

RURAL ADMINISTRATION IN HITTITE ANATOLIA

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ABSTRACT

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Administration is a tool consisting of a set of processes that underpin modern management methods in all realms of society. Its use is taken for granted in most present day cultures, by all governments and in most institutions. The elements of modern administration are well set out in management text books and 'how to' manuals, yet surprisingly little is known about the historical development of administration, other than in specialised modern arenas, such as public administration, the judiciary and the defence forces. This thesis aims to describe the administrative system in an ancient civilisation, that of the Hittites in Bronze Age Central Anatolia. The study compared evidence from archaeological and textual data with a framework of dimensions of administration in ancient societies identified from the literature. The Hittite system of rural administration rated highly on almost all dimensions and the conclusion drawn is that it was well developed and comprehensive. However, a propensity to rely too heavily on traditional systems beyond their use-by date may have prevented a level of flexibility developing to deal with new problems as they arose, such as climate change and the migration of new groups into the area. Further research is needed to assess whether a propensity for administrative traditionalism contributed to the eventual collapse of the Hittite civilisation. Research is also needed to assess the impact of technological innovation on social and administrative change, including grain storage and water management technologies.

Keywords: Central Anatolia, Hittite, Bronze Age, Administration

ÖZET

HITIT ANADOLUSUNDA KIRSAL YÖNETİM

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Yüksek Lisans, Arkeoloji Bölümü
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İdari yönetim toplumun her alanındaki modern işletme yöntemlerinin temelinde bulunan işlemler dizisidir. Günümüzde uygulandığı çoğu kültür, bütün hükümetler ve çoğu kuruluş tarafından kabullenilmektedir. Modern yönetimin esasları işletme kitaplarında ve el kitaplarında açıkça belirtildiği halde kamu yönetimi, yargı ve savunma gücü gibi özelleştirilmiş modern alanlar dışında idari yönetimin tarihsel gelişimiyle ilgili şaşırtıcı şekilde az şey bilinmektedir. Bu tez bir antik medeniyet olan Tunç Çağı Orta Anadolu Hititlerinin yönetim sistemini tasvir etmeyi amaçlamaktadır. Bu çalışma antik toplulukların akademik kaynaklarda tanımlanan idari ölçüleri çerçevesini arkeolojik ve yazılı verilerden toplanan kanıtlarla karşılaştırmıştır. Hitit kırsal yönetim sistemi neredeyse bütün ölçülerde yüksek sıralarda yer almıştır, gelişmiş ve kapsamlı olduğu sonucuna varılmıştır. Ancak zamanları geçtikten sonra da geleneksel sistemleri kullanmaya olan aşırı eğilim iklim değişikliği ve yeni grupların bölgeye göçü gibi yeni sorunların ortaya çıktıkça müdahale edilmesini sağlayan esneklik seviyesinin gelişimini engellemiş olabilir. Yönetimin kökleşmesine olan bu eğilimin Hitit medeniyetinin nihai çöküşünde payı olup olmadığını belirlemek için ilave araştırma yapmak gerekmektedir. Aynı zamanda tahıl depolama ve sulama gibi teknolojik yeniliklerin sosyal ve idari değişikliklere olan etkisini anlamak için de ilave araştırma gerekmektedir.

Anahtar Kelimeler: Orta Anadolu, Hitit, Tunç Çağı, yönetim

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CHAPTER I: ADMINISTRATION IN HITTITE SOCIETY

This chapter introduces the present study. It discusses administration in the rural sector as a prospective research topic and outlines a rationale for the study. It considers the place of administration as a technological innovation and its relationship to social structures.

1.1 Introduction

This thesis is directed to understanding the processes through which a state might proceed to develop systems to allow it to achieve its goals. In the case of ancient states, such as the Hittite, such goals might include forging a kingdom, subduing enemies, placating the gods or governing an empire. While very basic, an essential component in achieving these goals is having sufficient sustenance to feed the population in general (Fairbairn, 2014), and armies and gods in particular in relation to achieving military and religious goals, in which case systems of production and distribution are central to achieving both the internal and expansionist aims of states. A key question for archaeological research is how states went about achieving their goals, such as effectively producing and distributing food. Developing routine systems through which actions can be planned and outcomes predicted is one response to problem solving and goal attainment that can be implemented and improved over time. The value of understanding the context of need within which such systems of administration arose, the internal evolution of a systematic response to problem solving and the sustainability and endurance of established systems, is in charting not only the development of an administration system in ancient societies but also its relevance to our own.

1.2 Technological innovation as a factor in structuring society

Identifying and evaluating technical developments is essential when charting the history of early humans, specifically the reasons for technological change (Schoop, 2014). Binford (Binford, 1962: 218) following White (White, 1959) sees culture as an extra-somatic means of adaptation, and as such as an intervening variable in the human ecological system, through which tools and relationships

connect the organism with the physical environment. In relation to the Hittites, Schoop agrees, stating that, when confronted with ecological problems, communities tend to develop technical solutions to remove the problem that impact on the social structure (Schoop, 2014: 1-2). Critical for this study is Schoop's observation that this relationship of the interaction between technical and social development is underdeveloped (Schoop, 2014: 2). Thus, agriculture and pastoralism as an area of potential technological innovation would have had a considerable impact on the development of Hittite society and the extent to which the Hittite state was able to achieve the broad aims identified earlier. Following Schoop, such technological change should be visible in social structures¹. The implication here is that technology is anchored in the production process and linked to social change, possibly even being its cause². The increasing interest in social and economic aspects of society and the recent recovery of related archaeological evidence suggest that a study into the rural economy may be timely and pertinent. With relation to agriculture and pastoralism, the areas of grain production and storage, animal husbandry and water management rank as areas of technological innovation most relevant to the Hittites and to this thesis.

1.3 Rural administration in Hittite Anatolia as a research topic

In relation to Anatolia specifically Pasternak and Kroll note that *(d)ie spätbronzezeitlichen und früheisenzeitlichen Kulturen Zentralanatoliens sind als Agrargesellschaften mit einem hohen Anteil an Beschäftigten in der Landwirtschaft - als primärem Wirtschaftssektor – einzustufen* (Pasternak & Kroll, 2014: 203).

These authors make several key observations about the importance of the agrarian sector and agricultural production for the Hittites in Central Anatolia. First was that guaranteed long-term over-production of agricultural and pastoral produce was a prerequisite for developing key Hittite social, religious and military areas. Second was that only through the intervention of power holders did such overproduction occur. Without it, agrarian yield would otherwise have

¹ Layton (Layton, 1973) makes a similar connection in relation to technological innovation, changes in the social structure and concomitant development of administration systems in relation to the rural sector in France.

² Sherratt (Sherratt, 1981: 261), for instance, considers the development of milk-based technologies in the Chalcolithic period in the Near East as 'the secondary products revolution'.

remained consistently lower throughout the Hittite period (Pasternak & Kroll, 2014: 203), and expansion to a subsequent kingdom and empire may not have occurred. The corollary is that the Hittite's fate would have been that of the other city-states that they conquered. That it was the elite rather than individual households that caused this overproduction Pasternak and Kroll make clear. Individual households including families and slaves had the physical capacity to produce required surpluses but it was the elite that put the planning and execution into effect. Thus the improved performance of the agrarian economy was a crucial contribution to the rise and ultimate success of the Hittite state.

Pasternak and Kroll 's third point is that such surpluses must have been planned ahead to ensure the availability of food resources not only through to the next harvest season, but beyond, taking into account the possibility that harvests in some years might fail and agricultural production become unstable. Such preplanning necessitated a capacity for requirement forecasting and for grain storage. It was not until May of each year that the extent of the harvest would be known, and hence whether the year would be one of prosperity or want (Pasternak & Kroll, 2014). Power holders could not risk a poor harvest, thus forward production and cultivation planning were needed annually regardless of expectations of continuing good seasons. Significantly, neither political change within the kingdom nor the changing size of the empire throughout its existence changed the structure of the agrarian system itself. One reason given for this stability was the danger inherent in experimentation (Pasternak cited above). Notwithstanding the possible influence of neighbouring states, Pasternak gives as an example of risk aversion the lack of use of irrigation systems in Hittite agricultural production, relying instead on yearly rainfall, although evidence of the use of irrigation is made in the Hittite laws. If this is the case, Hatti differed from, and sought not to follow the examples of both Mesopotamia and Egypt where irrigation systems ensured bigger and consistently good harvests, although arguably in different ecological zones with potentially different applications of technology. Lastly, Pasternak and Kroll (2014) regard transport as an aspect of food supply that has been significantly underestimated and that epitomizes the need for organisation. Deliveries within and from outside the

kingdom often needed to be carried over long distances in difficult terrain requiring a logistical capacity for collection, conveying and distribution.

All these processes have in common the need for reliable organization to underpin them. For instance: what was the process through which a surplus of agricultural production for immediate and future needs was determined, how were production targets set and communicated to individual households for their own planning purposes, how was the implementation of an overproduction strategy kingdom-wide managed and controlled, how was the surplus stored, delivered and distributed, how was it used, and who was eligible to access it? Organisation was the mechanism through which such objectives could be implemented, but can the existence of an administration capacity to do so be assumed?

1.4 Rationale for the thesis

In Glatz's view (Glatz, 2011) investigation of the internal structures and power relationships of the Hittite state and empire via material evidence is in its infancy. According to van den Hout (van den Hout, 2011a), the absence of documentary sources is one reason for the lack, skewed as the available sources are towards cultic texts, politico-diplomatic correspondence and historiographic accounts within which information on economic organisation and imperial administration is generally absent. Diffey et al (Diffey, Neef, & Bogaard, 2014) also note the paucity of written or documentary evidence about Hittite agriculture and the rural economy, suggesting that not much evidence has been found in the Hittite records, or that not much has been written about it if it had, or both. In support of the former, Diffey et al note that Hittite daily life was generally not recorded on permanently lasting clay tablets, but instead assigned to perishable wax tablets, thus explaining their absence. Dörfer et al (Dörfler, Herking, Neef, Pasternak, & von den Driesch, 2011) raise a similar point, asserting that the role of agriculture in Hittite society 'is often forgotten', commenting that the preponderance in texts of military conquests, king lists and religious matters overtake the more mundane matters of daily life. Glatz (cited above: 879) also cites a preference by scholars for studying early states and

empires in their abstract form, as well as a tendency to ignore the archeological record, that has left a gap in the textual voice of everyday Hittite-controlled Anatolia.

A further problem, she believes, is the propensity for historical researchers to ignore the value of archaeological evidence. What is known to date has been pieced together from textual Hittite laws (Hoffner, 1974). These points raise questions about how Hittite systems of administration in relation to agricultural and pastoral production in either the textual or archaeological record can be detected. Thus there is both a dearth of and opportunity for archaeologically based research studies into the day-to-day practices of the Hittite empire, how it was organized, how it functioned, how it fitted together and how this structure and organisation contributed to achieving the overarching aims of the state, and, relatedly, how relevant data can be recognized archaeologically.

In relation to the rationale for this thesis, Hittite palace administration generally is a research priority, evident from the major project presently being conducted under the auspices of the Universität Würzburg³, albeit from a textual perspective. Further, the need for archaeological research into agricultural organisation and production to provide data on the Hittite political economy is also well recognized (Glatz 2011). This is particularly the case in view of the centrality of planned surpluses and their large-scale storage needs for the political economy of the Hittites, both for the reasons outlined here, and for the knowledge it would provide about Hittite elites, their development and their ideologies of power (Glatz 2011). Pasternak (1998) has also supported the thrust of these research directions, but noting that exploration of dominance relationships and political economy should be seen from the perspective of central institutions, as well as from that of the population affected by such policies.

³ Reference to this project can be found at <http://www.altorientalistik.uni-wuerzburg.de/forschung/hittite-palace-administrative-corpus>.

As a first step, the objective of this thesis is to attempt to identify the administrative systems that existed in Hittite Anatolia. This work is made possible with the increasing availability and publication of documents relating to the organisation of the rural economy in regions of Hittite-controlled Central Anatolia. Having regard to the discussion above, identifying technological innovation and its impact on social structure and administrative development would be a secondary aim, possibly beyond the scope of the present thesis. The next chapter sets out a review of the main literature about what is currently known about Hittite administration.



CHAPTER II: A BRIEF HISTORY OF HATTI IN AN ADMINISTRATIVE CONTEXT

Part 1 Understanding the research context in Hatti

At the beginning of the second millennium BCE the Anatolian plateau was politically fragmented, consisting of small fortified city-states (Gorny, 1989) and more extensive territorial states with a capital and several villages ruled by a 'prince' or 'great prince' (Michel, 2011). Allegiances and conflict characterised the changing political fortunes of this period, and included the conquest of Kaneš by Pithana, ruler of Kuššara and father of Anitta. An archive of Old Assyrian cuneiform documents from this period records events in the Hittite⁴ territories where Assyrian traders lived and worked. The documents mention 'a huge building' representing 'a highly-structured' Anatolian administration presided over by the royal couple (Michel, 2011: 323). This is where this thesis begins.

The Hittite kingdom lasted for approximately five hundred years from around 1650 to 1180 BCE, with its formative period from around 1800 to 1650 BCE (Collins, 2007). The Hittites have an Indo-European origin and are believed to have arrived in Anatolia sometime in the 3rd millennium BC (Beckman, 2006), gradually integrating with the local Hattian people and eventually displacing them and their language (Bryce, 2002; van den Hout, 2011b). Over time the Hittites emerged, consolidated and forged a kingdom (Bryce, 2002). Other Indo-European groups include the Luwians and Palaians, about whom little is known.

Hattušili I consolidated power around 1650 BC and institutionalized inherited kingship (Klengel, 2011). In the aftermath of Muršili I's murder in late 16th century BCE a period of struggle ensued. Some time subsequently, Telipinu sought to stabilise royal succession by naming his heir (Klengel cited above) and revamping the high-level council to better manage the process (Beal, 2011). He simultaneously attempted administrative reforms to improve the taxation

⁴ The term Hittite is used here for convenience and refers to a ruling elite, recognising that the Hittite civilization comprised different ethnic groups speaking a variety of languages.

system and establish sealed royal storehouses in major regional and rural centres (Klengel cited above). Hence the rural economy was important for the developing polity from very early times. Continuity of Hittite rule depended on produce from these households, as production levies delivered to district storehouses fed service personnel locally or in Hattuša. It was around this time that kings began to distribute land grants to secure loyalty of powerful subjects, marking a change from relationships based on kinship to those influenced by economic and social factors (Klengel cited above).

Hittite history is generally divided into three periods: the Old Kingdom, New Kingdom and Empire periods. Gerçek (Gerçek, 2017a) structures her analysis of Hittite imperialism according to three dated periods, namely: the Old Kingdom (from Hattušili I to Muwatalli I), the Early Empire (from Tudhaliya I to Tudhaliya III) and the Empire (from Šuppiluliuma I to Šuppiluliuma II) with Hatti as the enduring political entity. At its height, the Hittite Kingdom stretched over much of the Anatolian landmass to northern Syria and the Western edges of Mesopotamia (Bryce cited above). The period of interest for this thesis is predominantly, but not restricted to the Old Kingdom in Central Anatolia, that is from 1750 to 1400 BCE, having regard to Pasternak and Kroll's view (cited above) that the early initiation and sustainability of Hittite systems over time was based on developments initiated early in the Old Kingdom.

1.1 The land of Hatti

The Hittites were largely inland-oriented people due to the structure of the peninsula having the sea on three sides (Seeher, 2011). The geographically diverse terrain has shaped Anatolia's climate, biological diversity and cultural heterogeneity (Schachner, 2014). Geographically the eastern limits of the kingdom are difficult to establish. The region east of the Upper Land, that is the land east of Sivas and the upper Kızılırmak, is rugged terrain formed by the Pontic and the Taurus Mountains. A harsh climate restricts effective agriculture to a few mountain plains (Seeher, 2011). However, several key administrative innovations helped the Hittites to adapt to their environment, including the

adoption of a written script, the use of the stamp seal and improved exploitation of rural resources (Schachner, 2014).

Hittite kings followed an active settlement policy to consolidate their rule by maintaining existing settlements and founding new provincial centers⁵ (Seeher cited above). About 2000 settlements with the Sumerogram URU are identified in surviving Hittite documents, and urban settlements formed the core of Hittite society, only a few of which have been confidently paired with a modern site (Mielke, 2013a). The rise of Hattuša, the capital, conventionally dated to the second half of the seventeenth century BCE, was an important centre for governance and decision-making. Maşat Höyük (Hittite Tapikka), already inhabited in the *kārum* and Old Hittite periods (Seeher cited above) is an important site for this thesis.

Temples were centres of power and religion as well as of economic activity, evident from the storerooms surrounding the temple complexes in Hattuša, Maşat Höyük and Ortaköy (Mielke cited above). Thus temples are important for this study in terms of their administrative, economic, industrial and cultic functions. Archives are also an important source of information about the Hittite state. Those from Hattuša and Kuşaklı (Šarišša) record events of the early state, particularly cultic, literary, military, diplomatic and autobiographical subject matter (Mielke cited above). Only a few relate to administrative issues, economic matters or social subjects (Klengel 2011).

1.2 The developing Hittite state

Centralised administration and an effective bureaucracy contributed to the longevity of the Hittite imperial apparatus (Gerçek, 2017a). This developing administrative capacity is evident in Hittite documents showing the close link between the formation of the Hittite state, the development of a state religion and the state-wide implementation of a set of consistent religious practices that fused architecture with ritual and official responsibilities, and whose origin

⁵ Excavations in several residential areas of Hittite cities describe their size, organization and administration, suggesting a hierarchical system of settlement stratified socially both vertically and horizontally, possibly representing a Near Eastern transregional concept (Mielke 2001).

Gates (Gates, 2017) situates firmly in the Old Kingdom. Internal cohesion and governance were consolidated through the reintroduction of writing after 1650 BCE via Syrian scribes, which increased text production, and by the acknowledgement of the empire's cultural and linguistic diversity, evident in the use of Anatolian hieroglyphs written in Luwian, for monumental inscriptions (Gerçek cited above). Further, the Hittite legal system included administrative regulations, such as epistolary communication, the laws of dynastic succession and a system of compulsory goods and services detailing taxes, corvée labour and other service obligations, essential to the solidarity of the empire. Schachner (Schachner, 2009) notes further features, namely the expanding capacity for grain and water storage, and the growth of an artistic style on vases and reliefs that displayed a commonly recognised language and a standardised mode of pottery. The Hittite language cemented this mix, becoming an important medium of communicating throughout Anatolia and beyond (Gerçek cited above). Gerçek (cited above), Dercksen (Dercksen, 2004) and Waal (Waal, 2013) identify other overlapping features between the *kārum* and Old Kingdom periods, including titles, the concept of inserting binding obligations in treaties with vassal states and in instructions and oaths for administrative personnel, possibly also royal ideology, royal titles and the system of land donations.

The 16th century BCE was a turning point for Hittite Anatolia with the implementation of major infrastructure projects, namely water reservoirs, grain silos and newly established cities (Schachner cited above). Implementing these projects may have been facilitated by the use of the hieroglyphic script for administrative communication within the core realm⁶ (Doğan-Alparslan & Alparslan, 2014: 56). These features suggest a common system of administration developing as plans, rules, responsibilities and accountabilities. Together they indicate a period of stability within which imperialist forms could consolidate. Clearly a systematic approach to administration was developing in central Anatolia possibly from the Old Assyrian Colony Period onwards. Gerçek

⁶ Alparslan and Alparslan (cited above) hypothesise that the use of hieroglyphs may be associated with the introduction of official titles coinciding with an evolving administrative system, wherein the broader public could recognize the script, particularly the title of the seal-holder and their position of authority.

(2014) takes the argument a step further, concluding that expansionist objectives of local territorial acquisition, evident in administrative systems that were foundational for imperial ambitions in developing strategies for domination and control, may have been in place early in the Hittite polity.

Gerçek (2014) raises problems around attempts to classify the Hittite state because of the multiple approaches to chronology, royal succession, historical periodisation and terminology, and the use of different text and material culture data sets where one is often favoured over the other. This one-sidedness may have minimized the contribution of the Old Kingdom in state development and ignored the early internal development of mechanisms on which the empire was eventually established. Schuol (Schuol, 2014) supports this assessment in that the consolidation of Hittite domination and the successful extension of Hittite territories necessitated both the creation of political-military functions and the establishment of regional administration centres aligned with Hattuša. Thus the strategies and structure for later territorial expansion from 1300 BCE onwards were either already in place or being developed in the first half of the 2nd millennium BCE (Gerçek cited above). This point is significant for this thesis in suggesting that the basis of Hittite imperialism is an underdeveloped area of research (Glatz, 2011), based as it is on an examination of administrative systems that may well have begun in the Old Kingdom period or even earlier.

1.3 Collapse

Several theories have been advanced to explain the collapse of the Hittite State, including the coming of the Sea Peoples and grain shortages caused by drought (Kuzucuoğlu, 2015). The first hypothesis is outside the scope of this thesis, except in relation to disturbance of trade. The second (Kuzucuoğlu cited above), although contested, is of interest, based on evidence that some settlements in southern and southeastern Anatolia were abandoned rather than destroyed (Gates, 2011), with displaced populations from Central Anatolia dispersing to places such as Cappadocia that appeared not to have been so affected. Evidence suggests that internal upheavals had already strained food supplies (Kuzucuoğlu cited above), and the destruction of Minoan and Mycenaean

civilisations in 1450 and 1300 BCE illustrate just how catastrophically trade and exchange could be disrupted. Klengel (Klengel, 2002) suggests that this disruption and economic collapse began well before Hattuşa was abandoned. Factors such as climate change and population increases have been cited as contributing to similar economic and political instability and collapse in other polities in the Near East, as well as increasing aridification from successive droughts, albeit at a later time (Schneider & Adalı, 2014, 2016).

Thus there is a growing view that the collapse of some Hittite settlements may have resulted from a combination of internal and external factors (Kuzucuoğlu cited above). Kuzucuoğlu believes that, internally, the increasing claims of local elites may have affected food production and distribution putting further pressure on a rigid central government already experiencing a weakening hold on authority. Evidence from a range of settings shows that elites tend to take advantage of crises through competition for existing resources leading to price rises and hoarding (Gutiérrez, 1996; Hindle & Humphries, 2008). Poorer sections of society are affected not only by the immediate lack of food, but also by a poorer health status rendering them less able to resist disease that accompanies famine (Lorant & Bhopal, 2011). The enduring administrative structure that the Hittites established early on may have proved inflexible in dealing with a new and dynamically evolving political situation, especially when coupled with environmental constraints.

Kuzucuoğlu (cited above) raises a number of possible scenarios, concluding that an inability to access resources and assistance from outside the country may together have exacerbated the effects of climate change, a contention that Le Roy Ladurie broadly supports in relation to climate change as a triggering effect (Le Roy Ladurie, 2013). Thus resource scarcity may have exacerbated social inequality as climates changed, affecting the number of people able to benefit from the available resources that may, in turn, have also been affected by how well the resources were managed. That is, administrative systems on which a regime's establishment and expansion were founded could seriously disrupt it when they have outgrown their usefulness and are unable to change.

Part 2 An emerging administrative capacity in Hittite society

This part is presented from a broad systems perspective, in that sub-systems within a society are believed to be connected and that a change in one will lead to a change in all (Renfrew, 1972). The focus of this thesis is administrative systems, and the reach of agricultural and pastoral activities to all aspects of Hittite society is assumed. The section describes the social structures through which general administration was carried out. Administration in the rural sector is dealt with more intensively in a later chapter. Although Weber (Henderson & Parsons, 1947) identifies three types of communal organisation of labour, namely the household, the military and religious, in the case of the Hittites, the organisation of productive labour in royal palace complexes is a fourth category. Each is briefly described, with the chief interest of administration kept to the fore.

2.1 The palace

Palaces were an integral part of a network of redistribution centred on a residence, each having a bureaucratic linkage within the network⁷. Siegelova (Siegelova, 2001) outlines a three-tier administrative structure: the central authority, the palace and the community. Provincial palaces played a central role in the rural economy, principally through receipt and distribution of taxes and through officials' authority and freedom of action to direct local activities. Palaces received goods from surrounding communities, constituted as households, stone houses/mausolea and/or storehouses acting as granaries, while also functioning as a network of military establishments. Although poorly attested, this network funneled wealth in the form of produce to the central government for redistribution as foodstuffs, livestock, raw materials and finished products (Beckman, 1995b). A portion of the goods was delivered to Hattuša; the remainder was supplied by high officials, men of the city, who administered the districts, as homage to the king in the form of foodstuffs for festivals centred on the region (Siegelova cited above). The royal family were intimately involved in regional administration, with conferral of offices based

⁷ Beckman (Beckman, 1995b) and Bryce (Bryce, 2011) outline the responsibilities of the royal family, religious and military administration in detail and only brief mention will be made here.

on a system of patrimony (Bilgin, 2018). The major consideration in conferral of appointments was the security of the throne and loyalty of those appointed (Bilgin cited above). A parallel might be made with the Ottoman system of conferral of senior naval posts, within which the process of decision making was opaque and often based on factionalism and favouritism, including the influence of the harem (Türkçelik, 2017). No areas of specialization were apparent in Hittite's conferring of role and responsibilities, nor were instructions issued for these high-level posts. Bilgin (cited here) concludes that there was no rationally established hierarchy, or well-defined spheres of responsibilities, training or development for appointees.

2.2 Religion

Religion represented an essential plank in the Hittite cosmic and political order, and required a sophisticated system of administration to ensure rites and rituals were correctly performed and the associated work appropriately carried out. Many Hittite religious texts were administrative in nature, implemented by a bureaucracy organising and maintaining the king's religious responsibilities (Collins, 2007: 158). A 'complex religious bureaucracy' was required to manage this 'religio-political polytheistic sphere', with a hierarchy of personnel responsible for supporting temples in the cities and local villages (Collins cited above: 158).

Festivals were at the heart of Hittite religious, social and economic spheres, and as such had far-reaching organisational implications, principally organisation of the collective consumption of food and drink, mostly meat, bread and beer, but also pulses and fruit, within a highly ritualized context (Cammarosano, 2018). Religious rituals were the focus of local festivals and the objective of major agricultural operations, such that festivals themselves became the catalyst for labour mobilisation. The administration of religious cults connected to festivals and other religious observances concerned the central administration of production and distribution of goods, principally ensuring the quality and quantity of foodstuffs for festivals and other religious observations.

Cammarosano (cited above) refers to the Hittites' 'obsession' with fulfilling cult regulations, noting that festival texts made up 1/3 of all known Hittite written sources and represents the largest corpus of royal cult writings in the ancient Near East. Administration included a range of functions, namely maintaining cultic institutions, determining calendars, ensuring proper observance of festivals, managing religious observations both within the capital and in the regions, maintaining the proper traditions, and making any necessary adaptations from year to year. In relation to cultic observances, local palaces played an intermediary organizing role between the central power and local communities. Within these institutions a range of officials and groups of people were responsible for delivery of cult supplies and services, including priests, governors and officials, regional kings, local palaces, local threshing floors, palace servants and temple servants, specific individuals, local communities, the district, professional groups such as singers and labouring groups such as salt producers, wine stewards, cooks, etc. Apportionment of offerings also required listing of entitlements and related organization for distribution and clean-up. The economic role of central and regional temples does not yet appear to be fully laid out, and a more systematic appraisal of the people and institutions with cultic responsibilities would assist in understanding the economic role of the temples in overseeing festivals and religious observances (Cammarosano cited above).

2.3 The military

The Hittite military aimed to conquer territory and acquire war bounty, mainly animals, goods and people, an important resource in the under-populated homeland (Bryce cited above). Military campaigning required a sound economy, an efficient organisational regime and an operational system capable of supplying troops in times of war and peace, not the least of which was foodstuff (Yakar, 2000). Administrative issues involved the recruitment, training, equipping and maintenance of an efficient strike force (Lorenz & Schrakamp, 2011), and the Hittites quickly embraced new military technologies (Genz, 2014). The extent of military production needed for a campaign was considerable. The 1,000 chariots and 47,500 troops used against Ramses II were

a major logistical undertaking (Bryce cited above). Military provisioning before and during campaigns and the deployment of soldiers and captives after the event are issues affecting agricultural and pastoral organization and production.

2.4 The household

Hittite society was structured into small landholdings, operated by a farmer and his family with fields for grain, a few animals, an orchard, a garden and a mud brick house (Bryce cited above). Yakar (Yakar, 1976) describes the usual size of villages in the Late Bronze Age as comprising 25 households with between 120-150 people; a pattern similar to other parts of the Near East (Abu El-Haj, 2001). These small-scale production farms based around a family and their possessions may have been share-cropped holdings and could be spread over several sites to which the farmer travelled for his farming and gardening activities that constituted the general pattern of landholding in Hatti (Bryce, 2011).

Land was owned or leased from the crown, a town or village or a wealthy neighbour or bestowed on favoured individuals or institutions as a gift from the king. Gifts could be substantial, comprising estates, stock and workforce. Small farms could be allocated to palace employees or retainers of the state as payment for services rendered (Bryce cited above). The term of LÚ GIŠTUKUL, or man of the weapon/tool, suggests that the original recipients may have been soldiers in the king's employee who worked the land when not required for service, thus relieving the crown of the need to pay soldiers' upkeep. A downside to this arrangement was the absence of the farmer/soldier from the land at a time when his presence may have been required, for instance during harvest (Bryce cited above).

The land grant method of compensation for soldiers who might fight in the military season and then tend their farms when not on active duty became an important aspect of land allocation and agricultural administration (Lorenz & Schrakamp, 2011). Administratively the land grants to standing army officers, presumably similar to but separate from the larger Landschenkungsurkunden

(LSU) estates, would have required an orderly, sustainable and efficient allocation system, augmented by a method to recruit and account for civilian enlistments, and the provisioning of the army for its regular seasonal campaigns. Land grants also provided for the establishment of the defensive system for home protection from attack. Expectations imposed on LSU, institutionalised royal land grants, recipients were, firstly, payment of taxes, and, secondly and importantly for this thesis, the responsibility, presumably together with the small landholder, to use the land effectively, with risk of forfeit when not so used. Such forfeit may have been possible in the event of the estate being a gift from the king.

This is an important point both for the administration of such a system in agricultural terms as to how and by whom sanctions might have been operationalised, and the accompanying imposed requirement of centralised expectations and standards of what 'effectiveness' encompassed. This may well have been a duty of the local council of elders with their religious/judicial responsibilities (Bryce, 2011). While imposing standards on a smallholder may have been possible, it would be instructive to know whether the council also had responsibility for the surveillance of standards on large estates, notwithstanding their 'close collaboration with (the) local governor' (Bryce cited above) who may himself have been an LSU holder. It seems that this obligation was important for the prosperity of the kingdom suggesting either that arable land was at a premium and needed to be well managed to provide the level of food production necessary for the kingdom, or that there was a propensity for landholders to not manage their holdings well, resulting in significant and detrimental shortfalls in food production. Both of these scenarios are possible and important in understanding not only why surveillance of productivity was necessary, but also how it was conducted.

The structure described above existed throughout the whole of Hittite history, in the face of querulous neighbours and weak kings (Beal, 2011). State expansion caused the administrative apparatus to grow, and many high-level offices changed functions throughout the administration's history, while others

developed in the Old Kingdom period lost their prestige by the late Empire period (Bilgin, 2015). Notwithstanding this development and change, the coherence of the structure and its capacity to carry out administrative tasks effectively has been questioned (Bilgin cited above).

Part 3 Processes of administration in Hittite Anatolia

Collins notes that

Life in Anatolia under Hittite rule was highly regulated. In this world, every farmer, craftsman, and soldier labored to benefit the state. Every festival that was performed, piece of sculpture that was fashioned, or tablet that was inscribed ultimately served the interests of the king. The palace economy of the Late Bronze Age effectively centralized control of Anatolia's resources even as it inexorably bound the inhabitants of the land who were dependent on those resources to the ruling house.

(Collins, 2007: 102).

Administrative processes appeared to develop and evolve as responses to the growing and varying needs of the Hittite state and society. The main elements were the maintenance of the cultic calendar, the imposition of and accounting for taxes, external treaties and correspondence with regional areas (van den Hout, 2011b). To this can be added the various modes of communication throughout Hittite territories and beyond and legal administration as two domains important for effective administrative functioning. Michel and Beal (Beal, 2011; Michel, 2011), contrary to the above, regard the Hittites as highly organised administrators and careful record keepers whose instructions to officials and oath of office attested to a level of professionalism in public service. Administrative devices and evidence for their use may indicate a routinisation of events and practices. Included here are the exchange of correspondence, officials' management of a regional or border polity and the local adoption of imperial administrative systems and cultural styles (Scott, 1990). Contact between provincial centres, such as Tarsus and Korucutepe, and the Hittite center is attested by the local use of administrative technology during the second half of the Late Bronze period, extending into the previous period in the case of Tarsus. The majority of glyptic finds at these two sites are sealed bullae, administrative devices attached to writing tablets or containers documented in

large quantities at Hattuša and suggesting common administrative practices (Scott cited above). At both sites parallels can be found between persons represented on local seal impressions and those at the capital. Some of these impressions carried central or local royal titles or fulfilled official functions.

Examples from archives that detail the types of systems that existed come from royal edicts, such as those of Hattušili I, Telipinu I and possibly Hattušili III, used to set out instructions for the future direction and leadership of the kingdom (Collins, 2007). The growing complexity of society through conquest, related immigration of deportees and a growing population, a broadening of the religious pantheon from annexed lands and a developing urban and regional infrastructure brought the need for more detailed instructions for a wide range of public officials from the reigns of Tudhaliya II and Arnuwanda I onwards. These changes meant that rulers and bureaucrats were required to manage an increasing number and different types of social, economic and political interactions. A systematic means to manage this complexity is evident in the outline of responsibilities and expectations for priests and temple personnel, city mayors, military officers, district governors, border officials, the royal bodyguard, palace personnel and the aristocracy as a whole (Collins cited above). These royal decrees set down decisions relating to the elite, the towns and the institutions. Oaths bound all those in service to the king, from soldiers to the first family. Other instances include record keeping of land grants as donations to loyal retainers and servants and religious practices. In the latter case, religious establishments, festivals and rituals embodied the king's authority and needed to be organized and archived.

The population generally was not subject to a hierarchy except in the case of personal servants. Unlike modern bureaucracies, local officials did not seem to assume initiative in solving problems arising in their administrative area, turning to the king for decisions on local issues (Bilgin, 2015). As the Hittite state expanded, the system of government needed to become more elaborate, with normative procedures gradually established in lieu of ad hoc practices. Nonetheless the structure remained fragile with subordinate states keen to

throw off the Hittite yoke on the accession of a weak or inexperienced king or when under pressure from external enemies, thus contributing to instability in the kingdom and empire (Beckman, 1995b). This point may be relevant to the comments made earlier about the possible reasons for the collapse of the Hittite state in Central Anatolia.

As indicated earlier, levels of administration consisted of the king, prominent members of the royal family, often sons, but also uncles who may need to be subdued. The structure was fluid, fluctuating according to administrative and political exigencies. A further level of administration occurred in appanage kingdoms where rule passed down a collateral line of the ruling Hittite house without intervention by the Hittite king, such as at Carchemish. Within Hittite territory royal appointees or stewards presided over administrative units identified as districts, mostly in Central Anatolia, controlling grain storage facilities. The best-known steward, the lord of the watchtower, controlled territory on the frontier regions of Hatti and supervised a number of towns (Beckman, 1995b). It is not known if this system was kingdom wide.

Town mayors (*HAZANNU*) played key roles in settlement functioning, including in Hattuša, responsible for fire protection, public sanitation, securing the water supply, posting the guard and ensuring that the city gates were properly secured each night, assisted by a local bureaucracy of two city superintendents (*MAŠKIM*), one for the Upper City (the royal residence) and one for the Lower City with a herald (*NIMGIR*) and sentries to guard the city's fortifications. In more remote areas, such as Maşat/Tapikka, the council of elders, mostly local politicians selected from the local elite, assisted state-appointed administrators in judicial and cultic matters. Outside these elites, locals generally did not participate in administration. District governors (*BĒL MADGALTI*) or lords of the watchtower, all royal appointees who were often a close relation of the king and who supervised sizeable territories along Hatti's frontiers, administered larger provinces. These officials were responsible for the surveillance of enemy forces in the border area, organised agricultural activities on state lands, maintained royal buildings and temples and administered justice in their

districts, working closely with local elders and city/town administrators (Beckman, 1995b).

The structuring and communication of responsibilities and accountabilities of public service personnel listed in a number of archive documents is one of the better-known elements of Hittite administration. In the Old Kingdom, simple cautionary tales admonished bureaucrats to be honest, diligent and competent. In the early Empire and Empire period these cautions evolved to lengthy and detailed instructions (Beckman, 1995b). This evolution attests to a growing consciousness of the need for and specification of expectations of subordinates. Within these later manifestations roles and responsibilities were precise, structured and official, mostly including instructions to holders of office, especially the lord of the watchtower, that, as well as those duties regarding agriculture identified earlier, included surveillance of enemy forces in the border area, the upkeep of royal buildings and temples and the administration of justice within its jurisdiction.

To a great extent, available texts deal with the frequency of religious rites carried out within the precincts of regional officials more so than with the acquisition and disbursement of goods, such as agricultural and pastoral produce. In this regard, the king was responsible for the temples as chief priest, with Tudhaliya IV undertaking a census of local cults (Beckman cited above). Thus, the temple may have been a collection an/or distribution point evident from the storage of large vessels of foodstuffs, especially in Hattuša. However, there is no evidence that religious institutions performed any kind of active economic role, such as the granting of loans, setting of weights and measures or administering oaths to litigants as undertaken in Mesopotamian and Old Babylonian period temples (Beckman, 1995b).

3.1 Modes of communication

Major contemporary states in the Middle Bronze Age invested in communication infrastructure (Roaf, 1990). Communication was important in this age for states with sizeable territories and settlements a considerable

distance apart but needing to communicate with each other to affect the efficient running of the state. The need was particularly great for each state's central administration to communicate with its regions and with other state entities (Radner, 2014). Communication infrastructure included a network of roads and modes of conveying messages. The most common form of communication consisted initially of personal envoys with a capacity to represent the ruler, passing on messages verbally. Written messages appeared to play a secondary role, although letters eventually became the main medium of communication for both external diplomacy and internal administration.

3.2 Documentation

A records management system existed, which was highly complex and bureaucratic (van den Hout 2011: 70). The written legacy of the Hittites dates from 1650 to 1180 BCE - almost 500 years of recording on clay, wooden and metal tablets in cuneiform Hittite, Palaic, Luwian, Hattian, Hurrian, Sumerian and Akkadian, together with inscriptions on stone in hieroglyphic Luwian, and seals and seal impressions in both Akkadian cuneiform and Luwian hieroglyphs (van den Hout cited above). Kültepe merchants brought Assyrian cuneiform with them to Anatolia, and it was only at the end of the colony period that the Hittites began to use cuneiform for their own purposes (van den Hout cited above). The capacity to write seems to have been 'lost' until Akkadian cuneiform was reintroduced in the 1650s, after which kings and royal scribes used the script for official purposes and Luwian hieroglyphics for general public communication (van den Hout cited above). Correspondence was not retained, other than documents needing to be kept for a long time, such as loans or debts, contracts, deeds, land grants, tax receipts and exemptions (Hoffner, 2009) and LSUs (van den Hout cited above). No private correspondence was found other than 'piggy-backed' letters on official correspondence (Weeden, 2014). The smaller corpora of documents found in regional sites reinforces the view that the central power at Hattuša exercised a tight grip over its provinces (van den Hout cited above). Documents found include those for managing grain deliveries, and the storerooms and very large pithoi found at the Great Temple in the Lower City between the two main gates were well positioned to manage

incoming and outgoing traffic. They attest to both the storage and administrative functions of the Temple where economic accounting and scribal services were carried out. Scribes were the main functionaries within the bureaucratic communication system, who did not just communicate on behalf of the king but also implemented orders, coordinating action between officials throughout the kingdom (Bryce, 2011).

Stamp seals predominated in Hittite Anatolia, although both stamp and cylinder seals were used early on to validate, secure or denote possession of an object (Doğan-Alparslan & Alparslan, 2014). Hieroglyphic inscriptions with seals were used on boundary markers, a practice that spread from the Aegean, through Anatolia and the Near East (van den Hout cited above). Dinçol and Dinçol (Dinçol & Dinçol, 2008) provide a chronological classification of seals and seal types including the Tabarna seal, noting that the Hittite glyptic was already evident on both Mesopotamian cylinder seals and Anatolian stamp seals in the 17th century BCE. The well-developed hieroglyphic signs on early seals suggest that this script was not a development of the late 16th century BCE, but earlier (Dinçol & Dinçol, 2008). The first certain use of a seal on an LSU belonged to King Alluwamna in the 15th century BCE, and the practice of sealing can be confidently dated to 1500 BCE (Dinçol & Dinçol, 2008). The seal denoted responsibility for duties assigned to specific personnel, not previously possible with the anonymous tabarna seal. Both cuneiform script and hieroglyphics appear together on the kings' seals, and military, religious and administrative titles could be recognised on Hittite seals in the cuneiform script (Dinçol & Dinçol, 2008). Specific professions or professional grades could be identified through such titles, as well as the person themselves and the institution to which they belonged.

3.3 Legal administration

Hittite administration is linked to Hittite laws, evident from a compilation of precedents used as a reference manual for the adjudication of civil and criminal matters. The Hittite laws date to the early Old Kingdom, possibly to the reign of Hattušili I, with the earliest surviving copies dating to the reign of Muršili I. The

laws represent an early attempt to categorise types of rule, crimes and punishments on a traditional and evolving basis, and their locus as a cornerstone of Hittite administration is evident from their preservation and recopying from the 16th through to the 13th century BCE. The laws attempted to regulate activities of daily living, such as wages, hire fees and prices, to fairly determine economic practices and relationships within society. The list of prices, wages and hire fees and penalties that Hoffner (cited above) has tabulated suggests a structured system designed to underpin and stabilize the economy. Dispute resolution processes were not included (Collins, 2007) nor provision for commercial or contract law (Bryce, 2011). Important for rural administration is the replacement of blood revenge for injustice done with a system of compensation that acknowledged both the crime itself and the effect of the crime on the victim, with the calculation of compensation to the victim to the value of losses incurred (Bryce 2011). The substitution of compensation for a crime and incurred losses is an important point when considering the administrative aspects of agrarianism in Hittite lands as it affects rights and justice. Administratively, the imposition of judgments and the paying and recording of fines required organisation.

Although Hoffner questions whether a system of implementation underlay the guidelines, he notes that *'(l)aw cannot exist without authority to impose and execute it'* (Hoffner cited above: 4). An administrative element is evident in the assigning of responsibility for instituting the code, with towns responsible for criminal activity within their territories, adjudicated by magistrates appointed to a region and assisted by the district governors. Their tours of inspection included overseeing legal proceedings together with royal administrators and the local councils of elders. The king, as the highest law officer in the land, presided over difficult or important cases, such as tax, corvée exemptions or capital cases, with the pankus, a high level council supporting the king, witnessing agreements and proclamations (Collins cited above). Thus a structure for legal redress was in place, together with an ethic of public service that admonished temptation to corruption or bias in decision making by

administering oaths and taking depositions within a trial process (Collins cited above).

Part 4 Conclusion and research question

The literature reviewed suggests that the study of administration of the rural sector in Hittite society is underdeveloped and evidence cited clearly supports the importance of agriculture in Hittite society as a worthwhile research topic. Evidence also suggests that administrative systems most probably developed early in Hittite history, at least beginning in the Old Kingdom and possibly earlier. The literature reviewed indicates a long list of possible activity areas in which administrative systems would have been developed and implemented, including in agriculture and pastoralism.

Agriculture appears to have been well organised in Hittite Anatolia. An important point arising from the literature review is the aim of surplus production to ensure continuing future food supplies, requiring planning and implementation, which in turn required social and agrarian organisation through control of the means of production. Planning systems were in place to ensure that sufficient grain was available in times of normal harvest as well as in low harvest. Forward planning production capacity entailed practical problems to be solved, for example planting appropriate grain varieties, having a means of transport and wholesome storage. Further, taxes became due, were paid and accounted for necessitating an administrative accountability system. The use of land was under close surveillance. The religious needs of agriculture and animal contributions for devotion and sacrifice meant the production of offerings at sufficient volumes. While not addressed directly, one can infer that such planning capacity was also required for military expeditions. Added to this is the need for associated trades, such as pottery and tool production to support cultivation and harvesting, transport and storage.

As outlined above, a focus on more abstract topics means that there is a dearth of information about day-to-day issues in Hittite society and how they connect to the wider resource availability, rights of access to food resources and how the

rural sector contributed to the political economy of the Hittite state more broadly. However evidence is increasing about planning and organisation in relation to sighting and layout of settlements and the connection of provincial centres to Hattuša suggesting opportunities for extending the available body of knowledge. The review of literature on social structure and administrative organisation, practices and processes indicates that the organisational capacity of Hittite society at the central level was fairly advanced. A similar level of oversight might be expected at the provincial level. Archaeological evidence about rural organisation has recently come to light from a number of excavation sites, particularly Maşat/Tapikka. These data will allow (re)evaluation of the administrative capacity of the Hittites, especially the beginnings of formal systems of administration in the Old Kingdom and their changes over time. Thus, the organisational structures and processes identified in the literature review regarding general social organisation can now be augmented by data from the rural sector to give a more holistic picture of how the Hittite society functioned.

Based on the review of the literature, the gaps identified in the body of knowledge concerning Hittite administration and opportunities to address these gaps, the research question that presents itself for this thesis has been formulated as: Can systems be identified in the archaeological record relating to the organisation of the rural sector in Hittite Anatolia? Associated questions concern the reasons that new administrative structures and processes were developed and implemented. That a change in social structure and in turn of administrative systems might be linked to the introduction of technical innovation is a related area of interest that can be borne in mind throughout the data analysis phase. The processes associated with planned surplus production, grain storage and water management may represent forms of technical innovation that could act as a trigger for changes in the social structure and associated administrative systems. This topic does not form a structured question at this stage, and may best be borne in mind as a possible extension of the research.

CHAPTER III: METHOD

3.1 Literature review

A review of the literature was undertaken to ascertain a Hittite orientation to administration. The review showed that there is limited evidence on the administration in Hittite society, and, although there are few references to administrative, economic or social subjects in Hittite documents, it is this aspect that the present thesis seeks to explore. A review of the literature on 'administration' was undertaken, so as to recognise administrative aspects in texts and material culture as a form of data. Modern works consulted (Rabin, 1984; Simon, 1991; Uveges, 1982) were too far removed from ancient civilisations to be a reliable guide. 'Administration in ancient civilisations' used as key words identified several works that concerned economies, that is goods and services traded, rather than administration, and referencing 18th century AD. To counteract the paucity of works on ancient administration in the literature, the reference lists of general Hittite literature were searched and relevant sources identified. Based on a selected review, a framework for analysing administration in ancient societies was developed.

3.2 Defining the components of administration

For Kemp (Kemp, 2006) a developed bureaucratic system reveals and actively promotes a specific human trait, namely a deep satisfaction for devising routines for measuring, inspecting, checking and controlling other people's activities. He describes this type of bureaucratic activity as *a passive and orderly exercise of power in contrast to direct coercion* (Kemp cited above).

Administrative roles

A central component of administration is that of the group, where internal differentiation of roles embodies authority to command, responsibility for initiating action in response to a command and the power to enforce it. These processes infer a hierarchy in the form of a bureaucratic structure with a head

and an administrative staff. Within this structure individuals can be appointed, promoted, demoted or dismissed within a system of control and supervision. Weber⁸ identified three types of authority to command: a rational-legal authority, consisting of a body of generalized rules with the source of authority being the personal order; traditional authority, where rules are perceived to have 'always' existed or emanate from a judicial authority, such as a king, with property rights attaching to the position as a legitimation of authority; and charisma, which attaches to the person through claims of moral or persuasive authority. Two limitations can occur with these types of authority. First is the tendency for individuals to exceed the authority of their roles, constituting a failure to contain behaviour within officially sanctioned lines. Second is the tendency for resentment and resistance to arise between or among superiors and subordinates necessitating the imposition of disciplinary action ⁹.

An economic orientation

Administrative staff carries out economic actions, of which agriculture and pastoralism are a part. Economic action requires organization and the following briefly describes that relevant to this thesis. While developed for modern market economies, the concepts can be applied to ancient economies. Technology and technical innovation develop the capacity to create goods and institute services. The concept can be extended to rationality of action, or the systematic distribution of goods and services, and their capacity to produce utility. Planning processes occur in natural economies without a monetary currency, such as the Hittites, to identify future needs and develop strategies to satisfy them. The division of labour categorises persons into different types of work directed to a common goal, including managerial, direct, gendered and specialized labour. Associated concepts are the exploitation of resources or tasks, the period of work or type of payment for work performed. Optimizing

⁸ Weber's theory of social and economic organisation (Henderson & Parsons, 1947) forms the basis for this review. All comments are drawn from this reference and are not individually identified. Where this is not the case, individual references are given.

⁹ Discipline is defined as the probability that a command will be promptly obeyed in expected and accepted form. Power is assumed in this formulation, defined as the probability that commands will be carried out.

aptitudes, capacities and skills for a particular function through experience and practice and optimising incentives for work relate to this concept. Exchange and payment are types of economic good, both relevant in 'natural economies' without a monetary currency. Motives for initiating economic activity include accessing an income through rationing or exchange, producing goods in kind or through substitution. Taxation is central to the governing of a state, requiring differentiation of taxable and non-taxable goods and services. The external supply of resources through trade or tribute also requires planning, for example food in times of drought or food shortage.

Economies in antiquity

Different economic forms can be differentiated in history: namely planned and market economies. Planned economies are relevant here, defined as the production of consumption goods for immediate satisfaction and of investment goods for the future growth of the economy, with planning being centralised or limited to the activities of individual households (Schefold, 2013: 157). A question arises as to the extent to which the Hittite economy was planned and directed, particularly in relation to agricultural production. Further, some form of accounting was necessary once a form of taxation and/or corvée labour had been introduced. Relevant considerations are: how much was required to be produced for the state and when could these obligations be regarded as met? How were these taxes managed once fulfilled or when not? Based on a synthesis of the literature review, the following table sets out a framework with which to analyse administration in the rural sector of Hittite Anatolia presented under major headings with related dimensions and sub-dimensions.

Table 1: Framework for analysis

Elements of an administrative system	
Dimensions	Sub-dimensions
Economic planning	Identifying future needs Developing strategies to achieve identified needs Division of labour: managerial, direct production, gendered, specialized Means of exploitation of resource or tasks The period of work or type of payment: corvée and its organization Optimising work aptitudes, skills and capacities Optimising incentives Types of taxable and non-taxable goods and services Tribute from vassal states Acquisition of goods from outside the home borders
Authority to command	Identifying types of authority: rational-legal, judicial, charismatic The existence of a body of rules Pre-determined criteria for general application Existence of personal orders Special elements of a person's personality or character
Administrative roles	Identifying a group responsible for implementing administrative action Identifying a head role/person with authority to command Identifying coordinated action in response to a command The enforcement of action by a responsible administrative agency The existence of a hierarchy in the form of a bureaucratic structure Actions for employment of a staff: appointment, promotion, demotion, dismissal
Technical competence	Testing through examination Formalised training Assessment of experience
Remuneration	Maintenance of retainers at table or in the household of the chief Allowances of stores of goods and services Rights of use of land in return for service Appropriation of property income, fees or taxes or fiefs
Managing limitations	Identifying types of indiscretion Disciplinary system Responses to command/discipline: obedience, defiance

3.4 Archaeological research of Hittite civilisation and data sources

Archaeological and historical sources indicate a highly developed and organized system of settlements in the Hittite period (Genz & Mielke, 2011a; Glatz, 2011; Mielke, 2011; Schachner, 2009). While Hattuša dominates archaeological investigation, projects are ongoing at Alişar, Atchana (Alalakh), Karatepe (Azatiwadaya), Karkamis (Jerablus), Alaca Höyük, Çadır and Kaman-Kalehöyük in central Turkey, Kinet (Izziya), Mersin, Sirkeli, Hatip (Tarhuntašša) and the rock monuments of Gavurkalesi, Sirkeli, and Eflatun Pinar (Collins, 2007: 16). Cuneiform archives have been discovered at Boğazköy (Hattuša), Maşat Höyük (Tapikka), Ortaköy (Sapinuwa), and Kuşaklı (Šarišša). Based on this

archaeological research, the following sources have been used to elicit evidence relating to the rural sector in Hittite Anatolia:

- Material remains from archaeological excavations in rural sites
- Landschenkungsurkunden
- Correspondence from Maşat Höyük (Tapikka) as a significant provincial agricultural and pastoral site
- Relevant oaths and instructions

3.5 Limitations of the research

There are a number of limitations identified with the research, although these have not significantly affected the results. Firstly, terminology and chronology in relation to the Hittites can be confusing because of changes to dating of objects (Genz & Mielke, 2011a), although Maşat Höyük has been securely dated and terminology is relatively straightforward (Genz & Mielke, 2011b). Secondly, differences in the division of Hittite history into two stages and three could affect interpretation (Seeher, 2011: 378), although Gerçek's three-fold division is used here. Thirdly, Gates (Gates, 2011) suggests that the archaeological criteria applied to some past major excavations may need to be reworked based on reconsideration of Hittite chronology (Mielke, Schoop, & Seeher, 2006), although this does not appear to have affected the Maşat Höyük excavations (Mielke, 2013b). A further problem is interpretation based solely on texts, with archaeological finds often being shoehorned into an historical framework (Gates cited above) that may be an issue for this thesis and will be considered throughout the analysis phase. Trigger (Trigger, 2006: 391-396) also raises the problem of interpretation from the archaeological record, especially when dealing with abstract concepts such as ideology, religion, scientific knowledge and social behaviour. As this thesis is focused on administration broadly, it is not anticipated that these limitations will affect the research significantly.

CHAPTER IV: ADMINISTRATION IN THE HITTITE ECONOMY

Archaeological and textual data are presented in the next two chapters. This chapter is about the economy in Bronze Age Anatolia, emphasizing agriculture as the primary economic activity from an administrative perspective. The chapter is based on a literature review, and begins with a discussion of the environmental conditions, mainly climatic conditions and water sources. It discusses types of agricultural settlements, agricultural production, grain storage and animal husbandry, taxation, rural workers and pottery and metal manufacture as important production industries.

4.1 Environmental conditions in Anatolia in the Bronze Age

Climate

Climatic conditions in the Near and Middle East were reviewed for the late Holocene (Kuzucuoğlu, 2010), with two reference points given for Anatolia: Lake Van in eastern and Lake Eski-Acıgöl in southwestern Anatolia, where, based on pollen data, an overall dry to very dry period occurred from 2,000 to around 100 BCE, with droughts recorded at 2400, 2150, 1,200 and 850 BCE (Kuzucuoğlu cited above). Rainfall on the Konya plain and in southern Cappadocia averaged 280-340mm a year, making the region sensitive to climate change (Kuzucuoğlu cited above). Central Anatolia experienced long-term drought conditions from 3150 BCE to around 200 BCE, particularly from 1350 to 1250 BCE, with warm periods from 1750 to 1650 BCE. These dates cover the periods of the Hittite Old Kingdom and Empire periods including the period immediately prior to the collapse ca. 1170 BCE. Earlier data (Gorny, 1989) suggest that the climate in Anatolia from 1500 to 1200 BCE was cooler and moister, only becoming drier between 1200 to 900 BCE, resulting then in droughts, crop failure, famine, malnutrition, disease and declining fertility. Recent evidence, based on the availability of improved data, is important for obtaining an accurate interpretation of the period immediately before the collapse of the Hittite kingdom specifically and during the period of Hittite recorded history generally. That the Hittites managed the prevailing climate

well until their collapse suggests that production-planning systems were in place.

Water sources

Hattuša, the capital of the Hittite kingdom and Empire between 1650 and 1200 BCE, the period covered by Kuzucuoğlu's climate data, required an efficient water supply system to manage the hot dry summers (Wittenberg, 2014).

Hattuša lies in the Kızılırmak River basin with an annual mean temperature of 8 to 9 degrees centigrade. The mean precipitation of about 500mm is significantly less than a potential evaporation rate of about 1000mm due to high global radiation, leading to the drying up of the surface run off during summer

(Wittenberg cited above). However, artesian sources accessed via wells and willow fountains suggest that abundant sources were available to provide runoff to water tanks in the central upper town and fountains in the urban area.

Two pool complexes discovered in Hattuša, two East Ponds and five South Ponds, were constructed about the same time as the large subterranean grain silos during the 16th century BCE (Wittenberg cited above). Water could have been used for drinking or cultic purposes, or both (Erbil & Mouton, 2012).

These reservoirs were dug into impervious soil, closed by earth dams about 3 metres high with vertical clay cores founded in a trench in solid ground. Kuşaklı has similar types of construction. The same principle is used in modern earth and rock-fill dams (Wittenberg cited above). Wittenberg confirms that the ponds would easily have filled for summer. The water may have served human and other consumption purposes, although its quality as potable drinking water after a time is uncertain. Wittenberg calculates the capacity of the East Pond reservoirs as sufficient to serve around 4,000 inhabitants and the South Ponds about 2,750 during summer (Wittenberg cited above). Taking the drought years of 2013/14 as an indicator, low ground water levels may have brought famine due to failing rainfall, low stored water levels and poor grain harvests (Wittenberg cited above).

4.2 Agriculture in Hatti

Agricultural settlements

Permanent settlements were a means of balancing risk and ensuring a safe food supply (Schachner, 2009). Rural settlements were organized as *happiriya*, a network of estates or storehouse towns for agricultural produce (Beckman, 1999). The general pattern of landholding in Hatti was small-scale production farms based around a family and their possessions and spread over several sites (Bryce, 2002). Land could be owned or leased from the crown, a town or village or a wealthy neighbour, or bestowed on favoured individuals and institutions as a gift from the king. Land donations were generally divided into smaller parcels to avoid the temptation to use large landholdings with a sizeable labour force against the ruler (Bryce cited above). Gifts could be substantial with small farms allocated to palace employees as payment for services rendered (Bryce cited above). The term LÚ GIŠTUKUL, man of the weapon, suggests that the original recipients were the king's soldiers who worked the land when not required for royal service, thus relieving the crown of their upkeep. Downsides to this arrangement include the absence of the farmer/soldier at a time when his presence may have been required on the farm, for instance during harvest. That employees other than soldiers may have been the recipients of such royal largesse suggests a gradual change in donation practices during the life of the kingdom (Bryce cited above). Hittite farmsteads stood in close proximity to each other and strict laws governed rural community activities (Bryce cited above). Any threats to the livelihood of neighbours, either through deliberate criminal acts, malice or negligence threatened the livelihood of the state as a whole, and Hittite laws were explicit about compensation for damage to goods and property. A careless or malicious act could cause the culprit ruin (Bryce cited above). Thus, vigilance on the part of farm holders and the council was important in harmonious daily living.

Ökse investigated the size of agricultural settlements based on the distribution of archaeological finds and determined a model of settlement size (Ökse, 2006: 173), with Hattuša, the capital, deemed to be 'very large', Kalkankaya

(Kayalıpınar) and Kuşaklı (Šarišša) 'large', Alaca Höyük, Sur Tepesi and Gerdekkaya 'medium' and Kahvepınar and Eşmebaşı 'small'. Mielke describes a horizontal and vertical settlement pattern with the population of Hattuša estimated at between 15-20,000, medium sized cities of between 3-5,000 and smaller towns with around 150-200 people (Mielke, 2017). In the Sivas-Region a three-tiered settlement hierarchy of big, medium small and small towns has been identified in the Kızılırmak Valley and in the Yıldız and Altınyayla levels, and a group of three medium large towns in the Balıklıtohma region, namely Kel Osman Ağılı, Aşağı Kalaca and Havuz, all approximately 20 kilometres apart - the average daily marching distance (Ökse cited above). Ökse calculates a carrying capacity of 100-400 persons per hectare, giving an average village population of between 50-200 inhabitants. The amount of fertile agricultural land each settlement would require suggests that cultivated land could lie up to 5 kms from the settlement.

Systems of arable land management give information on growing conditions and management practices and in turn Hittite approaches to farming and resource management (Diffey et al., 2014). The Hittites made a clear distinction between the city and country, and texts differentiate between urban and rural settlements, with cities carrying the Sumerogram URU representing an administrative entity, and *happiriya*, a small agricultural settlement serving the state-organised agrarian economy (Ökse, 2006), containing a storehouse/city as part of a network of agricultural extraction and redistribution (Beckman, 1999). Depots called 'stone houses' or mausoleums of deceased kings or seal houses from the bullae used to seal storage vessels existed within the network of storehouses within and outside the city for collection and redistribution of agricultural produce (Collins, 2007). The Telipinu Proclamation describes the system of *happiriya* as the basis of Hittite imperial administration, comprising a process for extracting agricultural surpluses and a rural administrative structure where military commanders were responsible for exploiting the countryside and overseeing agricultural and pastoral activities (Beckman, 1999). The total amount of land under cultivation and the size of the population overall, however, are difficult to calculate (Mielke, 2017).

An example of land use: Kaneš

The agro-pastoral economy at Kaneš¹⁰ gives an idea of land use in Anatolia in the Middle Bronze Age (Atici, 2014; Dercksen, 2004). Its inhabitants at the time of the Assyrian Colony Period had Hittite and Luwian names, with Hittite personal and deity names evident (Kulakoğlu, 2014), and lived among people of a mixed ethnic origin. The settlement probably came to an end sometime after 1650 BC, seemingly from the pooling of the Sarımsarlı River valley caused by a geological fault (Kulakoğlu cited above). Kaneš lies in a zone with dry summers and a mean annual rainfall of 300-400mm, suitable for dry farming on three types of land: non-irrigated cropland, garden land and steppe, set out in plots of different sizes (Dercksen cited above). Water came from rivers, springs or collected rainwater. Inter-annual fluctuations in temperature and rainfall recorded during settlement phases could cause bad harvests, necessitating irrigated crop land to be situated next to the garden area and an irrigation system to be established along the valley floor (Fairbairn, 2014). Nine towns identified in level II ca. 19th century BCE lay within about 15 kms of Kaneš, thought to be the main town in the Kayseri basin, servicing Kaneš's agricultural and pastoral needs and providing a surplus to the palace, artisans and traders. Farmers, the palace and palace officials privately owned¹¹ the majority of land (Dercksen cited above). The surface area of a field was expressed by the amount of seed needed to cultivate a standard surface unit called the *naruqqum* or 'sack', roughly 9 iku or 3.24 ha (Dercksen cited above). Three categories of land identified in the Hittite laws in descending order of price were: an irrigated plot of land, jointly owned land and land adjoining the second category. The first is the best type of land because of its access to irrigation and its owner as the sole possessor. The local community or state fixed land prices, and both fields and complete 'villages' could be sold (Dercksen cited above).

¹⁰ Atici (Atici, 2014), Hertel (Hertel, 2014), Barjamovic (Barjamovic, 2014), Fairbairn (Fairbairn, 2014) and Kulakoğlu (Kulakoğlu, 2014) give a comprehensive description of Kaneš during its settlement period. Kaneš is useful for this study, as it may have been a model for the layout and functioning of Hattuša and other Hittite cities.

¹¹ The extent to which land was privately owned is not clear, although this thesis references authors who refer to private ownership.

The traditional Anatolian plough, the *saban*, well suited to dry farming conditions because of its light wooden construction and iron tip and drawn by a pair of oxen (*alpum*), was used for cultivation and sowing (Dercksen cited above), although horses, donkeys and mules were also used as draught animals. Harvesting was labour intensive. The harvest season from July to October involved reaping, binding and bringing sheaves to the threshing floor (*adrum*) where they were dried and threshed. The resulting grain and chaff was winnowed, the grain washed and dried and put into large sacks. Sieves were used to separate husks from seeds and appropriately sized sieves were needed for processing efficiency and securing a good yield (Pasternak & Kroll, 2014).

A comprehensive archaeo-botany study of Kaneš shows that hulled and naked wheat, hulled barley, lentils, bitter vetch and linseed were grown, with luxury products such as hazelnuts, pomegranate, figs and grapes traded (Fairbairn cited above). Additional information comes from archaeo-botanical research at Kaman-Kalehöyük which identified seven economic plant types grown, namely free-threshing wheat (11 samples), hulled barley (9 samples) and glume wheat (including emmer, 8 samples) preserved in dung fuel, providing information on animal rather than human diet. Bread wheat and hulled barley were the main crops, although emmer/einkorn use increased in later periods. Significantly different patterns of consumption were noted between the Upper and Lower towns at Kaneš (Fairbairn cited above). Atici (cited above) notes that only the elite regularly consumed meat because of higher prices; the poor may have consumed poorer quality cattle because of their lower price. Town inhabitants and foreign merchants needed to rely on food surpluses in the market (Dercksen cited above). A selective pricing policy was evident for sheep based on its origin, breed, condition and fleece and meat quality (Atici cited above).

Agriculture and pastoralism in Hatti

The mainstay of the Hittite economy was small-scale farming and animal husbandry in farmsteads clustered around a community with its own council and administration responsible for the land, organising payment of taxes and arbitrating in disputes (Bryce, 2002). The people largely sustained themselves

on what they grew (Bryce, 2002). A bucolic life on a country estate may have been a Hittite ideal, where good people lived and kings retired after death (Bryce, 2002). The number of yearly festivals devoted to agriculture attest to its importance (Collins, 2007). Festivals included those dedicated to the opening and sealing of storage containers (Hoffner, 1997) and establishing new towns (Collins cited above). Hattuša, the centre of power and government, controlled the distribution of wealth channeled directly to it from outlying palaces directed by stewards (formerly the AGRIG) accountable to the king (Collins cited above). The elite controlled the production process in their own areas, with farming activities undertaken by tenant or private farmers assisted by conscripted labour. Soil fertility was generally low, and land in the valleys and in pockets between mountain ranges offered the best chances for cultivation. Where the land was well tended a good yield could be expected and a good standard of living enjoyed.

Cereals, mostly wheat and barley, formed the major component of the central Anatolian diet and agricultural production (Bryce, 2002). The large number of plant species and varieties appearing in the Hittite agricultural repertoire suggests that both local and imported varieties were used (Dörfler et al., 2011). Archaeological evidence attests to a variety of fruit trees, olives, figs, apples and pomegranate (Hoffner, 1974). Vineyards for grapes and vegetable and fruit gardens produced apricots, peaches, cherries, pears, apples, lentils, chickpeas, beans, bitter vetch, cucumbers, leeks, onions, garlic, coriander, bitter garlic, asafoetida, garden cress, lettuce and nuts and seeds including the pistachio, almond, sesame and linseed (Bryce and Dercksen cited above). Agriculture and horticulture were augmented by oil and salt production with salt used as a preservative and for food flavouring (Klengel, 2006).

Herding was practiced on uncultivable land with the herds the personal property of the king, and comprising mainly of cattle, sheep, goats, donkeys, asses and horses. Pigs and poultry were also raised. Hunting and fishing were practiced but were not significant economically. Milk, cheese, meat, fat and wool were produced from domesticated animals. Meat was probably a meal for the

wealthy, as was wild game. Drying of foods, *hadan*, was used for meat, flour and fruits (Bryce, 2002). Honey was collected and used in cooking and sealing. This system of traditionally organised small-scale agriculture and pastoralism undergirded the flow of trade between the Hittites, Syria and Northern Mesopotamia (Schachner, 2009).

Storage

Normally these small-scale farmers would store and other foodstuffs individually as a matter of course, usually in the domestic living area, although the size of excavated storage facilities suggests that they were also communal (Bryce, 2002). At Kaman-Kalehöyük grains were stored in small lined earthen pits, with several thousand pots found clustered in pits outdoors between buildings (Fairbairn & Omura, 2005). Five larger round storage pits were found, although precise functions of the pits are unknown (Fairbairn & Omura cited above). Such large pits may not have been for daily use because of contamination of the contents through regular opening, but were most likely for extended storage of larger supplies of grain (Fairbairn & Omura cited above). The smaller pits may have held grain for either daily use or short-term storage (Fairbairn & Omura cited above).

A guaranteed food supply was a critical issue for the Hittites, and the simultaneous development of permanent settlements, water storage and large grain silos in 16th century BC Central Anatolia was not coincidental (Dörfler et al., 2011; Schachner, 2009). The expense of developing silos and their related administration suggest that the measures were for state controlled food reserves to prevent loss of seed in long periods of dryness (Schachner, 2009). Eleven underground grain storage pits found on the mountain ridge of Büyükkaya date to the Empire period, and an underground storage complex of two parallel rows of sixteen chambers behind the postern wall in the southwest of the Lower City with their grain in tact (Bryce, 2002) date to the Old Kingdom (Collins, 2007). The identical preparation and storage systems for the Büyükkaya and postern wall complexes suggest standardised methods (Seeher, 2006b). A further large pit was found at Büyükkaya assumed to be for water,

grain storage or ice storage (Seeher, 2006b). Similar storage finds occur at Kaman-Kalehöyük (Fairbairn & Omura cited above), Alaca Höyük and Demircihöyük (Seeher, 2006b), Ortaköy and Maşat Höyük (Hoffner, 2001) and Kuşaklı (Šarišša) (Mielke, 2013a). As many as 100 state granaries and fodder storehouses existed throughout the Upper and Lower Land, mainly for local purposes but also for transfer of grain to the Great Temple at Hattuša (Yakar, 2000) and excavation of these sites is yielding important information about agriculture, grain collection, storage and distribution. It seems unlikely that the silos in Hattuša alone provided for the whole kingdom (Seeher cited above), as yields are estimated at between 128 to 648 cubic metres for the Büyükkaya pit and 9,800 cubic metres for the postern wall complex, that is an annual ration for 32,000 people (Bryce, 2002; Diffey et al., 2014; Dörfler et al., 2011), well in excess of the estimated Hattuša population. It is more likely that the silos were for grain distribution throughout the homelands, rather than solely for Hattuša inhabitants, although this point is disputed (Yakar, 2000: 268).

The types of crops planted, storage techniques, pests affecting harvest, spoil prevention and preservation practices are currently the subject of research. Results show that the silo grain was locally produced, with little or none imported, at least at the time of storage (Diffey cited above). Hulled barley and glume wheat were stored in a semi-processed form, as well as green pea, lentil, bitter vetch and Celtic bean (Seeher, 2006b). Over 70 different taxa of weed were identified in the silos, each indigenous to Anatolia (Diffey cited above). Contamination of the silo contents indicates that fields may not have been well tended or intensively weeded, or that the grain was not thoroughly processed before storage (Diffey cited above). The small grain size further suggests either poor growing techniques in the provinces or poor environmental conditions (Dörfler et al., 2011), or, as Pasternak (Pasternak, 1998) and Scott (Scott, 1990) contend, the possibility that producing second-class quality grain was deliberate as a resistance to tax impositions.

Storage hazards needed to be managed¹². There were preventive measures that the Hittites could and did take. Underground storage is one method, practiced for millennia in the Near and Middle East (Fairbairn & Omura cited above), that required filling the storage space, covering it and sealing it to ensure lack of oxygen, maintaining a cool temperature and removing any moisture from the grains. Assuming these conditions were met, grain could be preserved for extensive periods. In Yemen, a period of ten years has been demonstrated; in Cappadocia up to 70 years (Seeher cited above). Aboveground storage also existed. Many pithoi were found in the Temple complex in the southern part of the site, containing naked barley and wheat, and elsewhere in Hattuša indicating storage connections across the city. In addition to grain, oil, wine, fruits and vegetables could be stored in this way for weeks or months (Seeher, 2006b). Such above ground storage suggests differences in consumption of naked versus hulled cereal types (Dorfler et al 2011) with grains used for brewing beer and animal fodder as well as for human consumption (Seeher, 2006b). Large pithoi found near Temple 1 at Boğazköy containing naked grains and legumes may have been for upper class use. Longer storage would have required preparation similar to that for underground storage, that is sealing to keep insect and fungal attacks at bay.

The Hittite's use of underground storage facilities reflects their intention to maintain centralised control over grain supply, an indicator of socio-political organisation of agricultural production and distribution (Fairbairn & Omura cited above). Administratively the storage, sealing and subsequent usage of grain needed to be planned and scheduled, requiring records to be kept on what grain was available, when the grain was stored and when to be used, together with a specialist knowledge of storage for maximum wholesomeness and optimizing storage spaces (Seeher, 2006b). Hoffner suggests that a record of the point of origin of the grain was kept when it was received at the royal silos, initially as temporary records on wax tablets and later in an official report sent

¹² Seeher (cited above) has undertaken extensive research on the technical issues of long-term grain storage and pit sealings. Diffey (cited above) has also written on pests and wholesome storage. Considerable debate surrounds the issues, and while relevant to the availability of food supply, they are tangential to this thesis and will not be taken up further here.

to the king, such as document no. HKM109 showing a table of three consecutive years of grain cultivation at Mašat (Hoffner, 2001). The increase in official stamps indicates that authority was being delegated over a broader area, allowing for a deeper penetration of administrative oversight and control throughout the land (Schachner, 2009). The apparatus of officials became the backbone of the state with their instructions communicated to each other in Hittite cuneiform and their seals used to communicate with the Luwian population (Schachner, 2009).

Both water and crop storage practices were key elements in organising agricultural production and management in Hatti with far-reaching social and political consequences for food management, distribution and access, as well as for the socio-political organization of Hatti more generally (Diffey et al., 2014). As with land management practices, more abstract concepts, such as the political economy of the Hittite kingdom, its demography and spatial organization, are also being investigated. Diffey et al (cited above) conclude that grain storage was a centrally organized system with the king the direct owner of all taxed agricultural produce, allowing him to exert power over other cities and vassal states by giving or withholding food (Diffey cited above). Agriculture and its administration were not just issues concerning domestic food supply, but also a potential political lever that could be used for diplomatic and political purposes at home and abroad.

4.3 Animal husbandry

Herding was an integral part of the Hittite rural economy (Beckman, 1988; Gerçek, 2017b). Shepherds (^{LÚ}SIPA or *weštara*), cowherds, horseherds, goatherds and swineherds are mentioned in the literature, and were included with the workers given to a royal mausoleum. The king used the *lituus*, ^{GIŠ}*kalmuš* or shepherd's crook as a symbol of office, suggesting a broader symbolism as shepherd of his Hittite flock. As mentioned earlier, Gerçek (cited above) believes that animal husbandry was an important pursuit of Hittite farmers, and stock grazed 'close-in' on estates adjacent to agricultural plots (Beckman cited above). While cattle were intensively raised, they needed to be regularly moved,

suggesting that semi-nomadism and transhumance was practiced. Herding was a dangerous pastime, as administrative correspondence shows, with the royal bureaucracy warning allies not to let their flocks mingle with those of the hostile Kaška (Bryce, 2002), and herding rights are mentioned in the agreements between the Hittites, the Kaška and Tarhuntašša (Beckman cited above) illustrating the need to clearly define rights formally and legally.

The Hittites had a good knowledge of breeding and husbanding animals. Domesticated animals included cattle, sheep, goats, pigs, dogs, horses, mules and donkeys, geese and ducks, with consumption evidence coming from refuse pits and temple excavations (Dörfler et al. cited above). Herds were augmented by gains from war, mostly cattle and sheep, whose possession was a marker of wealth (Bryce, 2002). Records show that significant quantities of sheep and cattle were sacrificed to the gods: 50 cattle and 1000 sheep in one instance (Bryce cited above). Only 1.5% of bones found were equid, suggesting that horses were used for warfare, driving, sport, riding and work purposes rather than food (Dörfler et al. cited above). Herding was a low status activity, and herdsmen may have been deportees from territorial conquest (Beckman, 1988) or slaves in view of the often harsh, lonely and dangerous life. It may have given disaffected slaves the opportunity to abscond, in which case trusted persons would have been assigned (Bryce cited above). Dogs were an important adjunct to a shepherd's life, evident from the high level of compensation prescribed in the laws for animals struck or killed. Wool production and processing were highly prized, as wool was thought to have magical powers, added warmth in harsh climates and was used in religious ritual (Beckman, 1999), and played an important role in the Hittite economy.

C14 samples from Kuşaklı/ Šarišša lakebed sediments used to establish chronology over the last 12,000 years suggest that cereals were grown on the flat valley floor where water was more plentiful, and animals grazed on land not suitable for agriculture, on mountain slopes or distant pastures. Pollen evidence indicates a different type of woodland in the Bronze Age, namely pine, oak and hazel, with a decrease of pine at around 1600 BC, and hazel and oak at around

1400 BC owing to environmental degradation from grazing and timber clearing that promoted the growth of open steppe. Pollen samples show that trees grew in the vicinity of the city, and charcoal evidence of extensive building activity in pine in Kuşaklı suggests that woodlands were important in the Hittite economy, evident from the generous proportion of rooms for which a dense wood with a very long growing time was needed. This suggests that cattle were not grazed in these woodlands, allowing natural reforestation (Dörfler et al. cited above).

Textual sources give information on the use of animals in Hittite society and Berthon notes the increasing number of zoo-archaeological studies on pastoral aspects of the Hittite economy (Berthon, 2014). Studies in the Hittite heartland and areas to the west and southeast suggest that Hittite influence on subsistence practices in these regions varied significantly (Berthon cited above). Studies (Berthon cited above) suggest that hunting was not a main source of food, with wild animals representing only 3-4% in the Old Kingdom and Empire periods. Sheep predominated on pastoral holdings, with goats and cattle next favoured and pigs making up only 8% of animals in the regions. The size of sheep increased dramatically between the two periods, suggesting a new breed of sheep selected for its wool and possibly sacrifice, although the size of cattle did not change, nor did the system of subsistence change over the two periods, suggesting a propensity for consistency and tradition (Berthon cited above).

The importance of livestock to Hittite welfare and prosperity is evident from the more than 20% of the laws relating to pastoralism and the disputes and claims associated with husbandry activities (Bryce cited above). Setting prices, hire rates and provisions covering grazing animals that had been stolen, injured or had strayed were important aspects of the laws. The importance of animal husbandry was evident in the careful categorisation of types of animals within their species class within the laws, be they horses, sheep, pigs, birds or bees (Bryce cited above). Severe penalties were imposed on thieves, with compensation amounting to fifteen cattle for the loss of one plough-ox (Bryce cited above). The opportunity for confusion in cattle dealings becomes clear in view of the agreements directed to organizing the sharing of common pastures,

and identifying where mix-ups might occur. Branding of stock was a requirement, and allowances were made for retrieval of stock that had strayed to be taken to the king's gate to distinguish genuine finders from potential thieves (Bryce cited above).

4.4 Tax on production

Agricultural goods were subject to taxation by the state. Revenues came chiefly from agricultural surplus collected as taxes from free peasantry, estates or produced on state-controlled lands. Land was taxed through its produce which was collected, stored and redirected to the central authority or redistributed locally as seeds for the coming year by regional palaces (É.GAL) (Hoffner, 1997), lower level administrative entities such as the *BĒL MADGALTI* or AGRIG officials via their seal houses (Singer, 2002), who forwarded the produce to the capital. As identified above, Hittite farming was generally small-scale, independent household farming, with large 'feudal' estates allocated to high-ranking individuals worked by serfs and/or slaves (Hoffner, 1997), and crown land sharecropped (Diffey et al., 2014). District governors controlled the system, with the taxed produce directly owned by the king (Diffey et al. cited above). Those not able to show full utilisation of the land would forfeit it, and shortfalls on large estates could affect overall production levels and in turn tax returns, a situation that the state would be keen to avoid.

Paragraph 56 of the Hittite laws mentions the *sahhan*, or socage, a tax requiring the provision of food products, wool, manufactured goods and livestock to the crown (Diffey et al., 2014). The tax owing from small holders was under the direct central control and therefore circumscribed and protected (Seeher, 2006b: 261). The law code stipulated that those not exempt, such as the elite and others with special royal dispensation, must perform *luzzi* service on crown-owned agricultural lands. While common in the Old Kingdom, such exemptions were reduced in the New Kingdom for large estates, temple establishments and small farmers. Each independent household was obliged to send a number of adults and oxen on average twice a week to cultivate crown lands as corvée labour, depending on family size family and number of draught

animals (Yakar, 2000). A percentage of small industrial production of textiles and metals made up a third revenue stream including tribute from vassal polities or as seized booty from enemies. Captured wealth was mostly cattle and civilian prisoners, gold and silver. The tax system of and participation in trade by the Hittite state is uncertain, as the wooden tablets used for recording have disappeared, although some summary records come from cuneiform texts about expected revenues (Beckman, 1995b) and from tax schedule evidence from specific sites (Siegelova, 2001).

Archaeological evidence for agricultural taxation comes from grain deposits found in two monumental structures at Kuşaklı (Šarišša). The diversity and generally poor quality of cereals, small grain size and frequent admixture of weeds routinely recovered from Temple 1 in Level 2, are likely the remnants of taxation payments (Pasternak, 1998). Pasternak (cited here) hypothesizes that fields whose produce was intended for taxation payments were less well tended than others. He refutes suggestions that small grain size and the presence of weeds were the result of ignorance or the inadequate techniques of farmers, demonstrated by a contemporary find of high quality emmer wheat in Building C, thought to represent temple provisions (Pasternak, 1998). According to Scott (cited in Pasternak) such actions could indicate rural resistance to state control, restricted to small-scale insubordination, disobedience and delay tactics rather than outright defiance (Scott, 1990). Similar strategies at a different sociopolitical level are evident in the delay tactics for delivery of grain by the kingdom of Ugarit, documented in its correspondence with the Hittite court (Glatz, 2013).

4.5 Who worked the land?

The Hittites distinguished the countryside from the city, that is non-urban land, (Beckman, 1999), and conceptualized it according to its suitability for cultivation, meadow for fodder crops, grazing land for sheep, cattle and goats and forest land, or land for horticulture, orchards and vineyards (Yakar, 2000). Pastures were important possessions with carefully defined borders and rights of exploitation made explicit in treaties (Yakar cited above). The system of land

distribution was similar to that in Mesopotamia, with land divided into three types: pasture and cultivated fields belonging to the palace, land allotted to royal officials, artisans, warriors and priests and land allotted under sharecropping arrangements. The bulk of the population worked on the land, while only a minority owned it. Land could be privately owned outside the royal estates, although private land was mostly in the hands of the elites in the second category of landholder¹³. Sharecroppers or tenant farmers under contract, or paid labourers were the third category of rural worker (Yakar cited above). Bryce describes a typical Hittite farmer, Tiwatapara, a family man, possibly a sharecropper or tenant farmer:

Estate of Tiwatapara: one man, Tiwapatara; one boy, Hartuwanduli; one woman, Azzia; two girls, Anitti and Hantawiya; (total) five persons; two oxen, twenty-two sheep, six draught oxen ... eighteen ewes, and with the ewes two female lambs, and with the rams two male lambs; eighteen goats, and with the goats four kids, and with the he-goat one kid; (total) thirty-six small cattle: one house. As pasture for oxen, one acre of meadow in the town Parkalla. Three-and-a-half acres of vineyard, and in it forty apple trees, forty-two pomegranate trees, in the town Hanzusra, belonging to the estate of Hantapii.

(Bryce, 2002: 74).

This excerpt reveals details about Hittite life beyond farming, in that the society was well organised and inventories were prepared, recorded and archived, detailing the possessions and living arrangements of inhabitants. It makes clear that Tiwatapara's holdings were located in two different places, namely his farm with domesticated livestock and his orchard, presumably rented from Hantapii. How far these holdings were from one another is not clear, although it appears that Tiwatapara went from one holding to another to farm. It would seem that Tiwatapara himself worked the farm, assisted by his children and his wife, who undertook the dairy-related activities, as no other workers are mentioned, or, if they existed, were not included in the inventory. Rural fields are designated as a *kapunu* of ten hectares, an *IKU* of 0.35 hectares and a *gipeššar* of unknown proportions. An average rural farm of 6ha could feed a family of six, produce enough seed for the next year's planting with a portion for exchange and supplemented with fodder, while also producing a surplus. This yield was possible even though 50% of the land could be under fallow (Yakar cited

¹³ See earlier footnote on private ownership

above). However, a farmer could get into difficulty with his crop and face ruin. In the absence of loans from grain merchants, the magnet, temple or palace could assist, but may take the land as collateral (Dercksen cited above). It is easy to see how a farmer might become indebted during bad times and possibly enslaved for debt.

Agricultural labour was a chronic problem, becoming critical in springtime when annual military duties drained the land of labourers. The problem would be exacerbated at precisely those times of greatest need during harvest time when most military expeditions were undertaken (Bryce, 2002). This problem could be offset by a system of partnership, allowing one landholder to go to war while the other remained to work the land (Yakar, 2000). The regular injection of prisoners of war from conquered lands helped swell the ranks of the labour force, and their importance is reflected in the higher degree of protection they enjoyed under the law than was usual in other slave-holding lands (Taylor, 2001). This included permission for deportees to work their own plots of land and earn an income, allowing them to attract free persons into their families or to form a family by providing a bride price for marriage, from which free children would be born (Bryce cited above). As Bryce (cited above) points out, an enterprising potential farmer, either a slave or freeman, could secure land that was relatively cheap, rearing and selling livestock to supply the income needed to buy it. This system of incentives would have encouraged deportees not to abscond.

Farmers like Tiwatapara probably employed labourers during busy periods, perhaps as many as ten. The usual hire rate set out in the Hittite laws of one shekel of silver per month for a male worker and half that rate for a female worker or payment in kind of 1,500 litres of barley for a male and 600 for a female per month just exceeds the monetary hire rate (Bryce cited above). The difference in hire rates could reflect the different types of labour required: more labour intensive work for the males, although it may reflect the different value attributed to men and women's work (Bryce cited above). Women also performed physically demanding work, such as that of millers, cooks, weavers

and fullers (Bryce cited above), as well as working in more specialised professions, including as doctors, ritual practitioners, musicians, dancers and tavern-keepers (Bryce cited above).

A complement of administrators distributed land and seed to soldier and tenant farmers and organised labour for agricultural and pastoral projects, harvesting and distributing the king's share of the harvest (Yakar cited above). Both civil and military administrators and scribes were posted to the provinces, and there was considerable overlap in their roles and responsibilities, with the post governor taking on many of the general organising tasks and attending to security issues in the region. Village councils that were integrated into the state had authority over judicial, religious and political matters in the provinces and worked closely with both the post and provincial governors. The provincial governor provided for the surveillance of enemy forces in the border area, organised agriculture, the upkeep of royal buildings and temples, administered justice within its jurisdiction, assisted by elders and petty office holders called city commissars and mayor who were responsible for fire protection, public sanitation and security against external foes. Regular reference to record keeping is made in the texts to seed sown, harvest yields and grain stored, to herds and flocks (Yakar cited above), although this information may have been written on wax tablets and therefore lost. The use of wax tablets in economic and administrative bookkeeping may have had the advantage of adding, subtracting and erasing information as it came to hand or was changed (Symington, 1991).

4.6 Associated craft production sectors

Over time pottery production became embedded in the economies of religion and agriculture. Through standardisation and specialisation vessel variability was reduced, and mass production brought homogeneity to pottery composition and appearance (Mielke, 2016). In this regard the size-standardised ware in the 'brewery' area at Kuşaklı (Šarišša) is notable (Mielke cited above). Hittite ceramics were thus homogenised and standardized to a high technical degree, professionalized and organized in both the capital of

Hattuša and the provinces (Mielke cited above). Pottery works located near storehouses suggests an integrated system of production, delivery and storage (Mielke cited above). The extraordinarily large pithoi dug into the temple grounds at Hattuša show scratch marks in hieroglyphic Luwian as if part of an administrative documentation process for delivery of taxes or tribute (Mielke cited above). Pottery marks show that production was closely tied to state institutions, suggesting a strong socio-cultural integration within the community (Mielke cited above). Potters may have been independent craftsmen, only seasonally attached to the palace, and there is evidence of training of potters to produce containers for foodstuffs for religious ritual (Mielke cited above). Further information about the production, distribution, delivery and training system is needed to understand the dynamics of the economic system relating to the use of pottery in agriculture.

A similar case may have occurred with tools, where metal, wood and stone tools and possibly leather and basketry were used in agriculture (Klengel, 2006). Metal production was a high value activity in Anatolia (Earle & Preucel, 1987) and there is evidence of the use of metal tools in agriculture (Lehner, 2014). In relation to trade, the Hittites used metal weights and measures (del Monte, 1995) and correct weighing scales were an important aspect of administration (Klengel, 1979), for tax payments and similar exchanges. Internationally Hittite merchants traded booty, animals, wine, grain and metal, and organized the import of foodstuffs, especially grain during drought (Seeher, 2008), and merchants wishing to trade in Anatolia required the king's permission.

4.7 Summary

The Hittites experienced challenging environmental conditions related to the geography of Hatti. The objective of agricultural and pastoral production was to ensure a surplus yield, although evidence suggests that this was a challenge, owing to climatic condition that were dry to very dry with regular droughts from the beginning of the Bronze Age to the beginning of the Iron Age, with water needing to be conserved. Small-scale households were the main farming units working available productive land around agricultural production centres

in provinces. Intensive cultivation of a variety of grains and other foodstuffs occurred on the good land on the river flats with herding a primary activity in marginal areas. Grain storage was a major activity to overcome poor harvests and provide for the population. Tax was paid in the form of produce or labour on royal/state projects for a set period of time. Organised craft production of pottery and tool manufacture were associated with the rural economy. Both domestic and international trade was carried out in a variety of goods, mostly royal tribute but also elite goods and foodstuffs including imported grain when needed.



CHAPTER V: ANALYSIS OF ARCHAEOLOGICAL AND TEXTUAL DATA

This chapter is in four parts. The first presents archaeological data from excavations in regional areas. Part 2 analyses pertinent information of LSUs relating to gifts of rural estates. Part 3 presents selected correspondence between the palace and the regional office at Maşat Höyük. Part 4 presents selected documents of the oaths and instructions to palace officials. A brief summary sets out the main points arising from the data presented.

Part 1 Archaeology in Hittite provincial centres

Archaeological excavation in Hittite lands has advanced to the extent that it is now possible to determine a pattern in the system of provincial administration and how it functioned. Rural administration was organised around a system of *happiriya*, a network of estate/storehouse towns designed to extract agricultural surplus from the land and distribute it according to eligibility (Beckman, 1995b). These towns were the seat of military commanders and administrative personnel responsible for the oversight and protection of agricultural and pastoral estates (Beckman, 1999) possibly extending to annexed territories such as Kizzawatna (Yakar, 2001). Seven sites have been identified as regional administrative centres, and depicted on the map included in this section. Three of the sites are described and compared, namely Maşat Höyük/Tapikka, Šarišša/Kuşaklı and Kilise Tepe, as models of provincial administrative centres. The sites were chosen based on the following criteria: their regional location, their representativeness as different types of settlements, their three different chronologies and the existence of tablets and seals that attest to their administrative functions.

Maşat Höyük (Tapikka) is situated on the main north-south east-west transport routes. The site is not large but it is compact. The entire single-building palace citadel covers the rock massif. Its construction works are well preserved and informative. The plentiful resources of the region suggest why it was chosen, with fertile land and water readily available, set in thick forests of

tree-covered mountains, and a ready supply of wood and stone for building. It is strategically positioned 150 kms from Hattuša, midway between the capital and Kaška territory. Its location, the size of the mound and the extent of its ruins suggest a significant regional centre (Özgüç, 1978).

Work began in Maşat Höyük in 1945 and continued in 1973 and 1984 (Özgüç, 1978, 1982). Finds of clay tablets (Alp, 1991) led to publications about the site (Beckman, 1995a). Four Hittite building layers cover the period from the Old Hittite Kingdom (16th century BCE) to the end of the Empire era (end of the 13th/beginning of the 12th century BCE) (Özgüç cited above). The most important building complex is located in Layer III (the Middle Hittite period from 15th to the first half of the 14th century BCE). Different functional areas including archival rooms and a storage area are evident (Özgüç 1982), and the town was the base for a border commander (*BĒL MADGALTI*) (Bryce, 2011).

Building layers excavated cover the Early Bronze period to the Iron Age including three Late Bronze levels. The oldest monumental architectural building level dates to the 15th century BC (Özgüç cited above). Deeper Hittite levels have not been confirmed. Although there is evidence of fire destruction, the absence of a sterile layer between Level III and II constructions suggests that the palace was immediately rebuilt, indicating the site's importance (Mielke, 2011). Two Kaška attacks may have caused the destruction, one between 1410 and 1380 BC in the reign of Tudhaliya II and the second between 1305 and 1282 BC in the reign of Muwattalli.

Excavations in Level III revealed a large mud brick building of at least 40 rooms with basement storage area. One wall measures 100 metres long and others are 2.50 metres high. The workmanship is described as excellent and adheres to planned measurements. Building techniques resemble those at Boğazköy and other provincial centres, namely a single building of two stories, the residence of a ruler and the main economic, military, political and administrative centre. Masonry techniques are similar to those of the two later construction periods. Storage rooms 13, 17 and 29 contained six cereal granaries with no doors; room

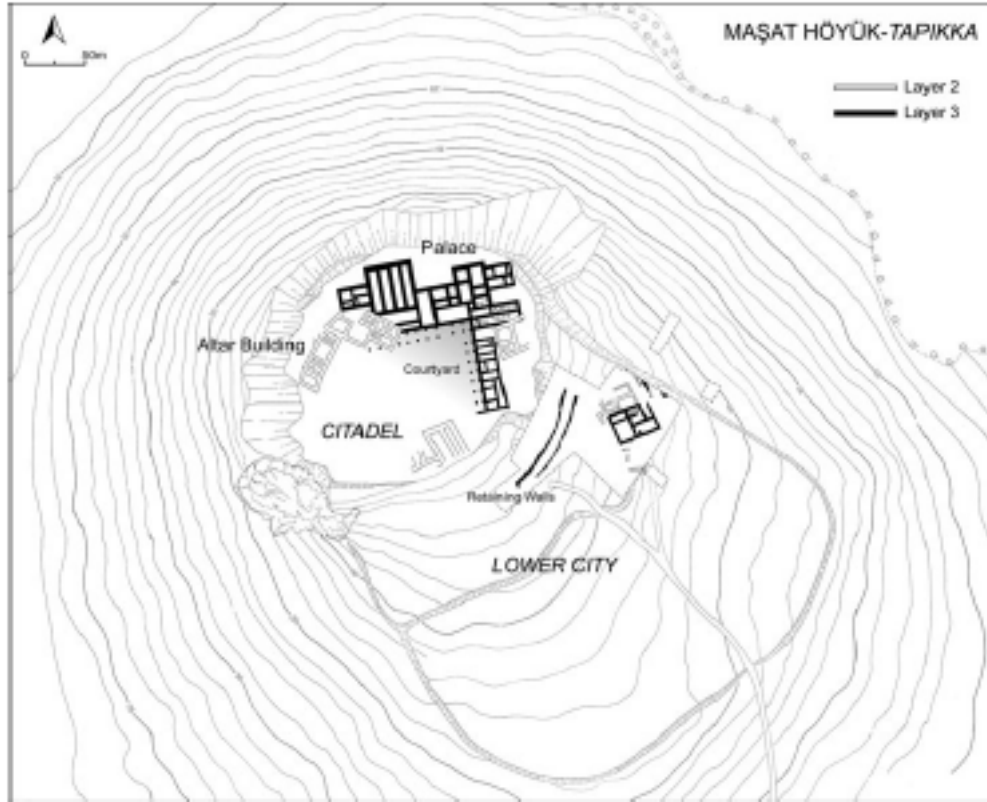
17 was also a granary with bullae and hieroglyphic seals. Rooms 14 and 15 contained large jars, one with a stepping-stone for access, with other pottery strewn in the vicinity, together with bullae and seals with hieroglyphics. Rooms 11 and 13 were granaries. Some jars of over two metres in height were incised with signs as at Boğazköy and Inandıktepe indicating the nature and amount of the contents. The different forms of storage arrangements suggest special arrangements for different type of goods. The absence of a staircase or foundations suggests trapdoor entry from the upper story to some rooms, although Room number 10 has a doorway. Both the archival room and storage chamber complex with embedded pithoi and silo bins attest to the palace's administrative collection function. Fragments of bull and deer statues similar to those from Boğazköy and Inandıktepe found in the basement may indicate ritual activity. No religious or literary texts were found, although the walls of part of the building opened on to a pillared hall with covered colonnades on the sides and an open courtyard that resemble temple architecture (Özgüç cited above).

Clay tablets found in rooms 22-26, 28, 8 and 9 confirm the town's name and its function as a border command officer's base (*BĒL MADGALTĪ*). The twenty cuneiform documents and bullae found in east Room 8 and the further 80 tablets in Room 9 contain official correspondence from the king suggesting frequent contact and reinforcing the site's classification as a provincial rural administrative centre. Seals of Tudhaliya II and his wife suggest that the correspondence dates to his reign. Wooden shelves similar to those at Boğazköy and Kültepe indicate a records' storage area. The correspondence identifies the site as the seat of the post governor, who corresponded directly with the Great King as his representative, ruling a border territory and a settlement of high-ranking civil servants and military contingents. Information on important issues of the day was exchanged, including troop and chariot movements, military deployments, enemy incursions and defense plans. Lists of persons in different towns and their titles, items in storage, private information about residents, lists of grains and fields, harvest organization, enemy movements, details of work gangs and information on metals, weapons, chariots and clothes give a rich picture of day-to-day life (Özgüç cited above).

Level II has architectural features similar to Level III. A small exposure of a large building dated by a bulla with the seal impression of Šuppiluliuma I found in a large altar building nearby attest to an ongoing administrative function (Mielke cited above). As at Level III the building used copious amounts of wood, with an added feature of an altar and altar hearth of the kind used in libation rituals. A basement area contained evidence for storage jars with bullae with hieroglyphics. Two stamp seals of Tabarna were found suggesting they had been in the town archives for a long time. Large foundation blocks on the southwestern part of this building date to Early Bronze Age houses (Özgüç cited above).

Evidence of the site's continuing administrative functions rests on bullae with Hittite hieroglyphs attached to long-necked bottles and pitchers. Özgüç (cited above) remarks that bullae were abundant and impressed with hieroglyphs demonstrating the importance of this script. Level I contains a house destroyed by fire in the 13th century that is badly eroded due to its location near the surface. Coarse kitchen pottery indicates a decline in pottery standards in this later period. The residential houses in both Levels I and II are smaller than those in Level III, although there is evidence of plumbing for wastewater at this level. Interesting finds include a Mycenaean III B stirrup jug, most probably from Mainland Greece, and milk bowls from Cyprus suggesting that this site was well connected with international trade.

The map below shows the two main excavation levels of Maşat Höyük and outlines the extent of a lower city, with data as yet unpublished. The building outlines indicate an extensive building complex in Level III, with a wall separating the citadel from the lower city.



Map 1: Maşat Höyük (Tapikka) Source: Mielke 2011

Kuşaklı (Šarišša), the second of the regional centres discussed here, was a more significant site in eastern Central Anatolia dated to the late 17th century, possibly established via a royal foundation act in the Old Kingdom period (A. Müller-Karpe, 2015). A medium town of 18 hectares, Šarišša lies some 200 km southeast of Hattuša at 1600 metres above sea level surrounded by 2000 metre high mountains. It was strongly fortified with a casemate wall, towers and four gates. Photos of the site show the close proximity of the agricultural fields as they were laid out that align with parts of the city layout (A. Müller-Karpe, 1996). It was partly destroyed in the first half of the 14th century but rebuilt immediately afterward, standing until the final destruction at the same time as other Hittite centers. The town was elevated at the acropolis in the center and had surrounding slopes and terraces (A. Müller-Karpe, 2002).

Forty-eight tablets found in a small archive in one room belonging to a large building, building A, suggest the site's administrative functions. All texts dealt with religious themes of ritual, cult inventories, oracles and a set of instructions for temple servants and indicate that the site was the home of a provincial

governor/rural administrator. A similar construction, entitled building B, stood immediately to the southeast. The northern terrace exhibited a large building of fifty-three rooms with under-floor drainage and water-collecting systems surround by a central court framed by colonnades (Müller-Karpe cited above).

The ruin in the southeastern part of the acropolis, building C, is thought to be the temple of the weather-god and comprised 110 rooms, with three metre high walls and the still-preserved ceiling/floor of the upper story. The many bowls and a brewery inventory found suggest that the building's activities included an economic function. This building also contained impressions of anonymous tabarna seals representing the oldest examples of this seal group, together with a small fragment of a tablet and two well-preserved Middle Hittite letters (Müller-Karpe cited above).

Royal seals were found in Room 9 of a temple on the northern terrace, together with 65 clay sealings spread over the floor, some of which were from an older floor layer and displaying a frame of an animal frieze or tress pattern. The older floor also contained impressions of a royal seal. A further royal seal impression was found on the western slope. The pottery workshop near an abandoned silo may have been the manufacturing site for grain storage containers (Müller-Karpe cited above).

Although located near land and trade routes evidenced by ceramics from Cyprus, **Kilise Tepe**, the third of the regional centres discussed, is a fairly isolated site in Tarhuntaşşa strategically located in southwest Anatolia in what is called rough Cilicia. The site was relatively easily defended, and came under Hittite control in the Late Bronze Age (Blakeney et al., 2011) based on an evaluation of pottery (Baker, 2008). Although the site shows signs of settlement in the Early Bronze Age (Baker cited here), it is the Late Bronze Age that is relevant for this analysis. Architecturally, a Late Bronze period 'public' building with large rooms designated the North-West Building and residential houses date to 1600-1200 BC. No major disruption is evident, based on pottery analysis (Blakeney et al., 2011). The reception room, platform, under-floor drainage and

associated cobbled open space indicate a building of public significance. A later building, the utilitarian Stele Building, served as a storehouse and housing for administrators in the 13th and 12th centuries BC (Gates, 2011). Utilitarian artefacts including a copper sickle blade suggest an agricultural function, and the presence of copper torcs and horn cores suggest a cultic function. The single ivory seal stamp found in the North-West Building and the four stamp seals around the Stele Building are further evidence of the building's administrative function (Blakeney et al. cited above). Significantly the last of two fires in this building dates to 1170 BC, just after the destruction phase of the Hittite Empire and coinciding with the end of the Tarhuntašša Dynasty, an appanage kingdom administered along the same lines as Carchemish (Blakeney et al. cited above).

The site shows evidence of significant environmental change from the Early Bronze Age to the Late Terminal Bronze Age. Archaeo-botanical evidence suggests that grains, legumes and figs were grown and stored during the time of the Hittite presence. Horticulture, vines and orchards still exist in the area today and it is an ideal location for goats, sheep and cattle, with transhumance practiced in summer months. This pattern of animal pastoralism was evident in the Late Bronze period, when the proportion of goats increased by 80% over the previous Middle Bronze period and cattle by 15-20%. The slaughter patterns suggest consumption of good quality meat from young animals, with older animals kept for wool or hair. Finds of loom weights and spindle whorls attest to the type of textile and fibre production carried out. Animal remains give evidence of the types of animals reared, consumed or offered at the site and provide further information on stock-raising practices, meat consumption and the use of wild animals in the diet. The intensification of meat and cereal production and emphasis on meat consumption may reflect a high standard of living as well as its possible use as tax or tribute. An older kill-off age in the Late Bronze Age suggests dairying activities, although dairy products did not play a large role in either the domestic economy or international trade (Atici, 2014). Wild animal species comprised only 5% of slaughtered animals, with over 35 bird species, mostly duck, goose and columbids identified (Baker cited here). This pattern suggests a sizeable settlement, perhaps supplying a provincial

administrative or military camp. The seals in the central building indicate its administrative function as a likely tax collection centre in the mid-Göksu Valley.

The map below shows the seven major Hittite rural settlements identified as part of the research, including the three sites featured and the capital Hattuša, with the majority of sites located in the northern part of the land of Hatti.



Map 2: Location of Hittite rural settlements Source: QGIS Courtesy Tuğçe Köseoğlu

Part 2 Landschenkungsurkunden grants

Although only attested through a chronologically limited corpus, the LSU system of grants¹⁴ appears to have been a well-defined component of Old Kingdom Hittite administration. The grants describe property transferred by official deed from one party to another under the authority of the king and authenticated by high-ranking witnesses. The documents provide a level of legality and specificity attesting to a concern for orderliness and legitimacy that show how the society was structured. Relatively secure dating comes from the seal of the reigning king stamped on each document, which cover the period from Telipinu to Muwatalli I in the 15th century BCE and possibly to the late 16th century BCE. LSUs mostly concern property, but also family matters such as adoption and inheritance, and can thus provide valuable information on family relationships and social formation. Information is given about who divested property, the grant recipients, grant witnesses and the scribes mentioned in the documents,

¹⁴ Data for this section are drawn from Rüster and Wilhelm (Rüster & Wilhelm, 2012) and will not be individually referenced. Any additional references will be noted.

whose careers can be charted, as many recur. The documents are a political record, with changes evident following the accession of a new ruler. Most documents were found in Hattuša, although several come from the towns Hanhana and Kamamma, perhaps large regional centres.

Some of the documents contain information on rural holdings, important for this thesis. Detail includes the extent of the grant, what was included and how much, the size of land holdings transferred and the size of individual land plots, the name of the grantee and the location of the grant. Indications are also given as to whether the land was for pasture (U.SAL), with forest and fruit-tree gardens (^{GIŠ}TIR and ^{GIŠ}KIRI) or was to be used for animal pasture. Grants of animals were often accompanied by their shepherds, possibly slaves (^{GEME}GU₄). A horse attendant (*UMMEDA ANŠE.KUR.RA.ḪI.A*) was included in several grants. Families could be included in the transfer. Although information is missing on a number of the grants, others have sufficient remaining to allow an analysis of pertinent data where the grantee is specified. Nineteen of the 90 grants included in Rüster and Wilhelm's list have been analysed and presented below, and identified by Rüster and Wilhelm's document number.

Of the 19 grants listed in the table that specified a grantee, locations could be determined in a number of instances. Where place names have been found (Alparslan, 2015; Matthews & Glatz, 2009; Weeden & Ullmann, 2017), their approximate location is noted. Locations show that grants were awarded in the north of Anatolia in border regions, in central Anatolia, in the southwest region, and several adjacent to Hattuša.

Table 2: LSU where grantee is specified

Doc no	Grantee	Grant	Location of land/people
4	Hattuša House in Sarišša	Farmland, pasture, gardens, trees, threshing place, temples	Waštišša (Central East)
5	Hattuša House in Sarišša	Farmland, pasture, gardens, trees, threshing place, house, palace	Waštišša (Central East)
6	Head of the Palace	Farmland, threshing place	Warratta (Warratta? Central Cappadocia)
7	Hattuša House in Sarišša	Farmland, pasture, gardens, palace	Newanzuya+, Alaliya (Alaya? North Anatolia), Zantanartta+
11	Leader of the 1000 Charioteers	Farmland	Hattuša
12	Leader of the 1000 Charioteers	Farmland and vineyards	Tapikka (North Anatolia)
14	The king's bodyguard	Vineyards, farmland and threshing place	Karakna (Karkarna? Tarhuntašša)
16	The Amme of Anna, servant	Farmland and people (less than 10)	Unspecified
22	The Prince	Twenty-two households comprising people (414), farmland, gardens, threshing place, 31 kapunu and 25 IKU	Tapikka (North Anatolia) Hantišezzuwa (Hatenzuwa? North Anatolia)
26	Hantili, son of the king	People (less than 10)	Unspecified
28	Head of the Pigeon (house?)	People (unspecified)	Unspecified
29	Palace servant	Unspecified	Unspecified
30	Head of the Bodyguard	Farmland, shepherds, pasture land, animals	Unspecified
39	Head of (unspecified)	River frontage, farmland, gardens, vineyards, threshing place	Kapittara (Kapatta? Town in administrative district near Zalpa), Katitimišša+, Munnanta+, Šaliwana Mountain+, Parmanna (Parminašša? SW Anatolia, Taurus region), Kapitra+, Hanhana (District in North Anatolia)
40	Head of the Cupbearers	People (51), farmland, gardens, threshing place	Unspecified
41	Servant	Land and pasture	Hattuša
42	Servant	People (number unspecified)	
46	Charioteer	Farmland, people (number unspecified), threshing place	Aranzana (Aramtamma? Central west, district of Harziura)
47	Head of the Queen's Singers	Farmland, people (104), trees, gardens, water frontage, threshing place	Šutaruya+

+Unable to be located

Most grants were substantial, in the case of grant numbers 22, awarded to the prince in the district of Tapikka, and 47 comprising the equivalent of whole

villages and whole families, some professional or skilled people, such as weavers, ploughmen and animal attendants. No land surveys or boundary markers were mentioned in the LSUs to locate property, generally designated by its location in relation to other installations, e.g. 'behind the vineyard'. Gerçek (Gerçek, 2017c) is clear, however, that the Hittites marked boundaries and took their violation seriously, including agricultural fields and pastoral resources. Stelae (*huwaši*) were also used as boundary markers (Camarosano, 2018). The royal house in Šarišša received substantial grants, as did the family of the king and palace servants. An interesting inclusion is the party from whom the land and other possessions were removed. This information is legible in only a few cases, but understanding why possessions were transferred is useful in assessing the power relationships in terms of who 'won' or 'lost' in the grant stakes and whether these divestments were one-off events, or happened en block. A further question is how often such grants were given, and when and how often they were divested and regranted. It was presumably through this form of organization via large rural estates that the Hittites administered their rural provinces. Thus not just the possession of property was important, but also the leadership responsibilities placed on grantees.

Part 3 Correspondence from Mašat Höyük

Three authors (Alp, 1991; del Monte, 1995; Hoffner, 2009)¹⁵ compiled the data used for this part. Alp dates the correspondence to the time of Tudhaliya III from the mid 14th century BCE, the Early Empire period. There is, however, some question as to whether Tudhaliya II actually reigned. Beckman (Beckman, 2000) lists a Tudhaliya III, although, if Tudhaliya II did not reign, then Tudhaliya III becomes Tudhaliya II, who may have been the king corresponding in the letters, the great-grandfather of Šuppiluliuma I, who reigned in the mid 14th century also and grandson himself of Tudhaliya I, who reigned in the early 14th century. Characteristics of the ductus suggest that the letters are in the script form from the Old Kingdom. This places them in the period just before Šuppiluliuma I's accession to the throne (Hoffner cited above). Hoffner outlines

¹⁵ Data in this section is drawn from these three authors and only the name of the author will be mentioned in references. Where other authors are references, details will be given.

the administrative structure of the area reflected in the letters, which consisted of the king (Tudhaliya II), subordinate central military and civil courtiers and scribal staff, two subordinate royal emissaries, two subordinate field officers, each with two subordinate commanders and local scribal staff administering Hittite and Kaška populations. Hoffner (2009:96) describes the duties of Kaššū, the district military field officer, with whom much of the king's correspondence is carried out, as defending the land, the livestock and crops from Kaška invasions. Beckman (Beckman, 1995a) expands on the role of military field officers as mobilising and commanding regional troops, organising large-scale public works, pursuing fugitives and receiving Kaška peace delegations.

Of overriding importance was the security of the land, particularly crops during harvest because of persistent Kaška raids. Seal impressions of King Tudhaliya and his Queen Tuduhepa raise speculation about possible visits to the site, or the use of their seals by district officials for administrative purposes. The king writes regularly to Kaššū asking for information on the condition of the vines, the cattle and the sheep. The contents of Kaššū's letters are unknown; they may be found at Hattuša. The correspondence gives a vivid picture of how agriculture and pastoralism were practiced in the district, how society was organised, how the Kaška threat was managed and how the area was administered. Following are selected excerpts in italics that highlight particular issues of interest, and a brief explanation. The document number is given, together with excerpt line numbers and page number from the Hoffner text and the paragraph and page number from the del Monte text.

Excerpt 1: Mst 75/21 (Hoffner, 2009 #2108: 1-12: 103) From the King to Kaššū

'Regarding the fact that you took the cattle of Kašipura and distributed them in the district of EN-tarawa: ' ... 'At this point in time you must not levy veteran troops and auxiliary troops out of the district of EN-tarawa. ...'

Kaššū appears to have moved livestock from one district to another for a work project. The king is concerned that troops are not called up for this project at the time. The oxen could have been used for agricultural purposes or for hauling building materials for fortification or other military related work. This

excerpt suggests that Kaššū, as the military field commander, had the authority to employ resources, suggesting a level of independence in decision-making, although the king overrides Kaššū's decision, instructing him not to levy men/troops for duty in EN-tarawa district. The excerpt indicates that there are at least two main forms of soldiers (able to be called up for general work): veterans, or long serving personnel, and auxilliary, most probably raw recruits.

Excerpt 2: 11. HKM 5 (Mšt 75/74 (3-11: 109) From the King to Kaššū

Concerning the matters about which you wrote to me: how the enemy is damaging the crops, how in Kappušiya he has attacked (the property) of the House of the Queen, how they have taken one team of oxen belonging to the House of the Queen, and how they have led away captive 30 oxen and 10 men of the serfs. (all this) I have heard.

The king's commentary is a response to hearing of the sudden arrival of the Kaška and the damage done to the crops, the queen's house and the capture of men and oxen. Hoffner comments that the king's concern is for the effect of the raid on future food supplies locally and in Hattuša. This excerpt shows the small size of this particular raid and the king's exasperation because he had already heard the news, and perhaps is worried that the attack was on his wife's property. This excerpt attests to the fact that the queen owned property in Tapikka, most probably deeded through an LSU.

Excerpt 3: 16. HKM 10 Mšt 75/112 (7-13: 111) From the King to Kaššū

"Pihinakki himself said to me: 'I intend to relocate (arnu--) three hundred families to Lišipra which I am resettling ...Eventually we will relocate (arnu--) the (entire) city.'"

The letter indicates that a group of 300 families (*arnuwala*, Sumerogram NAM.RA.MEŠ), possibly 30 families of 10 people each, to be settled in the town of Lišipra. Hoffner places these people very low on the social hierarchy, most probably deportees. He comments that the former inhabitants may have been taken by the Kaška and the new inhabitants are replacing them in a border area where settlement of civilians may assist with security. This relocation may relate to a Hittite policy of resettlement in an area important for food production, again attesting to the importance of bringing all available land under production. Questions raised by this excerpt concern where the people

came from, the reason for their location in hostile territory, whether they were free to cultivate their own land and who had administrative control of them.

Excerpt 4: 22. HKM 17 Mšt 75/47 (20-22: 123) From the King to Ḫulla, Kaššū, and Zilapiya

In relation to Kaška raids in the vicinity, the king says to Kaššū - 'so we will attack the sheepfolds which are in the vicinity of Marišta' ... 'and if the grain crop is ready let the troops take it'.

This excerpt does not make clear whether the sheepfolds are in Hittite or Kaška territory. Gavaz (Gavaz, 2017: 187) suggests that Marišta is located in the Kartaphaha region 'not too far south of Hattuša'. If they were Hittite sheepfolds, then military action was taking place very close to the capital. If they were in Kaška territory, then the Hittites gave as good as they got, pillaging in enemy territory as much as the enemy pillaged in theirs. Sheepfolds are thus attested as regular hiding or ambush places, making the work of shepherds a particularly risky one, as the next section of the letter (not presented) indicates, where the King exhorts Kaššū to guard the Hittite sheepfolds.

Excerpt 5: 30. HKM 25 Mšt 75/13 (4-19: 140) From the King to Tatta and Ḫulla

Pišeni has just written me from (the town of) Kašepura: "The enemy is moving en masse at night - some times six hundred sometimes four hundred of the enemy - and is reaping our crops. As soon as this tablet reaches you, go to Kašepura. If the crops have ripened, reap them and transport them to the threshing floor."

Following on from the excerpts above, this excerpt demonstrates how much a close run thing it was protecting crops from the Kaška. It confirms that crops were transported to a threshing floor close to town. It is not clear how the crops were transported - did the Hittites use large drays or wagons for this purpose and, if so, who owned them and how was transport organised? Could this have been the type of work project Kaššū was attempting to organise at the outset of this section? The excerpt indicates the size of the Kaškaean raiding party of three to four hundred - a significant number. Numbers of 7,000 have also been recorded (Document no 49. ABoT60 To the King from Kaššū? AnAr 9133: 176).

Excerpt 6: 26. HKM 21 Mšt 75/20 (9-13: 132) From the King to Pulli

Be very much on your guard toward that enemy, while I am about to make oracular inquiries (whether and how to proceed against him)

This excerpt shows how connected religion was with the cultivation of crops and troop movements and how dependent the Hittites were on oracular inquiries on which to base decisions about how to proceed against the enemy. Here the king is concerned to protect Pulli, an officer resident in Tapikka, responsible for the harvests in that area at a time when some of his troops were away, presumably attending to another Kaškaean raid. The letter goes on to mention the threat of locusts destroying the crops.

Correspondence from Mašat Höyük found in Hattuša

Excerpt 7: 29. HKM 24 Mšt 75/18 (4-19: 137) From the King to Pišeni

Regarding the following which you wrote me: "The Zaltayaš-troops who went to Kašepura, ... in a famine, are saying the following: ... (His Majesty answers) Because Takša drove here, let him lead the troops of Kašepura and Marišta. Let him proceed to take grain of the palace for cultivation. If he has come up, right now he will lead troops from Kašepura. If he leads any other (troops), let him take? grain for them for cultivation.

The importance of this excerpt is the confirmation of famine within Hittite territory. It indicates that seed grain is stored at the palace from where it is distributed for planting. However, it is not clear whether the palace is that at Hattuša or part of the regional agricultural network. Further, it is the troops who carry the grain to the place of cultivation, with Takša, possibly a military commander, authorized to take it. This excerpt further suggests that perhaps troops were given land and grain with which to cultivate their own food in response to famine conditions.

Excerpt 8: 35b: HKM 36 (42-48: 151) and HKM 30 (18-25: 155) Piggyback Letters to a superior (Himuili?) from Hašammili p151

Concerning what I informed you about my female slave: how your agents stole her away together with the flour (she had milled), and led her back to Tahazzimuna. Now send off my female slave to me! You must not ... or injure my female slave! (For) whatever this female slave has taken and stolen (from you), take threefold that amount also (as whatever this female slave has taken as compensation), but send it (i.e. the rest of my goods) to me whenever some other messenger comes (my way).

Here Hašammili describes a situation that he has discussed before where his slave has run off with stolen flour, had been found by Himuili's administrator and taken back to a town called Taḫazzimuna. The passage indicates that after having written repeatedly to Himuili nothing more is said of the slave suggesting that Uzzu (possibly one of Himuili's administrators), kept the woman either as compensation for the theft or because she had been entrusted to him to await judgment in his position as a scribe. The interest here is in demonstrating how circumstances are often not as straightforward as duty and obedience might suggest and that situations can be manipulated for personal benefit. While not directly connected with agriculture, it does demonstrate that slaves absconded, that there were opportunities for leeway in relationships and that not everyone acted to the letter of the law. By triple restitution of the goods stolen, the slave would not be mutilated as punishment, but returned 'whole' to Hašammili, for which he pleads.

Excerpt 9: 57. HKM 54 Mšt.75/53 (4-17: 198) From Kaššū to Himmuili
Concerning what you wrote me about seed: "There is no seed for the plowed fields." Shouldn't you have taken from there the barley and wheat which was intended for sowing (for) Tapikka, Anziliya, Hariya, and also Haninkawa? Then they could have sown those plowed fields.

This excerpt may indicate that seed was kept at the regional administrative centre for dispersal to the smaller local centres like Tapikka, or that on this occasion, because the seed had run out at Tapikka, it could have been taken from the regional centre to sow ploughed fields. Where this resource was kept, who was responsible for it and how it was distributed are questions to be clarified. Hoffner describes three levels of Hittite administrative-governmental structure, namely: the central level, the regional level, and the local urban level, with Tapikka in the third category. Siegelova (Siegelova, 2001) suggests that Šapinuwa was the regional centre, above Tapikka in the hierarchy and with whom Tapikka regularly corresponded.

Tablet HKM 103 (22-38; 1-18: 89-91)

Del Monte (del Monte, 1995) gives more fine-grained detail about provincial administrative and agricultural practices. The above-named tablet is a work

inventory detailing the organization of work gangs. The text numbers the gang, the number of people in the gang, their origin - mostly from the Tapikka district, the name of the supervisor, the amount of grain harvested expressed as *PARISU* and *SŪTU*, and workers' rations. A total of 19 work gangs comprising 223 people were paid a total of 75.5 *PARISU*. The multi-level nature of administration is evident in the different rates of pay for officers and workers; for the latter 30 *PARISU* of barley for 3 months' work, or 60 *SŪTU* a month or 2 *SŪTU* a day. del Monte (cited above: 92) suggests that the difference in some daily rations per person was due to the presence of women on lesser rations within the teams. Were women paid less because they produced less or because they ate less?

Tablet HKM 109 Mšt.75/59 (2-23: 122) Mašat Höyük

When at Kasasa, the seed to be planted in the first year (consists of): 900 PARISU of barley, 300 PARISU of wheat, 100 PARISU of farrago (mixed grains), 100 PARISU of spelt, 70 PARISU of karsi wheat. The seasonal harvest we will reap is: 2100 PARISU of barley, 900 parisu of wheat, 80 PARISU of rye, 100 PARISU of farrago, 100 PARISU of spelt, 90 PARISU of karsi wheat, 30 PARISU of peas, 30 PARISU of beans, 20 (PARISU) of lentils, which are from the seeds from the first year. The seeds we'll sow in the second year: 1300 PARISU of barley, 400 PARISU of wheat, 50 PARISU of farrago, 60 PARISU of spelt, 30 PARISU of karsi wheat, 10 PARISU of peas, 5 PARISU of beans, 10 PARISU of lentils. Seeds we'll sow in the third year: 500 PARISU of barley, seeds (...). In total: 7400 (+x? PARISU of.. at NP (...) behind (...). From Year three/ from the third year (...) NP (...).

This excerpt indicates what was planted in what proportions, and the rotations of crops. Any remains of harvested and threshed grain on the threshing room floor were a gift from the king for the workers, over and above their rations, that could be consumed or sold for profit. A number of local centres gathered the grain for sowing, cultivation and distribution, and included administrative buildings and warehouses (KIŠIB) spread throughout the district. Tablet HKM100 records a total of 33 storage facilities. Six called Houses of His Majesty may have been for the king's share. The presence of permanent fixed personnel at these buildings, including 32 at the House of the Settler, and some of which may possibly have been temples, suggests a well-developed and sustained system of agricultural activity and administration. A reference to salt distribution to villages suggests that Tapikka may have had a salt store.

Part 4 Royal Hittite instructions and administrative texts

Miller (Miller, 2013)¹⁶ sets out the obligations and instructions for a professional class of retainer, that outlines responsibilities and expectations in key areas of administrative activity, as the basis for the structure and functioning of the internal Hittite administrative system¹⁷. Confidence in the accuracy of the information comes from their being sworn before the gods, and the possibility of punishments if not adhered to. They are similar to military and loyalty oaths to kings, specifically those to Hattušili III and his successors, and vassal or treaty oaths. Some oaths circumscribe royal behaviour, and that of retainers of different levels of seniority, indicating the king's view on how appropriate relationships between the elite should be structured. The majority of texts come from the reigns of Tudhaliya I and Arnuwanda I in the Early Empire period, although the genre existed throughout the whole of Hittite history. These represent the zenith of the genre during which innovative administrative structures were developed in place of the former 'family management' style of administration. In relation to the Instructions for the Frontier Post Governors, a change from 3rd person to the 2nd person language suggests that a local person may have administered the oaths initially, and were gradually taken over by the king and personally administered in the presence of the governors. The texts outline expectations rather than daily realities and were therefore normative in intention and not descriptive in actuality. A small selected sample of oaths is referred to here where they relate to provincial administration, given in italics with a brief interpretation.

Excerpt 1: No. 1 A royal reprimand of the dignitaries (CTH 272 §2: 73-76 (Miller, 2013))

You constantly oppress the land tenants, and afterwards they began to oppress [...]. Thus you have preserved my father's word? If you do not know (his word), are there no old men here either? He can tell you the word of my father.

¹⁶ Miller is the only reference used in this section and data will not be referenced individually. Where other references are used, they will be noted.

¹⁷ The ongoing work of the HPM Hethitologie Portal Mainz (hethport.uni-wuerzburg.de) is noted in regard to present studies on administration, especially at the central level of Hattuša, and in regard to this thesis, the translations and interpretation of the field texts, esp CTH 239 and 586, as well as further ongoing work on the service instructions and protocols and stocktaking texts.

This excerpt set out the behaviour required of a provincial military officer, reinforcing standards and indicating violations, presumably also in operation at the time of the king's father. A superior appears to be oppressing land tenants, who may in turn oppress others. Miller (330) suggests that 'land tenants' were 'men of the weapon' or men 'who worked for the government or others, and received their pay in the form of land whose produce supported them'. Land tenants were free men, but whether they owned or rented the land is not clear, and their protection of others appears to be a traditional expectation. In the excerpt following, Tas, the chariot driver, is given as an example of corruption because of his undercutting allotted rations for his workers.

Excerpt 2: No. 8 (CTH 258.1) Tudhaliya I's Decree on penal and administrative reform

This instruction deals with the opening of the royal grain storage pit, indicating that only specific authorised officers should open it. Any unauthorized persons are to be apprehended and brought to the king's gate, and in the event of non-compliance, 'the men of the city' will pay compensation and the culprit will be punished. The oath continues:

(§11: 12'-18': 139) *He who remains inactive in these royal affairs, (i.e.) he or his associate, (and) you (sg.) conceal (it), then he gives him a bribe, and he or the associate of the administrator does not hand (him) over, so that following the affair it is not (al)together finished, and afterwards the matter is made known, then they will sakuwa- the both of them.*

This excerpt shows how valuable grain was in Hatti, given the security measures taken to protect and access it. Not only would theft be an issue, but possibly damage done to the whole store if oxygen and humidity entered. The excerpt indicates that bribes and corruption as previously mentioned were common enough for specific preventative instructions.

Paragraphs 4 and 7 of the oath set out the alacrity with which troops mobilized by the local governors are expected to respond. Any person not responding wholeheartedly or who flees from a campaign must be apprehended, notably by

his commander and his clan chief, and brought before the palace. The importance of this excerpt for rural labour is contained in the following:

(§9: 10'-15': 149) *However, as soon as the enemy has been vanquished or the work has been performed, then the troops that are to remain for the occupation, I, [(My Ma)]jesty, will leave them for the occupation, while whatever troops are to be released, I, My Majesty, [will] relea[se].*

This excerpt demonstrates the impact of military campaigns on the rural sector. Even if the campaign is successful, troops may not be immediately demobilised, but may remain in the field. Success in war does not mean immediate return home for the soldier/farmer.

Excerpt 3: No. 16 (CTH 252 §1: 1'-6': 208) Decree of Queen Ašmunikkal concerning the Royal Funerary Structure

Thus (speaks) Ašmunikkal, Great Queen: The royal funerary structure that we created, the towns that have been given to the royal funerary structure, the craftsmen that have been given, the ploughmen, cowherds and shepherds that have been given, those who were taken from the šari(ku)wa-troops and along with their homes and their towns given to the royal funerary structure, and the hilammi-cult personnel that had already been given to the royal funerary structure, they shall be exempt from the šahhun and luzzi-levies.

This excerpt reveals the way an LSU estate is awarded and organised. Miller suggests that a royal funerary structure is a stone-built structure with niches for interring the bones of the deceased. This decree of Queen Ašmunikkal, wife of Arnuwanda I, indicates that such a funerary precinct has been created for the royal family with a large complement of staff, all of whom are exempt from taxes. An eya (oak) tree planted in front of the estate signalled this exemption. Further stipulations relate to capital crime, in that the culprit's estate remains part of the structure, and the precinct's possessions cannot be sold. The closed nature of the structure is evident in the marriage requirements set down for men and women, in that young women may enter as brides, but no male or female is to marry out. These decrees give the royal funerary structure a specific and particular status as a dedicated rural estate.

Excerpt 4: No. 17 (CTH261.I) Instructions of Arnuwanda I for the frontier post governors

This Instruction is comprehensive, extensive and explicit outlining the tasks and responsibilities of frontier post governors, referred to by Miller (2012) and Beckman (1995) above. Many are concerned with the security of the town and surrounding area and are therefore military in nature. However, several sections refer to aspects concerned with agriculture, namely Section 7 c and d and Sections 9 and 10, each of which are discussed in detail. Contra Bilgin, instructions seem to have been given to high-ranking officials.

(§7: 17'-219) *And [they shall let] the cattle, the sheep (and) the workmen down from the town*

(§8: 18'-22': 219) *When night falls, though, the scouts shall make/do [...], and they shall take up the posts. The scouts who obser[ed (the first stretch)] of the day, however, [(shall)] drive forth [(the workmen, the cattle, the sh)eep], the horses (and) the donkeys, [(and th)ey] shall move them up [into the town].*

(§15: 7'-12': 220) *And they shall close up the towns. They shall not let the field workers, cattle, sheep, horses, (and) [don]keys down out (of the town). They shall pro<(te)>ct (them). The governor of the post, though, shall keep track of and record the frontier posts and the enemy routes. Further, three scouts shall hold each road, while three commanders shall supervise.*

These excerpts show how serious threats of attack were taken and the measures put in place to protect towns and their inhabitants, who must remain within the walls during the night supervised by the post governor, and let out during the day. Should the scouts perceive a threat, the governor is responsible for bringing the inhabitants to safety, shutting up the town and observing the enemy's movements. The next excerpt turns to building standards.

(§29: 16'-20': 227) *The plaster that crumbles down, though, they shall regularly remove from the walls, and they shall expose the foundation stones. Further, the threshing floor, the straw barn, the shrine, and the water installations for the orchards, gardens, (and) vineyards must be properly constructed.*

This excerpt instructs the post governor on maintaining public buildings to a good standard, suggesting that buildings and installations are regularly attended to for maintenance and inspected. 'Water installations' including archaeologically attested reservoirs suggest that some form of irrigation was being practiced, confirmed by later reference to maintaining clean canals and

irrigating forests and pastures. The next excerpt refers to the status of deportees.

(§41: 230) *You must keep an eye on a deportee who has been settled in the province with regard to provisions, seed, cattle (and) sheep; further, you must provide him with cheese, sourdough, (and) wool. Whoever remains in place of a deportee who leaves your province, though, you yourself must sow seed for him. Furthermore, he must be satisfied with regard to fields, s[o] they shall promptly assign him a plot.*

This excerpt indicates that the post governor is responsible for land tenants, including deportees, providing them with sufficient resources to be productive in exchange for settling and farming the land, and securing a high risk zone. A problem, however, is that the deportee could abscond, having been supplied with public goods, and it is the post governor who must make good by supplying any replacement with the same level of resources. This excerpt suggests that absconding was a common occurrence requiring surveillance.

(§45: 57'-59': 231) *[(Further, the) garde]ns? (and) vineyards [(mus)]t be well made (and) bu[ilt]. Further, the happidanu-installations and the canals shall be cle[an]ed up. Further, the word/matter of the scout [must (b)]e taken seriously.*

High construction standards are reiterated here with regard to the gardens and vineyards as well as the irrigation canals.

(§46: 60'-65': 231) *When, however, they sow seed for depo[(rte)]es, the governor of the post must keep his eyes on all of them as well. But if someone speaks thus: "Give me seed, and I will sow it in my field, then I will heap up stores (of grain)," then the governor of that very post must keep (his) eyes on (him). When the harvest arrives, then [he shall ha]rvest that field.*

The post governor has the role of overseer of planting of the seed, particularly for deportees, here to ensure that if seed grain is given to a deportee then that grain must be duly harvested and presumably overseen to ensure it is accounted for and added to the common granary store. This suggests that deportees may have had a propensity to sow seed, some of the harvest from which they kept illegally for themselves. The trustworthiness of deportees is clearly an issue, raising questions about their status in the community. However, absent deportees appear to have been quickly replaced.

(§53: 9'-12': 233) *You must [(also)] keep an eye on al[l the ...] (and) the palaces [(i)n your] province. You must also keep an eye on the seed for the ploughed fields and the land allotments of the palace servants.*

(§54: 13'-20': 233) *4 And you shall inquire regularly into the palaces and noble estates that are in your [p]rovince, whether someone has damaged anything, or whether someone has taken anything, or whether someone has sold anything, or whether someone has broken into a granary, or whether someone has killed royal cattle, or whether someone has consumed the grain stores then illicitly destroyed the wooden writing boards. You shall keep track of it.*

On the one hand, the post governor was responsible for supplying seed to those who needed it and ensuring land was allotted to palace servants. It seems that he also organized small-scale land grants at the local level. However, he was also the local constabulary, guarding against damage, theft, improper sale of goods or breaking and entering on the estates, notwithstanding their own often-sizeable complement of staff, including in some instances military personnel and their expectations of independence, as inferred from the royal funerary structure grant instructions above. There was considerable overlap between the role of the post governor and palace and estate managers, although the post governor may have been the only senior official in the district if estate owners were absentee landlords, such as royal estates. Nonetheless, given the discussion earlier about authority and freedom of action of the estate holders in the regions, clarification of the roles and responsibilities of these three levels of officials is required. The excerpt indicates that records were kept of stored grain and confirms the use of wooden writing boards for record keeping, along the lines mentioned earlier (Symington, 1991; Waal, 2012).

(§56: 43'-49': 235) *[... (Further)], [(you shall) keep (track of)] the plants of the gardens, [(and they shall be placed within a fence)]. A threef[old?] portion is for the parzahanna-cattle, [(and they shall regularly eat that portion)]. And no o[(ne)] shall [give] them in excess (of that). [Who(ever)] gives [(them)] in excess (of that), though, [...].*

This excerpt confirms that fences were used as animal enclosures that were the responsibility of the post governor, to ensure cattle did not stray and cause damage. An interesting aspect here is the precise amount of fodder set out for the fief owners' cattle (*parzahanna* = relating to the fief). This may be to keep

them in trim, especially if they were draught animals, as a measure of ploughed land is mentioned in the excerpt.

(§58: 43'-49': 235) *And as soon as spring [arrives, ...] at remains, it [...]. And as soon as(?) [...] in/to another town [...]. The ploughman, though, [... (the work)]. And as soon as the provinci[al (governor)] comes b[ac]k, [...] he will see [...], and [he will (count/keep track of) ...] for hi[m]. And the cattle [...] to him. But if/when the work [...].*

This excerpt suggests that the provincial governor was the superior of the post governor and to whom the post governor must account, providing him with details of the agricultural production such as outlined above. The comment 'as soon as the provincial governor comes' suggests that this official is not permanent in the region, but visits for site inspections to ensure that the post governor is managing as expected. The excerpt may also indicate that the ploughing team is mobile, moving from place to place in the spring.

The text for No. 20 Instructions for priests and temple personnel (CTH 264: 244) is not set out here, but passing reference is made to it because of the requirements of priests and temple personnel in relation to the purity of offerings of cattle to the gods. Specific instructions required double-checking of beasts and that the cowherds and shepherds accompanied the chosen beasts at all times. Such an instruction suggests that substitutions were common events, even though the crime was a capital offence and an offence to the deities.

4.1 Summary

A relatively comprehensive picture of rural administration in Hittite lands is emerging. This chapter demonstrates that there is a central command structure, a regional infrastructure and a complement of administrative and worker personnel to implement commands. Settlements appear to be of a similar design, layout and function in border areas at risk hostile attacks able to produce a range of foodstuffs. The settlements were centrally organized, responsible for collecting and storing the grain and administering the region. Military and civil administrators allocated land to small estates and oversaw all estates in the area, maintaining productive installations to an expected standard. Larger land grants were awarded to the elite and although such

estates may have been expected to play a significant role in the organization of cultivation in the region, the extent to which this occurred is questionable.

Correspondence between the capital and regional centres demonstrates the level of threat to communities and resources from enemy attack, and how much effort was directed to addressing it. Regional areas were on deportee labour, but such labour was uncertain given the risk of flight. Instructions and oaths are instructive in not only understanding the roles and responsibilities of the main military, civil and religious administrators in Hittite lands, but also how administration was structured, in that normative expectations of duty were set out in an explicit and itemized fashion for each level of administration, suggesting that Hittite rulers had a good idea of what was required to reach the objectives they had set themselves in both the long and short term, and how they should put these strategies into practice. The next chapter brings the data together in a summary form prior to drawing conclusions about the level and type of rural administration in Hittite lands.

CHAPTER VI: ASSESSING HITTITE RURAL ADMINISTRATION

This chapter assesses the evidence from Chapters 4 and 5 against the administrative framework set out in Chapter 3. It contains an assessment of the extent to which each of the components in the framework was present in the data, evaluated according to each major dimension, namely: economic planning, types of authority to command, administrative roles, technical competence, remuneration and managing compliance. The scales concern whether the component is judged to be ‘clearly evident’ in the data, that is explicitly mentioned, whether the component is ‘evident’ in the data, that is, if there is a mention or inference about the component, or, lastly whether the component was ‘not evident’ in the data, that is no mention was found. The series of tables below assess data against the predetermined administrative framework.

Table 3a: Economic planning

Economic planning: sub-dimensions	Clearly evident	Evident	Not evident
Identifying future needs	X		
Developing strategies to achieve identified needs	X		
A division of labour: managerial, direct production, specialized	X		
Means of exploitation of resource or tasks	X		
The period of work or type of payment for work: corvée and its organization	X		
Optimising aptitudes and capacities	X		
Optimising incentives		X	
Types of taxable and non-taxable goods and services	X		
Tribute from vassal states		X	
Acquisition of goods from outside the home borders		X	
Distribution of wealth	X		
Record keeping	X		

Economic planning and competent resource management was evident in crop cultivation of various types, animal husbandry, horticulture, water management, grain storage and associated production systems. The Hittites developed strategies to achieve their objectives through systematic crop cultivation and rotation, irrigation canals, dams and grain silos. A division of labour was clearly evident between the elites, military officers in the field, deportees and land tenants in planned settlements, and between genders.

Resource exploitation and work organization were repeatedly mentioned, namely corvée labour, work gangs and the use of troops for agricultural projects. Assessment of individual capacities was not evident in the data, although there is evidence that the capacities of individual officers, farmers and pastoral workers were optimised in managing projects. Incentives were evident in that deportees were able to own land, have their own earnings and to marry free partners and have free children (Bryce, 2011). However, while this component was mentioned in the literature, only one reference was found in the data. Thus incentives were judged to have been evident, rather than clearly evident. Taxes on goods and services were mentioned multiple times in the literature review, in the Hittite laws and in textual data. Acquisition of goods outside the home borders was mentioned in the literature, and there were references to captives and trade goods, although not explicit.

Two sub-dimensions not identified in the literature and therefore not included in the originally formulated framework are distribution of wealth and record keeping. The first component was clearly evident in the LSUs where resources were distributed from the king predominantly to the elite but also to retainers and the awarding of small grants by the post governor and to workers in the form of rations. The second sub-dimension, record keeping, was mentioned extensively in relation to keeping records on silo volumes, taking of census of populations and goods, on administrative marks on pottery containers, in relation to runaway land tenants, about available land allotments and in reference to the provincial governor 'keeping track' of local resources. It was epitomised in the archives from Hattuša, Maşat Höyük and possibly other regional centres. This sub-dimension was judged to be clearly evident.

Table 3b: Authority to command

Types of authority: sub-dimensions	Clearly evident	Evident	Not evident
The existence of a body of rules	X		
Pre-determined criteria for general application	X		
The existence of personal orders	X		
Special elements of a person's personality or character	X		

All sub-dimensions of authority to command were judged to be clearly evident. A ruler/ruling body issued orders, a body of rules was well set out in the instructions with sanctions in the event that expectations were not met, and a structure of palace, military and religious organisation and households was in place through which to implement commands. The Hittite laws ordered and regulated relationships and set expectations and consequences for non-compliance that included agricultural concerns. Pre-determined criteria for general application were evident in the instructions and laws. Personal orders were issued regularly and explicitly via correspondence. Charismatic royal authority was explicit in the correspondence, and the king's hands-on approach to managing military crises, especially relating to Kaška raids, was evident.

Table 3c: Administrative roles

Identifying a group responsible for implementing administrative action, Identifying a head/role/person with authority to command: sub-dimensions	Clearly evident	Evident	Not Evident
Identifying coordinated action in response to a command	X		
The enforcement of action by a responsible administrative agency	X		
The existence of a hierarchy in the form of a bureaucratic structure	X		
Actions in relation to the employment of a staff: appointment, promotion, demotion, dismissal		X	

All sub-dimensions of administrative roles were judged to be clearly present with coordinated action of military surveillance and security organised, and agencies/persons identified to enforce instructions with a clear hierarchy in the bureaucratic structure, both centrally and regionally. The only sub-dimension judged to be 'present' was actions relating to the employment of a staff. No information was given on how staff were appointed or dismissed, although a system was in place, because staff were present.

Table 3d: Technical competence

Methods of assessing technical competence: sub-dimensions	Clearly evident	Evident	Not Evident
Testing through examination			X
Formalised training		X	
Assessment of experience			X

Scribal schools and potters were the only mentions of formalised training in the law codes. No testing or assessment was evident for administrative officers, nor were instructions issued about their responsibilities in the region. The element was therefore judged to be not evident.

Table 3e: Remuneration

Means of remuneration: sub-dimensions	Clearly evident	Evident	Not Evident
Maintenance of household servants (retainers at table or in the household of the chief)	X		
Allowance of stores of goods and services	X		
Rights to use land in return for service	X		
Appropriation of property income, fees or taxes or fiefs	X		

A variety of means of remuneration was evident in the data, specifically income from labour with levels of worker and their remuneration differentiated. While the right to access goods and services is evident in the data, who specifically was eligible to receive grain was not made clear, other than the owners of large estates and those working their own land. Who, for instance, could access the grain store in the palace at Maşat Höyük? How were these military and civil field officers and palace servants remunerated? In relation to the servants in the Hattuša palace household, there is evidence in the LSUs that cupbearers, singers, bodyguards and others were provided with means of support in the form of productive cultivated land. The right to use land was formally set out in LSUs and small local grants. Reference was made to the appropriation of income via property, fees and taxes or fiefs in the instructions and in correspondence.

Table 3f: Managing compliance

Methods to manage compliance to commands and official expectations: sub-dimensions	Clearly evident	Evident	Not evident
Identifying types of indiscretion	X		
Disciplinary system	X		
Responses to command/discipline: obedience/defiance	X		

Each of the managing compliance sub-dimensions was judged to be clearly evident. Types of indiscretions and the sanctions attached to them, including for capital crimes, were well detailed in the instructions and in Hittite laws. Expectations of compliance to the king's commands are evident in correspondence. Officers would have had no doubt about what was expected of

them and what would follow should the king's orders not be carried out promptly and willingly. Prisoners were blinded as a means of preventing escape. However, while explicit, laws were not always complied with, as in the example of the female slave and absconding deportees. Ways to defy authority or get round regulations could be found. If such disobedience was discovered, the perpetrator may have been blinded, or worse.

6.1 Summary

Based on an evaluation of findings from archaeological and textual data with the framework developed from relevant literature relating to administrative attributes, the Hittites had an advanced organisational system in place that allowed them to plan agricultural production, command authoritatively, implement instructions to administrative officers both routinely and contingently, remunerated personnel according to their rank and gender and managed compliance through disciplinary and legal systems. Only the capacity to test for technical competence to carry out a particular task and assess the experience of officers for a specific task was missing. This may not be surprising if many of the more responsible jobs were automatically given to members of the royal family because of their personal connections, rather than on merit. However, it would be instructive to know on what basis lower level workers were appointed to their positions, for example military and civil field officers. Overall, this evaluation suggests that the Hittite system met the majority of dimensions of a rural administration.

CHAPTER VII: CONCLUSIONS

This thesis sought to investigate the state of Hittite rural administration. A secondary objective was to ascertain if technological innovation could be detected as a trigger for social and administrative change. The rural economy was considered an ideal vehicle through which to address these aims, because of its essential role in society, its relatively underdeveloped status in Hittitology and hence the opportunities presented for generating new knowledge. The conclusion reached is that the Hittites had a well-developed system of administration in general and in the rural sector in particular ¹⁸. An analysis of administrative capacity based on the identification of six major dimensions and sub-dimensions in the literature show that the Hittites developed their administrative system to a high degree. Although there is still much to be revealed about how the society and the rural sector functioned as more evidence comes to light, a clear picture is emerging about how an administrative system was structured, how it functioned and how effective it was in achieving the goals of maintaining a strong state, protecting its territory and expanding its borders.

Hittite administrative practices had their origins in the Old Kingdom period, and possibly as far back as the Old Assyrian Colony Period. Thus continuity in administration is evident from this early period through to the Empire period. Although the pace of social and administrative change accelerated after the 16th century BC, many of the achievements of this later period rested on an Old Kingdom foundation. This continuity and endurance may, however, have been a factor in the weakening of the Hittite state, if a propensity to rely too heavily on tradition obstructed a flexible approach to managing problems such as climate change and new groups of migrants to the region.

The climate in Central Anatolia can be harsh. Nonetheless, the Hittites managed to grow a variety of grains and legumes, develop a pastoral sector, establish

¹⁸ This conclusion is drawn, notwithstanding some unevenness in the textual and archaeological evidence in terms of chronological and geographical distribution of the data (Mielke et al., 2006; Seeher, 2006a). However, the data available provided ample evidence on which confident conclusions could be made.

orchards and manage forests based largely on a dry farming regime, relying predominantly on rainfall possibly supplemented by canal irrigation. Recent evidence shows that the period from the Early Bronze Age in the late 3rd millennium BC and again in the late 2nd millennium BC, just prior to the end of the Hittite civilisation in Central Anatolia, experienced dry to severe dry periods with regular droughts. The Hittites were thus obliged to manage rural production in a period of climate change through a system of surplus production, evident in the extensive grain storage facilities at Hattuša and at other regional centres, for which preplanning and ongoing surveillance were necessary preconditions. This suggests that they had developed the capacity to adapt to the prevailing climatic conditions and to cooperate to meet their objectives and survive in spite of the challenging climate (Bentley, Lipo, Maschner, & Marler, 2008)¹⁹. Evidence suggests that yields of two- to threefold were achieved; not high compared to modern standards, indicating that the volume of the area cultivated was as important as its yield, an objective to which the Hittite scrupulously attended.

Anatolia was widely settled in the period of Hittite occupation. Although the literature suggests a flat administrative structure to manage these settlements, with only a few levels between the command function and the execution function of a command, in fact it was fairly hierarchical. The king, his civil and military advisers and scribes at the capital were replicated in the regions with up to three levels in the capital and four in the regions. Rural life revolved around small family-sized landholdings that were either owned outright or rented by land tenants. Deportees (NAM.RA.MEŠ) could also own land, marry and have free born children, although they were also enlisted to settle new towns, particularly in the border lands where risk of enemy attack was heightened. Slavery was a known feature of Hittite society, however, there is surprisingly little mention of this social status in Hittite texts. Larger holdings

¹⁹ Several authors (Dunnell, 1999; Sterling, 1999) raise the issue of 'waste' to define the use of energy for activities other than reproduction, for instance on monumental building projects. This aspect has not been investigated in this thesis, although the uses to which the Hittites were able to put their surplus production for purposes other than reproduction is a beneficial consideration in terms of being able to meet broader aims as outlined at the outset of this thesis.

existed in the form of agricultural and pastoral estates granted to the elite, special foundations or to retainers as income-producing concerns, such as the royal family, temples and royal funerary structures and singers/cupbearers respectively. A leadership role would have been expected to be evident from the owners of such estates, although this does not seem to have been the case. Rather, the post governor was responsible for organising workers for projects on estates and throughout the region. He was also responsible for distributing rations to workers and for collecting taxes of goods and labour from those from whom it was due. Special foundations, such as the royal funerary structure, were notably exempt from taxation at the time that the LSU grant was given. While these estates did seem to play an organising role in relation to cultic functions, the extent to which this occurred is not yet clear. Similarly, the economic role of temples in the collection, storage and distribution of foodstuffs for tax purposes, over and above the storage of their own independent produce, is not yet clear. While the temple at Hattuša clearly had such a function, this may not have been the system in regional centres. This function appeared to be the responsibility of the central palace administration in the region located in the main building of which a temple may have been a part. At Maşat Höyük, where the palace building also exhibited temple architecture, a possibly integrated function may have operated. The temple's economic function at Kuşaklı/Şarišša, however, was evident. Elucidation of this point may come with the excavation of the Lower Town at Maşat Höyük where Özgüç believes temples to be located.

A division of labour in respect to function and gender is evident from the texts. Women were paid less than men for agriculture-related labour, although the literature suggests that women could hold skilled, high-profile jobs. That mixed labour groups were paid less may have caused problems for those men expecting to receive bigger rations for their labour. However, the majority of woman may have been engaged in household activities, especially labour on the farm. A division of labour is also evident between civil administrators and military field officers. The latter, possibly both veterans and recruits, were most probably those responsible for attending to the king's urgent exhortations to protect the sheepfolds and to harvest the grain. Although the literature indicates

that the king may have been a 'micromanager', making decisions about the smallest of issues, the texts suggest otherwise. Both the civil administrative officer and the military field officer were responsible for taking decisions in the field, and the reliance of the king on, and his discomfort from such reliance, is evident in correspondence. Things didn't always go as the king had planned, and he was often forced to await the actions of others. Further, decision making was often dependent on augury, that either the king himself or priests practiced on his behalf. Such decisions were mentioned in relation to forward military strategies to divine future activities of the enemy or the likelihood of Hittite military successes.

Protecting the local population and responding to enemy raids, mostly by the Kaška people in the north, was a constant occupation for military officers in the field as well as for the scouts. Evidence suggests that the Kaška raided towns, as did the Hittites, based on the level of security and surveillance described for the urban inhabitants and the vigilance of scouts for the inhabitants. Their most frequent incursions were small 'smash-and-grab' raids of crops, cattle and people, especially shepherds and oxherds who looked after the flocks. Raiding bands of ten to thirty persons were mentioned, although bigger raids of several hundred raiders occurred, and on one occasion numbering in the thousands. Thus, not only did the Hittites have to manage their natural resources in a relatively harsh climate, they also needed to protect them from depredation of the enemy and from natural predators, such as insect infestation, in the fields and in the silos. In this regard the Hittites did not just practice defensive tactics but mounted aggressive campaigns into Kaška territory.

In terms of general systems, scales were used for measuring and weighing goods for sale in trade. Copper weights were used, forged in the metal workshops in the provinces near to mines. Measures such as the *PARISU* and *karsi* were used for weighing grain. There does not seem to have been a system for surveying and allocating land. Although sizes of land parcels are given, including the *kapunu*, *IKU* and *gipeššar*, a particular parcel of land was identified by its general location. The Hittites differentiated types of cultivated

farmland, pasture land, land suitable for forests or orchards and land suitable for animal grazing. Systems of record keeping were commonly referred to, including the volumes of grain in storage facilities, records of those eligible to access specific facilities, and the records that the post governor kept for accounting to the provincial governor. More permanent record keeping is evident in the presence of archives, epitomised by the retention of LSUs over a long period of time. The instructions and Hittite law are also examples of record keeping of a public nature to guide actions and expectations and to outline sanctions in the event of non-compliance. These instructions and laws, while covering a wide range of subject matter, contained specific reference to agriculture. The instructions set out these expectations in the form of a 'duty statement' that officers in particular positions carried out. Civil administrative personnel were responsible for surveillance of the population, to ensure people acted as expected and that wrong-doing was identified and punished.

Specialised craft production facilities also existed in Hittite society associated with agriculture. Pottery was used for small and large scale storage purposes and standardised for specific purposes. Metal, stone and wooden tools were used in agriculture and suggest specialized production for sickles, rakes and knives, and weights and measures. Stone was used for grinding, wood for implements for threshing the grain and possibly transport, and basketry for sieving. Leather production existed for harnesses.

Based on the above assessment, it is apparent that the Hittites had a clearly identifiable and developed system of rural administration in place. However, a propensity to rely on traditional methods developed early in the Old Kingdom and continued into the Empire period may have precluded a propensity to manage emerging problems such as the migration of new groups into Hatti and fluctuations in climate that affected food production. In relation to the specific link between technology, social and administrative change, production forecasting, grain storage and water management are areas where this link can most readily be seen. The relationship between these entities may benefit from further research.

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