Building Assyrian society: the case of the Tell Sabi Abyad Dunnu

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III. The Archaeology of the *Dunnu* of Tell Sabi Abyad

Excavations on Tell Sabi Abyad started in 1986. The initial primary focus of investigation was the Neolithic settlement, but soon the remains of a Late Bronze Age fortified settlement, a *Dunnu*, surfaced as well, which has been under investigation since the late 1980s (Akkermans and Rossmeisl, 1990; Akkermans, Limpens and Spoor, 1993; Akkermans, 2006; Akkermans and Wiggermann, 2015). It was excavated by teams of primarily students and staff from Leiden University and locally hired workers lead by professor Peter Akkermans until 2011, after which work came to a forced halt as result of the war in Syria. The excavations have largely unearthed the Late Bronze Age settlement, although minor parts remain unexcavated. Of the core settlement within the exterior fortification wall, the excavated area is about 90%. Most of the remaining 10% consists of square balks that were left standing. Since these are comparatively minor features, and form no large contiguous blocks, we can relatively confidently reconstruct many missing parts. However, not in all squares the earliest Late Bronze Age levels have been uncovered, which contributes to a mildly biased picture in favour of the higher levels which were uncovered more completely. If we take the whole settlement, including all areas on both sides of the moat, only an estimated 55% has been excavated. However, this number depends on the estimate of the original extent of the settlement, which is hard to assess since it is clear that the edges have largely been eroded away. Nevertheless, the ratio of excavated total area to the complete original settlement area is large compared to other excavated sites. The conclusion is thus that we have a comparatively complete picture of the settlement, which increases the analytical potential.

III.1 Stratigraphy and chronology

The settlement was founded on a Neolithic habitation mound dating to the Late Neolithic. In many cases, Neolithic cultural material including sherds, installations, and buildings, are found directly below Late Bronze Age walls and floors. The stratigraphic make-up of the Late Bronze Age settlement reveals various periods of use, natural decay, and instances of demolition and construction. Each of these left characteristic traces in the stratigraphic record. In most cases, not much material is deposited on the initial floors, indicating active usage and cleaning. On various places, this is interrupted by layers of variable thickness (20-110 cm) containing primarily construction rubble. This is generally followed by a new floor and a new

use-phase. Therefore, such stratigraphic sequences most likely indicate demolition and construction. The number of such consequent rebuilding cycles varies between groups of buildings, which makes it hard to understand the chronological relations between these events. In certain other areas during the primary use phase of the *Dunnu*, and especially in the 'after-life' of the *Dunnu*, we find stratigraphic units consisting of layered or laminated sediments. These reflect periods of natural decay, although they are often mixed-in with cultural material, suggesting that during such phases use would have continued. The thickness of the single distinguishable layers of sediment in a larger deposit of layered sediments varies significantly. This is indicative of a variable rate of decay, and infill through eolic sedimentation and erosion of the architecture. Such rates may be depending on the architectural context, importance and use of a certain area. See chapter 3 for further discussion of these issues.

Main phase	Level	Character
?	7	Pre-Assyrian/Mitanni. Precise extents unclear. Focussed on single central building but possibly with certain use area around.
1230 BCE *Dunnu* phase 1184 BCE	6	Beginning of Assyrian *Dunnu*, construction, active usage, occasional rebuilding. Administration.
	5	End of Assyrian *Dunnu*, internal function shifts to pottery manufacture. Administration.
HEAVILY BURNT MATERIAL – PRIMARY TABLET CONTEXTS		
ABANDONMENT	ABANDONMENT	ABANDONMENT
Farmstead phase	4	Re-use of *Dunnu*, domestic. Some manufacture. Some renovation & some new light architecture.
	3	Similar to level 4, but locally already built over primary phase settlement walls.
ABANDONMENT	ABANDONMENT	ABANDONMENT
Late phase	2	Completely new buildings running over older architecture. Heavy architecture.

Table 1. General archaeological chronology of the Dunnu.

Very generally, we may divide the stratigraphy in a primary use-phase, characterised by relatively little deposition, a secondary use phase characterised by much deposition of material, and a tertiary use-phase during which the original settlement was completely buried and oveuilt. The primary use phase is in some places ended by a large fire, which left a distinct stratigraphic mark in large areas of the settlement. Floors and walls are burnt red, orange and green, while burnt mud brick rubble, construction wood, blackened barley and chaff is found on top of floors and within room fills. Sedimentation and additional rubble layers generally follows the burnt layer, and over time new architecture is added, or older buildings are re-used. Buildings may be partly renovated, but in other cases new use-surfaces occur on top of rubble layers within buildings that do not in all cases seem to have been roofed anew. It is clear that habitation occurs in between ruins, which by chance also justifies the designation 'secondary use-phase' qualitatively. At some point,

walls are built over the remains of the walls of the first settlement, indicating that the ruins were now almost completely eroded and covered up.

Figure 10. Plans made for levels 6, 5 and 4, colours indicating important zones of modification from level 6 to 5. Colours by author (after Akkermans and Wiggermann, 2015).

Akkermans' interpretation of the stratigraphy distinguishes 7 levels (Akkermans and Wiggermann, 2015). The boundaries of these are however often hard to draw due to phases of continuous use and architectural

renewal, which will be discussed in detail in chapter IV and V. Complete and synchronised settlement plans are therefore difficult to produce, and may give a somewhat misleading picture of certain fixed architectural phases. This is problematic for levels 7 through 5, between which no site-wide stratigraphic boundaries exist. It is clear however that by the end of level 5, most areas have risen in elevation due to decay, sedimentation and architectural renewal. On the other hand, some areas have not risen at all, or not at the same rate as others, producing variations in accumulated levels. The fire at the end of level 5, and the messy state of the subsequent layer due to abandonment, scavenging and collapse, did most likely occur in a relatively narrow time-frame. It forms a distinct stratigraphic end-point for level 5 and the primary use-phase, interrupting the continuous use-cycle. Levels 4 and 3 are part of the secondary use-phase and show stratigraphic continuity in a phase during which the buildings of the primary use-phase are still present, but in an increasingly ruined state. Level 2 is formed by the establishment of a heavy walled building on top of the ancients remains of the *Dunnu*, clearly disregarding the older architecture, and indicating that we are dealing with a new settlement altogether. Level 1 is not relevant here, but it is used to indicate the mediaeval Islamic burial ground on top of the Late Bronze Age remains.

III.2 Dating

Accurate dating is possible both through dates mentioned on the cuneiform tablets, and C14 dating. A few tablets contain Assyrian *limus*, or year-names (Figure 11), which allows us to date administrative activity on the *Dunnu* from 1229 to 1184[15] [16]. However, by far the largest number of dated tablets are found in the range of the years 1197 to 1184, peaking in 1188-1187 (Figure 12). Moreover, only 3 of the 12 datable tablet collections contain tablets that belong to the period before 1197 (Figure 13). It is important to emphasize that this uneven temporal distribution of dates is not reflective of the intensity of administrative activity in certain periods, but a result of the habit of recycling clay tablets after their use has expired. Only some tablets are preserved, for instance if they contain information that must be preserved or more accidentally as part of random discards that were not recycled (Klinkenberg and Düring, 2023). As regards to the latest dated sources, a few tablets referring to a certain 'lord' Kidin-Sîn seem to post-date the primary use-phase. Nonetheless, the main administration of the Assyrian *dunnu* stopped in or just after 1184.

C14 dating has been performed on eight samples taken from early stratigraphic contexts, representing the potential inception of the *Dunnu* and late ones representing its end[17]. These suggest a starting point at 1297

[15] Dates used in this study follow the Middle Chronology.
[16] The *limus* have been identified and listed by Frans Wiggermann and shared in internal documents with the research group. Publication of this entire corpus is forthcoming.
[17] Executed by the Centre of Isotope Research, University of Groningen.

+/- 64 BCE, and a final date of 1121 +/- 66 BCE. This covers and extends the period of use as indicated by the tablets, which is expected considering the small subsample of tablets with surviving *limu* dates. The C14 dates are thus a more realistic reflection of period of habitation, albeit with a for this context relatively large margin of error.

Figure 11. Location of tablets with limu *dates* (after Klinkenberg, 2016, fig. 4.31).

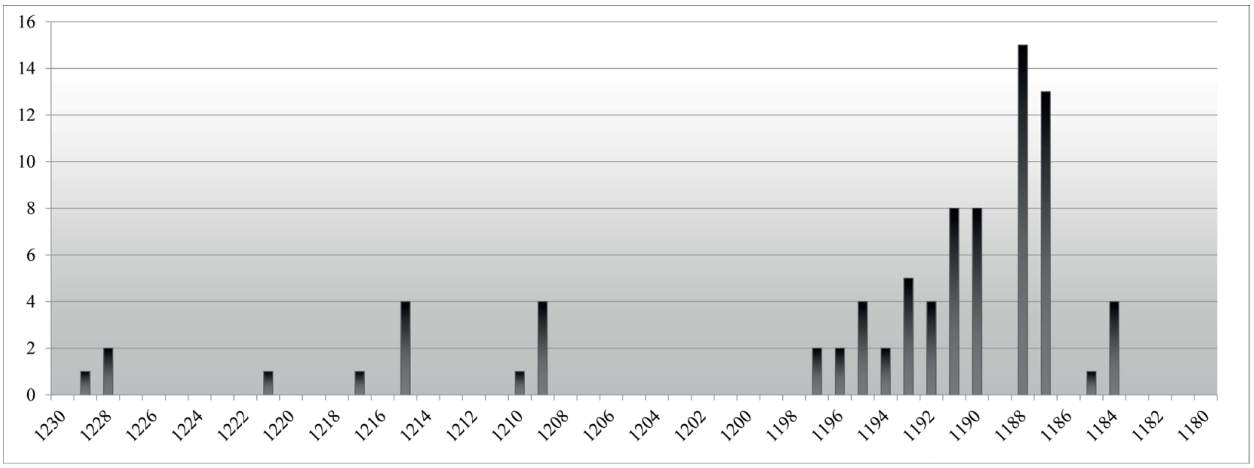

Figure 12. Number of dated writing tablets for each year, showing a peak in the final years (after Klinkenberg, 2016, fig. 4.30).

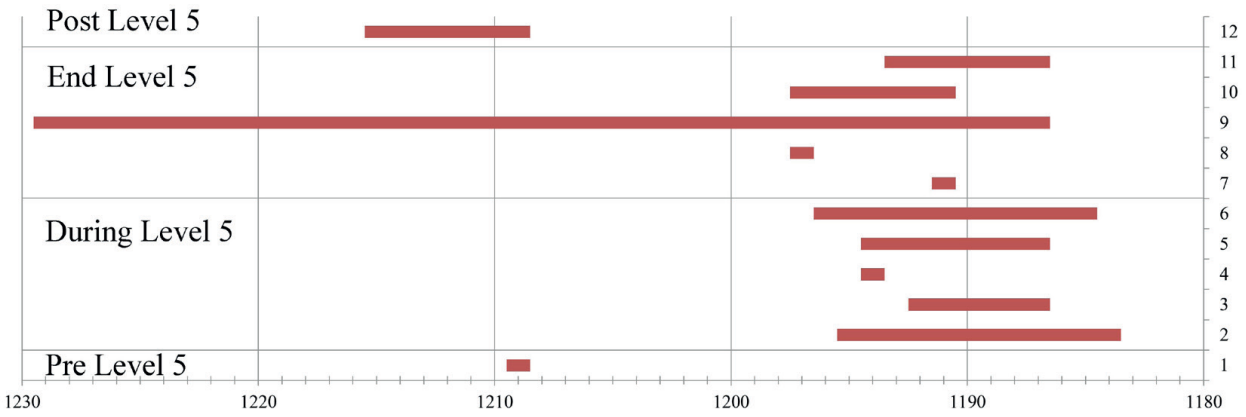

Figure 13. Dating ranges of the various limu *dated tablet groups* (after Klinkenberg, 2016, fig. 4.32).

III.3 Cuneiform tablets

About 400 clay tablets containing written evidence of administration and correspondence were excavated. Most tablets occur in larger concentrations. Since such groups often also show much coherence regarding the involved individuals and administrated activities, we may speak of private 'archives'. On the other hand, much is missing, and they represent only a very small subset of the total of writing once present on the site. Moreover, many strays and refitted tablets indicate that the archives were much meddled with during or after discard.

Six larger concentrations of tablets were excavated, and many smaller ones, or single, isolated ones. Klinkenberg's analysis of the contexts of deposition showed that most of the tablet assemblages were discarded as secondary refuse (Klinkenberg, 2016). In one case, the archive belonging to the last steward, Tammitte, found in the north-western corner, the tablets are multi-directionally distributed in a 30 cm thick earth layer, clearly indicating they were deposited as part of that layer. Others were found in large scatters

on top of floors, indicating that they had been moved from their original location. In a few instances only, collapse had saved tablets from being re-located from their original place of discard or storage.

The tablets show us a world otherwise unknown to us, but at the same time also a world that is confirmed by the archaeology. They confirm the picture of a settlement that is primarily involved with food production and storage of crops, mainly barley, and played a central role in the pastoral economy (Wiggermann, 2000). On the other hand, the tablets give a rich view on the internal logistics and organization of production and storage, international trade, judicial matters, and the background and identities of the people that lived here (Wiggermann, 2000, 2006, 2007, 2010).

III.4 Architecture

The architecture of the *Dunnu* will be subject of two detailed chapters in this dissertation. This paragraph aims to give an introductory overview. The architectural remains of the *Dunnu* consist of mud brick walls which have been preserved relatively well. However, the level of preservation varies considerably: the best-preserved parts were still standing three meters high, while at the worst preserved parts no architecture at all is found due to heavy erosion around the edges of the settlement. At the boundary of the preserved area, of many walls just a few centimetres remain standing. This state of affairs clearly impacts our ability to reconstruct the original architecture and understand the function of the buildings, or more general the spatial functioning of the *Dunnu* as a single larger unit.

Walls are universally built of large square mud bricks, measuring 36 cm to 42 cm in width and 9 to 12 cm in thickness. Such bricks weigh on average 20 to 25 kg each, which is just about the weight that can be handled with some ease using two hands. Wall width varies significantly, from 1 to 7 bricks, which is indicative of differences in structural function, discussed in chapter 7. Wall construction is simple and straightforward, using running bonds and is, certain exceptions aside, characterised by an absence of foundation trenches. Vaulting is applied over narrow passages, such as doorways and corridors, and for stairway construction. For the existence of larger vaults there is no evidence, although its absence cannot be does not mean absence of presence, since Bronze Age architecture from other sites in the Western Asia supplies us with ample parallel evidence for the use of larger above-ground vaults of up to 3 meter (Besenval, 1984; Oates, 1990). Roofs were however most likely primarily of the flat mud terrace type, constructed of beams crossed by purlins covered by reeds and 30 to 40 cm of loam. Some remains of burnt construction wood have been found and occasionally imprints of the reed coverage that formed a membrane to keep the loam roof deck in place. However, only very few pieces of construction wood have been found of a sufficient circumference to cover the larger spaces of up to 5 meters. This is surprising, considering the

large-scale fire that ended the primary phase and thus the potential incidence of timber preservation. This may indicate that significant scavenging and re-cycling of construction materials did take place afterwards.

One well-preserved stairway has been found in the centrally located ‘tower’ building. The spaciously dimensioned and heavy, vaulted construction of this stairway suggests that it did not just run up to a roof, but had at least one and perhaps a number of additional floors. Two more stairways were identified along the fortification wall, which thus gave access to the wall-way and the appending buildings. Although no steps were preserved, perhaps indicating a lighter construction method using more easily decayable materials, the long and narrow rooms can hardly have been constructed for any other purpose than to hold the steps of stairs.

The general architectural layout of the *Dunnu* is formed by a core consisting of two large near square buildings in the middle, their architectural character differing strongly. One being extremely heavy, with 9 small rooms arranged in a tree like configuration, the other showing a distinct plan with a large central space winged by two ‘apartments’ fitted with bitumen-sealed baked tile pavement bathrooms. Clearly, the first building is rather utilitarian in nature, and has been named ‘the tower’ and ‘the fortress’ in the excavation documentation for reason of its thick walls, the other was residential in nature, and has been characterised as a ‘palace’, in earlier publications. Whether the remains justify the term ‘palace’ is questionable, but it was most definitely the residential area of important individuals. These two large buildings are surrounded by a continuous ring of open space of varying width, on the other side of which we find more buildings perched against a large encircling fortification wall. The variety in form and size of these buildings probably also indicates a variety in functionality. Two gates, an old, and a new one, are found in the northern façade of the fortification. The old one is integrated in the architecture and loses its function after the construction of the new gate, which is, curiously, slightly less heavy. A small postern gate, or back door, is found in the south-eastern corner. Outside the fortification wall a 6 to 16-meter-wide space boasts what seems a relatively dense concentration of architectural structures. The entire complex discussed so far is encircled by a three-meter-deep dry moat that can as far as we know could be crossed on just one place in a certain period. This passage shifted during the use of the *Dunnu* from the northern part of the western side to the western part of the northern side of the *Dunnu*. Other crossings are not known, but large parts of the moat remain to be investigated. The moat seems to have served as a measure of defence only temporarily, since it filled up during the use of the *Dunnu* and is even overbuilt at some point. This must have occurred late in the primary use-phase. Outside the moat, yet more buildings are found, which show less variation in wall construction width and room size than the core. These have occasionally been characterised as barracks or stables by the excavators, however in absence of good evidence for their usage.

The precise extent of this outer shell of architecture is unclear due to partial excavation and poor preservation.

The architectural characteristics seem to justify the classification as a fortified settlement that housed a number of people and functions, which is in general what a *dunnu* is expected to be.

III.5 Moveable objects

The registered object assemblage of the *Dunnu* of Tell Sabi Abyad counts nearly 10.000 objects, which cover all late Bronze Age settlement phases hence also the post-Assyrian phases (Klinkenberg, 2016). By far most objects are stone implements or ceramic vessels, which are indeed the material categories that preserve best. Including the clay cuneiform tablets, stone and clay objects constitute over 95% of the total number of finds. Bronze objects include 11 arrow heads, two daggers, two axes, a hoe, a sickle, four spear heads, one bowl, a razor, jewellery, a few (cloth) pins and small tools. Bronze objects are thus relatively rare, which is to be attributed to the value of the material which make them susceptible to re-use or recycling. Some of the larger objects, such as undamaged spear heads, the bronze bowl, and axes were clearly lost in catastrophic collapse related to the fire at the end of the first use-phase (Klinkenberg, 2016, p. 160). Other objects include relatively small numbers of glass (beads) and bone (combs, needles) items. Although many smaller and larger objects such as a wide range of tools and weapons would have been made partly or completely of perishable materials such as wood and reed, none of this has survived. Especially reed would originally have been used in plenty for furniture, mats, constructional elements and especially baskets of variable size and function. In the excavations of Neolithic Tell Sabi Abyad evidence for wickerwork was more regularly found, mainly preserved as impressions in bitumen (Berghuijs, 2013). Its relative absence in Late Bronze Age contexts may mean that in the Late Bronze Age wickerwork was not as commonly waterproofed with bitumen, or that pottery was more universally used as a container. Other plant-fibre materials such as cloth and rope did also not survive apart for its occasional impression in pottery.

III.6 Fixed features

Fixed features, also known as installations in archaeological practice, include primarily (bread) ovens, cooking places, hearths, bins and kilns.[18] Approximately 220 bread ovens belonging to the primary phase (levels 7>5) were found. Such ovens are generally circular and range in size from 35 to 100 cm, and are

[18] Inventories and reports on the fire features (ovens, kilns, hearths and cooking places) and bins were written by student interns Donna de Groene (de Groene, 2015) and Dimitri Jachvliani (2015).

most commonly 50 to 70 cm in diameter. They resemble ovens used in traditional settings today known as *tannur,* which etymologic origin can be found in the Akkadian word for oven (and kiln), *tinûru* (Tkáčová, 2013). About 25 hearths, which may have been used for cooking as well, and five built-in cooking places were excavated. The cooking places take the form of low U-shaped niches which were used to contain the fuel for a fire, while their low walls supported a cooking pot. All are located along the walls of the same room, which is thus identified as a 'kitchen'. A total of eight up draught pottery kilns were excavated: four outside the walled part of the settlement, and four within the walls.[19] The exterior kilns are early in date, and are taken no longer in use during the primary phase, while the interior kilns are late additions and seem to indicate a functional shift in the fortified core of the *Dunnu*. About 80 bins have been identified, which come in a variety of shapes, sizes and construction materials. Bins are generally rectangular constructions with walls shaped out of clay or constructed of mud bricks. A few larger bins have been described as 'silo's' in the excavation notes, but there is no indication these were indeed used for grain storage. The precise use of bins is not clear, but many of them are relatively small and are likely to have fulfilled the function of short-time storage for goods or foodstuffs. Also, a number of installations that relate to the water/waste management of the settlement such as toilets, cess pits, gutters, irregular drainage channels, and small basins have been identified. No wells were located on site, nor any large basins, which implies that water had to be carried to the summit of the tell from the nearest irrigation channel and stored in vessels.

III.7 Functions and activities

The objects and the texts found in the excavations give insight in the range of human activities, and the general functions – economic, military, social and political – of the settlement. The treatment below is much indebted to the thesis of Victor Klinkenberg (2016), and published and unpublished material of Frans Wiggermann about the cuneiform tablets. These provide us with the basic hypotheses regarding the functions and activities that the physical settlement structure had to accommodate.

III.7.1 Crop production & storage

Agriculture is clearly one of the main functions of the *Dunnu* of Tell Saby Abyad, as much of the evidence points at managing the agricultural economy of the territory and the bulk storage of crops. The texts about the agricultural economy have been exhaustively dealt with by Frans Wiggermann (2000). Some document the distribution of rations to *Dunnu* workers, or of seed corn, and one especially important one records a procedure that was called the 'dissolution of the grain heap' or *pišerti karū'e* (T98-115). During the dissolution the labour costs and seed corn where subtracted from the fresh harvest, and the left over was

[19] The kilns and the *dunnu's* pottery production have been studied by Kim Duistermaat (2007).

added to the storage (Wiggermann, 2000, p. 179). From it we know that at some point a total amount of 10.759 *homer* or 667 metric tonnes of barley was stored in the *Dunnu*. The total harvest that year was 4873 *homer* or 302 metric tonnes, from which rations and seed corn was subtracted before the remainder was moved to storage.

The archaeological evidence helps us to identify the species of grain, but it largely confirms the focus on barley cultivation. The lion share of the grain is made up by hulled 2-row barley (*Hordeum vulgare* ssp. *distichon*), found at a proportion of 80%-90% of the sample aggregate (Fantone, 2015, p. 219). To a lesser degree 6-row barley (*Hordeum vulgare* ssp. *vulgare*), naked wheat (*Triticum durum/aestivum*) and emmer wheat (*Triticum turgidum* ssp. *dicoccon*) are identified. The wheat is not found in the texts, which may be a coincidence, or it may mean that it was not produced under the auspices of the *Dunnu*, but by the free farmers and sold or traded privately.

The harvest of 302 tonnes of barley mentioned above is used by Wiggermann (2000, p. 183) to approximate the required acreage under cultivation. To it must be added land that is not cultivated by the *Dunnu* directly but by farmers for their own use which can be approximated using parallel evidence, fallow land, and an estimation of pasture, woods and wasteland. The total of territory needed for all this fits into a circle of a 3.5 km radius. This seems like a realistic figure and proves that the *Dunnu* was the centre of a agricultural estate comparable to the size of an average pre-modern European village and territory (Roberts, 1996). Although modest in scope to modern standards, this was probably a significant enterprise in the Late Bronze Age.

The tonnages of barley administrated implies the presence of a granary structure that was used, and perhaps built, specifically for this purpose. Although the excavation has revealed a few hundred ‘bins’ or small fixed storage containers, these were most likely used for short-term storage within specific production or logistical chains, and not only for barley. On the other hand, the large heap of burnt barley found in the courtyard of the residence does suggest bulk storage. However, as this is found in a final phase of the *Dunnu* when it is destroyed by a fire, it seems unlikely this is a typical storage representative for the earlier phases. As will be argued in this dissertation, the most likely candidate for a granary is the large central building, a thick-walled building containing rooms with narrow access ways, and probably more rooms on a second floor which all may have been used for storage.

Besides barley and wheat, other products must have been produced in the territory of the *Dunnu*. In one personnel list, 2 gardeners appear on the payroll of the *Dunnu* and in another 3 (T98-45, T99-5+). Compared to the hundreds of people involved in the barley production, this is very little. Archaeologically this is reflected by much less evidence for other botanical products, which includes garlic, lentils and a few herbs.

The texts frequently refer to cress as an important part of the meal (T93-6, T96-11, T98-117, T98-127), and on occasion we find references to terebinth nuts, onions, chick-peas, coriander, cumin, and sesame (T98-117, T98-73). Some of these must have been produced in gardens near to the *Dunnu*. The spices, however, were evidently traded as they occur as payment in texts dealing with the administration of trade.

III.7.2 Animal husbandry & housing

Both the texts and the archaeological finds suggest that the pastoral economy was important for the *Dunnu*. Animal bone was found in large quantities. A sample (n = 1217) of the faunal remains has been analysed, showing that goat/sheep were most common (47%), followed by equids (horse/donkey/mule) (25%), pig (13%), gazelle (8%), and cow (7%) (Cavallo, 2002). This is similar to other sites of this period, and has a large overlap with the species that are found in the texts, apart from Gazelle, a hunted species and apparently not part of the official administration. Also pig is only indirectly mentioned as food, but not the activity of rearing them (Wiggermann, 2000, p. 199). The absence of pig in the administrative sources of ancient Western Asia is a common feature of the region, and has been associated with the small scale nature of pig rearing (Zeder, 1998). The text-based numerical analysis, which may be more reliable since individual animals are counted rather than totals of bones, suggest an even larger discrepancy between ovids and other animals than the archaeological evidence. Ovids may thus make up to 90% of the animal stock (Wiggermann, 2000, p. 198).[20] The tablets refer frequently to herding, the consumption of sheep and goat, the use of their skin and hair, and the trading of these animals (T93-3, T97-18, T98-34, T98-43, T98-82, T98-91).

As for the other animals, bovids (castrated bulls and cows) are a relatively small group. Oxen are assumed to have been used primarily to pull ploughs, although this use has not been recorded. In the records, they were used for threshing grain (T97-17), pull wagons (T96-9) and for their skin (T98-14). Wiggermann (2000, p. 198) estimates a population of 250 to 500 bovids being trained or used for agricultural tasks in the territory of the *Dunnu*. Donkeys are supposed to be the standard draught animal, for local transportation and in long distance caravans, but they are only mentioned once on record as cart pullers. The animals were used in T98-119 to provision the soldiers of Ilī-Padâ. A rough estimate is that between 100 and 200 donkeys were employed by the *Dunnu* (Wiggermann, 2000, p. 192).[21] Pigs were probably mainly kept for consumption. Apart for the mention of pork in a food inventory (T98-31), there is little evidence for their use recorded in the texts. Wiggermann (2000, p. 192) estimates a total of 100 pigs, based on comparative

[20] Gazelle, included in the percentages of animal bone found in excavation, is not included in the text-based counts.
[21] Wiggermann bases his estimates on a text from Kar-Tukulti-Ninurta which lists the possessions of average families.

evidence. Judging from their numerical presence in the faunal material, their contribution to the diet must have been reasonably large. Horses had an important military function and a clear status animal. There are multiple references to the horses of Ilī-Padâ, and of charioteers. The texts add ostriches to the list of species that are being kept at the *Dunnu* (T97-33). Ostrich eggshell also occasionally turned up in excavation, but no bones have been found indicating they were not frequently consumed. Gazelle is found amongst the faunal remains in the excavation, but not mentioned at all in the administration. This implies that hunted species are not traded or used otherwise economically and are thus consumed directly on site. Both hunted and herded species confirm that the steppe was an important resource and base of subsistence. The fact that at some point a group of merchants receives 36 donkeys and 64 sheep (T97-18) moreover suggests a for-profit motive of rearing animals.

A question regards the location where these animals were kept or housed. The texts clearly indicate that many of the goats, sheep, donkeys, mules, cows, bulls and oxen were herded when they were not needed for work. Their location would have been the steppe or the marshy areas near the river. Some of the animals must however have been kept near or in the *Dunnu*, which has certain implications for the use of space. Pigs, ostriches and the 'sheep of the stable' (T98-43), suggest that animals were fattened by grain rather than herded and housed in pens or stables in and around the *Dunnu* (Wiggermann, 2000, p. 200). Some donkeys will also have had a place. On some occasions, large flocks or herds must have been present nearby, or an increased number of donkeys and horses of the merchants and charioteers. The larger groups of animals were naturally housed outside the main structures, probably with the herdsmen camping near them. As for the horses, the most valuable of animals, we may expect these to be stabled in a secure area, possibly even in the intramural area of the *Dunnu*. The area directly east of the residence appears to be the best candidate for the stables (see VI.9.2).

III.7.3 Food preparation

The harvested crops were used for consumption, either directly or after treatment to produce other types of food or products used in cooking. In fact, Klinkenberg's (2016) spatial and functional analysis shows that by far the largest number of objects relates in some way to food production or consumption. Stone objects such as grinding slabs, grinders, pestles and mortars point at grinding and crushing. Many grinding slabs were undoubtedly used to produce flour from barley. Flour does not occur commonly in the texts, which is understandable since it would have been made only when it was needed. Other food processing activities that are documented in the texts are for instance the oil-pressers 'dehulling sesame' (T93-7), for which a type of pestle and mortar would probably have been used.

Barley was thus the main staple food. It was used as animal fodder, to brew beer and bake bread. The 220 ovens mentioned that have been excavated (not all in use simultaneously), were for a large part used for

bread baking. The importance of bread baking is supported by the texts belonging to the administration of baker Paja, found in the south-eastern and south-western corners of the *Dunnu*. Ethnoarchaeological examples suggest that barley might have been used to bake a tough, dry barley bread (Fantone, 2015, p. 223). This has historically been a very popular bread as it could be stored for months. Storage of such bread was however not recorded in the texts. The bread ovens nevertheless point at large scale bread production, mainly in the southern part of the *Dunnu*. Significantly, this is within the area of the main fortification walls near to where baker's Paja's administration was unearthed. Considerable numbers of similar ovens have however also been found in the settlement beyond these walls. This may reflect a separation between the official and administrated *Dunnu* bakery inside the walls, and ovens used for bread baking for private consumption.

A significant volume of pottery must be associated with beer production (Klinkenberg, 2016). Beer was next to bread the most important staple food, so this comes as no surprise. Klinkenberg (2016, p. 192) identifies a building in the centre north (building NE-2) as a brewery, although there are two additional potential beer brewing locations based on the presence of strainers and large vessels with a base hole. Beer is also amply attested in the texts. Deliveries of beer for a meal of Ilī-Padâ (T97-23 and T97-24) are recorded, and the presence of a brewer on site is proven by a letter of Sîn-Mudammeq in which he complains about an ignored order to ask the brewer of the *Dunnu* to send a potter to him in Dunni-aššur (T93-3). The brewer apparently controlled the potters, which suggests a relative high social standing of the brewer, and underlines the importance of beer throughout all levels of society. Also, no evidence for beer brewing outside the fortification walls is found, showing how much the central authority was concerned with controlling its production and, consumption. This puts into perspective the treaty with the Suteans discussed previously (T04-37), who were not allowed to drink beer bought from the brewer at the brewery of the *Dunnu* but should take it to their own '*Dunnu*'. It is very interesting to note that, in view of the previous, this seems to indicate a spot within the walled area.

The use of barley as animal fodder is a somewhat neglected topic in archaeology. But it was most certainly of high importance. Barley was used as fodder for the horses of Ilī-Padâ (T98-33). But more significant amounts of fodder needed to go to the cattle and donkeys. Barley straw, possibly chaff of barley, was used to feed these. Storage of barley straw is recorded in other texts, but not in those of the *Dunnu*. However, large quantities of burned plant fibre, possibly chaff or straw, were found in an area in the *Dunnu* directly west of the residence (see VI.9.2). Like the burnt barley grain found inside the residence, this may be related to stored harvest.

The inhabitants of the *Dunnu* cooked their food inside the *Dunnu.* We assume that many of the fireplaces that were excavated were used for cooking. There is one location where large-scale cooking did take place

for certain, which is in an area in front of the central building. Here in a room a series of inbuild stoves are found, thus establishing a space that we might call a kitchen. These relatively large stoves could be fitted with cooking pots with contents of about 40 litres, also excavated in the same area, proving that significant amounts of food could be cooked here (Klinkenberg, 2016). What this centralisation of cooking indicates precisely is unclear. Was this a daily occurrence or only for special occasions such as the dinners that Ilī-Padâ held, as recorded in the texts (Wiggermann, 2010, p. 21)? In the first case, this would mean a meal was cooked for the entire *Dunnu* staff of an estimated 60 individuals (Wiggermann, 2000, p. 184) every day. If so, this would have increased the efficiency of the operation allowing people more time on their tasks. On the other hand, the many other distributed fireplaces could also be taken as evidence for widespread private cooking activity.

Meat production or cooking is not mentioned in the texts, but animals were naturally consumed which is shown by the faunal material found in excavation. Unfortunately, no spatial analysis of the faunal remains has been performed, which could have identified slaughter areas or locations for disposal of bones of consumed meat. A butcher is not mentioned in the texts, but there should be a location or more locations in or around the *Dunnu* where these animals were temporarily kept, and slaughtered.

It is likely that food preparation activity mostly served the group of dependents living on the site, but the texts also reveal the possibility of externals coming to the *Dunnu* to buy drinks and possibly food. Hence, food and primarily beer production also were traded some cases. On the other hand, externals such as the army and merchants also received barley and animals from the *Dunnu*, but were probably expected to prepare their food and eat elsewhere.

III.7.4 Housing

Wiggermann (2000, p. 191) estimates that roughly 60 people could be housed in the walled precinct of the *Dunnu*. This number is based on a rough surface estimate, which excludes the areas probably needed for representation, administration and storage: e.g. most of the western half, plus the large central building. Several excavated structures are likely interpreted as houses or apartments with private bathrooms. It seems likely that these were inhabited by the inhabitants of the *Dunnu* with higher status. The small somewhat irregular structures in the south and southeast of the *Dunnu* can be tentatively interpreted as small domestic units (Klinkenberg, 2016). As Klinkenberg also includes roof and second floor areas, his calculations of potential floor surface used for living suggests more people could have lived within the walled area. A more precise allocation of space for domestic purposes is attempted in the last chapter (VII.5.3). But multi-functionality is likely to be the norm, with few areas purely used for private living/sleeping.

III.7.5 Administration

The presence of many cuneiform tablets implies a very active and meticulous administration. Probably the largest part of the administration was dedicated to agricultural production. This included recording the amount of harvest that was stored, the giving out of seed corn, and the rations for the personnel. This fell under the responsibility of the steward of the *Dunnu,* the highest official on site. Administration related to food production, mainly bread and beer, was not the responsibility of the steward, but was the concern of the baker and brewer. In contrast to barley, records of stocks of beer and bread were apparently not kept. It is only mentioned when it is send out, or when supplies are needed. The second important aspect of the administration was the clearance of trade goods coming from the west that are shipped to Aššur.

The concentrations of tablets indicate the presence of various separated archives, kept by various individuals on site: the baker, the brewer, the steward and a scribe (see VII.5.2). These probably kept their administrations near their private quarters, and near the loci of their main economic activity.[22] In the case of the stewards, who were responsible for the main administration of incoming and outgoing staples and goods, the activity of administration probably involved interaction with many others. Therefore, to prevent undesired movement of these visiting people, a fixed location or 'office' near the entrance is practical and logical. The archaeological evidence does indeed imply the main official courtyard as the location of this activity.

III.7.6 Judicial

It is possible that the *Dunnu* acted as a court of justice on occasion. Verdicts were spoken by the same figures who ruled: the king and its high-ranking representatives or relatives. We have relatively little evidence for such occasions happening in the *Dunnu*, but there are some indications. One tablet (T97-5) records the transaction of a donkey of princess Epirat-aššur, possibly the grand-vizier's wife, judges favourably in an issue a man from Suadikanni is involved in. It is interesting that a woman is allocated such responsibilities, although not unheard of even in patriarchal societies such as the Assyrian. Moreover, Suadikanni is 150 km eastward from the *Dunnu*, on the Khabur river, which reveals an incredible range of action. This however, is not unexpected if we indeed deal with the wife of the king of the entire land of Hanigalbat. It makes clear how mobile these individuals were, and that the court of justice is wherever such an individual is, which is not on a fixed location. The *Dunnu* will thus have acted as a court of justice only on occasion. Another reference to this function is made in the treaty with the Suteans (T04-37). Article 4

[22] Nevertheless, the archaeological context of their deposition implies some movement of these archives before being discarded (Klinkenberg, 2016).

stipulates that whenever a problem rises with the returning of unlawfully confiscated possessions to Suteans, sheiks of two specific subgroups of the Suteans will act as witnesses in court. The fact that (a copy of) the treaty is found at the *Dunnu*, suggests that this court could have been in the *Dunnu*.

III.7.7 Production and manufacture

There is evidence for production of pottery, bronze, beads, leather or leather products, and chariots.

The eight excavated kilns, sometimes with associated workshop areas, suggest that pottery was produced intermittently on-site by mobile potters. However, as will be argued later (VI.8.3) at least 4 of these kilns are stratigraphically dated to a phase that the *Dunnu* had shrunk to its inner core and some of its original architectural functions and spatial organization had been modified or abandoned. The question of temporal representativity of the sample is therefore an important one, that has so far not been tackled. The local pottery production has been studied comprehensively by Kim Duistermaat (2007).

Bronze tool manufacture must have taken place, since some slags and moulds were found, but no workshop was identified. Also, for bead manufacture evidence has been found in the form of small stocks of half-products and bead working tools. Two letters by Ilī-Padâ to the steward of the *Dunnu* (T 96-1, T 97-34) mention perfume makers, but they seem to be located elsewhere as they need to be supplied with oils and spice plants from the *Dunnu* (Wiggermann, 2000, p. 173).

The most interesting aspect of the manufacture economy of the *Dunnu* is most definitely the production of chariots. For this, supplies of bronze, wood, leather and rope would be necessary. Animal resources used in chariot production that did not preserve physically are known to us through the texts, such as the use of fat and skin of wild boar (T93-10, T98-7, T98-56). The fat may have been used to lubricate the hubs and bearings of the wheels, while the skin would have made a strong and light-weight front cover for the wooden frame of the upper part that housed the soldiers. Hides of goats and oxen are also mentioned in a few instances.

Leather production is implied in the texts, but there is no direct evidence (Wiggermann, 2000, p. 198). Various administrative texts refer to the delivery of donkey, sheep and cow hides to the *Dunnu* (T 98-14, T 98-124), while another mentions the delivery of leather to a leather worker involved with chariot manufacture (T 98-56). Hence, it seems likely that the hides are procured in or around the *Dunnu* as well.

A surprising absentee is a cloth producing industry of which wool and linen yarn and cloth would be the main products. Hardly any loom weights have been found, nor many spindle whorls (Klinkenberg, 2016). In one text (T 97-34) Ilī-Padâ requests his steward to send him ‘good linen’ for his residence, but there is no indication that this is a *dunnu* product, neither is it clear where this residence is located if not in the

Dunnu. The mobility of both the steward and the grand-vizier may mean that this shipment could be send from and to almost anywhere, while the function of the *Dunnu* as trade-hub may also easily explain the presence of linen fabric there. Linen was certainly used to make clothing, as dress makers are attested (Wiggermann, 2000, p. 190). Bronze and bone needles are also found commonly in the *Dunnu* (Klinkenberg, 2016). The evidence therefore suggests that linen or wool fabrics were not produced at the *Dunnu*, but blankets and clothing were.

III.7.8 Trade & customs post

The role of the *Dunnu* in trade networks has been discussed before (see II.10). One of the supposed special roles of the *Dunnu* is to act as a custom post in which trade goods coming from Western Syria and the Levant are cleared before further travel towards the Habur and Assur (Akkermans and Wiggermann, 2015, pp. 109–110). Evidence is found in tablet 93-20:

"Speak to Tammitte, thus says Nāsir-Nabû: (react) as soon as you have read my tablet. Earlier I gave you the following instruction: 'caravans which come to me from Karkamiš may not pass without your consent and (I added) seal all wares.' Now I have heard that caravans have (in fact) set out towards me (and I repeat) 'whichever caravans come to me, be they of Ilī-padâ, of the princess, or of the nobles, seal everything.' I have also heard that they are carrying balsam; (if) any balsam is missing, you […] to be executed." (Akkermans and Wiggermann, 2015, p. 110).

It must be said that this is the only text specifically referring to caravan clearance. To what extent this was a commonly performed procedure at the *Dunnu*, or whether all caravans coming from the west had to pass the *Dunnu*, or could also be cleared elsewhere is therefore not certain. The fact that it required a letter to emphasize that this task of high importance should be carried out, may also suggest that it was not part of daily business. On the other hand, given the fact that the *Dunnu* was controlled by the highest ranking representative of the king, the *Dunnu* would be a logical location for such activity.

Aside from administrating long distance trade, merchants that bring or take goods from the *Dunnu* to be delivered elsewhere, appear frequently in other administrative texts (Wiggermann, 2000, 2010). Examples are merchants to have received 36 donkey and 64 sheep (T 97-18), coriander, cumin and rams (T 98-73), 405 kg of bark of *kiškanû* tree to exchange for an equal amount of tin (T 98-80), to deliver 0.25 homer (25 litre) of honey (T 98-92), or arrived with spice plants from Sidon (T 98-63).

III.7.9 Military & control

As has already been pointed out earlier, the degree to which *dunnu's* in general had an important military function may have varied. With regards to the *Dunnu* of Tell Sabi Abyad, the evidence is unclear. It does not seem that a large group of soldiers was permanently based here, but one text refers to cavalry men in

service of the *Dunnu* (T 97-6). Other texts document the provisioning of passing groups of soldiers (T 97-10) and chariot teams (T 98-12, T 98-41).[23] The *Dunnu* may have had a more general military function in the sense that it was strategically placed to secure and control an area and vital routes.

Although near the edge of the empire, the *Dunnu* is not a boundary fortress. The location of the actual boundary, whether it was strictly linear in nature or more a transitional zone, is unclear. There certainly is an attempted claim of the Assyrian rulers to extend the territory up to upper Euphrates. Kings Adad Nirari I and Salmanessar I campaigned here in the mid-13th century (Kertai, 2009, pp. 28–33), but it is unlikely they gained full control, as they came into conflict with the Hittites. After the collapse of the Hittite empire, the Assyrians appear to have taken their chances and made another more successful attempt to control the area until the upper Euphrates. Archaeological evidence shows a string of fortified sites indicating militarised border defence (Tenu, 2023). But at this time (12th and 11th centuries), the *Dunnu* had already ceased to exist. During the period of the *Dunnu* the transition to foreign territory was probably located in the sparsely populated steppe zone between the Balikh and the Euphrates. It is likely that Assyrian territory included the entire Balikh valley, i.e. both banks of the river. The *Dunnu* was located on the eastern edge of the Balikh valley, and thus a short distance behind the actual frontier. It was not the first settlement a traveller or enemy army coming from the north or west would find. But danger did not come only from the north or west where the Hittites resided, but also from within Assyrian territory. As has been discussed above, the situation was such that bands of 'enemy's' were attacking Assyrian controlled settlements, and especially caravans. Hence, there would be a need for internal defence, which could explain the perimeter wall and moat of the *Dunnu*, giving the *Dunnu* the properties of a fortification.

The location, near the eastern edge of the Balikh valley could point at two other things: it was to safeguard this rich agricultural production area, and to protect and control the routes going further east. Above, two routes were reconstructed from the *Dunnu* in eastern direction: one going north-east towards Ḫarbe (Tell Chuera) and one running across the desert in the direction of Dur-Katlimmu and Aššur. For the latter route, the *Dunnu* was the last settlement of some stature before one launched into a dangerous trip through barren lands. The *Dunnu* was vice versa the first stop for someone coming from the east to the Balikh valley.

III.8 Conclusion

The archaeology of the *Dunnu* of Tell Sabi Abyad reveals a picture of a large complex with many structures varying in dimensions and form. This complexity most probably reflects the multifunctional nature of the

[23] See Wiggermann (2000, p. 196) for the references. The full content of the texts remain unfortunately unpublished.

settlement, for which much evidence is found in the excavated artefactual and textual evidence. Time adds another layer of complexity, as the stratigraphic ordering of structures reflects building activity in a settlement that morphed over time. This may also reflect an evolution of functions and modification of spatial organisation of people and activities.

The texts and artefacts are supplementary but highlight different aspects of the local society and economy. In the textual evidence, the agricultural/pastoral economy features most prominently, while the artefactual evidence is for a large part related to food production. The ample archaeological evidence gives insight in the day-to-day activities, which involves grinding, bread making, slaughtering, cooking, beer production, and small-scale storage. The prime focus of the texts is on the administration of the agricultural and pastoral economy. According to the hypothesis of Wiggermann (2000, p. 196), the agricultural surplus was used to sustain the administrative and domestic staff of the *Dunnu* (estimated at 60 people), supply the residence of Ilī-Padâ, provision elements to the army (foot soldiers, cavalry and chariot teams) and send some to the temple in Aššur as part of a tax. It additionally functioned as centre for manufacture of various goods, including chariots, and a customs and trade hub.

Dated evidence (*limmus* on cuneiform tablets) shows that the *Dunnu* was a relatively short-lived settlement, with its primary use phase lasting just about 50 years. Stratigraphically, this phase covers archaeological levels 6 and 5. These levels should not be conceptualised as separate use phases with hard boundaries between them, as will be argued extensively in the next chapter. The complex that is called the *Dunnu* therefore morphed over time into a new complex structure, most likely reflecting change in social en economic use. This chronological and temporal complexity seen in the stratigraphic record also demands us to ask to which degree the textual and artefactual evidence is representative for the entire period. It most certainly is not, as the majority of all archaeological evidence reflects the later phase, towards the end. The moment of abandonment and partial destruction ensured that much of the later evidence was left more or less in situ, although much has probably been meddled with it afterwards. The result is that the archives end at a common date around 1180 BC, and by nature of the way such administrative archives are formed by adding new documents and discarding the old, the body of texts gravitate towards the final phase. This mostly covers the period that Tammitte was steward, and Ilī-Padâ was King of Hanigalbat. That there was an even longer phase before that, is just about discernible. Due to luck, we possess some of the texts associated with the period of Mannu-kî-Adad stewardship under Aššur-Idin, but the total amount of information that can be derived from it is very limited. The artefactual evidence is possibly even more biased towards the end phase, as it mainly reflects what was left at the point of abandonment. Moreover, a messy abandonment phase is associated with re-use, scavenging and relocation of artefacts and building materials. Such processes of artefactual discard as primary, secondary and tertiary deposits, have been

studied in detail by Klinkenberg (Klinkenberg, 2016). The biased nature of artefactual evidence towards the later phases is clear when one looks at contexts where multiple floors have been excavated. As a rule, the earlier phase floors and deposits on top of them are relatively devoid of artefacts, if one compares them to the massive amounts found in the abandonment contexts.

In the next chapter, the temporal dimension is further investigated by looking at the formation of architectural deposits from the initial foundation to abandonment and collapse. As the original architecture is preserved relatively well in certain areas, it allows for a better reconstruction of functional settlement change than the other classes of evidence. By tracking how buildings were built, modified and demolished, more can be said about the changing interactions between people and the built environment, and how this bears on shifting patterns in daily life, activities and settlement functions.