m^3, the mean ceramic density for dumps is 38.9 g/m^3, still above that for redeposited dumps).

An analysis of variance for both types of dumps and all wall-derived deposits shows that, despite some predictable differences due to transport, there are no significant differences within wall-derived and dump-derived[1] deposits when all categories of artifacts are considered. That is, there is no significant net loss or gain when these kinds of deposits are modified from their original deposit locations.

Combining these two groups of deposits together to facilitate comparison with other deposit types, I then examined how variation was distributed among the remaining deposit classes (excluding the burials [BUR] and column bases [CB] because of small sample sizes). Table 4.3 shows various density measures for the modified deposit types. To equalize the variance and satisfy the assumption of normality, I transformed each of the density variables using the natural logarithm of the density value; lithic densities were transformed using the natural logarithm of the density value plus one (i.e., $Ln(1+D_l)$ where D_l is the individual lithic density for a deposit) as this produced more normal distributions than the simple logarithmic transformation. Error plots for transformed variables are shown in Figure 4.3a-c. Variances for all three variables are approximately equal and testing for homogeneity of variance using the Levene statistic showed that the transformed ceramic and bone densities can, in fact, be assumed to have equal

[1] Without the Room 17 DU-7 outlier.

Table 4.3: Artifact densities within modified deposit type (wall-derived and dump-derived deposits combined).

Deposit Type		Mean	St. Dev	Range
Wall (N=71)	CERAMD	6.80	8.92	54.92
	BONED	108.48	111.34	509.33
	LITHICD	4.96	11.02	82.96
Dump (N=35)	CERAMD	844.35	4814.66	28513.33
	BONED	336.80	347.11	1381.43
	LITHICD	9.14	8.33	26.42
Floor (N=25)	CERAMD	10.67	9.75	36.89
	BONED	115.47	116.87	420.00
	LITHICD	7.21	10.43	45.68
UPL (N=13)	CERAMD	24.94	30.36	95.56
	BONED	146.65	166.27	493.33
	LITHICD	22.73	24.21	88.89
Pit (N=10)	CERAMD	49.00	74.69	240.00
	BONED	480.24	950.59	3020.00
	LITHICD	23.42	67.15	214.29
Fluvial (N=7)	CERAMD	2.07	1.81	4.59
	BONED	34.89	26.89	69.63
	LITHICD	0.23	0.62	1.64
Burial (N=2)	CERAMD	14.99	12.10	17.11
	BONED	175.84	218.76	309.38
	LITHICD	1.15	1.63	2.30
	CERAMD	0.00	.	0.00
	BONED	3783.33	.	0.00
Column Base (N=1)	LITHICD	33.33	.	0.00

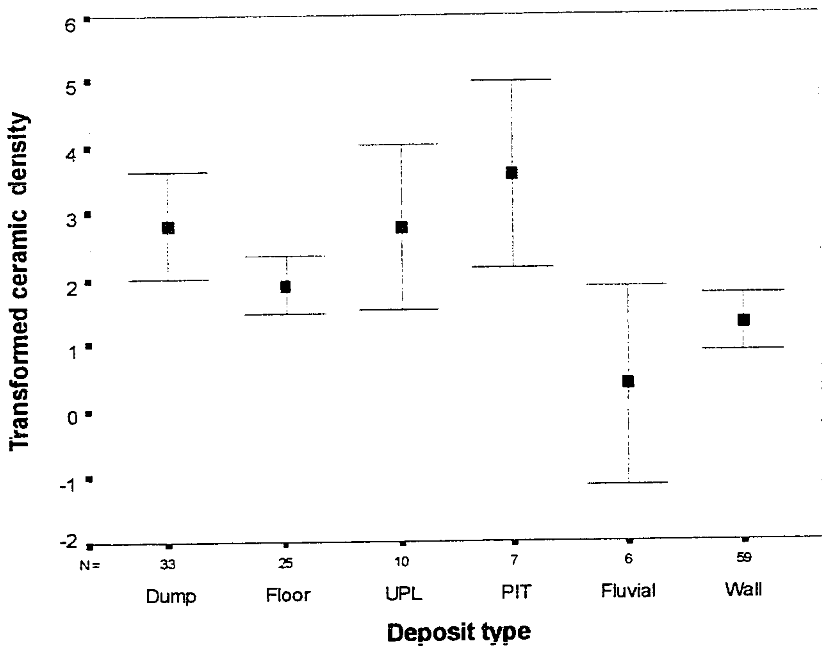

Figure 4.3a. Mean and 95% confidence intervals for transformed ceramic densities among deposit types.

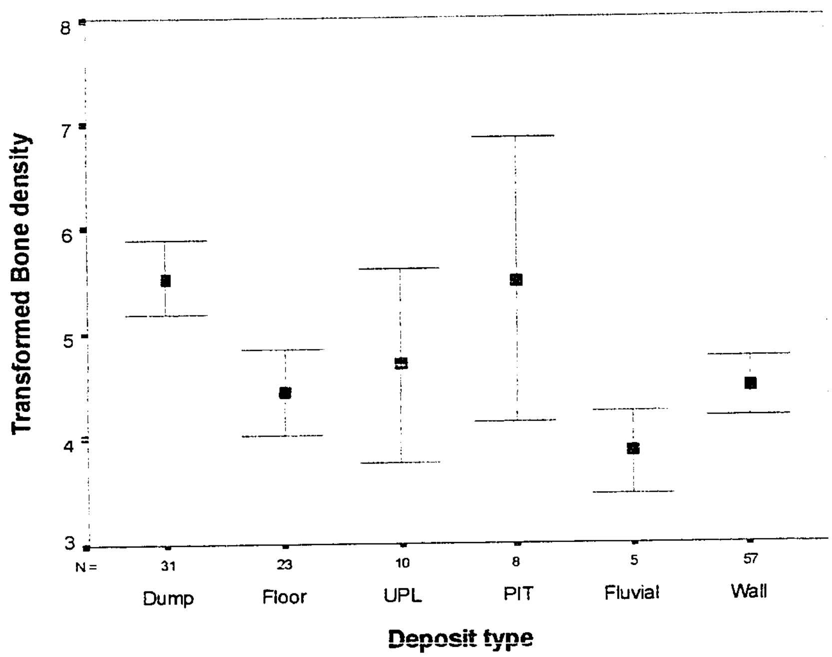

Figure 4.3b. Mean and 95% confidence intervals for transformed bone densities among deposit types.

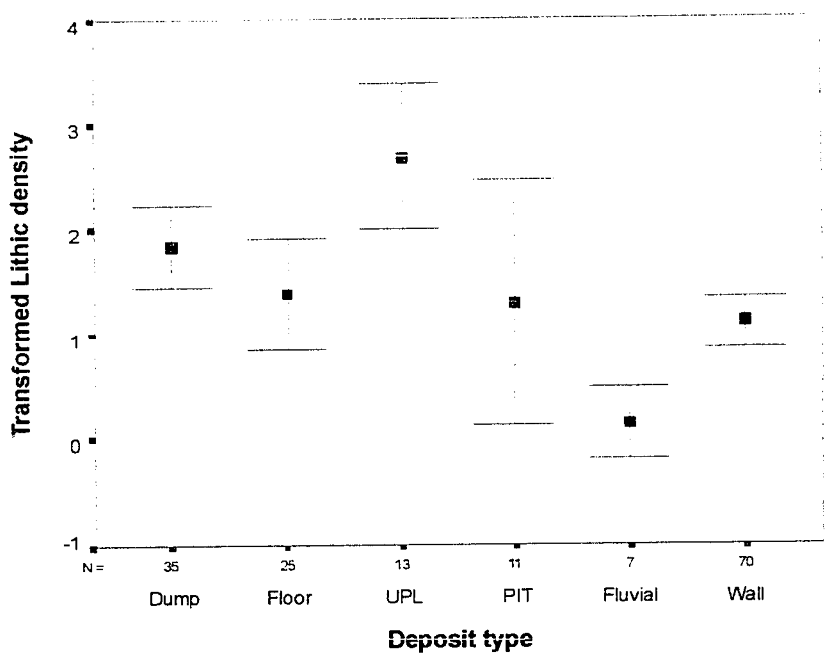

Figure 4.3c. Mean and 95% confidence intervals for transformed lithic densities among deposit types. Density values represent the number of items per cubic meter.

variances (p=0.788 and 0.372 respectively). For transformed lithic density, the null hypothesis that all variances are equal is rejected (p=0.02); thus for this variable the assumption of equal variances is violated.

Examining the plots of the transformed variables shows several apparent patterns which were subsequently investigated statistically using one-way analysis of variance with the transformed variables. For the ceramics (Figure 4.3a), there are two basic groups: those with high densities of ceramics -- dumps, floors, pits, and the upper pottery layer -- and those with low densities of ceramics -- walls, and fluvial deposits. This was expected from the definition of the deposits themselves: fluvial deposits are generally devoid of larger artifacts due to the relative incompetence of water as a transport agent, while walls and wall-derived deposits should contain only ceramics included during construction as chinking or incidentally through subsequent collapse and redeposition. One-way ANOVA generates similar conclusions. None of the higher density deposits can be distinguished from one another, nor can the lower density deposits be distinguished from one another. However, only pits and dumps can be statistically differentiated from fluvial and wall deposits ($p<=0.05$). As the error plots show, the confidence intervals of floors and the upper pottery layer both extend in to the range of fluvial and wall deposits. Thus, there is a largely binary distribution of ceramic density within these deposits, with the highest densities associated with human transport mechanisms (dumps, floors, and pits) and as a lag deposit (UPL), and the lower density deposits associated with a less competent transport mechanism (fluvial) and the structural requirements of the initial deposit source (walls).

Bone density (Figure 4.3b) shows wider variation in density values, probably due to the relative lightness of bone with its consequent ease of transport. Dumps have a significantly higher average density than floor, wall, and fluvial deposits ($p<=0.05$). The wide variation in bone density of pit deposits reflects their varied sources. Two brick pits from Room 5 (DU's 8 and 9), for example, contained a great deal of fish bone relative to their volume indicating post-use dumping in the structure, while a series of clay layers from the bottom of the brick pit in Room 2 (DU's 6, 7, and 8) contained no bone at all. Dumps, with their relatively smaller variance, are the only deposit type that have consistently higher densities of bone than most other deposits.

Lithic density (Figure 4.3c) is more problematic to assess since lithic density tends to be more variable (due to the relative scarcity of stone artifacts) resulting in wider distributions. Some patterns are discernible, however, and can (with dubious confidence, due to the failure of the equal-variances assumption) be seen in the ANOVA tests as well. Fluvial deposits have predictably low densities of lithics, again due to the relative incompetence of running water as a transport mechanism. Pits have a wide distribution due to their varying modes of deposition, but generally have few lithics. The high mean density for pits is due largely to a single outlier, (1212/1072r05du09) which has a relatively large number of lithics (3) for a very small DU by volume (0.014 m3). The upper pottery layer has a high density of lithics overall and because of this can be differentiated by this variable from all other deposit types except for dumps which also have a fairly high lithic density. Otherwise, the deposits follow the same pattern as for ceramics and bone: dumps generally have a high lithic content and can be differentiated from lower-density wall and fluvial deposits.

Strictly in terms of artifact densities then, several patterns are noted. Wall, fluvial, and floor deposits have low frequencies of bone which distinguishes them from dumps. This is not unexpected since dumps are thought to represent food refuse deposits, while floors are assumed to be cleaned of macroscopic food remains. Ceramic densities tend to relate to the type of transport mechanism and the source of the deposits. The combined wall-derived deposits had few ceramics because walls contain few ceramics unless they were included as chinking or incidentally through collapse and transport of the sediments. Fluvial deposits contain few ceramics because water (at least in the amounts to be found flowing at Kom el-Hisn) is a relatively incompetent transport mechanism. The others contain varying amounts of ceramics but all higher than walls or fluvial deposits in large part because humans were directly involved in transporting them to their current positions.

Therefore, since artifact densities are shown to be non-randomly distributed among deposit types, and the observed patterns are readily explained by the sedimentary principles on which the deposits were created, I would argue that my depositional units have empirical justification. In analytic terms, I am safe in assuming that variation within deposit types is reflective of something other than depositional processes.

4.4 General depositional history of Kom el-Hisn.

Certain kinds of deposits can be expected to be associated with different structures and in particular spatial locations within the site. By definition, floors are associated with enclosed structures (courtyards excepted, none of which are part of the excavated sample). Wall collapse deposits are closely associated with the location of the original wall, as are heavily decomposed wall collapse deposits. Where significant transport (usually by human agents) occurs, the spatial distributions of deposits is more complex. Fluvial deposits tend to form in enclosed basins bounded by mud brick walls or as natural or artificial topographic depressions. Because of the low relief at Kom el-Hisn fluvially transported deposits are not thought to have transported material very far from the source.

Dumps or refuse areas ('secondary' deposits of Schiffer 1972, 1983, 1987) are more complex in their spatial distributions. Many configurations of dumping areas have been noted both archaeologically and ethnographically. Living areas are regularly maintained and cleaned of accumulated refuse which is then deposited in locations away from the occupation area (e.g., Meehan 1982; Yellen 1977; O'Connell 1979). Dumping areas can occur in several different locations depending on the circumstances. Hayden and Cannon (1983), for example, describe contemporary Maya villages where trash is deposited in streets, peripheral dumps, or in nearby streams and ravines. Archaeologically, Dunnell (1983) found secondary refuse concentrated in a ring around the periphery of the Mayo site. Abandoned structures (both rooms and pits) as well as natural and artificial depressions are also ubiquitous locations of trash disposal. The spatial location of dumps is therefore partially controlled by the structural layout of the site itself.

Refuse disposal can also be culturally controlled. Hoffman (1974), in his analysis of trash disposal locations at the early Dynastic town of Hierakonpolis in southern Egypt noted several social factors that controlled the location of garbage dumps. Hoffman differentiated between elite, non-elite, and industrial disposal patterns which correspond to the social stratification present in Egyptian society. In non-elite areas trash is removed from living areas but may be only transported a short distance to nearby depressions or abandoned structures. Often, debris is used as leveling material on which to build new structures or within structures to provide a level surface for another occupation surface.

In elite areas (both sacred and administrative) there is a deliberate attempt to remove all refuse so that the entire area is relatively clean of debris. After abandonment of these areas, refuse deposition can occur.

Industrial areas tend to have specialized sorts of debris reflecting the manufacturing activity. At Hierakonpolis, Hoffman recognized three separate industrial areas representing copper smelting, flint retouching debris found in a large sunken ceramic pot (interpreted as a butchery), and a circular structure that contained the debris of stone vase manufacturing. In all, Hoffman found "substantial differences in the treatment of architectural space and patterns of trash disposal" (Hoffman 1974: 48) and was able to discern distinct industrial, sacred-administrative, and elite and non-elite residential quarters.

The depositional sequence in a given location can show how the function of a structure and of a given area can change over time, for example, from habitation structure to a dump upon abandonment. The sequence in which the deposits occur reveals the basic site formation processes operating at Kom el-Hisn. Specifically, I hope to find any patterns in depositional sequences that indicate how the use of various structures change over time and the overall depositional sequence of this area of the site.

Initially, I tallied the kinds of deposits that each deposit type is bounded by -- what each deposit underlies and overlies -- and several patterns emerged. First, dumps are most often found on top of some form of wall collapse deposits (including decomposed and redeposited wall collapse). Of the fourteen dumps that had an underlying deposit (i.e., they were not at the bottom of the excavated stratigraphic column), nine (64%) were resting on some form of wall collapse indicating that dumping most often occurred after a building had already partially collapsed. In only four cases (29%) was the dump lying directly on a floor deposit. These four units -- 1235/1056, and Rooms 12, 17 and 23 -- showed no obvious spatial patterning, though they all contained moderate to high bone and ceramic densities relative to other dump deposits. All four were either at the top of the stratigraphic section and covered only by UPL or, in the case of 1235/1056 DU-12, were covered by later (First Intermediate or Middle Kingdom) deposits. In fact, the majority of dump deposits that occur in the Old Kingdom levels occur at the top of the section, generally overlain only by UPL. The exceptions are Room 6 DU-2, where the dump is only a thin layer between two episodes of wall collapse, and 1204/1060 where a redeposited wall collapse deposit (DU-3) was intermingled among the many redeposited dump deposits from that unit. Old Kingdom dumps, then, generally occur only after a period of time that allowed the room walls to collapse and were not overlain by other deposits.

Second, wall collapse deposits (including decomposed and redeposited wall collapse) preferentially occurred directly on top of floor deposits (14 of 25 cases, or 56%) and secondarily on top of dumps (8 of 25 or 32%); interestingly, only one of the dumps directly underlying wall collapse was itself resting on a floor (1235/1056 DU-12). This indicates again that dumping was generally not practiced before the walls of the room had already begun to collapse.

Floors and standing walls were generally built on top of wall collapse or heavily decomposed wall collapse, not often on brick platforms or redeposited wall collapse, and in only one case on top of dump material. This indicates that foundation deposits were, as noted above, generally carried out by knocking down and leveling existing walls, much as Giddy (1987) described at Ayn Asil.

The general sequence of deposits, then, followed the pattern Floor-Wall Collapse, followed by either dump material, UPL, or further sequences of Floor-Wall Collapse; rarely did dumps lie directly on top of floors. As Hoffman (1974) suggests, this may indicate that refuse was deposited primarily in either natural topographic depressions – such as 1192/1035 and 1204/1060 – or in abandoned room structures that had already begun to collapse. Since the majority of dump deposits in the main excavated portion of the site occurred on top of wall collapse deposits, this suggests that this part of the site was left abandoned for some period of time with limited refuse disposal occurring within the existing structures.

A possible explanation for this lack of dumping directly on top of floors may be found in the burials located in this area. Three adult burials were excavated along with several infant burials. All of the adult burials (one contained within Room 5, a second, excavated as Room 15, and a third excavated as Room 20) showed evidence of plastered coffins and the Room 15 and 20 burials were in specially constructed mud brick tomb structures. The burial in Room 20 had been cut into by (presumably) the *sebakhin*, and only the lower portion of the skeleton remained intact. All of these burials were intrusive into the existing Old Kingdom structures, as were the infant burials.

The ceramic assemblages from the deposits directly associated with the adult burials were all typical Old Kingdom wares. The depositional sequence in Room 15, for example, consisted of wall collapse and coffin plaster (DU-4) directly overlying the body and containing numerous ceramics, followed by a layer of typical dump material (DU-3) containing abundant bone, charcoal, and Old Kingdom ceramics. The remaining deposits (another layer of wall collapse and UPL) contained primarily Old Kingdom ceramics with two sherds of Middle Kingdom ceramics mixed in. This sequence suggests that the tomb was constructed after the room containing it (the large structure also containing Room 10) was abandoned, then left for some time for collapse of the coffin and surrounding walls to begin, at which time more Old Kingdom dump material was deposited on top of the burial.

I would suggest that at some time during the Old Kingdom, this part of the site was abandoned and used as a cemetery for both adults, including some relatively high-status individuals, and numerous child and infant burials. This would explain the relative absence of dump deposits directly on top of abandoned floors: the structures were allowed to collapse while the area was used as a cemetery and thus refuse was not dumped here. After some time, during which the previous habitation structures continued to decay along with the structures surrounding the burials, refuse dumping resumed with even the burial structures used as dumping areas.

If this is the case, then one would expect that most of the deposits identified as dumps within these structures – those dumps not lying directly on top of room floors – would not relate to the actual occupation of these structures, but to a period after the area's use as a cemetery and presumably from occupations in another part of the site. Certain non-room sequences of dumps, i.e., units 1192/1035 and 1204/1060, would presumably contain refuse from the period of occupation of the nearby structures.

After analyzing the depositional sequences throughout the site I have concluded that there are basically six sets of deposits involved in this part of the site. The topmost level, which I have designated as Level 0, comprises all material later than Old Kingdom date, including most of the Upper Pottery Layer, and those excavation units containing First Intermediate period and later ceramics. Beneath this, Level 1, are the dumps deposited after abandonment of this area and after it was used as a cemetery. Level 2 deposits are those directly associated with the adult burials. Level 3 deposits are those directly associated with the uppermost habitation structures, but excluding the intrusive burials and other deposits (mostly dumps) that were deposited after abandonment and partial collapse of the structures (comprising Levels 1 and 2). Below these main Old Kingdom occupation deposits are any older deposits, numbered sequentially down from Level 3; most units with lower deposits have only one lower level that was excavated (designated Level 4), and only one (Room 18) has more than one level below the main Level 3 deposits, designated Level 5.

The level designations are analogous to the chronostratigraphic units described by Stein (1987, 1990): the definition of a level is based on the time of the initial formation of the deposit. These units are meant to clarify the relationship of the deposits within a structure to the history of that structure; this is done to control for chronological variation that may occur within a sequence of deposits. For example, wall collapse deposits are tightly associated with a room's structure regardless of when the sediment moved from the intact walls of the room to collapse deposits inside the room. And, as the analysis in the previous section showed, little if any material was added during the time of collapse. The level associated with these deposits is chronological, indicating the period of construction and occupation. Other deposits, such as dumps, may only be associated with a particular room when they are deposited there which may be during the period the room was in use (i.e., the same chronostratigraphic unit) or at some later date and different chronostratigraphic period.

Consequently, wall collapse deposits are assigned to the same level as the walls making up a room and the room floor, since the materials making up these deposits were configured at roughly the same time: when the room was built and occupied. Dumps and other deposits that lie directly on the room's floor surface are also assigned to the same level as the floor and wall deposits, while dumps that were deposited later (i.e., after a period of deterioration evidenced by wall collapse deposits) are assigned to a different level. This may, of course, result in some instances of so-called 'reversed stratigraphy' (such as two Level 3 wall collapse deposits separated by a later level-1 dump deposit) and is a consequence of the definition of the units (chronostratigraphic rather than lithostratigraphic). The next chapter will describe each excavation unit in detail and provide a more detailed analysis of this proposed sequence.

5.0. Description of excavated deposits.

This chapter describes in detail the stratigraphic sequence in each excavation unit and places it in the overall context of the depositional history of this part of Kom el-Hisn. A detailed description of each deposit in the sequence is provided for each unit, followed by a summary of the depositional history of the unit. A schematic diagram illustrating the stratigraphic relationships of the deposits is also provided for each unit. For the 1986 units I have indicated the corresponding Profile Unit number used by Buck (1990) as additional reference. Each DU description will therefore consist of its number, the interpretive group to which it was assigned, the 4-mode classification of the deposit (Structure, Dominant Large Clast, Presence of Bricks, Burning), the occupation level (described in Section 4.4 in the previous chapter), and Buck's corresponding Profile Unit if applicable. Profile drawings are also given for most units. Metric data of ceramic, bone, lithic, and plant densities are given in Appendix I.

The occupation levels for Kom el-Hisn as defined in Chapter 4 are:

Level 0: All non-Old Kingdom deposits.

Level 1: Dumps (along with a single wall and column base) deposited after abandonment of Level 3 structures.

Level 2: Child and adult burials within the Level 3 architecture.

Level 3: Main architectural units defined in the block area.

Level 4-5: All occupations earlier than Level 3.

The Level 3 deposits were defined as the main occupation under investigation and are the occupations associated with the room block uncovered in the block area. A portion of this architecture was uncovered during the 1986 excavations when several contiguous 2-meter units were excavated. In 1988 this area was extended by uncovering the near-surface architecture to the west and south of the original block area.

The visible architecture indicates that most of the rooms in this block were probably occupied at the same time. These include rooms 1 - 9, 12, 13, 18, and Unit 1220/1072, all of which can be linked to the same period of occupation by direct architectural and/or stratigraphic association. These include some deposits excavated in 1986 as part of the block area excavations. The deposits assigned to Level 3 in these structures are the walls, floors, and other deposits directly related to the structure, such as collapsed wall deposits whose source is the walls making up the room. Dumps that are separated from the occupation floor of the room by wall collapse deposits are assigned to a later level (1) as they were presumably deposited after abandonment of the structure. Some rooms within the block area are obviously of later date, including Room 15 (a tomb built into an existing structure) and Room 10 (a set of deposits adjacent to Room 15). These are assigned according to the level definitions outlined above.

The remainder of the units cannot be directly linked stratigraphically or architecturally to these block area structures, and the typological analysis of the ceramics is not sufficiently detailed at this time to be able to seriate the units effectively. An examination of the ceramic type distributions for floors and dumps (the only deposits types that have a significant number of ceramics) indicates that, in general, levels 1 and 3 are more similar to each other than to level 4, most notably in their high densities of Type O sherds. Statistically, however, t-tests between these three levels only show a significant difference between the mean density of Type D between levels 3 and 4 ($p=.01$), and for Type O between levels 1 and 4 ($p=.05$). Because of the small number of dump and floor deposits in levels 1 and 4, however, these tests are not deemed to be particularly reliable. My overall interpretation is that the only reasonably secure ceramic type that can discriminate between levels for these deposits is Type O, which tends to be much more abundant in the later deposits than in the earlier ones.

Therefore, I used the ceramic distributions as one factor in determining the level assignments for the remaining noncontiguous units, but for the most part I assigned the topmost deposits that were directly associated with visible architecture to Level 3 unless other criteria militated otherwise, such as the presence of later ceramic types. Dumps lying above layers of wall collapse were also assigned to a later level (1) as in the other units.

Unit 1166/1066

Profile drawing is shown in Figure 5.1. Schematic deposit sequence is shown in Figure 5.2.

DU-1 (SU1):

Level: 3

Class: 1200

Interpretive group: UPL

Corresponds to Buck's Unit I

Upper pottery layer. This is typical UPL consisting of a coarse mixture of reddish brown sandy sediment with a great deal of decomposed and salt-encrusted ceramics.

DU-2 (SU-2, 4, 5):

Level: 3

Class: 1110

Interpretive group: Wall collapse

Corresponds to Buck's Unit II

This is a massive deposit with abundant brick pieces and bricks as dominant large clast. Some whole bricks are noted in the profile. Occasional large sherds were noted as being present and may represent chinking material. Otherwise, no ceramic weights were available. Bone density is moderate at 52.38 g/m^3 due to several medium and large mammalian limb fragments, indicating that there may be some food waste material included. Evidence of burning is absent. This deposit seems to be typical wall collapse.

DU-3 (SU-3; Not shown on profile) :

Level: 3

Class: NA

Interpretive group: Intact brick wall (unexcavated)

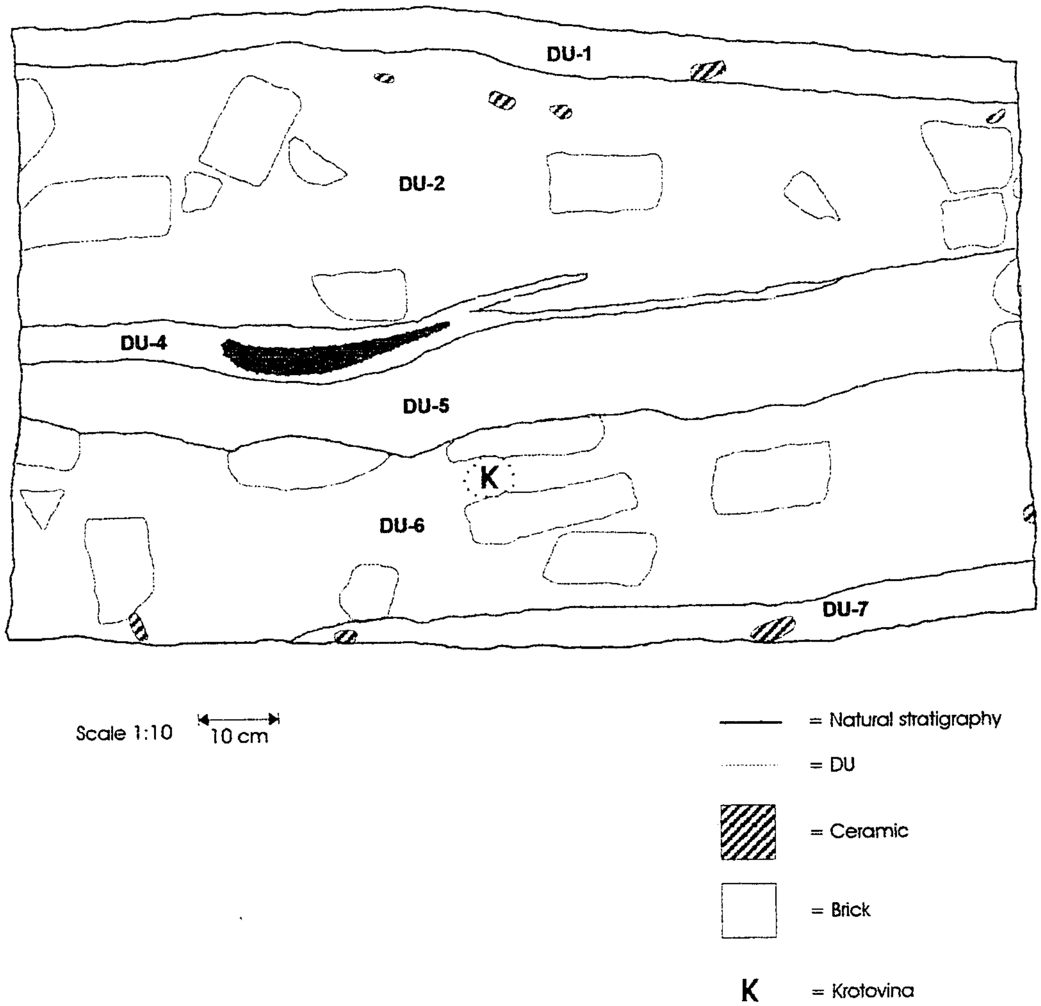

Figure 5.1. West Profile drawing for unit 1166/1066.

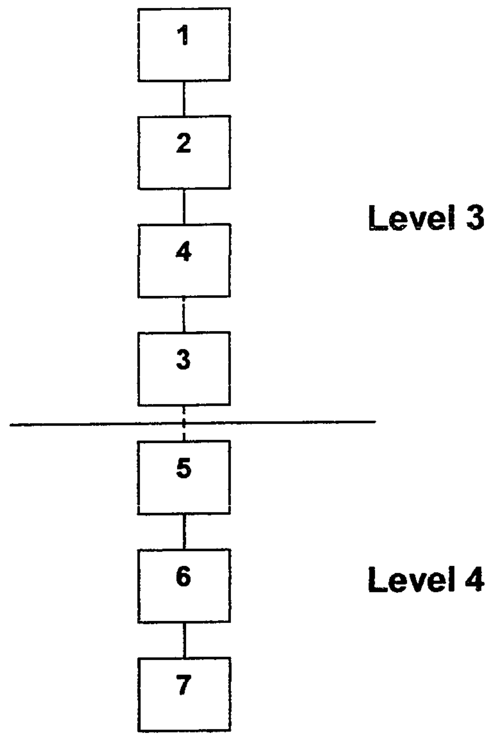

Figure 5.2 Depositional sequence for unit 1166/1066.

Intact wall in the north end of the square. Five courses of bricks are preserved and it is the only brick wall to appear in this square.

DU-4 (SU-6,7):

Level: 3

Class: 1202

Interpretive group: Floor

Corresponds to Buck's Unit III

This is a relatively thin (2-3 cm) laminated unit with sherds as dominant large clast. It slopes slightly from the south where it abuts the DU-3 intact wall to the north. Abundant charcoal and ash was noted, and in several areas the sediment was yellow-orange, apparently a result of *in situ* burning; in addition, a small shallow pit (seen in the west profile) contained material burned *in situ*. All categories of artifacts had low densities. Several (10-15) large pieces of ceramics were found on the surface, but otherwise ceramic density was low (only 1.12 g/m^3). Bone density was similarly low with only 36.67 g/m^3. The apparent hearths, laminated structure, and position at the base of the DU-3 wall indicate this as a floor/occupation deposit.

DU-5 (SU-8,9):

Level: 4

Class: 1200

Interpretive Group: Heavily decomposed wall collapse

Corresponds to Buck's Unit IV, V

This DU appears to be the remains of collapsed wall, though no brick fragments were noted (it is underlain by typical wall collapse). It is essentially a clean brown sand with occasional sherds and little other artifactual material and may be the foundation deposit for the DU-3 (north wall) structure.

DU-6 (SU-10,11):

Level: 4

Class: 1110

Interpretive Group: Wall collapse

Corresponds to Buck's Unit VI

DU-6 is a massive coarse textured deposit with bricks and brick fragments as the dominant large clast. Some possible burning of some of the edges of the larger brick pieces were noted but are not included in the class definition. All categories of artifacts are uncommon especially given the size of this unit (1.155 m^3).

DU-7 (SU-12):

Level: 4

Class: 1200

Interpretive Group: Floor

Corresponds to Buck's Unit VII

There is little description of this unit available since it was apparently into the water table and was only partially excavated. The excavator did describe it as a floor surface and it may have represented some form of habitation debris. Ceramic density is moderate and bone density is fairly high (110.00 g/m^3), the latter resulting from 3 large unidentified mammalian limb fragments. Lithic density (16.67/m^3) was the highest in this square, though this results from a small excavated volume (0.06 m^3) and a single sickle blade fragment.

1166/1066 Summary.

Two distinct occupations are represented in this unit. The upper deposits, DU's 1-4 including the DU-3 wall, are from Level 3 and contain one distinct occupation surface (DU-4) which is associated with the intact wall in the north end of the square (DU-3). The occupation surface is overlain by collapsed wall material (DU-2) and the unit is capped by UPL.

Directly below the DU-4 occupation level and representing a Level 4 occupation are two collapsed wall deposits, the upper one apparently made up of heavily decomposed bricks such that no intact bricks are observed and may be the foundation deposit for the upper units. This may indicate that a substantial amount of time passed between the two occupations. Below the wall collapse deposits is a possible floor (DU-7) though this deposit was into the water table at the time of excavation making a determination of structure difficult.

Unit 1192/1035

The profile drawing for this unit is shown in Figure 5.3. The schematic deposit sequence is in Figure 5.4.

DU-1 (SU-1,3,4):

Level: 0

Class: 1200

Interpretive Group: UPL

Corresponds to Buck's Unit I

This unit is typical UPL. It contains abundant reddish, salt-encrusted ceramic material in a sandy matrix. Artifact densities are all high, notably the density of lithics (51.28/m^3) which has the fourth highest density of all units analyzed (due in large part to 13 pieces of mostly sandstone and marl chunks).

DU-2 (SU-2; Not shown on profile)

Level: 0

Class: 1000

Interpretive Group: Fluvial

Corresponds to part of Buck's Unit I

This is a small unit in the northeast corner of the square consisting of loose brown silty sand with little artifactual material (only a tiny amount of ceramics were retrieved). Though no bedding planes are described, I interpret this unit as a small fluvial deposit. It is stratigraphically above the UPL of DU-1.

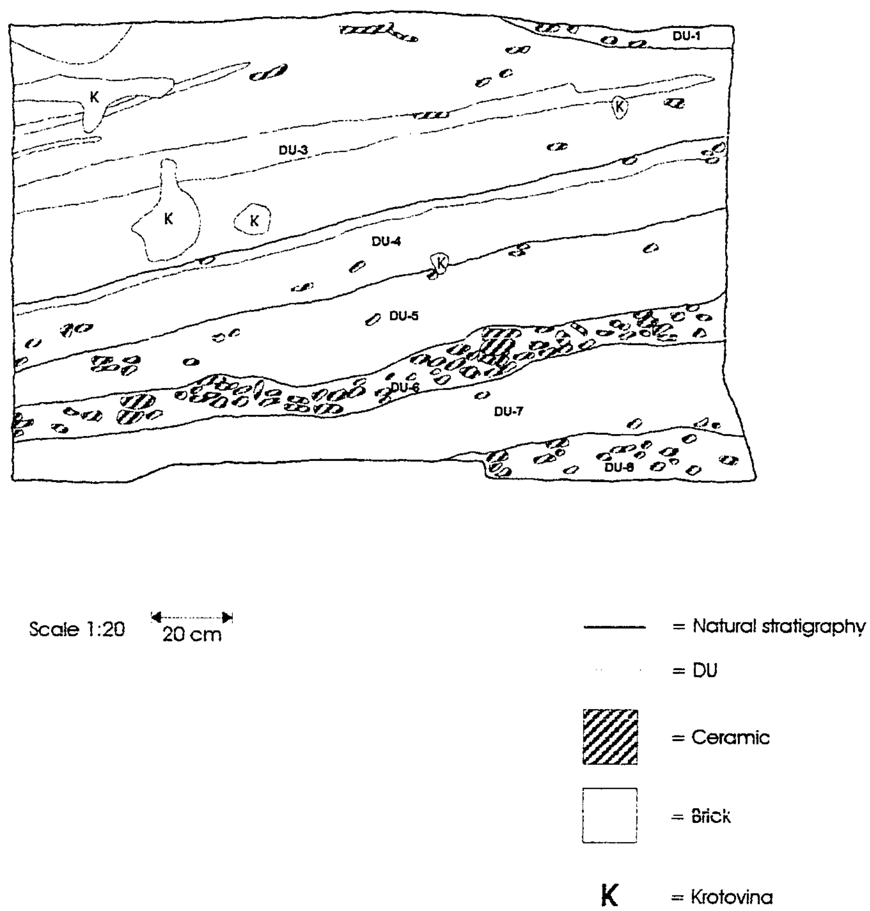

Figure 5.3. West Profile drawing for unit 1192/1035.

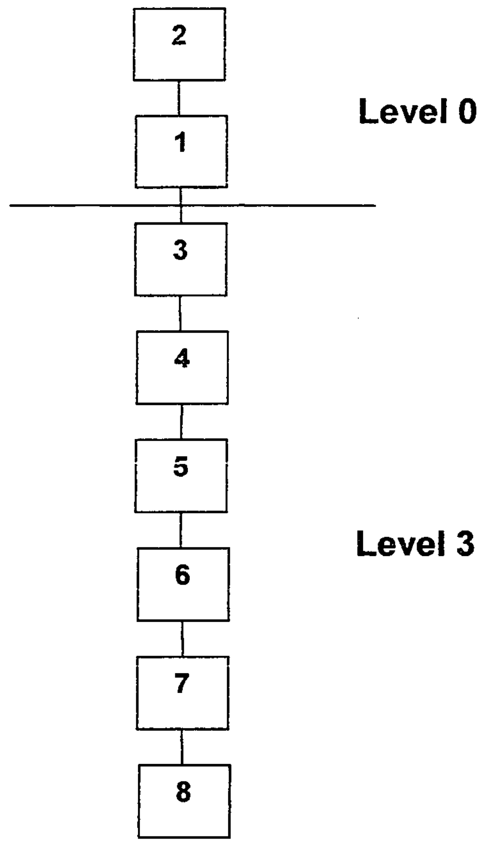

Figure 5.4. Depositional sequence for unit 1192/1035.

DU-3 (SU-6,7,8,9):

Level: 3

Class: 2201

Interpretive Group: Redeposited Dump/Floor

Corresponds to Buck's Unit II, IIa, and IIIa

This is a large unit ($1.58m^3$) of black to brown silty sand with abundant ash, charcoal, and bone. Faint bedding lines were present and many of the larger sherds were oriented parallel to the bedding planes. In addition, several patches of weakly stratified lenses were present that appeared to represent individual dumping events. Bone density was especially high ($464.08\ g/m^3$) the majority of which was sheep/goat and pig. Because of the weak stratification and somewhat bedded ceramics, this unit is classified as redeposited dump, though from the lenses there may also be direct dumping events embedded within it. Since bone is especially dense, with the majority of the bone being remains of sheep/goat, this probably represents the dumping of habitation and/or food consumption remains.

DU-4 (SU-10,11,12,13):

Level: 3

Class: 2211

Interpretive Group: Redeposited Dump/Floor

Corresponds to Buck's Unit III, IV

This unit is essentially identical to DU-3 with the exception of the inclusion of brick pieces in the matrix and a more strongly laminated structure. Otherwise, its description is the same: black to brown silty sand, bedded with several weakly stratified lenses, and abundant ash, charcoal, and artifacts. Artifact densities are somewhat lower in this unit, perhaps because it contains a higher volume of building materials (bricks) and less habitation debris; this may relate to the unit being composed of relatively more redeposited material (hence the stronger stratification than DU-3) and less directly dumped material. One of the SU's making up this unit (11), however, is a jumble of large pottery fragments in a more tan-colored matrix indicating that some of the material was directly dumped here.

DU-5 (SU-14,15,16):

Level: 3

Class: 1211

Interpretive Group: Dump

Corresponds to Buck's Unit V

This DU is distinguished from DU-4 by a change to a more reddish brown color and a more finely textured matrix. No stratification is present indicating a change in the depositional environment from the two units directly above to this less redeposited material. Artifact densities are comparable to the upper units.

DU-6 (SU-17):

Level: 3

Class: 1211

Interpretive Group: Dump

Corresponds to Buck's Unit VI

This is a layer of massive sherd concentration, in some places ceramics being the majority particle to the virtual exclusion of any other sediment matrix. Ceramic densities are high (78.12 g/m^3) and bone is extraordinarily high (1067.09 g/m^3). Identified faunal material is predominantly sheep/goat and pig. Lithics are composed mostly of flakes and chunks of marl or sandstone. The jumbled nature of the deposit, the high density of ceramics, and the very high density of sheep/goat and pig remains suggest that this was a concentrated dump of household food remains.

DU-7 (SU-18,19,20):

Level: 3

Class: 1210

Interpretive Group: Dump

Corresponds to Buck's Unit VII

This deposit is differentiated from DU-6 by much lower numbers of ceramics, a finer texture, and no burning in the form of ash or charcoal. Mottling appears in the upper portion (SU-18) but disappears in the lower portion by SU-19. A lack of internal stratification argues against calling this a form of fluvial deposit, though it may contain some slumped wall material along with other nearby debris.

DU-8 (SU-21):

Level: 3

Class: 1201

Interpretive Group: Dump

Corresponds to Buck's Unit VIII

This unit represents another deposit of massive sherd dumping similar to DU-6. Ceramic concentration (132.83 g/m^3) is higher than that of DU-6, but bone density (397.78 g/m^3) is lower and lithics are absent.

1192/1035 Summary.

The sloping structure and contents of the deposits in this unit indicate its use as an area of primarily habitation refuse dumping. Throughout the sequence there are slight changes in the manner of deposition and source contents. The upper layers (DU's 1 and 2 excepted) represent some degree of redeposited material. The laminations and identifiable patches of discrete dumping events of DU-3 and DU-4 argue for an area that was left open for longer periods of time with occasional minor dumping. The lower units, with more massive structures and little evidence of discrete dumping events, particularly in the sherd dumps of DU-6 and DU-8, indicate heavy use as dumping grounds separated either by a period of disuse or dumping of other less artifact-intensive activities (building materials?) based on the clean sand deposits of DU-7. Because of its proximity to the habitation structures in the main architectural block in this area of the site, which is designated as Level 3, it is presumed that this unit represents a topographic depression outside of nearby structures that was used as a general dumping area by the Level 3 occupants. The ceramics are all Old Kingdom (except for DU-1 and DU-2 and a few isolated sherds in some upper deposits) and are similar to those found in the nearby structure of Room 17.

Unit 1204/1060

The profile drawing for this unit is shown in Figure 5.5. The schematic deposit sequence is in Figure 5.6. Buck classified all of these as a single depositional unit (I); hence, no correspondence information is given for the individual DU's.

DU-1 (SU-1,2):

Level: 0

Class: 1200

Interpretive Group: UPL

Typical UPL. Compared with other UPL deposits, this one contains moderate amounts of both ceramics and lithics and no bone.

DU-2 (SU-3,4):

Level: 3

Class: 2210

Interpretive Group: Redeposited dump

This is a laminated deposit consisting of alternating layers of brownish-gray sandy clay with black lenses and two tan sand lenses (SU-5) within it. Ceramic densities are rather moderate and bone density is high (244.71 g/m^3). Cattle bone (including 18 bovid tooth fragments) made up part of the faunal remains from this DU, one of the few

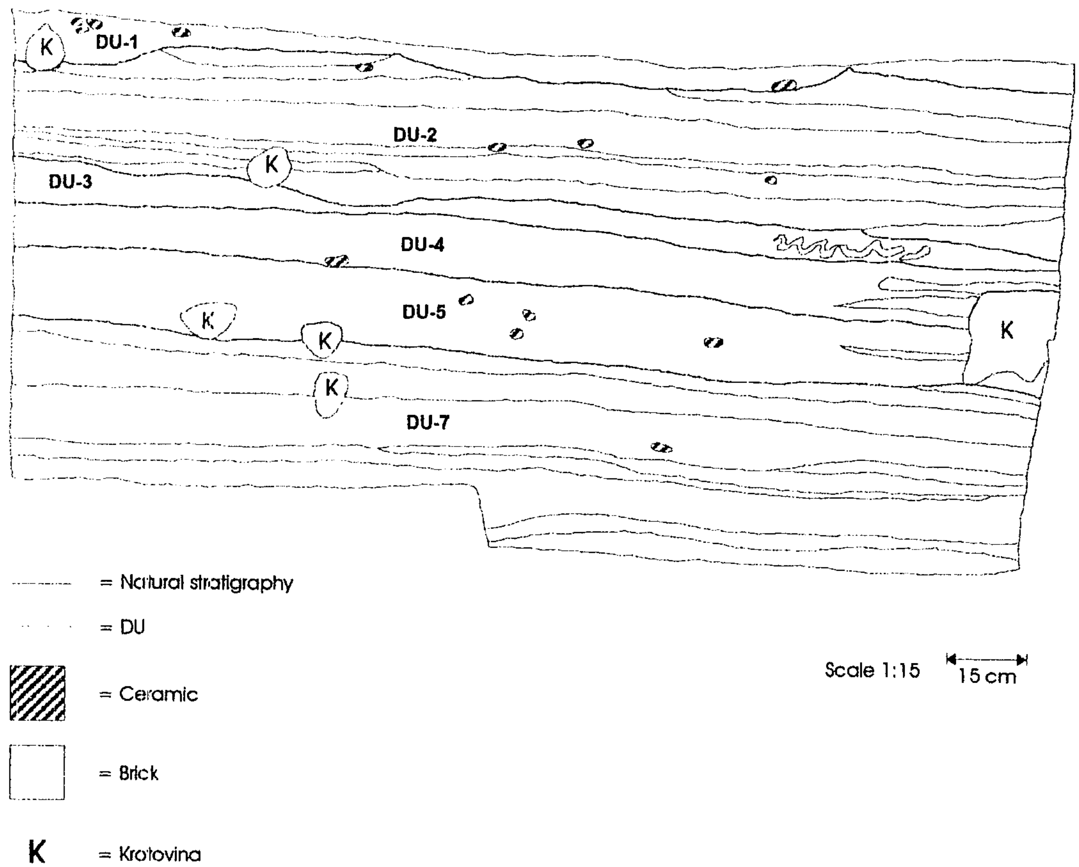

Figure 5.5. East Profile drawing for unit 1204/1060.

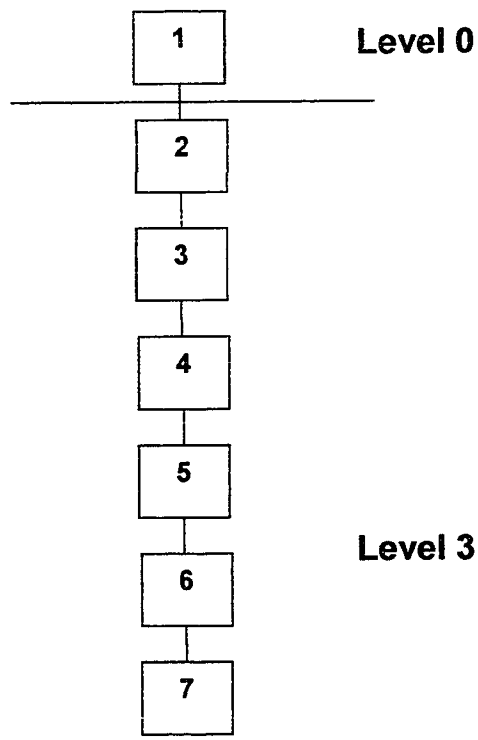

Figure 5.6. Depositional sequence for unit 1204/1060.

units to actually contain any *Bos* remains; the remainder of the identified faunal remains were sheep/goat and pig, and a variety of unidentified body part fragments. Lithic density is also moderate (4.36/m^3) consisting of four pieces of debitage and a flake of unknown material. The presence of bone indicates some kind of habitation debris as a source, but the presence of brick fragments also suggest wall material was included. At least some deposition due to water flow is indicated by the laminated structure, but the patchiness could also result from some small individual dumping events.

DU-3 (SU-6,10):

Level: 3

Class: 1110

Interpretive Group: Redeposited wall collapse

This deposit is a small area of redeposited wall collapse in the eastern section of the square. The types of bricks noted seem to be typical *gezira* bricks of yellow color with occasional snail shells. Very few ceramics were present and no lithics. Bone density is fairly low (67.73 g/m^3) mostly from a few unidentified limb fragments. The massive structure of this deposit indicates slumping from a nearby structure rather than fluvial movement.

DU-4 (SU-9,11):

Level: 3

Class: 2210

Interpretive Group: Redeposited dump

The description of this unit is similar to that of DU-2 and may in fact be a continuation of it: brown sand with lenses of black and tan material. I suspect that the tan sandy lenses in this unit and in DU-2 may represent decomposed *gezira* brick noted in DU-3. Otherwise, the artifact densities of DU-2 and 4 are very similar except that DU-4 has a lower frequency of bone (25.08 g/m^3).

DU-5 (SU-12,13,14,16):

Level: 3

Class: 1210

Interpretive Group: Redeposited dump

This is a massive unstratified layer of brown sandy silt and higher, though still low, densities of ceramics than the one immediately above it (DU-4). Occasional brick pieces were noted, and these seemed to be more prevalent in the northeast corner and tapered off to the southwest as if they were originally dumped in that corner and slumped away. Ceramic and lithic densities are both low, while bone density (139.17 g/m^3) is again rather high, due to several unidentified skull and limb fragments. The excavator also noted that SU-12 contained a great deal of fish bone. No laminations are present, so the mode of deposition may be dumped and/or slumped building debris (decomposed mud brick) with some habitation debris mixed in.

DU-6 (SU-15; Not shown in profile):

Level: 3

Class: 1110

Interpretive Group: Redeposited wall collapse

This unit is differentiated from the others by its high content of brick fragments. It contains no bone or ceramics and one prepared core.

DU-7 (SU-17 to 28):

Level: 3

Class: 2000

Interpretive Group: Fluvial

This entire DU consists of numerous alternating layers of different sediments, ranging from brown sand to gray clay. Ceramics are rare as were all other types of artifacts. The highly laminated structure of this deposit, along with the low artifact densities indicate numerous sheet wash events.

1204/1060 Summary:

Buck described this entire unit as consisting of a single stratified deposit with the same sources and transport mechanisms for all of the strata. I largely concur on this interpretation, but with slight modifications. DU's 3, 5, and 6 appear to have been transported more by slumping or some deliberate dumping of wall material rather than fluvial movement since none of these deposits show evidence of laminations due to water movement. The remaining DU's (except DU-1) are all more characteristic of sheet wash events carrying in a variety of wall collapse and habitation debris. In many places, the laminations show a deformity of structure (convolutions) directly indicating running water as a transport mechanism. The overall interpretation is of an unoccupied sedimentary basin into which debris from nearby habitations flowed with some individual dumping events. The apparently slumped wall collapse in places suggests a nearby structure.

The deposits in this unit are assigned to Level 3 because it is likely that the debris washed into this unit is from structures and their associated habitation debris whether or not the actual transport and deposition took place at this time. I suspect that much of the actual deposition probably took place after the area was abandoned and the nearby structures were allowed to decompose.

Unit 1219/1095

The profile drawing for this unit is shown in Figure 5.7. The schematic deposit sequence is in Figure 5.8.

DU-1 (SU-1,2,3,4,6)

Level: 0

Class: 1200

Interpretive Group: UPL

Corresponds to Buck's Unit I - IV

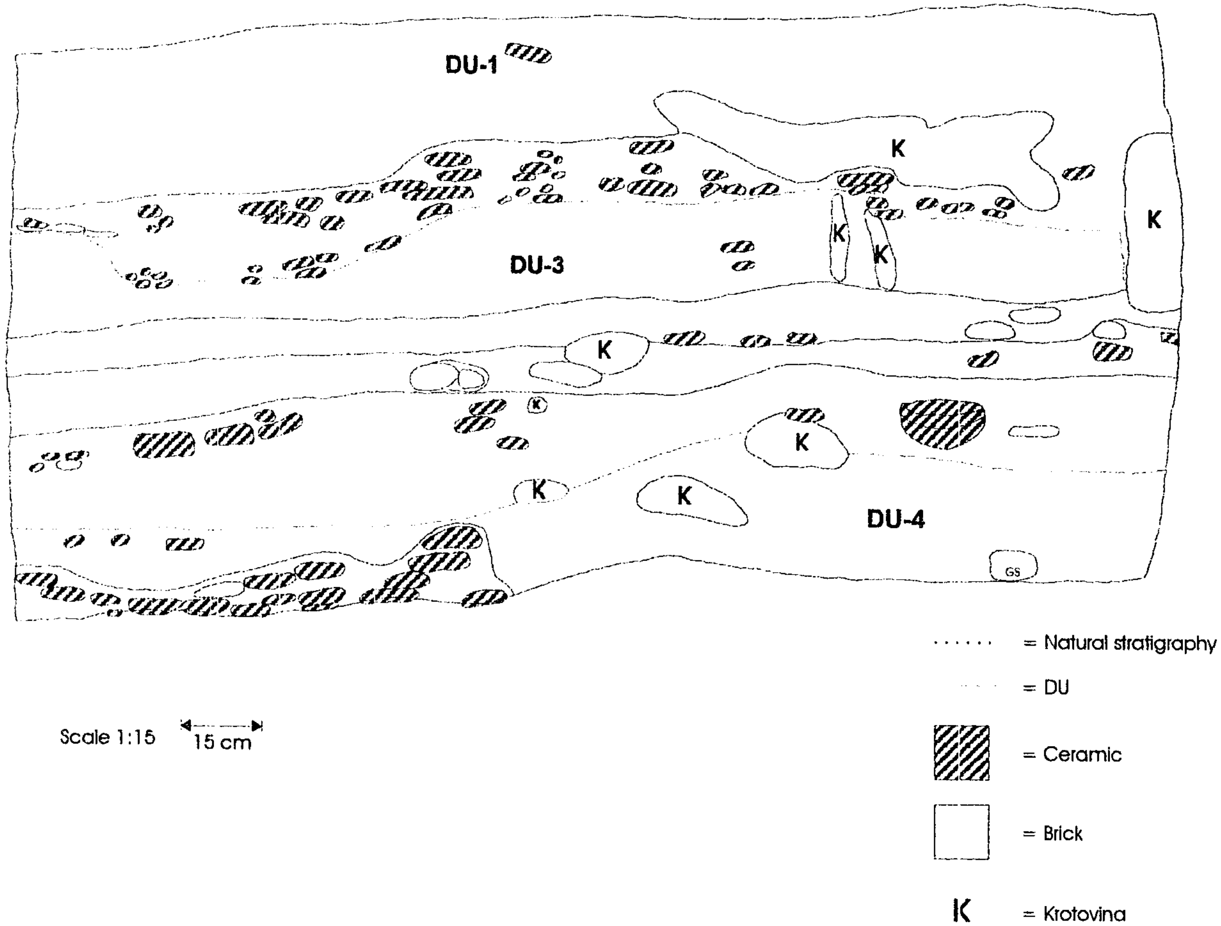

Figure 5.7. East Profile drawing for unit 1219/1095.

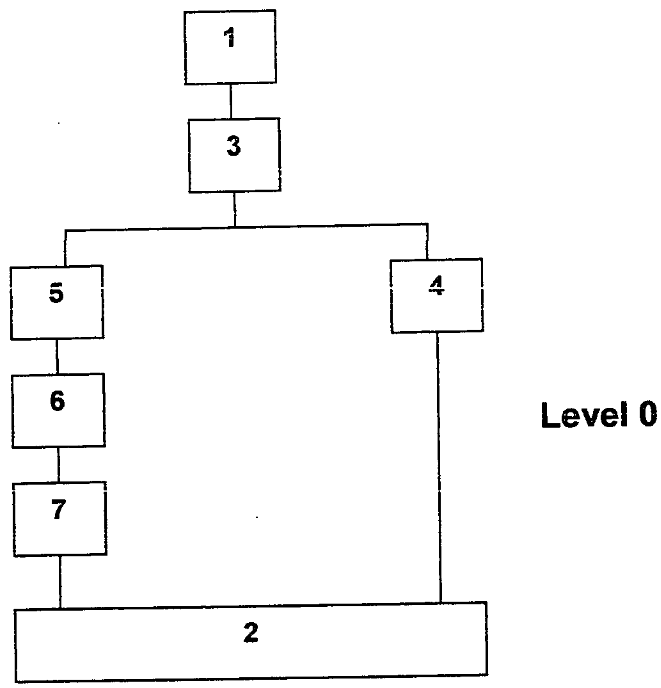

Figure 5.8. Depositional sequence for unit 1219/1095.

This DU is something of a composite of two strata that are distinct in profile but due to heavy disturbance and mixing by plant roots and rodent burrowing they were indistinct during excavation. The upper parts (SU-1,2) are clearly UPL. The lower portions (SU-3,4,6) have little description due to the heavy disturbance. They are probably a combination of mixing between the higher UPL, dump material with abundant ceramics (shown in profile) and some wall collapse of the underlying unit, DU-3. Ceramic density is moderate compared to other deposits and also with regard to other UPL deposits. Bone density is quite high (354.33 g/m^3) though still in the range of other UPL deposits. A wide variety of lithic material is present (N=14, density=6.62/m^3) and consists of three sickle blades, a fragmentary blade blank, one flint chip, one single platform flint core, seven marl and sandstone chips and chunks, and a portion of an alabaster palette.

DU-2 (SU-5; not shown on profile)

Level: 0

Class: 3120

Interpretive Group: Intact wall

Corresponds to Buck's Unit XV

This wall is ill-defined and only a portion of it is exposed as whole *in situ* bricks. It was first recognized as a possibly intact wall at a depth of 50 cm below datum and was still in evidence at the bottom of the excavations at about 150 cm below datum. The upper portions of this wall were heavily decomposed, but in plan views of the upper deposits seems to constitute a defined unit, roughly splitting the square into northern and southern halves. Since the apparent occupation surface of this unit (DU-7) was on the southern half and was overlain by wall collapse very similar to the material comprising the wall itself, it is likely that the wall mostly collapsed and dissolved to the south, leaving the north half to be used as a dumping ground. Ceramic densities are low for this unit, but bone density is rather high at 143.67 g/ m^3, the majority of bone represented by unidentified fragments.

DU-3 (SU-7,8,9,10,11)

Level: 0

Class: 1210

Interpretive Group: Wall Collapse

Corresponds to Buck's Unit V, IX, X

This unit consists of a large amount of yellowish brick material with brick pieces in the lower levels. It is essentially collapsed wall, probably material slumped or washed down on either side of the more intact portions of the DU-2 wall, where the upper levels decomposed to show no brick outlines. Very little ceramic material is present, but bone density (384.12 g/m^3) is rather high, mostly consisting of unidentified bone fragments though some identifiable *Bos* remains were found. This may result from rodent activity. Lithic density is moderate, consisting mostly of marl and sandstone flakes and chunks. DU-3 also acts as a capping deposit for underlying units that are on opposite sides of the DU-2 wall, which is probably the source of this collapse material.

DU-4 (SU-13; North of DU-2 wall):

Level: 0

Class: 1201

Interpretive Group: Dump

Corresponds to Buck's Unit XI, XII, XVI

This deposit consists of a jumble of burned pottery and bone in a gray and black mottled matrix with a massive structure. A portion, seen in the lower left of the North profile, seems to be a pottery dump, albeit with the ceramics aligned in a single plane. Ceramic density is moderate for this type of deposit, due largely to the size of the unit and the fact that most of the pottery is concentrated in one area. Bone density is moderately high, though the actual number may be deflated due to the burned and fragmentary nature of the bone.

The remaining deposits in this unit are to the south of the DU-2 wall.

DU-5 (SU-12; South of DU-2 wall):

Level: 0

Class: 1200

Interpretive Group: Heavily decomposed wall collapse

No correspondence information

No bricks are present in this unit, but it appears to be heavily decomposed brick material, as the unit underlying it (DU-6) is composed of similar material but which has visible brick fragments. All artifact categories are rare in this unit.

DU-6 (SU-14; South of DU-2 wall)

Level: 0

Class: 1110

Interpretive Group: Wall collapse

No correspondence information

Material is similar to that of DU-5 but with visible brick fragments. The source of this material is probably the DU-2 wall as the colors for both are in the range of dark gray to brown (2.5Y4/2 or dark grayish brown for the wall, and 10YR3/2, very dark grayish brown for the wall collapse of DU-5 and 6). All artifact categories are rare (ceramics) to absent (lithics and bone) for his unit.

DU-7 (SU-15,16; South of DU-2 wall)

Level: 0

Class: 2201

Interpretive Group: Floor

No correspondence information

This unit probably represents the floor associated with the DU-2 wall and consists of two SU's, 15 and 16, each with somewhat different characteristics. SU-15 was described by the excavator as a floor with a dark, sticky matrix, containing a lot of bone and ceramics. This was underlain by a lighter brown sand of SU-16, thought to comprise a foundation deposit for the SU-15 floor. The excavator also noted that the darker layers contained a great deal of pottery and bone, but the densities for these materials is moderate. Part of this discrepancy is due to the relatively less artifact-rich SU-16 being included as part of the DU. Underlying this unit was another apparent floor surface similar to that of SU-15, but this was not excavated due to encroaching ground water. Thus, there is probably at least one more occupation surface associated with the DU-2 wall.

1219/1095 Summary:

This unit contains part of one structure represented by the DU-2 wall. This wall runs roughly N-NW from about the middle of the east baulk and continues to within 20 cm of the west wall. At this point, it does not end abruptly but seems to be collapsed. The collapsed portion of the wall is approximately 30 cm deep, part of which was no doubt incorporated within the DU-2 and DU-3 deposits.

The upper strata were heavily disturbed by rodent burrowing and roots and this continued throughout the unit. Though not apparent in the profile, the excavator noted that a great deal of mixing had occurred in these upper levels and probably in the entire sequence. Consequently, the higher strata, composed mostly of decomposed wall collapse and dump debris along with some upper pottery layer, were lumped into two large units, DU-1 and DU-3 seen in the north profile provided.

At the level where whole bricks composing the DU-2 wall appear, the deposits are split into two sides, to the north and south of the DU-2 wall. To the north of the wall is a single deposit, DU-4, a dump with at least one apparent episode of heavy pottery dumping. This may have been partially deposited by fluvial activity since the ceramics tend to be bedded, though no laminations in the matrix structure were noted by the excavator. Significant rodent activity was also noted within this deposit.

The south side of the wall contains the occupation surface associated with this structure. Below more wall collapse (DU-5 and DU-6) of varied decomposition lies a floor surface (DU-7). DU-7 is composed of an upper layer of dark, sticky matrix with abundant charcoal, bone, and ceramics, and a foundation deposit of relatively clean brown sand.

This foundation deposit seems to have been laid down to cover a previous floor surface (unexcavated) whose association with the DU-2 wall is unknown.

Because of the large number of Middle Kingdom (Type M bread molds) and later ceramics in the upper strata and Type J (Middle Kingdom) ceramics in the lower strata (especially in the occupation floor itself), and because of the degree of mixing throughout this unit, the entire sequence is designated as Level 0. It is possible (perhaps even probable) that the DU-2 wall is of Old Kingdom age, and consequently the deposits directly associated with it as well, but because of the evident mixing with later deposits I conservatively chose to place this unit with later deposits.

Unit 1235/1056

The profile drawing for this unit is shown in Figure 5.9. The schematic deposit sequence is in Figure 5.10. A plan drawing of the architecture is in Figure 5.11.

DU-1 (SU-1-4,6):

Level: 0

Class: 1210

Interpretive Group: UPL

Corresponds to Buck's units I, II, III, and VI

This unit appears to be a mixture of UPL (Buck's Unit I) and other apparently highly disturbed material. No ceramic weights available. Bone density is rather high at 194.5 g/m^3.

DU-2 (SU-5; Not shown on profile)

Level: 0

Class: 2211

Interpretive Group: Pit

Corresponds to Buck's Unit VII

The excavator described this deposit as a well defined pit feature that sloped

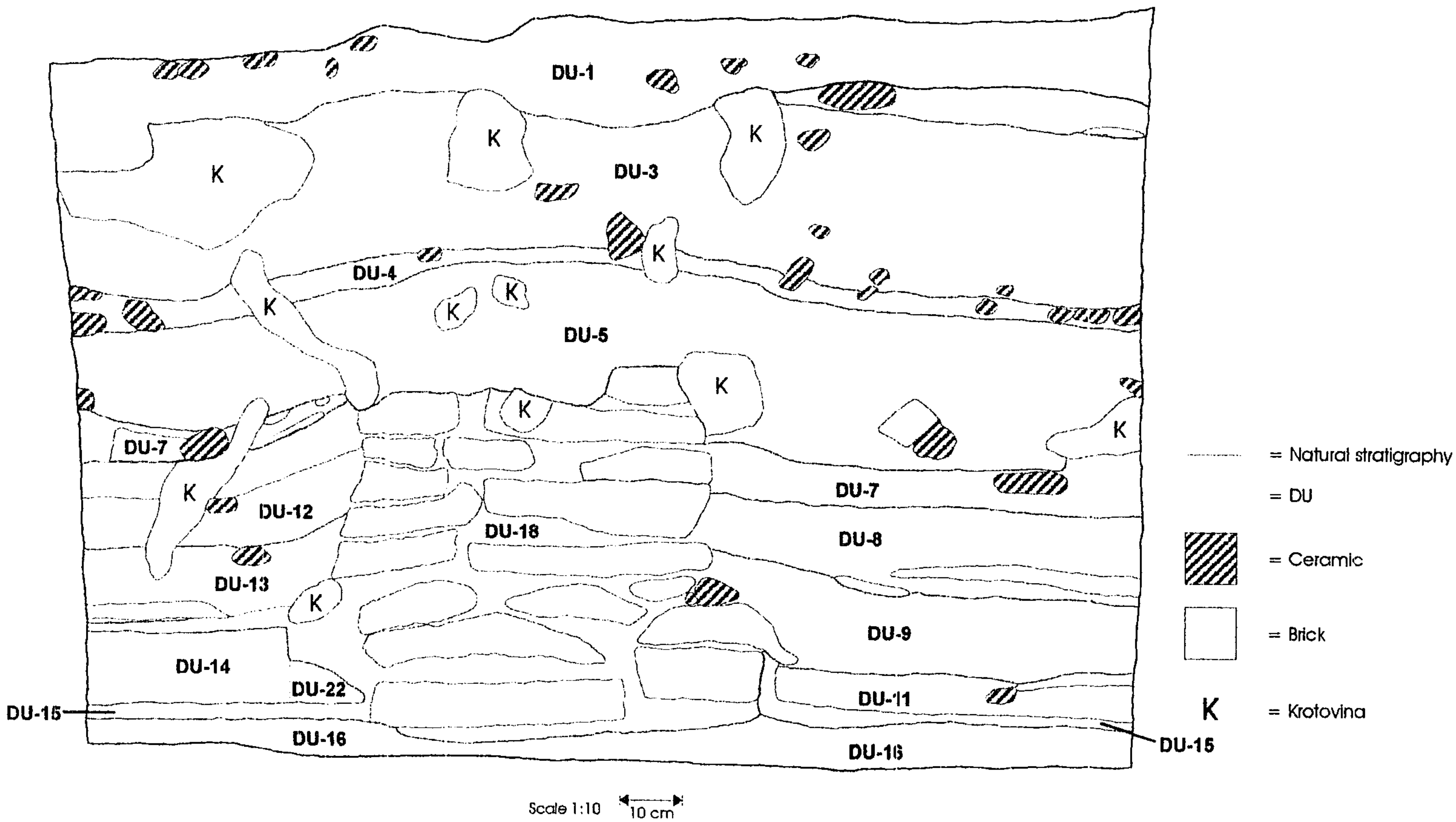

Figure 5.9. South profile drawing for unit 1235/1056.

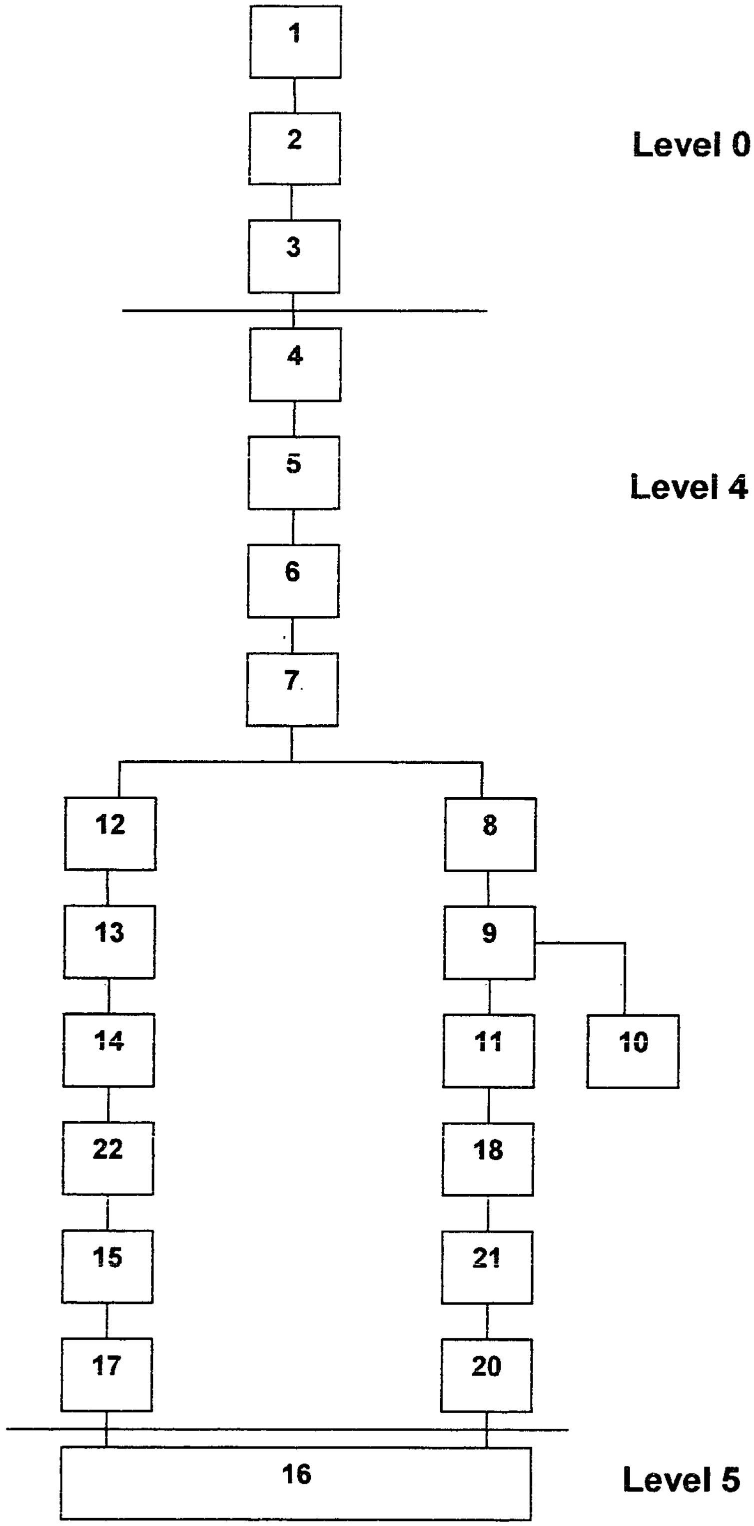

Figure 5.10. Depositional sequence for unit 1235/1056.

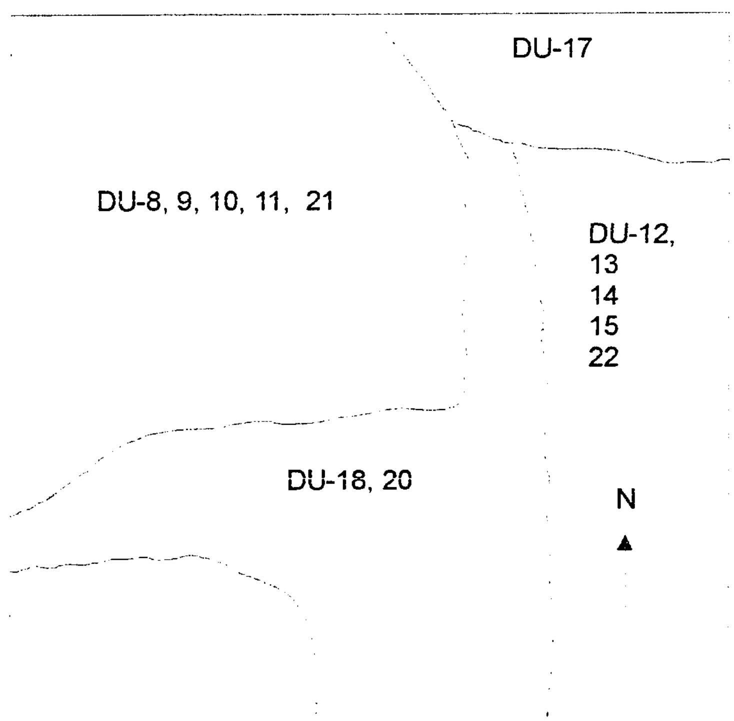

Figure 5.11. Schematic plan drawing of unit 1235/1056 below the DU-7 capping deposit. The portion of the DU-18/20 wall extending to the west is shallow and the deposits along that side of the square (DU-8, 9, 10, 11, and 21) link up beneath it.

slightly to the northeast, contrasting with the surrounding sediments in both color and texture. The sediments contained abundant ceramics and small brick pieces indicative of transported bricks. Charcoal fragments were also noted. Ceramic densities are not available; bone and lithic densities are moderate. Because of the noted density of ceramics and burned material I suspect that this is a combination dump and wall collapse deposit. The shape and clear boundaries indicate that it was a shallow excavated pit into which refuse and building material was dumped. The upper portion also showed thin laminations of fine sediment suggesting the area was left open for a portion of time to fill in with sheet wash deposits.

DU-3 (SU-7,8,10):

Level: 0

Class: 1200

Interpretive Group: Dump

Corresponds to Buck's Unit IV

This is a relatively thick deposit (up to 30 cm in places) that covers the entire square. Ceramics are the dominant large clast (no ceramic density available) and the sherds are randomly oriented indicating rapid deposition. Slight laminations were noted in places suggesting that the area was left open for sheet wash to be deposited. Bone density was very high (321.1 g/m^3) and the excavator noted that large amounts of fish bone were present in SU-8. Lithic densities were also very high (26.1/m^3) with the majority being blade blank fragments. Only one of the blades showed evidence of burning.

DU-4 (SU-9,11,12):

Level: 0

Class: 1200

Interpretive Group: Dump

Corresponds to Buck's Units VI, VIII, IX, and X

This DU is distinct from DU-3 lying directly above it based mainly on artifact contents. DU-3 contains a much higher density of ceramics as gleaned from the excavator's notes, the profile drawings, and Buck's descriptions (1990:159). Buck also notes that the ceramic density curves for this DU peaked in the large size range and that there were many clusters of very heavy pottery deposition. The lithic densities are much lower than in DU-3 (12.1/m^3) as was bone density (100.4 g/m^3). As seen in the profile this DU was heavily disturbed by rodent burrowing.

There is some question as to the interpretation of this DU. The excavator initially described it as a floor deposit, but depositionally it appears to resemble a dump. This has implications for the chronology of the unit since, if DU-4 were a floor, there would be a stratigraphic break between it and the underlying DU's 5,6, and 7.

DU-5 (SU-13-16, 20):

Level: 4

Class: 1010

Interpretive Group: Redeposited Wall Collapse

DU-6 (SU-23; Not shown on profile):

Level: 4

Class: 1111

Interpretive Group: Wall Collapse

DU-7 (SU-19, 21, 22, 25, 26):

Level: 4

Class: 1110

Interpretive Group: Wall collapse

Corresponds to Buck's Unit XI (DU-55), XII (DU-6), and XIII (DU-7)

These three DU's are treated together as they are all composed of roughly the same material (collapsed wall) but have slightly different characteristics indicating somewhat different modes of deposition of the same basic source material. DU-5 is classified as redeposited because of the presence of several different brick types and the generally small size of the brick fragments. There are no laminations present in the deposit suggesting that the material was not transported fluvially. The character of the various brick pieces is similar to the walls defined as DU-17 and DU-18. Because of the size of the brick pieces and generally jumbled character of this deposit, I interpret it as having been deliberately knocked down and transported (redeposited) only a short distance. Ceramics were absent except for a few diagnostic sherds; these were probably included as chinking material in the original source walls. Bone density is relatively high (166.9 g/m^3) owing primarily to the presence of three large identified bone fragments (1 *Bos*, 2 ovicaprid) and a few medium and large limb fragments. Lithic density is low (3.5/m^3) consisting of three debitage fragments (1 blade fragment and 2 chips).

DU-6 is primarily restricted to the northwest corner of the square and is differentiated from the overlying sediments on the basis of burned material and a greater density of more homogeneous brick pieces. The burned material consisted of charcoal flecks, though at least one charcoal fragment was large enough to be bagged separately (SU-23, Bag 108).

DU-7 represents a capping deposit and is the last deposit common to the entire square. While the DU-18 intact wall was uncovered at the bottom of DU-5 and several of the SU's comprising DU-7 were excavated in separate areas of the square separated by the DU-18 wall, the sediments were so similar that they were considered as part of the same depositional unit. The dominant large clast remains bricks, most of which are olive in color (5Y 6/2, 5Y 5/4, and 2.5Y 4/4) while others are of *gezira* type. *Gezira* bricks are those whose color is lighter than typical brick, are more indurated, and may contain shells of freshwater gastropods (Buck 1990: 160-161). It is thought that these bricks contained a high component of sand from the underlying *gezira* sand deposit. The dual nature of the brick fragments found may relate to the two walls that this DU butts up against, DU-18 and DU-17. Again, bone density (134.00 g/m^3) is higher than one would expect from wall collapse and this is, again, due to the presence of a single large fragment of *Bos* bone, and large and medium limb fragments. Ceramic and lithic densities are very low (0 and 4.44/m^3, respectively), although a few diagnostic ceramics were present, apparently used as chinking or otherwise intrusive.

This sequence (DU-5,6,7) represents a capping deposit for all lower deposits. As a unit, these DU's represent a series of wall collapse events with slightly different characteristics. The source of all material in them probably comes from the DU-17 and DU-18 walls, though as yet undiscovered walls adjacent to the square may also have contributed material. The heterogeneous nature of the brick types represented in these deposits results from the different types of bricks used in the construction of these two walls, DU-17 being composed of light, probably *gezira*, bricks, and DU-18 having more common olive colored bricks.

At this point in the sequence, the deposits are differentiated into two main areas, those to the east of the DU-18/20 wall (DU's 8, 9, 11, and 10) and those to the west of it (DU's 12, 13, and 14), both sequences of which rest upon a lower basal deposit, DU-16.

<u>West portion (1235/1056).</u>

DU-8 (SU-29):

Level: 4
Class: 1000
Interpretive Group: Fluvial
Corresponds to Buck's Unit XIV

This is a small deposit in the southwest corner of the square and is composed of mostly clean sandy silt. All artifact classes have low densities, with the exception of bone; this results from a few pieces of unidentified bone in a very small amount of sediment.

DU-9 (SU-28, 32, 34, 35, 38, 40):

Level: 4
Class: 2211
Interpretive Group: Floor
Corresponds to Buck's Unit XV

This DU is composed of several SU's in the northwest and southwest portions of the east half of the square. All are laminated to some extent. The laminations are composed of dark brown layers separated by thin yellowish sand layers. These do not appear to have resulted from fluvial deposition. The darker layers also contain charcoal flecks. The sequence appears to represent several occupation surfaces separated by layers of clean sand put down as covering material. Artifact densities are low in all categories. The upper SU's of this sequence are separated by a small partition (DU-20), but the sediments appear identical on either side. The lower layers are directly connected beneath the partition.

DU-10 (SU-45,46):

Level: 4
Class: 1110
Interpretive Group: Wall collapse
Corresponds to Buck's Unit XXI, XXII, XXIII

DU-10 is restricted to the northwest corner of the square and is stratigraphically coeval with DU-11. It seems to be composed largely of wall collapse from the *gezira* brick of the DU-17 wall. All artifact categories are low to absent.

DU-11 (SU-47,48)

Level: 4
Class: 1010
Interpretive Group: Heavily Decomposed Wall Collapse
Corresponds to Bucks' Unit XXVII, XXVIII

DU-11 is contained within a small portion of the southwest corner of the square. The majority of the sediment is composed of multicolored mottles indicating heavily decayed bricks. It is directly adjacent to the DU-20 wall. The lower portion of this DU (the lowest portion of SU-48) was described by the excavator as "a surface of consolidated *gezira*" and interpreted in the field as a plaster surface associated with the DU-20 wall as it curves up to come in contact with the base of that wall. Artifacts are rare to nonexistent.

DU-18 (SU-18)

Level: 4

Class: 3120

Interpretive Group: Intact Wall

DU-21 (SU-41)

Level: 0

Class: 2001

Interpretive Group: Fluvial

DU-20 (SU-39)

Level: 4

Class: 3120

Interpretive Group: Intact Wall

Correspond to Buck's Unit XV (18)

These three deposits make up the major wall in the room (see Figure 5.11). The wall itself is divided stratigraphically into two sections. The upper portion was excavated as SU-18 and is the main construction; the lower portion consists of two rows of bricks set at an angle and divided by approximately 4 cm of mortar, apparently a leveling foundation for the main wall. Between these two levels is a thin layer (2-3 cm maximum) of dark brown sediment with some charcoal flecks, a few small ceramics and two bovid teeth -- DU-21. Some of the sediment had a swirled appearance which suggests deposition by water which was allowed to settle and solidify before the upper portion of the wall was built. The small volume of DU-21 accounts for the apparently higher than expected ceramic and bone densities that one would expect with a fluvial deposit. I suspect this may have been intentionally deposited as a slurried mud in order to further level the DU-20 foundation before construction of the DU-18 wall.

East Portion (1235/1056).

DU-12 (SU-24, 27, 30)

Level: 4

Class: 1201

Interpretive Group: Dump
Corresponds to Buck's Unit XVI, XVII

This DU consists of mostly unstratified silty sand with no mottles or brick pieces, and is similar in character to DU-8. However, unlike DU-8, DU-12 has a thin black layer with several sherds at its upper boundary. This black layer may represent either a short occupation surface or a minor dumping event. All artifact classes have low density, a characteristic that may argue against classing this as a dump.

DU-13 (SU-33,36, 37)
Level: 4
Class: 2201
Interpretive Group: Floor
Corresponds to Buck's Unit XVIII

This DU is very similar in structure to DU-9 (directly opposite on the other side of the wall) and is classified as a floor. Structurally, it is composed of numerous alternating layers of dark brown to black sediment with ceramics and bone fragments separated by light brown sandy layers. These lighter layers are not continuous over the whole surface and the dark layers occasionally articulate. Ceramic density is modest, bone absent except in small fragments, and lithics are similarly absent. As seen in the profile drawings, this DU curved up to meet the lower portion of the DU-20 wall.

DU-14 (SU-42):
Level: 4
Class: 2000
Interpretive Group: Fluvial
Corresponds to Buck's Unit XIX

This DU consists of a series of paper-thin laminated deposits alternating between dark and light brown. There is no measurable bone or lithic material and the low ceramic density (7.81 g/m^3) and the general paucity of artifactual material indicate fluvial deposition.

DU-22 (SU-44):

Level: 4

Class: 1000

Interpretive Group: Heavily decomposed wall collapse

No correspondence information

This is a strip of clean brown sand right next to the base of the DU-20 wall. It contains virtually no artifacts, and the higher than expected bone density (27.69 g/m^3) is a function of the small volume of sediment (0.0975 m^3) and three unidentified bone fragments. It is interpreted to be either decomposed wall material slumped from the adjacent wall or perhaps plastering material to repair an undercut portion of the wall.

DU-15 (SU-43):

Level: 4

Class: 2110

Interpretive Group: Redeposited wall collapse (Plastered floor?)

Corresponds to Buck's Unit XXV

This is a layer of either decomposed wall collapse or the remains of a plastered floor surface. The sediment is a silty sand matrix with scattered *gezira* brick fragments. While the artifact densities are low in all categories, the excavator noted the presence of fish bone fragments and rare ceramics. As indicated in the profile, DU-15 curves up to meet the base of the DU-20 wall and was probable deposited shortly after construction, perhaps as a plastered surface with some construction material as part of the matrix.

DU-17 (SU-17; Not shown in profile):

Level: 4

Class: 3120

Interpretive Group: Intact wall

Corresponds to Buck's Unit XXIV

This is a large brick wall in the northeast corner of the square and is probably the northern boundary of the room containing the eastern set of deposits. The bricks are yellowish brown in color and contain small silt-clay nodules, brick types found in much of the wall collapse deposits. Artifacts are low density in all categories.

Basal deposit.

DU-16 (SU-50):

Level: 5

Class: 1000

Interpretive Group: Fluvial or prepared sand surface

Corresponds to Buck's Unit XXVI

Represents a basal deposit underlying all of the above units. It is an unstratified silty sand with rare sherd bits and no lithic or faunal material.

1235/1056 summary:

The main occupation deposits in this unit have been designated as Level 4 because of the similarity of the sherd densities to securely-placed Level 4 deposits in the block area and because the depth of these deposits is well below the securely-placed Level 3 deposits at about the same average depth as the securely-placed Level 4 deposits.

This complex unit contains three basic elements: a set of upper capping deposits and two sets of occupation deposits associated with the walls underlying the capping deposits. The upper deposits are made up of DU's 1-7. A covering of UPL material (DU-1) covers the entire square. Below this is a shallow excavated pit into which refuse and building material was dumped (DU-2, not shown on profile). DU's 3 and 4 represent dump deposits covering the entire area of the square and are differentiated by their relative proportions of artifacts, DU-4 having significantly heavier concentrations of pottery. DU's 1-4 are all assigned to Level 0 as they all contain later than Old Kingdom ceramics. The remaining capping deposits common to the square as a whole are DU's

5, 6, and 7 which represent different forms of wall collapse. All of these collapse deposits have their source as the underlying brick walls that are associated with Level 4 occupations and are thus all assigned to Level 4.

Beneath these upper deposits are the occupations directly associated with the intact walls (DU's 17, 18, and 20). The deposits are divided roughly between the east and west halves of the square separated by the DU-18/20 wall shown in the south profile. The overall sequences in the two halves are roughly similar: an upper layer (DU's 8 and 12) of either fluvial sediment (possibly with some dumping in DU-12), underlain by rather thick floor deposits (DU's 9 and 13) at roughly the same elevation and relation to the wall, which both rest atop a series of wall collapse (DU's 10 and 11) and either fluvial or prepared sand/plaster surfaces (DU 22) . The Floor deposits (DU-9, 13) are sparse in terms of artifact densities. Below these lower occupations is a clean sand surface (DU-16) on which the walls were constructed.

Unit 1261/1074

The profile drawing for this unit is shown in Figure 5.12. The schematic deposit sequence is in Figure 5.13.

DU-1 (SU-1):

Level: 0

Class: 1200

Interpretive Group: UPL

Corresponds to Buck's Unit I

Typical UPL. Ceramic densities are missing for this unit. Bone density is low compared to all units and moderate compared to other UPL deposits. Lithic density is high (24 /m^3) compared to all units and moderately high compared to other UPL deposits. The high lithic density results from several (N=5) chips and chunks of sandstone and marl, and a fragment of a polished sandstone grinding stone.

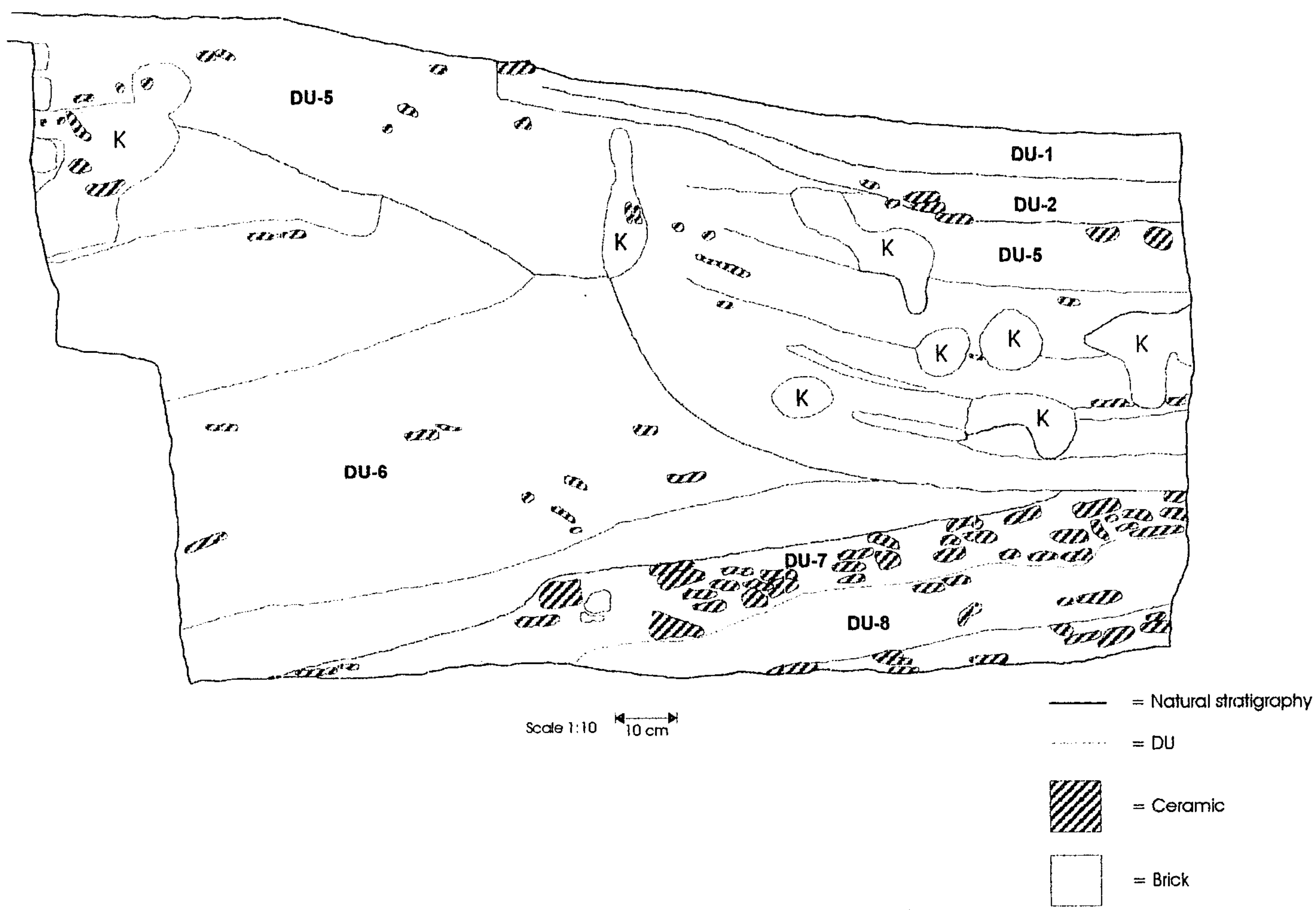

Figure 5.12. West profile drawing for unit 1261/1074.

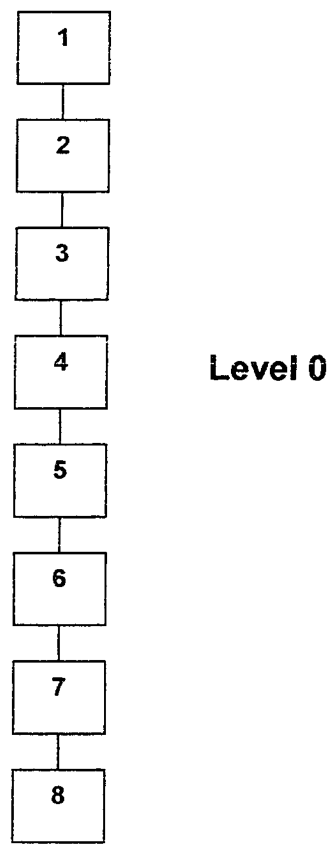

Figure 5.13 Depositional sequence for unit 1261/1074.

DU-2 (SU-2,3):

Level: 0

Class: 2200

Interpretive Group: UPL (Stratified)

Corresponds to Buck's Unit II

This unit seems to be a typical UPL but shows sings of having been redeposited by running water. Some larger ceramics are parallel with bedding planes. Ceramic and bone densities are comparable to DU-1, and lithic densities are similarly high (28 /m^3) and again is composed primarily (N=10) of chips and chunks, this time of granite and marl, and five fragments of sandstone grinding stones (two of which were obviously polished, one of which was recognized as a metate).

DU-3 (SU-5; Not shown on profile):

Level: 0

Class: 1010

Interpretive Group: Wall collapse

No correspondence information

This is a small unit in the southwest corner of the square. It was described as being clean, greenish mottled sand with few artifacts. This is true for ceramics and bone, but there is again an extraordinarily high density of lithics (N=6, 35 /m^3), composed of sandstone and marl chunks, a single fragment of a conglomerate grinding stone, and a single (burned) flint blade fragment.

DU-4 (SU-4,6; Not shown on profile):

Level: 0

Class: 2210

Interpretive Group: Redeposited wall collapse or dump

No correspondence information

This deposit is part of a small erosional depression against the south wall of the square. The two SU's comprising the unit are somewhat different but are contained within the same overall depositional structure. SU-4 is a dense layer of pottery that has faint laminations. SU-6 is a dense reddish sandy deposit on top of a layer of laminated sandy clay. A second layer of dense pottery rests on the bottom of SU-6. Sherds are generally conformable to bedding planes. Ceramic, bone, and lithic densities are all fairly high, typical of this square. All of the lithics (N=14) are chips and chunks of sandstone or marl, and two grinding stone fragments, one of sandstone (a mano) and another of conglomerate. This deposit was created after the construction of the wall on the south side of the square.

DU-5 (SU-7,8,10,11,12,15,16,17,20):

Level: 0

Class: 2201

Interpretive Group: Redeposited dump

Corresponds to Buck's Unit III

This is a large, complex unit composed of numerous interfingered layers or lenses of yellow sand, darker brown silt or clay, and occasional thick black lenses of burned, ashy material. Ceramics, which are low in density, are generally conformable to bedding planes. Bone density is the second highest of all units analyzed at 1364.08 g/m^3. *Bos* remains are present in the identified specimens but the majority of identified specimens (by weight) are of domestic ass (*Equus asinus*, N=29), pig (*Sus scrofa*, N=15), and hartebeest (*Alcelaphus buselaphus*, N=5). Lithic density, while lower than overlying units, is composed of the same sort of objects: chunks of sandstone and marl, and a fragment of a sandstone metate. Buck (1990:188) notes two possible interpretations of this unit: a small channel deposit in which water is flowing into a small gully; or a depression filled with colluvium from the habitation structure immediately to the south. I tend to favor the former hypothesis as the DU-5 deposits seem to cut through underlying deposits as if active erosion was taking place.

DU-6 (SU-9,13,14,18,19,21,23,24,25):

Level: 0

Class: 1201

Interpretive Group: Dump

Corresponds to Buck's IV-V, VI, VII, VIII

This unit goes underneath the brick wall in the south of the square. It is a large unit composed of a massive dark brown silty sand matrix with abundant ceramics and bone. The upper boundary of this unit seems to have been cut by the upper DU-5 deposit. Burning was evident in several aspects including the presence of charcoal and ash, numerous burned (or heat treated) lithics, burned bone, and blackened ceramics. The lithics show a distinct trend away from earlier deposits. In this case, the dominant object type is flint blade fragments (N=7) three of which show evidence of burning or heat treatment. Identified bone is exclusively from sheep/goat and pig. A 12th Dynasty seal was found in SU-14 indicating a Middle Kingdom date for these deposits.

DU-7 (SU-22):

Level: 0

Class: 1210

Interpretive Group: Dump/Sherd dump

Corresponds to Buck's Unit IX

This is primarily a sherd dump in a medium sand matrix. There is no preferred orientation to the sherds, nor are there any bedding planes, indicating rapid dumping rather than any sort of fluvial deposition. Ceramic density is the second highest of any unit analyzed, which may result from the majority of the ceramics being bread mold fragments, a very large and heavy ware. Lithic densities are lower than other units in this square and are only three in number, two marl and conglomerate chunks, and a single (burned) flint blade fragment.

DU-8 (SU-26,27):

Level: 0

Class: 1201

Interpretive Group: Dump

Corresponds to Buck's Unit X, XI

The matrix for this DU is a light brown sandy clay with less pottery than DU-7 and more evidence of burning in the form of ash and small charcoal flecks. There is no stratification present in the structure of the deposit but many of the ceramics were noted as being in a preferred horizontal direction. There are two components to this DU, SU-27 (the lower of the two) which is similar in content to DU-7 (a sherd dump), and SU-26 which has a much lower ceramic content than either DU-7 or SU-27. Ceramic density is high and bone density is exceptionally high (1217.14. g/m^3). The only identified faunal remains are three pig bones; the remainder (and majority by weight) are unidentified fragments. Lithic density seems moderate but is only represented by a single specimen, a sandstone flake.

1261/1074 Summary.

Two sets of deposits are represented in this unit. The lower layers (DU-6, 7, 8) are dump deposits of somewhat differing character. These lower units were cut through by an erosional (excavated?) basin which was then filled in with later materials making up a distinct upper layer. The bulk of the upper layer (DU-5) consists of a complex series of redeposited material cut through by extensive rodent burrowing. The character of the deposits suggests a series of alluvial deposits transporting dump and/or household debris into the basin. These deposits appear to be directly associated with an adjacent wall. Capping these deposits are two layers of UPL, the lower of which was apparently redeposited by running water.

The artifacts found within the lower and upper units differ markedly in some respects. The higher of these (DU's 3,4, and 5) are characterized by high densities of ground stone and fragments of sedimentary stone objects, perhaps waste products from the production of ground stone tools. These are also some of the few deposits where cattle (*Bos*) and wild game or draft animals (hartebeest and ass) remains were found. These upper units were deposited after the brick wall in the south of the square and may contain material derived from this structure. DU-5 especially was rich in burned animal bone and can be construed to be the remains of hearths or other food preparation sources. The lower units, in contrast, are generally much poorer in ground stone debris, little cattle or wild game, and much higher ceramic densities.

All of these deposits are assigned to the Level 0 occupation of Middle Kingdom date. The upper set of deposits is certainly of Middle Kingdom date due to the large number of typical Middle Kingdom bowls (Type J) contained within them. Similarly large numbers of Type J bowls were found within the lower set of deposits along with the Middle Kingdom seal, and these too are assigned to the later occupation level. I would argue that these deposits were probably created after the Middle Kingdom occupations ceased and weathering of adjacent structures and deposits had occurred, allowing their contents to be redeposited into some sort of erosional basin in this area.

Room 1 (1202/1070)

No profile drawing for this unit. The schematic deposit sequence is in Figure 5.14.

DU-1 (SU-1):

Level: 3

Class: 1111

Interpretive Group: Wall collapse

Described as brick rubble fill with mottled gray-orange brick fragments with burned edges, apparently collapse from the walls that make up the room. Ceramic density is minimal as are lithics. Bone density, however, is moderately high at 107.18 g/m^3, the only identified specimen being a pig bone; the remainder (and majority) of faunal remains are unidentified fragments.

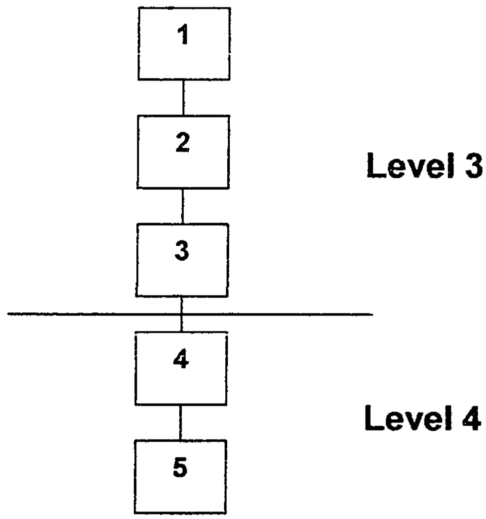

Figure 5.14 Depositional sequence for unit Room 1.

DU-2 (SU-4):

Level: 3

Class: 1010

Interpretive Group: Pit

DU-2 is a pit feature originating in the 'occupation surface' of DU-3 (SU-2). The outside of the pit was not apparently a brick structure, though the bottom was lined with what appeared to be low-fired bricks and brick fragments covered with a thin layer (approx. .5 cm) of gray clay. There is no evidence of any burning. The faunal density seems high at 240 g/ m^3, but this is due to the very small volume of the unit and the presence of three unidentified bone fragments. Ceramic density is also rather high, also probably owing to the small volume of sediment.

DU-3 (SU-2):

Level: 3

Class: 2201

Interpretive Group: Floor

This was referred to by the excavator as the occupation surface of the room and was a horizontally bedded dark gray compact sediment. The horizontal bedding is due to a series of lenses that do not form a continuous layer, some of which contain pockets filled with ash, burned bone and blackened ceramics. Ceramic density is moderately high and bone density is very high, the highest of any floor deposit analyzed. The majority of the identified faunal remains were of pig (N=10) along with some sheep/goat, while the majority of the unidentified fragments were from either ribs or limbs.

DU-4 (SU-3,5,6):

Level: 4

Class: 1200

Interpretive Group: Dump

This unit lies under the brick walls making up the room and is stratigraphically unrelated to the overlying deposits. The matrix consisted of reddish brown loosely compact sand. The unit had a moderate amount of ceramics compared to all other deposits and a low density compared with other dumps; the same is true of bone density which was composed mostly of unidentified limb and rib fragments. Burning was not evident.

DU-5 (SU-7):

Level: 4

Class: 3120

Interpretive Group: Intact wall

This deposit was described as a semi-continuous paving of mud bricks. The plan drawing suggests that this was not a paving but a wall that fell over largely intact. It contained no ceramics and moderate bone density which was all unidentified fragments. Because of the presence of the bone I suspect this is probably a collapsed wall with some dump material either jumbled in with it or with part of the overlying deposit inadvertently excavated with it.

Room 1 summary

This room was partially excavated in 1986 as a 2-meter unit as unit 1202/1070 and even though the current room deposits do not lie within the 2-meter unit defined by 1202/1070 the name was retained. The room boundaries are defined by brick walls on the west and south and a less well-defined wall to the east.

The upper deposits (DU's 1, 2 and 3) are associated with the walls making up the room boundaries and are assumed to be contemporary with the block area architecture to the south of the room. The pit feature did not contain burned material and probably functioned as storage rather than as a hearth.

Beneath the occupation surface of DU-3 is a dump that is stratigraphically beneath the walls making up the room and therefore not associated with it. Beneath this dump, which acts as a foundation deposit for the room, lies a largely intact wall from a previous structure that had fallen over.

Room 2 (1208/1074).

No profile drawing for this unit. The schematic deposit sequence is in Figure 5.15. The deposits for this room contain some excavated in 1986 and in 1988. The SU's for the 1986 units are given for the unit that they were originally a part of.

DU-1 (1207/1074 SU-1,2):

Level: 0

Class: 1200

Interpretive Group: UPL

Typical UPL. All categories of artifacts were of moderate density, both compared to all units and within UPL deposits. The lithic component (N=9) consisted of almost all sickle blades or blade blanks (N=8). Identified faunal remains were predominantly sheep/goat and pig.

DU-2 (1207/1074 SU-3, 1209/1074 SU-3):

Level: 3

Class: 1111

Interpretive Group: Wall collapse

This unit is composed of a tumble of beige-colored bricks as the dominant large clast together with charred pottery fragments and can be considered part of a collapsed wall. All artifact densities are moderate for a wall collapse deposits and moderate overall. The lithic component is comprised of three blade blanks.

DU-3 (SU-1):

Level: 3

Class: 1210

Interpretive Group: Wall collapse

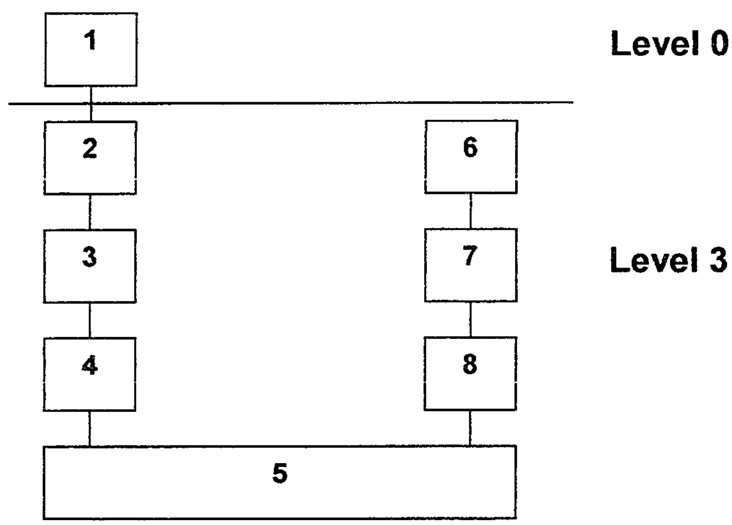

Figure 5.15. Depositional sequence for Room 2.

This is probably a continuation of the overlying wall collapse above it but without the burned material and a higher density of ceramics (20.90 g/m^3 as opposed to 6.34 g/m^3 for DU-2). Ceramic density for this unit is one of the highest of all wall collapse deposits and moderate for all deposits.

DU-4 (SU-2):

Level: 3

Class: 2000

Interpretive Group: Floor

The structure of this unit was, according to the excavator, "a dark brown clay material with a series of fine laminations with in a fining upwards sequence" suggesting a fluvial deposition. Arguing against this is the fact that its matrix is very similar to the unit below it (DU-5) which is more securely interpreted as a floor. Artifact densities are not indicative of either as the values for DU-4 lie in the middle of the range of both floors and fluvial deposits. The upper portion may, in fact, represent a period of abandonment with some fluvial deposition.

DU-5 (SU-3):

Level: 3

Class: 1000

Interpretive Group: Floor

The matrix for this unit is the same as that of DU-4: dark brown clayey material but without the laminated structure. Both of these units coincide with the base of the walls making up Room 2. All artifact categories have moderate densities compared to all other deposits and within all floor deposits, though bone density (128.72 g/m^3) is somewhat higher.

DU-6 (SU-4):

Level: 3

Class: 1302

Interpretive Group: Pit

This is the topmost stratum of the deposits making up the interior floor of the pit structure in the northwest corner of the room; this pit structure is associated with the DU-4 and 5 floors. It consists of a reddish matrix that contains a great deal of bone, especially fish bone. The burning appeared to the excavator to be *in situ*. This is probably a dump deposit but was classified as a Pit deposit for analytical purposes. This unit was excavated as a single sediment sample and the only available artifact densities were calculated from the microscopically sorted heavy fraction of this sample (see Cagle 1991) and thus are not comparable to others in this study.

DU-7and 8 (SU-5,6):

Level: 3

Class: 1000

Interpretive Group: Pit

Both of these units were layers of hard clay lining the bottom of the pit and pressed into the mud bricks making up the bottom of the pit structure. Both were excavated as single sediment samples and contained little to no artifacts.

Room 2 summary

The upper strata of this room were initially excavated in 1986 as parts of two units, 1207/1074 and 1209/1074. The room is defined by three walls, to the north, west and south, all associated with the Level 3 occupations in this area. DU-4 is the occupation surface proper, and DU-3 is probably part occupation surface and part fluvial deposition after the room was abandoned. The pit structure is associated with these floors. The pit contained a thin layer of apparently dumped refuse lying atop two hard-packed layers of clay that were pressed tightly into the mud bricks making up the bottom of the pit.

Room 3 (1212/1074)

No profile drawing for this unit. Only one DU is represented from this unit so there is no deposit sequence. The deposits for this room contain some excavated in 1986 and in 1988. The SU's for the 1986 units are given for the unit that they were originally a part of.

DU-1 (1211/1074 SU-3; 1213/1074 SU-3; SU-1):

Level: 3

Class: 1110

Interpretive Group: Wall collapse

This deposit was described by the excavator as having a dark brown to black mottled matrix with tumbled brick. Ceramic density is low and bone density is moderate. Lithic density is moderate and results from 4 blade blanks and one sickle blade. It is probably material derived from the walls making up the room and is therefore part of the Level 3 occupation deposits.

Room 3 summary

The north, south, and east walls of this room are well defined, the north wall separating it from the adjacent Room 2 deposits. The western wall is less defined and may have only a small partition jutting out from the south to separate it from the deposits further west and defined as Room 5. The only deposit excavated from this unit is some wall collapse.

Room 4 (1216/1072).

The profile drawing for this unit is shown in Figure 5.16. The schematic deposit sequence is in Figure 5.17.

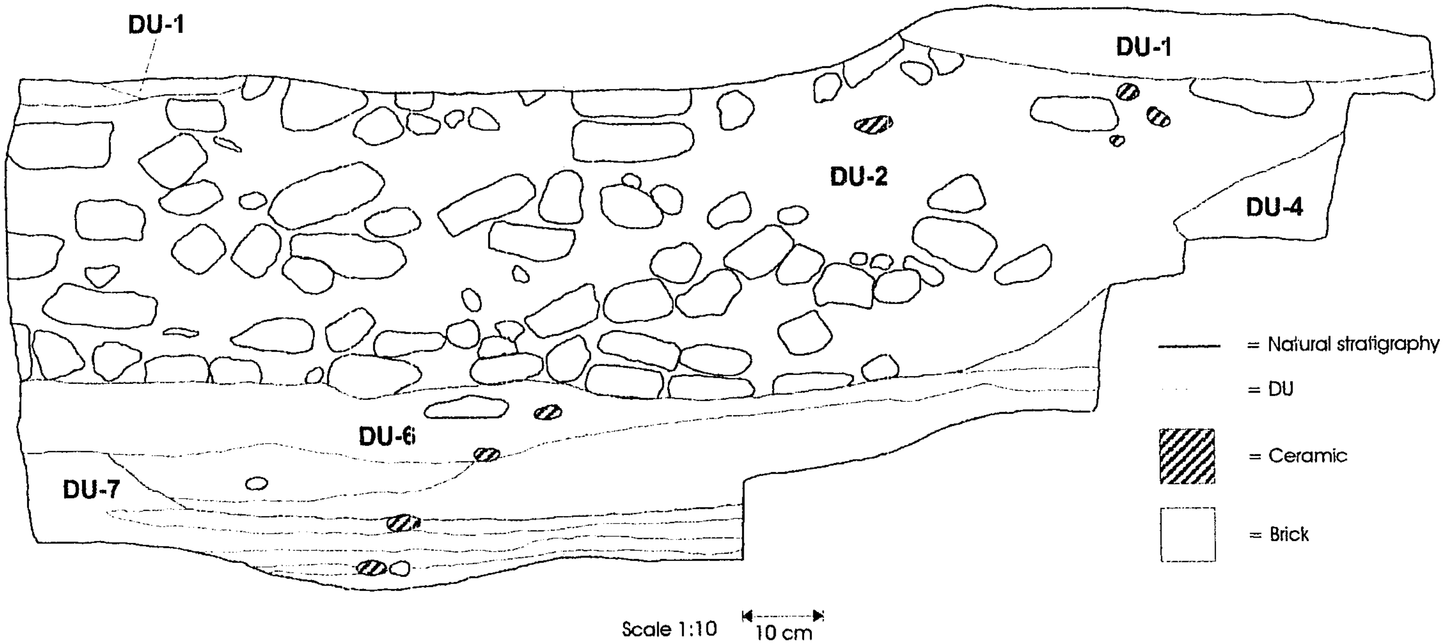

Figure 5.16. West profile drawing for Room 4.

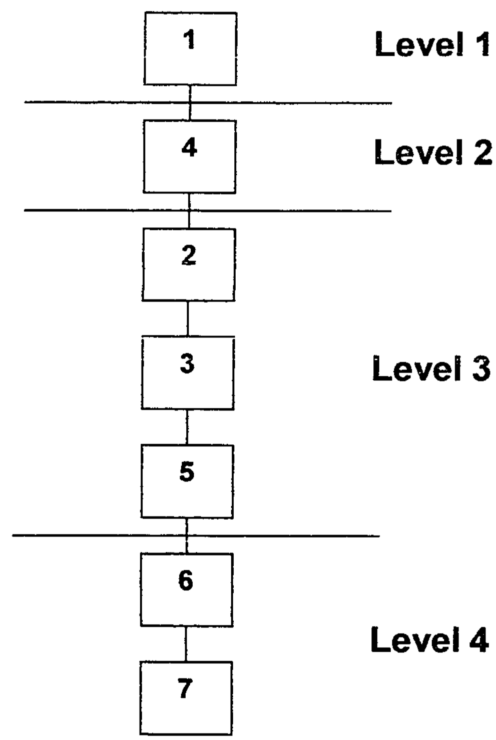

Figure 5.17 Depositional sequence for Room 4.

DU-1 (SU-2):

Level: 1

Class: 1200

Interpretive Group: Dump

There was little description of this unit by the excavator except that it was a dark gray to black loosely compacted material. Ceramic and bone densities are moderate to high. This unit is above the burial dug into the occupation deposits of this room and is therefore assigned to a later level (1).

DU-2 (SU-3,7):

Level: 3

Class: 1111

Interpretive Group: Wall collapse

Described as black to brown mottled matrix that slopes towards the southeast. The upper portion (SU-3) contains more brick than the lower layer (SU-7) and the brick pieces also become larger with more evidence of burning towards the bottom of SU-3. I have interpreted these two SU's as representing the same basic wall collapse deposit although the excavator also noted that there were several large ceramics lying on the surface of SU-7 indicating that some time may have elapsed between the deposition of SU-7 (lower) and SU-3 (higher). Ceramic density is moderate, and bone density is moderate compared to all deposits but rather high compared to other wall collapse deposits. The only lithic found was a blade blank.

DU-3 (SU-4):

Level: 3

Class: 3120

Interpretive Group: Intact wall

This is a portion of the north wall that was removed to obtain access to the infant burial of DU-4. This wall contained a moderate amount of bone and ceramics compared to all deposits, and also a high amount of ceramics compared to other intact walls.

DU-4 (SU-5,6):

Level: 2

Class: 1300

Interpretive Group: Burial

This unit is a human burial cut into the DU-2 (wall collapse) deposit. The artifacts associated with this deposit are probably intrusive. The burial was that of an infant and seems to have been cut partially into the north wall of the room. Sex of the skeleton is undetermined and was placed in the fetal position with the head facing east and the back towards the north wall.

DU-5 (SU-8; Not shown on profile):

Level: 3

Class: 1010

Interpretive Group: Heavily decomposed wall collapse

This unit is not shown in the profile and was a small mound of sediment in the northeast corner of the room. The sediment itself consisted of a thin (approximately 4 cm) layer of compact gray-green material on top of another thin layer of blackened material. There were no artifacts in this deposit and it is difficult to determine precisely what it is. The character of the sediment suggests that the upper gray-green portion is decomposed bricks; the lower portion may be a small dumping event consisting mostly of fine ash.

DU-6 (SU-9,10):

Level: 4

Class: 1210

Interpretive Group: Wall collapse

SU-9 is the first unit that underlies the walls of the room. Both of these SU's are described as gray-green mottled clay; SU-9 contains three brick-shaped discolorations as well, indicating collapsed walls. Ceramic densities are moderate, as are bone densities, though compared to other wall collapsed deposits the bone density for this unit is low. Lithic density (6.67/m^3) is somewhat high for wall collapse but this is due to a single object (a sandstone flake) in a relatively small SU.

DU-7 (SU-11,12,13):

Level: 4

Class: 2201

Interpretive Group: Floor

This DU is interpreted as an occupation surface but does not appear to be associated with the walls defining Room 4. It consists of mostly dark gray and tan mottled matrix with tan and black lenses within, the latter containing higher concentrations of bone. The excavator also noted a high proportion of rim sherds present. Bone density (359.47 g/m^3) is quite high compared to all deposits and particularly floor deposits (it has the second-highest amount of bone for floor deposits). Lithic densities (6.67/m^3) are also high compared to all deposits and floor deposits. The lithics (N=7) consisted of three sickle blade fragments, three blade blanks, and a small fragment of a coarse sandstone metate.

Room 4 summary

The upper layer of this room, DU-1, is apparently dumped material and covers the entire area enclosed by the room walls. Some time before this material was deposited, an infant burial (DU-4) was cut into the north wall through the underlying sediment of DU-2.

Below the later DU-1 dump and the infant burial are two episodes of wall collapse deposits, DU-1 and DU-5, the latter a smaller mound of material in the northeast corner of the room. It was the excavator's opinion, and the profile seems to bear this out, that

DU-5 was the lowest deposit directly associated with the room architecture. This means that no occupation surface was observed or excavated. I suspect that the occupation surface was probably very thin and obscured by the later wall collapse.

Not associated with Room 4 are two deposits, DU-6 wall collapse and an occupation surface, DU-7. Both clearly are underneath the walls making up the room.

Room 5 (1212/1072)

No profile drawing for this unit. The schematic deposit sequence is in Figure 5.18. The deposits for this room contain deposits excavated in 1986 and in 1988. The 1986 units that are combined in this room are 1211/1072 and 1213/1072. The SU's for the 1986 units are given for the unit of which they were originally a part.

DU-1 (1211/1072 SU-1,2; 1213/1072 SU-1,2):

Level: 0

Class: 1200

Interpretive Group: UPL

Described as typical UPL but with some brick pieces in evidence (not reflected in classification). Artifact densities are in line with other UPL deposits. Lithics of interest (N=11) include a notched flake and a fragment of a biface, and several sickle blades and blade blanks.

DU-2 (1211/1072 SU-4, 1213/1072 SU-4):

Level: 2

Class: 1301

Interpretive Group: Burial

The 'Other' large clast refers to the adult human skeleton. The grave is intrusive into the occupation surfaces of the room, and cuts into two pit structures (DU-8 and 9). The grave itself was initially split between two 1986 excavation units, 1211/1072 which contained the head and torso, and 1213/1072 which contained the lower extremities. In addition to the adult burial, another infant burial was found in 1213/1072 west of the

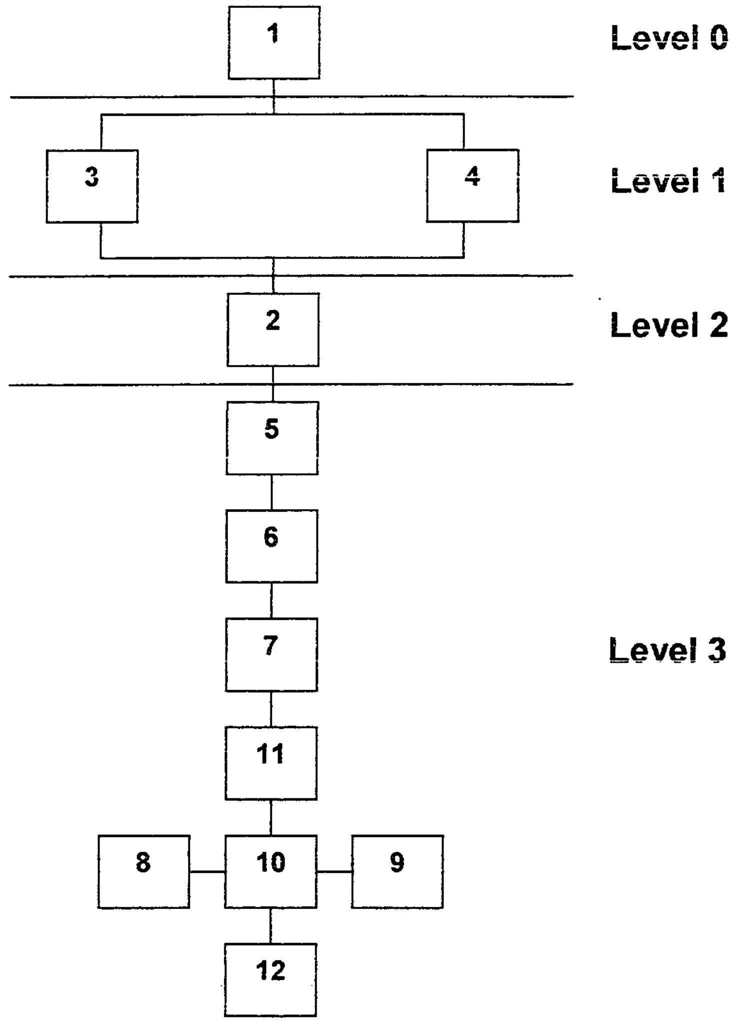

Figure 5.18. Depositional sequence for Room 5.

adult burial and just south of the pit structure (DU-11). The infant burial was also oriented with the head to the north, but there is no obvious relation between the two burials.

DU-3 (1213/1072 SU-5):

Level: 3

Class: 1110

Interpretive Group: Wall collapse

The stratigraphic relationship of DU-3 to DU-4 is unclear because of the intervening burial. DU-3 occurs in the southern (lower extremity) end of the burial and is interrupted by it. It consists of irregular patches of beige sand bricks and is derived from the walls making up the room, and thus assigned to Level 3. It contains moderate amounts of ceramics, and a fairly high density of bone (231.56 g/m^3) especially when compared to other wall collapse deposits; the bone consisted entirely of unidentified fragments. No lithics were found.

DU-4 (1211/1072 SU-3):

Level: 1

Class: 1201

Interpretive Group: Dump

This deposit consisted of four patches of somewhat different material: a black-brown gravelly sediment; a small patch of hard-packed gray clay; a patch of white loose sand; and a fourth patch of loose clay. All contained some evidence of burning in the form of what appeared to be decomposed charcoal. Its stratigraphic relationship to DU-3 is unclear as the intervening sediments are interrupted by the human burial. This material was apparently dumped before the burial was cut into the deposits, but is assigned to Level 1 because there is an intervening period of wall collapse between DU-4 and the occupation surfaces associated with this room. Ceramic and bone density are both moderate compared to all deposits and low compared to other dumps. Lithic density is high, due to the small volume of sediment and the presence of two lithic pieces, a sickle blade fragment and a blade blank.

DU-5 (SU-2):

Level: 3

Class: 1210

Interpretive Group: Wall collapse

This unit underlies both DU-3 and DU-4 and consists of gray clay and loosely compacted light to dark brown sediment mixed with brick tumble. Two clusters of rough ceramics were also noted. Ceramic density is high compared to all deposits and to wall collapse deposits. Bone density is similarly high and DU-5 has the highest bone density of any wall collapse deposit. The bone component consisted of a single large ovicaprid bone and a single pig bone (together, 57.3 g), and several unidentified fragments (18.6 g).

DU-6 (SU-3):

Level: 3

Class: 2200

Interpretive Group: Floor

This deposit was interpreted as a floor because it covered the entire room's surface and consisted of several laminated layers. Ceramic density is moderate, but fairly high compared to other floor deposits. Bone density is moderate with no identifiable specimens. Lithic density is also moderate and consists of a chunk of limestone and a globular piece of chert with rubbing visible on several faces.

DU-7 (SU-4):

Level: 3

Class: 1200

Interpretive Group: Floor

This unit was differentiated from DU-6 because it was a much lighter colored hard clay 'plastered' layer restricted to the northwest corner of the room though clearly associated with DU-6. Artifact densities are similar to those of DU-6. The lithic component (N=9) consisted of a single sickle blade fragment, a blade fragment, a *lame a crete*, a sandstone flake, a chunk of limestone, and four sandstone grinding stone fragments all of which were apparently part of a saddle-shaped metate.

DU-8 (SU-6):

Level: 3

Class: 3110

Interpretive Group: Pit

This DU is a D-shaped structure just to the east of the burial. Structurally, it is a thin, circular brick-like wall enclosed by 2-3 cm of heavy, thick gray clay. The interior contained tumbled brick pieces, some bone, and ceramics. According to the excavator the bottom of the pit appeared to go through the bottom of DU-7; it thus appears that the DU-8 pit was constructed before the DU-6 and 7 floors were laid down but was probably cut into the floor surface making them contemporaneous. Ceramic density is moderate; bone density is high compared to all units and very high for intact walls. I suspect that bone density is so high because this pit was probably used as a small dumping area before collapsing in on itself. Lithic density is also high, but this reflects on the small size of the DU (0.075 m^3) coupled with a single lithic (a sandstone flake).

DU-9 (SU-5):

Level: 3

Class: 1200

Interpretive Group: Pit

This is a large brick-lined pit structure that is cut into by the northeast corner of the burial. The contents were only described as 'fill' material but the contents indicate use as a small dump. All artifact categories have high densities with respect to all deposits; lithic density is highest for this unit than any other. Compared to all dump deposits, the densities are moderate to high, with the lithics having the highest density of any dump.

DU-10 (SU-7,8,9):

Level: 3

Class: 2201

Interpretive Group: Floor

This DU is the second of two sets of floors that are associated with this room structure and consists of three SU's representing a series of laminated layers. The layers tend to be loosely compacted brown sediment with thin (1 cm) blackened layers in between. There were also small blackened areas filled with charcoal and ceramics that could indicate small hearths. Structurally, these deposits occur near the bottom of the enclosing walls. All artifact densities are moderate compared to all deposits and to other floors. The faunal material consists of one *Bos* bone, and various ovicaprid and pig bones, together with a large component of unidentified remains, the majority (by weight) being limb fragments. There were a number of lithics (N=16). Three of these were blade fragments. The remainder were: a single limestone flake; five irregular chunks of chert, limestone, and silicified wood; two globular chunks of chert with rubbing apparent on several faces; and six sandstone metate fragments.

DU-11 (1213/1072 SU-3):

Level: 3

Class: 1222

Interpretive Group: Pit

This is a second pit structure constructed of bricks in a semicircular (D-shaped) outline. The excavator described the contents as consisting of burned sand and charred bone and ceramics indicating *in situ* burning. Ceramic density is high compared to all units and to other dump deposits. The only bones present were from fish (not analyzed for 1988 data). There were no lithics present. I interpret these contents to indicate trash dumping like the other two pit structures in this room.

DU-12 (SU-10):

Level: 3

Class: 2201

Interpretive Group: Floor

This deposit was originally differentiated from those above as being more of a compact clay sediment. This series of deposits are right at the base of the walls. On the north and south walls some of these bricks were angled as leveling courses. The deposit itself consisted of three layers: a hard-packed clay floor, underlain by a brown sediments with a less-consolidated clay running through it, all on a base of a black surface. Artifact densities are similar to those of DU-10 though without a lithic component. Faunal remains were predominantly unidentified fragments. It is possible that this deposit is not directly associated with this room structure; however, I interpret it as the foundation deposit for the room.

Room 5 Summary:

This room is composed of two distinct sets of occupation surfaces both of which are associated with the room structure. The initial occupation is represented by the DU-10 and DU-12 floors, the latter probably functioning as the foundation deposit of the room. Two of the pits, DU-8 and DU-9, are directly associated with these floors. A second occupation surface, DU-6 and 7, leveled the underlying pit structures and a third pit structure (DU-11) is associated with these two floors. After the occupation represented by DU's 6 and 7, the structure was probably left open for a time, during which time some minor dumping occurred in the pit structures. The adult and infant burials were then cut into the occupation surfaces. Further collapse of the structure proceeded (DU-3), followed by at least one episode of refuse dumping (DU-4).

Since both sets of occupation surfaces are directly associated with the room structure, I have assigned them both to Level 3. Several factors militate in favor of interpreting both sets of occupation surfaces having the same general functions associated with them. Both sets of floors are associated with similar pit structures. Both floors also contain several ground stone fragments and rather unique chert nodules with rubbing wear on several faces, suggesting their use as a machine tool of some sort (perhaps for working wood or softer stone). However, the earlier floors, particularly DU-10, contain far more ash and blackened sediments along with charred limb bones which suggests that some form of food preparation took place which did not apparently take place in the later floors. Thus, there may have been a short period of abandonment of this room at which time it was used for purposes other than storage (indicated by the pit structure). Since both sets of floors are tightly associated with the room structure, a Level 3 designation seems appropriate. Finer chronological control through attribute seriations of the ceramics may elucidate their chronological relationship better in the future.

Unit Room 6 (1212/1068)

No profile drawing for this unit. The schematic deposit sequence is in Figure 5.19.

DU-1 (SU-1,2):

Level: 3

Class: 1210

Interpretive Group: Wall collapse

This DU consists of typical wall collapse material in a brown matrix. The structure of the deposit is slightly humped up in the middle of the room and slopes down on all sides to the walls. The bricks also seem to be more patterned near the center as if the wall collapsed there. Ceramic and bone density is moderate for all deposits and compared to other wall collapse deposits. The faunal material consists of approximately equal quantities of identified (ovicaprid and pig) and unidentified fragments. Lithic density is also moderate and consisted of a blade and a limestone chunk.

DU-2 (SU-3):

Level: 1

Class: 1201

Interpretive Group: Dump

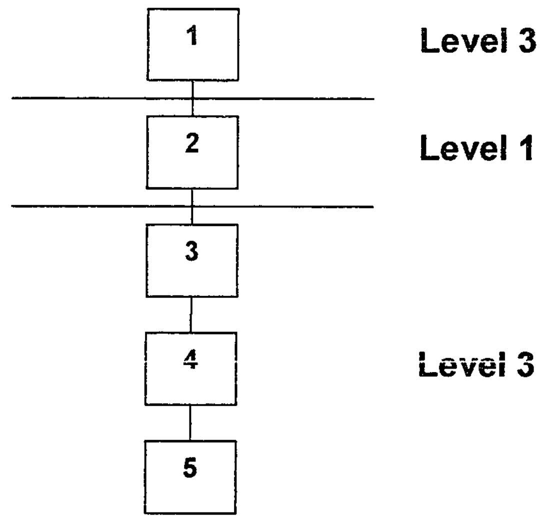

Figure 5.19 Depositional sequence for Room 6.

This is a black unit which follows the structural contours of DU-1: humped up in the middle and sloping to all sides. The deepest part of the deposit is in the center and southeast corner. The excavator noted that it seemed to be full of ash, charcoal, and burned bone that did not appear to be burned *in situ*. Ceramic density is moderate. Bone density is high compared to all deposits and other dumps, and the identified portion consisted almost exclusively of pig (N=14). Lithic density is moderate to high, and consisted of two sickle blade fragments, a sandstone flake, and a saddle-shaped metate fragment. Because this was deposited after an earlier episode of wall collapse (DU-3 and 4) it is assigned to Level 1.

DU-3 (SU-6):

Level: 3

Class: 1210

Interpretive Group: Wall collapse

This is essentially the same deposit as DU-1 but interrupted by the dump of DU-2, and is confined to the southeast corner of the room. Artifact densities are similar to those of DU-1 but with a higher ceramic content.

DU-4 (SU-4,5,7,9):

Level: 3

Class: 1000

Interpretive Group: Heavily decomposed wall collapse

This thick unit (ca. 40 cm deep) was described as a brown sandy sediment with no visible brick fragments. However, its appearance and position underneath similarly colored brick fall indicates this is wall collapse where all brick fragments have decomposed. Artifact frequencies are similar to that of DU's 1 and 3 except that DU-4 has a higher frequency of lithics than the other two: two sickle blade fragments, two blade fragments, one limestone chunk, one alabaster chunk, a quartzitic sandstone flake, and three sandstone metate fragments.

DU-5 (SU-8):

Level: 3

Class: 1200

Interpretive Group: Floor

This thin unit (no more than 3 cm thick) is the occupation surface of the room. It consists of dark brown to black sediment with a great deal of ceramics and stone on the surface. It is underlain by a deposit (SU-10) that is similar to that in the adjacent Room 8. Ceramic density is moderate and high for a floor deposit. The same is true for bone density; faunal material consists of two pig bones and several unidentified fragments. No lithics were present.

SU-10 (Analyzed as part of Room 8 DU-4):

Level: 3

Class: 2201

Interpretive Group: Floor

This is a very black sediment with a great deal of burned bone. It connects under the south wall to DU-4 of Room 8 and is analyzed and described in more detail as part of that room's deposits.

Room 6 summary.

The occupation surface directly associated with the Room 6 walls is DU-5, an apparently brief occupation based on the thinness of the deposit. Below this is another floor surface that connects to a floor in the adjacent Room 8. After the room was abandoned the walls collapsed and decomposed to form DU-4 indicating a substantial passage of time. This was followed by a period of further decomposition of the walls, perhaps some done intentionally as the material was humped up in the middle of the unit beginning with DU-3 indicates. A short dumping episode occurred with DU-2, interrupting the wall decomposition, which continued with DU-1.

The connection and overall sequence of this and Room 8 is discussed more fully in the latter room's summary.

Unit Room 7 (1218/1072)

No profile drawing for this unit. The schematic deposit sequence is in Figure 5.20. This room is defined as an irregular semicircular structure adjacent to the room in unit 1220/1072.

DU-1 (SU-1,2):

Level: 3

Class: 1210

Interpretive Group: Wall collapse

This unit largely followed the bricks on the surface and in toward the center of the structure. The upper portion was a dark brown to black sediment with brick fragments. Lower down (SU-2) it became more brown and sandy with only small spots of brick fragments. The excavator noted that the ceramics seemed to occur in clusters indicating that some small sherd dumps (broken whole pots?) may have been incorporated into the matrix. Ceramic density is moderate. Bone density is low and consists of only two unidentified fragments. Lithic density is very high, the highest of all wall collapse deposits. The lithics (N=14) consist of two blade fragments, and twelve sandstone flakes.

DU-2 (SU-3):

Level: 3

Class: 1201

Interpretive Group: Floor

This unit was described as a thin layer of gray clay with charcoal flecks and abundant artifacts. Structurally, it curves upward to meet the bricks of the eastern portion of the wall and the underlying sediment clearly goes beneath the walls. Ceramic density is moderate for all deposits and floors, while bone density is low in both. Lithics are absent.

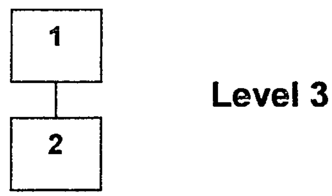

Figure 5.20 Depositional sequence for Room 7.

Room 7 summary.

The function of this structure and its relation to the adjacent room (north) in unit 1220/1072 or to Room 4 to the south is unclear. The upper wall collapse deposit (DU-1) contains several (N-12) sandstone flakes and two flint blades and a variety of ceramic types. The charcoal in the matrix of the DU-2 floor may indicate some form of cooking, but otherwise the function of this room is unclear.

Room 1220/1072

There is no profile drawing for this unit. The schematic deposit sequence is in Figure 5.21. This is a 2-meter unit that was excavated in 1988 to determine if any structures were present to the east of a wall along the western boundary of the square that was cleared earlier.

DU-2 (SU-2):

Level: 3

Class: 2010

Interpretive Group: Redeposited wall collapse

Only a portion of this deposit had visible brick fragments but the remainder is likely decomposed and fluvially redeposited due to the presence of fine laminations within the structure. The unit has fairly high ceramic and bone densities indicating some inclusion of dump/household debris. Lithic density is moderate and only consisted of a single blade fragment.

DU-3 (SU-3):

Level: 3

Class: 1210

Interpretive Group: Redeposited wall collapse

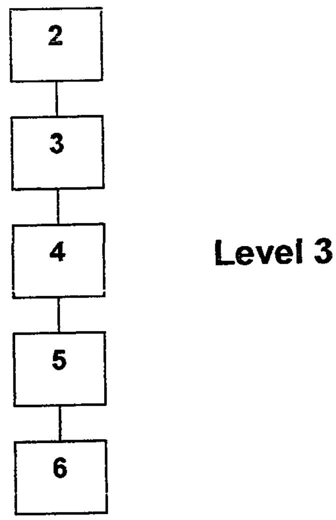

Figure 5.21 Depositional sequence for unit 1220/1072.

This unit was found only in the northeast corner of the square and consisted of a buff to tan sandy layer; the excavator noted that it was probably brick wash or fall from the structure to the north (Room 7). Ceramic and bone densities are fairly low, the latter comprised of a single unidentified limb fragment. No lithics were present.

DU-4 (SU-4):

Level: 3

Class: 2200

Interpretive Group: Redeposited dump/debris

This was a thin layer of moderately compact laminated sediment that covered the entire square. Several fine strata were noted indicating fluvial deposition. Ceramic and bone densities were moderate for all deposits and for all dump deposits. No lithics were present.

DU-5 (SU-5):

Level: 3

Class: 2000

Interpretive Group: Fluvial

This deposit was described as several thin alternating layers of mottled brown sand and tan sand with very few artifacts observed. It is possible that this represents redeposited wall collapse (because of the mottles) but seems to be predominantly fine-grained material with no identifiable brick fragments visible. Artifact densities are high compared to other fluvial deposits, perhaps because of the inclusion of some wall collapse material.

DU-6 (SU-6):

Level: 3

Class: 1200

Interpretive Group: Heavily decomposed wall collapse

The only description of this unit was as a massive homogeneous brown sand. Artifact densities are in line with other types of wall collapse deposits. This may be a prepared foundation deposit but its overall structure is unclear as it extends to, and presumably past, the edges of the excavation square.

1220/1072 summary.

I interpret this unit to represent an unoccupied depositional basin that accepted slumped or washed in material from the adjacent structure to the north (Room 7) and west. The wall along the west boundary of the square has no connecting members within this unit. As the excavator noted, much of this material seems to have been fluvially deposited material with its source being the deposits to the north in Room 7 as the slope of the deposits is down to the south of the square.

Room 8 (1216/1068)

The profile drawing for this unit is in Figure 5.22. The schematic deposit sequence is shown in Figure 5.23.

DU-1 (SU-1,2):

Level: 3

Class: 1211

Interpretive Group: Wall collapse

Typical burned wall collapse in the upper portions (SU-1) and unburned, more fragmentary bricks in the lower portion (SU-2), in a brown to dark brown matrix. The excavator noted several large ceramic pieces and bone indicating some dumped material may be included in this deposit. Indeed, ceramic density is high for wall collapse deposits and moderate compared to all deposits. The same is true for bone. Lithic density is also fairly high for wall collapse and consists of a sickle blade fragment, a *lame a crete*, two quartzitic sandstone flakes, and a fragment of a quartzitic sandstone metate.

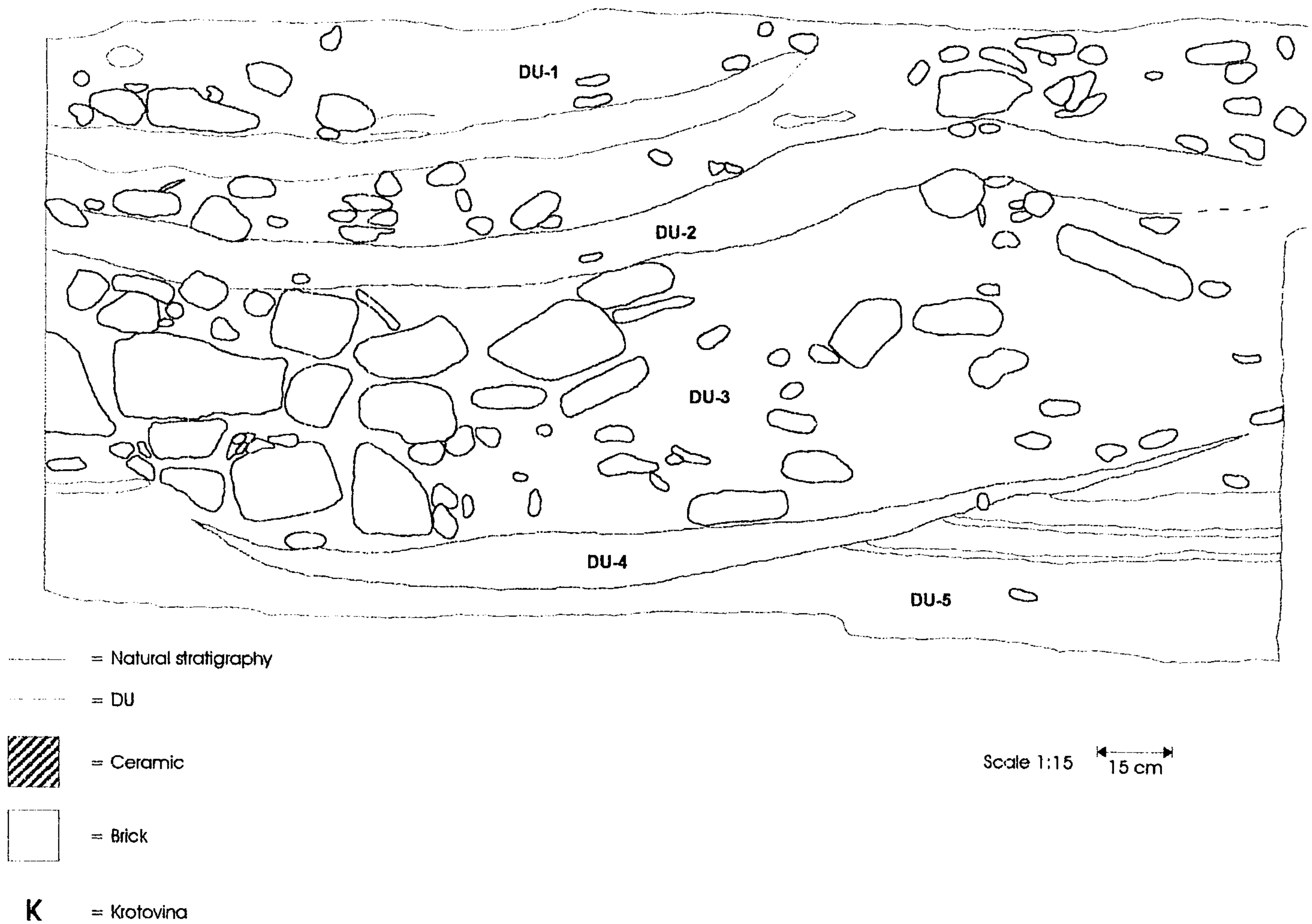

Figure 5.22. East Profile drawing for Room 8 (1216/1068).

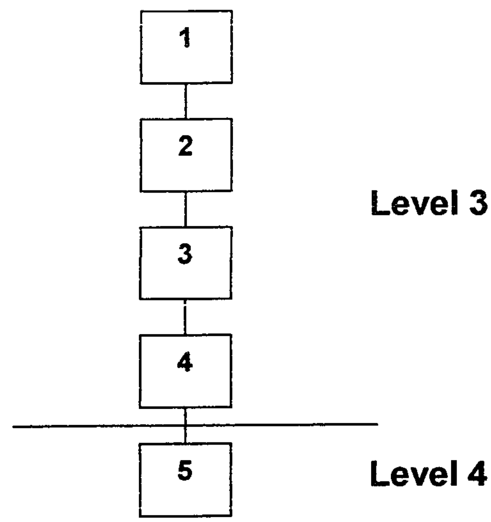

Figure 5.23 Depositional sequence for Room 8.

DU-2 (SU-3):

Level: 3

Class: 1210

Interpretive Group: Wall collapse

This deposit is differentiated from the one above it by being predominantly decomposed brick material and no burning evident. Artifact categories are similar in all respects to DU-1 and is probably from the same source. The single lithic found is a sandstone flake.

DU-3 (SU-4):

Level: 3

Class: 1111

Interpretive Group: Wall collapse

This unit represents heavier brick fall than the above units and the large clast is therefore bricks rather than ceramics. In several areas the edges of exposed brick fragments were burned, though not *in situ* as the burning did not extend to the surrounding matrix. Since some of the intact bricks in the walls were obviously burned, much of this unit's bricks were probably burned while they were part of the surrounding walls before collapsing. The brick fall is especially heavy near the bottom of the unit. Nevertheless, artifact categories are still similar to the overlying deposits except that ceramic content is lower. The lithics consisted of three limestone flakes, three sandstone or quartzitic sandstone chunks, and a fragment of a sandstone metate.

DU-4 (SU-5 and Room 6 SU-10):

Level: 3

Class: 2201

Interpretive Group: Floor

The excavator noted that this deposit was directly associated with the Room 8 walls, but the profile shows that the lowest of these also extend beneath the north wall and link up to the Room 6 SU-10 deposit there. Consequently, there may be two separate but related occupations evident in this deposit. It was described as a mottled dark black sediment with abundant burned bone and ceramics. It also contained thin laminations and curved up to meet the bottom of the walls. Ceramic and bone density is moderate for all deposits and moderate to high for floors. Identified faunal remains are predominantly pig (N=3) and ovicaprid (N-1), and several unidentified fragments. Lithic density is quite high for all deposits and for floors. The lithics consisted of a fragment of a bifacial knife, four blade blanks, and five sandstone chips.

DU-5 (SU-6,7):

Level: 4

Class: 1110

Interpretive Group: Wall collapse

This unit is well below the walls making up Room 8 and are not associated with them. This same deposit was also noted as lying under Room 6 SU-10 (DU-6) though the deposit in Room 6 was not excavated. The upper portion (SU-6) was more decomposed showing fewer actual brick pieces while the lower portion had many more identifiable bricks.

Room 8 summary:

Three walls make up the boundaries of this room on the north, east, and west. The north wall is shared with Room 6 and the west wall is shared with the larger structure surrounding Rooms 15 and 10. The eastern wall is a large, perhaps outer, wall separating many of the units excavated in 1986 from those excavated in 1988.

The top of Room 8's deposits consisted of three slightly different episodes of wall collapse. The top two deposits, DU-1 and DU-2, have less brick content than the lower one, DU-3. DU-1 also contained burned material and the higher than expected densities of ceramic and bone indicate some dumping may have occurred within this deposit. The upper layers also contained much less whole brick and brick fragments indicating more gradual deposition. Much of the brick in DU-3 was burned, apparently while the brick was still part of the structure from which it came which suggests active destruction of the structure.

The occupation surface is DU-4 and is shared in part with Room 6. As noted above, the lower portion of the floor surfaces seems to extend into Room 6, but the upper ones seem to be restricted to Room 8 suggesting that Rooms 6 and 8 were originally a single structure and a later wall was built to separate the two. Beneath the occupation is more brick fall (DU-5) which seems to be common to Room 8 and 6 and extends under the walls in both rooms.

Room 9 (1216/1076)

There is no profile drawing for this room. The schematic deposit sequence is in Figure 5.24 and a plan drawing is found in Figure 5.25. The entire area of the room was excavated for SU's 1-3 and then sectioned along an east-west line for the remaining depth.

DU-1 (SU-2):

Level: 1

Class: 1211

Interpretive Group: Dump

Though this unit contains some brick pieces it is not classified as wall collapse, but dump due to the scattered nature of the brick pieces and the overall black color and amount of bone and ceramics. Ceramic density is high overall and moderately high compared to other dump deposits. Bone density is also high compared to all deposits and compared to other dumps. Bone remains were fragmented with the majority unidentified; the only identified bone was a single hartebeest (*Alcelaphus buselaphus*) specimen.

DU-2 (SU-3):

Level: 1

Class: 2300

Interpretive Group: Column bases

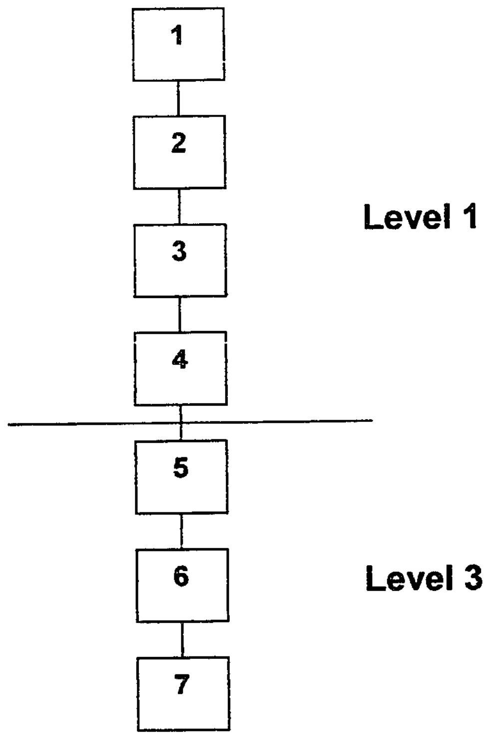

Figure 5.24 Depositional sequence for Room 9.

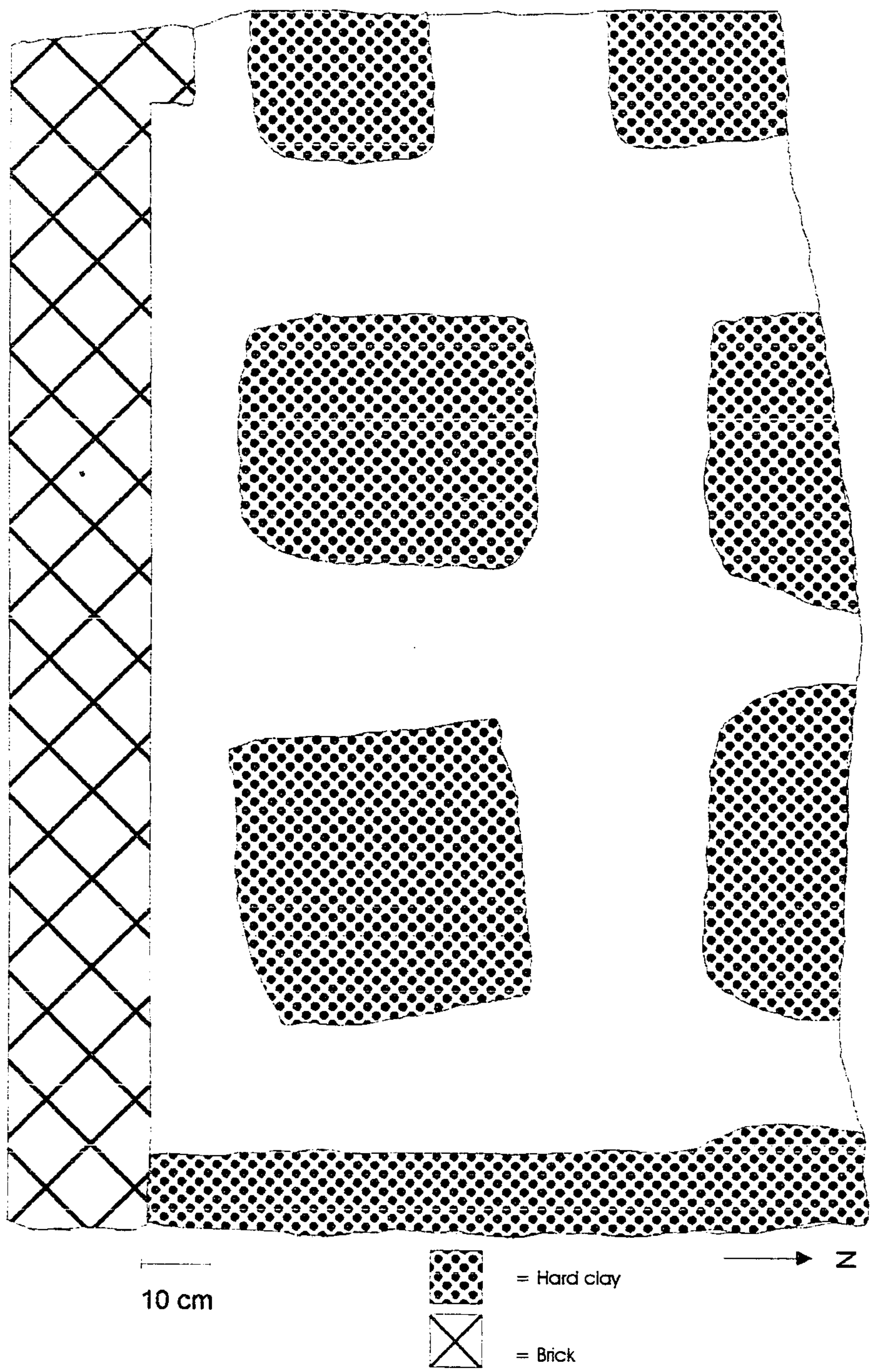

Figure 5.25. Plan drawing of the occupation surface of Room 9 (sectioned for excavation).

This DU consisted of three clay structures each with a large rock embedded in the center, presumably as a base for some sort of column or post. The bone density for this unit is the highest of any recorded as a large goat bone and a few unidentified pieces were found within this relatively small unit (volume = .03 m^3). A fragment of a sandstone metate was also found. The positions of these deposits do not readily indicate the type of structure that was supported but suggest a light structure, perhaps a lean-to such as those proposed by Giddy (1987) at Ayn Asil which seem to have been temporary "squatter's camps" during a period of abandonment.

DU-3 (SU-4,5):

Level: 1

Class: 1211

Interpretive Group: Dump

This deposit is composed of an upper layer of a mottled brown sandy sediment (SU-4) sitting on top of a much blacker sediment with patches of gray clay (SU-5). The mottles are assumed to be decomposed brick pieces and the excavator also described the upper layer as 'rubble fill.' The ceramic density of this unit is high compared to all units but moderate for a dump. The same is also true for bone which consists of several (N=8) pig bones and numerous unidentified fragments. Lithic density is high and is composed of two sickle blade fragments, a whole blade blank, a fragment of a flint chip, a faceted globular piece of flint (core?), five chunks of sandstone and one of slate.

DU-4 (SU-6):

Level: 1

Class: 1200

Interpretive Group: Dump

This was differentiated from DU-4 above it as having a greater content of clay and a much harder surface, and a higher density of ceramics though the weight of the screened ceramics is not available. Bone density is low and the only lithic is a blade fragment.

DU-5 (SU-7):

Level: 3

Class: 1010

Interpretive Group: Heavily decomposed wall collapse

Only described as a sandy brown sediment with very little artifactual remains in it. Not noted during excavation was the relatively high density of lithics: 24.24/m^3: one sickle blade fragment, two blade fragments, and several chunks of limestone (N=2) and sandstone (N=5).

DU-6 (SU-8):

Level: 3

Class: 1110

Interpretive Group: Wall collapse

This deposit consists of less-decomposed brick material similar to that of DU-5 and abuts the bottom of the east and south walls. A small amount of ceramics (5.83 g/ m^3) was the only artifactual material recovered from this unit.

DU-7 (SU-9):

Level: 3

Class: 1000

Interpretive Group: Floor

The excavator originally described this deposit as consisting of softer clay in between areas of very hard clay. During excavation, however, it became apparent that the hard clay areas were square and laid out at regular intervals. These may be column bases but they seem rather large and too close together to act as support structures that one could actually walk between. Artifact frequencies are on the low side (except for a single limestone flake) among other floor deposits. Excavation was halted at this point but it is apparently the basal deposit for this room.

Room 9 Summary.

The upper strata of this room consist of dumps deposited later than the occupation of the room after a period of abandonment and wall collapse. The 'column bases' of DU-2 may represent a short period of occupation, perhaps a short-term occupation with a small roof supported on posts anchored by these deposits.

Below the series of dumps assigned to Level 1 (DU's 1, 3, and 4) lie two episodes of wall collapse, with the upper deposit (DU-5) being relatively more decomposed than the unit underneath it (DU-6). The floor of this room is unusual and not seen in any other room excavated thus far. The plan drawing (Figure 5.25) is only half of the room as it was sectioned for excavation after DU-3 and consequently does not show the full relation of the rectangular clay features to the walls of the room. The features tend to be approximately 45-50 cm square and approximately 20 cm. from the walls and from each other. No depressions or other attributes indicating whether some sort of posts were placed on these features was indicated by the excavator.

Room 10 (1212/1064)

The profile drawing for this room is found in Figure 5.26. The schematic deposit sequence is in Figure 5.27.

DU-1 (SU-1):

Level: 1

Class: 1111

Interpretive Group: Wall collapse

This unit is a hodgepodge of different materials apparently deposited during an extended period of wall collapse and fluvial infilling after the construction of the Room 15 tomb. The predominant sediment is a dark gray to black matrix with scattered charcoal fragments throughout. One area contained alternating sand and clay laminations apparently the result of fluvial activity. There were also two small

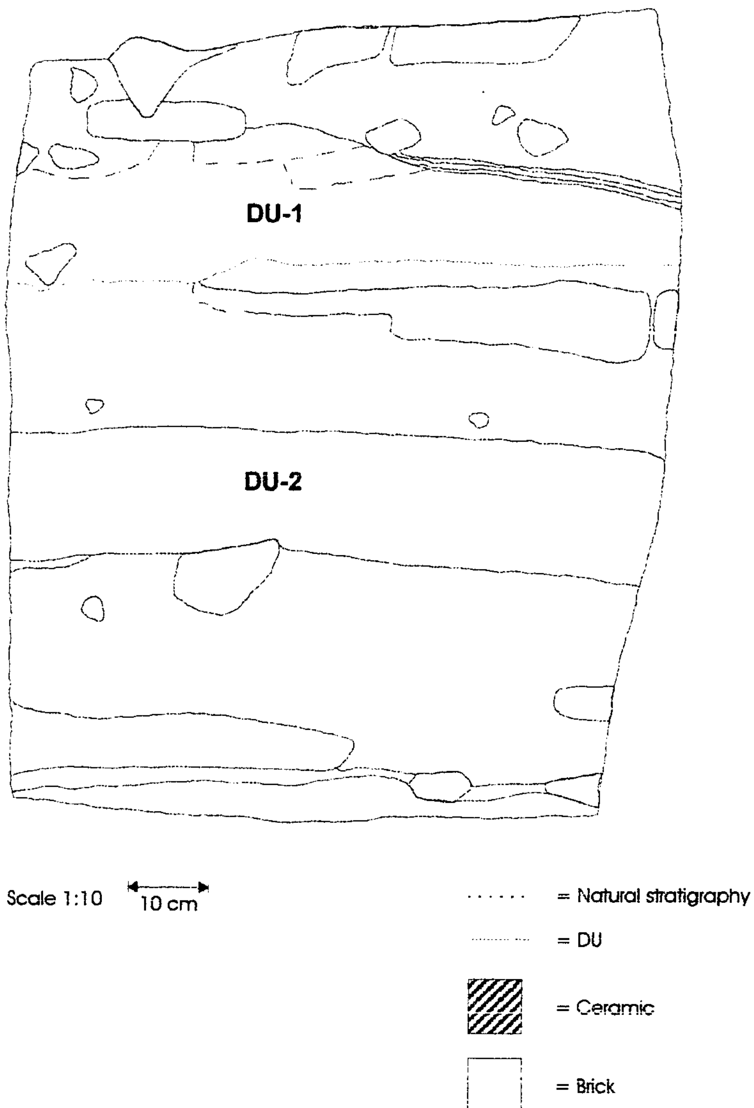

Figure 5.26. East Profile drawing for Room 10 (1212/1064).

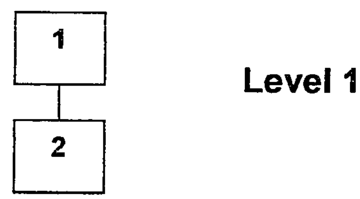

Figure 5.27 Depositional sequence for Room 10 (1212/1064).

depressions with coarse white sand in and around them. Both ceramic and bone densities are moderate compared with other wall collapse deposits. The sole lithic was a fragment of a sandstone metate.

DU-2 (SU-2,3):

Level: 1

Class: 2001

Interpretive Group: Redeposited dump/debris

There are few bricks present in this deposit and it is lighter in color than DU-1. The base matrix is gray to light gray sediment with numerous lenses of darker sediment that appeared to contain more ash/charcoal, bone, and ceramics. These lenses tended to be roughly 40-80 cm in diameter and may either be periodic dumping episodes or infilling of naturally scoured depressions. Artifact frequencies are similar to those of DU-1 but with more lithics: a blade fragment, one limestone chunk, five sandstone chunks, and what appears to be a four-faceted limestone point.

Room 10 Summary:

This room is actually one small end of a larger room that was subsequently cut into by a later mud brick tomb (Room 15). Because of the construction of this later tomb the materials within these room deposits are not thought to be associated directly with the occupation of the larger room.

The upper deposit, DU-1, contained wall collapse material and several lenses of apparently fluvial deposits. Artifact contents are thought to represent objects occasionally washed in from elsewhere or included as part of the collapsed wall material. The lower deposit, DU-2, was more laminated than DU-1 and contained more lenses with charred material that may represent intentional dumping of material rather than inwash. Both deposits were assigned to Level 1 because they were deposited after the construction of the Room 15 tomb, and probably represent wall collapse from both Room 15 and the larger room containing it, fluvial activity, and perhaps some minor dumping activity after the tomb was constructed.

Room 12 (1214/1062)

The profile drawing for this room is found in Figure 5.28. The schematic deposit sequence is in Figure 5.29.

DU-1 (SU-1,3):

Level: 3

Class: 1200

Interpretive Group: Dump

This unit may be regarded as either a dump or an intact house floor assemblage. The material is lying on top of the floor of DU-2, but it is not clear whether the artifacts were left lying on the surface (presumably where they were used) or dumped there later. The matrix is composed of a sandy brown sediment and a large number of grinding stones, ceramics, and bone was found right below the surface of the unit. Structurally, the DU consists of two parts separated by a single-course brick partition: a northern portion (SU-1) that is rich in ceramics, and a southern portion that had fewer ceramics. Ceramic content is moderately high compared to all units and other dumps as is bone density. The identified bone consisted of majority pig (N=17) and two ovicaprid bones; the unidentified remains were predominantly medium skull fragments (N=38) and medium limb (N=55). Lithic density is high and the inventory for this unit contains several fragments and whole grinding stones, the majority of which are metates. No hearth features were noted.

DU-2 (SU-2,4):

Level: 3

Class: 2201

Interpretive Group: Floor

This unit was a stratified layer of thin laminated clay and silt sediments that may be either prepared floors or fluvial deposits. Structurally, they appear more like fluvial deposits as they display a fining-upwards sequence and contain only fine-grained sediments. However, the top layer is dark black and contained a great deal of charcoal

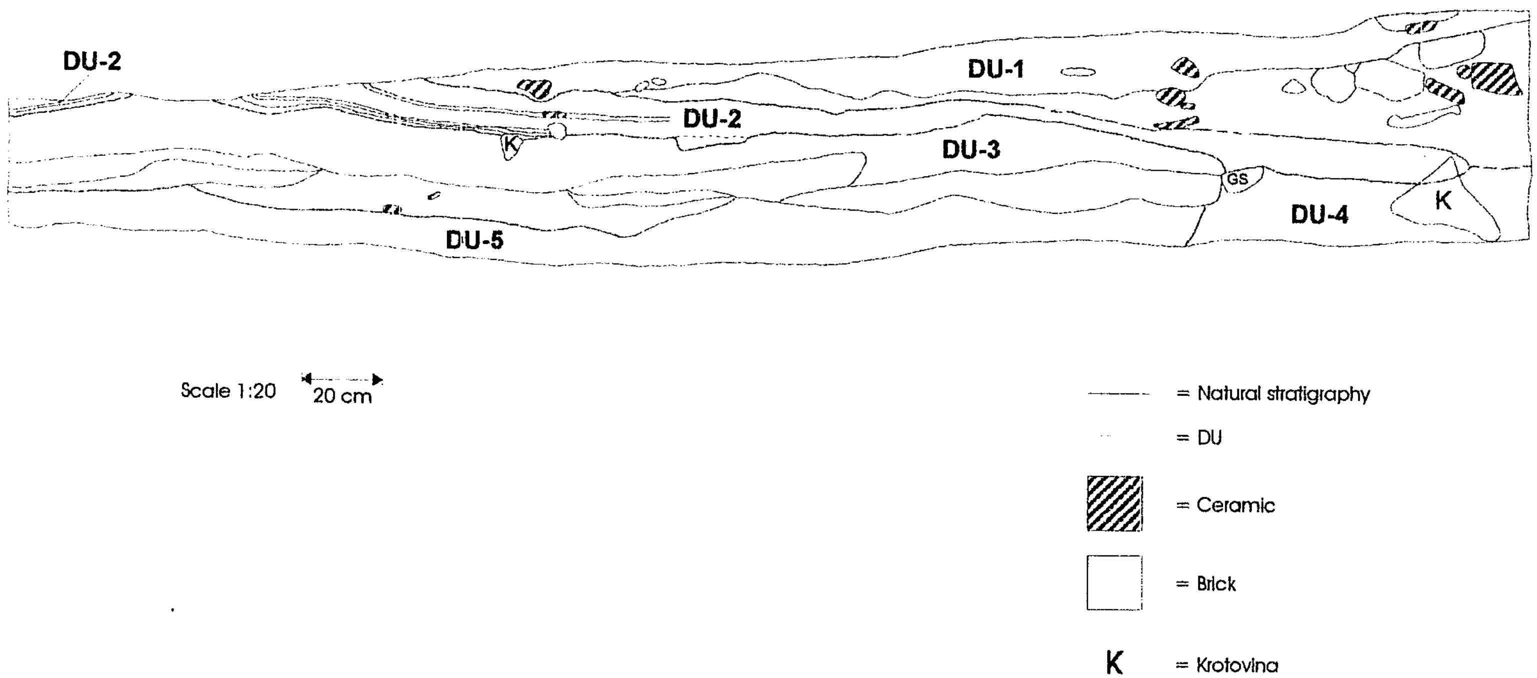

Figure 5.28. East Profile drawing for Room 12 (1214/1062).

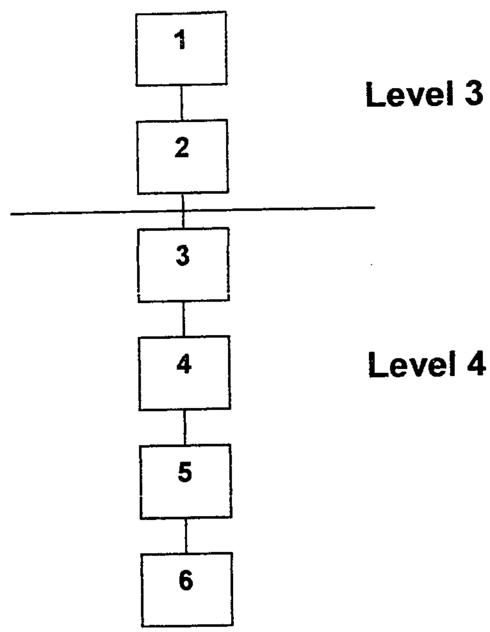

Figure 5.29 Depositional sequence for Room 12.

and small burned bones. All of this deposit went beneath the small brick partition in the north-central portion of the room and sloped towards the south where the majority of grinding stones in DU-1 were found. All artifact categories are much lower than those of DU-1. Ceramic density is moderate compared to all deposits and high for floors as is bone density, none of which was identifiable and the unidentified remains consisted largely (N=25) of limb fragments. The lithics consisted of a blade fragment, and three chunks of sandstone (N=2) and limestone (N=1).

DU-3 (SU-5,7):

Level: 4

Class: 2000

Interpretive Group: Heavily decomposed wall collapse

This is a complicated unit and appears to consist of several distinct episodes of wall collapse which subsequently decomposed. It is designated as laminated because of several horizontal substrata. The majority of the SU-5 portion consisted of largely clean brown sand underlain by a greenish-gray material similarly devoid of much artifactual material. Also within SU-5 was a thin layer of black sediment which *may* have been a brief occupational layer or more likely a small dump of mostly burned organic material. SU-7 was more heterogeneous and consisted of several slightly different materials: light brown sand in its southernmost extent, darker brown material in the center, and much darker brown in the north becoming thinner in this end as well. This thinning towards the north indicates a source wall in the south. A second course of bricks along the west side of the room and jutting out from the original wall may be the top portion of a room from an earlier occupation and part of the source material for these and the lower wall collapse deposits. Artifact densities were light to moderate in all categories. There was no identifiable bone and the only lithic was a single basalt chunk. This unit may represent collapsed and decomposed wall material originating in the south and undergoing several periods of collapse and slumping into the room.

DU-4 (SU-6):

Level: 4

Class: 1010

Interpretive Group: Decomposed wall collapse

A dark brown sandy sediment restricted to the south end of the room directly abutting DU-3 and continuing beneath the level of excavation. The lowest part of the south and west walls also ended right under the top surface of this DU indicating that the walls and subsequent occupations were built on top of this deposit. Though no bricks were described by the excavator, the character of this deposit is similar to others interpreted as decomposed wall collapse and was designated as such in the classification and interpretive group. Artifact densities are somewhat greater than those of DU-3 and are moderate overall where those of DU-3 tended to be lighter. Again, there was little identified bone (two pig bones) with the majority being unidentified limb fragments. The lithics (N=2) consisted of a single blade fragment and a globular chert nodule that was pink in color on one end (possibly heat treated).

DU-5 (SU-8):

Level: 4

Class: 1110

Interpretive Group: Wall collapse

Confined to the north end of the unit, DU-5 was differentiated from the overlying DU-3 by being a hard packed greenish sand. Bricks appeared in the lower north end of this unit and the unit is interpreted to be wall collapse. All artifact categories are low to moderate for wall collapse deposits. This unit also went beneath the walls and is not part of the overlying occupation levels.

Room 12 Summary

Room 12 contains four intact walls. The south wall is shared with Room 13. The east wall is shared with the large structure that contains Rooms 10 and 15 with a doorway connecting Room 12 with this large structure.

The deposits in this room are complex and excavation obscured some of the relationships between deposits. The top two deposits, DU-1 and 2, may represent a single occupation surface though DU-1 is classified as a dump. There was a great deal of artifactual material within DU-1, including a number of metate fragments. This may indicate an 'intact' house floor, since metates are generally heavy and not subject to transport; however, their fragmentary nature militates in favor of a dump. DU-2 is a more typical floor deposit, consisting of several layers of fine-grained laminated sediments. These layers all go underneath the brick 'partition' that divides the room width-wise into two areas. This partition may be from a later occupation that has since been destroyed.

These floor deposits are underlain by a complex series of what appear to be collapsed and decomposed walls -- DU's 3, 4, and 5 -- with a presumed source to the south of the unit. DU-4 takes up the southern end of the room and the walls of Room 12 in this area are built directly on top of it. DU's 5 and 6 are probably later than DU-4 as they appear to cut into the latter's northern extent, though all extend underneath the room's walls.

Room 13 (1220/1064)

The profile drawing for this room is found in Figure 5.30. The schematic deposit sequence is in Figure 5.31.

DU-1 (SU-1,2; Not shown on profile):

Level: 3

Class: 1211

Interpretive Group: Wall collapse

This layer combines a small amount of UPL with general wall collapse. The upper portion (SU-1) was described as a black sandy matrix with tan mottles, along with thin lenses of tan sand. The latter indicates at least some fluvial deposition during the

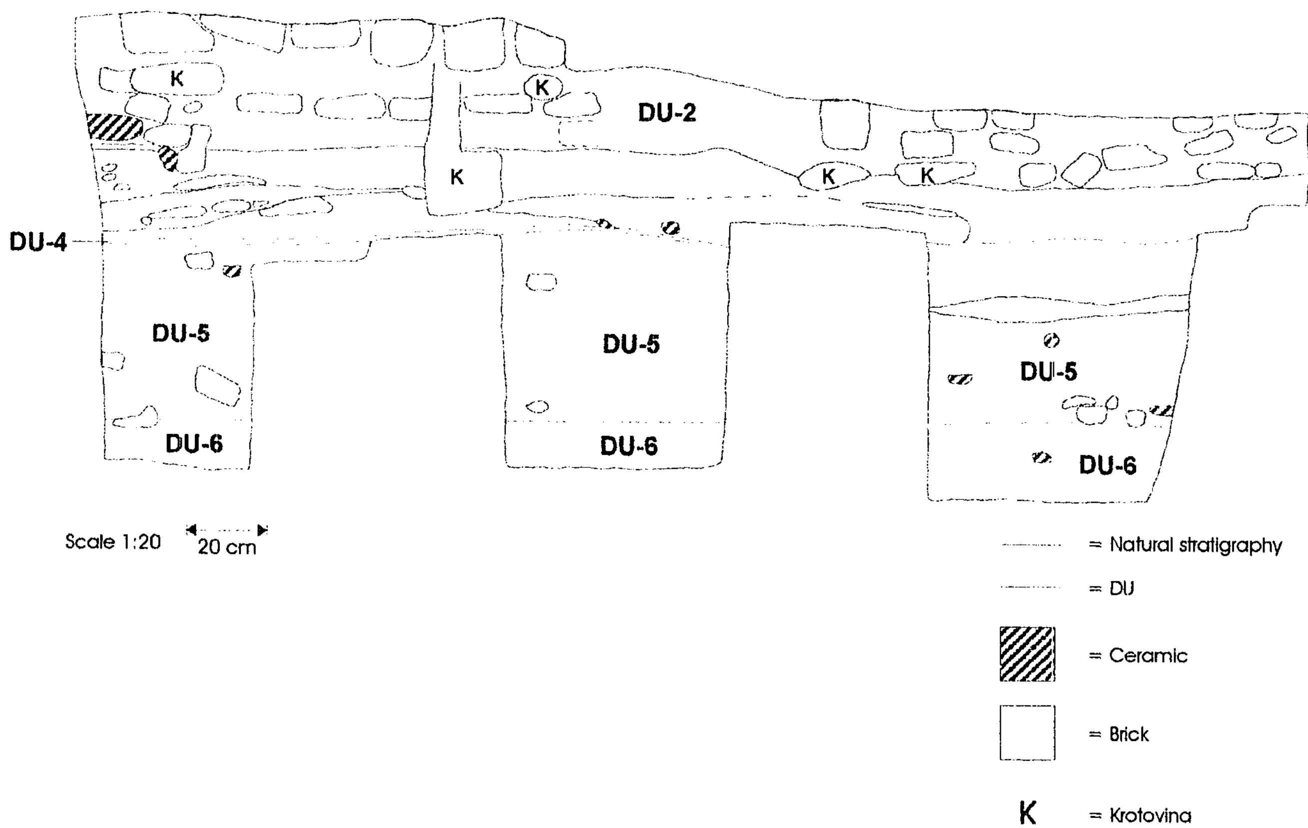

Figure 5.30. South Profile drawing for Room 13 (1220/1060).

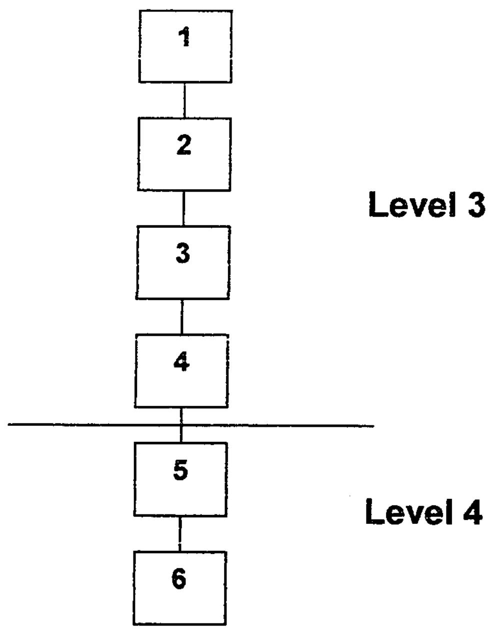

Figure 5.31 Depositional sequence for Room 13 (1220/1060).

sequence of wall collapse. The lower portion (SU-2) was darker with more reddish-colored mottles and patches of gray clay with charcoal flecks suggesting some burning of bricks and dump material. An infant burial was also found within this deposit. Ceramic and bone density is fairly high compared to all deposits and for wall collapse deposits only, perhaps because of some dump material included. Most of the identified mammal remains are of pig (*Sus scrofa*, N=13) and ovicaprid (N=4), but two hartebeest specimens (*Alcelaphus buselaphus*) were also identified. There were several lithics present (N=18) and were distributed between three sickle blade fragments (two of which showed evidence of burning), four blade blanks, nine chunks (five of sandstone, 3 of limestone, one of slate), and a whole sandstone mano. The lithic density is high for wall collapse but not the highest of all of these deposits.

DU-2 (SU-3):

Level: 3

Class: 1110

Interpretive Group: Wall collapse

This large unit (almost 4 m^3) was differentiated from DU-1 by a lighter tan color and more bricks and fewer artifacts. Artifact densities are correspondingly lower, though it still contained nine lithics: one broken flint blade, six sandstone chunks, a single sandstone flake, and a fragment of a sandstone metate.

DU-3 (SU-5; Not shown on profile):

Level: 3

Class: 1212

Interpretive Group: Pit

The material comprising DU-3 is inside of a semicircular brick structure and consisted of tumbled burned brick around the outside of the pit nearer the walls of the structure with non-burned brick nearer the center. The interior side of the bricks of the structure were also burned. Ceramic concentration was noted by the excavator to be very high, consisting mostly of heavy, bread platter or bread mold wares (Types D and

E, respectively). The overall character of the deposit suggests a dump with bricks from the collapsed pit structure. Bone density is only moderate, and consists of a single identifiable pig bone and numerous unidentifiable fragments. Lithic density is moderate with only a single sandstone flake present.

The overall structure, the character of the burning evident (on only one side of the bricks), and the presence of ceramics associated with bread baking suggest this was an oven. Though little archaeological evidence for baking facilities prior to New Kingdom times exists, it closely resembles the descriptions of later ovens given in Samuel (2000).

DU-4 (SU-4):

Level: 3

Class: 1201

Interpretive Group: Floor

This unit represents the occupation surface of the room as it occurs at the bottom of the walls. It is a brown layer with several lenses of rich black material throughout. Artifact densities are typically low compared to other deposits and low compared to other floor deposits.

DU-5 (SU-6):

Level: 4

Class: 1110

Interpretive Group: Wall collapse

This unit and the one below it both occur beneath the walls making up the room and are not associated with the deposits above. DU-5 consisted of a gray-brown mottled matrix with a few light brick patches and was interpreted as light brick fall or decomposed wall collapse. All artifact classes are moderate. Interestingly, the identified bone is distributed similarly to that of DU-1 with hartebeest, pig, and ovicaprid represented. Lithics are also similar to DU-1, including a single sickle blade, a single blade fragment, and three chunks of limestone (N=2) and sandstone (N=1).

DU-6 (SU-7):

Level: 4

Class: 1111

Interpretive Group: Wall collapse

This is composed of heavy brick fall of large chunks of green and orange colored bricks. Several lenses of clay flecked with charcoal were also noted which are probably fluvially deposited. Ceramic density is low compared to all deposits but moderate compared to other wall collapse deposits. Bone density is moderate. Only a single lithic was present, a flat, circular chert core.

Room 13 Summary:

The excavated portion of this room contains two occupations. The upper occupation is associated with the visible outer room walls. The topmost deposits (DU-1 and 2) are predominantly wall collapse with a small amount of UPL contained in the top of DU-1. This material covers the occupation surface (DU-4) and the "oven" (DU-3).

Below the occupation surface and associated architecture are two, perhaps a single, episode of wall collapse from some as yet undetected structure(s). The boundaries between DU-5 and 6 are unclear in the profile and were noted by the excavator as being very gradual. This probably indicates that the upper portion (DU-5) is essentially the same deposit as DU-6 with the bricks having been more gradually broken down and collapsing.

This room was sectioned so that only the southern portion was excavated; hence the relationship to the deposits in the adjacent room 12 is not clear, though both rooms share a common wall and are assumed to be contemporaneous.

Room 14 (1224/1060)

There is no profile drawing for this room. The schematic deposit sequence is in Figure 5.32. This 'room' is really a small (ca. 2 meters in diameter) circular structure to the southwest of the main block area. It was excavated because of a large limestone block in the center of the structure.

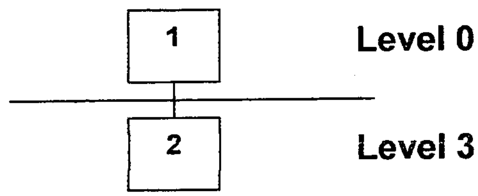

Figure 5.32 Depositional sequence for Room 14 (1224/1060).

DU-1 (SU-1):

Level: 0

Class: 1200

Interpretive Group: UPL

Typical UPL. It has a moderate density of ceramics for UPL.

DU-2 (SU-2):

Level: 3

Class: 1311

Interpretive Group: Wall collapse

This deposit contains a mixture of black sediment and fragments of brick and seems to be a mixture of some burned dump material and loosely compacted wall collapse. Below the tumbled brick and black material is a regular paving of brick laid on edge which may have encircled the limestone block. It contains a high density of ceramics, especially for a wall collapse deposit. Bone density is also high, probably as a result of the possible dump material included within it. The identified mammal remains consist of ovicaprid (N=3), pig (*Sus scrofa*, N=1) and hartebeest specimens (*Alcelaphus buselaphus*, N=1). The function of this structure is unclear. The limestone block was not of regular shape nor was it in any obviously functional position.

Room 15 (1214/1066)

There is no profile drawing for this room. The schematic deposit sequence is in Figure 5.33.

DU-1 (SU-1):

Level: 0

Class: 1200

Interpretive Group: UPL

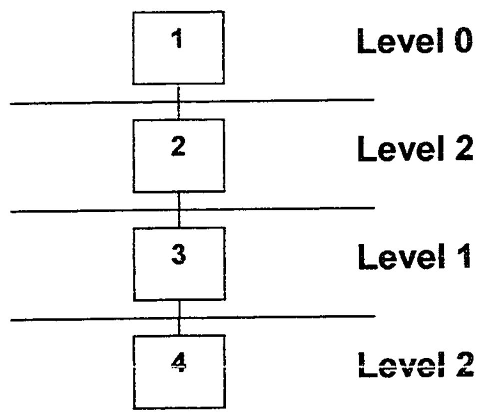

Figure 5.33 Depositional sequence for Room 15 (1214/1066).

This DU is typical UPL. However, while it contains moderate densities of all artifact types compared to all deposits, it contains the highest densities of ceramics, lithics, and bone of all UPL deposits.

DU-2 (SU-2):

Level: 2

Class: 1210

Interpretive Group: Wall collapse

The matrix for this DU ranges from dark brown to tan and contains numerous small brick pieces and some ceramics. It rises in elevation to the south of the unit. Artifact densities tend to be moderate compared to all deposits and moderate to high compared to other wall collapse deposits. Since the brick material is from the tomb structure constructed after the main occupations of Level 3, it is designated as Level 2.

DU-3 (SU-3):

Level: 1

Class: 1211

Interpretive Group: Dump

This is a very black deposit containing abundant charcoal fragments, some ceramics, large pieces of bone, and a few scattered brick fragments. There are occasional patches with abundant burned bone and ash as well. The deposit was humped up along the eastern wall and tapered off down towards the corners of the room, implying that the material was dumped over the wall on this side. While artifact densities are moderate in this unit compared to all other deposits, they are all low in comparison to other dumps. The lower density of bone seems unusual when the excavator noted the presence of abundant burned bone, but this is probably due to the burned and fragmentary nature of the bone. The identified faunal specimens (N=13) were about equally distributed between mammals (6 pig, 1 goat) and fish.

DU-4 (SU-4):

Level: 2

Class: 1000

Interpretive Group: Heavily decomposed wall collapse

The majority of this deposit consisted of a light brown sandy sediment assumed to be the decomposed remains of collapsed wall material. Towards the bottom of the deposit were also the remains of the plaster coffin material above the burial. Ceramic densities were moderate compared to other wall collapse deposits, but both bone and lithic densities were high. Again, the identified faunal specimens (N=26) were roughly equally divided between mammals (13 pig, 1 hartebeest) and fish/reptiles (11 fish, 1 turtle). I suspect that these were not part of the grave offerings, but may have been mixed from the above dump deposit.

Room 15 Summary.

This room is a tomb built into a preexisting structure that contains Room 10 directly north of Room 15. Both layers of wall collapse (DU-4 and DU-2) are presumed to be from the tomb structure and thus date to Level 2. The tomb was probably constructed after the Level 3 occupation of the larger structure. After a period of decomposition in which the walls of the tomb and the coffin began to collapse creating DU-4, the dump material of DU-3 was deposited on top. From the structure of the deposit, it seems as though the DU-3 material was dumped over the eastern wall. DU-3 may consist of several episodes of dumping as there is a certain patchiness to the deposit. The presence of a great deal of burned bone and ash suggests hearth or oven refuse was being dumped here. After the dumping of DU-3, the structure was allowed to collapse more creating the further Level 2 deposits of DU-2 capped by the ubiquitous UPL of DU-1.

The remains were that of a female, estimated age unknown. She was placed in an extended position with the head pointing to the north. The hands were placed at her sides. A bronze or copper mirror was placed just above her right hip between the torso and the right arm, with the handle end towards the head.

Room 16 (1212/1052)

There is no profile drawing for this room and no schematic deposit sequence since there is only one deposit from this room used. The 'room' itself is not a clear structure, but several walls; several contiguous 2-meter units -- identified below by their southwest corner -- were excavated to try to clarify the structures.

DU-1 (1212/1058 SU-3, 1214/1058 SU-4):

Level: 3

Class: 1211

Interpretive Group: Wall collapse

Both of these SU's are of the same material: a gray and brown mottled matrix with red, apparently burned, bricks and brick pieces scattered throughout. Artifact densities tend to be high in all categories which may indicate that some dumping occurred with this unit.

Room 17 (1156/1004)

There is no profile for this unit. The schematic deposit sequence is in Figure 5.34 and a schematic plan of the architecture is shown in Figure 5.35.

DU-1 (SU-4,9):

Level: 3

Class: 1110

Interpretive Group: Wall collapse

These SU's occupy the northwest and eastern portions of the structure. The deposit as a whole is typical wall collapse with green and yellow brick pieces scattered throughout with a generally gray matrix. Ceramic density is low to moderate while bone and lithic densities are high compared to all deposits; the same is true when this deposit is compared to all wall collapse deposits. Identified faunal remains consist of

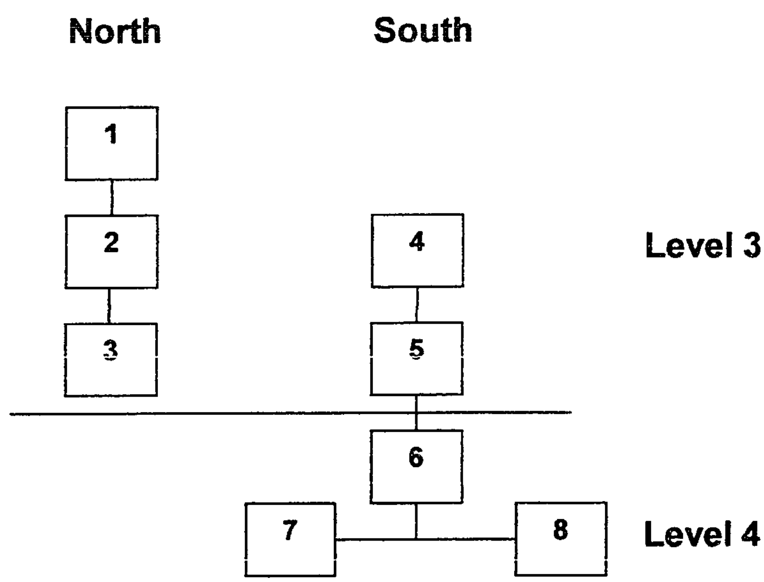

Figure 5.34. Depositional sequence for Room 17 (1156/1004).

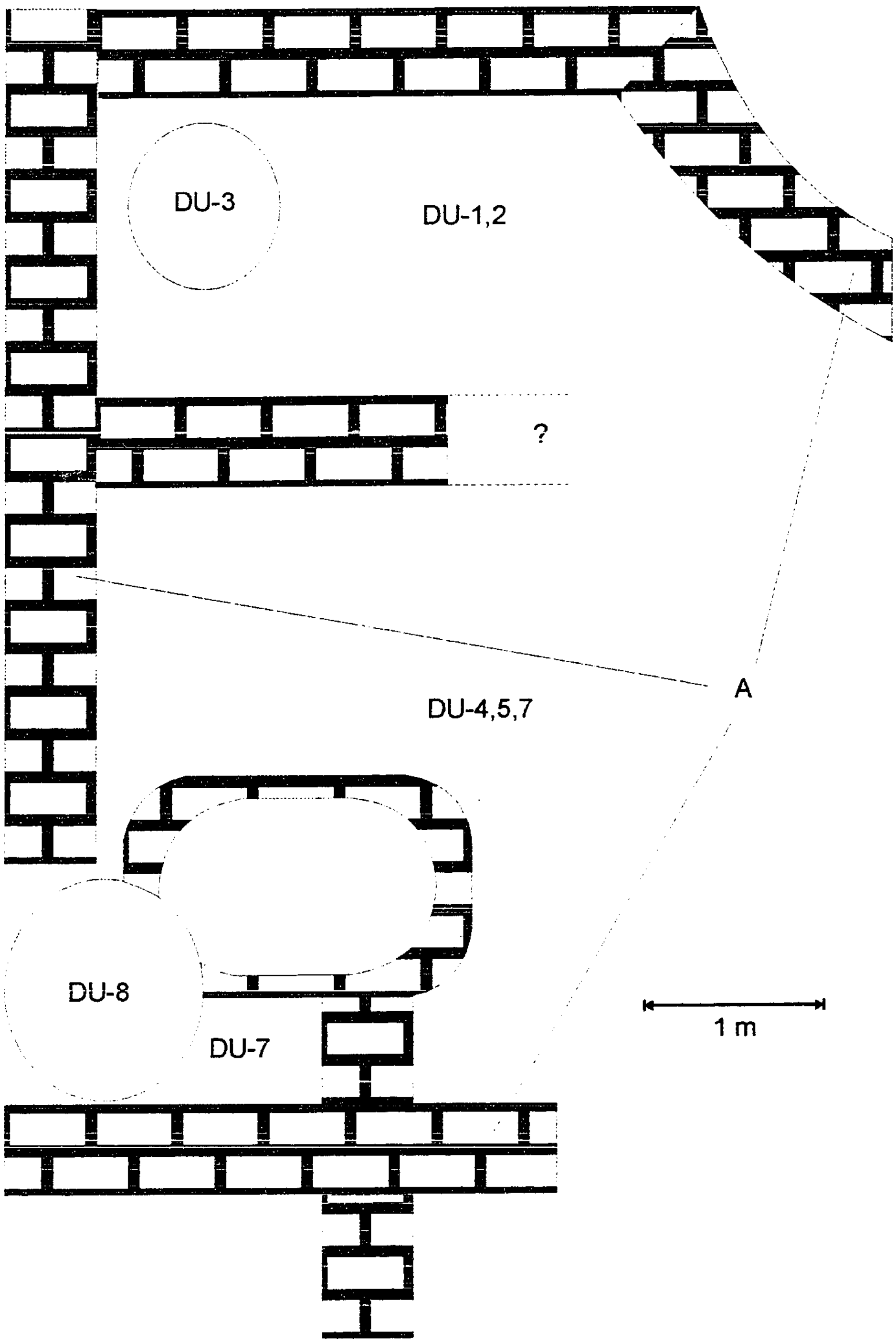

Figure 5.35. Schematic plan of Room 17 architecture. Only walls labeled as 'A' are associated with Level 3. The pit (DU-8) which appears to interrupt the large west wall underlies the floor (DU-5) associated with that wall, as do the other walls in that area.

numerous ovicaprid (N=30) and pig (N=10) elements along with minor components of other species.

DU-2 (SU-5,10):

Level: 3

Class: 1211

Interpretive Group: Wall collapse

DU-2 rests underneath DU-1 throughout its extent. It is differentiated from DU-1 by a more brown to black matrix in the lower portions of the deposit, while the upper portion contains brick pieces similar to those in DU-1. The excavator also noted the presence of more sherds, though the density of ceramics is lower compared to DU-1. There also appeared to be more burned areas and lenses with abundant ash and charcoal, suggesting that some dump material may be incorporated into this unit. Bone density is only moderate for this deposit, but lithic density is high compared to both all deposits and to wall collapse deposits. The lithics consist of 2 bifacial knife fragments, nine sickle blade fragments, four flakes, a fragment of a ground stone, and fourteen blade fragments. The distribution of identified faunal remains is similar to DU-2.

DU-3 (SU-1):

Level: 3

Class: 1202

Interpretive Group: Pit

This is a circular structure close to the northwest corner of the structure. The pit itself is defined by a wall of burned red clay. The deposit has a compact matrix and contained large and small sherd fragments and a few identifiable bones. I interpret this feature to be a hearth, perhaps filled in with some refuse. Ceramic and bone densities are high compared to all deposits and also to other pit deposits, and lithic density is low compared to all deposits and to other pit deposits. Identified faunal remains are minimal with the majority of all bone consisting of small, unidentifiable pieces.

DU-4 (SU-2,3):

Level: 3

Class: 1200

Interpretive Group: Dump

This unit lies to the south of the above DU's on the other side of a small wall. The deposit has a brown matrix and includes a heavy component of sherds and bone. All artifact categories have high densities compared to all other deposits and to other dump deposits. Faunal remains are again similar to the preceding deposits DU-2 and DU-3 with the majority of identified specimens from ovicaprid and pig.

DU-5 (SU-6):

Level: 3

Class: 2200

Interpretive Group: Floor

Lying beneath DU-5, this deposit was described by the excavator as one or two floors lying on thin layers of greenish bricks. The matrix is black but no mention of ash or charcoal remains was noted. All artifact categories had high densities compared to all deposits and other floor deposits; lithic density was the highest of an floor deposit. The lithics included numerous (N=26) flakes, seven blades or blade fragments, and 4 sickle blade fragments. The identified faunal remains were consistent with the other units in this room, predominantly ovicaprid and pig.

DU-6 (SU-7):

Level: 4

Class: 1200

Interpretive Group: Heavily decomposed wall collapse.

This deposit was underneath the floor surface of DU-5 and is thought to represent an earlier occupation (Level 4). It is composed of brown-gray sand which has the appearance of decomposed brick. The sherds were described as numerous but many were in a decomposed state, indicating some time lapse before they were covered. Sherd density is very high compared to all deposits and to other wall collapse deposits, as is bone (it has one of the highest concentrations of bone of any wall collapse deposit). Faunal remains are similar to the other units in this room. The lithics consist of six blades or blade fragments, two limestone chunks, a single flake, and one fragment of an end scraper; perhaps notably absent are any sickle blades which were common in upper levels.

DU-7 (SU-8):

Level: 4

Class: 1001

Interpretive Group: Dump

This deposit is in a small area bounded by a rectangular brick structure to the north, walls to the east and south, and the DU-8 feature to the west. Only a small amount of sediment was removed from this unit, and it consisted of a dark matrix rich in charcoal and charred seeds. It had the highest density of ceramics of any other deposit, but had no macroscopic bone or lithic material.

DU-8 (SU-11):

Level: 4

Class: 1202

Interpretive Group: Pit

This deposit is similar to that of DU-3: a sharply defined circular pit structure with walls of burned clay, presumably a hearth. Sherd density is generally low compared to all deposits and to other pits, while bone is moderate or high. Lithic density is high, but only consists of a single blade fragment and a single sickle blade.

Room 17 summary.

This room consists of a single large structure with two separate occupation areas, north and south, separated by a wall. The north half, DU's 1, 2, and 3, contains one hearth (DU-3) and two episodes of wall collapse. I suspect, however, that the lower portion of DU-3 contains either a dump or most likely the occupation surface associated with this room and was inadvertently excavated with the wall collapse above it. This would explain the unusually high artifact densities and black color of this unit. Only Level 3 deposits are represented in this half of the room.

The deposits to the south contain deposits contemporaneous with those in the north, and also some lower ones. The upper deposits are composed of a dump (DU-4) and an occupation surface (DU-5). Below these is another set of occupations defined by a complex series of room walls and smaller brick structures. This set of deposits is capped by collapsed walls (DU-6). A small dump (DU-7) was situated between two large walls and a smaller rectangular structure and bounded by another hearth (DU-8). The faunal remains from all of these deposits are predominantly ovicaprid and pig, and together with the hearths suggests that this structure was related to food processing/preparation in both occupation levels.

Room 18 (1208/1068)

The profile drawing for this room is found in Figure 5.36. The schematic deposit sequence is in Figure 5.37. A schematic plan drawing of the architecture of this room is provided in Figure 5.38.

DU-1 (SU-2):

Level: 0

Class: 2201

Interpretive Group: Dump

A medium brown silty sand with abundant large pottery in its upper extent and a lower portion of yellowish brown silty sand with occasional brick fall. The north end contains some laminated structures of dark brown to black alternating with yellowish brown sand, presumably from fluvial deposition. All categories of artifacts have high densities compared to all deposits and dump deposits. The majority of the bone is fragmentary, the only identified specimens being ovicaprid and pig; the remaining

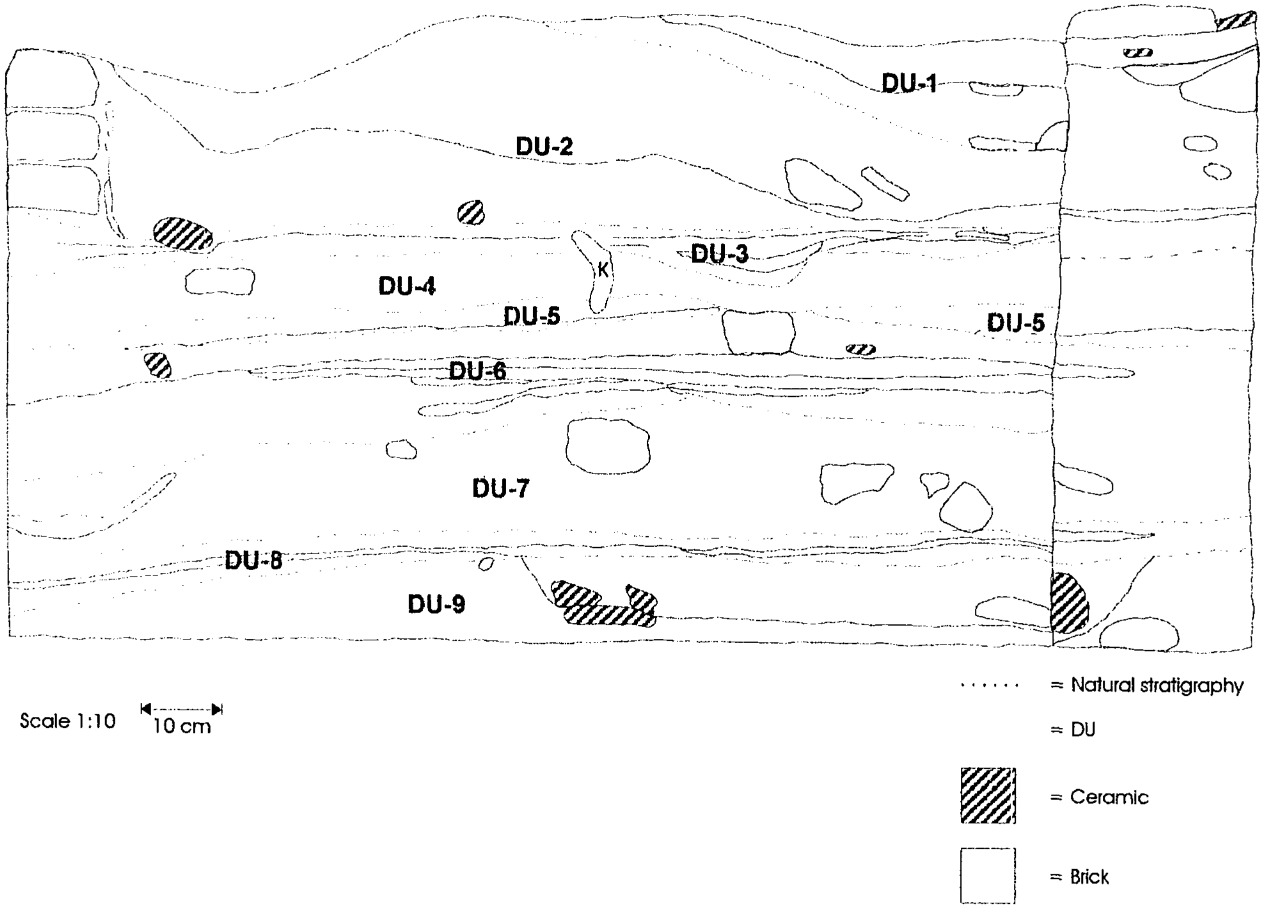

Figure 5.36. West profile, south section for Room 18 (1208/1068).

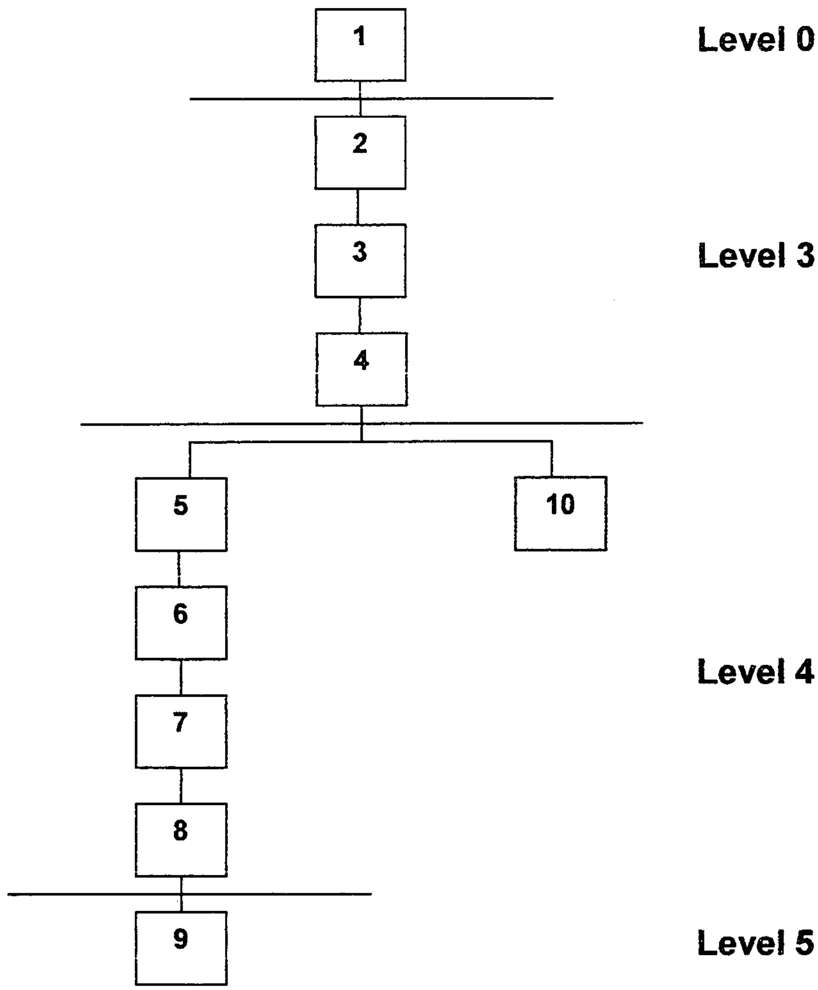

Figure 5.37. Depositional sequence for Room 18 (1208/1068).

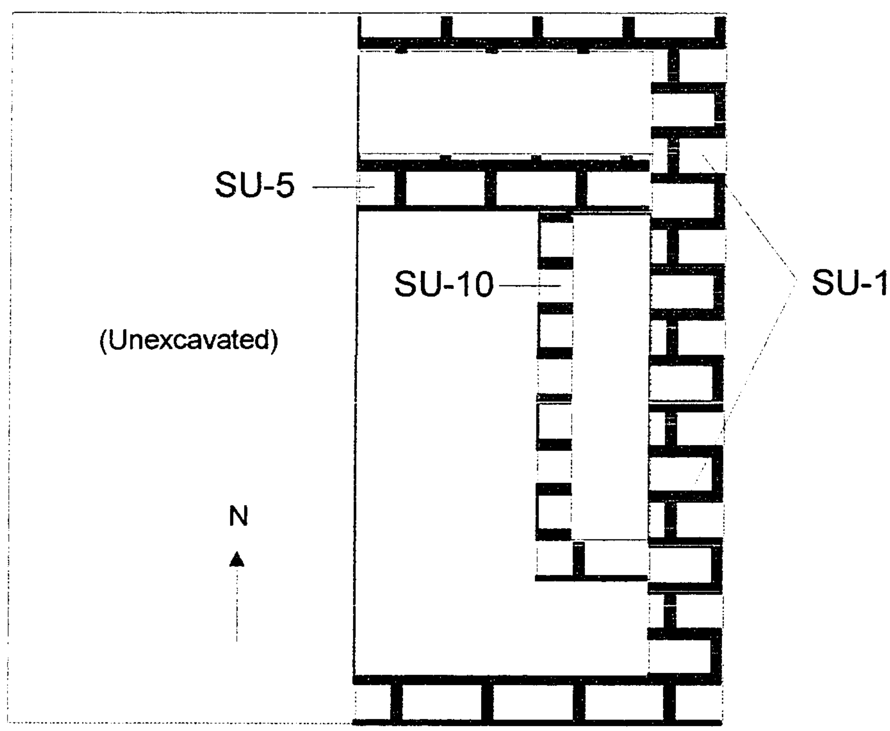

Figure 5.38. Schematic plan of Room 18 architecture. All walls were unexcavated. The walls represented by SU-1 are Level 3 structures. The SU-5 wall was designated a Level 4 structure, and the lowest wall, SU-10, was designated as Level 5.

unidentified material is predominantly limb fragments. The lithics consist of a sickle blade fragment, two chunks of sandstone, and a fragment of a sandstone metate.

DU-2 (SU-3,4):

Level: 3

Class: 1111

Interpretive Group: Wall collapse

This unit is composed of predominantly brick fall with diffuse charcoal throughout. A small thin lens of darker black material was also excavated as part of this unit in the northern third of the room. Ceramic and bone density is moderate in general, and bone density is fairly high compared to other wall collapse deposits. Bone remains consisted of ovicaprids and pig along with three bovid tooth fragments. The lithic component is moderate and composed of fragments of sickle blades and blank blades, three sandstone flakes and chunks, and a sandstone metate fragment.

DU-3 (SU-6):

Level: 3

Class: 2001

Interpretive Group: Floor

This is the occupation surface associated with the large walls making up the room (east and north walls). It is a clayey silt with diffuse charcoal flecks and fine black laminations. It has a low incidence of ceramics and bone compared to other floor deposits, but the lithic component is fairly high, consisting of two sickle blade fragments, a blade fragment, and a chunk of unknown raw material (perhaps basalt).

DU-4 (SU-7):

Level: 3

Class: 1110

Interpretive Group: Wall collapse

This is a capping deposit sealing the lower layers from those above south of the SU-5 (not excavated) wall uncovered during excavation of the upper layers. This wall (SU-5) lies closer to the north wall of the main room structure and may be a short occupation between those represented by the upper walls and a lower and larger (SU-10, not excavated) wall; consequently, it is assigned to Level 3 along with the upper deposits. This unit is a mottled yellowish brown brick fall with one lens of light tan sand within it. Ceramic and bone densities are moderate and no lithics were found. Very little identifiable bone remains were found in this unit, the majority being unidentified fragments.

DU-5 (SU-8):

Level: 4

Class: 1201

Interpretive Group: Floor

The excavator interpreted this as a floor but noted that the relation to any of the walls is unclear. It is certainly below the main (SU-1) walls of the upper level and the north profile shows it to be below the small SU-5 wall as well. However, in outline its eastern edge corresponds to that of the wall making up SU-10 which is slightly to the east of the main eastern wall of the room. Thus, I believe this is an occupation surface associated with these lower (SU-10) walls. It is a gray-black layer which becomes very black and flecked with charcoal in the southwest end. Notes and profiles show this to be a discontinuous layer indicating a brief occupation. It contains moderate amounts of all artifact classes. The faunal remains contained no identifiable material and only two pieces of unidentified fragments. The only lithic was a fragment of a sickle blade.

DU-6 (SU-9,12,13):

Level: 4

Class: 1210

Interpretive Group: Wall collapse

This unit occurs to the west of the SU-10 wall. The deposit is comprised of several slightly different strata, all containing some amount of brick fall, though not as much as the underlying DU-7 material. The three main layers were an upper layer of yellowish brown silty sand with relatively few ceramics (SU-9); a darker layer containing more ceramics (SU-12); and a lower layer (SU-13) of mottled sediment with coarse sand pockets and a color similar to that of SU-9, but containing fewer ceramics. Artifact densities are all moderate. Faunal remains consist of only unidentified fragments. Lithics consist of two blade fragments, and a limestone chunk.

DU-7 (SU-14):

Level: 4

Class: 1110

Interpretive Group: Wall collapse

DU-7 underlies DU-6 and is differentiated from it by having a greater abundance of brick fragments relative to ceramics. Artifact densities are similar to DU-6 but with a greater abundance of bone. Again, no identifiable faunal remains were present, and the lithic inventory consisted of two sandstone flakes.

DU-8 (SU-16,17,18):

Level: 4

Class: 1201

Interpretive Group: Floor

This unit consisted of three areas of black, highly organic sediment rich in burned pottery fragments, some burned bone, and charcoal. SU-17 was a shallow basin filled with relatively more burned organic matter and pottery than the other SU's. Artifact densities for this unit are low but consistent with other floor deposits.

DU-9 (SU-15):

Level: 5

Class: 1110

Interpretive Group: Wall collapse

DU-9 underlies DU-8 and does not appear to be associated with the walls containing the Level 4 occupations. It consisted of black to grayish-brown silty sand with brick fragments of tan to greenish color. All artifact categories are modest in density compared to other wall collapse deposits, though lithics are absent. This deposit was not completely excavated due to the encroaching water table.

DU-10 (SU-11):

Level: 4

Class: 1000

Interpretive Group: Heavily decomposed wall collapse

This is the only excavated unit on the east side of the SU-10 wall. DU-10 directly contacts DU-4 above it and is presumed to be of the same occupation level as those on the other side of the SU-10 wall. It is a very dark silty sand and the excavator noted that it had a sticky consistency. It is interpreted to be heavily decomposed wall collapse. The only artifactual material present was ceramics and these are of moderate density compared to other wall collapse deposits.

Room 18 summary.

This room has a complicated sequence of occupations. The upper deposits, presumably associated with the other Level 3 occupations of the block area, are represented by DU-3 and are directly associated with the upper walls (shown in upper left corner of the profile). This floor deposit is covered by the wall collapse of DU-2 and dump of DU-1, the latter of which is restricted to the northern portion of the structure and designated as a Level 0 deposit.

The DU-3 floor is underlain by a fairly shallow layer of wall collapse DU-4, which acts as a capping deposit for the underlying deposits and is designated Level 4. Below DU-4, a second set of occupations is visible with a single wall running north-south (SU-10) as the only architectural unit visible with these lower occupations. In addition, a very shallow wall (SU-5) splits the underlying room area into a northern and southern portion (1/3 of the total area in the north, 2/3 in the south). This wall is only two courses deep and may be associated with the upper deposits rather than those below, and is consequently designated as a Level 3 occupation. A floor (DU-5) may be associated with this small wall, but both the profile drawings and the excavator's notes indicate that any relationship is unclear. Clearly, however, the DU-5 floor is not associated with the upper occupation, but is either intermediate or associated with the lower architectural units and is therefore associated with the lower occupations, Level 4.

Below the DU-5 occupation lie two episodes of wall collapse, DU's 6 and 7, the former having fewer whole bricks visible and probably representing a longer-term period of slow collapse and disintegration of the bricks. DU-8 is the lowest occupation excavated and is not clearly associated with visible walls though presumably it is part of or immediately adjacent to the SU-10 wall.

A final deposit, DU-10, was excavated to the east of the SU-10 wall. This DU is considered to be decomposed wall collapse and contemporary with the other Level 4 deposits in this unit.

Room 20 (1160/1002)

There is no profile for this unit and since there is only one DU there is no stratigraphic sequence.

DU-1 (SU-1):

Level: 2

Class: 1210

Interpretive group: UPL

This 'room' is another small mud brick tomb contained within the confines of a later room, in this case Room 17. The deposits appeared to be heavily disturbed and so were taken out as a single SU. Much of the deposit consisted of UPL, particularly the northern half which was UPL down to the lowest level of excavation. The southern portion was mostly intact and contained only a shallow layer of UPL, below which was collapsed wall and the burial itself. Coffin plaster was noted approximately 5 cm from the western wall and 10 cm from the eastern wall, which continued up to the southern wall of the tomb. All artifact densities are moderate to high compared to all deposits and UPL deposits, especially ceramic densities. Lithics consist of 8 sickle blade fragments and a 17 blade fragments. Faunal remains are predominantly ovicaprid and pig.

Room 20 summary.

This is a brick tomb similar to that of Room 15, but somewhat smaller. The northern half of the tomb was cut away by later occupations or *sebakhin* activity. Consequently, the upper half of the body above the 10th or 11th thoracic vertebrae was gone. The distal portion of the right humerus was present and articulated with the ulna upon excavation; a portion of the left humerus was also observed. All of the remaining ribs were broken midshaft. The body itself was lying on its left side facing east and was an adult male of apparently large, robust stature. The plaster surrounding the burial was mostly white with some red coloring in it. Due to the condition of the remains, the northern half of the tomb (containing most of the torso and head) was apparently cut through and completely removed sometime after burial after which it was filled in with some wall collapse and UPL. The lithics and faunal remains seem similar in distribution to those in other Room 17 deposits and I suspect that they are probably part of that assemblage included here in the UPL that was excavated as part of this unit.

Room 22 (1210/788)

The profile for this room is provided in Figure 5.39 and the schematic deposit sequence is shown in Figure 5.40.

DU-1 (SU-1):

Level: 3

Class: 1210

Interpretive Group: Wall collapse

A dark brown, fairly compact sediment with some brick pieces around the wall borders and in the center of the room at the surface. Brick pieces cover the entire unit

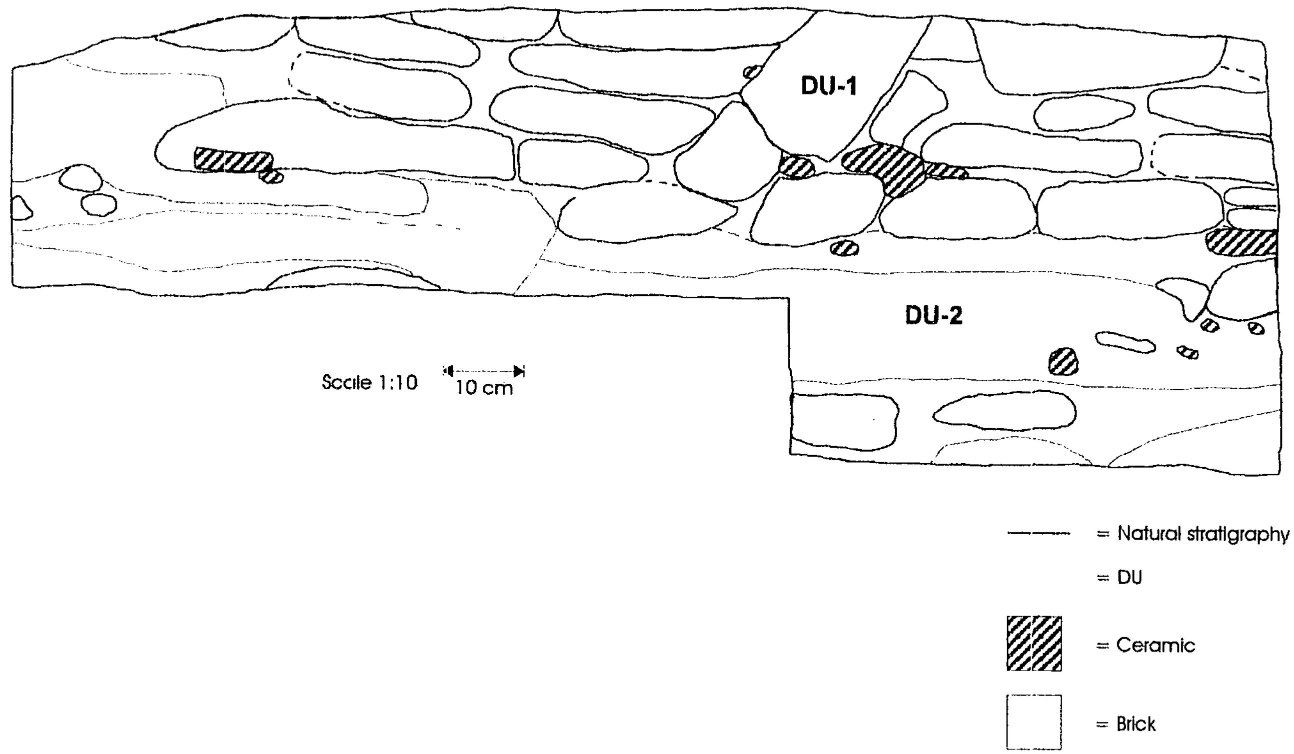

Figure 5.39. East profile drawing for Room 22 (1210/0788).

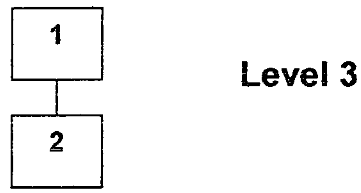

Figure 5.40 Depositional sequence for Room 22 (1210/0788).

below ten cm. Ceramic density is high compared to other wall collapse deposits and bone density is moderate. Identified faunal remains are ovicaprid and pig. Lithic density is also moderate for wall collapse deposits and consists of a sickle blade fragment, a fragment of a flint blade, three sandstone chunks, two limestone chunks, two globular chert nodules (cores?), and a fragment of a sandstone metate.

DU-2 (SU-2,3):

Level: 3

Class: 1201

Interpretive Group: Floor

This is a deep unit and probably contains more than one floor surface separated by other deposits. The majority of the material was dark brown with few artifactual remains visible during excavation. The exceptions were two thin lenses covering a majority of the room surface that were much blacker and contained a great deal of ash and burned bone. All categories of artifacts are moderate compared to other floors. No identified faunal remains were present due to their burned and highly fragmentary nature. The lithic remains consisted of a fragment of a sickle blade, a chunk of flint, a fragment of a flint blade, and two chunks each of limestone and sandstone.

Room 22 Summary:

The deposits in Room 22 are separated from those in Room 23 by the brick wall at the south end of this unit (shared with Room 23). The sediments below DU-2 (unexcavated in this room) are equivalent to those in Room 23 (DU-3 and DU-4). The upper layer of this room (DU-1) is typical wall collapse. The lower unit, DU-2, probably contains several distinct floor deposits along with other material separating them. The floor deposits are directly associated with the visible room walls.

Room 23 (1214/788)

The profile for this room is provided in Figure 5.41 and the schematic stratigraphic sequence is provided in Figure 5.42.

DU-1 (SU-1):

Level: 3

Class: 1201

Interpretive Group: Dump

A brown fairly compact sediment with numerous ceramics and some bone and ash. All artifact categories were moderate to high density compared to other dump deposits. A great deal of identified bone was recovered including hartebeest (N=6), ovicaprid, pig, and equid (*Equus asinus*, N=1). Four bovid teeth were also found. Among the lithics recovered were a sickle blade fragment, a flint blade fragment, seven limestone chunks, eight sandstone chunks, a limestone flake, and an elongated piece of sandstone that was square in cross-section and interpreted as a pounder.

DU-2 (SU-2):

Level: 3

Class: 2201

Interpretive Group: Floor

This unit was at the base of the wall making up the room. It is generally a dark brown to black sediment with faint to clear laminations visible, especially along the north wall adjacent to Room 22. Ceramic content is moderate compared to other floor deposits, but bone density is high. All of the identified faunal remains are from ovicaprids and pig, and two bovid teeth were also found. Lithic density is also moderate for a floor deposit consisting of seven flint blade fragments, an elongated piece of limestone with a groove at one end, and a saddle-shaped sandstone metate fragment.

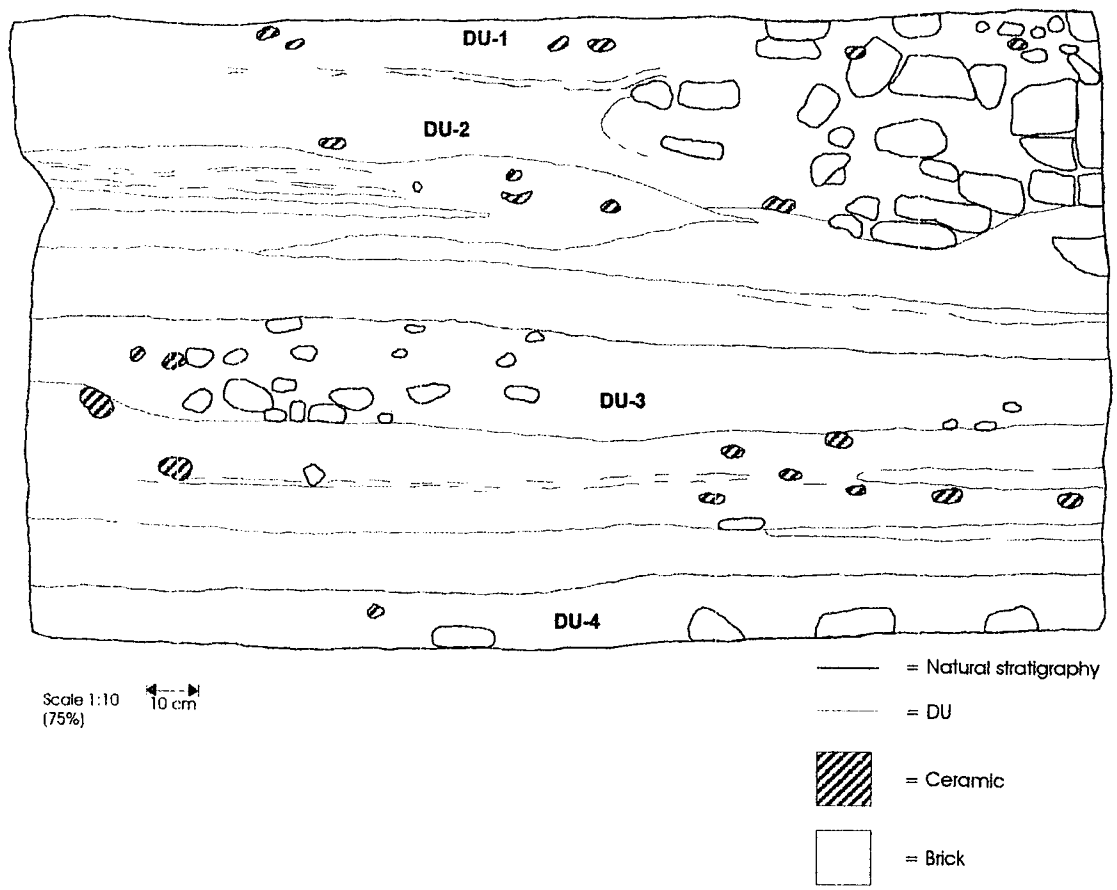

Figure 5.41. North profile drawing for Room 23 (1214/0788).

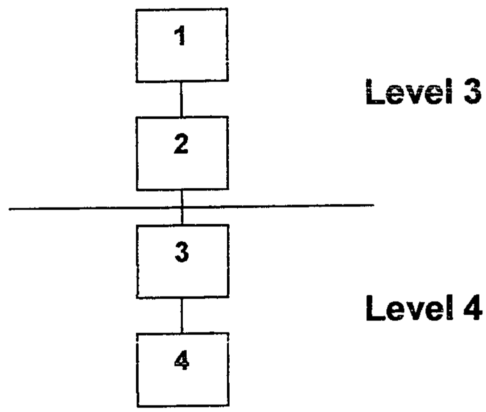

Figure 5.42 Depositional sequence for Room 23 (1214/0788).

DU-3 (SU-3):

Level: 4

Class: 2011

Interpretive Group: Redeposited wall collapse.

This deposit is beneath the walls making up the room and are not directly associated with them. DU-3 was described as being identical to the (unexcavated) SU-4 in Room 22. The majority of the material was dark brown with some brick pieces and several black lenses that may have been minor dumping episodes. There were also faint laminations visible throughout implying that the material was redeposited at least in part fluvially. Ceramic and bone counts are moderately high, and the identified bone contains six hartebeest fragments along with ovicaprid and pig. The lithic content is low compared to other wall collapse deposits and contains a single sickle blade fragment, two chunks of limestone and one of sandstone.

DU-4 (SU-4):

Level: 4

Class: 1110

Interpretive Group: Heavily decomposed wall collapse

This unit was composed of a light brown sandy sediment with a few large brick pieces. Ceramic content is low for a wall collapse deposit, and bone density is moderate. Apart from two bovid teeth no identifiable faunal material was recovered.

Room 23 Summary.

The deposits of Room 23 are separated from Room 22 by the north wall of this room (not shown clearly on profile). There are two sets of deposits within Room 23, the upper two associated with the room walls.

The top set of deposits consist of a dump (DU-1) underlain by a floor (DU-2). The boundary between DU-1 and DU-2 is not shown clearly in profile; nor are the separate laminated strata that make up the floor deposits. This may be indicative of disturbance from the collapsed wall to the east of the room as shown in the profile. DU-2 ends at the base of the northern wall. Below this, the deposits in Rooms 22 and 23 are equivalent, though only those in Room 23 were excavated.

The lower deposits, DU-3 and DU-4, are both collapsed wall deposits. DU-3 shows signs of having been redeposited, in part, by running water because of the laminations present. DU-4, the basal deposit excavated, has few brick pieces through most of its extent, but a few show up in the bottom of the unit, perhaps indicating the top portions of a lower set of occupations.

Summary of depositional history.

There are basically six sets of deposits in the excavated portions of Kom el-Hisn, five of which (Levels 1-5) are of Old Kingdom date. The topmost level, Level 0 (N=29 individual DU's) is composed primarily of Upper Pottery Layer deposits (N=10) and Dumps (N=10), along with a few wall-derived (N=5, only one of which was an intact wall), and fluvial deposits (N=2). In addition, one floor of this level was identified in unit 1219/1095, and one shallow excavated pit in unit 1235/1056.

Apart from the UPL which occurs over a wide area, these later deposits are restricted to the southeastern portion of the excavated area. Two units in this area, 1219/1095 and 1261/1074, contain (or are adjacent to) architectural structures containing Middle Kingdom artifacts and/or epigraphic material. 1219/1095 has an intact wall with its associated wall collapse, along with a floor and dump deposit from this period. 1261/1074 is adjacent to a structure in unit 1263/1074 (not analyzed here) and has a series of dump deposits presumably from this adjacent structure and others nearby. Other dump deposits from this level are somewhat more scattered, occurring in 1235/1056, 1192/1035, and Room 18. The excavated pit in 1235/1056 also contains dumped material. Thus, the overall spatial distribution of the various deposit types is consistent with Middle Kingdom occupations being restricted to the southeast.

Below the Level 0 deposits lie a series of dumps and two other deposits associated with an Old Kingdom occupation which presumably occurred in another area of the site. The Level 1 deposits (N=10) consist of eight dumps, a set of possible column bases from Room 9, and a one set of wall collapse deposits from Room 10 which were deposited after the construction of the Level 2 tomb within the Room 10 structure. All of these deposits occurred within the architectural units excavated in 1988, most in the more eastern rooms of this area. These upper deposits of Room 9, which contained three of the dumps and the 'column bases' may represent a small occupation with the column bases supporting a small roofed structure (perhaps a lean-to). All of the dumps contain typical Old Kingdom ceramics and few, if any, later types indicating that they were deposited sometime during the Old Kingdom after this area of the site had been largely abandoned. Since the dumps in Rooms 5 and 15 are stratigraphically above the burials in these rooms, this further suggests that at least these burials, and probably others, are of Old Kingdom date.

Level 2 represents several burials found within this area of the site. A total of seven burials were found, three adult and four infants or children. All were associated with the existing Old Kingdom (Level 3) structures. Two of the adult burials had mud brick tomb structures built for them, Rooms 15 and 20. The Room 15 tomb was constructed within the confines of the larger Room 10 structure and the Room 20 tomb was built within the Room 17 walls. All had the remains of plaster evident surrounding the body, generally white with some red coloring as well. Only one, Room 15, a female burial, contained grave goods, in this case a bronze or copper mirror. It is possible that the male in Room 20 also contained grave goods as a tomb structure was built for this one as well. However since most of the torso and head were missing, any grave goods would have been removed when this burial was disturbed.

No brick structure was apparent in the burial within the confines of Room 5 (originally excavated in units 1213/1072 and 1209/1072 in 1986). Only the remains of the coffin plaster were present and no grave goods were found.

The remaining burials were all infants or young children. These too were directly associated with the existing Old Kingdom architecture, as all were placed immediately adjacent to intact walls. There is no apparent pattern in the placement of these infants (apart from all being placed next to walls). None were more than approximately 2-3 years old. No grave goods are associated with the infants, with the possible exception of some sheep/goat ribs lying atop the head of the child in Room 4 (these may have been intrusive).

An Old Kingdom date for these burials is indicated by the presence of deposits with typical Old Kingdom ceramic assemblages directly overlying them. In both Room 5 and Room 15, typical dump deposits were found directly overlying the burials, neither containing later ceramic types. Consequently, since the burials are directly associated with the existing architecture and are stratigraphically below other Old Kingdom deposits, I conclude that these are Old Kingdom burials deposited in this area after the main occupations of Level 3, but before additional Old Kingdom remains were deposited in the same area, these later deposits being mostly dumped refuse.

The majority of deposits are from Level 3, the main set of occupations dealt with in this study. Level 3 deposits (N=75 individual DU's) consist mostly of walls and wall collapse deposits (N=33), Floors (N=18), and Dumps (N=12). Most of the pits (N=9) used in this analysis are also from this level. All of the architecture portrayed in the foldout architectural plan map is from Level 3.

Only one Level 3 floor was excavated in 1986, in unit 1166/1066. The remainder were all associated with room structures excavated in 1988. Several of the rooms excavated in 1988 had no floor associated with them, either because they were only excavated to a shallow depth to clarify architectural associations (Rooms 3, 7, and 16) or because they were not really room structures at all (Rooms 10, 14, and 1220/1072). The one distinct room which did not appear to have an occupation surface associated with it was Room 4. This remains a puzzle, but the activity involving the infant burial in this room may have obscured a thin floor surface.

The dumps for this level tended to be restricted to particular areas which I interpret to be specific locations reserved for refuse disposal: units 1192/1035 and 1204/1060. The structure and morphology of the deposits in these two units indicate depositional basins into which dumped material was either deliberately placed or was washed in from a nearby source (this is also the case for a thin deposit of redeposited material in 1220/1072). The remaining dumps that occur within architectural units tend to be at the very top of the depositional column (Rooms 12, 17 and 23, though Room 12 may represent *in situ* floor remains) or in existing pit structures. I interpret this pattern to indicate deposition shortly after (or during) abandonment since, with the exception of the thin redeposited deposit in 1220/1072, all of these dumps occurred directly on top of occupation surfaces without intervening wall collapse.

The pit structures in this level tend to be a mix of different kinds of structures and deposits. Four of these are similar in structure and are constructed of mud brick in either circular or semicircular shape; however, the semicircular shape of the Room 5 DU-8 pit is probably due to having been cut through by the adult burial there. These are all of similar structure, having either a clay lining or (at the bottom of Room 9 DU-9) or a layer of large sherds. Based on this structure, I interpret them to have been storage pits, probably for grain. All had some dumped material in them which suggests that they were used as small dumping areas after their primary use was finished.

The pit in Room 17 (DU-3) is apparently a small hearth. That in Room 1 is a shallow excavated pit filled with dump material. The last pit in Room 13 is more difficult to interpret. It is larger, approximately 70 cm across, and has a concave bottom instead of the flat bottom of the Room 5 and 2 storage pits. The sides of this structure were burned, but it is unclear whether this burning occurred after abandonment.

A certain spatial structure within this level is thus apparent. Dumping was primarily restricted to particular areas outside of the occupation structure (the basins of units 1192/1035 and 1204/1060) with some possible post-abandonment dumping within a few rooms and in some pit structures. Storage pits, presumably for grain, were restricted to three adjacent rooms, 2 and 5, with other similar structures in yet another room directly north of Room 5 (not analyzed here; see foldout map). Room 13, may represent a bakery. Provisionally then, portions of this area seem to function as food storage and preparation areas, with only limited dumping in nearby topographic basins.

The overall impression one gains from the Level 3 deposits is that the majority of rooms had something to do with food storage and preparation. Storage areas are located in the area around Rooms 2 and 5, cooking facilities are apparent in Rooms 13 and 17, and Room 12 with its abundant ground stone and faunal remains may represent a basic food preparation room. The function of several other rooms in this area, for example, rooms 6, 8 and 18, are not readily apparent in the preceding analysis. The unusual floor structures in Room 9, located in the far eastern end of the excavated block area, makes this room quite distinct from the others and does not have any apparent relation to food preparation. If Room 9 is representative of non-industrial structures to the east of the block area, this is suggestive of an overall structure similar to other settlements, particularly those associated with pyramid and temple complexes. The number of storage facilities does not indicate large-scale storage, but only enough for a few households. This pattern is reminiscent of that described for the Old Kingdom village near the tomb of Khentkawes and the Middle Kingdom temple towns near Lahun described in Chapter 2: a central habitation surrounded by ancillary rooms that supported a single family and their supporting workers. A larger area needs to be cleared and excavated to determine what sort of buildings surround the current excavated areas in order to resolve this issue.

At least two occupation levels exist below Level 3. Most of these are Level 4, with only a single wall collapse deposit in Room 18 and a small fluvial deposit in 1235/1056 assigned to Level 5. The remainder Level 4 deposits are largely restricted to five units: 1166/1066, 1235/1056, and Rooms 4, 17, and 18, with minor occurrences in other units (usually some wall collapse underlying Level 3 deposits). Units 1235/1056 and 1166/1066 contain substantial exposures with associated architecture and occupation floors. Other exposures with floors and substantial walls occur in Rooms 4, 17 and 18. All of these occur under Level 3 architectural units. There does not appear to be any relationship between Level 3 and 4 architecture; that is, the later Level 3 structures were not aligned with respect to earlier structures. Rather, it seems that the underlying structures were leveled and the later structures built according to a different plan altogether. Since little of the underlying architectural plan is exposed this is necessarily tentative, yet what is visible does not seem to correspond to anything in later levels.

6.0. Artifact analysis.

This chapter is an analysis of the Kom el-Hisn artifacts – ceramics, lithics, floral and faunal remains, and epigraphic material -- in terms of their overall type distributions and how they are distributed among different kinds of deposits. Their spatial distributions are examined in Chapter 7.

6.1 Ceramics.

6.1.1 General description of ceramic types.

All ceramics in each excavation unit were saved. Body sherds were separated from diagnostic elements and sorted according to fabric type (Nile A, B, and C and marl), bagged, weighed, and stored on-site. Diagnostic sherds were washed and sorted according to a typology developed specifically for Kom el-Hisn. The typology is somewhat paradigmatic and is based on overall morphology, fabric type, and surface treatment. See Appendix II for definitions and drawings of a sample of each type used in this analysis.

A total of 27 types were defined over three seasons. Each successively defined type was numbered sequentially with odd numbers (1, 3, 5, etc.). Some of these were subdivided into additional subtypes and lettered sequentially (3A, 3B, 3C, etc.). These subdivisions were based on several factors including rim angle and shape, decoration and rim form.

These types correspond in large part to the whole-vessel categories derived from the standard corpus of Old Kingdom pottery types initially developed by Reisner (1931, 1932, 1942, 1955; also Mond and Meyers 1937; Brunton 1927). I have, therefore, assigned each Kom el-Hisn type to a corresponding standard Old Kingdom type as derived from mortuary assemblages from the Giza plateau and Saqqara. Reisner's original typology, while derived from purely mortuary assemblages, has continued to be used in settlement contexts with some modifications. It appears that, due to standardized mass manufacture of ceramics (probably in only a few production centers), there is a widespread correspondence between ceramics found in tomb and settlement contexts.

It should be noted, however, that both Reisner (1955:67) and Giddy (1987) are of the opinion that many cemetery vessels were produced specifically for that context.

Giddy, in an initial comparison of the settlement and mortuary ceramics in the Old Kingdom areas of Dahkla oasis, suggests that the cemetery pottery "[appears] to have been fabricated solely for use in a burial context, and is consequently of much poorer quality and finish than the pottery from the settlement site" (1987:230, footnote #194). Reisner (1955) also notes that all or most of the ceramics from the tomb of Hetep-heres were unused and made (bought?) especially for burial. It is unclear, however, whether wholly different vessel *types* were produced for mortuary contexts (though some highly specialized forms do exist) or if the same forms were produced somewhat differently for mortuary and settlement uses. In some cases -- for example the offering jar (type IV in the Mycerinus typology) -- vessels produced for mortuary/temple use were subsequently recycled and used in everyday contexts. Reisner also describes one tomb vessel that had a manufacturing flaw rendering it otherwise unusable. Consequently, until extensive descriptions of Old Kingdom settlement assemblages are published the correlation between settlement and mortuary vessel forms should be treated as tentative.

As with most generalized typologies, Reisner's type definitions contain a mix of functional, technological, and stylistic criteria, though it appears to be predominantly functional in nature. Types were generally defined on the basis of overall form (especially the type of base), kind of clay and quality of manufacture, and surface treatment. Decorative elements tend to differentiate subtypes rather than defining entire types. The attention to function is understandable since there is a great deal of textual and pictorial evidence indicating the kinds of uses certain vessels were put. In addition, many vessels were placed in the tombs in their use context for use in the afterlife, often containing the materials (or residues thereof) that they were meant to hold.

Stylistically, there is little in the typology itself to indicate chronological variation for two reasons. First, Old Kingdom ceramics were mass-produced, probably at only a few centers, and were extremely utilitarian in nature. Compared with earlier Predynastic pottery, Old Kingdom forms lack the variety in shape and decoration characteristic of earlier periods when local production dominated. Second, from a typological viewpoint, Old Kingdom types were defined in a mortuary context where chronological concerns were not of paramount importance when defining the types since other dating methods (i.e., textual references) were more readily available. Some studies have suggested that chronologically significant variation does exist in various metric dimensions of vessel form (e.g., Ballet 1993). The practical relevance of this is that stylistic variation is only available through a detailed attribute analysis and is beyond the scope of this work.

Since the Kom el-Hisn typology is based on the standard Old Kingdom corpus, the types in this analysis are also based on overall morphology, fabric, and surface treatment. Of the 27 types defined thus far, only those types that had profile drawings and could with reasonable confidence be placed within a whole-vessel category were used in this analysis. An initial set of morphological types were created that combined the types and subtypes into larger categories of similar vessels corresponding to Reisner's types. A total of 12 morphological types were created from 19 of the ceramic types.

6.1.2 Ceramic type descriptions.

The majority of Egyptian ceramics are made of Nile silts with varying amounts of temper. Nile silt is defined as clays that were deposited by the river between the upper Pleistocene and the present (Bourriau et al. 2000) and were obtained from the Nile floodplain or nearby canals. These silts are rich in organics, iron compounds, and silica content, are brown to black when wet, and fire to brown or red in an oxidizing atmosphere. These have been classified into three categories based on the size and quantities of inclusions present, mostly sand and straw (from Boodle in Mond and Meyers 1937 p. 188). These are:

Nile A: Contains fine sand but no straw.
Nile B: Contains fine to coarse sand and some fine straw.
Nile C: Contains sand and coarse straw.

An additional source of clay are the marls originating in the shales and limestones bordering the Nile between Esna and Cairo with secondary deposits such as those from the Wadi Qena (Bourriau et al. 2000:121). Lucas and Harris (1962) describe the dominant sources of clays from outcrops near Qena and Ballas in upper Egypt (see also Nordstrom and Borriau 1993). Marl clays contain little to no organic matter but are high in calcium carbonates. They are generally brown or gray when wet and fire to pink or gray-green when fired. The marls have been divided into three types, A, B, and C, with four variants in the A-type defined by the size and type of inclusions. All have some form of limestone inclusions reflective of their source. Very few marl ceramics have been found at Kom el-Hisn and all of the diagnostic elements are of First Intermediate period dates (ca. 2134-2040 BC).

The following is a brief description of each Kom el-Hisn type with its corresponding type(s) from the standard corpus where applicable. Table 6.1 displays the metric data associated with each type. The data for Table 6.1 was derived from profile drawings for typed sherds. Only those drawings with diameter and fabric type were used. The average thickness was obtained by measuring each sherd profile in three places (fewer depending on the size of the sherd), calculating the mean thickness of each sherd from these measurements, and then calculating the mean for each type from these. To increase sample size, all sherds with good data were used, even if they were not from excavation units used in this study.

Type A: Bowl with tubular spout (Appendix II, Figure II.1).
KeH types: 7A,B,C

Corresponds to Reisner's types D-XXXV and D-XXXVI. Vessels of this type are often shown in tomb paintings depicting the beer brewing process and thus are interpreted as used for filtering beer, the spout facilitating the draining of the liquid portion into smaller vessels. They have rolled or recurved rims, and may have either flat or rounded bases. Those found in mortuary contexts most often have rounded bases but Reisner (1955) does not believe the shape of the base represented an essential functional difference. The Kom el-Hisn vessels are generally fine-textured of Nile B or C ware. Subtype is determined by the length of the spout.

Type B: Jars with rounded or pointed base (Appendix II, Figures II.2-3).
KeH types: 1B, 9A,B,C

Corresponds to Reisner's Type A-II (probably A-IIb). These functioned as generalized containers of liquids, most often represented pictorially as wine or beer

Table 6.1. Types and metric data for Kom el-Hisn ceramics. N refers to the number of profile drawings with adequate measurements.

Type	Description	N	Rim Diameter (mm)		Body thickness (mm)		Diameter/
			Mean	St. Dev	Mean	St. Dev	Thickness
A	Bowl with tubular spout	8	22.5	11.34	8.59	1.32	0.04
B	Jars, pointed	15	10.03	2.58	8.01	1.33	0.32
C	Ordinary Traditional Offering jar	44	11.42	6.85	9.78	1.76	0.05
D	Bread platter	NA	NA	NA	NA	NA	NA
E	Bread mold	38	29.26	13.04	18.58	4.68	0.01
F	Flared Bowl	59	34.69	12.63	9.84	3.37	0.02
G	Bent-Sided Bowl	77	27.73	10.24	8.22	1.94	0.04
H	Meidum (carinated) Bowl	74	22.75	6.08	6.49	1.12	0.05
I	Round-Bottom Bowl w/ Molded Rim	125	27.26	7.6	7.51	1.49	0.04
J	Little Brown Bowl	16	15.06	4.64	4.82	0.85	0.09
K	Basin w/ Roll Rim	48	35.79	10.32	11.84	3.99	0.03
L	Flat Bowl/Plate w/ Contracting Mouth	14	18.89	5.64	6.51	1.05	0.07
M	Tall bread mold	NA	NA	NA	NA	NA	NA
N	White bottle	NA	NA	NA	NA	NA	NA
O	Round-Bottom Bowl	72	20.9	5.7	6.39	1.05	0.06

jars. Reisner (1955:69) notes that they were particularly abundant in 4th Dynasty graves and were often found closed with mud or plaster stoppers. Most of the Kom el-Hisn examples are B ware of moderate hardness. Many were described as cooking jars, though only 9 of the 45 drawn profiles have evidence of burning indicated. A red slip was noted on most samples. The subtypes of Type 9 are based on the amount of curvature just below the rim. Examples of subtypes 9A, B, and C are shown in Figure II.2 with a reconstructed vessel in Figure II.3. Subtype 1B represents a base (no examples shown).

Type C: Ordinary traditional offering jar (Appendix II, Figures II.4-9).

KeH types: 1A, 11A,B,C,D

Corresponds to Reisner's type A-IV. This vessel apparently originated as a beer jar during the 3rd Dynasty (Reisner 1955:70) and was commonly used as grave equipment during the Old Kingdom. They seem to have been specially produced for funerary uses (for both interment and as offering jars), but were often recycled as general-use vessels for carrying a variety of materials, including water and plaster (Bourriau indicates their use for 'every conceivable purpose'; 1981:61). While similar in overall shape and size to the pointed jars of Type B, these were of much coarser ware and were handmade by either coiling or low-rotation wheel, and they generally had a wider and less constricted opening than the Type B vessels. Several examples are shown in Figures II.4-6. Bases for these vessels (subtype 1A) vary from sharply pointed (Figure II.7) to somewhat flat as indicated by the two reconstructed vessels shown in Figures II.8 and II.9. The subtypes of Type 11 are based on the amount of curvature just below the rim.

Type D: Bread platter (Appendix II, Figure II.10).

KeH types: 3A,B, 13.

Corresponds to Reisner's Type F-XXVI ("Offering trays"). These are very large, thick coarsely made vessels and have been found in some tomb contexts holding food offerings or other smaller vessels. They have also been associated with baking throughout Dynastic times (Arnold 1982; Aston 1996; Nagel 1938), though Samuel (2000) believes this connection is tenuous. They have been found in association with ovens (Peet 1921:177) and the 12th Dynasty tomb of Intefiqer shows a platter being used for baking (Davies and Gardiner 1920:14, plates 8, 9, and 9A). In addition, the fabric, construction, and wall thickness are all very similar to definite bread molds (Type E).

Many of these were drawn but, due to the size and shape of the vessel, diameters could be calculated from only 6 (see Figure II.10 for two examples). Type 13 tended to be thinner and the rim more flared than those of Type 3. Type 13 may also have had a more concave base. The manufacture of these vessels seems to be related to the bread molds (Type E) in that they are both coarse, soft Nile C wares of similar color and texture, and handmade. Many also have red slipping on the interior (exposed) surface.

Type E: Bread mold (Appendix II, Figure II.11).

KeH types: 3D,E,F

Corresponds to Reisner's Type F-XXV. Used to bake bread (a 12th Dynasty tomb model shows a woman tending a stack of the Middle Kingdom forms over an open fire), this is one of the more ubiquitous ceramics found at Kom el-Hisn and, as Reisner (1955:88) notes, are common in graves from the 3rd Dynasty through the 6th Dynasty. Similar forms have been described at Qau and Badari (Brunton 1927) and Dahkla (Giddy 1987) where they dated to Dynasties 4-6. They are crudely made vessels thought to be produced by pressing clay over a wood or stone form (the interior surface is very smooth) and many found at Giza had designs imprinted on the interior surface to show on the finished loaf. The clay is usually a soft Nile C or any readily available clay. Their generally cheap construction is probably a function of both their ubiquity and the fact that they were often broken to extract the bread (Bourriau 1981:65). Only 15 of the 91 drawn specimens show evidence of slipping: 11 are slipped on both interior and exterior surfaces, 3 on the exterior side only, and 1 on the interior side only.

Type F: Flared bowl (Appendix II, Figure II.12-13).

KeH types: 17, 19, 35A, 49A,B

Corresponds to Reisner's Type D-XXXIX (Flaring flat-bottomed bowl). This type represents a somewhat variable set of flared bowls. The clay type is primarily Nile B with a few of Nile C and most often are medium to very hard. Types 17 and 19 are heavier, coarser, and larger vessels than Types 35A and 49A and B, but are of similar overall shape. Type 17 contains a rope impression on the exterior just below the rim. Type 19 is a subtype resembling Reisner's Type D-XXXIXc in which a ridge is molded into the interior of the vessel just below the rim. Whether this ridge is functional or stylistic is unclear; Reisner suggests it may be derived from a particular type of stone bowl with a cup hollow.

Type G: Bent-sided bowls (Appendix II, Figures II.14-16).

KeH types: 23AB, 27AB, 35B, 37AB

Corresponds to Reisner's Type C-XXX (Bent-sided bowls and basins). These vessels are especially abundant in 5th and 6th Dynasty tombs. The majority of the Kom el-Hisn specimens are finely made, most of a hard Nile B clay and most (130 of 165 drawn specimens, or 79%) were slipped. Reisner interpreted the bent shape and fine, hard fabric as indicative of water or other liquid storage/serving rather than as than cooking vessels. Smaller vessels of this type have been described as drinking cups (Bourriau 1981:19,61). Type 23 is from a larger vessel of more variable size, probably of the 'basin' type, and of somewhat cruder manufacture, some of which are of clay type C. Type 35B tends to be smaller than the rest with less variation in size and of relatively finer construction.

Type H: Meidum (carinated) bowls (Appendix II, Figure II.17).

KeH types 31A-G, 33ABCD

Corresponds to Reisner's Type C-XXXII. This is a common form found all over Old Kingdom Egypt. It is a finely made ware of very hard Nile B or A clay, and nearly all have some form of slip applied. There is a great deal of variation in the degree of carination present (which may have chronological significance; Ballet 1987) as evidenced by the number of subtypes associated with these vessels. They are often represented as holding food or liquid and occasionally as a decorative dish holding flowers floating in water (Bourriau 1981:53). At Kom el-Hisn, preliminary analyses suggest that they tend to be associated with faunal remains and features associated with food production and consumption (Wenke et al. 1988a:27).

Type I: Round-bottom bowl with molded rim (Appendix II, Figures II.18-19).

KeH types: 29A-F.

Corresponds to Reisner's type C-LXIII. The type is similar in most respects to other round-bottomed bowls, but differentiated by the molded rim with an interior groove just below the rim. The bowls themselves have a concave to slightly flaring wall in some cases, and are predominantly of a medium-hard Nile B clay.

Type J: Little brown bowls (Appendix II, Figure II.20).

KeH types: 39

Type 39 is the typical small brown bowl with a slightly beveled rim that is characteristic of the 12th Dynasty. Various uses are applied to this type but they are generally regarded as drinking cups as they are often placed beside the deceased's mouth as burial equipment. Some specimens (e.g., #91 in Bourriau 1981: 67) have a pinched rim and functioned as oil lamps. At Kom el-Hisn most (65%) had some form of slip applied and the majority were of Nile B clay type and very hard. The color of the slip ranges from brown (10YR5.3) to light red (2.5YR6/6). These were abundant in the Middle Kingdom areas of the site, but were also found in small quantities in other parts of the site, presumably due to either sediment mixing or misidentification with a bowl of similar type, O (see below).

Type K: Basin with roll rim (Appendix II, Figure II.21, 22).

KeH types: 25

Corresponds to Reisner's Type C-XXIX. Some of these may be parts of Type A vessels since the shape of the rim in both are nearly identical. Reisner also states that the two are very similar with this type having a round bottom and no spout (1955:79). Fabric types are evenly distributed between Nile B and C and all are medium-hard. The majority (74%) have some slipping evident.

Type L: Flat bowls or plates with contracting mouths (Appendix II, Figure II.23).

KeH types: 61

Corresponds to Reisner's Type D-LXXII. These vessels may have been used to contain some sort of liquid since there are a few examples from Giza that had small spouts (subtypes D-LXXIIc and d) and the contracting mouth also indicates the containment of liquid. All of the drawn examples are of Nile B ware of medium hardness. Another vessel form, goblets, have similar rim shape and diameter; but the distinctive bases of these types have yet to be found at Kom el-Hisn.

Type M: Conical bread molds (no drawings).

KeH Types: 2A-G

No corresponding Old Kingdom type. These are typical Middle Kingdom conical bread molds. They closely resemble their Old Kingdom counterparts in fabric, manufacture (coarse, soft Nile C ware) and function.

Type N: White bottles (no drawings).

KeH types: 43ABC

No corresponding Old Kingdom type. These sherds resemble those from a form of First Intermediate Period (2134-2040 BC) bottle (e.g. #21 on page 2 of Bourriau 1981). They are made of marl clay, hard-fired and have a white slip.

Type O: Round-bottom bowls (Appendix II, Figures II.24, 25)

KeH type 41

Corresponds to Reisner's type C-LXI (Round-bottom bowls with plain rim) and possibly C-LXII (Round-bottom bowls with contracting rim). These are similar to the Little Brown Bowls of Middle Kingdom date (Type J) but tend to be larger (p=0.000 for 2-tailed t-test comparing rim diameters) and more red than brown in color with a less tapered/beveled rim. Functionally, they were probably equivalent to the Middle Kingdom variety (e.g., drinking cups, infant feeding cups, and lamps, the latter two by pinching in a portion of the lip; Bourriau 1981:67) and are abundant at Kom el-Hisn. Fabric is predominantly a medium-hard Nile B. Of the 114 specimens 76 have some form of slip.

6.1.3 Chronological issues.

Several ceramic types present have chronological significance within the period encompassed by these occupations. The majority of the deposits at Kom el-Hisn (and the majority of those excavated) are of Old Kingdom date. However, a few areas contain deposits of First Intermediate or Middle Kingdom date. The two ceramic types present at

Kom el-Hisn that are typically Middle Kingdom are Type J (Little Brown Bowls) and Type M (Conical bread molds). The Middle Kingdom deposits are restricted to the southeastern portion of the excavated area near unit 1261/1074 where a 12th Dynasty scarab seal was found in DU-6 (SU-14) below the adjacent brick wall in unit 1263/1074. An analysis of the distributions of Type M ceramics shows that this type is most abundant in the area surrounding 1261/1074 and decreasing in frequency away from this unit. While unit 1261/1074 itself contains only one Type M sherd, a nearby unit, 1256/1072 (excavated in 1988 and not used in this analysis) contained abundant Type M sherds (153 of 194 total sherds from SU-1, or 79% of the total). The only other unit with a large number of Type M sherds is 1219/1095 (22 of 193 or 11.4% of the total). The Type M sherds found outside of the explicitly Middle Kingdom units are found exclusively in either the Upper Pottery Layer or dump deposits close to the surface.

Type J vessels, Little Brown Bowls, are also indicative of Middle Kingdom dates, but the distribution of this type is somewhat more problematic. Generally, they are common in those units defined by other criteria as Middle Kingdom. For example, in 1261/1074 Type J sherds make up 70% of the identified sherds (109 of 156). In a nearby unit 1256/1072 (not used in this analysis) they make up 19% of the total identified sherds (37 of 194). Unexpectedly, a significant number were also found in 1219/1095 which was ostensibly of Old Kingdom age. The Type J sherds found in this unit occurred in virtually all deposits throughout the sequence, notably in the intact floor deposit of DU-7 and the wall collapse of DU-6, both deposit types that are tightly associated with the existing architecture.

Apparent Type J sherds also are found in small amounts in widely scattered locations all over the site. The numbers tend to be small, usually between one and four sherds in an entire excavation unit/room; those units with a relatively large number (1192/1035 with 17 and 1235/1056 with 14) have them concentrated in UPL, dump, and other reworked deposits. Unit 1192/1035 is thought to be composed of a variety of sloping dump or sheetwash deposits which may also explain the wide variety of sherds found in this unit. This would indicate that their distribution was due to transport and mixing with earlier deposits, but several Type J sherds are found in otherwise sealed Old Kingdom deposits in floors and wall collapse deposits.

I suspect that these "Type J" sherds are probably of a related type, O (Kom el-Hisn

Type 41), which is very similar in overall shape to Type J. As noted in the type descriptions above, Type O bowls differ from Type J as being larger and more often red than brown in color and have a more rounded rather than beveled rim. In terms of spatial distribution, Type O sherds are more widespread, occur more often in strictly Old Kingdom contexts and occur less often in otherwise Middle Kingdom deposits than Type J sherds. Furthermore, Type O is more abundant in later levels (1 and 3) than in earlier (4) levels. It is therefore possible that, due to the similarity in the two kinds of sherds, that some misidentification could have occurred.

Type N, Small White Bottles, are of marl clay and are thought to be First Intermediate Period and later (Wenke et al. 1988a:27; Bourriau 1981). Only 36 diagnostic sherds were found in widely dispersed locations across the site and are most often found in dump and Upper Pottery Layer deposits, though some are found in wall collapse deposits. Unit 1192/1035 contained several (8) indicative of this unit's formation from transported dump and sheetwash deposits. Several were also found in the apparent Middle Kingdom deposits of units 1261/1074 and 1219/1095 though these were all in UPL, or dump deposits so they may be there because of dispersive processes as is assumed with the other locations. Because of the unpatterned distribution of these sherds they are not thought to convey much information of chronological significance as far as the sequence of occupation is concerned.

6.1.4 Ceramic distribution among deposit types.

The distribution of ceramic types among different deposits can provide some indication of their use environment. Schiffer (1987), for example, has related the rate of waste production (discard) to the manufacture rate multiplied by a waste/defect production constant. This latter term may also be expressed as the failure rate during either production or use. Assuming broken items are not left in occupied areas, those ceramic types with higher discard rates should have correspondingly higher manufacture rates and/or failure rates. Consequently, those types that are more prone to manufacturing or use breakage should be discarded more often and thus found more often in dump deposits.

To determine whether any types occur more often in certain deposit types than others, I employed Chi-square tables crossing the presence/absence of each type with the deposit types. To ensure some minimal level of reliability to these tests I initially dropped fluvial, UPL, burials, and column bases from Old Kingdom levels since they are rare and result in numerous cells with expected values <5 and minimum expected values of <1.0. After inspecting the resulting distributions, I also dropped pits because several of these (e.g., the clay linings) can be expected to have few or no ceramics at all and were causing most of the observed significant results. That is, most of the significant probabilities were being driven primarily by the relative absence of ceramics from the pit deposits.

When pits are dropped from the analysis (leaving only dump, floor, and wall-derived deposits), only types C ($p=0.003$), F ($p=0.037$), K ($p=0.003$), and to a lesser extent E ($p=0.078$) show significant patterning when all levels are combined ($\alpha=0.05$). When only Level 3 deposits are used only types C ($p=0.003$) and K ($p=0.000$) show significant patterns ($\alpha=0.05$). Levels 4+, 1, and 2 have too few deposits for reliable results. Residuals indicate that all of these are found significantly more often in Dumps and less often in Floors (Type C is also found significantly less often in Wall deposits as well). Some factor or factors are causing these vessel types to be discarded more often than other vessel types.

Types C (Ordinary traditional offering jars) and E (Bread molds) are large, heavy, poorly made vessels that are cheap to manufacture and consequently easy to replace. The presumed functional regime of these two types (cooking) would also subject them to thermal shock on a regular basis resulting in more opportunity for mechanical failure. Another poorly made vessel, Type D (Bread platter), was generally not used in a heated environment and consequently not subjected to as many opportunities for failure.

The other two types, F (Flared bowls) and K (Basins with roll rim), are more problematic. Neither is particularly abundant relative to other types. Unlike Types C and E, these are made mostly of the harder Nile B clays (87% and 73%, respectively) and although the available data is not sufficient to determine the firing regime, it is undoubtedly higher than the very low temperature firings of Types C and E. The ratio of rim diameter to wall thickness for these two types is also close to those of other bowls (0.04; see Table 6.1) suggesting that they may not be inherently more fragile structurally and therefore more prone to breakage and discard. However, they both have the largest diameters of all types which, combined with their presumed function of water/liquid storage, may render them more prone to breakage apart from the simple rim diameter:thickness ratio. Reisner (1955: 65) describes most of this type as having a black fracture profile which may indicate a lower firing temperature and thus a softer and weaker final form contributing to more breaking. I suspect that their increased presence in dump deposits is probably a combination of a somewhat softer fabric on a large vessel and their probable use in beer brewing -- a common staple of the Egyptian diet -- which would lead to increased failure. Their large size would make them relatively expensive to manufacture which might explain the overall low frequency of this type throughout the site. A more detailed analysis of the performance characteristics of these vessels may elucidate this issue further.

I next conducted a one-way analysis of variance to determine if any ceramic types occur in any deposits with greater *frequency* than expected. I used only the three main deposit types (Dump, Floor, and Wall) used in the Chi-square analysis above to avoid spurious results from rare deposits with few ceramics. I also used the logarithmically transformed densities to satisfy the normality and equal variances assumptions. The results largely confirmed those obtained in the Chi-square analysis. Types C, E, and K were all found in significantly higher frequencies in Dumps than in Floors or Walls ($p=0.002$, $p=0.001$, and $p=0.023$, respectively). In addition, Type H (Meidum bowls) were also found in greater abundance in Dumps than in Floors or Walls ($p=0.006$). Type G occurred in roughly equal frequency in Floors and Dumps, both higher than in Walls.

Among the other types, G and H are only found in statistically higher densities in Dumps as opposed to wall-derived deposits; the densities of these types between Dumps and Floors are not statistically different. I do not deem this particularly significant since those sherds appearing in wall-derived deposits are there only incidentally or through their use as chinking material which is not a primary function of the vessels themselves. Thus, the only types that seem to be found significantly more often in dumps and in higher frequencies are Types C, E, and K. I have argued above that Types C and E are cheap to manufacture; Type C vessels are used in a variety of contexts; Type E (bread molds) are used in an environment conducive to thermal shock and resulting breakage, and textual sources also indicate these molds were often purposefully broken to remove the bread; Type K may be structurally weak because of a relatively soft fabric and use as a container of large amounts of liquid. Thus, their abundance in dump deposits could be their simple low-cost, abundance, and use in environments that promote failure. However, it is also possible that the relative absence of these types from floor deposits results from their not having been used in this area of the site, yet discarded here. This will be examined in the next chapter when spatial distributions are examined in more detail.

6.2 Stone tools

Lithic analyses were performed by M. Kobusiewicz. The lithics are divided into three broad categories: chipped stone tools, debitage, and stone objects (Table 6.2). The latter category contains ground stone tools and any other non-naturally occurring rock not contained within the other two categories (basically, all non-flint objects). The chipped stone tools and debitage are grouped according to the basic stone tool typology derived from Tixier (1963, 1974).

6.2.1 Chipped stone tools.

A total of 367 pieces of chipped stone were recovered from the 1986 and 1988 excavations. These are broken down as shown in Table 6.3. Some examples are shown in Appendix II Figure 27a-g.

The raw material for both debitage and retouched tools is predominantly Egyptian flint (N=360, 98.09%), a fine-grained brown-to-gray chert common throughout the desert margins of the Nile valley. A coarser chert made up a small number of specimens (N=5, 1.36%) and an additional 2 specimens were unidentifiable due to extensive burning. The source of the flint is outside of the Delta and the Nile floodplain proper. Weathered flint nodules may be found in extensive Plio-Pleistocene gravels up and down the valley and along the margins of the Delta. *In situ* nodular and tabular flint is also found in outcrops of Eocene-Oligocene limestones. The most extensive outcrops of this material are found to the south near Bir Kiseiba but it is also available nearer the Delta at Abu Roash (Aston et al. 2000).

Table 6.2. Total number and percentage of all stone tool categories used in this analysis.

Category	N	%
Retouched tools	133	17.36%
Debitage	234	30.55%
Ground stone	399	52.09%
Total	766	100.00%

Table 6.3. Totals and percentages of chipped stone objects used in this analysis.

Object type	N	%
Cores	3	0.82%
Debitage	232	63.22%
Retouched tools	132	35.97%
Total	367	100.00%

Cores[2]. Only three cores were found during these two seasons, two of flint and one of a coarser chert (two were also found in 1984). One was a single platform core (flint) in the early stages of preparation (Figure II.28g). The platform was prepared by striking a few small flakes from the sides of the nodule and slightly roughening the surface. Only one full flake appears to have been struck from this core. The other two cores (one of flint the other of coarse chert) were circular or discoidal in shape with prepared platforms (Figure II.28f). Neither seems to have been used for the production of blades. All three had cortex present in either primary (>50% covered) or secondary (<50% covered) coverage.

Debitage. The 232 pieces of debitage (minus cores) are broken down in Table 6.4. Of those with discernible platforms (N=93) pointed platforms dominate with N=80 or 86.02%. The remainder are distributed between *lisse* (N=5, 5.38%), faceted (N=3, 3.23%), cortex (N=3, 3.23%), and other unidentifiable platform types (N=2, 2.15%). 77 (96.25%) of the 80 unretouched blades with a discernible platform are of the pointed type, the remaining being faceted and *lisse*. Similarly, pieces with no trace of cortex also prevail with 197 or 84.91% of the total; of the blades only, 191 of 197 or 96.95% have no cortex. Of the remainder, 6.84% (N=16) have secondary cortex present, and only 1.72% (N=4) have primary cortex present.

Most of the blades (N=184 of 197) are broken, probably intentionally to eventually fit them to sickle handles. Of the 13 whole blades, the mean length is 75.85 mm (± 12.73), the mean width is 14.38 mm (± 3.28), and the mean thickness is 4.38 mm (± 1.39). Length ranges from a minimum of 56 mm to a maximum of 95 mm; width ranges from 10 to 19 mm, and thickness from 2 to 6 mm.

Some form of excessive heating or burning is evident in 50 (21.34%) of the debitage specimens, 36 of which (72.0%) are blades. Of the 50 burned specimens, 34 (68.0%) are in deposits that do NOT show other evidence of burning; only 13 (36.11%) of the 36 blades are in burned deposits. A chi-square test reveals that the distribution of between burned and non-burned deposits is statistically random. That is, burned pieces of debitage are not found preferentially in otherwise burned deposits, implying that there is no necessary connection between the burning evident in certain deposits

[2] Cores were defined as either debitage or retouched tools. Two of the cores were grouped with the debitage, one with the retouched tools.

Table 6.4. Categories of debitage (minus cores) used in this analysis.

Debitage type	**N**	**%**
Blade	197	84.91
Flake	15	6.47
Chip	14	6.03
Lame a crete	5	2.16
Chunk	1	0.43
Total	232	99.57

and the burned or unburned state of these lithics. Still, of the cores collected over all three seasons, only two show any evidence of heating and both of those were described as only slightly burned or fire-cracked. Consequently, I interpret the heating evident on some lithic specimens to be most probably the result of post-manufacturing accidental heating rather than heat treatment for any technological or functional purpose.

Retouched tools. The most abundant form of retouched tool is the sickle blade which comprises almost 85% of the total in Table 6.5. Examples are shown in Appendix II Figure 29. The majority of sickle blades are broken, which Kobusiewicz interpreted as a result of manufacturing -- purposely breaking them to size for fitting into a sickle handle -- rather than from use. In addition, fully 83.72% of the sickle blades are central fragments (both distal and proximal ends missing), while 11.63% are proximal ends, and only 4.65% are distal ends -- also indicative of purposeful breaking. Average dimensions for all sickle blades are: Length: 33.09 mm ($\pm$ 13.51); Width: 12.95 mm ($\pm$ 3.10); Thickness: 3.85 mm ($\pm$ 1.40). Since the average length of sickle blades is less than half that of unretouched blades (and assuming that the unretouched blades are the source of the sickle blades), it is apparent that the unretouched blades were broken further before fitting into the final tool. This indicates that blade blanks rather than finished sickle blades were being brought to the site where final manufacture and fitting took place, as well as (presumably) maintenance.

As with the debitage, only 29 (26.36%) sickle blades have evidence of burning (recalling that 18.27% of blade blanks had evidence of burning). And again, there is no apparent correlation between their location in burned or unburned deposits.

The majority of sickle blades (69; 62.72%) have retouch only along one edge, split roughly equally between the left and right sides. The remainder (N=41; 37.27%) have retouch along both edges. Somewhat surprisingly, only 54 (40.60%) have polish present from use; the presence of polish is also about evenly divided between those with one and two retouched edges.

Of the remaining retouched tools, all of the bifaces are broken (Figure II.28a-e). Eight are of unknown type, however one was probably a bifacial knife which was subsequently broken and then reworked along one edge for other purposes. Of the four fragments of bifacial knives, three are central fragments and one is probably part

Table 6.5. Totals and percentages of retouched tools used in this analysis (minus cores).

Tool type	N	%
Sickle blade	110	83.33
Biface	8	6.06
Bifacial knife	4	3.03
End scraper	2	1.52
Truncation	2	1.52
Blade	1	0.76
Burin	1	0.76
Chunk	1	0.76
Notched flake	1	0.76
Retouched tool	1	0.76
Side scraper	1	0.76
Total	132	100.02

of the tang. The smaller of the two endscrapers has a concave working edge and the larger (Figure II.27e) has a convex working edge (both are whole).

6.2.2 Ground stone tools.

The distribution of ground stone tools is shown in Table 6.6. The majority of ground stone objects are made of a fine sandstone or quartzitic sandstone (N=252, 63.16%), followed by limestone (N=70, 17.54%), marl (N=53, 13.28%) and other materials (N=24, 6.02%) which includes chert, alabaster, conglomerate, and others. The distribution of raw materials among flakes and grinding stones is very similar (88.42% and 92.68%, respectively) suggesting that the flakes were derived from modifications to the grinding stones.

Of the grinding stones, most (87.80%) were fragmentary. Of those that were identifiable to upper (mano) or lower (metate), the vast majority (N=48, 90.57%) were from metates. Five of the metates were whole, the remainder, fragmentary. The largest of these is from unit 1192/1035 DU-2 and measures 260X132 mm. A smaller one from Room 12 DU-1 is made of limestone and measures only 25X13 mm, and was probably used for grinding something other than grain.

Only a single whole mano was found, from Room 13 DU-1 and measured 75X63 mm. At least one of the fragmentary specimens gives a good idea of the overall shape and size of the original, that from Room 17 DU-1, which measures 81X100 mm and was split longitudinally and has one end broken off (Appendix II, Figure II.26).

The chunks present a mixed bag of material and object characteristics. Many are probably fragments of grinding stones without any worked surfaces present. A sizable portion are of limestone and marl, however, of which there is little represented in the grinding stone assemblage.

Of the remaining objects, several merit some mention. An elongated piece with grooves cut or worn into both ends appears to be a net weight (Appendix II, Figure II.27). This was found in Room 23 along with a whole sandstone pounder, possibly a small grinding stone. Room 23 also contained a metate fragment and several sandstone and limestone fragments, suggesting some of the manufacturing may have been done within that room. Several (8) globular chunks of chert were also found which do not appear to have been cores for chipped stone tool production; half of these were

Table 6.6. Ground stone objects used in this analysis.

Object type	N	%
Chunk	198	49.62
Flake	95	23.81
Grinding stone	82	20.55
Chip	11	2.76
Globular	8	2.01
Shaped object	1	0.25
Pounder	1	0.25
Point	1	0.25
Palette	1	0.25
Elongated	1	0.25
Total	399	100

found within a single room, 5, suggesting their use as tools of some sort. Finally, a fragment of a polished alabaster palette was found in unit 1219/1095.

6.2.3 Summary of stone tool assemblage.

The majority of chipped stone tool production involved the specialized manufacture of sickle blades. Most were struck from single platform cores using a soft hammer technique and at least one edge was retouched for use. Because the majority of sickle blades had only one edge that was used, they were probably hafted and used only until dull and then discarded.

Little evidence involving the manufacture of any chipped stone tools is available apart from the tools themselves. Due to the very small number of cores and core trimming elements, the lack of debitage characteristic of bifacial reduction, and the overall lack of cortex present on any specimens, one must conclude that lithic production was either carried out off-site or in restricted areas within the site which have yet to be excavated. Even a detailed microscopic analysis of sediment samples (Cagle 1991) failed to produce more than a few isolated flakes that could represent the remains of trimming or retouch. This lack of manufacturing debris or even debris associated with tool maintenance leads me to believe that most of the chipped stone tools were imported in finished, or nearly finished state. This would explain the general single-use nature of the dominant lithic type, sickle blades. However, the large number of unretouched blades suggests that at least some retouching, fitting, and maintenance took place on-site. The raw material would have had to be imported, possibly from as near as Abu Roash near Giza or as far away as southern Egypt; it seems unlikely that transport of whole, unmodified cores would have taken place over such long distances.

A different situation exists for ground stone tools. Much evidence of reshaping in the form of small flakes exists to support the hypothesis that a good deal of modification occurred within the site, possibly at the location of use. Large scale production is not in evidence, but maintenance and remanufacture into other items seems to be somewhat common. The most common stones -- sandstone, limestone, and marl -- are all abundant in northern Egypt; harder granites that are only located far to the south near Aswan are very rare at Kom el-Hisn.

All of the tool forms and distributions at Kom el-Hisn are well known from other sites

(Ginter, et al. 1979; Midant-Reynes 1983, 1985; Schmidt 1992a, 1992b) reflective of an agricultural economy. At least as far as the stone tool assemblage is concerned, Kom el-Hisn conflicts with the idea that rural Old Kingdom settlements were relatively self-sufficient in terms of commodity production. The evidence presented indicates that most stone tools were imported in finished or nearly finished form with minimal modification thereafter at least for chipped stone tools.

6.2.4 Stone tool distribution among deposit types.

Table 6.7 presents the mean densities for each class of stone object for each of the major deposit types sorted in descending order of density. The high densities of debitage and ground stone for pit deposits is largely due to a single outlier, Room 5 DU-9 which is a very small deposit (.01 m^2) and contains a single piece of debitage and two ground stone objects. Without this deposit, the density for debitage in Pits is 0.618 $\pm$ 1.52 and that for ground stone would be 2.02 $\pm$ 4.27, putting both just above Fluvial deposits.

UPL deposits have the highest concentrations of stone objects of all types, owing to its nature as a lag deposit. Among the other deposit types, wall-derived deposits, as might be expected, have the lowest densities of stone objects. Pits (without Room 5 DU-9) also have few lithics overall, though they tend to be quite variable. Again, this is due to the mixed nature of the deposits themselves: those that might otherwise be classified as dumps (e.g., Room 5 DU-9) have higher densities than others, such as those composed of clay linings (e.g., Room 2 DU-7 and 8) or collapsed bricks from the pit structure itself (e.g., Room 13 DU-3). Dumps have higher densities of debitage and ground stone than Floors, but Floors have higher densities of retouched tools than Dumps (for all levels and Old Kingdom levels only). None of these are statistically significant.

This pattern is consistent among individual types of objects as well with a few exceptions. For example, there are more ground stone flakes in floors than in dumps. This is not statistically significant either but it does suggest that the inhabitants were maintaining or modifying their ground stone implements themselves within the habitation

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[3] The only statistically significant difference is between ground stone chunks where Dumps have a mean density of 2.33/m^3 and Floors have a mean density of .56/m^3.

Table 6.7. Mean density for each stone tool category across all major deposit types. Each column is sorted by density value.

Retouched tools	3.97 +/- 3.56 (UPL)	**Debitage**	7.06 +/- 21.40 (Pit)*	**Gr. Stone**	14.83 +/- 42.66 (Pit)**
	2.24 +/- 4.38 (Floor)		5.73 +/- 5.32 (UPL)		14.61 +/- 25.78 (UPL)
	1.62 +/- 2.53 (Dump)		2.59 +/- 3.97 (Dump)		5.13 +/- 6.82 (Dump)
	0.63 +/- 1.51 (Pit)		1.64 +/- 2.92 (Floor)		3.33 +/- 6.79 (Floor)
	0.48 +/- 0.91 (Wall)		1.27 +/- 2.03 (Wall)		2.99 +/- 9.50 (Wall)
	0 +/- 0.00 (Fluvial)		0.23 +/- 0.62 (Fluvial)		0 +/- (Fluvial)

* Without Room 5 DU-9: 0.62 +/- 1.52

** Without Room 5 DU-9: 2.02 +/- 4.27

structures. The most abundant retouched tool, sickle blades, also are found in greater densities in floors than dumps (again, not significantly so). Beyond this, there is little observable patterning. Floors tend to have higher densities of burned and polished sickle blades, and also higher densities of those with retouch on one side only, but not significantly so. This latter pattern suggests that sickles were more readily disposed of after both sides were used.

Overall, deposits with high densities of debitage do not often have high densities of retouched tools. However, there is a linear correlation between sickle blade density and unretouched blade density ($r=0.575$, $p=0.000$). This correlation only holds within floors and walls; dumps do not show any correlation and generally have higher densities of unretouched blades than sickles. This is consistent with the interpretation that the residents were finishing the sickle blades themselves at least partly within the habitations.

There does not appear to be any significant patterning in ground stone object types or raw materials across deposit types. The only *materials* with abundance measures amenable to statistical testing are sandstone, limestone, and marl. Sandstone and limestone are not more or less abundant in any deposit type, though limestone does have a higher mean density in Dumps. Marls are marginally ($p=0.088$) more abundant in Dumps than Floors.

The preceding observations largely support the conclusions reached from the analysis of the tool types alone. Very little chipped stone debitage is present and that which is found is usually blade blanks presumably to be used in the production of sickle blades. At least some sickle blades were finished and maintained on-site, as indicated by the correlation between blade blanks and retouched sickle blades in floor deposits. Sickle blades were often used along only one side and then discarded, but there is some evidence for greater discard to dumps of sickles with retouch on both sides. Floors also tend to have greater concentrations of finished tools, with dumps containing somewhat greater concentrations of debitage suggesting the removal of manufacturing waste from occupation areas (Clark 1984; Gallagher 1977; Schiffer 1987).

Ground stone tools show somewhat different distributions. Ground stone objects as a whole are generally found in greater concentrations in dumps, except for flakes which are found in greater densities in floors. There is no apparent relationship between the occurrence of ground stone objects and manufacturing/maintenance debris (chunks and flakes) in any deposit type, and ground stone implements are not more abundant in floors than dumps. A plausible interpretation of this pattern is that of the inhabitants maintaining or modifying their ground stone implements in their places of apparent use (floors) and discarding those that are beyond repair, which would result in more amorphous chunks and broken objects in dumps. However, one would expect that this kind of manufacturing debris would, like their chipped stone counterparts, be removed to refuse areas; such is not the case. It is possible that many of these flakes may have been put to other uses while the irregular chunks and shatter were removed to refuse dumps, but analyses of possible wear on these objects have not been performed.

The overall impression one gains from this analysis is that most stone implements were imported in largely finished condition from outside of Kom el-Hisn, with some finishing and maintenance performed by the inhabitants. Chipped stone tools were probably imported as either prepared cores or more probably blade blanks and then retouched as needed. The abundant flakes and chunks from ground stone implements suggest that a good deal of maintenance or reshaping for other uses was performed at the site itself, apparently in the rooms where the objects were used. This suggests a degree of dependence on some basic goods and services that is at odds with the traditional impression of villages and towns being largely independent and self-sustaining.

6.3 Faunal remains.

Bone and shell were removed from the screens (or during excavation), dried in the sun, washed, and brushed of excess dirt before being analyzed by Richard Redding in the field laboratory (Redding ND). The material was initially sorted into shellfish, fish, reptile, bird, mammal, and unidentified groups. Shellfish remains were not further identified but only weighed and counted. Fish remains were identified to at least genus level; that which could not be identified to genus was sorted by element: cranial, vertebrae, post-cranial, and unidentified. These were both weighed and counted in 1986 and 1988. Reptiles and birds were identified to the lowest level possible, weighed and counted (bird material was identified by Steven Goodman). Mammal bone, where possible, was identified to at least genus level, counted and weighed. The remainder was sorted into Large and Medium skull, vertebrae, and rib. Teeth were also identified as either bovid, pig, canid, or other. All of these were counted and weighed.

6.3.1 Fish.

A total of 1750 fish bones were recovered from the 1986 and 1988 seasons. Of these, 364 could be identified to at least genus level. Table 6.8a presents the genus breakdown of the fish remains. The distribution of body parts for each species is presented in more detail by Redding (ND) for the 1984, 1986, and 1988 seasons combined, but individual distributions are not available for the set of deposits used here. Consequently, further references to body-part composition of individual species are taken from Redding's analysis of the three combined seasons' assemblages.

Fish are considered to have been an important subsistence item during dynastic times and before. Fish remains are common in both tombs and settlement sites and are commonly represented pictorially and in texts. They were captured by a variety of methods, including hooked lines, nets, spears and, in certain situations, simply gathered from shallow water (Darby et al. 1977). Tomb representations indicate that fish were most often dried, either with or without vertebral columns and/or heads. There is little information available as to the specific processing methods performed on individual species, which makes interpretations based on species representation problematic.

The most common type of fish found at Kom el-Hisn is *Tilapia*, a type of chiclid, two species of which are found in the Delta region. They inhabit shallow, near-shore water, and their meat is considered to be very good. Cranial elements represented approximately 58% of the total, a figure much higher than that at Merimde (von den Driesch and Boessneck 1985:95). Redding (ND) suggests that the proportion of cranial elements at Merimde is what one would expect if whole fish were entering the archaeological record; that is, they were being caught and consumed locally. The higher proportion of cranial elements at Kom el-Hisn is thus thought to reflect preferential processing of fish rather than consumption whereby the heads were removed and the body shipped elsewhere. This pattern may also reflect processing in this particular area of Kom el-Hisn with consumption taking place at another location.

Table 6.8a. Fish remains broken down by genus/species.

Genus/species	NISP	%
Lates niloticus	0	0
Barbus sp.	1	0.27
Chrysichthyes auratus	1	0.27
Cyprin. sp.	1	0.27
Tetradon fahaka	3	0.82
Clarias sp.	9	2.47
Polypterus bichir	18	4.95
Bagrus sp.	57	15.66
Sparus auratus	58	15.93
Synodontis sp.	77	21.15
Tilapia sp.	139	38.19
Total	364	99.98

The second most abundant fish is *Synodontis*, an omnivorous bottom feeder that prefers deep, open water. *Synodontis* is considered edible, but rather dry and flavorless. The majority of specimens (88.7%) are cranial elements. Analysis of the proportions of individual elements indicates that pectoral girdle and dermatocranial elements are actually underrepresented at Kom el-Hisn suggesting that these fish were imported into the site with their heads already removed. The proportions of body parts are also comparable to those at Merimde (von den Driesch 1986; von den Driesch and Boessneck 1985) indicating processing was similar at both sites.

Sparus auratus and *Bagrus sp.* are found in approximately equal numbers, 58 and 57 specimens, respectively. *Sparus auratus* is a marine fish whose meat is considered excellent and was undoubtedly imported into Kom el-Hisn. As at other sites (Tell Maskhuta, Minshat Abu Omar and Tell El Dab'a, though not at Merimde; von den Driesch 1986), this genus is represented only by pharyngeal plates and teeth. *Bagrus* is found in the Delta and is a carnivorous bottom feeder. *Bagrus bayad* was considered sacred. The Osiris myth relates that when Osiris was cut into pieces by his evil brother Set the phallus was thrown into the Nile and was consumed by three types of fish one of which Plutarch called 'Phagrus'. Possibly because of this cultic association thousands of *Bagrus* were mummified (Brier 1994; Brier and Bennett 1979) and placed in tomb contexts. The majority (87.1%) are cranial elements, though as Redding (ND) notes, the post-cranial skeleton is soft and does not preserve well, and pectoral spines are considered as cranial elements in his analysis. Still, the foregoing suggests that these two types of fish were brought into the site whole.

Clarias (Nile catfish), of which two species are found in Egypt (*C. anguiaris* and *C. gariepinus*), prefers shallow, poorly oxygenated water and can be caught easily during the breeding season in shallow pools. The meat is considered edible but not particularly good. About 2/3 of the specimens are cranial elements.

The remaining fish are found in small quantities. *Tetradon fahaka* is a puffer fish reported occasionally from other sites. It is found at Kom el-Hisn as jaw elements and the occasional tooth and is considered edible. *Lates niloticus*, the Nile perch, is considered to have excellent meat, but is represented at Kom el-Hisn by only six specimens, all from the 1984 season and all cranial.

Table 6.8b compares the rank orders of fish remains (based on NISP) from several

Table 6.8b. Ranking by genus/species based on number of identified specimens from Kom el-Hisn and other Neolithic, Early Dynastic, and Dynastic sites. Data other than that from Kom el-Hisn is from von den Driesch 1986.

	Rank					
Site	1	2	3	4	5	6
Kom el-Hisn	Tilapia	Synodontis	Sparus	Bagrus	Polypterus	Clarias
Merimde	Clarias	Synodontis	Tilapia	Polypterus	Lates	Bagrus
Minshat	Tilapia	Synodontis	Lates	Clarias	Mugil	Sparus
Tell el-Dab'a	Clarias	Lates	Tilapia	Synodontis	Bagrus	Mugil
Ma'adi	Synodontis	Lates	Tilapia	Clarias	Bagrus	
Qasr el-Sagha	Tilapia	Clarias	Lates	Synodontis	Bagrus	
Elephantine (necropolis)	Synodontis	Lates	Bagrus	Hydrocyon	Labeo	Barbus

sites. As Redding (ND) indicates, the distribution of fish remains at Kom el-Hisn most closely resembles that of the Neolithic site of Merimde and the Early Dynastic Minshat Abu Omar, both Delta sites. The major differences between the Kom el-Hisn and Merimde assemblages are: *Clarias sp.* is extremely abundant at Merimde and comparatively rare at Kom el-Hisn; *Sparus auratus* is abundant at Kom el-Hisn and rare at Merimde; and Merimde has a larger number of rare species. The greater species richness at Merimde may be a function of much larger sample sizes there. Minshat Abu Omar has more abundant *Tilapia sp.* and *Lates niloticus* than Kom el-Hisn, while *Bagrus* is absent at Minshat Abu Omar.

Of the four most common types at Kom el-Hisn, *Tilapia sp., Synodontis sp., Sparus auratus*, and *Bagrus sp.*, *Sparus* and *Synodontis* both seem to have been imported from some distance away (probably *Bagrus* as well) with only the most abundant *Tilapia* providing some evidence of local capture. The higher relative abundance of these species at Kom el-Hisn may reflect the more developed trade networks in place in the Old Kingdom. This suggests that there was at most a portion of the community or perhaps a nearby satellite community engaged in fishing for locally available species. The similarities with Minshat Abu Omar and Merimde further imply that similar divisions of labor hold there as well. Aldred (1987:58) notes that fish were considered ritually impure foods and were generally consumed by the working classes, particularly artisans working on state projects who were given a daily ration of fish along with their other provisions.

6.3.2 Birds and reptiles.

Few reptiles remains have been found over three seasons of excavation. A single snake vertebrae, probably from the family Colubridae, was found in the upper pottery layer of unit 1235/1056. Several species of this family are found in the Delta region and they were probably not consumed at Kom el-Hisn. A single lizard bone was found in 1984, but could not be identified to either genus or family.

A total of 62 turtle bones were recovered, but the majority came from a single room, 12. The specimens in Room 12 probably came from a single animal, *Trionyx triunguis*, the soft-shelled turtle. The carapace from this animal was found largely intact in one corner of Room 12 and was probably butchered within the confines of this room. Difficult to catch, the meat from this species is considered excellent. The remaining turtle bones are of unknown species, but may be either *Trionyx* or *Testudo graeca*, a tortoise also considered to have excellent meat.

A variety of bird remains have been found at Kom el-Hisn owing to its position in the Delta, a prime wintering area for many Eurasian species. Tomb representations and textual references indicate that birds were widely hunted and consumed in dynastic times. 200 bone fragments were identified as avian; identification for the 1988 season is not available. Of the 178 avian bones from the 1984 and 1986 seasons, 23 were identifiable to species (plus 9 specimens identified by eggshell only). The species composition is as follows, in order of abundance:

Anas sp. (duck): N=12;
Struthio camelus (ostrich): N=9 (all eggshell fragments);
Fulica atra (coot): N=6;
Ardea cinerea (Gray heron): N=1;
Platalea leucorodia (Spoonbill): N=1;
Gallinula chloropus (Moorhen): N=1;
Porphyrio madagascariensis (Purple Gallinule): N=1
Tringa cf. erythropus (Red shank): N=1

Ostrich (*Struthio camelus*) is generally identified by eggshell fragments and only rarely by bones. They are thought to have entered Egypt as tribute from Nubia and used as food, containers, and for bead production.

All of the identified species are found to winter in Egypt from about mid-September through April, and all are found represented on tomb paintings in various fowling, offering, and procession scenes and their remains are found occasionally as food offerings in tombs. Some (e.g., the purple gallinule, *Gallinula chloropus*) are also sold for food in the modern Delta region. All of the above (except ostrich) are water birds and are non-nesting inhabitants of the Delta during the winter months. All of the bones examined have fused epiphyses indicating none were young enough to have been hatched during this period.

Compared to other sites, Kom el-Hisn is most similar in the dominant species of ducks (*Anas*) and coot (*Fulica atra*) to Giza (Kokabi 1980; Redding 1992) and Tell el-Dab'a. At Merimde the dominant genii are ducks (*Anas*), geese, and rail, while coots are represented only by a single specimen. The dominant species at Giza (gray cranes) and Tell el-Dab'a (flamingoes) are entirely absent from Kom el-Hisn. In the latter case this may be environmental since flamingoes are abundant near the coast where Tell el-Dab'a is situated. This suggests that much of the fowling was done locally by either inhabitants of the sites themselves or by those of nearby settlements.

6.3.3 Mammals.

Mammal bone makes up the bulk of animal remains found. A total of 12,126 identified bone fragments were recovered from the 1986 and 1988 seasons. Of these, 866 could be identified to at least the genus level (Table 6.9); the remainder was identified to body part (Table 6.10).

Bos taurus: Only 11 bones could be identified as belonging to domesticated cattle (compared with 20 total for the 1984 and 1986 seasons). The ratio of cattle to sheep/goats at Kom el-Hisn is 0.06:1 and the ratio of cattle to pigs is 0.04:1. These are generally much lower than at other sites. Giza has a cattle:sheep/goat ratio of 0.8:1 and a cattle:pig ratio of 43.7:1 (Kokabi 1980:520; Redding 1992); at Merimde the cattle:sheep/goat ratio is 0.6:1 and the cattle:pig ratio is 0.5:1 (von den Driesch and Boessneck 1985:6); the Predynastic areas of Hierakonpolis have a cattle:sheep/goat ratio of 0.8:1 and a cattle:pig ratio of 5.7:1 (McArdle 1982:16). Data supplied by Mark Lehner from the workman's village at Giza show the cattle:sheep/goat ratio is 3.1:1 and the cattle:pig ratio is 32.7:1 (Redding 1992:105).

This suggests that cattle were much less of a subsistence item than were pigs or sheep/goats. This does not necessarily negate the hypothesis that Kom el-Hisn could have functioned as a specialized cattle-raising station and other data indicate that cattle were common in and around the site. The plant data analyzed by Moens and Wetterstrom (1988) suggest to them that much of the plant material found at Kom el-Hisn came from cattle dung used as cooking or other fuel. The character of the plant material further suggests that the cattle were kept close to the site for at least part of the year and fed cut fodder (see section 6.3.4 below for a more detailed discussion of these data). Additionally, of the nine *Bos* bones for which fusion data was possible, only one

Table 6.9. Identified mammal remains from Kom el-Hisn.

Species	**NISP**	**%**
Sus scrofa	422	48.73
Ovis/Capra	315	36.37
Equus asinus	37	4.27
Alcelaphus buselaphus	31	3.58
Canis familiaris	26	3
Rodent	17	1.96
Bos taurus	11	1.27
Gazella sp.	3	0.35
Felis sp.	2	0.23
Hippo	2	0.23
Total	866	99.99

Table 6.10. Unidentified mammal remains by body part.

Body part	NISP	%
Large skull	7	0.06
Medium skull	332	2.95
Large vertebrae	6	0.05
Medium vertebrae	227	2.02
Large rib	6	0.05
Medium rib	744	6.62
Large limb	352	3.13
Medium limb	4328	38.48
Bovid teeth	482	4.29
Pig teeth	78	0.69
Canid teeth	0	0
Other teeth	60	0.53
Unidentified mammal	4625	41.12
Total	11247	99.99

was from an animal that lived past the age of two years (Redding ND:19). Thus, it appears that only young animals were being processed for food, probably those that died of natural causes. At other sites where cattle are relatively more abundant, the number of adult animals is much higher. For example, in eight out of nine excavation units at Merimde, adults outnumber juveniles by at least 3:1 (von den Driesch and Boessneck 1985:7) and at Hierakonpolis mature cattle account for 75% of the samples (McArdle 1982:117).

Redding (1992, ND) has developed a model of cattle production that may account for the apparent lack of cattle in the Kom el-Hisn assemblages. In this model, the cattle produced at Kom el-Hisn would have been exported to other locations, presumably for elite consumption or as provisions on state projects. Local consumption would be restricted to the very young that died before reaching an appropriate age for export, and the very old. If, as Redding suggests, the preferred animals for export were males between 1.5 and 2 years of age, then one would expect that the destination sites would be dominated by male animals in the 1.5-2-year old age range. The Old Kingdom workmen's village at Giza is one such state project, and in that assemblage (based on fusion data from first and second phalanges) between 84% (second phalange) and 88% (first phalange) of the animals were less than two years old (Redding 1992:105). Of the five fragments from which sex could be determined, four were males. Thus, at least one site that could have received estate-raised cattle conforms to this model.

It seems unlikely that cattle, an abundant part of the faunal assemblages from a wide variety of sites from different time periods in Egyptian history, were entirely absent at Kom el-Hisn. The possibility remains, however, that the processing and consumption of cattle remains are in as yet unexcavated portions of the site. It is also possible that cattle remains were disposed of differently from other types of remains. C.C. Edgar, for example, noted that an area to the north end of the site contained an abundance of what appeared to be cattle bones (Edgar 1919-1915:63). Consequently, while a great deal of circumstantial evidence points to the presence of cattle despite their absence archaeologically, more direct evidence must await further archaeological and perhaps textual research.

Ovis/Capra: Sheep and goats represent 315 specimens. These animals served a variety of purposes during Dynastic times as sources of meat, milk, leather, and fiber (wool). The ratio of meat-bearing to non-meat-bearing bones is similar to that of complete animals (Redding 1992, ND) and, since most of the remains come from floor and dump deposits, it is likely that the animals were being slaughtered and butchered within or close to the areas of the site that were excavated.

The kill pattern for the animals for which age data is available (N=82) indicates that 75.6% were slaughtered after they reached two years of age. This is similar to the 70% at Giza, but higher than that at Merimde and Hierakonpolis where the percentage of adult animals is 50% or less. The Merimde and Hierakonpolis figures correspond to a pattern that maximizes the amount of meat for local consumption. The Giza and Kom el-Hisn figures may have several sources. The Kom el-Hisn kill-off pattern is similar to that constructed by (Payne 1973) for maximization of wool production. It is also possible that younger animals were shipped off to urban areas for consumption there. The sex ratio of three females to every one male at Kom el-Hisn (Redding 1991, 1992, ND) also supports the idea of male animals being preferentially removed for consumption elsewhere.

Sus scrofa: Pigs are the dominant remains at Kom el-Hisn. 422 specimens were identified as pig (2860.1 g), representing almost half of the total identifiable remains recovered. Pigs were primarily used for food in dynastic Egypt and the Kom el-Hisn data corresponds to such a strategy. The ratio of meat-bearing to non-meat-bearing elements is 0.55:1 compared to 0.37:1 in a whole animal (Redding ND:26) and the number of cranial fragments recovered indicates that, along with sheep and goats, the animals were being slaughtered and butchered in or near to the area of excavation. Almost half of the pigs for which age data is available (N=76) were between the ages of one and two. At Merimde, the only other site where kill-off data is available (based on tooth eruption), the majority of pigs were slaughtered before the age of six months (von den Driesch and Boessneck 1985:25). Both Harris (1985) and Redding (1991) have argued that there is an inverse relationship between the intensive growing of grain and the incidence of pigs. Pigs will only be abundant in an agricultural settlement when there are sufficient food sources besides grain, when raising grain is a secondary activity, or when there is sufficient surplus available for grain to be fed to pigs. Kom el-Hisn may meet the first two requirements for abundant pigs if the hypothesis of a specialized cattle-producing station is correct, and may be contrasted to Merimde where a more generalized agricultural community seems to have existed (that is, less specialized). In this scenario, pigs could be kept at Kom el-Hisn for consumption by the local population while not competing for the same food resources.

The remaining domestic taxa consist of animals for which no clear evidence of subsistence use exists. *Equus asinus*, the domestic donkey, has 37 specimens, 30 of which come from a single excavation unit (1261/1074, which is not of Old Kingdom date). The domestic dog, *Canis familiaris*, is represented by 26 specimens, although the jackal (*C. aureus*) may also be part of the sample. The cat (*Felis sp.*) is represented by only two elements of unknown species.

Several wild taxa are present that demonstrate that some hunting of wild game was still in effect during the Old Kingdom, though this is not thought to represent a significant part of the diet. A gazelle of unknown species is represented by three specimens and an addax (*Addax nasomaculatus*) was recovered from the 1984 season. Both of these species were probably hunted in the western desert.

31 specimens of Bubal Hartebeest (*Alcelaphus buselaphus*) were recovered (the 482 bovid teeth in Table 6.10 are thought to be from this species as well). These animals are common at Egyptian sites and were probably hunted in the desert areas bordering the Nile valley. The ratio of meat to non-meat bearing elements is 0.37:1, compared to 0.47:1 for a whole animal, suggesting that the animals were brought to the site intact.

A pair of hippopotamus bones were also recovered from Room 17; element composition is unknown. Room 17 also contained several hartebeest and gazelle remains.

Rodent specimens numbered 17 in all and are of unknown species. However, Redding (ND) reports that at least one mandible belonging to the house shrew (*Suncus murinus*) was identified in the 1986 excavations. This shrew is not native to Egypt and probably entered the country (probably as a stowaway) as part of a trade shipment(s) from its native Indian subcontinent. A cape hare (*Lepus capensis*) was also located in the 1984 samples.

6.3.4 Distribution of fauna among deposit types.

As noted in Chapter 4, dumps contain higher densities of faunal material than do any other deposit. In terms of NISP density (NISP/m^3) dumps have significantly higher densities of total identified specimens than other deposits, and significantly higher densities of unidentified bone than other deposits.

The densities within individual groups of species (cattle, sheep/goat, pigs, fish, birds, and rodents) are also consistently higher in dumps than in other deposits, with one exception: three pits, Room 5 DU-8, 9, and 11, all contain high densities of fish bone (40 g/m^3, 500 g/m^3, and 44 g/m^3, respectively). The *number* of bones in each is not particularly excessive (NISP=3, 7, and 2, respectively), but they are all relatively small deposits. Perhaps not coincidentally, Cagle (1991) also noted the presence of numerous fish cranial elements and teeth in the sediment sample for Room 5 DU-9, as well as in a similar pit structure in Room 2 (DU-6). The material used in that study is from flotation samples and much of the recovered bone would have passed through the mesh used for the bulk of the sediments used in the present analysis. Because of this, one might posit that these pit structures were often used to dispose of fish remains after the primary function of the pits had been completed. It also suggests an area where more detailed examination of fish remains is needed.

The distribution of unidentified faunal remains is also consistent with the inhabitants regularly removing animal remains from occupied areas. Dumps contain far higher densities (by weight) of these remains than other deposits, as one would expect were the inhabitants regularly removing food remains to refuse deposits.

The presence of burning in the deposits does not seem to have a significant impact on the amount of bone present. Dumps with burning evident had a higher average density of both identified and unidentified bone than unburned dumps, but not significantly so. Conversely, floors with *no* burning evident actually had higher densities of identified and unidentified bone than did burned floors but again not significantly so. Burned wall deposits, however, had a significantly higher average density of both identified and unidentified bone than unburned walls (p=0.000). The only observable pattern that might explain this is that most of the burned wall deposits (12 of 13) were deposits where the bricks or brick fragments were visible and had not decomposed *in situ* or been redeposited. I would argue that these deposits were probably formed by active burning and perhaps demolition of the structure with some accompanying dumping of refuse.

Other patterns emerge when individual taxa are examined in burned and unburned deposits. Ovicaprids and pigs in particular have markedly different distributions. There is little difference in density when all deposits are considered together. However, pigs are more abundant in burned ($9.30/m^3 \pm 11.83$) than unburned ($5.99/m^3 \pm 5.08$) dumps, but are less abundant in burned ($3.29/m^3 \pm 5.26$) than unburned ($8.50/m^3 \pm 15.04$) floors (the differences are not significant at the 0.05 level). Birds follow this same pattern, though there is little difference in densities between burned and unburned Floors. Ovicaprids, however, are more abundant in unburned ($5.90m^3 \pm 7.40$) than burned ($2.99/m^3 \pm 3.28$) dumps and also more abundant in unburned ($3.08/m^3 \pm 8.73$) than burned ($1.52/m^3 \pm 3.01$) floors (neither is significant at the 0.05 level). Fish also are more abundant in unburned dumps but there is little difference between burned and unburned Floors.

While the relatively high standard deviations makes interpretation necessarily tentative, if one assumes that burned deposits are the refuse from cooking, the relatively low levels of ovicaprids in burned deposits suggests that they were not often consumed in this part of the site. The pattern of pig remains suggests there was some butchering done in the occupation areas along with cooking and discard of the remains. This coincides with Redding's interpretation of ovicaprids as primarily used for purposes other than consumption while pigs were raised, butchered, and eaten locally.

Among fish species, there is generally less patterning evident. Only four species are abundant enough to meaningfully compare densities: *Tilapia sp.*, *Synodontis sp.*, *Sparus auratus*, and *Bagrus sp.* Both *Tilapia* and *Synodontis* are relatively more abundant in unburned than burned Dumps (not significant at the 0.05 level). The remaining species are approximately equally distributed between burned and unburned deposits.

Species composition is largely consistent across deposit types: pigs are dominant, followed by fish, ovicaprids, and birds, in dump, floor, and wall deposits. One exception to this pattern is pit deposits where fish remains comprise the vast majority of faunal remains, with low levels of pigs and ovicaprids, and virtually nothing else. In addition, rodent remains were low in most deposits, but substantially higher in wall deposits. Wall deposits contained significantly higher densities of rodent bones than floors or dumps.

Rodents also were absent from redeposited collapse and intact walls and occurred exclusively in wall collapse and decomposed wall collapse. I interpret this to be a function of the density of the sediments, wall collapses being less dense than intact walls or redeposited material, the latter of which is sorted into relatively finer, and therefore more closely packed, sediments.

In sum, the distribution of faunal remains among different deposit types is what one would expect in a situation where the inhabitants were actively removing food debris from occupied areas and transporting them to refuse dumps. With the exception of pits, the species composition within deposit types mirrored the overall abundance of taxa in the site as a whole. The inhabitants also apparently had some predilection for disposing of fish remains in pit structures.

The pattern of abundances in burned or unburned deposits seems to support the interpretation that sheep and goats were kept primarily for their milk and wool with some consumption of adult animals, while pigs were raised locally primarily for their meat. Butchering and cooking seem to have taken place in the same general area.

6.4 Floral remains.

A total of 82 flotation samples are used in this analysis, distributed among 57 DU's; of these 48 were Old Kingdom. The species identification was carried out by two different investigators and in some cases the species identification was not consistent between the 1986 and 1988 seasons (W. Wetterstrom analyzed the 1984 and 1986 floral remains, A.C. D'Andrea analyzed the 1988 remains). Consequently, I have chosen to use only those species that were identified in both the 1986 and 1988 seasons. Because of this, some of the species distributions will differ somewhat from the published data (e.g., Moens and Wetterstrom 1988).

Recovery techniques also differed somewhat between the 1986 and 1988 seasons. In 1984 and 1986 a single bucket flotation system was used in which the flotation sample (usually 3-4 liters in volume) was poured into the bucket containing water and the floating plant remains were decanted into a sieve covered with fine mesh cloth. In 1988 a double-bucket apparatus was used in which water was agitated up through the interior bucket containing the sediment with the floated material passing through a spout and into a fine mesh sieve. In both cases, flotation samples were air dried before processing and the light fractions (the floated plant material) further air dried before analysis. Both sets of remains were analyzed using binocular microscopes (10X to 50X for the 1988 material, unknown magnification for the 1984 and 1986 material).

6.4.1 General description of plant remains.

Totals for each DU sampled are provided in Appendix I, Table I.5; summaries for individual taxa are provided in Table 6.11. A total of 10,719 specimens are reported, of which 3,593 have been identified to at least the family level or below. By and large, the percentages of identified specimens correspond with those given by Moens and Wetterstrom, with one major exception: reeds and sedges make up 22.5% of their total identified specimens while those in Table 6.11 make up only 5.16%. This results from an identification anomaly: the 1988 data do not contain either *Phragmites australis* or *Carex sp.* (a reed and sedge, respectively) which together make up a large portion of the 1984 total.

The cereal remains and weeds are probably both the result of grain processing. The majority of the chaff is composed of glume bases and spikelet forks, mostly of emmer wheat, which are separated during threshing and winnowing of the grain. The weed species are also probably a result of grain processing. Darnel grows almost exclusively in cultivated fields and canary grass is common around modern fields. Both of these have been found in tombs as contaminants of grain offerings (Schweinfurth in Schafer 1908:154-157).

Reeds and sedges are common in the marshy environment of the Delta and probably entered the site incorporated in the dung of cattle though they also could have been burned directly as fuel. The higher percentage of wild grasses in the 1988 samples may explain the anomalous absence of grasses in the 1984 samples reported by Moens and Wetterstrom: reeds and sedges would be expected to be present along with wild grasses if cattle were foraging in the immediate environs of Kom el-Hisn, since grasses remain common even among these other marsh-dwelling plants.

Among the fodder plants, the clover identified at Kom el-Hisn is probably berseem (*Trifolium alexandriunum*), one of the principal crops grown in modern Egypt, and is

Table 6.11. Species composition of Old Kingdom plant remains from Kom el-Hisn. The far right column contains percentages of each taxon not including the 7192 unidentified specimens.

Type/Common name	Genus/Species	With Unidentified specimens		% not including Unidentified specimens	
		N	%		
Cereal grain		**348**	**3.25%**	**9.80%**	
Barley	*H. sativum*	99	0.92%		2.79%
Emmer wheat	*T. dicoccum*	31	0.29%		0.87%
NA	Unknown grain	218	2.03%		6.14%
Chaff		**616**	**5.75%**	**17.35%**	
Barley straw	*H. sativum* straw	15	0.14%		0.42%
Emmer straw	*T. dicoccum* straw	601	5.61%		16.92%
Field weeds		**1254**	**11.70%**	**35.31%**	
Canary grass	*Phalaris sp.*	696	6.49%		19.60%
Darnel	*Lolium temulentum*	558	5.21%		15.71%
Reeds and sedges		**181**	**1.69%**	**5.10%**	
Nutgrass	*Cyperus sp.*	10	0.09%		0.28%
Bulrush	*Scirpus sp.*	36	0.34%		1.01%
Sedges	*Cyperaceae sp.*	135	1.26%		3.80%
Fodder		**753**	**7.02%**	**21.21%**	
Clover	*Trifolium sp.*	425	3.96%		11.97%
Mustard family	*Brassicaceae sp.*	120	1.12%		3.38%
Dock	*Rumex sp.*	158	1.47%		4.45%
Vetch	*Vicia sp.*	49	0.46%		1.38%
Medick	*Medicago sp.*	1	0.01%		0.03%
Other/Unknown		**7567**	**70.59%**	**12.73%**	
Grass family	*Graminae sp.*	436	4.07%		12.28%
Goosefoot	*Chenopodium sp.*	5	0.05%		0.14%
NA	Unid. Seeds/frag.	7126	66.48%		NA
Total		**10719**	**100.00%**	**101.49%**	

considered an excellent fodder material. The seeds in the archaeological samples are smaller than their modern counterparts; Moens and Wetterstrom suggest that the Kom el-Hisn seeds may have shrunk during carbonization or possibly represent an older variety of berseem.

Little charcoal has been recovered, suggesting dung and/or plant stems rather than wood as the principal fuel. Dung fuel is usually prepared by mixing the dung with straw or some other tempering material, forming it into cakes, and allowing it to dry. Such methods are known from modern Egypt and throughout Pharaonic times. The chaff from grain processing could have served as a temper in this context and winnowing debris is also known as a major animal feed (van Zeist and Camparie 1984:4-5). Very few sheep/goat pellets have been found which tend to be common when used as fuel (Bottema 1984:208). Cattle are thus the most likely source for the *Trifolium* since cattle are often represented being hand-fed cereal, cereal stalks, straw, and cut fodder (Moens and Wetterstrom 1988:170) while pigs and sheep/goats were usually allowed to forage on their own.

The large amount of fodder plants indicates that cattle were fed for at least part of the year with cut fodder, presumably while they were kept in pens within or near the site. This may have occurred during the inundation when dry areas of the Delta were few and far between, generally on levees, along the desert margins, and (probably not coincidentally) on *gezira* deposits, upon which Kom el-Hisn rests. During the remainder of the year (approximately 9-10 months) the cattle may have been herded to more distant locales for foraging of wild grasses, explaining the relative lack of wild plant material at the site (though some local grazing probably did occur). It is also possible that the animals were kept in pens during a portion of the year and fattened with high-quality fodder in preparation for sacrificial offerings. In fact, two classes of cattle are referred to in representations and texts: *iw3-mdt* or stable cattle are generally shown being fed cereal, cereal stalks, or cut fodder (e.g., Montet 1954: 43-58; Lepsius 1849-1858, Pl. 62) while *ng3*-cattle were depicted as being thinner, used for agricultural labor, and herded into fields for grazing (e.g., Montet 1954:74).

6.4.2 Distribution of plant remains among deposits.

Density values in this section are based on the number of identified specimens per unit weight of sediment in the flotation sample. As one might expect, plant density is higher in those deposits that have evidence of burning, though a T-test only gives a probability of 0.075, just missing the cutoff for significance at the 0.05 level. Table 6.12 provides descriptive statistics for each class of plants. Field weeds and fodder plants have the highest mean density, followed by chaff, other identified plants (primarily grasses), cereal grain, and reeds and sedges. Contra D'Andrea (1989) and Moens and Wetterstrom (1988) I found that species diversity is not particularly evenly spread among deposits. Species richness is tightly correlated with the *number* of identified specimens (p=0.000) and the *density* of NISP (p=0.000); however, there is no relationship between either NISP or NISP density and the *amount of sediment* in the sample. Thus, one can interpret the apparent relationship between NISP and species richness as a function of the depositional process rather than the sampling regime.

As noted above, the density of plant remains is largely determined by the visible presence of burning in the deposit. The source of burned material is probably cooking fires, though other forms (such as trash burning) cannot be ruled out. Those floors with the highest densities of plant remains tend to be those where discrete areas with high concentrations of burned material were noted; e.g., Room 18 DU-8 and Room 1 DU-3. Probably not coincidentally, these two DU's also have the highest density of cereal remains of all deposits, save for Room 17 DU-2 which is wall collapse immediately adjacent to an obvious hearth (Room 17 DU-3). Those floor deposits with more diffuse areas of burning or no burning at all (e.g., Room 9 DU-7) have few plant remains.
To further examine this pattern, Figure 6.1 shows the mean densities for each category of plant by deposit type (the sole Burial, UPL, and Fluvial samples excluded). Floors tend to have a more even distribution of plant types than other deposits (save pits, which have little plant material overall), while dumps have a more uneven distribution, dominated by weeds, chaff, and fodder. Walls (primarily Wall Collapse deposits) have a distribution quite similar to floors. I suspect this is largely due to some mixing of floor deposits with overlying wall collapse, though the inclusion of hearth debris in the wall material itself cannot be ruled out (the only intact wall sample, 1235/1056 DU-20, has very few plant remains).

The plants represented in dumps are what one would expect if winnowing debris and spent fuel from cooking fires were being discarded. The more even distribution of

Table 6.12. Density of plant taxa by deposit type.

	Mean density (#seeds/kg)				
	All deposits	Dump	Floor	Pit	Wall
Cereal grain	1.23 +/- 2.61	0.94 +/- 1.36	1.92 +/- 4.36	0.24 +/- 0.22	1.08 +/- 1.80
Chaff	1.99 +/- 5.19	4.93 +/- 10.07	2.15 +/- 3.96	0.26 +/- 0.31	0.85 +/- 1.54
Field weeds	4.94 +/- 7.41	6.99 +/- 6.91	5.26 +/- 6.85	0.58 +/- 0.44	4.44 +/- 8.33
Reeds and sedges	0.67 +/- 1.21	0.45 +/- 0.44	0.94 +/- 1.47	0.27 +/- 0.23	0.66 +/- 1.35
Fodder	2.57 +/- 3.77	4.59 +/- 5.90	2.23 +/- 2.68	0.56 +/- 0.29	2.13 +/- 3.13
Other (ID)	1.54 +/- 5.68	0.90 +/- 2.53	2.37 +/- 7.71	0.52 +/- 0.08	1.49 +/- 5.89

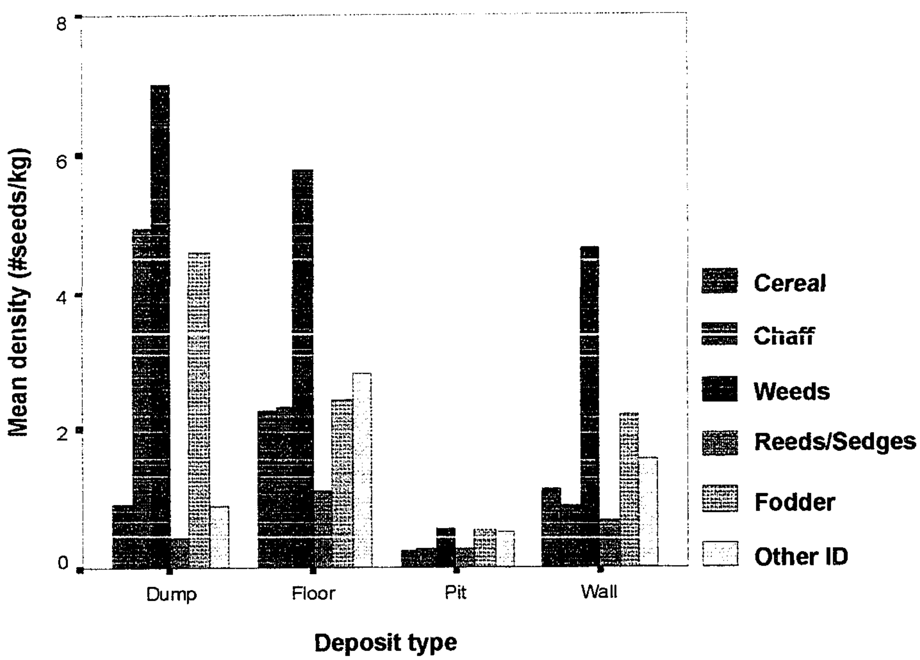

Figure 6.1. Densities of plant taxa by deposit type.

remains in Floors suggests that a variety of activities -- e.g., winnowing, cooking -- were taking place within the sampled structures. Indeed, as already mentioned, those Table 6.12 deposits with discrete areas of burning have higher concentrations of cereal grains than others. Further patterning (such as different areas for different activities) is not readily apparent from the plant data alone.

The following general relationships seem to hold: 1) Those deposits with high densities of plant remains (NISP density) tend to have high species diversity as well; 2) Dumps have a more uneven distribution of plant types than other deposits, possibly indicating the remains of winnowing debris and spent fuel; and 3) Floors have more even distributions of plant types, with cereal grains being more abundant in areas where discrete burning is evident.

A provisional interpretation of these trends is that the excavated area contains some rooms where food preparation and cooking were performed, accounting for the abundant cereal grains, with chaff and fodder material that was probably incorporated in dung fuel. Adjacent rooms, such as Room 9, contains little or no plant material and probably have little to do with food preparation. Dumps may have as their source the cooking and winnowing debris from nearby rooms, as the dumps sampled are high in plants one would expect would have been incorporated into dung fuel and also direct winnowing remains.

7.0. Spatial distributions.

The previous chapter examined all artifact classes individually and only dealt with the distribution of different artifact types (or plant/animal taxa) over deposit types. This chapter examines how the different kinds of remains are spatially distributed and how/if any types covary with each other and with architectural units and features.

7.1 Ceramic patterns

I have chosen to employ cluster analysis to investigate the spatial patterns in the Level 3 structures. The deposits themselves can be treated as purely formal units without inherent spatial coordinates; the spatial configuration of the clustered units can be investigated further once they have been grouped. The main problem with cluster analysis when used in an inductive mode is the identification of a 'correct' solution since any cluster analysis will always produce a solution. The strategy I have employed follows Dunnell (1983) by using several different methods. If the basic structure of the solution stays the same over different clustering algorithms it is assumed to be accurately portraying the structure of the excavated units. The *number* of clusters chosen for a solution is, of course, a matter of judgment.

The units of measurement are the percentage of each ceramic type (only Old Kingdom types). Only dumps, floors, and pits were used giving a total sample size of 39 deposits. The final solution provided here uses the squared Euclidean distance measure and Ward's method of agglomeration. The resulting dendrogram is shown in Figure 7.1. I have chosen to further analyze the 4-cluster solution.

Immediately apparent are two sets of deposits (Cluster 1) that cluster tightly together: three deposits from Room 17 and five from unit 1192/1035. The Room 17 deposits consist of a floor (DU-5), dump (DU-4) and a pit/hearth (DU-3) in a habitation structure; the 1192/1035 deposits are all dumps. Viewing the bar graph in Figure 7.2 that compares the relative frequencies of ceramic types in each of the clusters produced shows that these deposits are dominated by Type C jars with a lower percentage (but still higher than any other cluster) of Type E bread molds, and Type H (Meidum) bowls. These are the only units where Types C and E occur in any abundance. An obvious hypothesis is that debris from Room 17 was removed and deposited within the basin containing the 1192/1035 dump deposits.

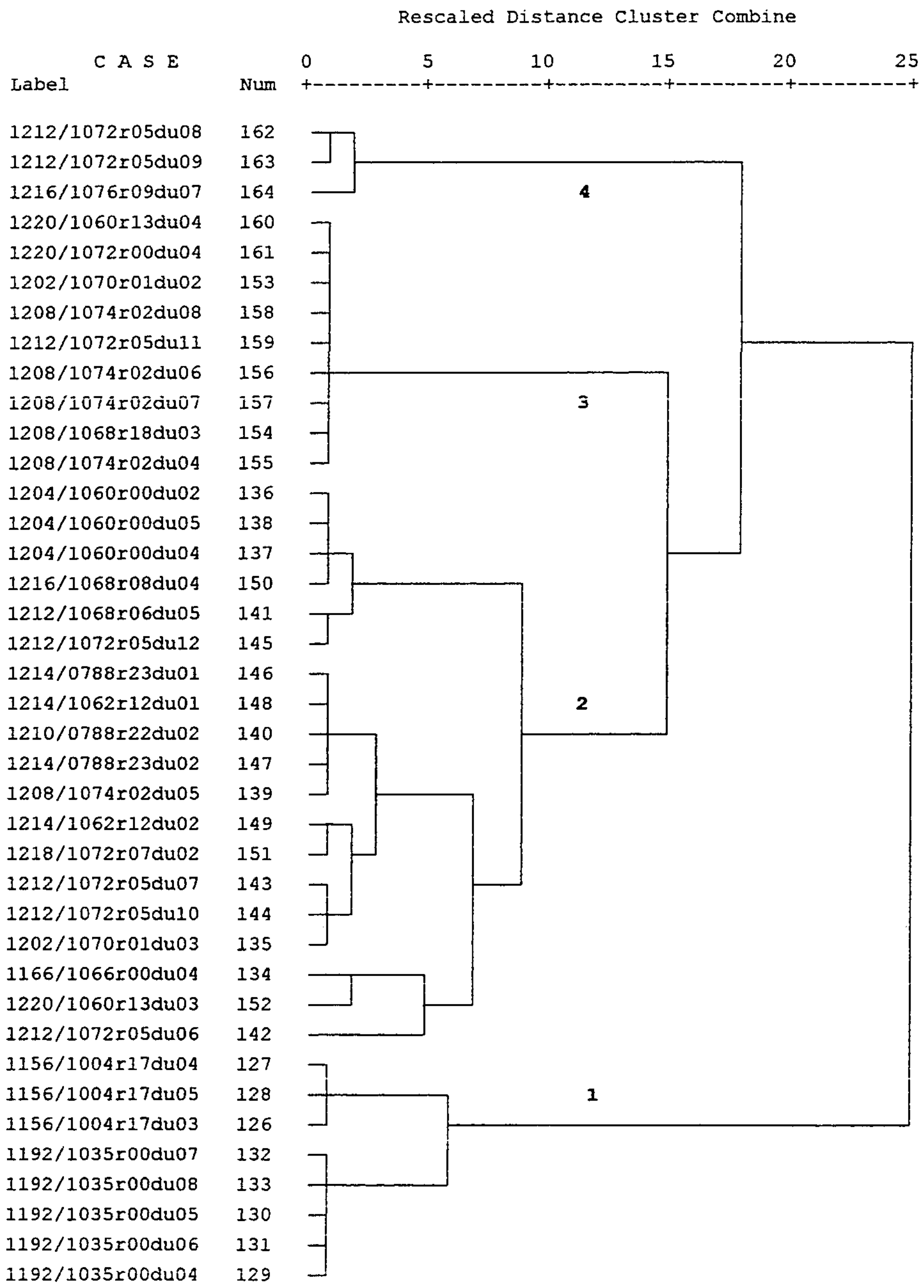

Figure 7.1. Dendrogram of Ward's method hierarchical cluster analysis of Level 3 deposits using Old Kingdom ceramic types. A 4-cluster solution is used.

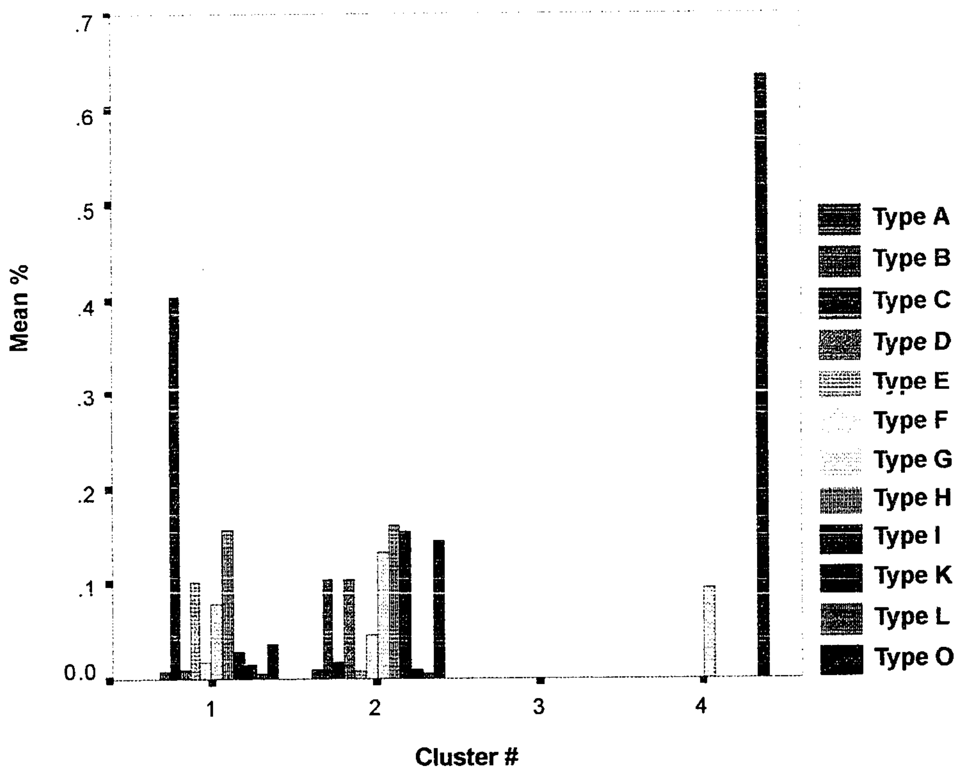

Figure 7.2 Bar graph showing the relative percentages of each ceramic type for the first 4-Cluster solution.

A second distinctive cluster is Cluster 4 which consists of three DU's, two each from Room 5, DU-8 and DU-9 (both pit structures) and the floor surface from Room 9, DU-7. The sherds from these deposits are isolated finds. The pits in Room 5 each contained a single diagnostic sherd each (Type O) and few other sherds. Three diagnostic sherds were found in Room 9 DU-7 (two of Type O and a single Type G) and few other sherds. Both of the Room 5 deposits resemble small dumps deposited within an abandoned storage pit and are probably not related to the occupation of the room, or perhaps a short final occupation before it was abandoned.

Cluster 3 contains deposits that have no diagnostic Old Kingdom ceramics and few sherds at all. There is little that ties all of these deposits together. The deposits from Room 2 consist of a floor (DU-4) and three thin layers from the bottom of the pit structure in that room. The pit deposits from Room 2 (DU-6, 7, and 8) were excavated as sediment samples and artifact counts are not available, though none had more than a few bits of ceramics within them (Cagle 1991). The brick pit structure from Room 5 (DU-11) shows no evidence of use for refuse dumping and also contains few ceramics, similar to the pit in Room 2. Room 13 also contains a pit structure (DU-3) that was not clustered with these, but the floor associated with that pit structure, DU-4, was. Other than these deposits having something to do with brick pit structures, the remainder represent a mix of deposit types and contexts: Room 1 DU-2 is a shallow excavated pit, Room 18 DU-3 is a laminated floor, and unit 1220/1072 DU-4 is a thin layer of redeposited dump material. The only real pattern one can infer from these deposits is that, without the later small dumping events in the structures in Rooms 5 and 13, the pit structures would be devoid of any ceramic remains, and probably any other types of remains as well. Thus, the rooms with brick pit structures tend to have few ceramics associated with them.

The last cluster, 2, contains a mix of deposits with varying percentages of different ceramic types. I have thus chosen to conduct a second cluster analysis on only these deposits to see if there are any other patterns present within this cluster. Again, I used a variety of clustering routines and similarity measures to ensure an accurate representation of any patterning present. The final dendrogram using squared Euclidean distance and Ward's method is shown in Figure 7.3.

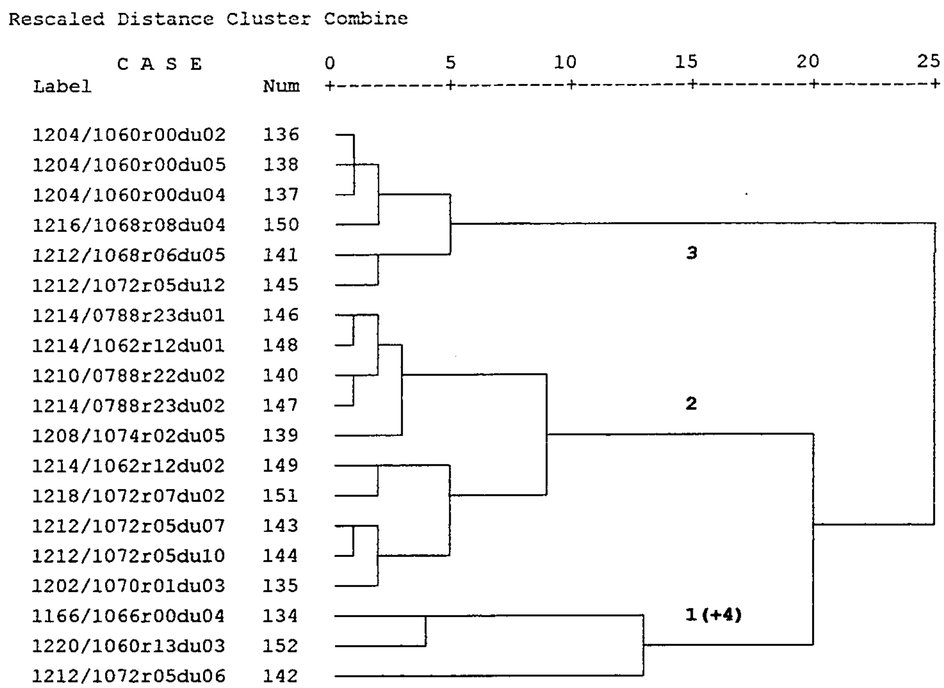

Figure 7.3. 2nd cluster analysis using only deposits in Cluster #2 from the first 4-cluster solution.

This second routine produced three and perhaps four distinct clusters. Figure 7.4 displays the bar graph showing the type distributions among using three clusters. Cluster 4 is probably the most distinct group with only two types -- B (a jar) and D (bread platters) -- present at all in Room 5 DU-6, a floor. This results from only two identified specimens. The deposits from Cluster 1 are more similar to Room 5 DU-6 than to the others as a result of containing relatively high proportions of Types B and D, but they also contain very abundant Type G Bent-sided bowls. Type A spouted jars are relatively more abundant in this cluster but are represented by two specimens in the unit 1166/1066 DU-4 floor. Specifically, the two units making up Cluster 1 are similar largely because of their relatively high proportions of Type G bowls and Type D trays. Otherwise, the Room 13 DU-3 pit is dominated by Type D bread platters, which occur as two diagnostic sherds and several kilograms of unidentifiable (but presumably Type D) fabric type C sherds.

Cluster 3 may reveal a pattern similar to that of Room 17 and unit 1192/1035: all of the unit 1204/1060 dumps are clustered together and are associated with the floor deposits of Room 8 DU-4, Room 6 DU-5, Room 1 DU-3, and Room 5 DU-12. These rooms are not all contiguous, and not particularly near to the dumps (actually redeposited dumps) of unit 1204/1060. Their main common types are Type H (Meidum bowls) and Type I (bowls with molded rims). All of these floor deposits contain significant blackened sediment with abundant charcoal and presumably represent cooking debris, though identifiable hearth features are not evident.

The remaining deposits making up Cluster 2 are a mix of floors and two dumps (Room 23 DU-1 and Room 12 DU-1). Overall these deposits contain a fairly even mix of several types with the accent on Type O bowls. There is no discernible spatial pattern in these units, except that all of the deposits from the units in the far western edge of the excavated area, Rooms 22 and 23, are clustered together.

Interestingly, while some deposits from the same rooms cluster together (e.g., Rooms 12 and 23) others do not. For example, the two floors in Room 2, DU-4 and DU-5, do not cluster together largely due to the absence of ceramics from DU-4. The several floors from Room 5 (DU's 6, 7, 10, and 12) mostly cluster differently. The lower two floors, DU-10 and DU-12, are associated with two of the brick pit structures (DU-8 and DU-9), and the upper two floors, DU-6 and DU-7, are associated with a third brick

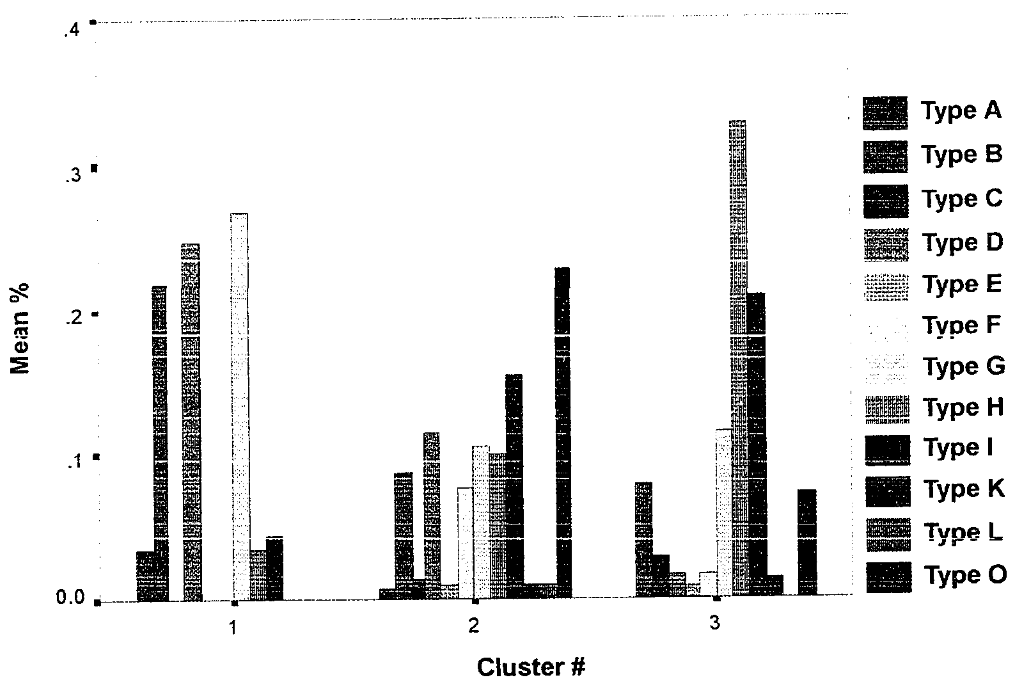

Figure 7.4 Bar graph showing the relative percentages of each ceramic type for the second 3-Cluster solution.

pit structure, DU-11. The pit structures associated with both sets of floors suggest that the basic function of the room did not change significantly over time though the different ceramic assemblages suggest that some change did occur.

These two sets of cluster analyses suggest that some sort of functional patterning is discernible within the excavated areas. Room 17 and unit 1192/1035 have similar ceramic distributions and may represent the habitation source (Room 17) and refuse destination (1192/1035) for this material. That two ceramic types (C and E) are by far the dominant types suggests a degree of specialization. A similar relationship may exist between three floors in Rooms 5, 6, and 8 and the redeposited dump deposits in unit 1204/1060. These latter deposits have a wider array of ceramic types but are dominated by types H and I (type H is also common in Room 17 and unit 1192/1035).

Several deposits have very few ceramics associated with them. Many of these are brick pit deposits (Room 2 DU-6, 7 and 8 and Room 5 DU-11) which were not (as opposed to several other brick pits) used as later dumps. Two of the floors from rooms containing brick pits are also similarly devoid of ceramics (Room 2 DU-4 and Room 13 DU-4), but this pattern is not consistent (also, the pit structure in Room 13 is probably a baking facility rather than a storage facility). Two other brick pit structures from Room 5 (DU-8 and DU-9) are clustered differently but have only one sherd apiece from an apparently later dump deposit. Similarly, Room 9 DU-7 contained only three sherds which may be intrusive.

The remaining deposits show no readily interpretable patterning. Several deposits (most from the same room structures) cluster together and are characterized by a relatively even distribution of most types, but with an emphasis on Type O bowls. The brick pit structure in Room 13 (DU-3) is clustered together with a floor in unit 1166/1066, but seem to be similar only in the proportion of type G bowls and type D trays. These two units are not structurally similar nor are they close together spatially and may be a fortuitous grouping.

Thus, there does seem to be some coherent patterning in room function in terms of ceramic distributions. Rather than attempt to explain this patterning in terms of the ceramic functions themselves I will investigate whether similar patterns are detectable in other types of remains before positing specific functional interpretations of each room.

7.2 Faunal patterns

For these analyses only cattle, sheep-goat, pig, fish, and birds were used for the quantitative analyses. These were added together to create a new NISP value for only these species and percentages for each group were calculated from this. The group percentages were entered into a cluster analysis for Level 3 dumps, floors, and pits. The same criteria were used to accept an accurate cluster solution as for the ceramics. The first clustering solution is shown in Figure 7.5. A 4-cluster solution is used for the remainder of this section.

The results are similar in a number of ways to those resulting from clustering by ceramic types. Once again, the deposits from Room 17 are clustered together, but this time with only one deposit from unit 1192/1035, DU-7. Also included within this cluster are the contents from the brick pit structure from Room 13 (DU-3) and a floor in Room 5 (DU-12). Referring to the graph in Figure 7.6 comparing the proportions of these five species, it is apparent that these deposits are dominated by ovicaprid remains. In fact, the only reason Room 13 DU-3 and Room 5 DU-12 are clustered together with these other deposits is because they both have a single identifiable bone, both ovicaprids, in relatively small deposits.

I expected more deposits from unit 1192/1035 to be clustered with the Room 17 deposits. That they are not seems to be more due to the presence of other kinds of species besides the ovicaprids in several of the 1192/1035 deposits that so fully dominate the Room 17 deposits. For example, if one calculates the ratio of ovicaprids to pig, only seven deposits have a ratio higher than 1.0. Of these, six are from either Room 17 or unit 1192/1035; the other is Room 22 DU-2 which has only three identifiable ovicaprid and pig remains. Thus, with this one exception, only Room 17 and unit 1192/1035 contain more ovicaprid than pig.

Fish dominate in Cluster 4. Several of these units are from brick pit structures which seem to have functioned as dumps upon abandonment, primarily for fish remains, particularly cranial and vertebral specimens (Cagle 1991). Three of the four floors from Room 5 also clustered together with these pits, along with the dump and floor from Room 12. For the most part, the Room 5 deposits contained only a small number of fish remains and nothing else. The same is true of Room 9 DU-7 which contains a single identifiable bone, a *Tilapia*. Only DU-10 from Room 5 contained other species making

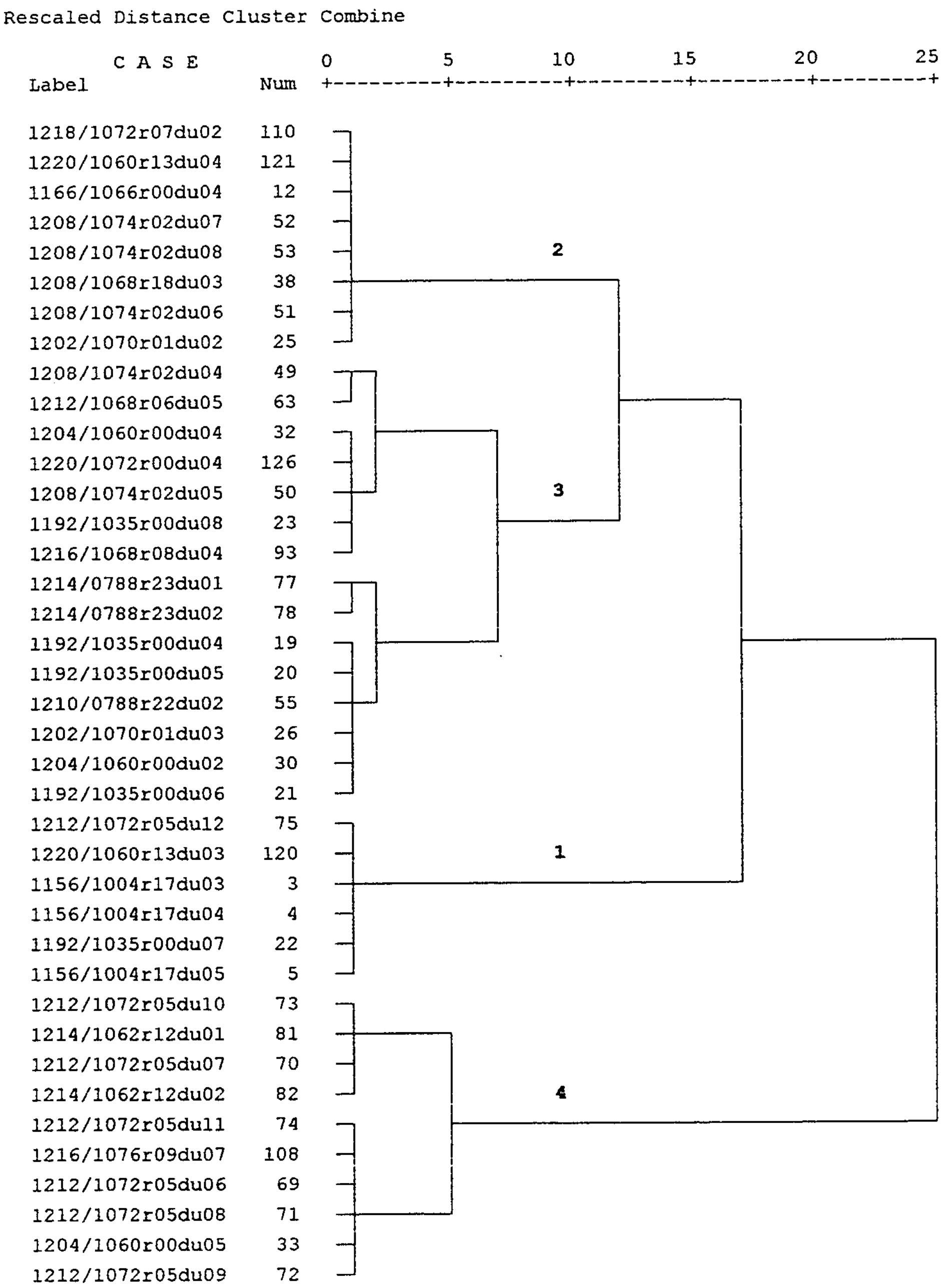

Figure 7.5. Dendrogram of Ward's method hierarchical cluster analysis of Level 3 deposits for identified faunal remains. Five classes were used: Cattle, ovicaprid, pig, fish, and birds.

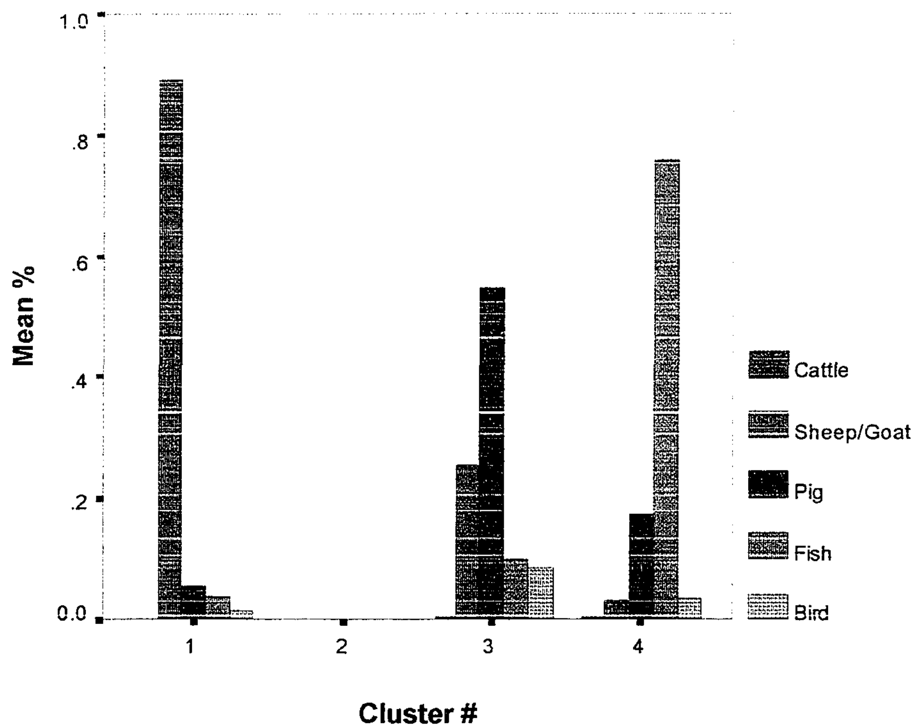

Figure 7.6 Bar graph showing the relative percentages of the major taxa of faunal remains for the 4-Cluster solution.

up more than half of the total number. The other deposits in this cluster all contain significant fish remains but occur in context with several other taxa and in greater numbers. I would argue that most of Room 5 and Room 9 DU-7 can be treated as isolated specimens and are not reflective of room function or subsistence activities. With that in mind, only Rooms 12 and 9 and DU-9 in Room 5 contain evidence of substantial fish processing. The unit 1204/1060 DU-5 dump also contains a large component of fish remains. The bulk of the remains from these four deposits are *Tilapia*, with a small component of *Synodontis*, *Bagrus*, and *Lates* (Room 5 only) in Room 5 and unit 1204/1060, and *Clarias* in Room 12.

Cluster 3 is characterized by abundant pig, a smaller component of ovicaprids, and small numbers of both fish and birds. In some respects, this cluster is similar to Cluster 2 derived from the second ceramic clustering routine. The floors from Room 6 (DU-5) and Room 8 (DU-4) and Room 1 (DU-3) are again clustered together with two of the dumps from unit 1204/1060 (DU-2 and DU-4), as are all of the units from Rooms 22 and 23 on the far western edge of the excavated area. Several deposits from unit 1192/1035 are also in this cluster, but as noted earlier may be more appropriately placed with the Room 17 deposits. Two floor deposits from Room 2 are also contained in this cluster: DU-4 contained no diagnostic ceramics, and DU-5 contained a mix of several types.

Several of the same deposits that had no ceramics also had no identifiable faunal remains. None of the small deposits from the interior of the Room 2 pit structure (DU-6, 7, and 8) had any ceramics or identifiable faunal remains, as did the Room 13 DU-4 floor, the Room 18 DU-3 floor, or the shallow pit in Room 1 (DU-2).

In sum, several recurrent patterns are seen when the ceramic and faunal cluster analyses are considered together. First, a clear relationship seems to exist between Room 17 and the dumps in unit 1192/1035. They both have distinct ceramic distributions emphasizing Types C and E, and are the only units (with one exception) where ovicaprids outnumber pigs. This implies that much of the refuse from Room 17 was removed to the topographic depression in which 1192/1035 is situated. A similar pattern may exist between three floors in Rooms 1, 6, and 8, and the dump deposits in unit 1204/1060. The faunal and ceramic composition for all of these deposits is different from that of Room 17 and 1192/1035 emphasizing pigs over ovicaprids, and ceramic types H and I. Second, the two rooms (22 and 23) located in the far western edge of the excavated area consistently clustered together, though not generally with the same deposits from other areas of the site.

Third, the pits located in Room 5 probably contain small amounts of dump material unrelated to the occupation of the room. They tend to be small deposits with few identifiable ceramics or faunal remains and this leads to their being clustered with a variety of other deposits. Most of the faunal remains from the floors of Room 5 (except for DU-10) seem to be isolated specimens, probably not related to subsistence activities within the room. There does not seem to be any consistent patterning in rooms with brick pit structures. The pits from Rooms 5 and 2 would probably be similar except for the minor dumping that occurred in several of the Room 5 pits, but their floor assemblages are quite distinct. The brick pit structure in Room 13 (DU-3) has a much different set of remains from other pits, being high in ceramic types D and G.

7.3 Stone object patterns

Stone objects include chipped stone tools, debitage, and ground stone objects. Most types are rare and not well suited for quantitative analysis. Those that can be found in sufficient quantities are sickle blades, unretouched flint/chert blades, and ground stone chunks, flakes, and other small fragments. Consequently, the following analyses will use only these types.

Lithics as a whole tend to be sparsely distributed -- over half of the Level 3 deposits have none or only a single object -- and are not well suited to quantitative analyses. Clustering routines using all deposits tended to group together deposits that were dominated by a single type which would obviously give greater weight to those deposits with small samples. Tests of linear association were also unduly affected by outliers. Chi-square tests were marginally more informative. Using all of the deposits, sickle blades were shown to occur more often with ground stone flakes ($p=0.002$), ground stone chunks ($p=0.000$), and unretouched blades ($p=0.000$) than would be expected by chance. This may be more reflective of the relative ubiquity of sickle blades throughout the deposits; when only those with five or more specimens were used ($N=11$ deposits), this association disappeared. Ground stone may occur less often with sickle blades than chance would allow, but this pattern only presented itself using the small sample of eleven deposits with more than five specimens.

An examination of individual room contents is more informative. Three deposits from Room 17 had large numbers of stone objects (the hearth, DU-3, contained no stone objects). The DU-5 floor had 37, the majority of which were ground stone flakes (N=26); it also had 4 sickle blade fragments and 7 unretouched blades. The Room 17 DU-4 dump had a similar distribution but was dominated by ground stone chunks rather than flakes. The deposits from unit 1192/1035 had somewhat similar distributions as well, but tending to emphasize sickle blades and unretouched blades more than ground stone flakes. Interestingly, none of these units contained any ground stone *implements*, either whole or fragmentary. The large number of unretouched blades and sickles suggest that some production of sickle blades occurred here and in fact, this was one of the few rooms where in an earlier study I found small amounts of debitage (in a flotation sample from SU-3/DU-4; Cagle 1991:45). Related to this may be the presence of several chipped-stone artifacts in the deposits from these two units. Of the 9 chipped-stone tools recovered from all Level 3 deposits, 5 are from Room 17 or unit 1192/1035 (the former occurring in a wall collapse deposit covering the floor). Together with the large number of ground stone chunks and flakes (presumably from remanufacture or maintenance work) one is left with the inference that some small scale stone-working was concentrated in this room.

Taken together, the dump and floor deposits from Room 23 are similar to those from Room 17 in having a large number of ground stone chunks and several (N=7) unretouched blades. However, the faunal and ceramic distributions in these two rooms are entirely different.

In contrast, Room 12 is almost entirely dominated by ground stone fragments and whole objects (N=23), only a small number of ground stone chunks (N=3), and a single unretouched blade fragment. Most (N=21) of the grinding stone fragments were of sandstone while the two whole objects were small limestone metates (both circular and 12-13 cm in diameter). Two of the ground stone chunks were limestone and one was sandstone. Most of these were found in the southern 2/3 of the room beyond the small partition that divided the structure, and a number of them were clustered in the far southern end. A large portion of a turtle (*Trionyx triunguis*) was also found in this immediate vicinity. This room also contained a wide variety of ceramics and faunal remains, particularly fish.

Two deposits from Room 5 also deserve attention, DU-7 and DU-10. Both of these have several grinding stone fragments (N=4 and N=6, respectively) and ground stone chunks and flakes. All of the ground stone fragments are from sandstone metates, though the chunks and flakes are from a variety of materials including limestone, chert, silicified wood, and sandstone. DU-10 also contained two globular pieces of chert. It is thus doubtful that the ground stone debris is a result of modifying the grinding stones. Since both DU-6 and DU-10 floors contained rather unique globular chert nodules with rubbing wear on several faces, at least one activity or set of activities was probably carried out during these two separate occupations. Also, these deposits are dominated by fish and pig rather than the ovicaprids in Room 17, and the ceramic distributions are quite distinct as well.

The remaining deposits have small numbers of stone objects associated with them. Sickle blades tend to be common, though unretouched blades are found in more deposits overall. Ground stone chunks and flakes also occur sporadically. Grinding stone fragments are only found in two other deposits not previously discussed the DU-9 pit deposit in Room 5 and the DU-5 floor deposit in Room 2.

7.4 Floral remains

A total of 23 Level 3 deposits were analyzed for their plant material. Of these, 13 are either floor, dump, or pit deposits. In the following discussion the same aggregate groups -- Cereal, Chaff, Weeds, Reeds, Fodder, Other-Identified and Other-Unidentified -- as in the preceding chapter are used. In this section I use density values rather than proportions as this measure can directly reflect certain depositional processes (mostly burning) as well as differential use.

Of the 13 Level 3 deposits analyzed, 7 are from floor deposits, 3 are from dumps, and 3 are from pits. Six deposits showed evidence of burning (4 floors, 1 dump, and 1 pit). As expected, burned deposits had a much higher overall density of plant remains, and the density of each category was also higher in burned deposits (except for Chaff and Other-identified) but the differences were not statistically significant. Dumps also contain higher densities of all categories except Other-Identified and Other-Unidentified but these differences are also not statistically significant.

Table 7.1 shows the categorical densities for all deposits in Level 3. Room 1 DU-3 has the highest density of plant remains in this sample largely due to an extraordinarily high density of Other-Unidentified plants. The relatively high overall density in Room 8 DU-4 is also due largely to the Other-Unidentified category. Both of these floor deposits were described as dark black, laminated structures with abundant burned bone and ceramics, though Room 1 DU-3 tended to have more discrete pockets of ash and other burned material than those in Room 8.

In contrast, the floor and pit from Room 17 (DU-5 and DU-3, respectively), which, based on other data outlined earlier, is presumably the source for the 1192/1035 material, are somewhat different from those in Room 1 and Room 8. The pit/hearth in Room 17 is sharply defined by a wall of burned, hardened clay lining its edges as opposed to the more diffuse nature of the burned deposits in the other two rooms. This suggests more of a well-defined function for Room 17, perhaps a specialized cooking facility.

The main differences in plant remains between these two sets of deposits is the high density of unidentified plants in Rooms 1 and 8, and the higher density of chaff in the 1192/1035 samples. Clover (*Trifolium alexandriunum*), a high-quality animal feed, is especially dense in the 1192/1035 samples compared to the others. Since much of this material probably entered the archaeological record as fuel for fires (either directly or incorporated within animal dung), the possibility exists that the differential distributions are a result of different fuel mixtures used in these rooms. One interpretation is that Room 17 specialized as a cooking facility for a particular segment of the Kom el-Hisn community while the other rooms were used for more generalized food preparation. Room 17 is defined by a large number of Type C jars, while Room 1 DU-3 and Room 8 DU-4 have more even distributions of different types (particularly bowls, such as Types H, G, I and O). The plant material may indicate some kind of differential access to fuel types, either for functional or social reasons. For example, a variety of plant material may have been used as fuel in Rooms 1 and 8 resulting in a large amount of unidentified remains, while Room 17 had access to a more homogeneous supply of dung fuel.

Comparing these Level 3 floor deposits with those from earlier levels reveals some important similarities. Room 18 DU-8 (Level 4) has a very similar distribution of remains

Table 7.1 Plant densities for Level 3 deposits.

Plant group densities (N/m^3)

Deposit	Cereal	Chaff	Weeds	Reeds/Sedges	Fodder	OtherUnid	OtherID	Total
1202/1070r01du03	4.69	10.20	8.37	3.27	7.96	124.29	0.41	158.78
1216/1068r08du04	1.13	0.65	10.89	0.56	3.63	27.10	1.37	43.95
1212/1068r06du05	0.45	2.69	7.76	0.00	3.58	15.67	0.00	30.15
1214/1062r12du01	0.00	0.16	2.22	0.48	0.63	9.52	0.00	13.02
1214/0788r23du02	0.77	0.00	1.23	0.77	0.62	6.15	0.00	9.54
1218/1072r07du02	0.57	0.00	2.43	0.14	1.29	5.86	0.00	10.29
1220/1060r13du03	0.00	0.00	1.06	0.12	0.35	5.18	0.59	6.71
1212/1072r05du09	0.28	0.60	0.52	0.16	0.44	4.26	0.44	6.25
1212/1072r05du06	0.38	0.38	0.75	0.75	0.38	4.15	0.00	6.79
1192/1035r00du05	1.81	16.52	9.03	0.72	13.60	3.90	0.00	42.60
1202/1070r01du02	0.44	0.18	0.18	0.53	0.88	2.65	0.53	4.87
1216/1076r09du07	0.00	0.00	0.00	0.00	0.00	2.06	0.59	2.06
1192/1035r00du07	4.23	29.63	6.00	1.23	6.70	0.71	0.35	48.50

to Room 1 DU-3: very dense cereal grains and unidentified plants, and moderate amounts of other taxa. Clover especially is of similarly low density. The structure of Room 18 DU-8 is also similar to the floors of Rooms 1 and 8: a series of (3) dark patches rich in burned organic material (the flotation sample came from SU-17). These patches, like those in Room 1 and Room 8, are not as well-defined as the hearth structure in Room 17. Room 18 only contained a single (identified) pottery type, H, also similar to Room 8.

The DU-13 floor from unit 1235/1056 (Level 4) *is more similar in plant distribution to* the dumps from 1192/1035 than to the other floors: it has a moderate density of cereal grains, higher chaff and somewhat higher fodder densities, and a low density of unidentified specimens. Structurally, it is somewhat distinct from the floors in rooms 1, 8, and 18 in that, while no well-defined hearths are present as in Room 17, the lenses of dark ashy material are more sharply separated from other areas of clean sand than the indistinct patches of the other rooms. The ceramic content is also somewhat unique: it contains several of the same bowls (types F, G, and H) found in the room 1, 8, and 18 floors, but relatively more Type C jars that are abundant in Room 17.

In most other rooms from all levels, plant densities are much lower. In some cases this is what one would expect. For example, Room 9, which contained numerous 'column bases' and no apparent connection to any kind of cooking activity, contained very little plant material of any kind. Room 12, however, contained numerous grinding stone fragments and a great deal of faunal material and seemed to be directly related to food preparation. However, DU-1 from Room 12 (a dump or possibly an intact floor assembiage) contained no cereal grains, and very little other plant material. The only burned material within these two upper layers (the DU-1 dump and the DU-2 floor) was a thin layer of blackened material within DU-2 and it is possible that while some form of food preparation may have occurred in this room little opportunity in the form of charring was afforded for the preservation of plant material.

Those rooms with brick storage pits -- 2, 5, and 13 -- contain relatively little plant material, but the generally moist conditions at the site and the absence of burning in any of these deposits (except Room 13 DU-3) precludes extensive preservation of organic matter. The burning evident in the pit structure in Room 13 (DU-3) seems conducive to plant preservation. The ceramic contents, primarily Type D bread platters, suggests this room's use as a bakery. If this interpretation is correct, the absence of plant remains is puzzling as the fuel used would certainly leave some charred plant remains.

The overall impression one gains from the evidence provided is of an area of mixed-use, much of it related to food storage, processing, and cooking. Different forms of cooking seem to have been practiced which may be distinguished by the types of fuel used. Room 17 (as derived from the unit 1192/1035 dumps) contained a distinct hearth structure, a specialized ceramic form (Type C jars), and a great deal of chaff and clover which one might expect if cattle dung were the primary fuel. Other rooms (1, 8, and 18) contained less-distinct areas of burning, more generalized ceramic forms, and high densities of unidentified plant types which might result from the use of various plant stems and brush for fuel.

Other rooms contained predictably low levels of plant material and probably had little to do with food processing. The storage facilities (rooms 2, 5, and 12) also contained little plant material, probably due to preservation factors. Lack of preservation may also be the cause for low plant remains in Room 12 which contained abundant other evidence of plant processing (grinding stones).

7.5 Summary of artifact patterns.

This section will examine patterns of co-occurrence between different artifact types and the implications such patterns have for individual room function and the overall functional complexity of the site.

Linear correlations between pairs of variables are difficult to assess. The distribution of artifacts often results in statistically significant correlations, but when plotted against one another the correlations are most often seen to be a function of a few outliers. For example, ceramic types C and E can be shown to be significantly correlated with ovicaprid remains ($r=0.633$ and 0.636, respectively; $p=0.000$). When these two pairs of variables are plotted against one another (e.g., Figure 7.7), one sees that most of the relationship is defined by the deposits from Room 17 and unit 1192/1035; most other deposits have few of either type. In many other cases a significant correlation coefficient is generated but the distributions are too scattered to suggest a truly linear relationship.

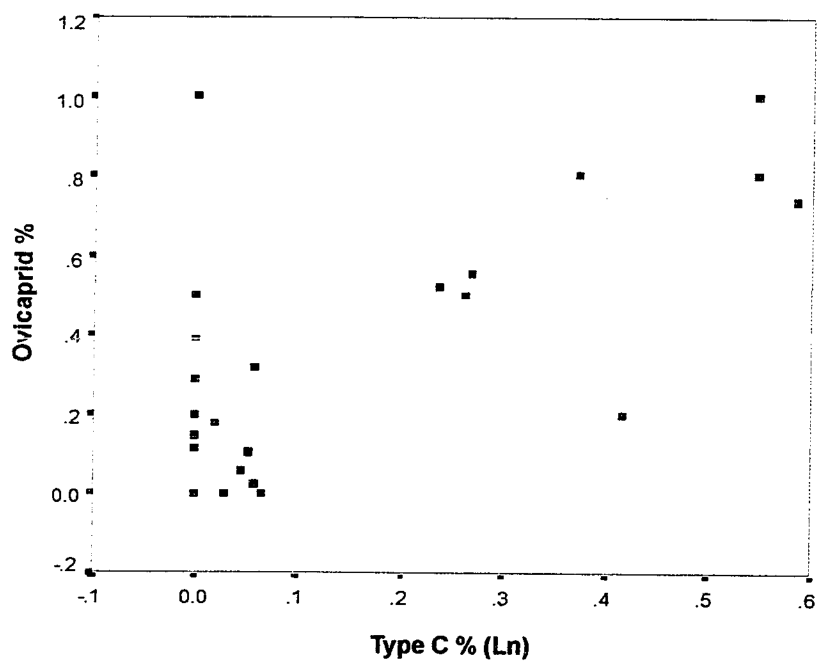

Figure 7.7. Plot of Type C ceramic proportions (logarithmically transformed) against ovicaprid proportions for Level 3 deposits. All of the points that appear to show a linear trend are from Room 17 and unit 1192/1035.

The cluster analyses above do show, however, that there is consistent patterning measured across different artifact categories in that several sets of deposits consistently clustered together (e.g., those from Room 17 and unit 1192/1035). This suggests that at least some artifacts co-occur discretely in space rather than continuously. The obvious implication of this observation is that, since the artifact classes are assumed to be primarily functional in nature, some degree of functional specialization is being observed.

An examination of artifact diversity is useful in explaining this patterning. Generally, discussion of artifact diversity is couched in the language of 'activities', the assumption being that co-occurring sets of artifacts are describing distinct activity sets. As with all other analyses conducted thus far, this lack of theoretical sophistication in the creation of units will result in some interpretive ambiguity (Dunnell 1989).

I argued earlier that the ceramic typology used herein is largely derived from functional concerns. Thus, spatial variation in ceramic distributions is likely reflecting different functions or suites of functions carried out in different structures. I further posit that rooms with a greater diversity of artifact types represent more functionally diverse structures. In this case, Room 17, which contains a few abundant ceramic types, would be considered more specialized than others containing a more even distribution of several types. The question remains as to whether variation in diversity is non-random. That is, do diversity indices vary more than one would expect if the underlying distribution of artifacts were distributed randomly across the site?

To test this, I created a series of simulated random samples using the observed proportions of ceramic types found at Kom el-Hisn. I determined the probability density function for each ceramic type (i.e., its proportion in the entire assemblage), and drew a series of 50 samples for a range of sample sizes from 1 to 300 based on these density functions. I then calculated the average richness and standard deviation for each sample size. In this case, richness was computed as the number of classes. I also calculated the average and standard deviation for evenness, which was measured using Σp_i^2, where p_i is the percentage of each type in the sample. This provided an expected range of values for richness and evenness for a randomly distributed set of ceramics based on the observed proportions. Consequently, any excavated unit whose richness or evenness index falls outside of two standard deviations can, with 95% confidence, be considered to be non-random.

Plots of the simulated random samples are shown in Figures 7.8ab and 7.9ab. The plot in Figure 7.8a, sample size against mean richness, shows that average richness increases fairly rapidly as sample size increases until the sample size reaches approximately 50-75 where it begins to level off. Figure 7.8b, sample size against standard deviation, shows a general trend downwards in the standard deviation which one would expect with increasing sample sizes, approaching 0.00 as the sample size nears the population size. Again, the standard deviation tends to stabilize when the sample size reaches approximately 50-75 sherds. A minimum sample of about 50 sherds is thus required before significance can be reliably assigned.

The behavior of the evenness measure (Figures 7.9a and b) shows that as sample size increases the evenness index (Figure 7.9a) approaches that of the population (0.1365). Very small samples, of course, have very high indices as they restrict the number of classes that can be represented. The standard deviation also decreases rapidly with sample size, again approaching 0.00 for sample sizes near the population size. Evenness measures are much less variable than richness, probably as a result of the inherently uneven distribution of the underlying population. The inflection point where evenness stabilizes is somewhat lower than for richness at approximately 25-50 sherds. For both measures, a conservative estimate for minimum reliable sample size is about 50 sherds.

Overlaying the actual richness values for Level 3 deposits on top of the simulated richness values for the same sample sizes reveals the variation from randomness that the actual distributions contain, shown in Figure 7.10a. The plots of evenness and sample size are shown in Figure 7.10b. It is readily apparent that several actual samples deviate substantially from their random counterparts. A total of 12 deposits deviate by more than two standard deviations (95% confidence interval) from the average of the simulated samples for richness values; 16 deposits deviate by more than two standard deviations from the simulated samples for evenness values. The two sets of deposits are compared in Table 7.2.

Note that the deposits are the same in each category except for Room 5 DU-12, unit 1166/1066 DU-4, and several deposits in unit 1192/1035. The Room 5 and unit

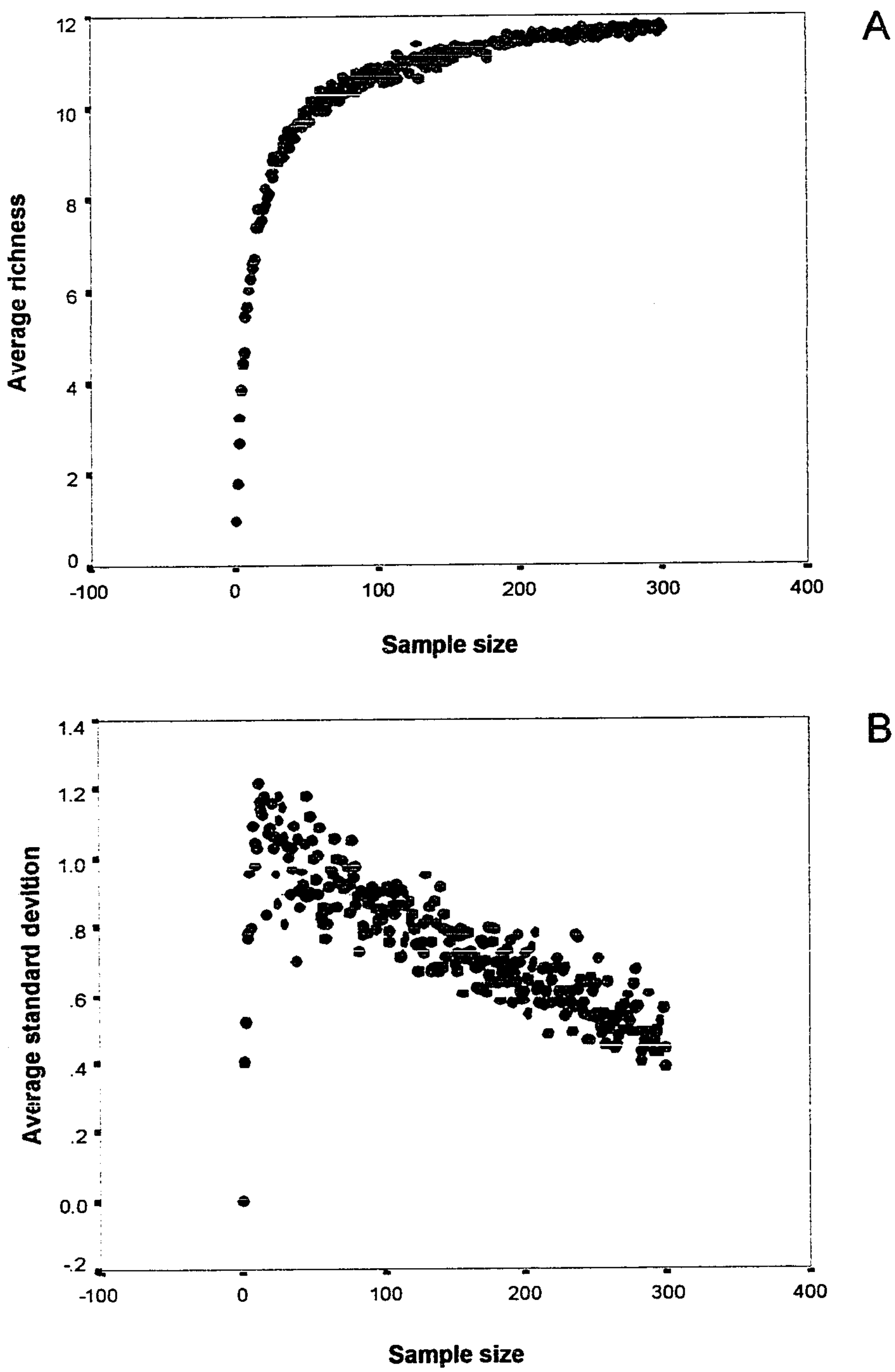

Figure 7.8a and b. Plots of average richness and standard deviation against sample size for simulated sample of Kom el-Hisn ceramic types.

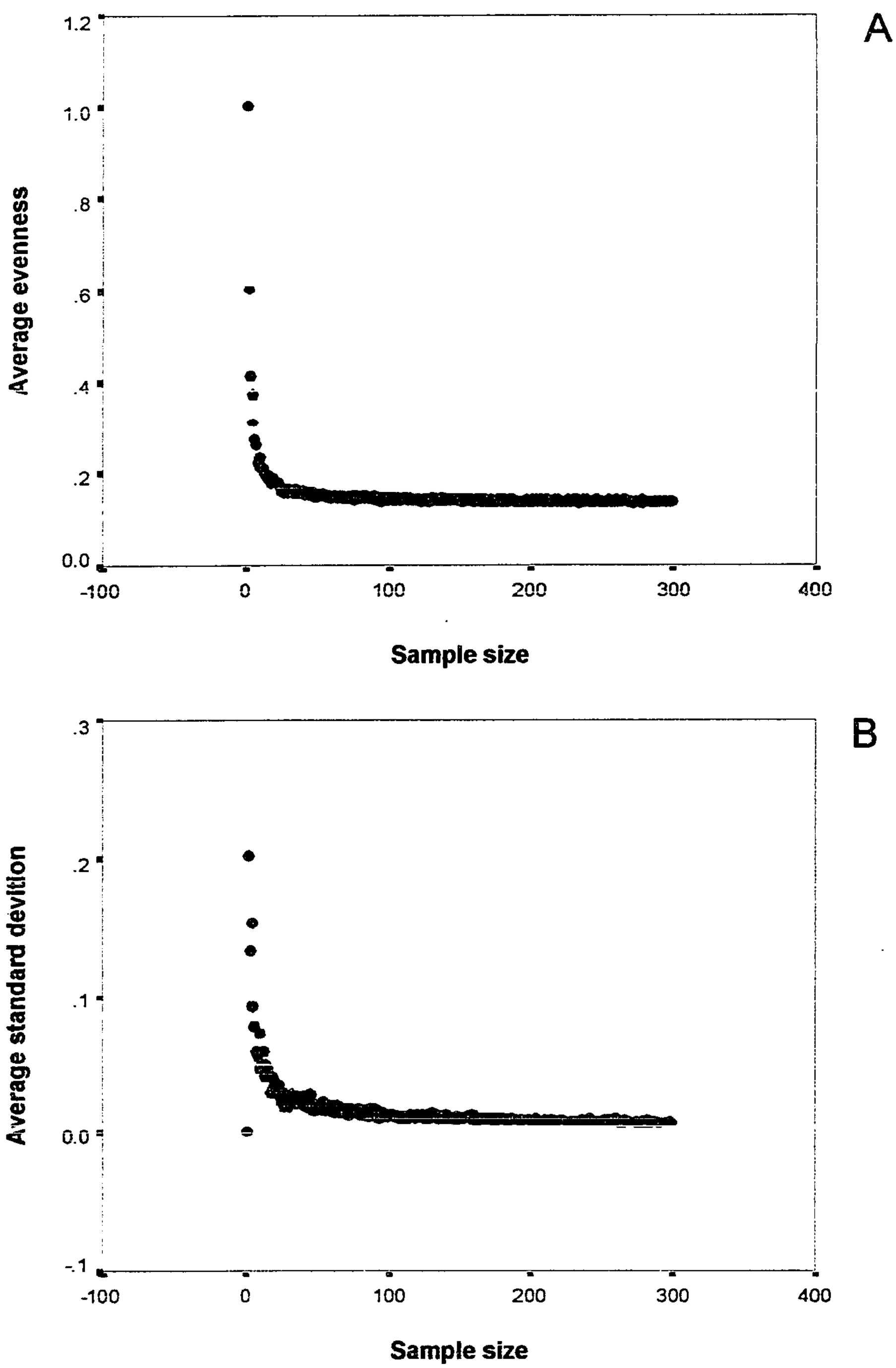

Figure 7.9a and b. Plots of average evenness and standard deviation against sample size for simulated sample of Kom el-Hisn ceramic types.

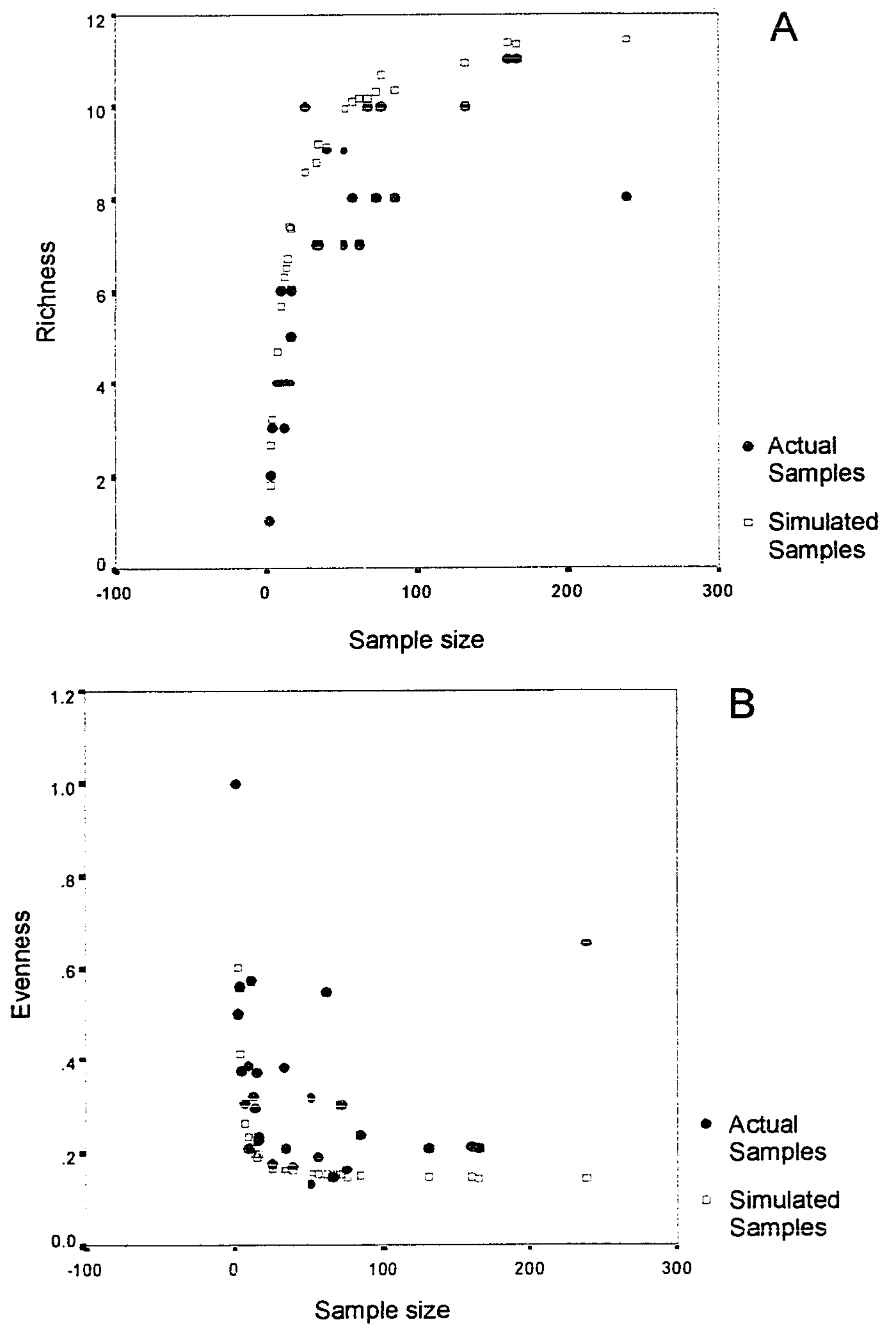

Figure 7.10a and b. Plots of sample size against richness and evenness for actual and simulated samples. Those actual samples that are more than two standard deviations from the simulated sample average are considered significant.

Table 7.2. Level 3 deposits that show significant deviation from expected values for richness or evenness given their sample size.

Richness		Evenness	
DU	Deposit type	DU	Deposit type
Room 1 DU-3	Floor	Room 1 DU-3	Floor
Room 5 DU-12	Floor		
Room 8 DU-4	Floor	Room 8 DU-4	Floor
Room 12 DU-2	Floor	Room 12 DU-2	Floor
Room 17 DU-3	Pit/hearth	Room 17 DU-3	Pit/hearth
Room 17 DU-4	Dump	Room 17 DU-4	Dump
Room 17 DU-5	Floor	Room 17 DU-5	Floor
Room 22 DU-2	Floor	Room 22 DU-2	Floor
1204/1060 DU-2	Dump	1204/1060 DU-2	Dump
1204/1060 DU-4	Dump	1204/1060 DU-4	Dump
1204/1060 DU-5	Dump	1204/1060 DU-5	Dump
1192/1035 DU-7	Dump	1192/1035 DU-4	Dump
		1192/1035 DU-5	Dump
		1192/1035 DU-6	Dump
		1192/1035 DU-7	Dump
		1192/1035 DU-8	Dump
		1166/1066 DU-4	Floor

1166/1066 deposits tended to be included or excluded depending on the particular simulation as they are close to the average cutoff for the 95% confidence interval. Also, all of the richness values that are significantly different from the simulated average are negative and all of the significant evenness values are positive. Thus, all of these deposits have fewer classes and are more uneven than expected compared to random distributions.

To determine which ceramic types were causing these discrepancies I ran the same simulation of random samples for each ceramic type individually. The same set of sample sizes (300) and trials (50) were used as for the richness and evenness values. For each sample size I generated an expected proportion (the average, which should and did approximate the percentage of the total assemblage for each type) and standard deviation. The percentage of each type in a deposit is compared to the average for that type and any percentage which falls outside of two standard deviations is considered significant.

The results (shown in Table 7.3) largely confirm the results gained earlier from cluster analyses. Taken together, the Room 17 deposits have higher than expected proportions of Types C and E and lower than expected proportions of Types B, D, G, H, and O. The dump deposits from unit 1192/1035 results are similar except that Types G and H have higher than expected frequencies in several of the units and Type K is higher than expected in DU-6. The deposits from other units are varied, but most contain lower than expected frequencies of type C. Three types of bowls (types G, H, and O) are more frequent in several of these deposits along with Type B jars and Type D platters.

An obvious question regards the distribution of deviation from normality for both of these measures: no deposits have significantly more classes or significantly more even distributions than expected. This richness pattern is similar to that observed at Broken K Pueblo by Schiffer (1989) who found depressed richness values in both floor and "fill" deposits. Schiffer argued that one plausible interpretation of this pattern results from the sherds of reconstructable (whole) vessels being counted as individual sherds rather than as a single unit. The presence of restorable vessels would tend to increase the number of sherds of that type giving the deposit a relatively lower overall richness value for a given sample size. Reconstructable pots are then taken as evidence that the floor

Table 7.3: Direction of significant deviation for the proportion of each ceramic type from the expected value for a given sample size. A -1 indicates the deposit had a lower than expected proportion, a 1 indicates a larger than expected proportion; missing values indicate the type did not deviated from the expected value.

	Ceramic type										
DU	A	B	C	D	E	F	G	H	I	K	L	O
1202/1070r01du03	.	.	-1	.	.	.	.	.	.	.	.	1
1212/1072r05du12	.	.	.	.	.	.	.	.	.	.	.	.
1216/1068r08du04	.	.	-1	.	.	.	1	.	.	.	.	.
1204/1060r00du02	.	.	-1	-1	.	.	.	1	.	.	.	.
1204/1060r00du04	.	.	.	.	.	.	.	1	.	.	.	.
1204/1060r00du05	.	.	-1	.	.	.	.	1	.	1	.	.
1214/1062r12du02	.	1	-1	.	.	.	.	-1	.	.	.	1
1156/1004r17du03	.	.	1	.	.	.	.	.	.	.	.	.
1156/1004r17du04	.	-1	1	-1	1	.	-1	-1	.	.	.	-1
1156/1004r17du05	.	.	1	.	.	.	-1	-1	.	.	.	.
1192/1035r00du04	.	-1	.	-1	1	.	.	1	.	.	.	-1
1192/1035r00du05	.	-1	.	-1	1	.	1	.	.	.	.	-1
1192/1035r00du06	.	-1	1	-1	.	.	1	1	.	1	.	-1
1192/1035r00du07	.	-1	1	-1	.	.	.	1	.	.	.	-1
1192/1035r00du08	.	.	1	.	.	.	.	1	.	.	.	.
1210/0788r22du02	.	.	-1	1	.	.	.	1	.	.	.	.
1166/1066r00du04	1	.	.	1	.	.	1	.	.	.	.	.

deposits in which these pots occur are "primary" floor assemblages, indicating that the pots are in their locations of use.

I suspect that a similar pattern may be represented at Kom el-Hisn albeit with different implications for site formation processes. Previous analyses have shown that Room 17 and unit 1192/1035 have similar distributions of ceramics, faunal remains, and plant taxa. Similar, though not as distinctive, patterns also exist between the floor deposits of Rooms 1, 6, and 8 and the dumps making up unit 1204/1060. All of these deposits (except for the floor in Room 6) have depressed richness indices and are more uneven than expected. If the "missed pot" hypothesis were correct, it would imply that some form of functional differentiation is evident within these room structures. Room 17 and its associated disposal area, unit 1192/1035 would be specialized in the use of types C and E, with the result that more whole or nearly whole pots would have been disposed of in these two areas. Similarly, the other rooms would be more specialized in the use of different sets of ceramic types. Rather than being indicators of "primary" or "secondary" refuse as Schiffer suggests, these patterns seem to describe patterns of use and discard in both contexts.

I believe the data presented supports this hypothesis. Room 17 contains a distinct hearth structure not found in other rooms with evidence of *in situ* cooking activities (e.g., the diffuse areas of burning and abundant charcoal in rooms 1, 6, and 8). Further, the two most abundant types in Room 17 – bread molds and coarse jars – exhibit characteristics suitable for cooking (i.e., resistance to thermal shock). Since both of these vessels were relatively cheap to manufacture it is not surprising that upon breakage they were readily curated to a nearby dump (unit 1192/1035). These deposits also contained quite distinctive faunal (mostly ovicaprids) and floral remains, the latter indicative of a specialized firing regime using animal (probably cattle) dung as fuel. While very few reconstructable pots were found, the distribution of vessel elements of Type C jars militates in favor of large numbers of whole or mostly whole vessels in Room 17 and unit 1192/1035. Type C jars are composed of rim sherds originally designated as Type 11, and bases originally assigned to Type 1A. Type 11 rim sherds have a fairly wide distribution in the Level 3 excavation units and rooms, occurring in 12 different rooms or units, of which Room 17 and unit 1192/1035 make up approximately 65% of the total number of sherds. Type 1A bases are only found in 4 total rooms or units, of which Room 17 and unit 1192/1035 make up 93% of the total. Clearly, bases are much more concentrated in these two units than in others suggesting that upon failure the entire vessel was discarded.

In contrast, Rooms 1 and 8 (and also 6) have a very different array of ceramics, concentrating on more finely made bowls which may have served as occasional cooking vessels, but more probably as serving or preparation vessels (see Chapter 6). The plant taxa from these rooms also suggests a more diverse set of fuels used in the cooking process. The faunal assemblages for these rooms also differs from Room 17, emphasizing pig, some ovicaprids, and minor components of fish and birds. Due to their depressed richness and uneven distributions, these rooms may also be considered as more specialized around a different set of functions compared to Room 17. The data suggest that some form of food preparation was carried on in these rooms, but perhaps of a more generalized nature than that found in Room 17. The dominant ceramic types, however, do not allow a more detailed analysis of the whole-pot content of these rooms.

Nothing in particular unites the remaining deposits with significantly deviating diversity values. Based on all other evidence they have varied functions. Room 12 seems to have been used for processing a variety of animals, and the large numbers of grinding stones indicates plant processing as well, though little plant material was found in this deposit (probably due to the absence of any firing regime to preserve them). The Room 5 deposit is associated with brick pit structures that presumably functioned as grain storage facilities. Its small ceramic assemblage (n=12) is composed mostly of three types of bowls, H, I and O. Room 22 contains a much wider array of ceramic types than the others, its unevenness largely accounted for by relatively abundant types D (bread platters) and H (Meidum bowls) and a generalized set of faunal remains (primarily pig) much like those in Rooms 8 and 1.

It is thus possible that different aspects of function have played a role in producing these distributions. The unusually large numbers of reconstructable vessels in Room 17 and unit 1192/1035 certainly contribute to the deviant richness and evenness values for these deposits, which is probably a function of both specialized activities and the stressful environment in which the vessels were used. Given the burning evident in the Room 1 and 3 deposits a similar functional environment may have contributed to the *in situ* breakage of a different suite of vessel types, though data on reconstructable vessels for these rooms is currently unavailable. The ceramic and other data from the remaining rooms indicate these also contained different sets of functions though without more detailed analysis of the artifacts themselves (e.g., wear) the exact nature of these functions is unclear.

8.0. Discussion and summary.

The foregoing analyses have shown at least four and possibly five episodes of use of the Old Kingdom portion of the excavated area, not all of which were for strictly habitation purposes. This is consistent with the pattern of occupation found by Giddy (1987) at Ayn Asil where building periods were interrupted by abandonment of a portion of the site, the abandoned portion being used for temporary habitation or refuse disposal. In this chapter I will first summarize the depositional history and spatial patterns in the Old Kingdom levels of Kom el-Hisn, compare this pattern to other settlements, and discuss how Kom el-Hisn functioned in the context of the larger Old Kingdom society.

8.1 Occupational history.

Level 0: The majority of Level 0 deposits are part of the Upper Pottery Layer and are thus distributed over most of the upper levels of the site. Apart from the UPL, most of this level's deposits are restricted to a small portion of Middle Kingdom deposits in the southeastern part of the site near unit 1261-3/1074 and 1219/1095. Most of these deposits are dumps or redeposited dumps.

Level 1: This level is the topmost in the stratigraphic section and consists largely of dumps (eight total) along with one wall collapse deposit and a series of column bases in Room 9. Four of the ten deposits from this level come from Room 9, which contains an apparent short-term occupation after the room had begun to collapse. The dumps from this level are all characterized by typical Old Kingdom ceramics and are usually separated from the underlying Level 3 habitation deposits by one or more strata of wall collapse deposits. That these dumps and other deposits are not directly related to the habitation structures of Level 3 is indicated most clearly by the sequence in Room 9. In this case, the floor associated with the structure (DU-7) is covered by two deposits of wall collapse material, the topmost one (DU-5) being heavily decomposed wall material indicating that some time had elapsed since the abandonment of the structure. Two dump deposits (DU-3 and DU-4) were directly on top of this wall material which were in turn covered by the column bases, interpreted as a brief occupation. Similar sequences occur in Rooms 4, 5, and 6 where these types of dump deposits also occur. The obvious implication is that the structures had been allowed to decay for some period of time before dumping of refuse from other parts of the site were deposited within the partially collapsed structures. There is no pattern evident as to where this level's deposits occur.

The synchronicity of the various deposits assigned to Level 1 is somewhat conjectural at this point since chronological control is not fine enough yet to seriate individual deposits. Consequently, that all Level 1 deposits are contemporaneous remains a working hypothesis, yet it seems clear that they all post-date the main Level 3 occupations to one degree or another.

Level 2: The few deposits of this level are all directly associated with various adult and child burials. All of the burials found in this level are intrusive to the Level 3 deposits. This is especially clear in the case of the Room 15 tomb. The tomb structure itself was constructed within the confines of a large Level 3 room structure (of which Room 10 is a part). Thus, all deposits within this tomb can be assumed to be later than Level 3. The dump in the Room 15 tomb (DU-3) was sandwiched between two episodes of wall collapse derived from the tomb structure itself. This dump also contained typical Old Kingdom ceramics. Therefore, the burial itself and the wall collapse derived from the tomb structure (DU-2 and DU-4) were all assigned to Level 2, while the DU-3 dump, having been formed initially after the walls, was assigned to Level 1. Again, the contemporaneity of this dump with other Level 1 deposits is somewhat hypothetical and requires further examination.

None of the child burials contained obvious grave goods or coffin material and seem to have just been placed within the abandoned structures and then covered with nearby sediment (usually wall material). Of the adult burials, only one contained an object directly and unambiguously associated with the occupant, a bronze or copper mirror found in Room 15 directly atop the skeleton. All of the adult burials had evidence of coffin plaster surrounding the bodies. Two of these adults, Rooms 15 and 20, were contained in mud brick tomb structures. The male in Room 20 was disturbed by later excavation/*sebakhin* activity and any grave goods associated with the upper half of the body would have been removed with that portion of the skeleton.

The obviously intrusive nature of all of the burials with respect to the Level 3 habitation structures points to post-abandonment use of this area as a cemetery. Dumps overlying these burials are usually separated by some wall collapse indicating that some time also elapsed between the burials and episodes of refuse disposal. Since the dumps overlying the burials are of Old Kingdom date, the burials are necessarily Old Kingdom as well. Beyond setting a terminal date of the end of the Old Kingdom for this sequence, chronological control is inadequate to set specific dates for these events.

Level 3: These are the main occupations associated with the excavated Old Kingdom structures. Most of the structures were located within the top 10-20 cm of the surface below the capping UPL. Most of the architecture presents a fairly coherent structure (see foldout map). From the architectural features and artifact analyses in preceding chapters, I would argue that this set of rooms is at least part of a larger functional unit primarily devoted to the preparation and distribution of food. It is not clear whether this is part of a larger habitation unit as yet uncovered or is a service area providing for residents in another part of the site. However, the functional differentiation of the rooms militates in favor of a set of functionally interdependent structures.

Three rooms contain brick pit structures presumably used for storing grain. These rooms – 2, 5, and the room directly north of Room 5 and not used in this analysis – are all clustered towards the northeastern part of the room block. The artifact contents of the rooms containing these pit structures are not particularly informative. Ceramics are generally sparse and not distinctive either in the floors or the pits themselves. The same is true of lithics, although two deposits from Room 5 (DU-6 and DU-10) contained distinctive globular chert nodules with rubbing wear on several faces. The function of these objects is unclear and not related to the pit structures in any obvious way. Plant remains were also sparse in these rooms as a result of there being no burning evident and hence little chance for preservation. Apart from the structures themselves about the only thing these rooms/pit structures have in common are the presence of fish cranial elements in the pits themselves which were probably dumped there when the main function of the pits was complete.

Room 12 had a distinctive set of artifactual and faunal remains. It contained numerous ground stone fragments, most of which were of a single type of stone (sandstone) and seem to represent both upper (mano) and lower (metate) parts of grinding apparatus. All of these were found in the southern portion of the room along with many of the faunal remains. Evidence that at least some of the grinding stone fragments are in their use locations is indicated by specimen #8 from this room, a thick, loaf-shaped fragment of a metate found resting on a clay setting. This room is also relatively rich in faunal remains containing nine different species, a large number of which are fish. A large portion of a *Trionyx* skeleton was also found in this room. The ceramics from this room are predominantly bowls, notably Types F (flared bowls), I (bowls with a molded rim), and O (small bowls), but also jars of Types B and C. The absence of either bread mold (Types D and E) indicates that if grain was being processed in this room it was not being subsequently used in the preparation of bread/beer in this location.

Nevertheless, the presence of grinding stones in apparent use locations and a wide variety of faunal remains, including a generally rare *Trionyx*, suggests this room functioned as a processing location for grain and animal foodstuffs. No evidence of cooking of this material was present which probably accounts for the lack of plant remains from this room.

The adjacent room, 13, is markedly different. The species richness and distribution for this room is similar to that of Room 12 but most of the faunal remains from Room 13 came from a wall collapse deposit that may contain some later dump material; the floor associated with this room contained no faunal remains and the circular brick structure contained only a single ovicaprid bone. The ceramics associated with this room tend to be large, heavy types, either Type D Bread platters or Type E Bread molds. Either of these types are associated with bread baking. As noted in the general description of this room, the ceramics and mud brick structure argue for a bakery as the sole function of this room. Its immediate proximity to Room 12's grain processing facilities, of course, indicates that at least some of the grain processed in Room 12 found its way into the bread oven next door.

The only other room for which a specific function can be reasonably inferred is Room 17. The faunal and ceramic distributions for this room are very distinctive from all other rooms. It is one of only two rooms where ovicaprid remains outnumber pigs, the other being Room 22 (ovicaprids also outnumber pigs in the dump deposits of unit 1192/1035). It is also only one of a handful of rooms where Type L contracting-mouth bowls are found in relatively high abundance. Further, the plant assemblage from the hearth and floor deposits contains a suite of taxa more consistent with the use of cattle dung as a fuel (Moens and Wetterstrom 1988). The co-occurrence of constructed hearth features, a distinctive set of faunal remains, and ceramic types (C and E) that are typically associated with cooking and whose physical properties are suited for such a regime suggest a fairly specialized function for this room, in this case cooking. Nearby, a series of dump deposits in a topographic depression, unit 1192/1035, have similar distributions of ceramics and faunal remains. The obvious implication is that the refuse from Room 17 was transported to 1192/1035 and dumped there. This short-distance transport of refuse indicates, following Hoffman (1974), a non-elite area of activity, though the goods and services produced here may have been meant for elite use.

Room 17 also contained abundant sickle blades, two fragments of a bifacial knife, and numerous blade blanks. This was also one of the few rooms where debitage was found (Cagle 1991). Consequently, at least some stone tool maintenance activities and possibly the production (from pre-existing blades) of sickles were carried out in Room 17.

Redding (1991, 1992, ND) has discussed the significance of different species in the Old Kingdom Egyptian diet. He suggests that, prior to the New Kingdom, pigs were kept and maintained by local populations (that is, the non-elites) primarily as a low-cost protein source, while ovicaprids were kept for their milk and wool with only a portion culled out and consumed primarily by the higher classes. Assuming that Room 17 is a specialized cooking facility with access to high quality fuel, it is reasonable to further posit that the output of this room's products were intended for elite individuals, perhaps administrators or other specialists.

This is contrasted with other rooms with clear evidence of cooking (Rooms 1 and 8) where pigs dominate and the plant taxa are more indicative of a variety of plant fuels, such as stems and brush. What other functions these rooms may have performed (apart from open-fire cooking) is not clear from the artifact, faunal, or floral material. Both of these rooms contain ceramic types G (Bent-sided bowls), I (Bowls with molded rims), and a large number of Type O small bowls. Room 3 DU-1 adds Type D (Bread platters), while Room 8 DU-4 substitutes Type H (Meidum bowls) and B (Pointed jars). These may all be considered as generalized serving wares.

Other Level 3 structures are difficult to interpret. The curving wall that defines Room 7 does not appear to be related to the rooms on either side (Room 4 to the north or unit

1220/1072 to the south. None of the artifact classes distinguish it in any way, and there are no consistent similarities to other rooms. The charcoal flecking in the DU-2 floor may represent some small amount of food preparation (cooking) but the lack of specific burned areas argues against any form of hearth. Similarly, Rooms 6 and 8 show no distinctive patterns. These two rooms may have originally formed a single unit, but was later divided into two separate rooms.

The two structures excavated in the far western part of the site, Rooms 22 and 23, are problematic. No real features were uncovered during excavation apart from two diffuse lenses of burned material in Room 22 DU-2. These burned areas are somewhat similar to the patches found in Room 1 DU-3 which were interpreted as open-hearth cooking areas. The ceramic assemblages from these two rooms represent a fairly generalized set of types. Most of the bowls are represented with especially high numbers of Type H (Meidum bowls). Type D (Bread platters) are also fairly abundant. This distribution is quite different from that of Room 1 DU-3, but somewhat similar to that of Room 12 DU-2 with which these deposits were clustered. The faunal remains are somewhat similar to those of Room 17 in having a relatively equal number of pig and ovicaprids though in Room 22 this is based on only three identified specimens. This room also contained a distinctive net weight, two grinding stone fragments, and several other ground stone fragments. Floral remains are available from Room 23 DU-2 only and these are low density across all categories.

The overall impression one gains from these two rooms is that they functioned in ways distinct from those in the other portions of the site. Individual artifact distributions resemble one or another of the rooms in the main occupation area, but these similarities do not carry over to other artifact categories. The ceramics argue more for a generalized set of functions rather than the specialized character of the rooms in the other area, perhaps containing a few activities (evidenced by the net weight) not present in the other excavated areas. Clearly, however, there is some major disjunction in the use of space between these two areas.

Level 4: This level represents 38 deposits from ten excavation units. All of these were defined by their relation to the uppermost architecture in a unit, or their depth relative to similar deposits in other excavation units. Most of these deposits are overlain directly by

Level 3 structures. Substantial exposures occur in units 1235/1056 and 1166/1066. For the most part, however, Level 4 deposits consist of some form of wall collapse lying below the Level 3 architecture. All ceramic types are present though in generally low numbers, except for Type C (Bread molds) and Type B jars, the latter of which is very abundant in the floor of Room 4 DU-7. The overall distribution of faunal remains is also fairly similar with pigs dominating the mammalian element and fish as a secondary component.

Because of the paucity of deposits no spatial patterns are observable. However, several aspects of Room 18 DU-8 are similar to some Level 3 deposits. This DU contains several distinct patches of burned material which are interpreted as open-air hearths. The plant component of Room 18 DU-8 is very similar to that from other similar black patches in Room 1 DU-3: a large percentage of unidentified plant taxa together with a relatively high proportion of cereal grains and low numbers of other plants. In Room 1 (and Room 8) this type of deposit and distribution of plant taxa was interpreted as a generalized cooking area using a mix of fuels in the form of stems and brush, compared with the more specialized facilities in Room 17.

8.2 Architecture.

The architectural plan shown in the foldout map indicates that there may be two distinct areas represented in the main occupation area. These two areas are separated by a large wall running north-south along Rooms 8, 6, and 18 to the west and along Rooms 4, 5, 7, and unit 1220/1072 to the east.

The series of rooms to the west of this wall constitute a coherent larger structure consisting of Rooms 6, 8, 10, 12, and 13. The only entrance to this block of rooms apparent from the visible architecture is along the south wall near the empty space south of Room 8. The main room in this block was not defined as a single entity but is L-shaped with the northern arm excavated as Rooms 6 and 8. This large L-shaped room offers entrance to Room 13 and that containing Room 10 (hereafter, this larger structure containing Room 10 and the Room 15 tomb will be referred to as Room 10). Access to Room 12 is gained only via Room 10 and perhaps through a possible doorway in the northwest corner of Room 12. Thus, this block consists of four main rooms, with the wall between Rooms 6 and 8 being built sometime during Level 3 to split this northern wing of the L-shaped room in two.

The functions of Rooms 6 and 8 are unknown but to some extent were used for cooking over an open fire. Room 13 is thought to be a bakery and Room 12 was probably used for plant and animal processing. The deposits from the excavated portion of Room 10 are not associated with the Level 3 occupation of this structure but represent a mix of wall debris from the construction and subsequent collapse of the Level 2 tomb structure built within it (Room 15).

The eastern block of rooms is less coherent overall, but some structure is seen in the northern half, comprised of Rooms 2 and 3/5 and the structure immediately to the north of Room 5. The jumbled nature of the visible mud bricks makes interpretation of the overall structure difficult. There do not appear to be any connections between these structures and those to the west. Entrance to Room 5 may have been gained through what appears to be a doorway in the center of the south wall and through the southwest corner of Room 2. Rooms 3 and 5 comprise a larger structure in which the individual rooms were divided by a short wall. Room 3 may also have been further subdivided into two very small sections by the divider projecting from the east wall of that room. Entrance to the room to the west of Room 2 (unexcavated in depth) seems to have been gained only via Room 2. The "pavement" to the north of this room may be the north wall of that room that fell over largely intact. The structures to the south of these four rooms (Rooms 4 and 7 and unit 1220/1072) do not have sufficient visible architecture to relate them to the overall structure.

All of the northern four rooms have specially constructed storage pits associated with them. Altogether, this block of four rooms contains at least six pits constructed of mud brick: three in Room 5, one in Room 2, and two visible in the unexcavated room. The distribution of ceramic types in Rooms 2 and 5 are similar with a wide range of types, but Room 3 only contains only types H, K, and O, suggesting that Room 3 may have performed some specialized function within the larger scheme of grain storage.

The structures to the south have no readily discernible function. The Level 3 deposits of Room 4 contain no detectable floor, which may have been obscured by the activities associated with the later infant burial in this room. The curving structure of Room 7 may be associated with Room 4 but, as indicated above, the artifact inventory and the character of the deposits does not suggest any particular function. The deposits in unit 1220/1072 are probably part of a shallow depression in which debris from adjacent structures washed in.

The most inscrutable room in this complex is Room 9. This room, which lies just east of Rooms 4 and 7, contains few occupational debris. The floor consists of a series of rectangular hard-clay structures provisionally interpreted as column bases. Because only a portion of this room was excavated no relation to the other structures in this area is available. However, it is the only room where no evidence of food preparation or consumption is evident. This may be only a portion of a much larger structure reminiscent of the columned porticoes observed fronting the residence blocks at Abydos (for example, Figure 8, p. 15 in Wegner 1998). If this is the case, then the structures in the main excavated areas may be the support structures for as-yet-unexcavated habitation units to the east.

Based on reports of earlier investigators (Edgar 1915-1919; Griffith 1888) the structure of the site as a whole probably consisted of a large oval or circular enclosure wall with a principle temple or administration complex located to the west under the modern village. As at other large towns, such as Abusir and Giza, this administrative district would be surrounded by a complex of buildings housing the administrators and their support staff. The habitation areas of these centrally administered pyramid/temple towns generally consisted of distinct blocks of residential units with repeating room units. The example of the village adjacent to the tomb of Khentkawes given in Chapter 2 has each residential block consisting of 3-4 rooms containing a grain storage room, kitchen area, and a larger general habitation room. This is contrasted somewhat by the larger, more centrally-planned towns of the Middle Kingdom such as at Kahun (David 1986; Petrie 1890, 1891) where room blocks were larger and contained courtyards, columned porticoes, living quarters, and ancillary rooms containing bakery-breweries, granaries, butcheries, etc.

The structure of the excavated areas described herein appears to be closer to the Middle Kingdom model. The east and west sets of rooms may each service a different set of people and the excavations coincidentally straddled two distinct functional areas of each. However, because of the limited extent of the uncovered architecture, these two sets of rooms may be related after all, with access to both obtained by other entrances to the north or south of the excavated areas. If this were the case, and if the columned area of Room 9 represents the habitation area associated with these other rooms, then a case could be made that what we have uncovered are the support areas that service inhabitants of further structures to the east.

The number of rooms represented here is larger than the blocks of 3-4 rooms described for the other Old Kingdom towns around Giza and Abusir. In these cases, the basic habitation unit was relatively small and probably only serviced a few people, perhaps a single family. Here, there seems to be a larger supported unit. That three separate rooms are devoted to grain storage seems to imply more than a few members of a single family. Food preparation is also divided between the intensive features of Room 17 (sharply defined hearths, cattle dung for fuel, and a higher percentage of ovicaprids) and the more generalized cooking areas represented by Rooms 3 and 8 (diffuse hearth areas, a variety of fuels, and a dominance of pig). Minimally, food preparation was directed at two different groups of people. As Redding (ND) suggests, this could reflect a more elite diet which included more ovicaprids contrasted with a commoner diet of predominantly pig.

That there is functional differentiation in such a restricted area implies that this was not a centralized area of industrial activity servicing the entire site such as is found at Hierakonpolis earlier. Rather, it seems more analogous to the structure at Kahun where large room blocks were devoted to an elite family or set of families and their attendant workers. However, at Kahun, each habitation block was more self-sufficient than that which obtains at Kom el-Hisn in that it contained numerous areas devoted to a wider range of activities such as weaving, carpentry areas, etc. While many of these activities may have left no material evidence at Kom el-Hisn, the rooms here tend to be centered around food preparation rather than a complete set of activities.

I interpret this to mean that Kom el-Hisn was in some ways dependent on the surrounding economy for much of its subsistence needs and partly independent of it. Pigs apparently were raised and consumed by some of the resident staff, implying that the residents themselves were not directly involved in intensive agriculture, though the presence of numerous sickle blades in various states of use and manufacture argues for some involvement. This militates in favor of their obtaining much of their grain from local fields rather than as assignments from the central government. However, it also seems reasonable to assume that since the residents were involved in the harvesting of grain that the fields were the property of the residents. Pious foundations often included tracts of land for support of the cult and this could have included fields for growing food to support the human population as well as grazing land or for growing fodder.

The presence of locally obtained fish and at least one net weight further indicates that some of the residents were involved directly with procuring local resources. However, many other resources, such as marine fish and stone, had to have been obtained from a distance. The ovicaprid data also suggest that many of these animals were exported rather than being consumed locally. The same is true of bovid remains. Thus, Kom el-Hisn was also involved in trade of a more national nature, perhaps trading sheep/goat or excess agricultural produce for non-locally available materials.

Rather than being an isolated island of state control, I would argue that Kom el-Hisn formed something of a middle ground between complete integration with the local economy and total independence of it. This model has textual support from the Middle Kingdom temple complex at Kahun where some papyri deal with business involving the surrounding community (see Chapter 2) while others involved strictly temple business.

This interpretation may shed light on the question of who the residents actually were. In some of the Old Kingdom pyramid towns, such as Abusir, the priest inhabitants were in residence for short periods of time rather than full-time inhabitants. The habitation blocks associated with these towns tended to be smaller with only a few rooms devoted to each household unit. Later in the Middle Kingdom residents inhabited the buildings full-time and the support structures were much larger and more complex. As I have suggested, the room structure presented here seems closer to the Middle Kingdom model but probably not as elaborate, having more to do with immediate subsistence needs rather than the full range of activities required for a family unit to be entirely self-sufficient. The differential distribution of ovicaprid and pig remains suggests that at least two populations were actively inhabiting Kom el-Hisn: one group of elites most likely engaged in non-subsistence activities, and another of support staff probably drawn from the surrounding population who provided for some of their own subsistence needs through the maintenance of herds of pigs.

This model implies that the residents were not involved in full-time agricultural production and required an ancillary population of support staff to provide subsistence and other domestic needs. Some of the surrounding land was part of the town's property and provided forage for animals and perhaps produce for the local population. This specialization required some dependence on an extra-local economy for some basic goods and services, which I have argued was a combination of direct procurement of local resources (e.g., fishing), use of local labor, and some long-distance trade/exchange nationally. The exact nature of the duties of the elite residents is not a settled issue. The data presented here lend some additional support to the hypothesis that one of the functions of Kom el-Hisn was as a specialized center for cattle production related in some way to the Estate of the Cattle. The close association with Hathor may also suggest the presence of a cult center at Kom el-Hisn.

This scenario of a major center involved in both the local and national economy lends some support to Trigger's 'territorial state' model and to Kemp's (1983) suggestion that active local economies operated alongside a national system of redistribution of certain goods. While no direct evidence of a strictly appropriative relationship between Kom el-Hisn and the central government has been presented, the fact that it was not wholly self-sufficient in basic goods and services suggests that at least one substantial Old Kingdom community was at least partly left to fend for itself apart from the national state structure.

In terms of developing a general explanatory theory for the development of complex societies, I have argued that Darwinian evolutionary theory can be a productive framework from which to develop appropriate models. If, as Dunnell (1978a, 1978c, 1995) and Dunnell and Wenke (1979) argue, the development of complex society is a result of the scale of selection moving from the individual to groups of functionally interdependent individuals, then determining the empirical units on which selection occurs is of utmost importance. This is the principle methodological problem dealt with by this research.

When dealing with a complex society such as Old Kingdom Egypt, if one accepts that the evolutionary "individual" is an aggregate of functionally differentiated individuals, then the data one uses to describe those individuals are aggregate data as well. In this case, the aggregate data are the phenotypic expression of the individuals: artifacts and other cultural remains. A key issue involves how the aggregate data were created; that is, do they represent a set of functionally relevant units and are they historically related to one another such that their spatial distributions represent their systemic (*sensu* Schiffer 1972) context?

I addressed the former question by using existing artifact types that are (arguably) largely functional in nature. This provided a basis for arguing that the spatial variation observed is, in fact, functional. I then attempted to establish the historical relations between the artifact types by using sedimentary principles that defined the spatial and temporal relationships between the deposits in which artifacts were physically aggregated. Thus, the aggregate data used to establish functional differentiation are derived empirically from the depositional events that created the assemblage rather than assigned by simple (contemporary) proximity. This strategy is largely in line with much current work involving formation processes. Where it differs is in the attention paid to the depositional history of the deposit as a whole rather than the inferred depositional histories of individual artifacts contained therein.

This study is a first step in establishing a set of units that can be used to explain the development of complex societies within a theoretical framework that can be used in truly cross-cultural fashion. Much further work at Kom el-Hisn and elsewhere is needed to refine the model developed here. Certainly, more rigorous analytic units can be created, units that unambiguously differentiate between homologous and analogous similarity. Once a set of appropriate functional and stylistic classes have been developed, the former may be used to explore functional differentiation in much more detail, while the latter can assist in establishing better chronological controls through seriation analyses and perhaps elucidating the types of social interaction that took place across the site as well. This research has, I believe, provided a sound basis for further exploration of many of these issues of more general archaeological importance.

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Appendix I: Deposit data.

The following tables contain the basic data on which the foregoing analyses were based. Coordinate data for each DU are either to the southwest datum stake for 1986 units (all designated with ""r00" for Room-00, except for 1220/1072) or an arbitrary datum stake outside of the room structure for 1988 units.

Table I.1 contains basic descriptive data for each DU including the assigned Level, deposit type, paradigmatic classification (defined in Section 4.2, pp. 59-60), and the volume of the DU in cubic meters. Table I.2 contains ceramic data for each DU; the weights (in kg) are for each fabric type (Nile A, B, and C) for body sherds, and the counts show the number of typed diagnostic sherds. Tables I.3a and b show the NISP for mammal taxa (I.3a) and fish, bird, and reptile taxa (I.3b). Tables I.4a, b, and c have the data for all stone objects including debitage (I.4a), retouched tools (I.4b), and other ground stone objects (I.4c).

Table I.5 contains the raw data on plant remains by DU. Only those DU's that were analyzed by either Moens and Wetterstrom or D'Andrea and are part of the deposits used in this study are presented here. The data represent numbers of identified specimens (NISP) and the sample weight is the weight of the original sediment sample in kilograms.

Table I.1: Descriptive deposit data. The 'Class' variable is defined by the dimensions described in Section 4.2, pages 59-60. Volume is measured in cubic meters.

DU	LEVEL	DEPTYPE	Class	VOLUME
1156/1004r17du01	3	Wall Collapse	12110	3.87
1156/1004r17du02	3	Wall Collapse	12211	2.775
1156/1004r17du03	3	PIT	12202	0.105
1156/1004r17du04	3	Dump	11200	0.735
1156/1004r17du05	3	Floor	21200	0.81
1156/1004r17du06	4	Decomposed Wall Collapse	11200	1.77
1156/1004r17du07	4	Dump	12001	0.01
1156/1004r17du08	4	PIT	12202	0.21
1160/1002r20du01	2	UPL	12210	0.8625
1166/1066r00du01	3	UPL	11200	0.255
1166/1066r00du02	3	Wall Collapse	11110	1.47
1166/1066r00du04	3	Floor	12202	0.18
1166/1066r00du05	4	Decomposed Wall Collapse	12210	0.765
1166/1066r00du06	4	Wall Collapse	11110	1.155
1166/1066r00du07	4	Floor	12200	0.06
1192/1035r00du01	0	UPL	11200	0.585
1192/1035r00du02	0	Fluvial	12000	0.0075
1192/1035r00du03	0	Redeposited Dump	22201	1.8525
1192/1035r00du04	3	Redeposited Dump	21211	2.1975
1192/1035r00du05	3	Dump	12211	1.0125
1192/1035r00du06	3	Dump	11211	0.705
1192/1035r00du07	3	Dump	12210	0.9075
1192/1035r00du08	3	Dump	11201	0.135
1202/1070r01du01	3	Wall Collapse	12111	0.195
1202/1070r01du02	3	PIT	11010	0.015
1202/1070r01du03	3	Floor	22201	0.615
1202/1070r01du04	4	Dump	12200	0.9525
1202/1070r01du05	4	Wall (Intact)	32120	0.195
1204/1060r00du01	0	UPL	11200	0.2775
1204/1060r00du02	3	Redeposited Dump	22210	1.1475
1204/1060r00du03	3	Redeposited Wall Collapse	12110	0.375
1204/1060r00du04	3	Redeposited Dump	22210	0.4425
1204/1060r00du05	3	Redeposited Dump	12210	1.0275
1204/1060r00du06	3	Redeposited Wall Collapse	12110	0.2025
1204/1060r00du07	3	Fluvial	22000	1.83375
1208/1068r18du01	0	Dump	22201	0.195
1208/1068r18du02	3	Wall Collapse	12111	2.33
1208/1068r18du03	3	Floor	22001	0.29
1208/1068r18du04	3	Wall Collapse	12110	1.4
1208/1068r18du05	4	Floor	12201	0.08
1208/1068r18du06	4	Wall Collapse	12210	0.97
1208/1068r18du07	4	Wall Collapse	12110	0.62
1208/1068r18du08	4	Floor	12201	0.08
1208/1068r18du09	5	Wall Collapse	12110	0.63

(continued)

(Table I.1 continued)

DU	LEVEL	DEPTYPE	Class	VOLUME
1208/1068r18du10	4	Decomposed Wall Collapse	12000	0.08
1208/1074r02du01	0	UPL	11200	0.915
1208/1074r02du02	3	Wall Collapse	11111	0.735
1208/1074r02du03	3	Wall Collapse	12210	0.39
1208/1074r02du04	3	Floor	22000	0.13
1208/1074r02du05	3	Floor	12000	0.47
1208/1074r02du06	3	PIT	12302	0.01
1208/1074r02du07	3	PIT	12000	0.01
1208/1074r02du08	3	PIT	12000	0.01
1210/0788r22du01	3	Wall Collapse	12210	1.605
1210/0788r22du02	3	Floor	12201	2.37
1212/1052r16du01	3	Wall Collapse	12211	0.83
1212/1064r10du01	1	Wall Collapse	12111	1.035
1212/1064r10du02	1	Redeposited Dump	22001	1.62
1212/1068r06du01	3	Wall Collapse	12210	1.9875
1212/1068r06du02	1	Dump	12201	0.36
1212/1068r06du03	3	Wall Collapse	12210	0.045
1212/1068r06du04	3	Decomposed Wall Collapse	12000	1.14
1212/1068r06du05	3	Floor	11200	0.045
1212/1072r05du01	0	UPL	11200	0.9
1212/1072r05du02	2	Burial	11301	0.57
1212/1072r05du03	3	Wall Collapse	12110	0.225
1212/1072r05du04	1	Dump	11201	0.09
1212/1072r05du05	3	Wall Collapse	12210	0.1575
1212/1072r05du06	3	Floor	22200	0.33
1212/1072r05du07	3	Floor	12200	1.095
1212/1072r05du08	3	PIT	32110	0.075
1212/1072r05du09	3	PIT	12200	0.014
1212/1072r05du10	3	Floor	21201	3.93
1212/1072r05du11	3	PIT	11202	0.045
1212/1072r05du12	3	Floor	22201	1.035
1212/1074r03du01	3	Wall Collapse	12110	1.26
1214/0788r23du01	3	Dump	12201	0.9
1214/0788r23du02	3	Floor	22201	1.425
1214/0788r23du03	4	Redeposited Wall Collapse	22011	1.89
1214/0788r23du04	4	Decomposed Wall Collapse	12110	0.795
1214/1062r12du01	3	Dump	11200	1.305
1214/1062r12du02	3	Floor	22201	0.96
1214/1062r12du03	4	Decomposed Wall Collapse	22000	1.77
1214/1062r12du04	4	Decomposed Wall Collapse	12010	0.375
1214/1062r12du05	4	Wall Collapse	12110	0.3525
1214/1066r15du01	0	UPL	11200	0.0225
1214/1066r15du02	2	Wall Collapse	11210	0.45
1214/1066r15du03	1	Dump	11211	0.96
1214/1066r15du04	2	Decomposed Wall Collapse	12000	1.2075

(continued)

(Table I.1 continued)

DU	LEVEL	DEPTYPE	Class	VOLUME
1216/1068r08du01	3	Wall Collapse	12211	1.23
1216/1068r08du02	3	Wall Collapse	12210	0.6825
1216/1068r08du03	3	Wall Collapse	12111	1.695
1216/1068r08du04	3	Floor	22201	0.43875
1216/1068r08du05	4	Wall Collapse	12110	0.525
1216/1072r04du01	1	Dump	12200	0.105
1216/1072r04du02	3	Wall Collapse	12111	1.98
1216/1072r04du03	3	Wall (Intact)	32120	0.03
1216/1072r04du04	2	Burial	12300	0.435
1216/1072r04du05	3	Decomposed Wall Collapse	12010	0.0225
1216/1072r04du06	4	Wall Collapse	12210	0.15
1216/1072r04du07	4	Floor	22201	0.375
1216/1076r09du01	1	Dump	12211	0.15
1216/1076r09du02	1	Column Base	22300	0.03
1216/1076r09du03	1	Dump	12211	0.795
1216/1076r09du04	1	Dump	12200	0.585
1216/1076r09du05	3	Decomposed Wall Collapse	12010	0.4125
1216/1076r09du06	3	Wall Collapse	12110	0.12
1216/1076r09du07	3	Floor	12000	0.0975
1218/1072r07du01	3	Wall Collapse	12210	0.16875
1218/1072r07du02	3	Floor	12201	0.0075
1219/1095r00du01	0	UPL	11200	2.115
1219/1095r00du02	0	Wall (Intact)	31120	0.735
1219/1095r00du03	0	Wall Collapse	11110	1.02
1219/1095r00du04	0	Dump	11201	0.75
1219/1095r00du05	0	Decomposed Wall Collapse	11200	0.27
1219/1095r00du06	0	Wall Collapse	11110	0.15
1219/1095r00du07	0	Floor	22201	0.1875
1220/1060r13du01	3	Wall Collapse	11211	1.9875
1220/1060r13du02	3	Wall Collapse	12110	3.9825
1220/1060r13du03	3	PIT	11212	0.21
1220/1060r13du04	3	Floor	12201	0.3
1220/1060r13du05	4	Wall Collapse	12110	1.26
1220/1060r13du06	4	Wall Collapse	11111	1.11
1220/1072r00du02	3	Redeposited Wall Collapse	22010	0.405
1220/1072r00du03	3	Redeposited Wall Collapse	12210	0.06
1220/1072r00du04	3	Redeposited Dump	22200	0.285
1220/1072r00du05	3	Fluvial	22000	0.465
1220/1072r00du06	3	Decomposed Wall Collapse	12200	0.18
1224/1060r14du01	0	UPL	11200	0.15
1224/1060r14du02	3	Wall Collapse	11311	0.435
1235/1056r00du01	0	UPL	12210	0.69
1235/1056r00du02	0	PIT	21211	1.41
1235/1056r00du03	0	Dump	12200	0.9225
1235/1056r00du04	0	Dump	11200	0.495

(continued)

(Table I.1 continued)

DU	LEVEL	DEPTYPE	Class	VOLUME
1235/1056r00du05	4	Redeposited Wall Collapse	12010	0.8475
1235/1056r00du06	4	Wall Collapse	11111	0.375
1235/1056r00du07	4	Wall Collapse	11110	0.45
1235/1056r00du08	4	Fluvial	12000	0.0675
1235/1056r00du09	4	Floor	22211	0.3375
1235/1056r00du10	4	Wall Collapse	12110	0.21
1235/1056r00du11	4	Decomposed Wall Collapse	12010	0.045
1235/1056r00du12	4	Dump	11201	0.21
1235/1056r00du13	4	Floor	22201	0.225
1235/1056r00du14	4	Fluvial	22000	0.0975
1235/1056r00du15	4	Redeposited Wall Collapse	22110	0.165
1235/1056r00du16	5	Fluvial	12000	0.255
1235/1056r00du17	4	Wall (Intact)	31120	0.3
1235/1056r00du18	4	Wall (Intact)	31120	0.63
1235/1056r00du20	4	Wall (Intact)	31120	0.21
1235/1056r00du21	0	Fluvial	22001	0.03
1235/1056r00du22	4	Decomposed Wall Collapse	12000	0.0225
1261/1074r00du01	0	UPL	12000	0.25
1261/1074r00du02	0	UPL	22200	0.5
1261/1074r00du03	0	Wall Collapse	12010	0.2
1261/1074r00du04	0	Redeposited Dump	22210	0.53
1261/1074r00du05	0	Redeposited Dump	22201	1.96
1261/1074r00du06	0	Dump	12201	2.06
1261/1074r00du07	0	Dump	11210	0.22
1261/1074r00du08	0	Dump	12201	0.14

Table I.2: Ceramic data by DU. Ceramic fabric weights (body sherds only) and type frequencies for diagnostic sherds.

	Fabric type weight (kg)			Morphological Type (N)														
DU	A	B	C	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1156/1004r17du01	0.10	0.75	19.00	0	1	47	0	16	0	6	0	0	0	0	1	0	1	6
1156/1004r17du02	0.00	0.55	10.25	3	0	18	0	2	3	5	0	0	0	0	2	0	1	1
1156/1004r17du03	0.00	0.35	8.75	0	0	8	0	2	0	0	0	0	0	0	0	0	0	1
1156/1004r17du04	0.00	2.70	62.40	0	1	190	0	29	2	7	1	0	1	0	2	0	0	7
1156/1004r17du05	0.00	1.00	25.25	0	2	45	3	7	0	2	0	0	0	0	1	0	0	2
1156/1004r17du06	0.00	2.45	94.75	1	3	146	3	6	4	9	0	0	1	2	0	0	1	21
1156/1004r17du07	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1156/1004r17du08	0.00	0.10	0.50	0	1	6	1	0	2	0	0	0	0	0	2	0	0	4
1160/1002r20du01	0.00	1.15	64.75	0	1	36	1	2	5	3	1	1	0	1	1	0	0	7
1166/1066r00du01	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1166/1066r00du02	0.00	0.00	0.00	0	0	0	0	0	0	3	1	0	0	0	0	0	0	1
1166/1066r00du04	0.00	0.00	0.20	1	0	0	2	0	0	5	1	0	0	0	0	0	0	0
1166/1066r00du05	0.00	0.07	0.42	0	0	0	1	0	1	0	3	0	0	1	0	0	0	0
1166/1066r00du06	0.00	0.01	0.15	0	0	1	1	1	0	0	1	0	0	1	0	0	0	0
1166/1066r00du07	0.00	0.08	0.50	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
1192/1035r00du01	0.00	1.70	18.50	0	4	10	1	5	1	12	19	2	15	5	1	4	1	11
1192/1035r00du02	0.00	0.00	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1192/1035r00du03	0.11	2.09	26.75	1	4	23	4	8	7	40	51	11	1	7	1	0	2	13
1192/1035r00du04	0.01	0.26	19.75	1	1	43	1	27	5	19	49	9	0	3	0	0	1	3
1192/1035r00du05	0.01	0.86	33.70	0	1	40	1	19	2	27	30	8	0	1	0	0	0	4
1192/1035r00du06	0.00	2.33	52.75	0	1	51	1	9	4	33	42	12	0	6	1	0	3	6
1192/1035r00du07	0.00	0.38	16.75	0	0	33	0	7	2	5	21	2	1	1	0	0	0	2
1192/1035r00du08	0.00	0.18	17.75	0	0	17	0	0	1	1	11	1	0	1	0	0	1	1
1202/1070r01du01	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1202/1070r01du02	0.00	0.10	3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1202/1070r01du03	0.00	1.35	5.75	0	0	0	2	0	0	3	0	3	0	0	0	0	0	6

(continued)

(Table I.2 continued)

DU	Fabric type weight (kg)			Morphological Type (N)														
	A	B	C	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1202/1070r01du04	0.00	1.35	6.25	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0
1202/1070r01du05	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1204/1060r00du01	0.00	0.10	4.15	0	4	2	1	0	1	0	15	0	1	0	0	0	0	5
1204/1060r00du02	0.00	0.85	8.75	0	10	5	0	4	0	9	36	11	0	1	0	0	0	9
1204/1060r00du03	0.00	0.00	0.02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1204/1060r00du04	0.00	1.30	3.75	0	0	1	0	0	0	3	8	3	0	0	0	0	0	0
1204/1060r00du05	0.00	0.51	2.03	0	3	3	0	0	0	4	27	8	0	4	0	0	1	3
1204/1060r00du06	0.00	0.00	0.00	0	0	0	0	0	0	1	2	1	1	0	0	0	0	0
1204/1060r00du07	0.00	0.76	3.93	1	5	4	0	2	0	8	21	4	0	0	0	0	0	0
1208/1068r18du01	0.00	0.35	8.00	0	0	0	0	0	2	1	3	2	0	0	0	0	1	3
1208/1068r18du02	0.10	5.50	34.10	0	7	2	0	3	11	17	11	14	0	0	0	0	0	14
1208/1068r18du03	0.00	0.00	0.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1068r18du04	0.00	0.70	5.75	0	1	0	0	0	0	3	7	1	0	0	0	0	0	1
1208/1068r18du05	0.00	0.10	0.40	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1068r18du06	0.00	0.65	3.35	0	0	0	1	0	0	0	1	5	0	0	0	0	0	2
1208/1068r18du07	0.00	0.25	3.50	0	1	1	0	0	1	3	0	3	0	0	0	0	0	0
1208/1068r18du08	0.00	0.00	0.10	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
1208/1068r18du09	0.00	0.10	2.85	0	3	0	0	0	0	2	0	2	0	0	0	0	0	1
1208/1068r18du10	0.00	0.00	0.50	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
1208/1074r02du01	0.00	0.23	13.00	0	3	3	2	0	3	12	11	6	2	8	0	1	2	7
1208/1074r02du02	0.00	0.16	4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1074r02du03	0.00	0.65	7.50	0	3	1	12	0	0	0	1	4	1	0	0	0	0	6
1208/1074r02du04	0.00	0.00	0.35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1074r02du05	0.00	0.25	2.75	0	0	0	3	0	3	1	2	1	1	0	0	0	0	6
1208/1074r02du06	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1074r02du07	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1074r02du08	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1210/0788r22du01	0.00	0.20	48.80	2	2	0	33	0	6	11	11	12	1	1	2	0	0	6
1210/0788r22du02	0.00	0.45	15.75	0	3	0	13	1	3	7	17	9	0	0	0	0	0	4
1212/1052r16du01	0.00	1.90	15.25	1	4	10	0	6	3	4	15	8	0	0	1	0	0	4

(continued)

(Table I.2 continued)

DU	Fabric type weight (kg)			Morphological Type (N)														
	A	B	C	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1212/1064r10du01	0.00	1.90	7.50	0	0	0	6	2	0	1	1	2	0	0	0	0	0	4
1212/1064r10du02	0.00	2.80	8.50	0	3	2	0	0	2	3	12	4	0	1	0	0	0	1
1212/1068r06du01	0.00	1.85	10.40	0	1	0	3	1	3	4	9	3	0	1	0	0	0	3
1212/1068r06du02	0.00	1.15	3.60	0	2	0	0	0	0	0	1	2	1	0	0	0	0	5
1212/1068r06du03	0.00	0.20	0.50	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
1212/1068r06du04	0.10	0.95	5.25	1	2	0	6	0	0	0	0	3	0	0	0	0	0	2
1212/1068r06du05	0.00	0.30	1.40	0	1	0	1	0	1	1	2	3	0	0	0	0	0	0
1212/1072r05du01	0.00	1.90	33.45	0	2	1	2	1	0	0	5	2	1	3	0	0	2	4
1212/1072r05du02	0.00	1.17	12.25	0	0	0	0	0	1	3	0	0	0	0	0	0	0	8
1212/1072r05du03	0.00	0.25	1.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1212/1072r05du04	0.00	0.01	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1212/1072r05du05	0.00	0.25	4.20	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
1212/1072r05du06	0.00	0.35	3.85	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
1212/1072r05du07	0.00	1.65	9.75	1	1	0	2	1	1	7	1	5	0	1	0	0	0	5
1212/1072r05du08	0.00	0.20	0.35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1212/1072r05du09	0.00	0.20	0.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1212/1072r05du10	0.00	3.10	44.90	0	6	4	8	1	3	9	8	21	0	0	1	0	0	15
1212/1072r05du11	0.00	0.06	2.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1212/1072r05du12	0.00	0.10	3.25	0	1	0	0	0	0	0	4	5	0	0	0	0	0	2
1212/1074r03du01	0.00	0.30	2.50	0	0	0	0	0	0	0	4	0	0	1	0	0	0	2
1214/0788r23du01	0.00	1.00	31.00	0	7	1	8	0	7	7	8	6	0	2	0	0	2	6
1214/0788r23du02	0.00	0.35	9.00	1	1	0	6	0	3	2	10	4	0	0	3	0	0	9
1214/0788r23du03	0.00	2.35	24.85	2	6	0	14	3	9	19	14	13	0	0	3	0	1	6
1214/0788r23du04	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1214/1062r12du01	0.00	2.20	31.15	0	12	3	13	2	7	3	5	8	4	1	0	0	0	13
1214/1062r12du02	0.00	1.00	13.00	0	6	1	0	0	6	3	1	6	2	0	0	0	0	11
1214/1062r12du03	0.00	1.25	5.75	0	2	0	0	0	3	2	1	1	0	1	0	0	0	3
1214/1062r12du04	0.00	0.50	3.50	0	2	0	0	0	0	2	1	0	1	0	0	0	0	3
1214/1062r12du05	0.00	0.60	0.25	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0
1214/1066r15du01	0.00	0.75	1.40	0	1	0	0	0	0	1	1	0	0	0	0	0	0	2

(continued)

(Table I.2 continued)

DU	Fabric type weight (kg)			Morphological Type (N)														
	A	B	C	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1214/1066r15du02	0.00	0.60	3.50	0	3	0	0	0	1	0	0	0	2	0	0	0	0	1
1214/1066r15du03	0.00	0.70	5.55	0	1	0	0	1	2	1	0	4	0	0	0	0	0	2
1214/1066r15du04	0.00	0.85	9.50	0	6	0	0	0	1	4	3	2	0	1	0	0	0	0
1216/1068r08du01	0.00	2.15	12.40	0	9	0	6	1	1	1	5	4	0	0	0	0	0	9
1216/1068r08du02	0.00	1.25	6.00	0	3	0	4	1	1	1	2	2	0	0	0	0	0	4
1216/1068r08du03	0.00	1.50	8.85	1	1	0	5	2	3	2	4	8	1	0	0	0	1	13
1216/1068r08du04	0.00	0.95	5.75	0	2	0	0	0	0	4	5	3	0	0	0	0	0	2
1216/1068r08du05	0.00	0.75	1.75	0	1	0	0	0	0	0	0	1	1	1	0	0	0	2
1216/1072r04du01	0.00	0.30	1.05	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
1216/1072r04du02	0.00	2.35	7.65	1	2	0	3	0	3	4	3	6	0	1	0	0	0	6
1216/1072r04du03	0.00	0.10	0.25	1	2	3	5	0	0	1	1	0	0	1	0	0	0	4
1216/1072r04du04	0.00	0.45	2.35	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
1216/1072r04du05	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1072r04du06	0.00	0.20	0.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1072r04du07	0.00	1.25	6.50	0	5	0	0	3	1	2	1	2	0	0	0	0	0	1
1216/1076r09du01	0.00	0.60	3.10	0	2	0	4	1	0	0	0	0	0	0	0	0	0	6
1216/1076r09du02	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1076r09du03	0.00	1.90	12.75	0	4	0	1	0	2	2	6	6	1	0	0	0	0	11
1216/1076r09du04	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1076r09du05	0.00	0.25	1.50	0	0	0	0	0	2	2	1	0	0	0	0	0	0	3
1216/1076r09du06	0.00	0.20	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1076r09du07	0.00	0.20	0.20	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
1218/1072r07du01	0.00	0.25	1.45	0	4	0	7	0	0	0	2	2	0	0	0	0	0	4
1218/1072r07du02	0.00	0.10	0.10	0	1	0	0	0	0	0	0	1	0	0	0	0	0	2
1219/1095r00du01	0.00	0.31	11.20	0	1	3	1	1	0	3	3	0	73	4	0	20	5	7
1219/1095r00du02	0.00	0.00	0.10	0	0	0	0	0	0	0	0	0	13	0	0	0	0	1
1219/1095r00du03	0.00	0.00	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1219/1095r00du04	0.00	0.11	3.75	0	0	0	0	0	2	0	0	0	2	1	0	2	1	3
1219/1095r00du05	0.00	0.10	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1219/1095r00du06	0.00	0.10	0.00	0	1	0	1	1	0	2	0	0	6	0	0	0	0	10

(continued)

(Table I.2 continued)

DU	Fabric type weight (kg) A	B	C	Morphological Type (N) A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1219/1095r00du07	0.00	0.11	2.11	0	0	0	0	1	2	1	1	0	3	0	0	0	0	18
1220/1060r13du01	0.15	6.20	21.15	0	6	1	3	4	4	8	10	15	4	0	3	0	0	32
1220/1060r13du02	0.00	3.65	14.80	0	5	0	2	1	3	5	13	11	0	0	2	0	0	12
1220/1060r13du03	0.00	0.35	14.75	0	2	0	1	0	0	3	0	1	0	0	0	0	0	0
1220/1060r13du04	0.00	0.25	0.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1220/1060r13du05	0.00	0.45	7.80	0	2	0	3	0	2	4	0	6	0	1	0	0	0	1
1220/1060r13du06	0.00	0.25	1.90	1	0	0	2	2	1	2	1	1	0	1	1	0	0	0
1220/1072r00du02	0.00	1.35	5.10	0	7	1	0	1	1	0	2	3	0	0	0	0	0	12
1220/1072r00du03	0.00	0.20	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
1220/1072r00du04	0.00	0.50	3.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1220/1072r00du05	0.00	0.25	1.25	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4
1220/1072r00du06	0.00	0.25	0.50	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
1224/1060r14du01	0.00	0.75	1.75	0	0	19	0	1	0	0	0	0	1	0	0	0	0	1
1224/1060r14du02	0.00	0.70	7.25	0	1	0	1	1	0	2	2	5	0	0	0	0	0	9
1235/1056r00du01	0.00	0.00	0.00	1	2	1	2	2	0	4	4	5	2	0	0	0	0	8
1235/1056r00du02	0.00	0.00	0.00	0	3	2	2	1	0	2	5	11	5	4	1	1	2	8
1235/1056r00du03	0.00	0.00	0.00	0	8	5	8	8	5	10	18	23	5	1	2	1	1	26
1235/1056r00du04	0.00	0.00	0.20	0	10	6	15	3	1	4	10	6	1	2	0	0	0	13
1235/1056r00du05	0.00	0.00	0.00	1	3	1	5	1	2	3	18	6	1	1	2	0	1	9
1235/1056r00du06	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du07	0.00	0.00	0.00	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0
1235/1056r00du08	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du09	0.00	0.08	0.23	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
1235/1056r00du10	0.00	0.05	0.20	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
1235/1056r00du11	0.00	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du12	0.00	0.00	0.00	0	0	0	0	1	0	1	2	0	0	0	0	0	0	1
1235/1056r00du13	0.00	0.07	1.69	0	0	1	0	0	1	1	2	0	0	0	0	0	0	0
1235/1056r00du14	0.00	0.00	0.01	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
1235/1056r00du15	0.00	0.02	0.12	1	0	0	0	1	0	0	2	0	0	0	0	0	0	1
1235/1056r00du16	0.00	0.07	1.10	0	0	1	0	1	0	2	2	1	0	0	1	0	0	0

(continued)

(Table I.2 continued)

DU	Fabric type weight (kg)			Morphological Type (N)														
	A	B	C	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1235/1056r00du17	0.00	0.00	0.10	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0
1235/1056r00du18	0.00	0.05	1.20	0	0	1	1	0	0	1	3	0	0	0	0	0	0	1
1235/1056r00du20	0.00	0.02	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du21	0.00	0.00	0.10	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
1235/1056r00du22	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1261/1074r00du01	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1261/1074r00du02	0.00	0.00	0.10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1261/1074r00du03	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1261/1074r00du04	0.00	4.75	7.75	0	0	2	0	1	7	2	1	0	13	5	0	0	2	3
1261/1074r00du05	0.00	2.62	14.50	0	1	2	0	0	1	0	1	0	7	0	0	1	0	2
1261/1074r00du06	0.00	8.38	81.45	0	1	7	0	1	1	4	2	1	80	0	1	0	3	4
1261/1074r00du07	0.00	1.34	39.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1261/1074r00du08	0.00	1.00	18.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table I.3a: Counts of identified mammal remains.

DU	Bos taurus	A. buselaphus	Ovis/Capra	Ovis	Capra	Gazella sp.	Sus scrofa	Hippo	Equus	Canid	Felid	Rodent
1156/1004r17du01	0	0	24	5	1	0	10	0	0	1	0	0
1156/1004r17du02	0	0	7	1	1	0	7	0	0	0	0	0
1156/1004r17du03	0	0	1	0	0	0	0	1	0	0	0	0
1156/1004r17du04	0	0	14	0	0	0	3	1	0	0	0	0
1156/1004r17du05	0	1	18	1	1	0	2	0	0	13	0	0
1156/1004r17du06	0	2	19	4	0	1	7	0	1	1	0	0
1156/1004r17du07	0	0	0	0	0	0	0	0	0	0	0	0
1156/1004r17du08	0	0	3	0	0	0	0	0	0	0	0	0
1160/1002r20du01	0	0	7	1	0	0	4	0	0	0	0	0
1166/1066r00du01	0	0	0	0	0	0	0	0	0	0	0	0
1166/1066r00du02	0	0	0	0	0	0	0	0	0	0	0	0
1166/1066r00du04	0	0	0	0	0	0	0	0	0	0	0	0
1166/1066r00du05	0	0	0	0	0	0	0	0	0	0	0	0
1166/1066r00du06	0	0	0	0	0	0	0	0	0	0	0	0
1166/1066r00du07	0	0	0	0	0	0	0	0	0	0	0	0
1192/1035r00du01	0	0	3	0	0	0	4	0	0	0	0	0
1192/1035r00du02	0	0	0	0	0	0	0	0	0	0	0	0
1192/1035r00du03	0	0	15	0	0	0	9	0	0	0	0	0
1192/1035r00du04	0	1	12	0	0	0	6	0	1	0	0	0
1192/1035r00du05	0	0	9	0	0	0	4	0	0	0	0	0
1192/1035r00du06	0	0	5	0	0	0	4	0	0	0	0	0
1192/1035r00du07	0	0	8	0	0	0	1	0	0	0	0	0
1192/1035r00du08	0	0	1	0	0	0	4	0	0	0	0	0
1202/1070r01du01	0	0	0	0	0	0	1	0	0	0	0	0
1202/1070r01du02	0	0	0	0	0	0	0	0	0	0	0	0
1202/1070r01du03	0	0	5	2	0	0	10	0	0	0	0	0
1202/1070r01du04	0	0	0	0	0	0	2	0	0	0	0	0
1202/1070r01du05	0	0	0	0	0	0	0	0	0	0	0	0
1204/1060r00du01	0	0	0	0	0	0	0	0	0	0	0	0
1204/1060r00du02	2	0	5	0	0	0	8	0	0	1	0	0
1204/1060r00du03	0	0	0	0	0	0	1	0	0	0	0	0
1204/1060r00du04	0	0	0	0	0	0	5	0	0	0	0	0
1204/1060r00du05	0	0	1	0	0	0	4	0	0	0	0	0
1204/1060r00du06	0	0	0	0	0	0	0	0	0	0	0	0
1204/1060r00du07	0	1	2	0	0	0	3	0	0	0	0	0
1208/1068r18du01	0	0	3	0	0	0	1	0	0	0	0	0
1208/1068r18du02	0	0	3	3	2	0	10	0	0	0	0	0
1208/1068r18du03	0	0	0	0	0	0	0	0	0	0	0	0
1208/1068r18du04	0	0	1	0	0	0	1	0	0	0	0	0
1208/1068r18du05	0	0	0	0	0	0	0	0	0	0	0	0
1208/1068r18du06	0	0	0	0	0	0	2	0	0	0	0	0
1208/1068r18du07	0	0	0	0	0	0	0	0	0	0	0	0
1208/1068r18du08	0	0	0	0	0	0	0	0	0	0	0	0
1208/1068r18du09	0	0	0	0	0	0	1	0	0	0	0	0

(continued)

(Table I.3a continued)

DU	Bos taurus	A. buselaphus	Ovis/Capra	Ovis	Capra	Gazella sp.	Sus scrofa	Hippo	Equus	Canid	Felid	Rodent
1208/1068r18du10	0	0	0	0	0	0	0	0	0	0	0	0
1208/1074r02du01	0	0	1	0	0	0	3	0	0	0	0	0
1208/1074r02du02	0	0	2	0	0	0	3	0	0	0	0	0
1208/1074r02du03	0	0	1	0	0	0	3	0	0	0	0	0
1208/1074r02du04	0	0	0	0	0	0	1	0	0	0	0	0
1208/1074r02du05	0	0	0	0	0	0	5	0	0	0	0	0
1208/1074r02du06	0	0	0	0	0	0	0	0	0	0	0	0
1208/1074r02du07	0	0	0	0	0	0	0	0	0	0	0	0
1208/1074r02du08	0	0	0	0	0	0	0	0	0	0	0	0
1210/0788r22du01	0	0	11	0	1	0	8	0	0	0	0	0
1210/0788r22du02	0	0	2	0	0	0	1	0	0	0	0	0
1212/1052r16du01	0	0	0	0	0	0	8	0	1	0	0	0
1212/1064r10du01	0	0	6	0	0	0	3	0	0	0	0	0
1212/1064r10du02	1	0	2	0	1	0	6	0	0	1	0	0
1212/1068r06du01	0	0	1	0	0	0	5	0	0	0	0	0
1212/1068r06du02	0	0	1	0	0	0	14	0	0	0	0	0
1212/1068r06du03	0	0	0	0	0	0	0	0	0	0	0	0
1212/1068r06du04	0	0	2	0	0	0	5	0	0	0	0	0
1212/1068r06du05	0	0	0	0	0	0	2	0	0	0	0	0
1212/1072r05du01	0	0	9	0	0	0	7	0	0	1	0	0
1212/1072r05du02	0	0	2	0	0	0	1	0	1	1	0	0
1212/1072r05du03	0	0	0	0	0	0	0	0	0	0	0	0
1212/1072r05du04	0	0	0	0	0	0	1	0	0	0	0	0
1212/1072r05du05	0	0	1	0	0	0	1	0	0	0	0	0
1212/1072r05du06	0	0	0	0	0	0	0	0	0	0	0	0
1212/1072r05du07	0	0	0	0	0	0	3	0	0	0	0	0
1212/1072r05du08	0	0	0	0	0	0	0	0	0	0	0	0
1212/1072r05du09	0	0	0	1	0	0	1	0	0	0	0	0
1212/1072r05du10	1	0	1	1	0	0	8	0	0	0	0	0
1212/1072r05du11	0	0	0	0	0	0	0	0	0	0	0	0
1212/1072r05du12	0	0	1	0	0	0	0	0	0	0	0	0
1212/1074r03du01	0	0	0	0	0	0	7	0	0	1	0	0
1214/0788r23du01	0	6	4	0	0	0	8	0	1	0	0	0
1214/0788r23du02	0	0	6	0	0	0	6	0	0	0	0	0
1214/0788r23du03	0	6	3	0	0	0	11	0	0	0	0	0
1214/0788r23du04	0	0	0	0	0	0	0	0	0	0	0	0
1214/1062r12du01	0	0	2	0	0	0	17	0	0	0	0	1
1214/1062r12du02	0	0	0	0	0	0	6	0	0	0	0	0
1214/1062r12du03	0	0	1	0	0	0	10	0	0	0	0	7
1214/1062r12du04	0	0	0	0	0	0	2	0	0	0	0	2
1214/1062r12du05	0	0	0	0	0	0	0	0	0	0	0	0
1214/1066r15du01	0	0	0	0	0	0	0	0	0	0	0	0
1214/1066r15du02	0	0	0	0	0	0	1	0	0	0	0	0
1214/1066r15du03	0	0	0	0	1	0	6	0	0	0	0	0
1214/1066r15du04	0	1	0	0	0	0	13	0	0	0	0	0

(continued)

(Table I.3a continued)

DU	Bos taurus	A. buselaphus	Ovis/Capra	Ovis	Capra	Gazella sp.	Sus scrofa	Hippo	Equus	Canid	Felid	Rodent
1216/1068r08du01	0	0	0	1	0	0	3	0	0	1	0	0
1216/1068r08du02	0	1	0	0	0	0	0	0	0	0	0	0
1216/1068r08du03	0	0	0	0	0	2	7	0	0	0	2	3
1216/1068r08du04	0	0	1	0	0	0	3	0	0	0	0	0
1216/1068r08du05	0	0	0	0	0	0	2	0	0	0	0	1
1216/1072r04du01	0	0	2	0	0	0	0	0	0	0	0	0
1216/1072r04du02	0	0	3	0	0	0	8	0	0	1	0	0
1216/1072r04du03	0	0	0	0	0	0	0	0	0	0	0	0
1216/1072r04du04	0	0	0	0	0	0	0	0	0	0	0	0
1216/1072r04du05	0	0	0	0	0	0	0	0	0	0	0	0
1216/1072r04du06	0	0	0	0	0	0	0	0	0	0	0	0
1216/1072r04du07	0	1	1	0	0	0	5	0	2	0	0	0
1216/1076r09du01	0	1	0	0	0	0	0	0	0	0	0	0
1216/1076r09du02	0	0	0	1	0	0	0	0	0	0	0	0
1216/1076r09du03	0	0	0	0	0	0	8	0	0	0	0	0
1216/1076r09du04	0	0	1	0	0	0	2	0	0	0	0	0
1216/1076r09du05	0	0	0	0	0	0	1	0	0	0	0	0
1216/1076r09du06	0	0	0	0	0	0	0	0	0	0	0	0
1216/1076r09du07	0	0	0	0	0	0	0	0	0	0	0	0
1218/1072r07du01	0	0	0	0	0	0	2	0	0	0	0	0
1218/1072r07du02	0	0	0	0	0	0	0	0	0	0	0	0
1219/1095r00du01	0	0	4	0	0	0	8	0	0	0	0	0
1219/1095r00du02	0	0	2	0	0	0	0	0	0	0	0	0
1219/1095r00du03	1	0	1	0	0	0	1	0	0	1	0	0
1219/1095r00du04	1	0	1	0	0	0	1	0	0	0	0	0
1219/1095r00du05	0	0	0	0	0	0	0	0	0	0	0	0
1219/1095r00du06	0	0	0	0	0	0	0	0	0	0	0	0
1219/1095r00du07	0	0	0	0	0	0	0	0	0	0	0	0
1220/1060r13du01	0	2	4	0	0	0	11	0	0	2	0	1
1220/1060r13du02	0	0	1	0	0	0	5	0	0	0	0	0
1220/1060r13du03	0	0	1	0	0	0	0	0	0	0	0	0
1220/1060r13du04	0	0	0	0	0	0	0	0	0	0	0	0
1220/1060r13du05	0	1	3	0	0	0	1	0	0	0	0	1
1220/1060r13du06	0	0	0	0	0	0	4	0	0	0	0	0
1220/1072r00du02	0	0	0	0	0	0	4	0	0	0	0	0
1220/1072r00du03	0	0	0	0	0	0	0	0	0	0	0	0
1220/1072r00du04	0	0	1	0	0	0	4	0	0	0	0	0
1220/1072r00du05	0	0	0	0	0	0	1	0	0	0	0	0
1220/1072r00du06	0	0	0	0	0	0	0	0	0	0	0	0
1224/1060r14du01	0	0	0	0	0	0	0	0	0	0	0	0
1224/1060r14du02	0	1	3	0	0	0	1	0	0	0	0	1
1235/1056r00du01	0	0	7	0	0	0	2	0	0	1	0	0
1235/1056r00du02	0	0	1	0	0	0	0	0	0	0	0	0
1235/1056r00du03	0	1	8	0	0	0	3	0	0	0	0	0
1235/1056r00du04	0	0	1	0	0	0	0	0	0	0	0	0

(continued)

(Table I.3a continued)

DU	Bos taurus	A. buselaphus	Ovis/Capra	Ovis	Capra	Gazella sp.	Sus scrofa	Hippo	Equus	Canid	Felid	Rodent
1235/1056r00du05	1	0	2	0	0	0	2	0	0	0	0	0
1235/1056r00du06	0	0	0	0	0	0	2	0	0	0	0	0
1235/1056r00du07	1	0	1	0	0	0	2	0	0	0	0	0
1235/1056r00du08	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du09	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du10	0	0	1	0	0	0	0	0	0	0	0	0
1235/1056r00du11	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du12	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du13	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du14	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du15	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du16	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du17	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du18	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du20	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du21	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du22	0	0	0	0	0	0	0	0	0	0	0	0
1261/1074r00du01	0	0	0	0	0	0	0	0	0	0	0	0
1261/1074r00du02	0	0	0	0	0	0	0	0	0	0	0	0
1261/1074r00du03	0	0	0	0	0	0	0	0	0	0	0	0
1261/1074r00du04	1	0	5	0	0	0	0	0	1	0	0	0
1261/1074r00du05	2	5	0	0	0	0	15	0	29	0	0	0
1261/1074r00du06	0	0	6	0	0	0	21	0	0	0	0	0
1261/1074r00du07	0	0	0	0	0	0	0	0	0	0	0	0
1261/1074r00du08	0	0	0	0	0	0	3	0	0	0	0	0

Table I.3b: Counts of identified fish, reptile, and bird remains.

DU	Clarias sp.	Synodontis	Bagrus	Tilapia	Tetradon	Cyprin sp.	Chrysichthyes	Sparus aurutus	Polypterus	Barbus sp.	Lates niloticus	Turtle	Snake	Bird
1156/1004r17du01	0	3	0	0	0	0	0	0	0	0	0	0	0	10
1156/1004r17du02	0	0	0	0	0	0	0	0	0	0	0	0	0	20
1156/1004r17du03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1156/1004r17du04	0	2	0	0	0	0	0	0	0	0	0	0	0	0
1156/1004r17du05	0	1	0	0	0	0	0	0	0	0	0	0	0	2
1156/1004r17du06	0	5	0	0	0	0	0	0	0	0	0	0	0	3
1156/1004r17du07	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1156/1004r17du08	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1160/1002r20du01	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1166/1066r00du01	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1166/1066r00du02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1166/1066r00du04	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1166/1066r00du05	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1166/1066r00du06	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1166/1066r00du07	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1192/1035r00du01	0	0	0	0	0	0	0	0	0	0	0	0	0	6
1192/1035r00du02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1192/1035r00du03	0	3	0	1	0	0	0	0	0	0	0	0	0	22
1192/1035r00du04	0	2	0	0	0	0	0	0	0	0	0	0	0	3
1192/1035r00du05	0	0	0	2	0	0	0	0	0	0	0	0	0	3
1192/1035r00du06	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1192/1035r00du07	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1192/1035r00du08	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1202/1070r01du01	0	0	0	0	0	0	0	1	0	0	0	0	0	1
1202/1070r01du02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1202/1070r01du03	0	0	0	0	0	0	0	1	0	0	0	0	0	0
1202/1070r01du04	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1202/1070r01du05	0	0	0	0	0	0	0	1	0	0	0	0	0	1
1204/1060r00du01	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1204/1060r00du02	0	0	0	1	0	0	0	0	0	0	0	0	0	0
1204/1060r00du03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1204/1060r00du04	0	0	0	2	0	0	0	0	0	0	0	0	0	0
1204/1060r00du05	0	1	1	33	0	0	0	0	0	0	0	0	0	2
1204/1060r00du06	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1204/1060r00du07	0	0	2	0	0	0	0	0	0	0	0	0	0	0
1208/1068r18du01	0	1	0	0	0	0	0	2	1	0	0	0	0	0
1208/1068r18du02	0	1	0	5	0	0	0	0	0	0	0	0	0	1
1208/1068r18du03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1068r18du04	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1208/1068r18du05	0	0	0	1	0	0	0	0	0	0	0	0	0	0
1208/1068r18du06	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1068r18du07	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(continued)

(Table I.3b continued)

DU	Clarias sp.	Synodontis	Bagrus	Tilapia	Tetradon	Cyprin sp.	Chrysichthyes	Sparus aurutus	Polypterus	Barbus sp.	Lates niloticus	Turtle	Snake	Bird
1208/1068r18du08	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1068r18du09	0	0	0	1	0	0	0	0	0	0	0	0	0	0
1208/1068r18du10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1074r02du01	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1208/1074r02du02	0	0	1	1	0	0	0	0	0	0	0	0	0	3
1208/1074r02du03	0	0	0	0	0	0	0	2	0	0	0	0	0	2
1208/1074r02du04	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1074r02du05	0	0	1	0	0	0	0	0	0	0	0	0	0	1
1208/1074r02du06	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1074r02du07	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1074r02du08	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1210/0788r22du01	0	0	21	4	0	0	0	0	0	0	0	0	0	3
1210/0788r22du02	0	0	0	1	0	0	0	0	0	0	0	0	0	0
1212/1052r16du01	0	0	0	1	0	0	0	1	0	0	0	0	0	1
1212/1064r10du01	0	0	0	0	0	0	0	2	0	0	0	0	0	1
1212/1064r10du02	0	4	0	0	0	0	0	3	0	0	0	0	0	1
1212/1068r06du01	0	1	0	0	0	0	0	1	0	0	0	0	0	1
1212/1068r06du02	0	0	0	0	0	0	0	0	0	0	0	0	0	3
1212/1068r06du03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1212/1068r06du04	0	1	0	0	0	0	0	1	0	0	0	0	0	0
1212/1068r06du05	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1212/1072r05du01	0	0	0	2	0	0	0	0	0	0	0	0	0	5
1212/1072r05du02	0	0	1	4	0	0	0	0	0	0	0	0	0	0
1212/1072r05du03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1212/1072r05du04	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1212/1072r05du05	0	0	0	0	0	0	0	1	0	0	0	0	0	0
1212/1072r05du06	0	0	0	1	0	0	0	0	0	0	0	0	0	0
1212/1072r05du07	0	0	2	2	0	0	0	2	0	0	0	0	0	0
1212/1072r05du08	0	0	0	0	0	0	0	3	0	0	0	0	0	0
1212/1072r05du09	0	0	0	3	0	0	0	4	0	0	0	0	0	0
1212/1072r05du10	0	1	1	4	0	0	0	0	1	0	0	0	0	2
1212/1072r05du11	0	0	0	2	0	0	0	0	0	0	0	0	0	0
1212/1072r05du12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1212/1074r03du01	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1214/0788r23du01	0	0	1	0	0	0	0	0	0	0	0	0	0	10
1214/0788r23du02	0	0	1	0	0	0	0	3	0	0	0	0	0	5
1214/0788r23du03	0	0	0	0	0	0	0	2	12	0	0	0	0	0
1214/0788r23du04	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1214/1062r12du01	3	4	1	8	0	0	0	0	0	0	0	60	0	1
1214/1062r12du02	2	0	3	5	0	0	0	0	0	0	0	0	0	3
1214/1062r12du03	0	1	3	0	0	0	0	0	0	0	0	0	0	3
1214/1062r12du04	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1214/1062r12du05	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1214/1066r15du01	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(continued)

(Table I.3b continued)

DU	Clarias sp.	Synodontis	Bagrus	Tilapia	Tetradon	Cyprin sp.	Chrysichthyes	Sparus aurutus	Polypterus	Barbus sp.	Lates niloticus	Turtle	Snake	Bird
1214/1066r15du02	0	1	1	0	0	0	0	0	0	0	0	0	0	0
1214/1066r15du03	0	0	1	1	0	0	0	3	0	0	0	0	0	1
1214/1066r15du04	0	2	0	1	0	0	0	8	0	0	0	1	0	0
1216/1068r08du01	0	1	0	1	1	0	0	0	0	1	0	0	0	1
1216/1068r08du02	0	1	0	1	0	0	0	0	0	0	0	0	0	0
1216/1068r08du03	0	3	3	2	0	0	0	0	0	0	0	0	0	0
1216/1068r08du04	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1216/1068r08du05	0	0	0	1	0	0	0	1	0	0	0	0	0	0
1216/1072r04du01	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1072r04du02	0	0	1	3	0	0	0	0	2	0	0	0	0	1
1216/1072r04du03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1072r04du04	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1072r04du05	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1072r04du06	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1072r04du07	0	1	0	0	0	0	0	3	0	0	0	0	0	0
1216/1076r09du01	1	0	0	0	2	0	0	0	0	0	0	0	0	1
1216/1076r09du02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1076r09du03	0	1	0	5	0	0	0	2	0	0	0	0	0	5
1216/1076r09du04	0	0	1	0	0	0	0	0	0	0	0	0	0	1
1216/1076r09du05	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1076r09du06	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1076r09du07	0	0	0	1	0	0	0	0	0	0	0	0	0	0
1218/1072r07du01	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1218/1072r07du02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1219/1095r00du01	0	0	1	1	0	1	0	0	0	0	0	0	0	2
1219/1095r00du02	0	0	0	0	0	0	0	0	0	0	0	0	0	2
1219/1095r00du03	0	0	0	0	0	0	1	0	0	0	0	0	0	1
1219/1095r00du04	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1219/1095r00du05	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1219/1095r00du06	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1219/1095r00du07	0	0	0	1	0	0	0	0	0	0	0	0	0	0
1220/1060r13du01	1	1	4	5	0	0	0	7	0	0	0	0	0	3
1220/1060r13du02	0	0	0	2	0	0	0	0	0	0	0	0	0	4
1220/1060r13du03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1220/1060r13du04	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1220/1060r13du05	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1220/1060r13du06	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1220/1072r00du02	0	0	0	0	0	0	0	0	0	0	0	0	0	2
1220/1072r00du03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1220/1072r00du04	0	1	0	0	0	0	0	0	1	0	0	0	0	0
1220/1072r00du05	0	0	0	0	0	0	0	0	1	0	0	0	0	1
1220/1072r00du06	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1224/1060r14du01	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1224/1060r14du02	0	0	1	0	0	0	0	0	0	0	0	0	0	0

(continued)

(Table I.3b continued)

DU	Clarias sp.	Synodontis	Bagrus	Tilapia	Tetradon	Cyprin sp.	Chrysichthyes	Sparus aurutus	Polypterus	Barbus sp.	Lates niloticus	Turtle	Snake	Bird
1235/1056r00du01	0	0	0	1	0	0	0	0	0	0	0	0	1	5
1235/1056r00du02	0	0	0	2	0	0	0	0	0	0	0	0	0	0
1235/1056r00du03	0	0	5	12	0	0	0	0	0	0	0	0	0	9
1235/1056r00du04	0	0	0	1	0	0	0	0	0	0	0	0	0	0
1235/1056r00du05	0	0	0	2	0	0	0	0	0	0	0	0	0	3
1235/1056r00du06	0	0	0	2	0	0	0	0	0	0	0	0	0	0
1235/1056r00du07	0	0	0	1	0	0	0	0	0	0	0	1	0	0
1235/1056r00du08	0	0	0	2	0	0	0	4	0	0	0	0	0	0
1235/1056r00du09	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du11	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du13	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du14	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du15	0	0	0	0	0	0	0	0	0	0	0	0	0	2
1235/1056r00du16	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du17	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du18	0	0	0	1	0	0	0	0	0	0	0	0	0	1
1235/1056r00du20	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du21	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du22	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1261/1074r00du01	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1261/1074r00du02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1261/1074r00du03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1261/1074r00du04	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1261/1074r00du05	0	31	0	0	0	0	0	0	0	0	0	0	0	3
1261/1074r00du06	1	0	0	6	0	0	0	0	0	0	0	0	0	29
1261/1074r00du07	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1261/1074r00du08	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table I.4a: Debitage frequencies.

DU	Blade blank	Burin spall	Chip	Chunk	Core	Flake	Lame a crete
1156/1004r17du01	11	0	0	0	0	0	0
1156/1004r17du02	14	0	0	0	0	1	0
1156/1004r17du03	0	0	0	0	0	0	0
1156/1004r17du04	3	0	1	1	0	0	0
1156/1004r17du05	7	0	0	0	0	0	0
1156/1004r17du06	6	0	0	0	0	0	0
1156/1004r17du07	0	0	0	0	0	0	0
1156/1004r17du08	1	0	0	0	0	0	0
1160/1002r20du01	17	0	0	0	0	0	0
1166/1066r00du01	0	0	0	0	0	1	0
1166/1066r00du02	2	0	0	0	0	0	0
1166/1066r00du04	0	0	0	0	0	0	0
1166/1066r00du05	1	0	1	0	0	0	0
1166/1066r00du06	0	0	0	0	0	1	0
1166/1066r00du07	0	0	0	0	0	0	0
1192/1035r00du01	4	0	0	0	0	1	0
1192/1035r00du02	0	0	0	0	0	0	0
1192/1035r00du03	6	0	1	0	0	0	0
1192/1035r00du04	5	0	0	0	0	0	0
1192/1035r00du05	2	0	0	0	0	0	0
1192/1035r00du06	4	0	0	0	0	0	0
1192/1035r00du07	1	0	0	0	0	0	0
1192/1035r00du08	0	0	0	0	0	0	0
1202/1070r01du01	0	0	0	0	0	0	0
1202/1070r01du02	0	0	0	0	0	0	0
1202/1070r01du03	0	0	0	0	0	0	0
1202/1070r01du04	0	0	0	0	0	0	0
1202/1070r01du05	0	0	0	0	0	0	0
1204/1060r00du01	1	0	0	0	0	0	0
1204/1060r00du02	2	0	1	0	0	1	0
1204/1060r00du03	0	0	0	0	0	0	0
1204/1060r00du04	1	0	0	0	0	0	0
1204/1060r00du05	1	0	0	0	0	0	0
1204/1060r00du06	0	0	0	0	1	0	0
1204/1060r00du07	1	0	0	0	0	2	0
1208/1068r18du01	0	0	0	0	0	0	0
1208/1068r18du02	2	0	0	0	0	0	0
1208/1068r18du03	1	0	0	0	0	0	0
1208/1068r18du04	0	0	0	0	0	0	0
1208/1068r18du05	0	0	0	0	0	0	0

(continued)

(Table I.4a continued)

DU	Blade blank	Burin spall	Chip	Chunk	Core	Flake	Lame a crete
1208/1068r18du06	2	0	0	0	0	0	0
1208/1068r18du07	0	0	0	0	0	0	0
1208/1068r18du08	0	0	0	0	0	0	0
1208/1068r18du09	0	0	0	0	0	0	0
1208/1068r18du10	0	0	0	0	0	0	0
1208/1074r02du01	4	0	0	0	0	1	0
1208/1074r02du02	3	0	0	0	0	0	0
1208/1074r02du03	0	0	0	0	0	0	0
1208/1074r02du04	0	0	0	0	0	0	0
1208/1074r02du05	0	0	0	0	0	0	0
1208/1074r02du06	0	0	0	0	0	0	0
1208/1074r02du07	0	0	0	0	0	0	0
1208/1074r02du08	0	0	0	0	0	0	0
1210/0788r22du01	1	0	0	0	0	0	0
1210/0788r22du02	1	0	0	0	0	0	0
1212/1052r16du01	1	0	0	0	0	0	0
1212/1064r10du01	0	0	0	0	0	0	0
1212/1064r10du02	1	0	0	0	0	0	0
1212/1068r06du01	1	0	0	0	0	0	0
1212/1068r06du02	0	0	0	0	0	0	0
1212/1068r06du03	0	0	0	0	0	0	0
1212/1068r06du04	2	0	0	0	0	0	0
1212/1068r06du05	0	0	0	0	0	0	0
1212/1072r05du01	5	0	0	0	0	2	1
1212/1072r05du02	0	0	0	0	0	0	0
1212/1072r05du03	0	0	0	0	0	0	0
1212/1072r05du04	1	0	0	0	0	0	0
1212/1072r05du05	0	0	0	0	0	0	0
1212/1072r05du06	0	0	0	0	0	0	0
1212/1072r05du07	1	0	0	0	0	0	1
1212/1072r05du08	0	0	0	0	0	0	0
1212/1072r05du09	1	0	0	0	0	0	0
1212/1072r05du10	2	0	0	0	0	0	0
1212/1072r05du11	0	0	0	0	0	0	0
1212/1072r05du12	0	0	0	0	0	0	0
1212/1074r03du01	2	0	1	0	0	0	1
1214/0788r23du01	1	0	0	0	0	0	0
1214/0788r23du02	7	0	0	0	0	0	0
1214/0788r23du03	0	0	0	0	0	0	0
1214/0788r23du04	0	0	0	0	0	0	0
1214/1062r12du01	1	0	0	0	0	0	0

(continued)

(Table I.4a continued)

DU	Blade blank	Burin spall	Chip	Chunk	Core	Flake	Lame a crete
1214/1062r12du02	1	0	0	0	0	0	0
1214/1062r12du03	0	0	0	0	0	0	0
1214/1062r12du04	1	0	0	0	0	0	0
1214/1062r12du05	0	0	0	0	0	0	0
1214/1066r15du01	0	0	0	0	0	0	0
1214/1066r15du02	1	0	0	0	0	0	0
1214/1066r15du03	1	0	0	0	0	0	0
1214/1066r15du04	1	0	0	0	0	0	0
1216/1068r08du01	0	0	0	0	0	0	1
1216/1068r08du02	0	0	0	0	0	0	0
1216/1068r08du03	0	0	0	0	0	0	0
1216/1068r08du04	4	0	0	0	0	0	0
1216/1068r08du05	0	0	0	0	0	0	0
1216/1072r04du01	0	0	0	0	0	0	0
1216/1072r04du02	1	0	0	0	0	0	0
1216/1072r04du03	0	0	0	0	0	0	0
1216/1072r04du04	0	0	0	0	0	0	0
1216/1072r04du05	0	0	0	0	0	0	0
1216/1072r04du06	0	0	0	0	0	0	0
1216/1072r04du07	3	0	0	0	0	0	0
1216/1076r09du01	0	0	0	0	0	0	0
1216/1076r09du02	0	0	0	0	0	0	0
1216/1076r09du03	1	0	1	0	0	0	0
1216/1076r09du04	1	0	0	0	0	0	0
1216/1076r09du05	2	0	0	0	0	0	0
1216/1076r09du06	0	0	0	0	0	0	0
1216/1076r09du07	0	0	0	0	0	0	0
1218/1072r07du01	2	0	0	0	0	0	0
1218/1072r07du02	0	0	0	0	0	0	0
1219/1095r00du01	1	0	1	0	1	0	0
1219/1095r00du02	1	0	0	0	0	0	0
1219/1095r00du03	0	0	0	0	0	1	0
1219/1095r00du04	0	0	0	0	0	0	0
1219/1095r00du05	0	0	0	0	0	0	0
1219/1095r00du06	0	0	0	0	0	0	0
1219/1095r00du07	0	0	0	0	0	0	0
1220/1060r13du01	4	0	1	0	0	0	0
1220/1060r13du02	1	0	0	0	0	0	0
1220/1060r13du03	0	0	0	0	0	0	0
1220/1060r13du04	0	0	0	0	0	0	0
1220/1060r13du05	1	0	0	0	0	0	0

(continued)

(Table I.4a continued)

DU	Blade blank	Burin spall	Chip	Chunk	Core	Flake	Lame a crete
1220/1060r13du06	0	0	0	0	0	0	0
1220/1072r00du02	1	0	0	0	0	0	0
1220/1072r00du03	0	0	0	0	0	0	0
1220/1072r00du04	0	0	0	0	0	0	0
1220/1072r00du05	0	0	0	0	0	0	0
1220/1072r00du06	0	0	0	0	0	0	0
1224/1060r14du01	0	0	0	0	0	0	0
1224/1060r14du02	1	0	0	0	0	0	0
1235/1056r00du01	5	0	0	0	0	0	0
1235/1056r00du02	2	0	0	0	0	0	0
1235/1056r00du03	14	0	2	0	0	1	0
1235/1056r00du04	0	0	1	0	0	0	0
1235/1056r00du05	1	0	2	0	0	0	0
1235/1056r00du06	0	0	0	0	0	0	0
1235/1056r00du07	2	0	0	0	0	0	0
1235/1056r00du08	0	0	0	0	0	0	0
1235/1056r00du09	1	0	0	0	0	0	0
1235/1056r00du10	0	0	0	0	0	0	0
1235/1056r00du11	0	0	0	0	0	0	0
1235/1056r00du12	2	0	0	0	0	0	0
1235/1056r00du13	0	0	0	0	0	0	0
1235/1056r00du14	0	0	0	0	0	0	0
1235/1056r00du15	0	0	0	0	0	0	0
1235/1056r00du16	0	0	0	0	0	0	0
1235/1056r00du17	0	0	0	0	0	0	0
1235/1056r00du18	0	0	0	0	0	1	1
1235/1056r00du20	0	0	0	0	0	0	0
1235/1056r00du21	0	0	0	0	0	0	0
1235/1056r00du22	0	0	0	0	0	0	0
1261/1074r00du01	1	0	0	0	0	0	0
1261/1074r00du02	1	0	1	0	0	1	0
1261/1074r00du03	1	0	0	0	0	0	0
1261/1074r00du04	0	0	0	0	0	0	0
1261/1074r00du05	0	0	0	0	0	0	0
1261/1074r00du06	7	0	0	0	0	1	0
1261/1074r00du07	1	0	0	0	0	0	0
1261/1074r00du08	0	0	0	0	0	0	0

Table I.4b: Retouched tools.

DU	Biface	Bif. Knife	Blade	Burin	Chunk	Core	Endscraper	Notched flake	Perforator	Retouched tool	Sickle blade	Sidescraper	Truncation
1156/1004r17du01	0	0	0	0	0	0	0	0	0	0	8	0	0
1156/1004r17du02	0	2	0	0	0	0	0	0	0	0	9	0	0
1156/1004r17du03	0	0	0	0	0	0	0	0	0	0	0	0	0
1156/1004r17du04	0	0	0	0	0	0	0	0	0	0	2	0	0
1156/1004r17du05	0	0	0	0	0	0	0	0	0	0	4	0	0
1156/1004r17du06	0	0	0	0	0	0	1	0	0	0	0	0	0
1156/1004r17du07	0	0	0	0	0	0	0	0	0	0	0	0	0
1156/1004r17du08	0	0	0	0	0	0	0	0	0	0	1	0	0
1160/1002r20du01	0	0	0	0	0	0	0	0	0	0	8	0	0
1166/1066r00du01	1	0	0	0	0	0	0	0	0	0	0	0	0
1166/1066r00du02	1	0	0	0	0	0	0	0	0	0	1	0	0
1166/1066r00du04	0	0	0	0	0	0	0	0	0	0	0	0	0
1166/1066r00du05	0	0	0	0	0	0	0	0	0	0	0	0	0
1166/1066r00du06	0	0	0	0	0	0	0	0	0	0	1	0	0
1166/1066r00du07	0	0	0	0	0	0	0	0	0	0	1	0	0
1192/1035r00du01	1	0	0	0	0	0	0	0	0	0	4	0	1
1192/1035r00du02	0	0	0	0	0	0	0	0	0	0	0	0	0
1192/1035r00du03	0	0	0	0	0	0	0	0	0	0	7	0	0
1192/1035r00du04	1	0	0	0	0	0	1	0	0	0	2	0	0
1192/1035r00du05	0	0	0	0	0	0	0	0	0	0	2	1	0
1192/1035r00du06	0	0	0	0	0	0	0	0	0	0	1	0	0
1192/1035r00du07	0	0	0	0	0	0	0	0	0	0	3	0	0
1192/1035r00du08	0	0	0	0	0	0	0	0	0	0	0	0	0
1202/1070r01du01	0	0	0	0	0	0	0	0	0	0	0	0	0
1202/1070r01du02	0	0	0	0	0	0	0	0	0	0	0	0	0
1202/1070r01du03	0	0	0	0	0	0	0	0	0	0	0	0	0
1202/1070r01du04	0	0	0	0	0	0	0	0	0	0	0	0	0
1202/1070r01du05	0	0	0	0	0	0	0	0	0	0	0	0	0
1204/1060r00du01	0	1	0	0	0	0	0	0	0	0	1	0	0
1204/1060r00du02	0	0	0	0	0	0	0	0	0	0	0	0	0
1204/1060r00du03	0	0	0	0	0	0	0	0	0	0	0	0	0
1204/1060r00du04	0	0	0	0	0	0	0	0	0	0	0	0	0
1204/1060r00du05	0	0	0	0	0	0	0	0	0	0	0	0	0
1204/1060r00du06	0	0	0	0	0	0	0	0	0	0	0	0	0
1204/1060r00du07	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1068r18du01	0	0	0	0	0	0	0	0	0	0	1	0	0
1208/1068r18du02	0	0	0	0	0	0	0	0	0	0	3	0	0
1208/1068r18du03	0	0	0	0	0	0	0	0	0	0	2	0	0
1208/1068r18du04	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1068r18du05	0	0	0	0	0	0	0	0	0	0	1	0	0

(continued)

(Table I.4b continued)

DU	Biface	Bif. Knife	Blade	Burin	Chunk	Core	Endscraper	Notched flake	Perforator	Retouched tool	Sickle blade	Sidescraper	Truncation
1208/1068r18du06	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1068r18du07	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1068r18du08	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1068r18du09	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1068r18du10	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1074r02du01	0	0	1	0	0	0	0	0	0	0	3	0	0
1208/1074r02du02	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1074r02du03	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1074r02du04	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1074r02du05	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1074r02du06	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1074r02du07	0	0	0	0	0	0	0	0	0	0	0	0	0
1208/1074r02du08	0	0	0	0	0	0	0	0	0	0	0	0	0
1210/0788r22du01	0	0	0	0	0	0	0	0	0	0	1	0	0
1210/0788r22du02	0	0	0	0	1	0	0	0	0	0	1	0	0
1212/1052r16du01	0	0	0	0	0	0	0	0	0	0	2	0	0
1212/1064r10du01	0	0	0	0	0	0	0	0	0	0	0	0	0
1212/1064r10du02	0	0	0	0	0	0	0	0	0	0	0	0	0
1212/1068r06du01	0	0	0	0	0	0	0	0	0	0	0	0	0
1212/1068r06du02	0	0	0	0	0	0	0	0	0	0	2	0	0
1212/1068r06du03	0	0	0	0	0	0	0	0	0	0	0	0	0
1212/1068r06du04	0	0	0	0	0	0	0	0	0	0	2	0	0
1212/1068r06du05	0	0	0	0	0	0	0	0	0	0	0	0	0
1212/1072r05du01	1	0	0	0	0	0	0	1	0	0	1	0	0
1212/1072r05du02	0	0	0	0	0	0	0	0	0	0	0	0	0
1212/1072r05du03	0	0	0	0	0	0	0	0	0	0	0	0	0
1212/1072r05du04	0	0	0	0	0	0	0	0	0	0	1	0	0
1212/1072r05du05	0	0	0	0	0	0	0	0	0	0	0	0	0
1212/1072r05du06	0	0	0	0	0	0	0	0	0	0	0	0	0
1212/1072r05du07	0	0	0	0	0	0	0	0	0	0	1	0	0
1212/1072r05du08	0	0	0	0	0	0	0	0	0	0	0	0	0
1212/1072r05du09	0	0	0	0	0	0	0	0	0	0	0	0	0
1212/1072r05du10	0	0	0	0	0	0	0	0	0	0	0	0	0
1212/1072r05du11	0	0	0	0	0	0	0	0	0	0	0	0	0
1212/1072r05du12	0	0	0	0	0	0	0	0	0	0	0	0	0
1212/1074r03du01	0	0	0	0	0	0	0	0	0	0	1	0	0
1214/0788r23du01	0	0	0	0	0	0	0	0	0	0	1	0	0
1214/0788r23du02	0	0	0	0	0	0	0	0	0	0	0	0	0
1214/0788r23du03	0	0	0	0	0	0	0	0	0	0	1	0	0
1214/0788r23du04	0	0	0	0	0	0	0	0	0	0	0	0	0
1214/1062r12du01	0	0	0	0	0	0	0	0	0	0	0	0	0

(continued)

(Table I.4b continued)

DU	Biface	Bif. Knife	Blade	Burin	Chunk	Core	Endscraper	Notched flake	Perforator	Retouched tool	Sickle blade	Sidescraper	Truncation
1214/1062r12du02	0	0	0	0	0	0	0	0	0	0	0	0	0
1214/1062r12du03	0	0	0	0	0	0	0	0	0	0	0	0	0
1214/1062r12du04	0	0	0	0	0	0	0	0	0	0	0	0	0
1214/1062r12du05	0	0	0	0	0	0	0	0	0	0	0	0	0
1214/1066r15du01	0	0	0	0	0	0	0	0	0	0	0	0	0
1214/1066r15du02	0	0	0	0	0	0	0	0	0	0	0	0	0
1214/1066r15du03	0	0	0	0	0	0	0	0	0	0	1	0	0
1214/1066r15du04	0	0	0	1	0	0	0	0	0	0	0	0	0
1216/1068r08du01	0	0	0	0	0	0	0	0	0	0	1	0	0
1216/1068r08du02	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1068r08du03	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1068r08du04	0	1	0	0	0	0	0	0	0	0	0	0	0
1216/1068r08du05	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1072r04du01	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1072r04du02	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1072r04du03	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1072r04du04	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1072r04du05	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1072r04du06	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1072r04du07	0	0	0	0	0	0	0	0	0	0	3	0	0
1216/1076r09du01	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1076r09du02	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1076r09du03	0	0	0	0	0	0	0	0	0	0	2	0	0
1216/1076r09du04	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1076r09du05	0	0	0	0	0	0	0	0	0	0	1	0	0
1216/1076r09du06	0	0	0	0	0	0	0	0	0	0	0	0	0
1216/1076r09du07	0	0	0	0	0	0	0	0	0	0	0	0	0
1218/1072r07du01	0	0	0	0	0	0	0	0	0	0	0	0	0
1218/1072r07du02	0	0	0	0	0	0	0	0	0	0	0	0	0
1219/1095r00du01	0	0	0	0	0	0	0	0	0	0	3	0	0
1219/1095r00du02	0	0	0	0	0	0	0	0	0	0	1	0	0
1219/1095r00du03	0	0	0	0	0	0	0	0	0	0	0	0	0
1219/1095r00du04	0	0	0	0	0	0	0	0	0	0	0	0	0
1219/1095r00du05	0	0	0	0	0	0	0	0	0	0	1	0	0
1219/1095r00du06	0	0	0	0	0	0	0	0	0	0	0	0	0
1219/1095r00du07	0	0	0	0	0	0	0	0	0	0	0	0	0
1220/1060r13du01	0	0	0	0	0	0	0	0	0	0	3	0	0
1220/1060r13du02	0	0	0	0	0	0	0	0	0	0	0	0	0
1220/1060r13du03	0	0	0	0	0	0	0	0	0	0	0	0	0
1220/1060r13du04	0	0	0	0	0	0	0	0	0	0	0	0	0
1220/1060r13du05	0	0	0	0	0	0	0	0	0	0	1	0	0

(continued)

(Table I.4b continued)

DU	Biface	Bif. Knife	Blade	Burin	Chunk	Core	Endscraper	Notched flake	Perforator	Retouched tool	Sickle blade	Sidescraper	Truncation
1220/1060r13du06	0	0	0	0	0	1	0	0	0	0	0	0	0
1220/1072r00du02	0	0	0	0	0	0	0	0	0	0	0	0	0
1220/1072r00du03	0	0	0	0	0	0	0	0	0	0	0	0	0
1220/1072r00du04	0	0	0	0	0	0	0	0	0	0	0	0	0
1220/1072r00du05	0	0	0	0	0	0	0	0	0	0	0	0	0
1220/1072r00du06	0	0	0	0	0	0	0	0	0	0	0	0	0
1224/1060r14du01	0	0	0	0	0	0	0	0	0	0	0	0	0
1224/1060r14du02	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du01	0	0	0	0	0	0	0	0	0	0	4	0	0
1235/1056r00du02	1	0	0	0	0	0	0	0	0	1	1	0	0
1235/1056r00du03	0	0	0	0	0	0	0	0	0	0	4	0	0
1235/1056r00du04	2	0	0	0	0	0	0	0	0	0	1	0	0
1235/1056r00du05	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du06	0	0	0	0	0	0	0	0	0	0	1	0	0
1235/1056r00du07	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du08	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du09	0	0	0	0	0	0	0	0	0	0	1	0	0
1235/1056r00du10	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du11	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du12	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du13	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du14	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du15	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du16	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du17	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du18	0	0	0	0	0	0	0	0	0	0	1	0	0
1235/1056r00du20	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du21	0	0	0	0	0	0	0	0	0	0	0	0	0
1235/1056r00du22	0	0	0	0	0	0	0	0	0	0	0	0	0
1261/1074r00du01	0	0	0	0	0	0	0	0	0	0	0	0	0
1261/1074r00du02	0	0	0	0	0	0	0	0	0	0	0	0	1
1261/1074r00du03	0	0	0	0	0	0	0	0	0	0	0	0	0
1261/1074r00du04	0	0	0	0	0	0	0	0	0	0	0	0	0
1261/1074r00du05	0	0	0	0	0	0	0	0	0	0	1	0	0
1261/1074r00du06	0	0	0	0	0	0	0	0	0	0	0	0	0
1261/1074r00du07	0	0	0	0	0	0	0	0	0	0	0	0	0
1261/1074r00du08	0	0	0	0	0	0	0	0	0	0	0	0	0

Table I.4c: Ground stone objects.

DU	Chip	Chunk	Elongated	Flake	Globular	Grinding stone	Pallette	Point	Pounder	ShapedObject
1156/1004r17du01	0	11	0	1	0	0	0	0	0	0
1156/1004r17du02	0	0	0	3	0	1	0	0	0	0
1156/1004r17du03	0	0	0	0	0	0	0	0	0	0
1156/1004r17du04	0	9	0	1	0	0	0	0	0	0
1156/1004r17du05	0	0	0	26	0	0	0	0	0	0
1156/1004r17du06	0	2	0	1	0	0	0	0	0	0
1156/1004r17du07	0	0	0	0	0	0	0	0	0	0
1156/1004r17du08	0	0	0	0	0	0	0	0	0	0
1160/1002r20du01	0	0	0	0	0	0	0	0	0	0
1166/1066r00du01	0	0	0	0	0	0	0	0	0	0
1166/1066r00du02	0	0	0	0	0	0	0	0	0	0
1166/1066r00du04	0	0	0	0	0	0	0	0	0	0
1166/1066r00du05	0	0	0	0	0	0	0	0	0	0
1166/1066r00du06	0	0	0	0	0	0	0	0	0	0
1166/1066r00du07	0	0	0	0	0	0	0	0	0	0
1192/1035r00du01	0	13	0	3	0	3	0	0	0	0
1192/1035r00du02	0	0	0	0	0	0	0	0	0	0
1192/1035r00du03	0	0	0	3	0	9	0	0	0	0
1192/1035r00du04	0	1	0	1	0	0	0	0	0	1
1192/1035r00du05	0	7	0	1	0	0	0	0	0	0
1192/1035r00du06	0	2	0	2	0	0	0	0	0	0
1192/1035r00du07	0	0	0	0	0	0	0	0	0	0
1192/1035r00du08	0	0	0	0	0	0	0	0	0	0
1202/1070r01du01	0	0	0	0	0	0	0	0	0	0
1202/1070r01du02	0	0	0	0	0	0	0	0	0	0
1202/1070r01du03	0	0	0	0	0	0	0	0	0	0
1202/1070r01du04	0	0	0	0	0	0	0	0	0	0
1202/1070r01du05	0	0	0	0	0	0	0	0	0	0
1204/1060r00du01	0	0	0	0	0	0	0	0	0	0
1204/1060r00du02	0	0	0	1	0	0	0	0	0	0
1204/1060r00du03	0	0	0	0	0	0	0	0	0	0
1204/1060r00du04	0	0	0	0	0	0	0	0	0	0
1204/1060r00du05	0	1	0	0	0	0	0	0	0	0
1204/1060r00du06	0	0	0	0	0	0	0	0	0	0
1204/1060r00du07	0	0	0	0	0	0	0	0	0	0
1208/1068r18du01	0	2	0	0	0	1	0	0	0	0
1208/1068r18du02	0	1	0	2	0	1	0	0	0	0
1208/1068r18du03	0	1	0	0	0	0	0	0	0	0
1208/1068r18du04	0	0	0	0	0	0	0	0	0	0
1208/1068r18du05	0	0	0	0	0	0	0	0	0	0

(continued)

(Table I.4c continued)

DU	Chip	Chunk	Elongated	Flake	Globular	Grinding stone	Pallette	Point	Pounder	ShapedObject
1208/1068r18du06	0	1	0	0	0	0	0	0	0	0
1208/1068r18du07	0	0	0	2	0	0	0	0	0	0
1208/1068r18du08	0	0	0	0	0	0	0	0	0	0
1208/1068r18du09	0	0	0	0	0	0	0	0	0	0
1208/1068r18du10	0	0	0	0	0	0	0	0	0	0
1208/1074r02du01	0	0	0	0	0	0	0	0	0	0
1208/1074r02du02	0	0	0	0	0	0	0	0	0	0
1208/1074r02du03	0	0	0	0	0	0	0	0	0	0
1208/1074r02du04	0	0	0	0	0	0	0	0	0	0
1208/1074r02du05	0	0	0	0	0	1	0	0	0	0
1208/1074r02du06	0	0	0	0	0	0	0	0	0	0
1208/1074r02du07	0	0	0	0	0	0	0	0	0	0
1208/1074r02du08	0	0	0	0	0	0	0	0	0	0
1210/0788r22du01	0	5	0	0	2	1	0	0	0	0
1210/0788r22du02	0	4	0	0	0	0	0	0	0	0
1212/1052r16du01	0	4	0	0	0	0	0	0	0	0
1212/1064r10du01	0	0	0	0	0	1	0	0	0	0
1212/1064r10du02	0	6	0	0	0	0	0	1	0	0
1212/1068r06du01	0	1	0	0	0	0	0	0	0	0
1212/1068r06du02	0	0	0	1	0	1	0	0	0	0
1212/1068r06du03	0	0	0	0	0	0	0	0	0	0
1212/1068r06du04	0	2	0	1	0	3	0	0	0	0
1212/1068r06du05	0	0	0	0	0	0	0	0	0	0
1212/1072r05du01	0	0	0	0	0	0	0	0	0	0
1212/1072r05du02	0	0	0	0	0	0	0	0	0	0
1212/1072r05du03	0	0	0	0	0	0	0	0	0	0
1212/1072r05du04	0	0	0	0	0	0	0	0	0	0
1212/1072r05du05	0	0	0	0	0	0	0	0	0	0
1212/1072r05du06	0	1	0	0	1	0	0	0	0	0
1212/1072r05du07	0	1	0	1	0	4	0	0	0	0
1212/1072r05du08	0	0	0	1	0	0	0	0	0	0
1212/1072r05du09	0	0	0	0	1	1	0	0	0	0
1212/1072r05du10	0	5	0	1	2	6	0	0	0	0
1212/1072r05du11	0	0	0	0	0	0	0	0	0	0
1212/1072r05du12	0	0	0	0	0	0	0	0	0	0
1212/1074r03du01	0	0	0	0	0	0	0	0	0	0
1214/0788r23du01	0	15	0	1	0	0	0	0	1	0
1214/0788r23du02	0	0	1	0	0	1	0	0	0	0
1214/0788r23du03	0	3	0	0	0	0	0	0	0	0
1214/0788r23du04	0	0	0	0	0	0	0	0	0	0

(continued)

(Table I.4c continued)

DU	Chip	Chunk	Elongated	Flake	Globular	Grinding stone	Pallette	Point	Pounder	ShapedObject
1214/1062r12du01	0	3	0	0	0	23	0	0	0	0
1214/1062r12du02	0	3	0	0	0	0	0	0	0	0
1214/1062r12du03	0	1	0	0	0	0	0	0	0	0
1214/1062r12du04	0	0	0	0	1	0	0	0	0	0
1214/1062r12du05	0	0	0	0	0	0	0	0	0	0
1214/1066r15du01	0	2	0	0	0	0	0	0	0	0
1214/1066r15du02	0	0	0	0	0	0	0	0	0	0
1214/1066r15du03	0	0	0	0	0	0	0	0	0	0
1214/1066r15du04	0	6	0	3	0	0	0	0	0	0
1216/1068r08du01	0	0	0	2	0	1	0	0	0	0
1216/1068r08du02	0	0	0	1	0	0	0	0	0	0
1216/1068r08du03	3	3	0	0	0	1	0	0	0	0
1216/1068r08du04	5	0	0	0	0	0	0	0	0	0
1216/1068r08du05	0	0	0	0	0	0	0	0	0	0
1216/1072r04du01	0	0	0	0	0	0	0	0	0	0
1216/1072r04du02	0	0	0	0	0	0	0	0	0	0
1216/1072r04du03	0	0	0	0	0	0	0	0	0	0
1216/1072r04du04	0	0	0	0	0	1	0	0	0	0
1216/1072r04du05	0	0	0	0	0	0	0	0	0	0
1216/1072r04du06	0	0	0	1	0	0	0	0	0	0
1216/1072r04du07	0	0	0	0	0	1	0	0	0	0
1216/1076r09du01	0	0	0	0	0	0	0	0	0	0
1216/1076r09du02	0	0	0	0	0	1	0	0	0	0
1216/1076r09du03	0	6	0	0	1	0	0	0	0	0
1216/1076r09du04	0	0	0	0	0	0	0	0	0	0
1216/1076r09du05	0	7	0	0	0	0	0	0	0	0
1216/1076r09du06	0	0	0	0	0	0	0	0	0	0
1216/1076r09du07	0	0	0	1	0	0	0	0	0	0
1218/1072r07du01	0	0	0	12	0	0	0	0	0	0
1218/1072r07du02	0	0	0	0	0	0	0	0	0	0
1219/1095r00du01	0	5	0	2	0	0	1	0	0	0
1219/1095r00du02	0	0	0	1	0	0	0	0	0	0
1219/1095r00du03	0	2	0	3	0	0	0	0	0	0
1219/1095r00du04	0	0	0	0	0	0	0	0	0	0
1219/1095r00du05	0	0	0	0	0	0	0	0	0	0
1219/1095r00du06	0	0	0	0	0	0	0	0	0	0
1219/1095r00du07	0	0	0	0	0	0	0	0	0	0
1220/1060r13du01	0	9	0	0	0	1	0	0	0	0
1220/1060r13du02	0	6	0	1	0	1	0	0	0	0
1220/1060r13du03	0	0	0	1	0	0	0	0	0	0
1220/1060r13du04	0	0	0	0	0	0	0	0	0	0
1220/1060r13du05	0	3	0	0	0	0	0	0	0	0

(continued)

(Table I.4c continued)

DU	Chip	Chunk	Elongated	Flake	Globular	Grinding stone	Pallette	Point	Pounder	ShapedObject
1220/1060r13du06	0	0	0	0	0	0	0	0	0	0
1220/1072r00du02	0	0	0	0	0	0	0	0	0	0
1220/1072r00du03	0	0	0	0	0	0	0	0	0	0
1220/1072r00du04	0	0	0	0	0	0	0	0	0	0
1220/1072r00du05	0	0	0	0	0	0	0	0	0	0
1220/1072r00du06	0	0	0	0	0	0	0	0	0	0
1224/1060r14du01	0	0	0	0	0	0	0	0	0	0
1224/1060r14du02	0	0	0	4	0	0	0	0	0	0
1235/1056r00du01	2	0	0	3	0	2	0	0	0	0
1235/1056r00du02	0	1	0	2	0	0	0	0	0	0
1235/1056r00du03	0	0	0	2	0	1	0	0	0	0
1235/1056r00du04	0	0	0	0	0	2	0	0	0	0
1235/1056r00du05	0	0	0	0	0	0	0	0	0	0
1235/1056r00du06	0	0	0	0	0	0	0	0	0	0
1235/1056r00du07	0	0	0	0	0	0	0	0	0	0
1235/1056r00du08	0	0	0	0	0	0	0	0	0	0
1235/1056r00du09	0	0	0	0	0	0	0	0	0	0
1235/1056r00du10	0	0	0	0	0	0	0	0	0	0
1235/1056r00du11	0	0	0	0	0	0	0	0	0	0
1235/1056r00du12	0	0	0	0	0	0	0	0	0	0
1235/1056r00du13	0	0	0	0	0	0	0	0	0	0
1235/1056r00du14	0	0	0	0	0	0	0	0	0	0
1235/1056r00du15	0	0	0	0	0	0	0	0	0	0
1235/1056r00du16	0	0	0	0	0	0	0	0	0	0
1235/1056r00du17	0	0	0	0	0	0	0	0	0	0
1235/1056r00du18	0	0	0	0	0	3	0	0	0	0
1235/1056r00du20	0	0	0	0	0	0	0	0	0	0
1235/1056r00du21	0	0	0	0	0	0	0	0	0	0
1235/1056r00du22	0	0	0	0	0	0	0	0	0	0
1261/1074r00du01	1	3	0	0	0	1	0	0	0	0
1261/1074r00du02	0	4	0	1	0	5	0	0	0	0
1261/1074r00du03	0	5	0	0	0	1	0	0	0	0
1261/1074r00du04	0	12	0	0	0	2	0	0	0	0
1261/1074r00du05	0	12	0	1	0	1	0	0	0	0
1261/1074r00du06	0	5	0	0	0	0	0	0	0	0
1261/1074r00du07	0	2	0	0	0	0	0	0	0	0
1261/1074r00du08	0	0	0	1	0	0	0	0	0	0

Table I.5: Plant remains. Sample weight is in kilograms, taxa are number of specimens.

		Grain			Straw		Reeds and sedges				
DU	Sample weight	Barley grain	Emmer grain	Unk. Grain	Barley straw	Emmer straw	Canary grass	Darnell	Nutgrass	Bulrush	Sedge
1212/1064r10du02	5.40	.00	.00	1.00	.00	1.00	3.00	.00	.00	.00	.00
1214/1066r15du03	4.50	3.00	.00	1.00	.00	.00	3.00	.00	.00	.00	.00
1216/1072r04du01	2.20	.00	1.00	3.00	.00	5.00	31.00	11.00	.00	.00	2.00
1216/1076r09du03	3.10	.00	1.00	.00	.00	.00	48.00	6.00	.00	.00	2.00
1216/1076r09du04	3.60	.00	.00	.00	.00	.00	14.00	.00	.00	.00	.00
1160/1002r20du01	5.70	.00	1.00	.00	.00	.00	5.00	9.00	1.00	.00	.00
1216/1072r04du04	2.90	.00	.00	.00	.00	.00	1.00	.00	.00	.00	.00
1156/1004r17du02	2.50	1.00	1.00	16.00	.00	7.00	18.00	80.00	.00	11.00	2.00
1192/1035r00du05	11.08	10.00	7.00	3.00	.00	183.00	41.00	59.00	.00	2.00	6.00
1192/1035r00du07	5.67	11.00	2.00	11.00	2.00	166.00	6.00	28.00	1.00	.00	6.00
1202/1070r01du01	3.20	.00	.00	1.00	.00	.00	1.00	.00	.00	.00	.00
1202/1070r01du02	11.30	1.00	.00	4.00	.00	2.00	1.00	1.00	1.00	1.00	4.00
1202/1070r01du03	4.90	4.00	1.00	18.00	1.00	49.00	13.00	28.00	1.00	2.00	13.00
1208/1068r18du02	8.80	1.00	.00	2.00	.00	2.00	12.00	3.00	.00	1.00	2.00
1208/1074r02du02	8.14	1.00	.00	.00	.00	21.00	4.00	4.00	.00	5.00	2.00
1212/1068r06du04	5.60	.00	.00	3.00	.00	3.00	9.00	1.00	.00	.00	.00
1212/1068r06du05	6.70	1.00	.00	2.00	.00	18.00	24.00	28.00	.00	.00	.00
1212/1072r05du05	8.80	1.00	.00	.00	.00	.00	.00	4.00	.00	.00	.00
1212/1072r05du06	5.30	2.00	.00	.00	.00	2.00	2.00	2.00	.00	2.00	2.00
1212/1072r05du09	25.10	4.00	.00	3.00	1.00	14.00	11.00	2.00	.00	.00	4.00
1212/1074r03du01	11.08	.00	.00	3.00	.00	1.00	4.00	.00	1.00	.00	3.00
1214/0788r23du02	6.50	1.00	.00	4.00	.00	.00	7.00	1.00	.00	.00	5.00
1214/1062r12du01	6.30	.00	.00	.00	.00	1.00	10.00	4.00	.00	.00	3.00
1216/1068r08du04	12.40	2.00	4.00	8.00	.00	8.00	82.00	53.00	.00	1.00	6.00

(continued)

(Table I.5 continued)

	Fodder					Other			
DU	Clover	Brassicae	Dock	Vetch	Medick	Oth. Grass	Goosefoot	Oth. Ident.	Oth. Unknown
1212/1064r10du02	.00	.00	.00	.00	.00	.00	.00	.00	11.00
1214/1066r15du03	.00	2.00	1.00	.00	.00	.00	.00	.00	29.00
1216/1072r04du01	27.00	5.00	3.00	.00	.00	.00	.00	.00	430.00
1216/1076r09du03	2.00	.00	.00	.00	.00	25.00	.00	25.00	189.00
1216/1076r09du04	3.00	.00	.00	2.00	.00	.00	.00	.00	45.00
1160/1002r20du01	6.00	2.00	1.00	1.00	.00	.00	.00	.00	81.00
1216/1072r04du04	.00	.00	.00	.00	.00	.00	.00	.00	7.00
1156/1004r17du02	7.00	5.00	.00	1.00	.00	5.00	.00	5.00	783.00
1192/1035r00du05	123.00	1.00	16.00	11.00	.00	.00	.00	.00	10.00
1192/1035r00du07	29.00	4.00	1.00	4.00	.00	.00	2.00	2.00	2.00
1202/1070r01du01	1.00	1.00	3.00	.00	.00	.00	.00	.00	30.00
1202/1070r01du02	3.00	.00	3.00	4.00	.00	6.00	.00	6.00	24.00
1202/1070r01du03	9.00	1.00	29.00	.00	.00	1.00	1.00	2.00	607.00
1208/1068r18du02	1.00	4.00	1.00	1.00	.00	.00	.00	.00	36.00
1208/1074r02du02	5.00	6.00	.00	1.00	.00	2.00	.00	2.00	2.00
1212/1068r06du04	.00	.00	.00	.00	.00	.00	.00	.00	29.00
1212/1068r06du05	12.00	7.00	5.00	.00	.00	.00	.00	.00	105.00
1212/1072r05du05	.00	.00	.00	.00	.00	4.00	.00	4.00	17.00
1212/1072r05du06	1.00	1.00	.00	.00	.00	.00	.00	.00	22.00
1212/1072r05du09	7.00	.00	3.00	1.00	.00	10.00	1.00	11.00	96.00
1212/1074r03du01	.00	.00	.00	.00	.00	.00	.00	.00	21.00
1214/0788r23du02	.00	1.00	3.00	.00	.00	.00	.00	.00	40.00
1214/1062r12du01	2.00	.00	1.00	1.00	.00	.00	.00	.00	60.00
1216/1068r08du04	28.00	6.00	9.00	2.00	.00	17.00	.00	17.00	319.00

(continued)

(Table I.5 continued)

		Grain			Straw		Reeds and sedges				
DU	Sample weight	Barley grain	Emmer grain	Unk. Grain	Barley straw	Emmer straw	Canary grass	Darnell	Nutgrass	Bulrush	Sedge
1216/1076r09du05	3.60	.00	.00	2.00	.00	.00	4.00	1.00	.00	.00	.00
1216/1076r09du07	3.40	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
1218/1072r07du02	7.00	2.00	.00	2.00	.00	.00	12.00	5.00	.00	.00	1.00
1220/1060r13du01	6.20	9.00	8.00	16.00	8.00	34.00	.00	37.00	1.00	.00	19.00
1220/1060r13du03	8.50	.00	.00	.00	.00	.00	6.00	3.00	.00	.00	1.00
1224/1060r14du02	3.60	2.00	.00	5.00	1.00	1.00	10.00	15.00	.00	.00	.00
1156/1004r17du07	1.80	.00	.00	.00	.00	.00	10.00	9.00	.00	.00	1.00
1208/1068r18du05	5.40	.00	.00	.00	.00	.00	2.00	1.00	.00	.00	2.00
1208/1068r18du06	6.80	1.00	1.00	.00	.00	4.00	5.00	2.00	.00	.00	.00
1208/1068r18du08	6.00	22.00	2.00	71.00	.00	6.00	108.00	29.00	.00	.00	9.00
1208/1068r18du10	5.90	3.00	.00	.00	.00	3.00	37.00	7.00	.00	.00	.00
1214/0788r23du03	5.10	4.00	.00	6.00	.00	.00	5.00	37.00	.00	.00	6.00
1214/1062r12du03	9.00	6.00	.00	10.00	2.00	12.00	75.00	49.00	1.00	10.00	18.00
1216/1072r04du06	4.40	.00	.00	3.00	.00	.00	13.00	5.00	.00	.00	2.00
1220/1060r13du05	8.60	2.00	2.00	15.00	.00	17.00	16.00	8.00	.00	.00	1.00
1220/1060r13du06	6.80	2.00	.00	3.00	.00	2.00	14.00	8.00	.00	.00	1.00
1235/1056r00du05	20.58	1.00	.00	.00	.00	2.00	2.00	4.00	.00	.00	2.00
1235/1056r00du07	12.09	.00	.00	.00	.00	.00	2.00	4.00	.00	.00	1.00
1235/1056r00du09	15.79	.00	.00	.00	.00	2.00	.00	.00	.00	.00	1.00
1235/1056r00du11	2.77	.00	.00	.00	.00	3.00	1.00	.00	.00	.00	.00
1235/1056r00du12	9.17	1.00	.00	.00	.00	5.00	2.00	2.00	.00	.00	.00
1235/1056r00du13	2.52	1.00	.00	2.00	.00	27.00	15.00	6.00	3.00	1.00	8.00
1235/1056r00du20	3.85	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
1208/1068r18du09	7.00	.00	.00	.00	.00	.00	7.00	2.00	.00	.00	.00
Total		99.00	31.00	218.00	15.00	601.00	696.00	558.00	10.00	36.00	135.00

(continued)

(Table I.5 continued)

	Fodder					Other			
DU	Clover	Brassicae	Dock	Vetch	Medick	Oth. Grass	Goosefoot	Oth. Ident.	Oth. Unknown
1216/1076r09du05	2.00	.00	.00	.00	.00	1.00	.00	1.00	15.00
1216/1076r09du07	.00	.00	.00	.00	.00	2.00	.00	2.00	5.00
1218/1072r07du02	5.00	1.00	3.00	.00	.00	.00	.00	.00	41.00
1220/1060r13du01	37.00	.00	4.00	1.00	.00	175.00	1.00	176.00	1122.00
1220/1060r13du03	3.00	.00	.00	.00	.00	5.00	.00	5.00	39.00
1224/1060r14du02	10.00	6.00	5.00	2.00	.00	3.00	.00	3.00	166.00
1156/1004r17du07	1.00	9.00	.00	1.00	.00	1.00	.00	1.00	162.00
1208/1068r18du05	1.00	.00	.00	.00	.00	.00	.00	.00	12.00
1208/1068r18du06	6.00	2.00	.00	1.00	.00	.00	.00	.00	74.00
1208/1068r18du08	7.00	6.00	1.00	2.00	.00	168.00	.00	168.00	902.00
1208/1068r18du10	15.00	9.00	1.00	.00	.00	.00	.00	.00	175.00
1214/0788r23du03	3.00	.00	.00	1.00	.00	.00	.00	.00	230.00
1214/1062r12du03	36.00	21.00	57.00	2.00	1.00	1.00	.00	1.00	861.00
1216/1072r04du06	1.00	.00	1.00	1.00	.00	8.00	.00	8.00	48.00
1220/1060r13du05	10.00	7.00	3.00	.00	.00	1.00	.00	1.00	147.00
1220/1060r13du06	9.00	3.00	.00	1.00	.00	.00	.00	.00	80.00
1235/1056r00du05	2.00	.00	.00	2.00	.00	.00	.00	.00	.00
1235/1056r00du07	1.00	2.00	.00	1.00	.00	.00	.00	.00	.00
1235/1056r00du09	.00	1.00	.00	1.00	.00	.00	.00	.00	.00
1235/1056r00du11	1.00	.00	.00	.00	.00	.00	.00	.00	.00
1235/1056r00du12	1.00	.00	1.00	.00	.00	.00	.00	.00	.00
1235/1056r00du13	4.00	6.00	2.00	4.00	.00	1.00	.00	1.00	8.00
1235/1056r00du20	1.00	.00	.00	.00	.00	.00	.00	.00	.00
1208/1068r18du09	3.00	1.00	1.00	.00	.00	.00	.00	.00	44.00
Total	425	120	158	49	1	436	5	441	7126

Appendix II. Artifact drawings.

Figures II.1-25 contain samples of drawn sherds for all Old Kingdom ceramic types used in this study. Types M and N, Middle Kingdom and First Intermediate Period wares (respectively) are not shown. Figures II.26-29 show various chipped stone and ground stone artifacts. All figures unless otherwise indicated are shown in 1:1 scale.

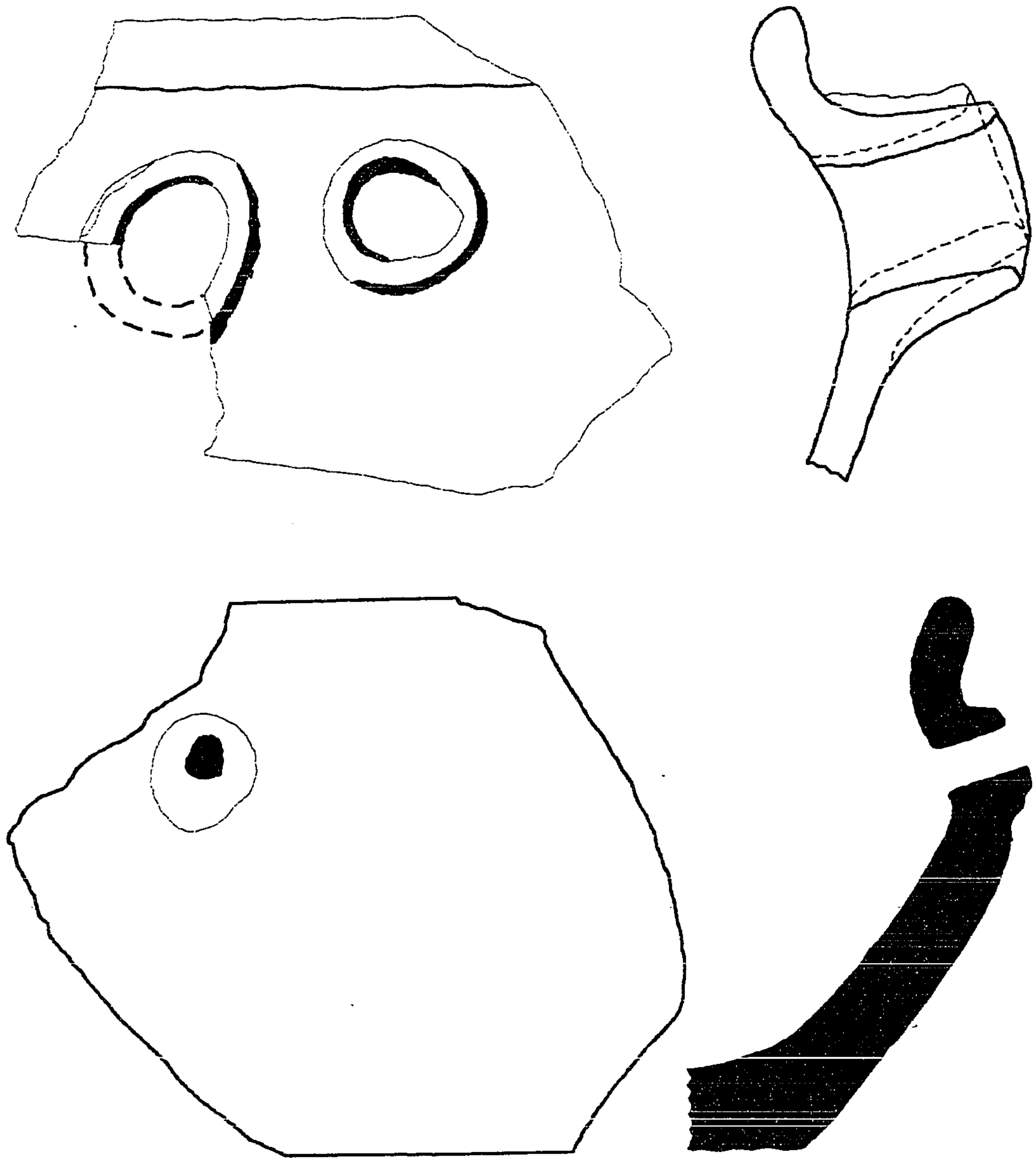


Figure II.1. Type A. Bowl with tubular spout (D-XXXV and DXXXVI). Similar to Type K. Both are subtype 7B.

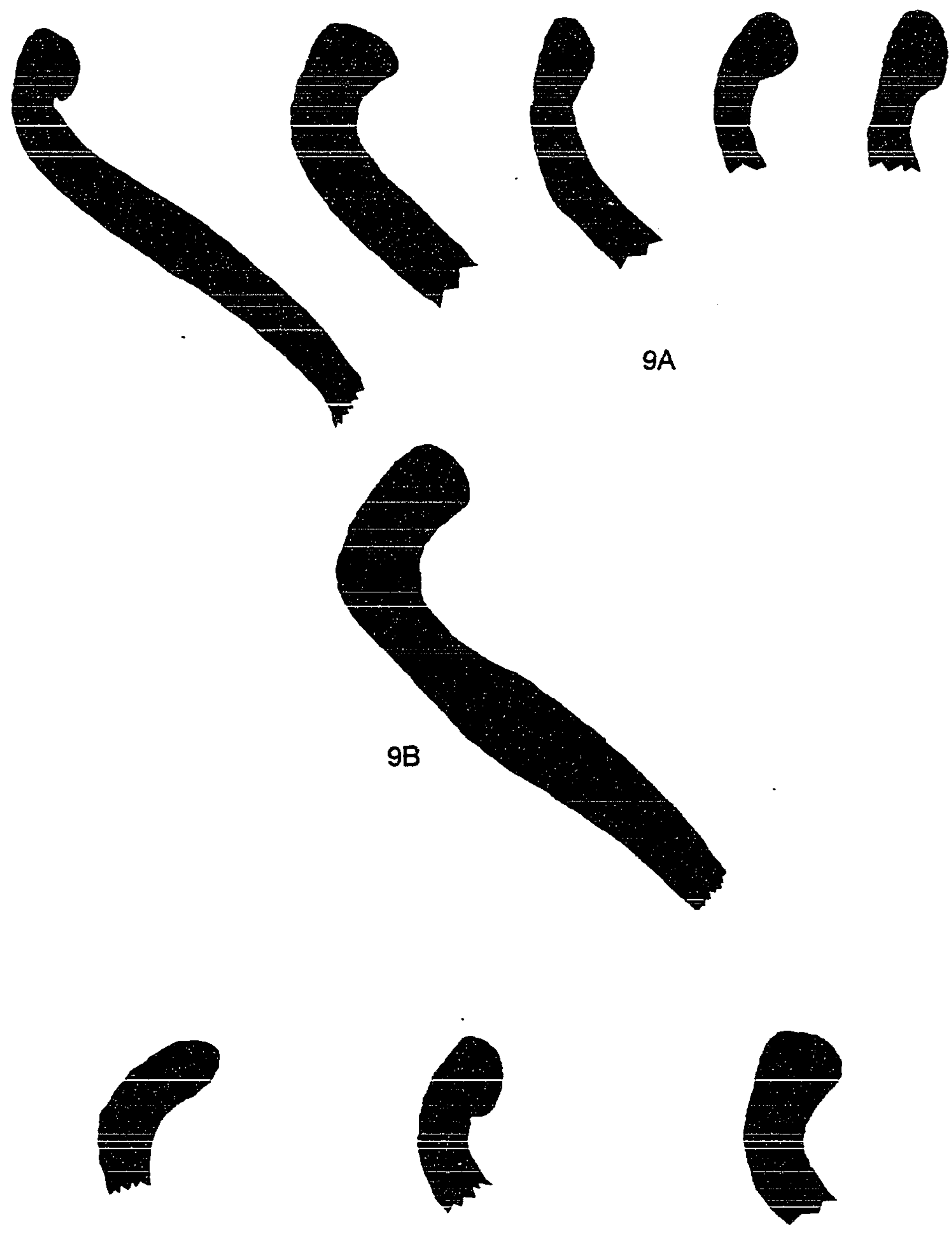


Figure II.2.Type B. Jars with rounded or pointed base (A-II), subtypes 9A, B, and C.

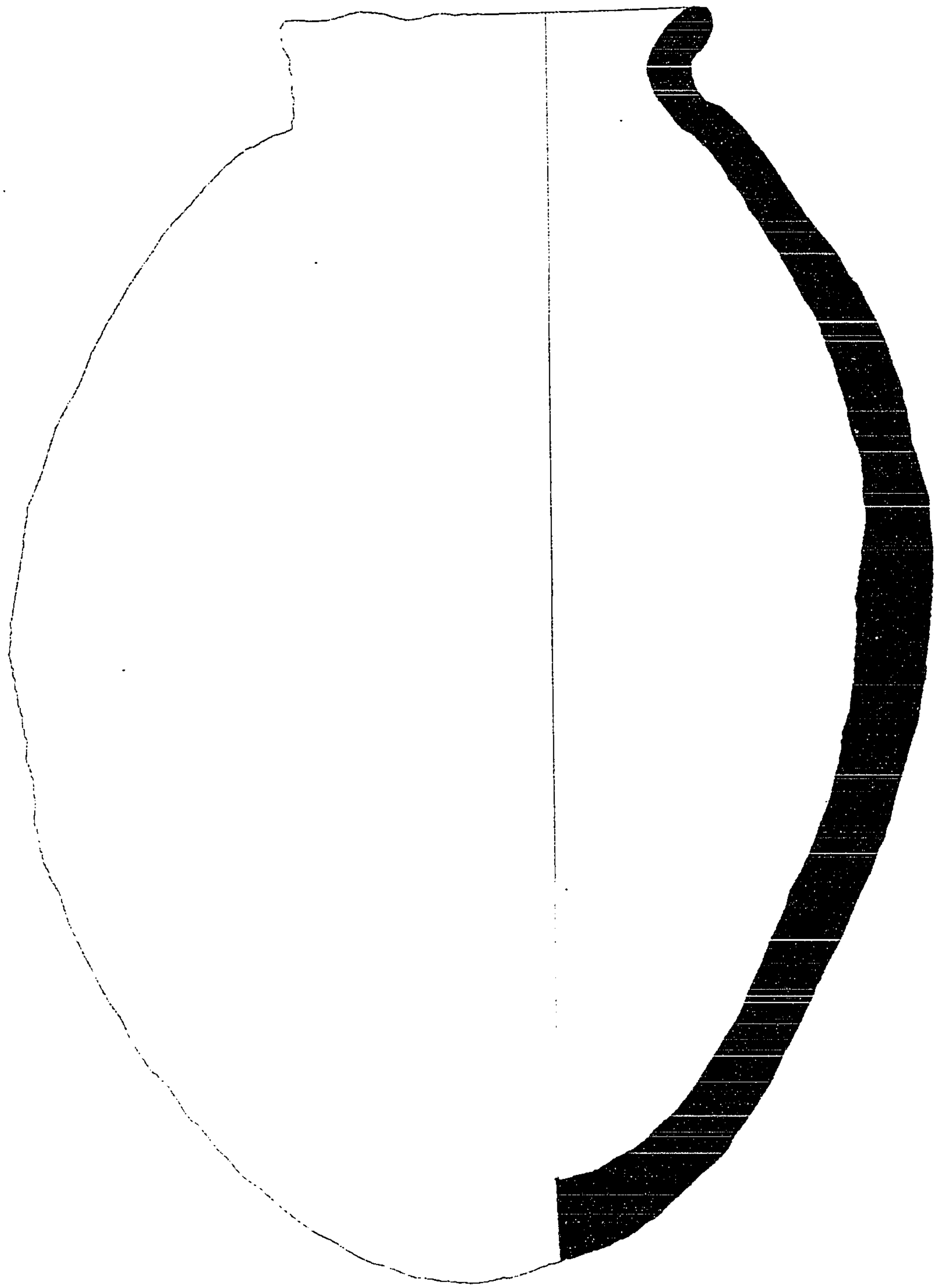


Figure II.3. Type B. Whole vessel (#Y6108) from Room 12 DU-3 (actual size).
Subtype 9A.

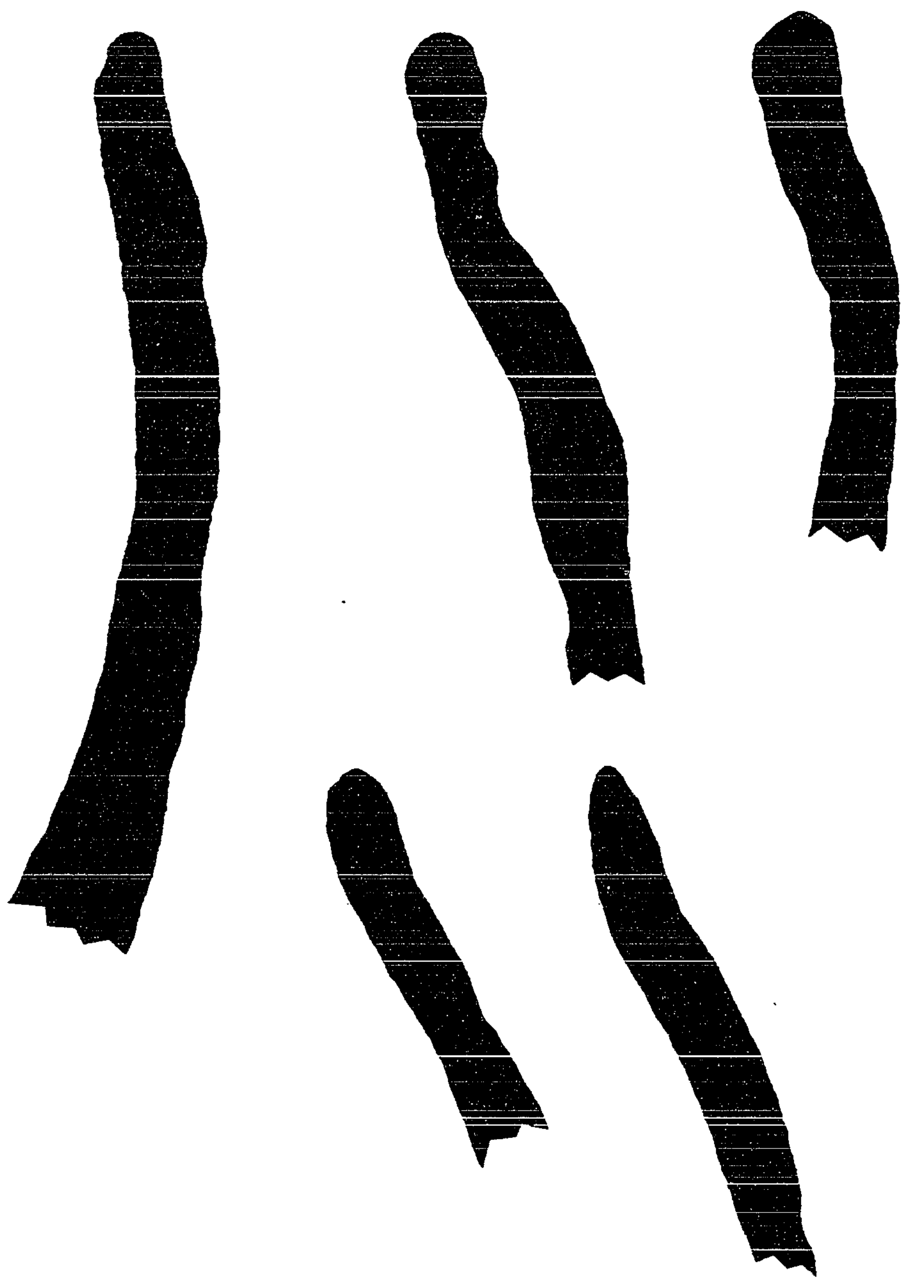


Figure II.4. Type C. 'Ordinary traditional offering jar' (A-IV), subtype 11A.

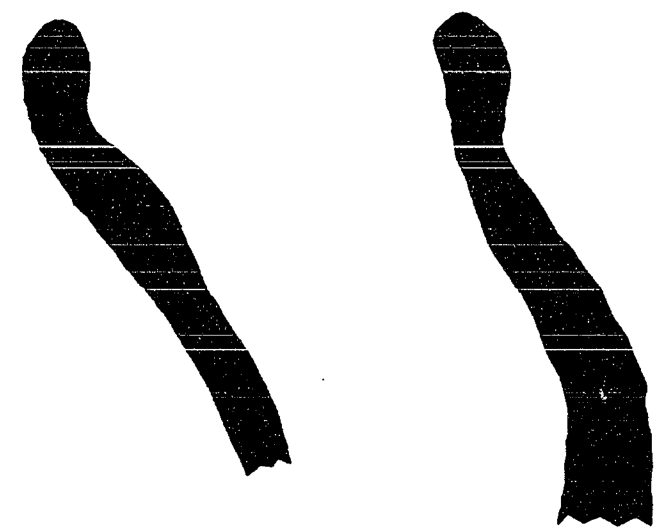


Figure II.5. Type C. 'Ordinary traditional offering jar' (A-IV), subtype 11B.

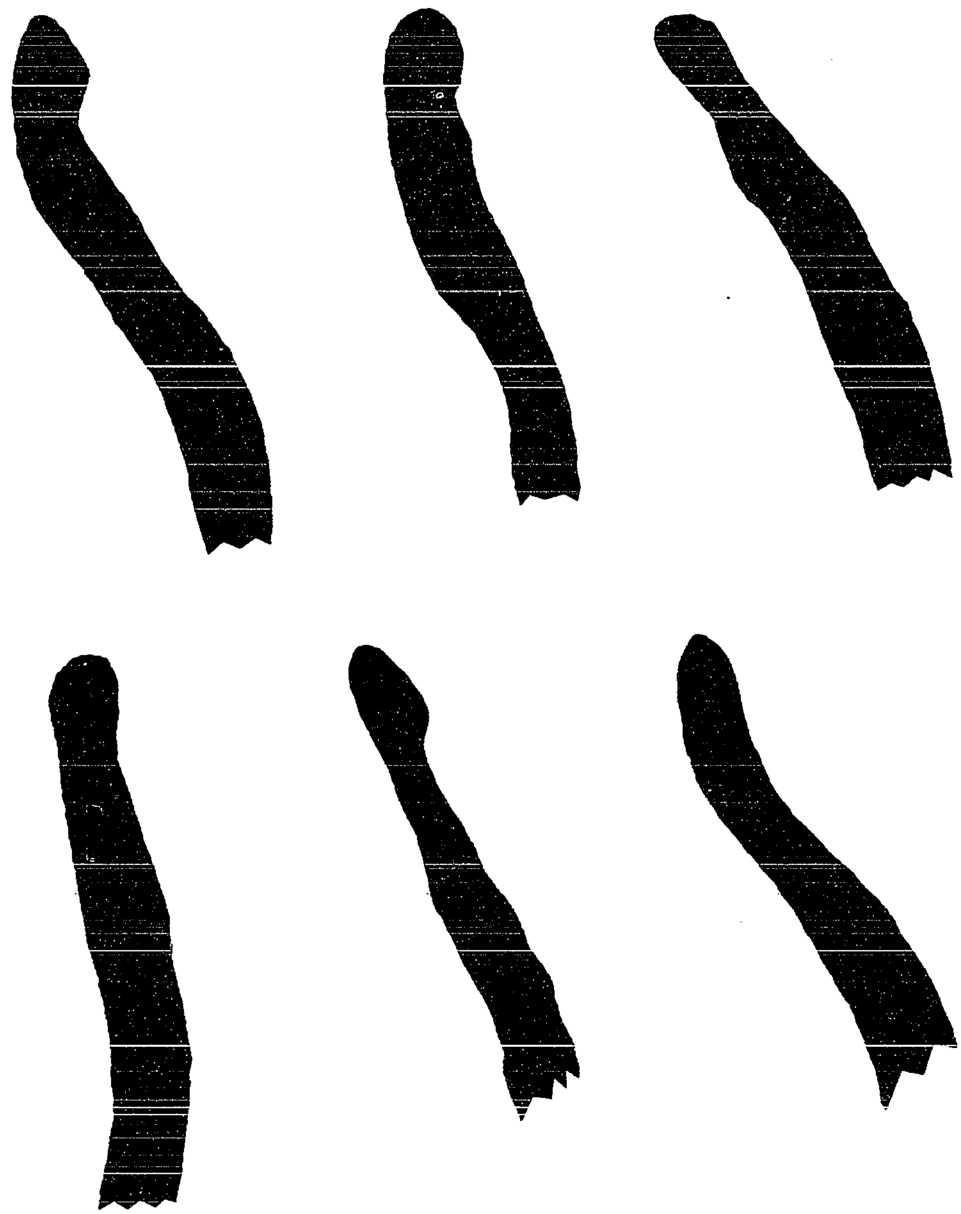


Figure II.6. Type C. 'Ordinary traditional offering jar' (A-IV), subtype 11C.

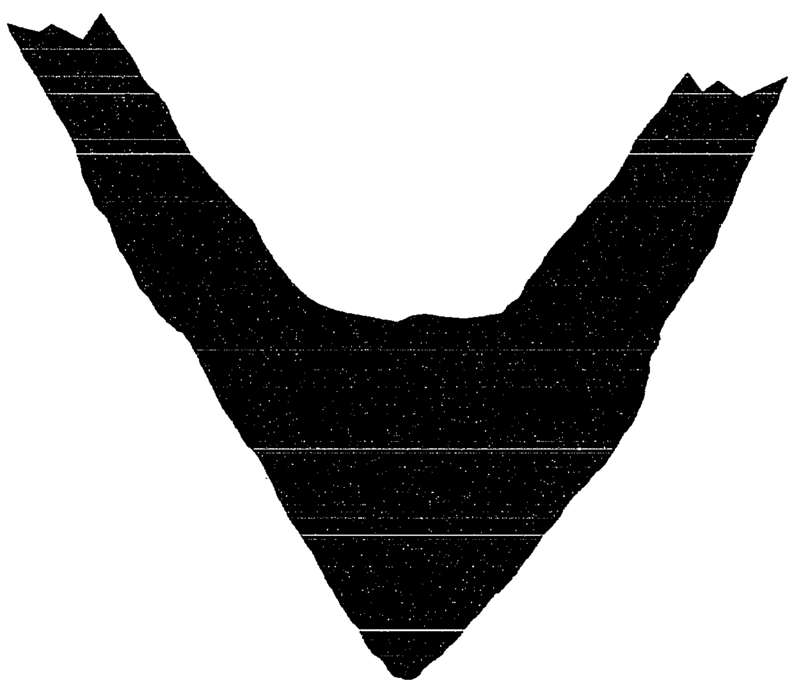


Figure II.7. Type C. 'Ordinary traditional offering jar' (A-IV), subtype 1A base.

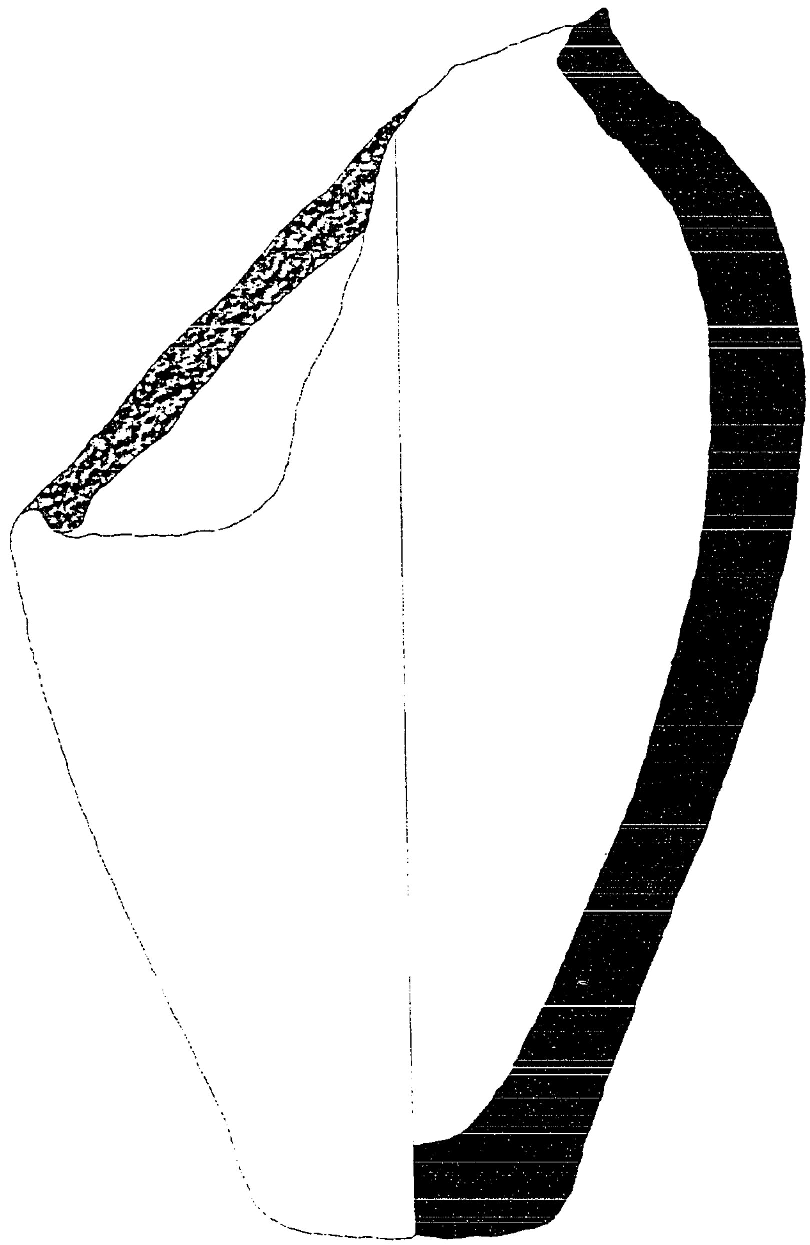


Figure II.8. Type C. 'Ordinary traditional offering jar' (A-IV) whole vessel, subtype 11C.

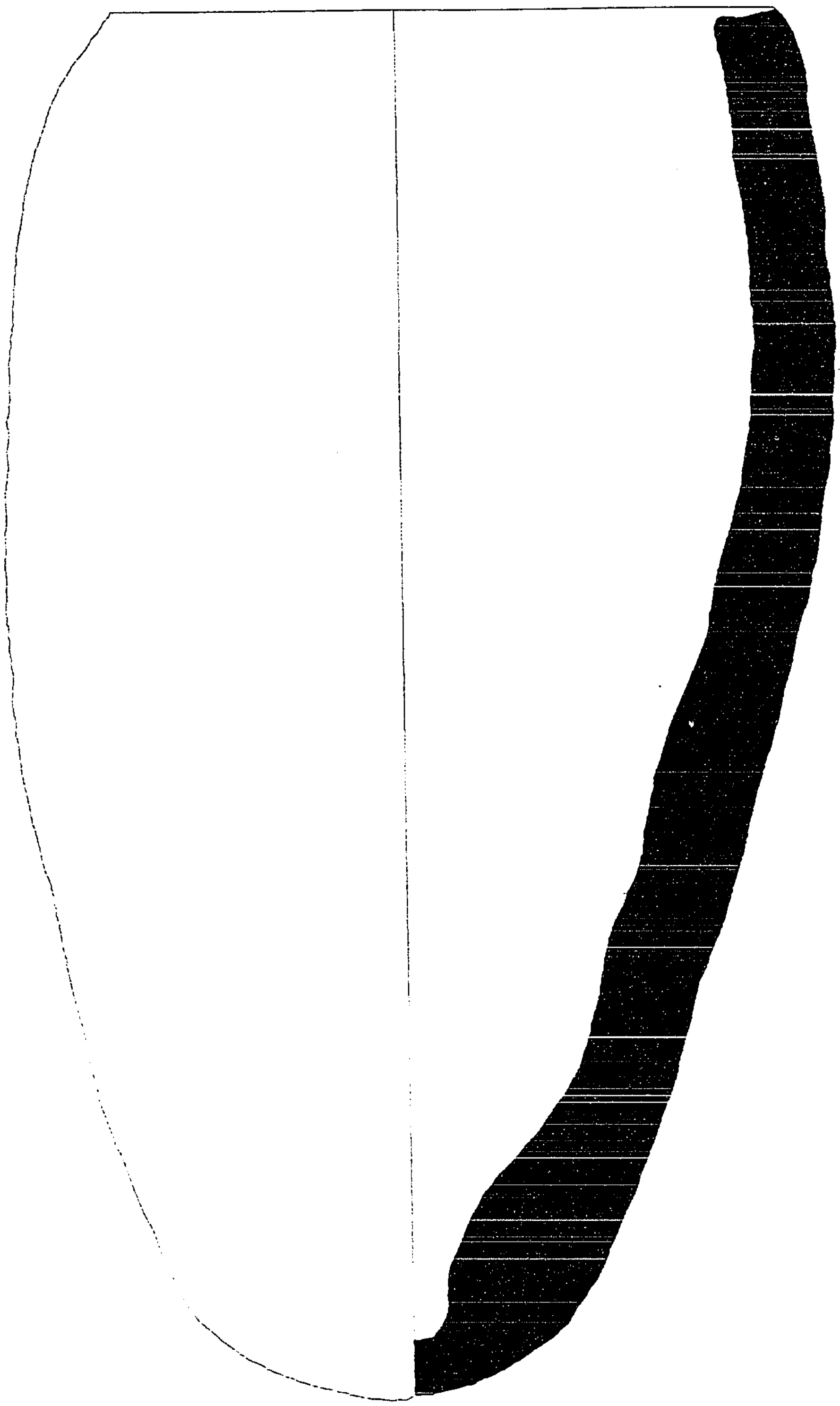


Figure II.9. Type C. 'Ordinary traditional offering jar' (A-IV) whole vessel, subtype 11C.

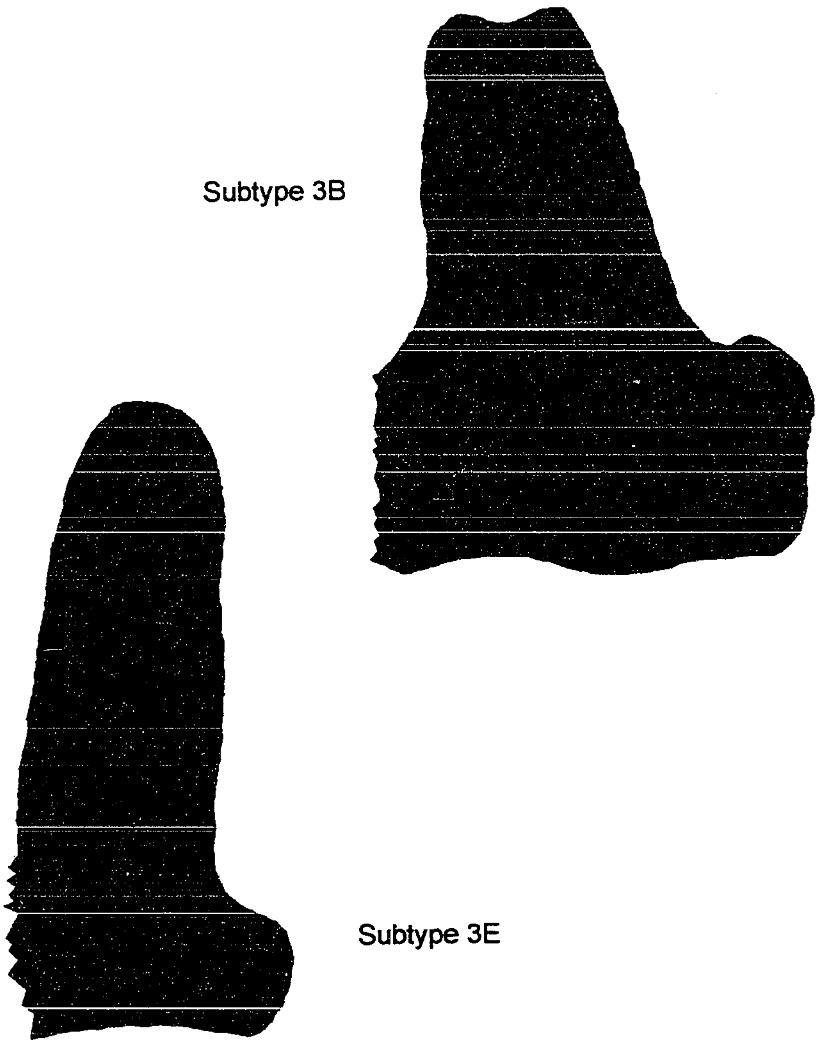


Figure II.10. Type D. Bread/serving platters (F-XXVI).

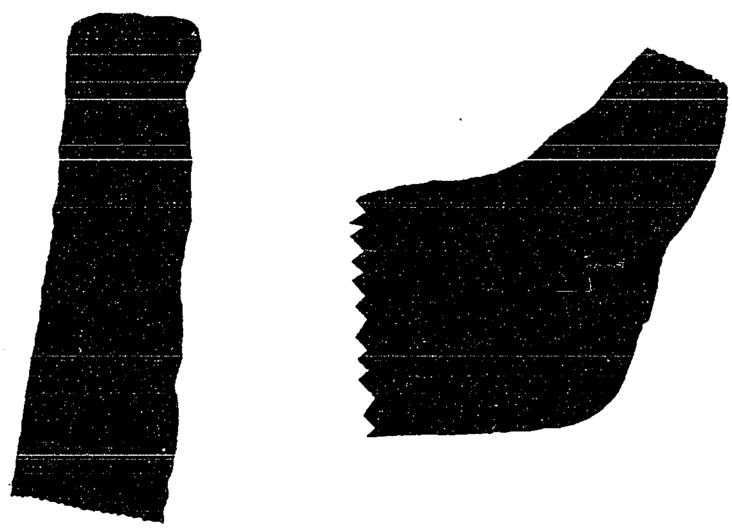


Figure II.11. Type E. Bread mold (F-XXV). Both examples are subtype 3E.

Figure II.12. Type F. Flared bowl (D-XXXIX), subtype 17.

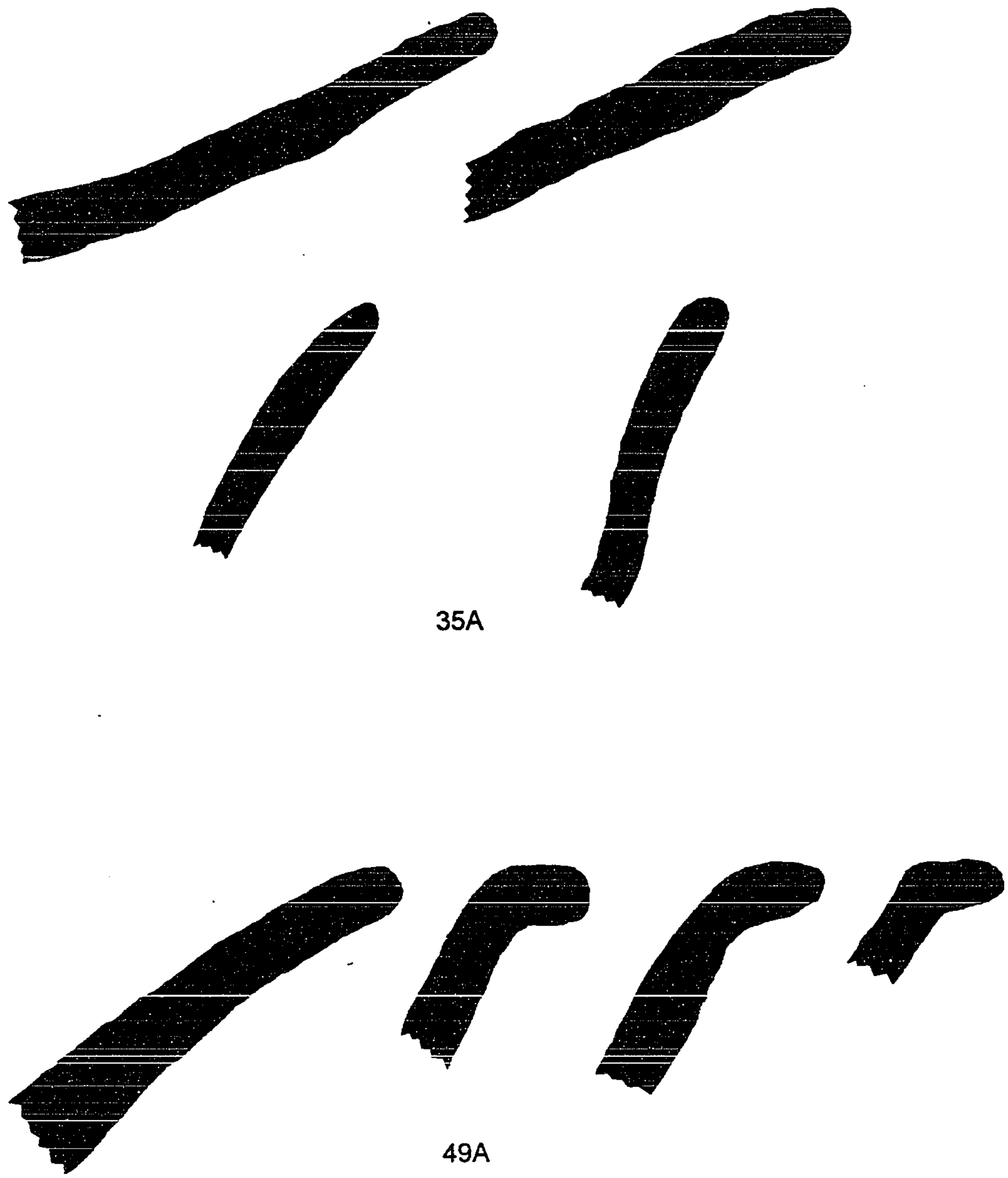
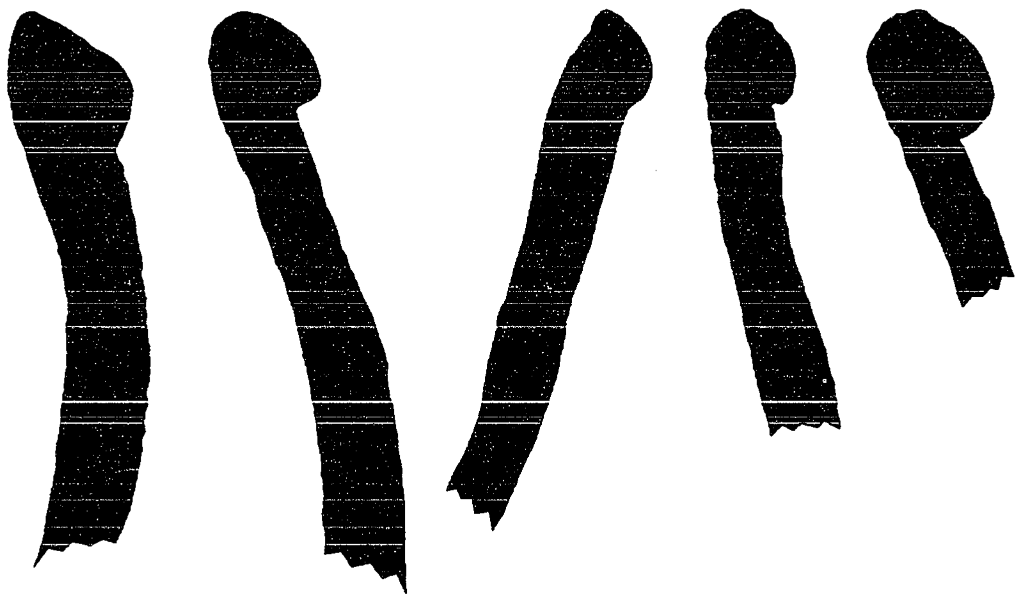
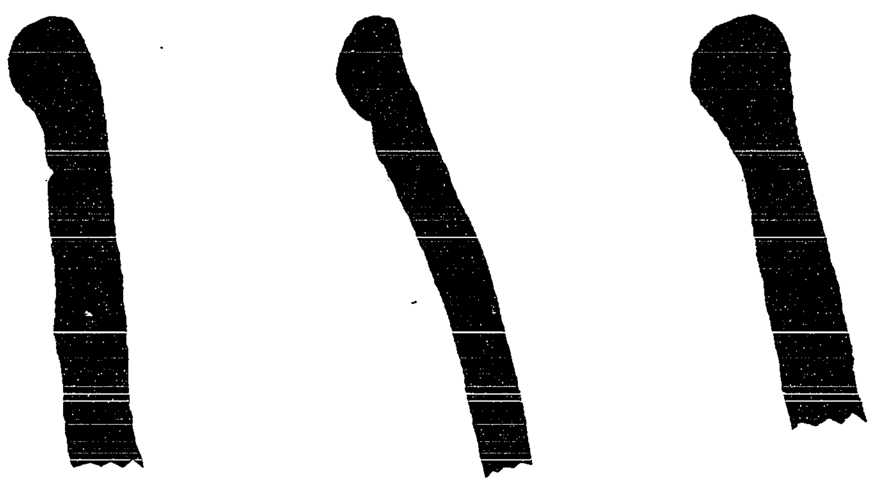


Figure II.13. Type F. Flared bowl (D-XXXIX), subtypes 35A and 49A.



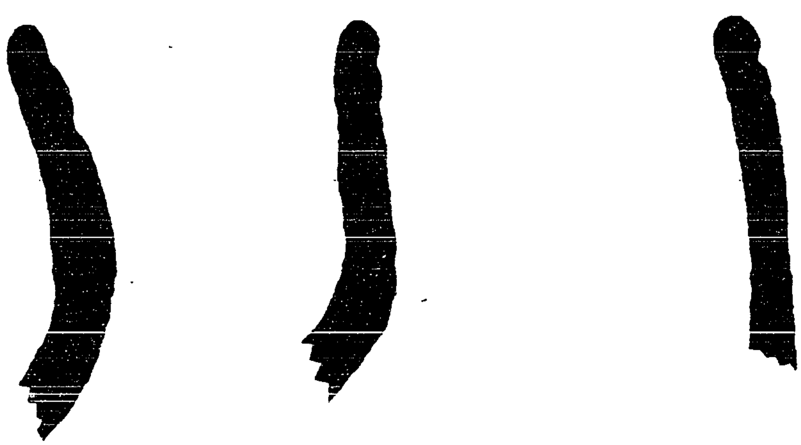
23A



23B

Figure II.14. Type G. Bent-sided bowls (C-XXX). Subtypes 23A and B.

27A



27B

Figure II.15. Type G. Bent-sided bowls (C-XXX). Subtypes 27A and B.

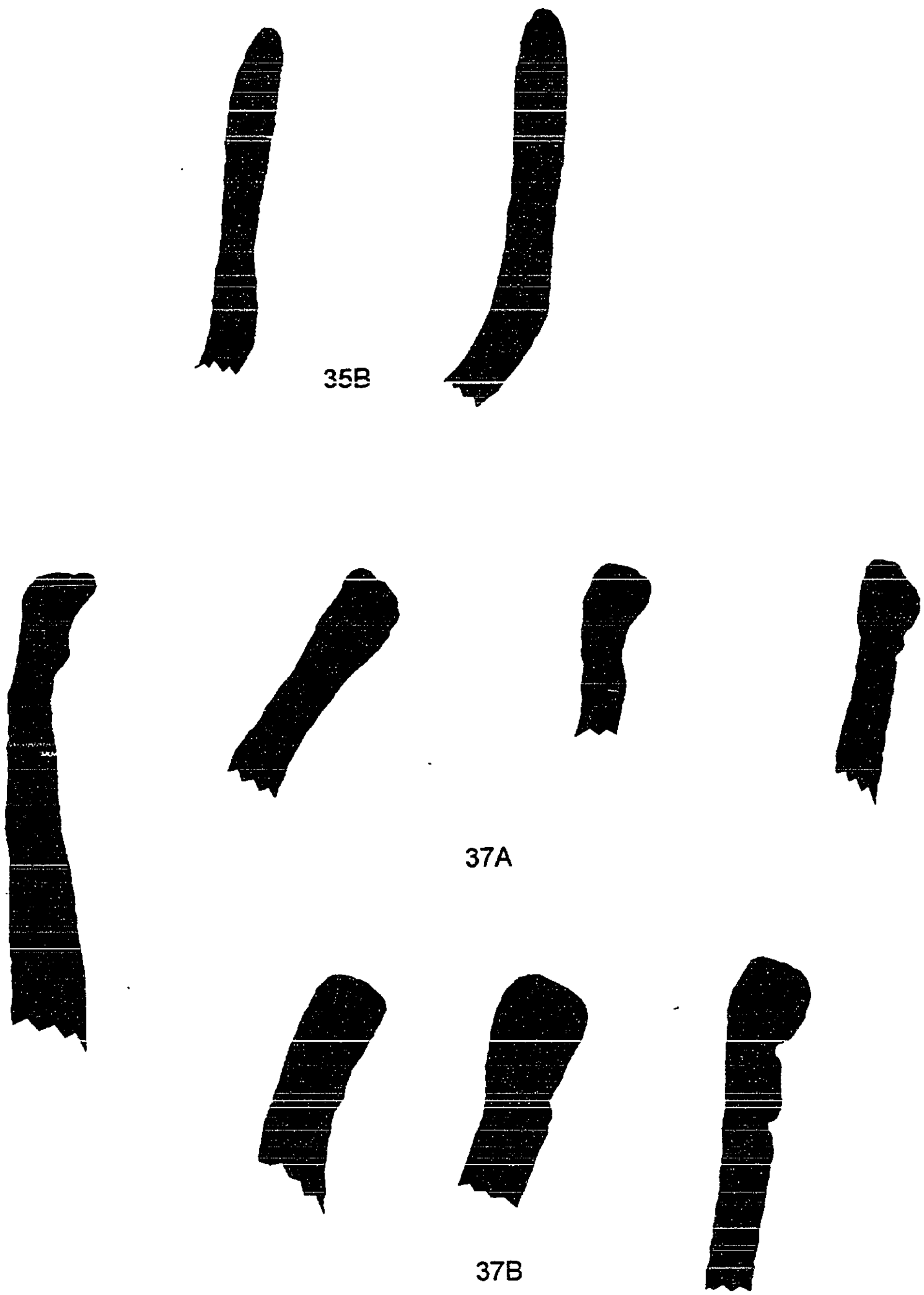


Figure II.16. Type G. Bent-sided bowls (C-XXX), subtypes 35A, 37A and B.

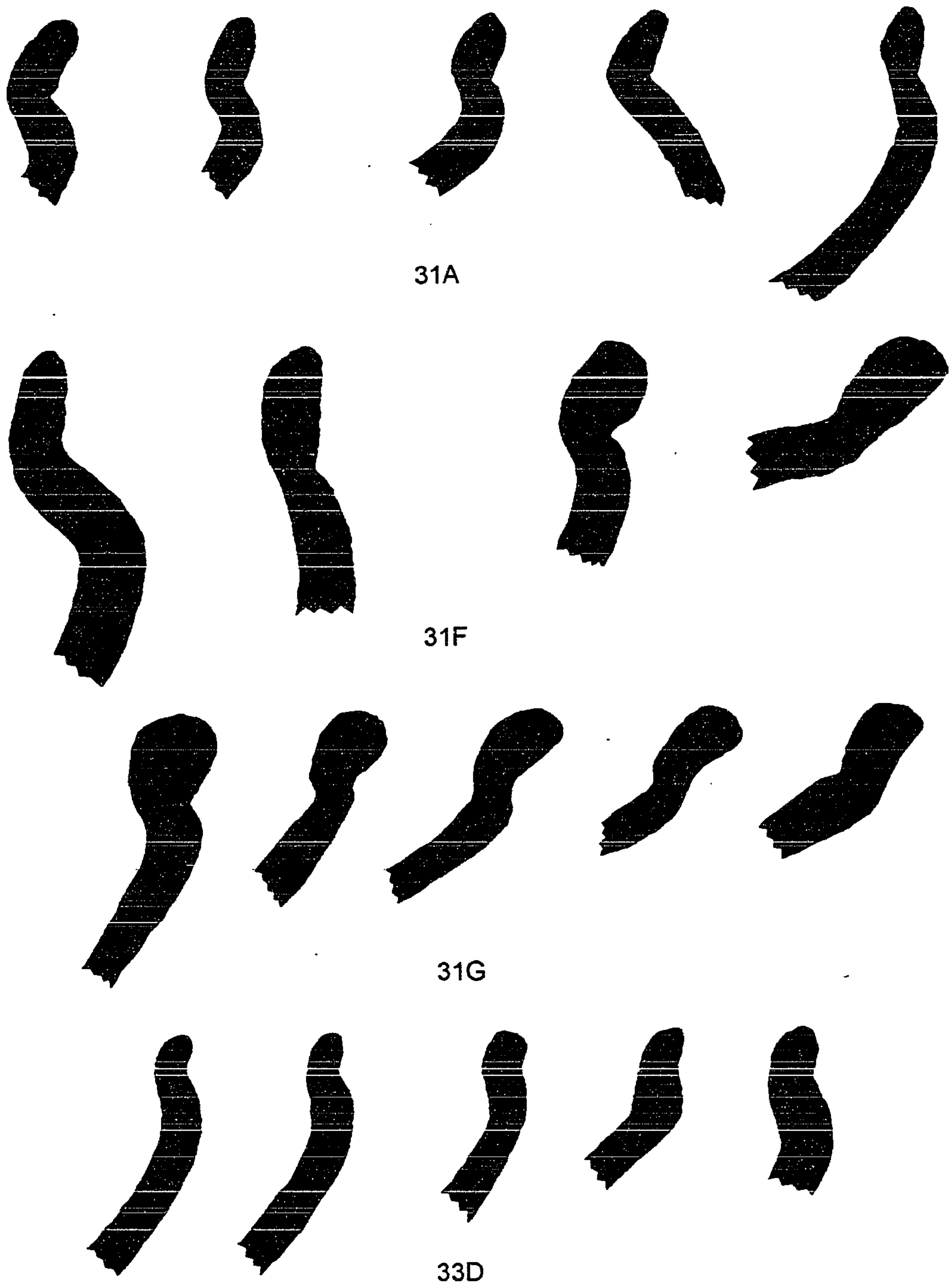


Figure II.17. TypeH. Meidum bowl (C-XXXII), subtypes 31A, F, and G and 33D.

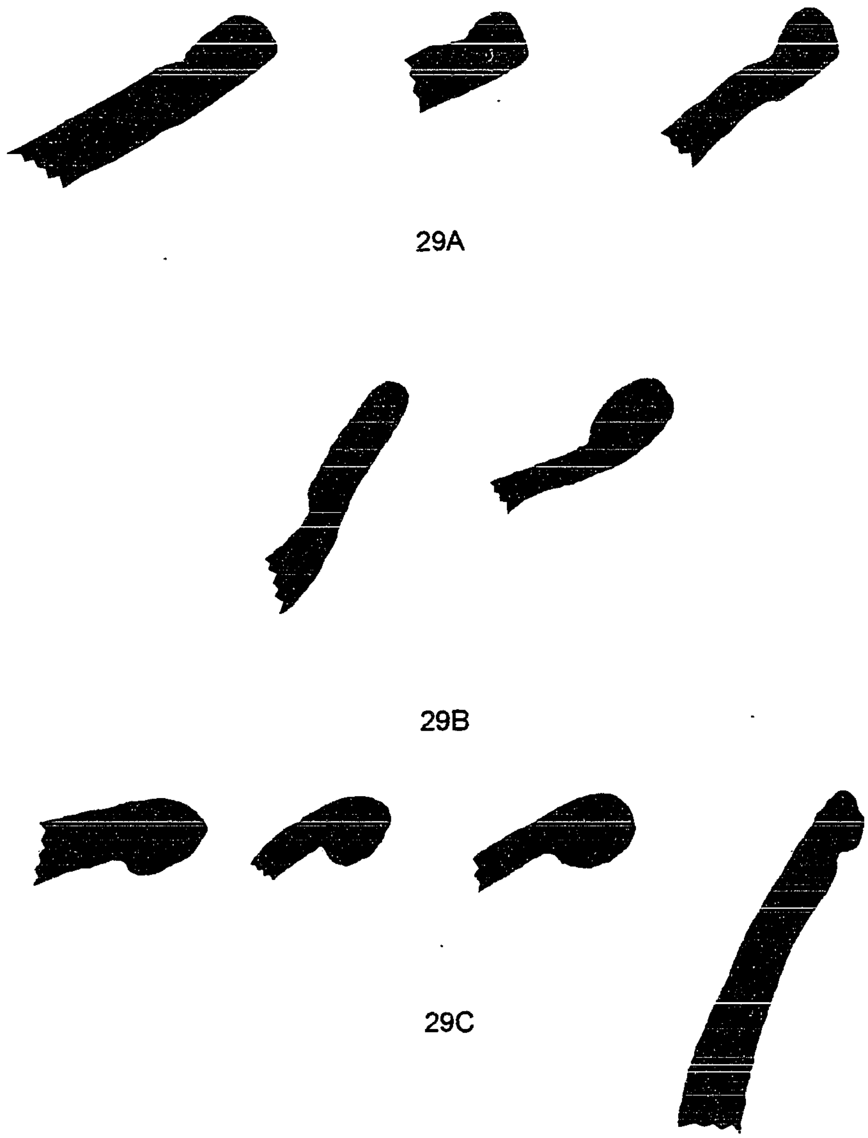


Figure II.18. TypeI. Round-bottom bowl with molded rim (C-LXII), subtypes 29A, B, and C.

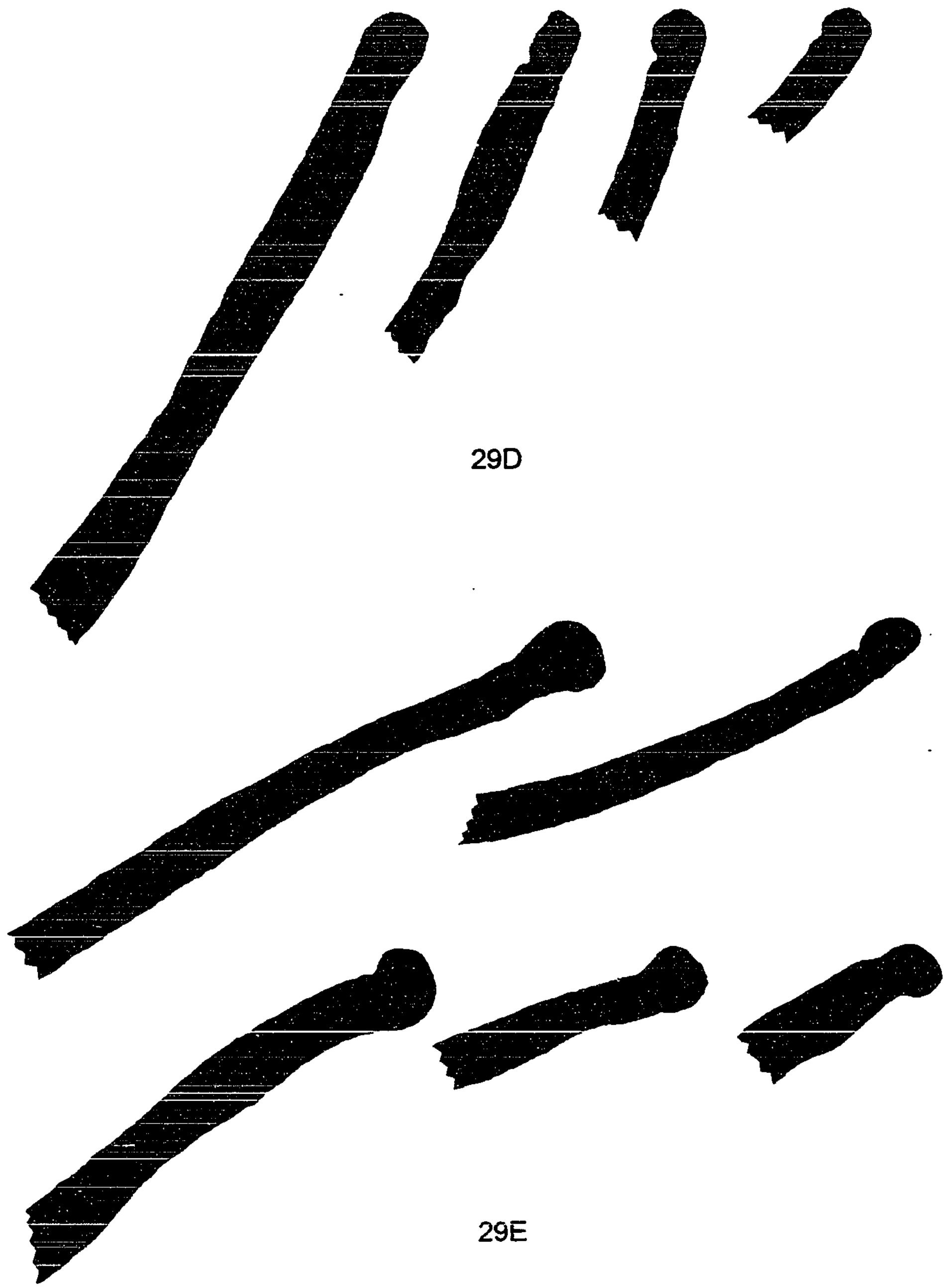


Figure II.19. TypeI. Round-bottom bowl with molded rim (C-LXII), subtypes 29D and E.

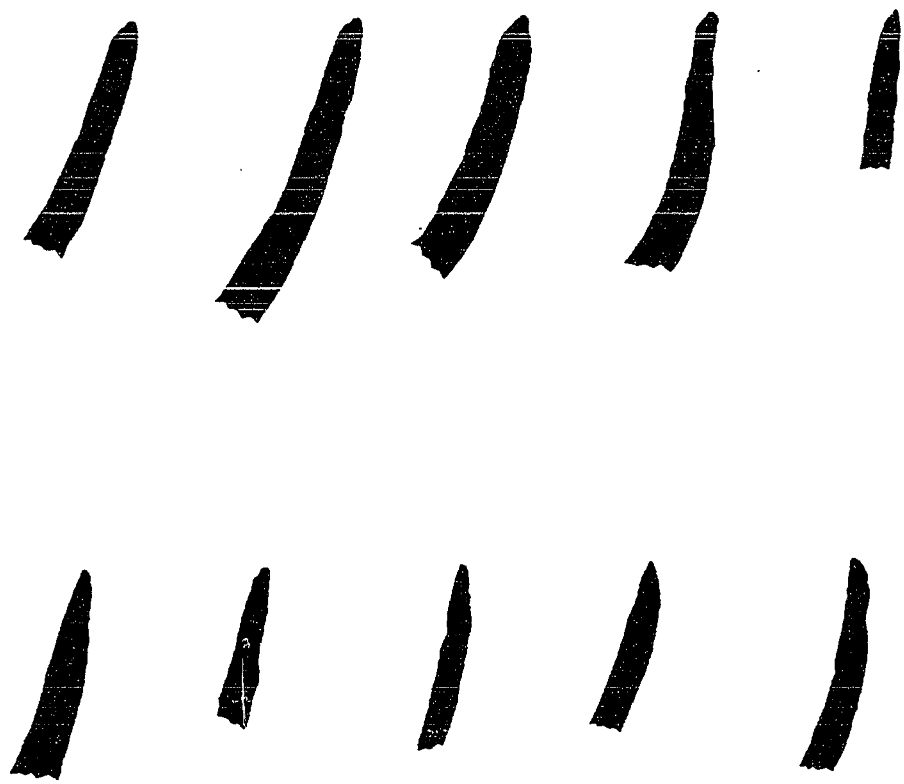


Figure II.20/ Type J. Little brown bowl of Middle Kingdom age, all subtype 39.

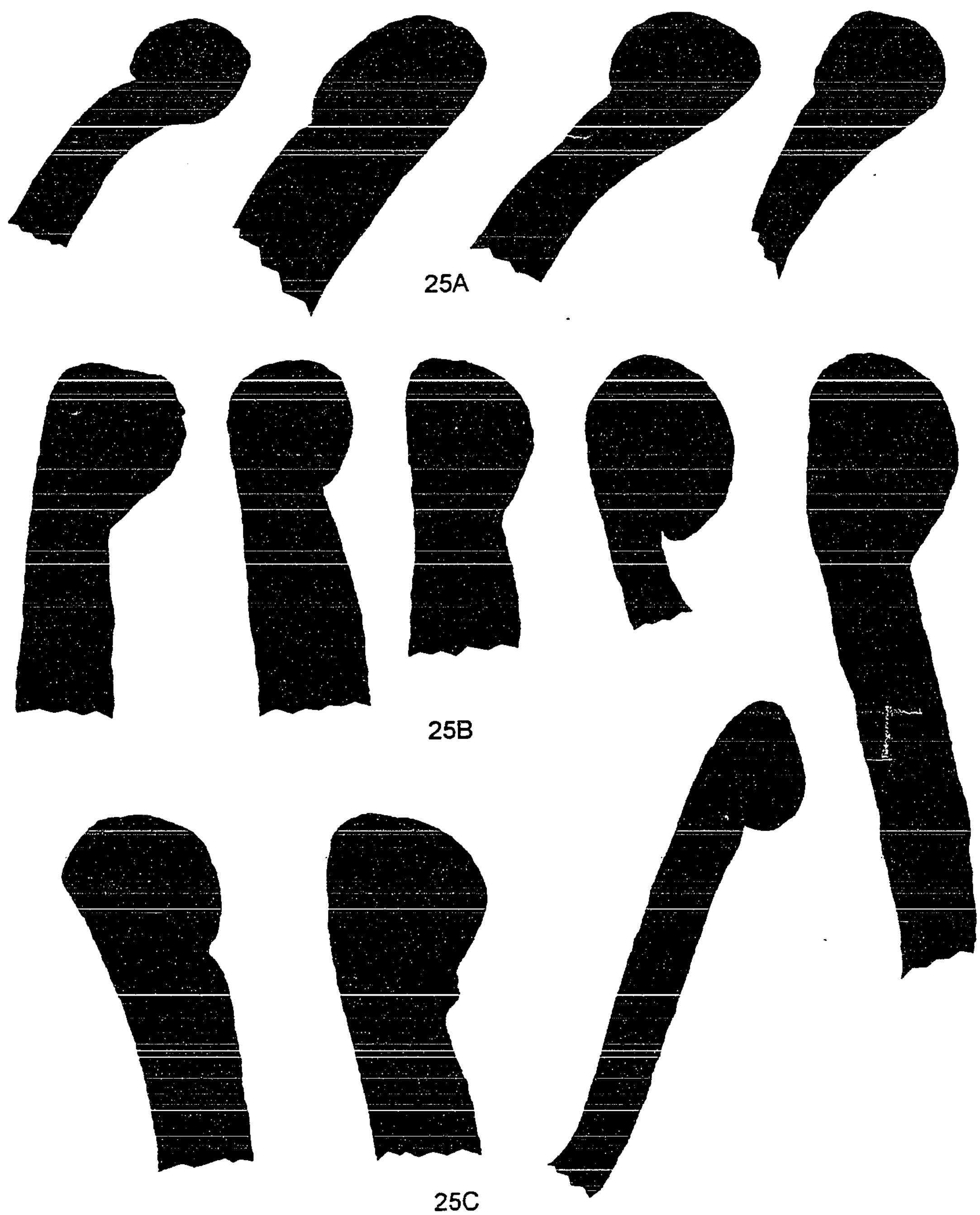


Figure II.21. Type K. Basin with roll rim (C-XXIX), subtypes 25A, B, and C.

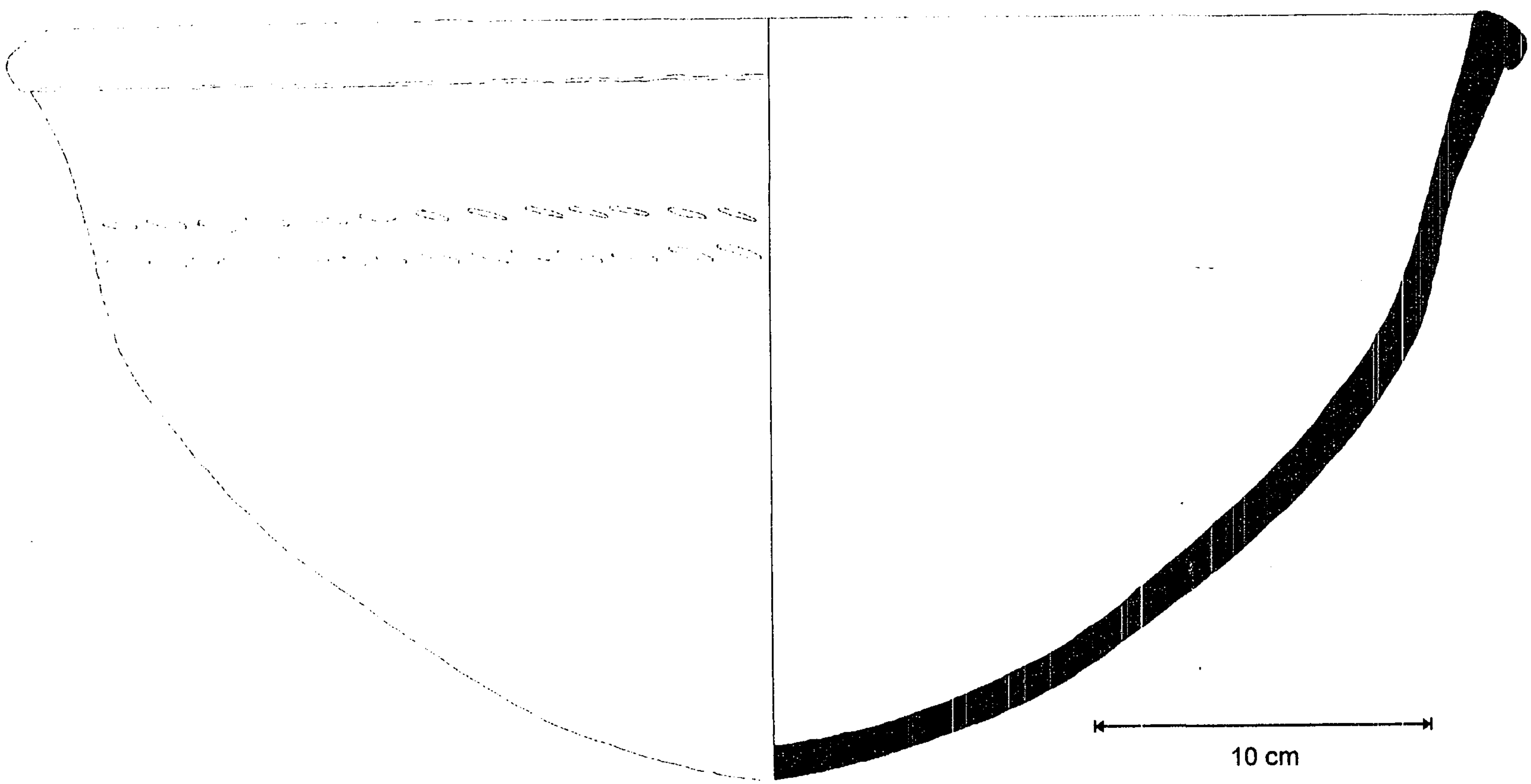


Figure II.22. Type K reconstructed bowl from Room 15 DU-3, a dump not directly associated with the burial in this structure.

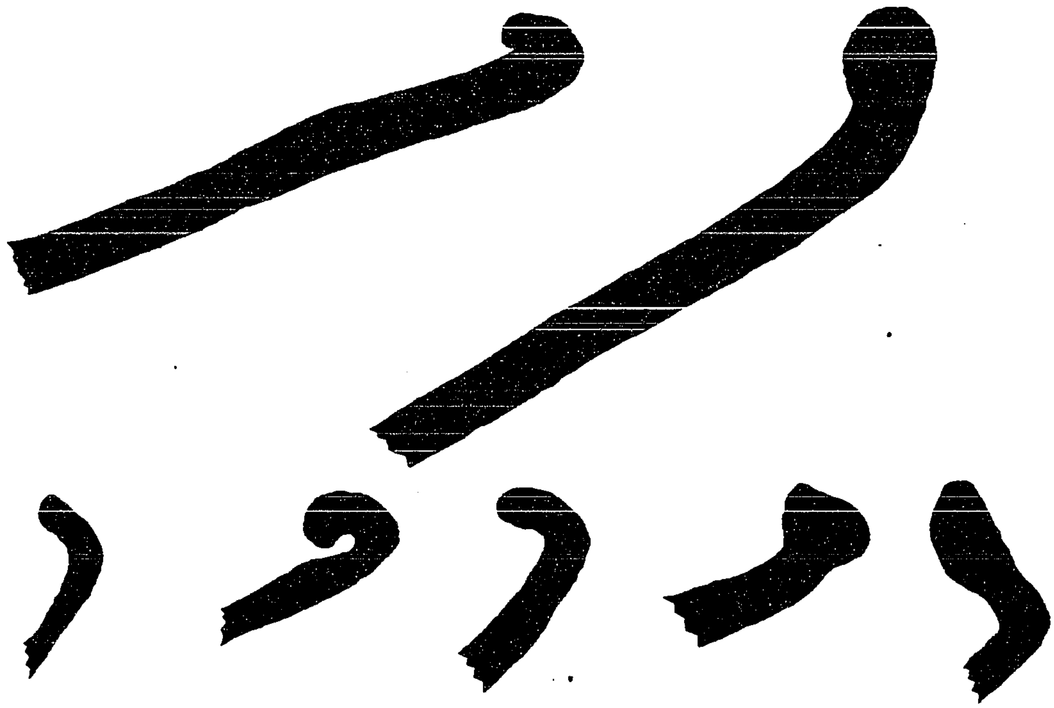
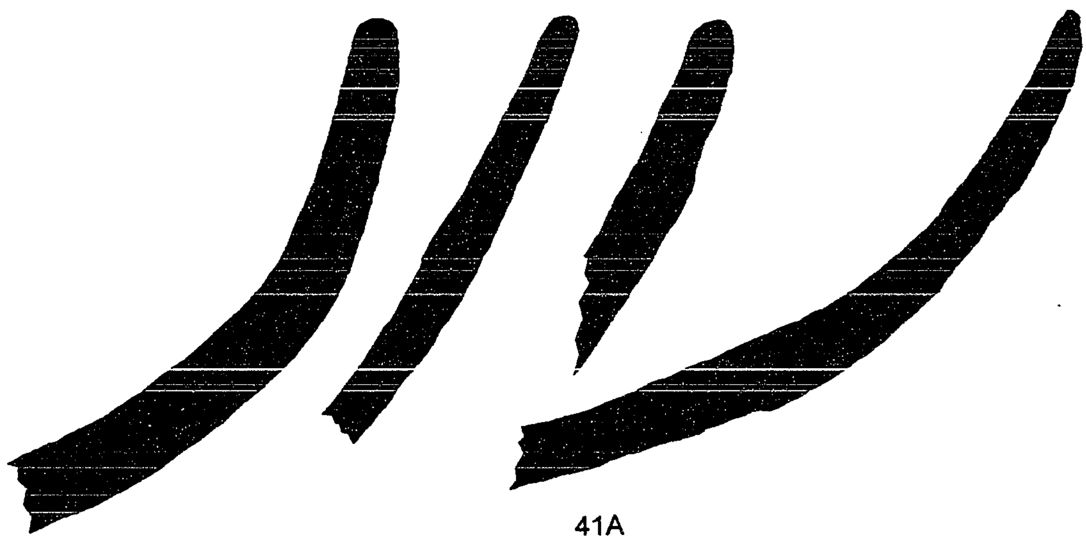
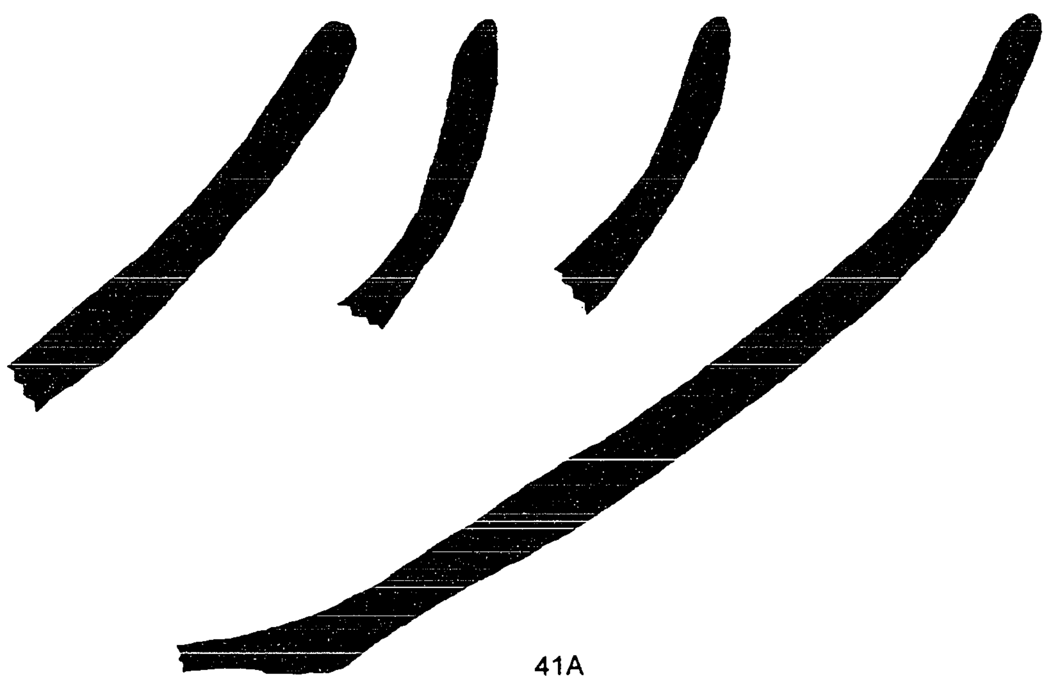


Figure II.23. Type L. Flat bowl or plate with contracting mouth (D-LXXII), subtype 61A.



41A



41A

Figure II.24. Type O. Round or flat-bottomed bowl (C-LXII/LxII), subtypes 41A and B.

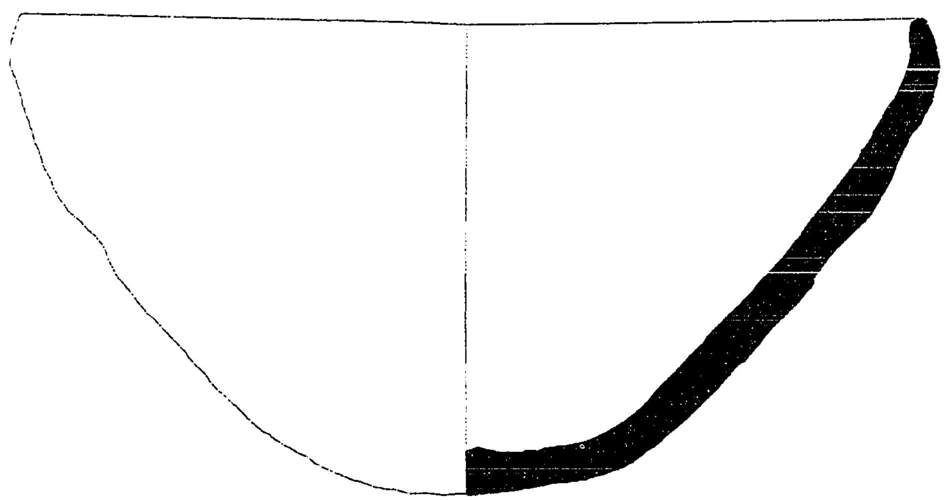


Figure II.25. Type O. Round or flat-bottomed bowl (C-LXII/LxII), whole vessel.

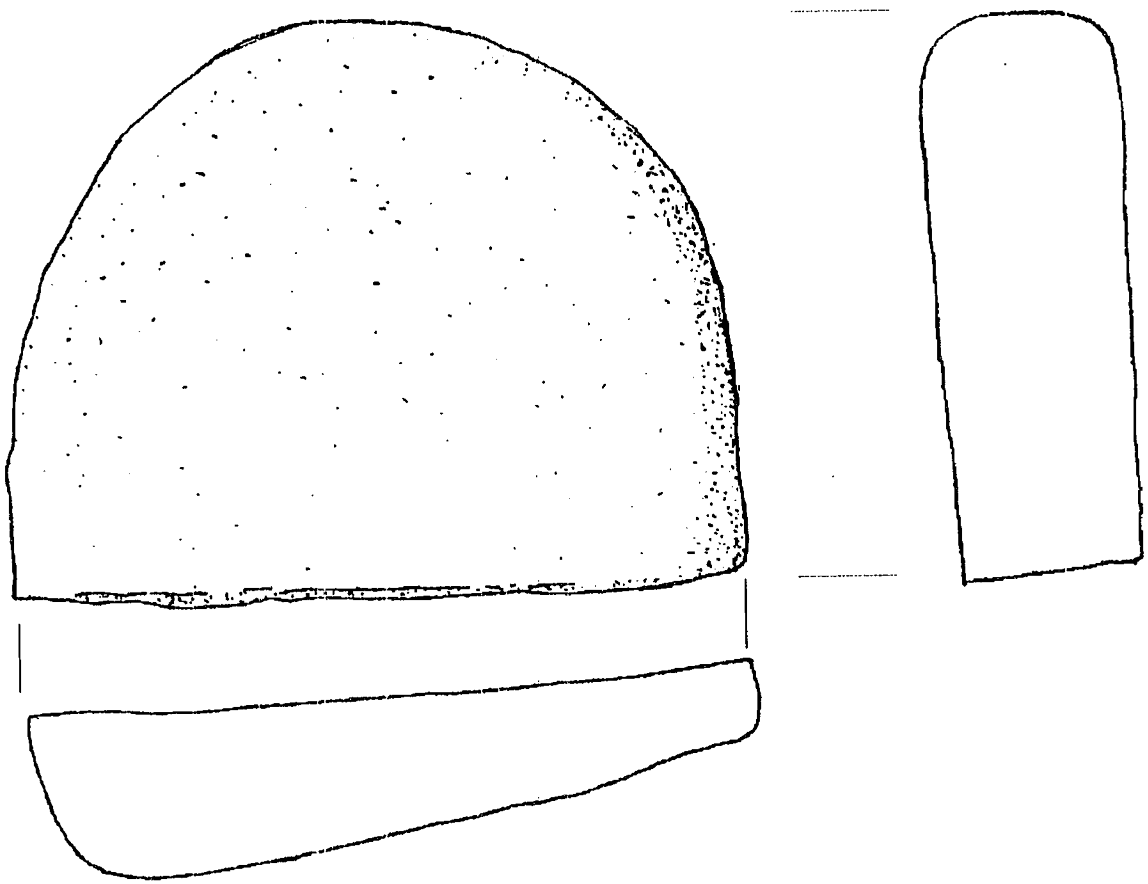


Figure II.26. Upper grinding stone (mano) from Room 17 DU-2 (GS-12). Hard, fine-grained sandstone.

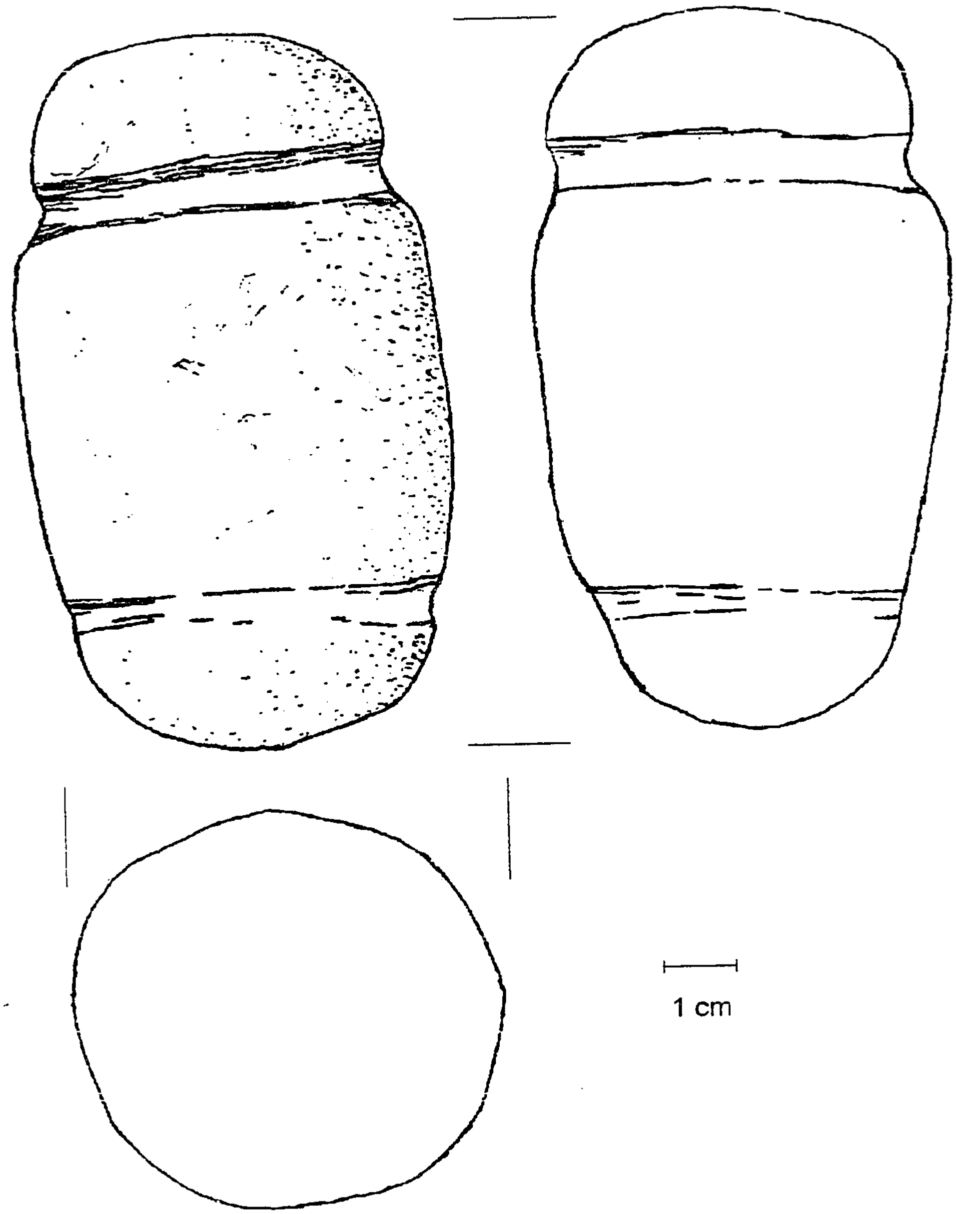


Figure II.27. Ground stone (net weight?) from Room 23 DU-2 (GS-7). Soft, light gray limestone

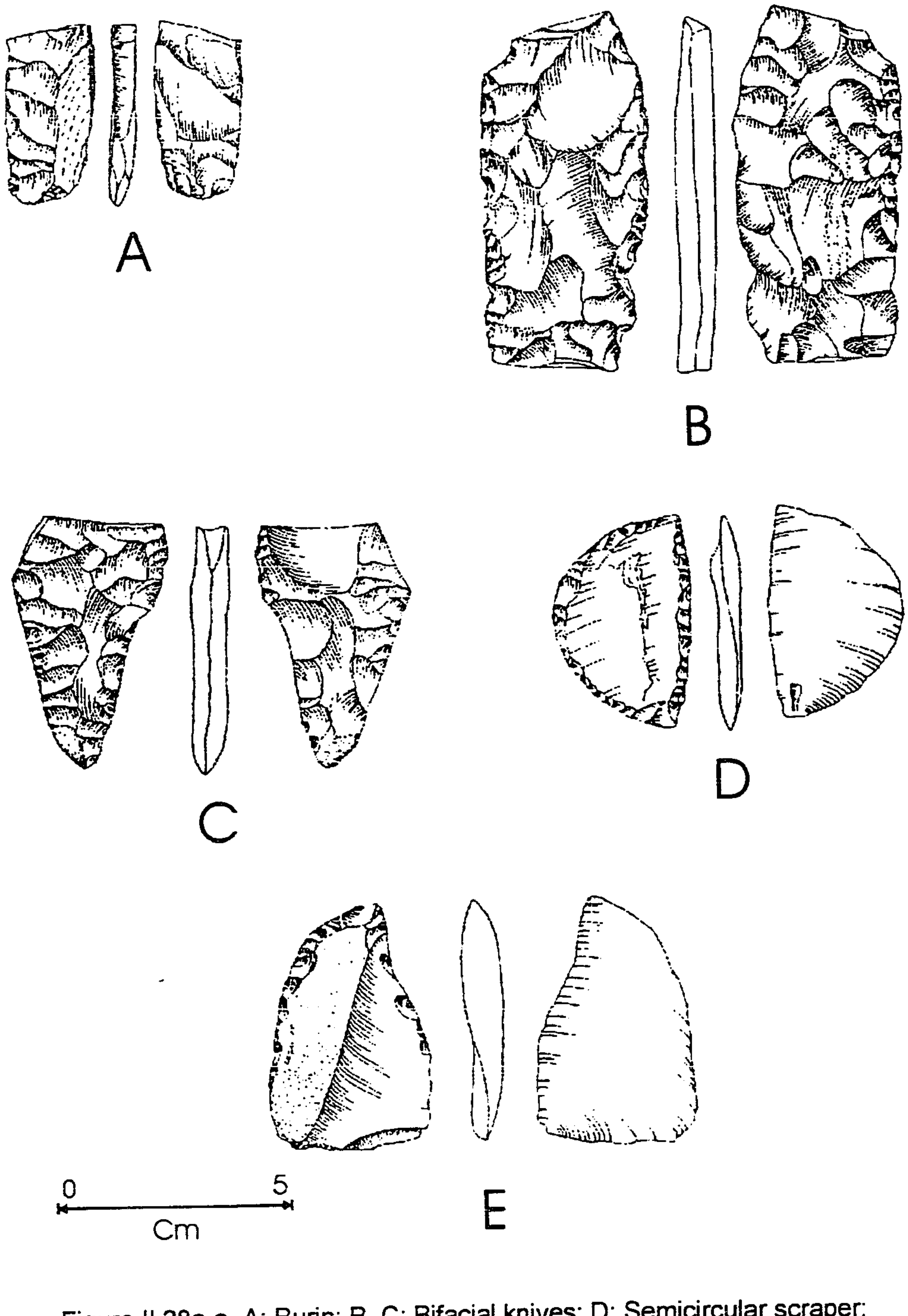
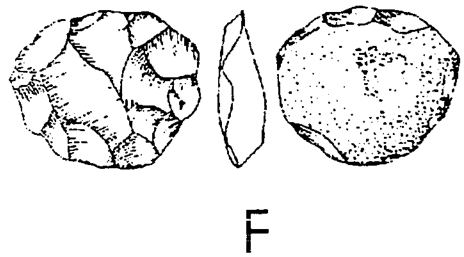


Figure II.28a-e. A: Burin; B, C: Bifacial knives; D: Semicircular scraper; E: Simple convex sidescraper.



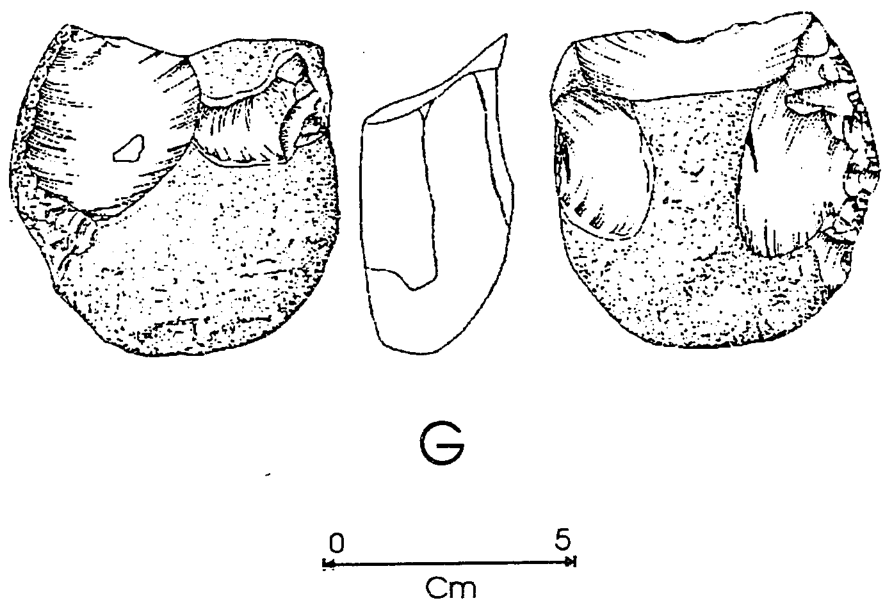


Figure II.28f,g. F: Discoidal core; G: Prepared core, little used, with some retouch.

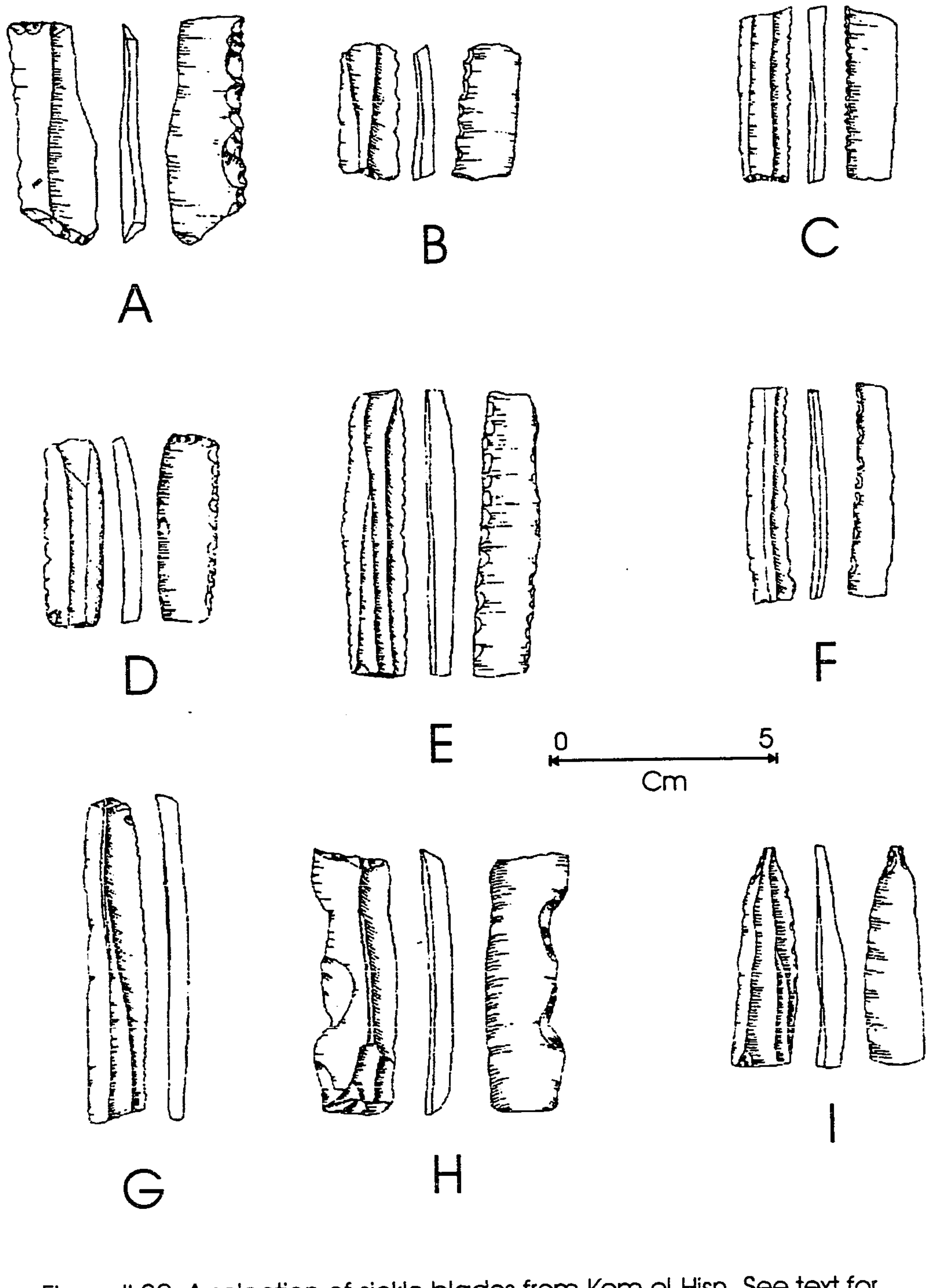
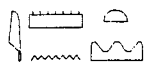


Figure II.29. A selection of sickle blades from Kom el-Hisn. See text for discussion.

Appendix III. Textual references to Kom el-Hisn.

Kom el-Hisn has long been thought to be the capital of the third (Libyan or western) nome of Lower Egypt. The western nome is known as 'Ament' or 'Imenti' from the Egyptian word *Ỉmnt,* written phonetically as:

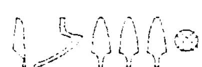


or

showing the association of the nome with Horus (Montet 1957:57). This association with Horus extends to the capital, Yamu ('Amu' or 'Amou' in earlier sources), which is often referred to as *pr nbt imꜣw* or "the Residence of the Mistress of Yamu":

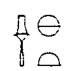
The moniker Yamu (*imꜣ* or *imꜣw*) is represented by a tree glyph either alone or in groups of two or three:

Or with a slightly different spelling as in Zibelius (1978):



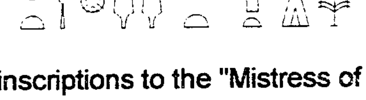
According to Buhl (1947), *imꜣ* is the masculine form of the word for the date palm and Griffith refers to Kom el-Hisn as the "(city of) palm trees" (1888:82). Hathor was associated in the Old Kingdom as a tree goddess, notably at Memphis where she was referred to as "The Mistress of the Southern Sycamore", *nbt nht rśt* (Buhl 1947:86). The name 'Hathor', *Ḥwt-Ḥr*, literally translates to "House of Horus" and is written as the Horus symbol within the symbol for house or residence:

Thus, there is an early and close association between the western nome, *Ỉmnt*, and Hathor. However, the precise location of Yamu and whether it is, in fact, Kom el-Hisn is not known with certainty. Griffith (1888) refers to, but does not specifically cite, numerous textual references to Yamu or *im3w*. Griffith also notes that these references are often in connection with the worship of Hathor or Sekhmet (1888:78). Hathor is also frequently combined with Sekhmet (or Sekhet) as a dual goddess Sekhmet-Hathor (Porter and Moss 1934:51) or Sekhat-Hor (Moens and Wetterstrom 1981). Sekhmet (*Sẖt*) is usually written:



The close association between Sekhmet and Hathor seems to have its source in a destruction myth found on five royal New Kingdom tombs – Tutankhamun, Seti I, and Ramesses II, III, and VI – and is part of a larger work known as "The Book of the Cow of Heaven" (Lichteim 1976:197; Watterston 1999:42). According to this story, Re plotted the destruction of mankind and sent as his agent Hathor in the form of a lioness (Sekhmet). Hathor as Sekhmet, however, performed her task so well that Re was alarmed and decided to save mankind. Re had his priests prepare barley beer mixed with red ochre to give it the color of blood and on the morning that Hathor was to finish her destruction, Re poured the beer over the land. Hathor, thinking the red beer was blood, drank it until she forgot about destroying mankind. Thus, Hathor is also the goddess of drunkenness and is also known as the "Eye of Re" as a result of her work for Re.

Fieldwork conducted at Kom el-Hisn has not altogether clarified the status of Kom el-Hisn as Yamu. Griffith reported that, prior to his 1885 work at Kom el-Hisn, a "copy of the decree of Canopus in favor of Ptolemy Euergetes and Berenice" had been found a few years before he visited the site (Griffith 1888:77; the papyrus referenced is Cat. Bulak, 1884, no. 5401, p. 354). Petrie (1886) had also visited the area in 1884 and noted an offering tablet to Sekhmet (Figure III.1). The relevant text in the top register below the seated figure reads (r-l) *ḥtp di nsw nbt im3-sẖt* or "the king gives an offering (to) the mistress of Yamu, Sekhmet".



Petrie also noted similar inscriptions to the "Mistress of Yamu" at Kom el-Hisn though does not mention the specific monuments on which these occur. Based on these observations Petrie was unable to determine whether Kom Firin or Kom el-Hisn is the Yamu being referenced.

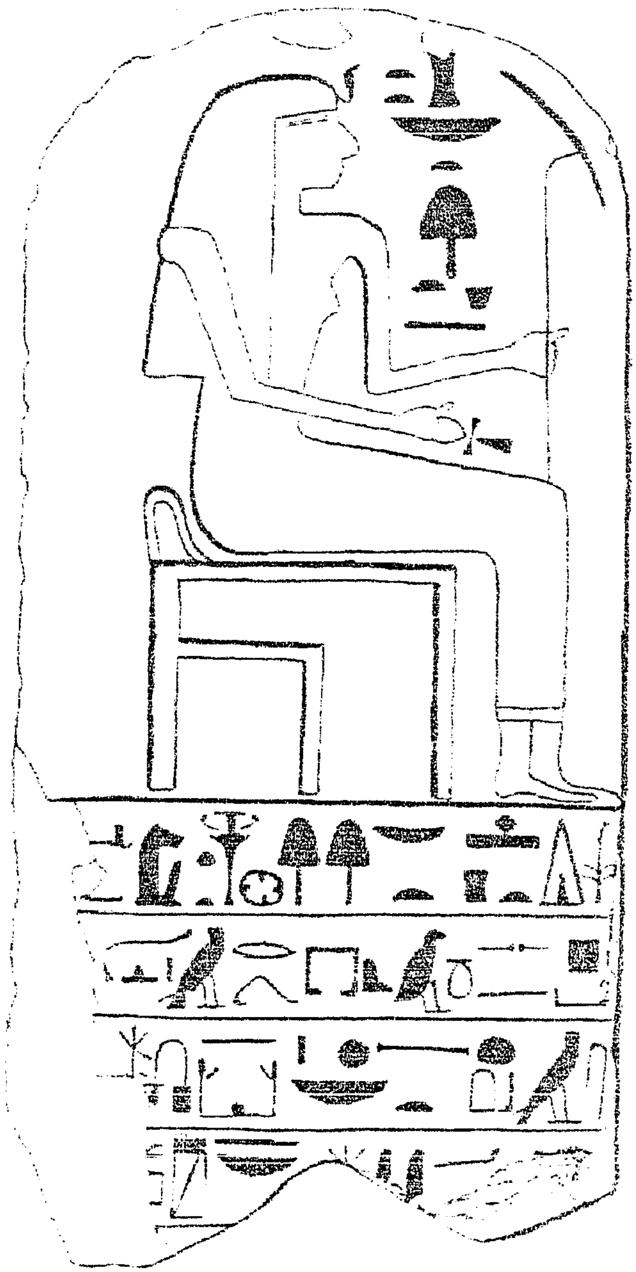


Figure III.1. Tablet found by Petrie. See text for translation of the pertinent passages. Figure is from Petrie 1886, Plate XXXVI, #2.

More extensive work was carried out by Griffith in December of 1885 and published as an appendix in Part II of the Naukratis monographs (Griffith 1888). At that time, Griffith noted that the enclosure walls were still visible together with the foundation of one pylon at the southern end of the enclosure (Figure III.2) and four inscribed statues (labeled I-IV in the 1888 volume). The enclosure, as measured by Griffith, was 127 yards E-W by 70 yards N-S, was four yards thick, and rested on 'rubbish' and built of mud bricks of nine by eighteen inches. Griffith's estimate of the span of the entrance defined by the pylons is approximately ten yards.

As described to Griffith by the *sebakhin*, the positions of the statues in Figure III.2 are displaced but close to their original locations. Two of these statues are still extant at Kom el-Hisn as determined by Coulson and Leonard (1981:81-83). Griffith's statues I and II correspond to Coulson and Leonard's statues A and C, respectively. All are Ramesside monuments. The inscriptions on statues I and II are presented in Figures III.3a-c.

Statue I is of sandstone and shows Ramesses II seated with a goddess, presumably Hathor. The inscriptions for the back and left of this monument are shown in Figures III.3a and III.3b, respectively. The far left column in Figure III.3a refers to "Sekhmet, beloved mistress of Yamu" (*di ʿnḫ Sḫt nbt imꜣ mry*). The left column in Figure III.3b refers to Sekhmet-Hathor as "Beloved mistress of Yamu" (*Sḫt- Ḥt-Ḥr nbt imꜣ mr*).

Statue II is the lower portion of a quartzite statue of the same pair standing and the inscription on the back of this monument is shown in Figure III.3c. Again, the "Beloved Mistress of Yamu" is found on the two left registers, this time referring to both Sekhmet (far left) and Hathor.

Thus, two of the statues described by Griffith (I and II) remain at Kom el-Hisn today, now placed near the rest house. Edgar (1909-1915) states that the best preserved of Griffith's four statues, number IV, was removed to the Cairo museum; the whereabouts of statue number III are unknown.

Another statue also currently situated near the rest house and not described by Griffith was reported by Daressy (1903). This is probably statue 'B' described by Coulson and Leonard, a "badly weathered statue of Ramesses II advancing, left leg forward, on a high base" (Coulson and Leonard 1981:82). The dimensions, material (sandstone), and

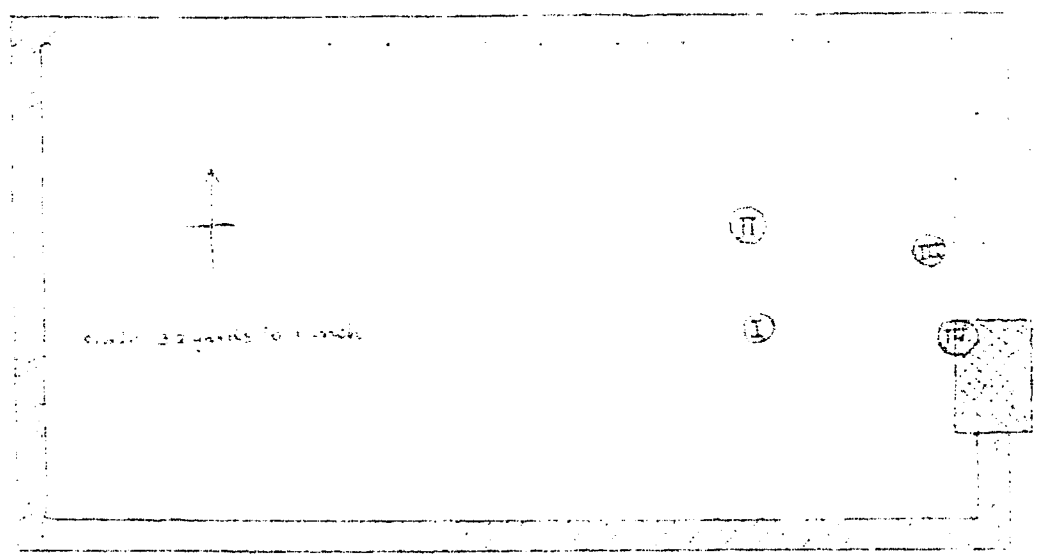
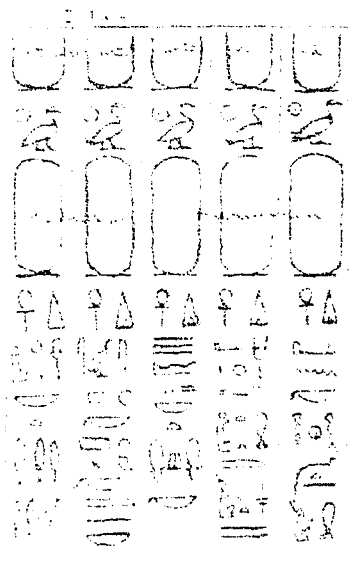
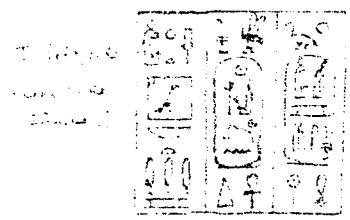


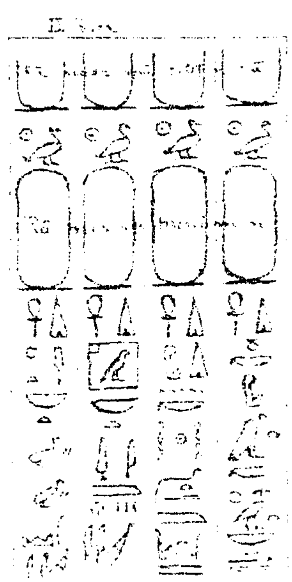
Figure III.2. Sketch plan of the Kom el-Hisn enclosure walls and pylons drawn by Griffith in 1885. The caption within the enclosure is Griffith's. The Roman numerals show the placement of the statues (in Griffith 1888, Pl. XXIV).



a



b



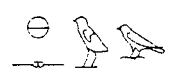
c

Figure III.3. Statues drawn by Griffith in 1885. a = Statue I, back; b = Statue I, left side; c = Statue II, back. Captions in and near the drawings are Griffith's. All are from Griffith 1888, Pl. XXIV.

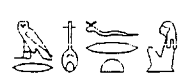
inscriptions on the back of the statue match those described by Daressy (1903:282-283). The inscriptions provided by Daressy (no drawings or plates of the statue itself were provided by Daressy) are similar to those in the other monuments but do not mention either Sekhmet-Hathor or Yamu. However, Coulson and Leonard (1981:82) note some discrepancies between the inscriptions published by Daressy and those observed on Statue B so it is possible that the statue Daressy described is not Statue B of Coulson and Leonard or that there is some error in Daressy's copy.

The other major monument at Kom el-Hisn is the tomb of Khesu-wer. The tomb lies in the southwest portion of the site near the modern village and is constructed of limestone blocks with (in Edgar's time) traces of mud brick walls surrounding the structure. The inscriptions on the walls of the tomb were drawn but never published in translated form. The inscriptions around the door are provided in Figure III.4. The dead man's name, *Ḫsu-wr* (Khesu-wer) was variously written as:

or



Ḫsu-wr was described as being 'Overseer of the women' who were, presumably, servants of the Hathor cult:



Ḫsu-wr himself is also described as a priest of Hathor (*nṯr ḥm*; not shown in Figure III.4)

and had charge of the temple (*mr ḥwt*):

Edgar argued that the temple where he held this office was Kom el-Hisn because of the Ramesside monuments found there by Griffith and Daressy which all mention Yamu as being associated with Sekhmet-Hathor. Edgar dated the tomb to the reign of Amenemmes (Amenemhat) III based on the character of the religious texts (Edgar

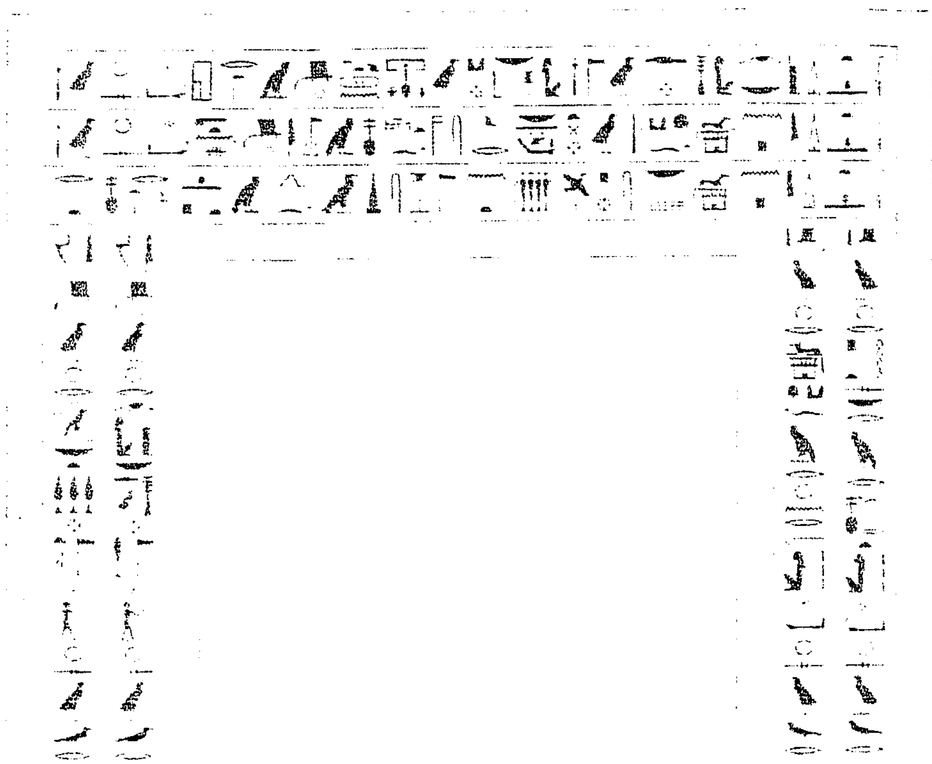


Figure III.4. Inscriptions surrounding the door of the tomb of Khesu-wer at Kom el-Hisn. The figure appears on page 56 of Edgar (1909-1915) with no number or caption.

1909-1915:61) and by the form of a basalt head found in the tomb (Plate XXXII in the original) which Edgar argued is typical of those found during the Middle Kingdom reigns of Amenemmes III or Sesostris III (both 12th Dynasty). Still, as both Edgar and Coulson and Leonard (1981:83) note, the head was obviously intrusive and the dating is best determined through a more detailed analysis of the inscriptions (see also Helck and Otto 1980).

The next detailed work at Kom el-Hisn was carried out by Hamada, el-Amir, and Farid in the late 1940's (Hamada and el-Amir 1947; Hamada and Farid 1947, 1948, 1950). Their primary interest was the abundant graves, most of which were at the north end of the main midden area. Most of the graves are dated by seals or scarabs to the New Kingdom. For example, the following are illustrated in Hamada and Farid (1950): an oval seal with the name of Thutmosis III (Plate VII, #16); a scarab with the name of Thutmosis III within a cartouche (Plate VII, #17); and a scarab with the name of Amenophis III within a cartouche (Plate VII, #19; all 19th Dynasty; objects are described on page 371 of that volume). Hamada and Farid exposed a small area in the main midden to the northeast of the excavations on which the current research are based. These graves were contained within the existing architecture, much like the burials excavated in this general area in 1986 and 1988. Unfortunately, Hamada and Farid were unable to provide secure dates for these graves.

The last work at Kom el-Hisn before the current project was a brief visit to the site by Coulson and Leonard in connection with their work at Naukratis. In their published work (Coulson and Leonard 1981) they described in more detail the three remaining Ramesside statues at the site (now all situated near the rest house) and correlated them with those described by Griffith and Daressy. By that time almost all of the large wall surrounding the site described by Griffith had disappeared, along with the pylons. In their brief visit, Coulson and Leonard were able to clarify some of the glyphs described by Griffith and collect a small sample of sherds.

Summary

There is thus much evidence that Kom el-Hisn is indeed the *im3* referred to in the inscriptions that remain at the site today. At least three statues – Griffith's statues I and II and that described by Daressy – contain inscriptions referring to *im3*. Indeed, most who have worked at the site have determined Kom el-Hisn to be *im3*. However, Griffith seems to have had second thoughts. The main part of the appendix Griffith wrote for the Naukratis Volume II was written in November of 1887. In a later addendum written in May of 1888 he posits that Kom el-Hisn was, instead, a residence of Ramesses named "Tell abu Samadeh pres de Damanhour" and that "the nome capital [i.e. *im3*] is to be looked for elsewhere" (Griffith 1888:82-83). Petrie regarded Kom Firin as a larger site but was uncertain which (if either) was the nome capital (Petrie 1886:94-95).

Certainly the presence of a large inscribed tomb on the site that refers to the occupant as a priest of Hathor "mistress of Yamu", *Ḫsu-wr*, militates strongly in favor of Kom el-Hisn as the site of the temple in which he served. In addition, Edgar also mentioned an area "[at] the north end of the site, near the Delta Light Railway, [where] the ground is full of large bones of some kind of cattle" (Edgar 1909-1915:63). Edgar interpreted this as a cemetery for the sacred cattle involved in the temple. While this "cemetery" has not been verified by any later workers, it would explain the absence of many cattle bones within the habitation areas of the site.

Curriculum Vitae

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Ford, Pamela and A. Cagle
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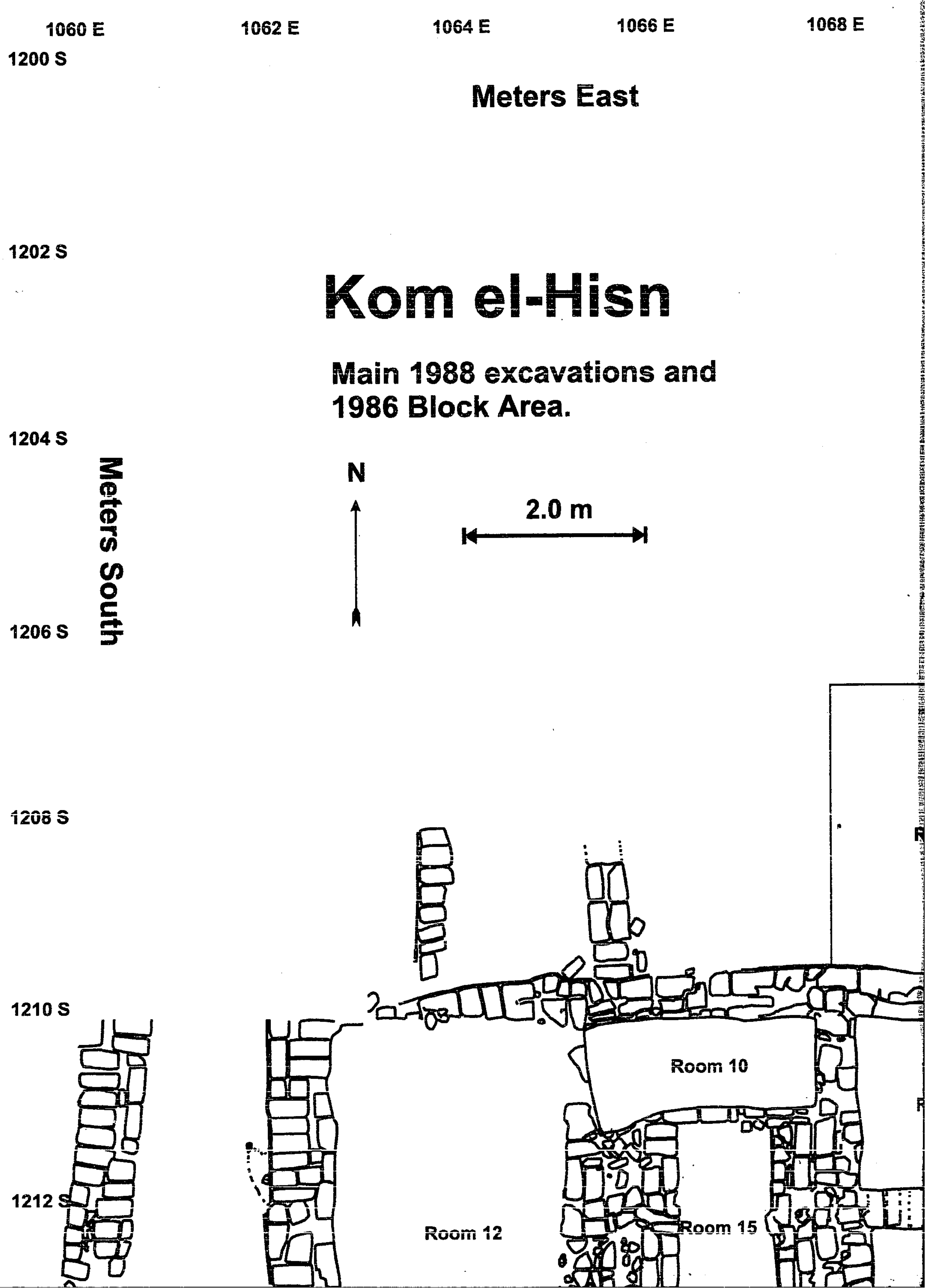
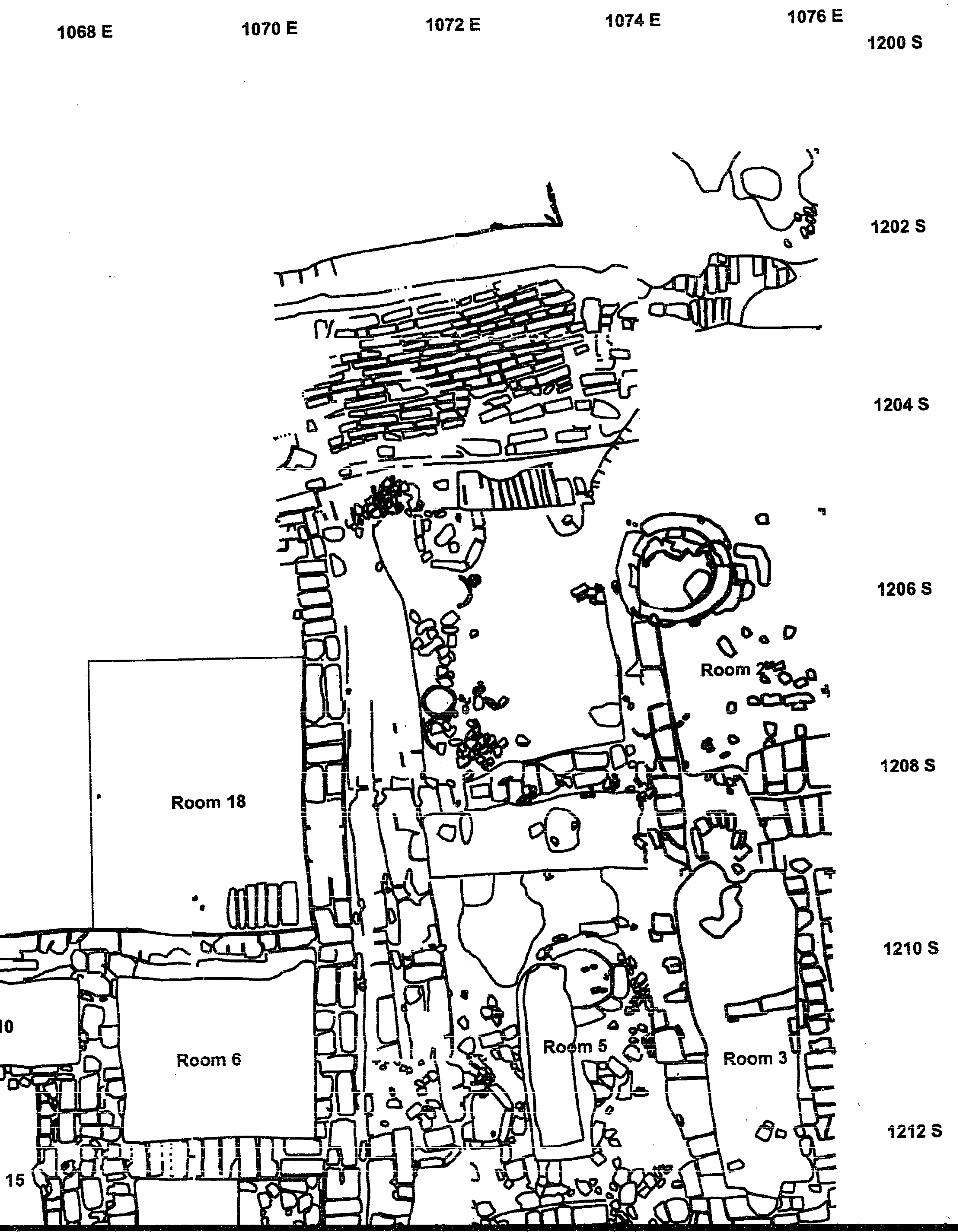
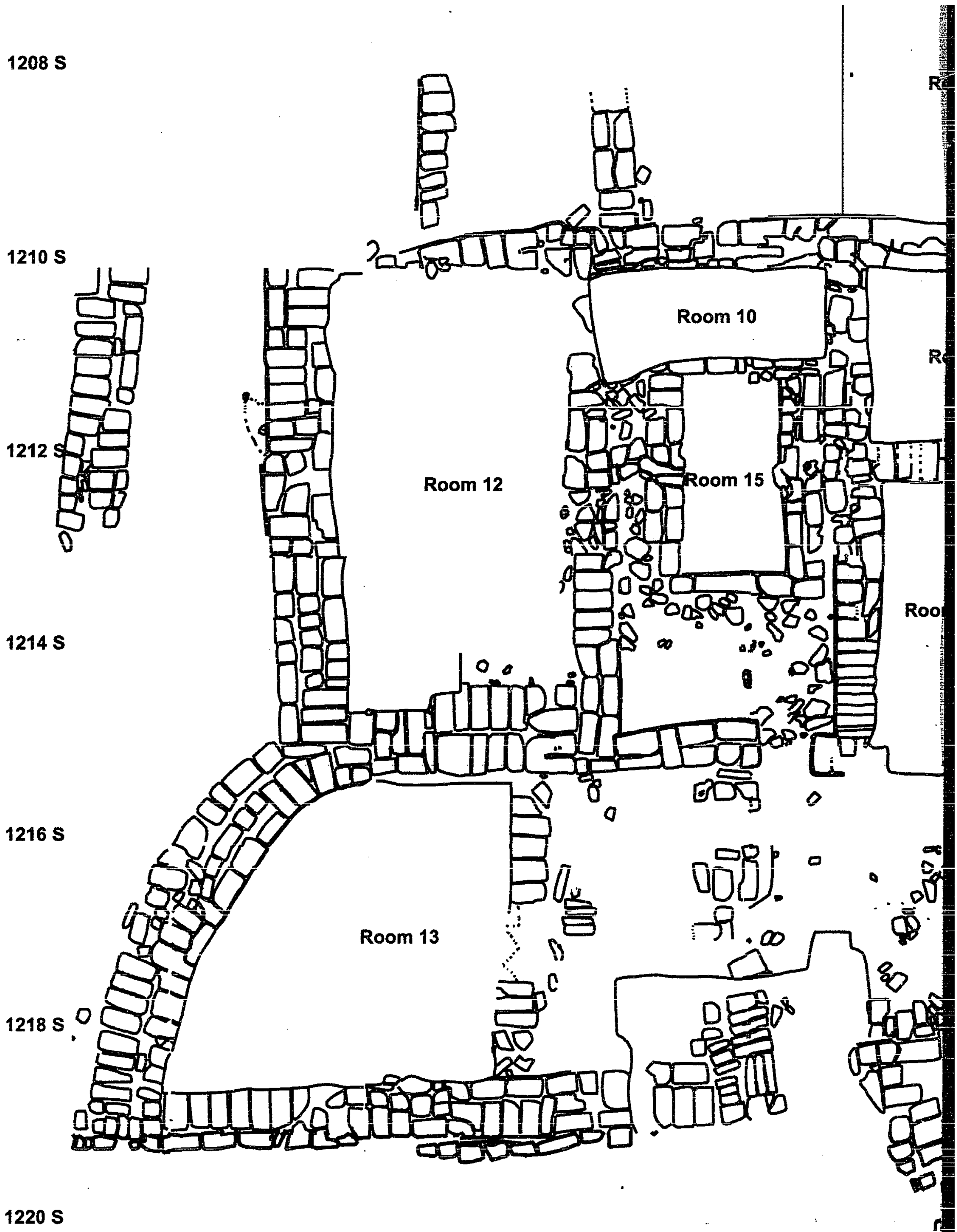
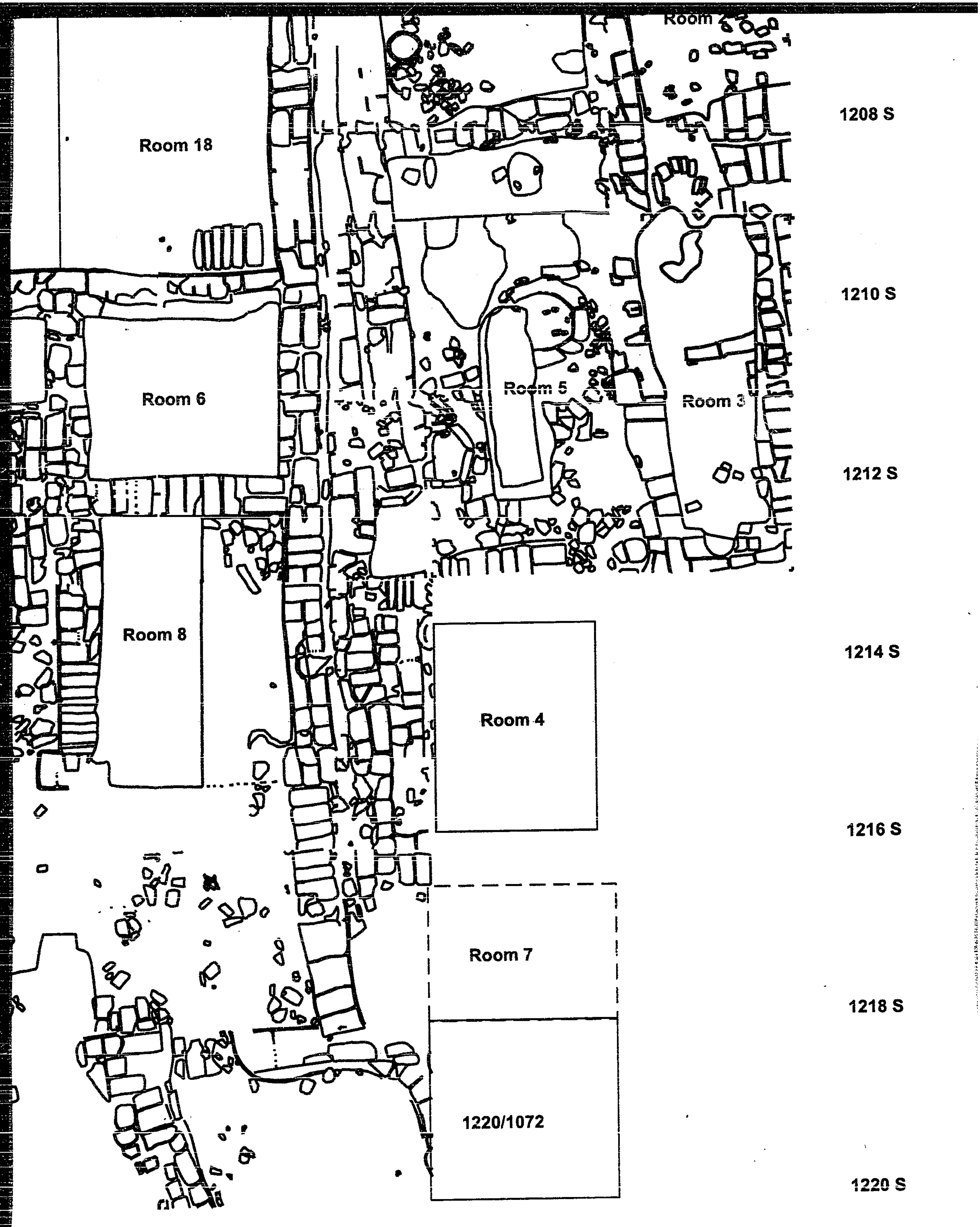

1060 E
1062 E
1064 E
1066 E
1068 E
1200 S
Meters East
1202 S
Kom el-Hisn
Main 1988 excavations and
1986 Block Area.
1204 S
N
2.0 m
Meters South
1206 S
1208 S
1210 S
Room 10
1212 S
Room 12
Room 15


1068 E
1070 E
1072 E
1074 E
1076 E
1200 S
1202 S
1204 S
1206 S
1208 S
1210 S
1212 S
Room 2
Room 18
Room 6
Room 5
Room 3
10
15



1208 S
1210 S
1212 S
1214 S
1216 S
1218 S
1220 S
Room 10
Room 12
Room 15
Room 13


Room 2
Room 18
Room 6
Room 5
Room 3
Room 8
Room 4
Room 7
1220/1072
1208 S
1210 S
1212 S
1214 S
1216 S
1218 S
1220 S