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Colonizing Cattle: The Zooarchaeology of a Military Frontier in the Egyptian-Nubian Borderlands

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by

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ABSTRACT

Colonizing Cattle: The Zooarchaeology of a Military Frontier in the Egyptian-Nubian Borderlands

by

Shayla LaDawn Monroe

In this dissertation I examine the faunal remains of the Middle Kingdom Egyptian fortress of Askut, a stronghold on the Egyptian-Nubian border at the height of political tensions between ancient Egypt and Kush (1850 to 1550 BC). The aims of this investigations are: 1) to examine the relationship between the exchange of cattle in Lower Nubia, and Egyptian-Nubian geopolitics, and 2) to explore the complex intersection between climate change, colonialism, herd collapse and the cultural fragmentation of the Nubian C-Group, a group of semi-nomadic agropastoralists in the path of Egyptian colonialist expansion. I employ the archaeology of political ecology to parse through the various effects of Egypt's colonial presence in Lower Nubia, including the impact of the Second Cataract fortresses on the Lower Nubian landscape, the impact of military surveillance on pastoral seasonal mobility, and the Egyptian influence on the transformation of *Bos taurus* from a religious and

cultural symbol to a commodity with a crucial exchange value in regional trade. I use zooarchaeological methods to quantify the amount of cattle in this archaeological context and I compare those measures with equivalent data taken for sheep, goat, and pig remains. After comparing the economic importance of each species, I use several analytical models from three zooarchaeological studies to interpret specific archaeological correlates indicating possible exchange strategies of Lower Nubian herders in the vicinity of Askut. These correlates show how livestock transactions were advantageous or disadvantageous for the participants involved in local exchange, including Lower Nubian herders, Egyptian military personnel, and subsequent Egyptian colonists living in Askut. I also osteometric analysis to ensure the cattle in this assemblage were locally raised, as opposed to provisioned to Askut from herds to the north (within Egypt proper), or from Kerma's abundant cattle resources to the south. Results from these combined analyses are summarized for each chronological period of Askut's occupation and then variables of each measure are tested for statistically significant differences a) across spatial context and b) over time. The sum of these results will explain 1) the manner in which Egypt provisioned soldiers on its military frontiers, 2) the effect of asymmetrical power relations on cattle exchange between Lower Nubian herders and Egyptian soldiers and subsequent elite Egyptian colonists, and 3) the overall nature of the inter-regional distribution and movement of cattle in and around Lower Nubia during the Middle Kingdom and Second Intermediate Period. By clarifying the association between multiple causes of the decline in Lower Nubian cattle herding, along with adding a new, tightly controlled time frame, this dissertation offers a practical archaeological model illustrating how climate change, colonialism, and herd collapse worked together to exacerbate the cultural fragmentation of the Nubian C-Group.

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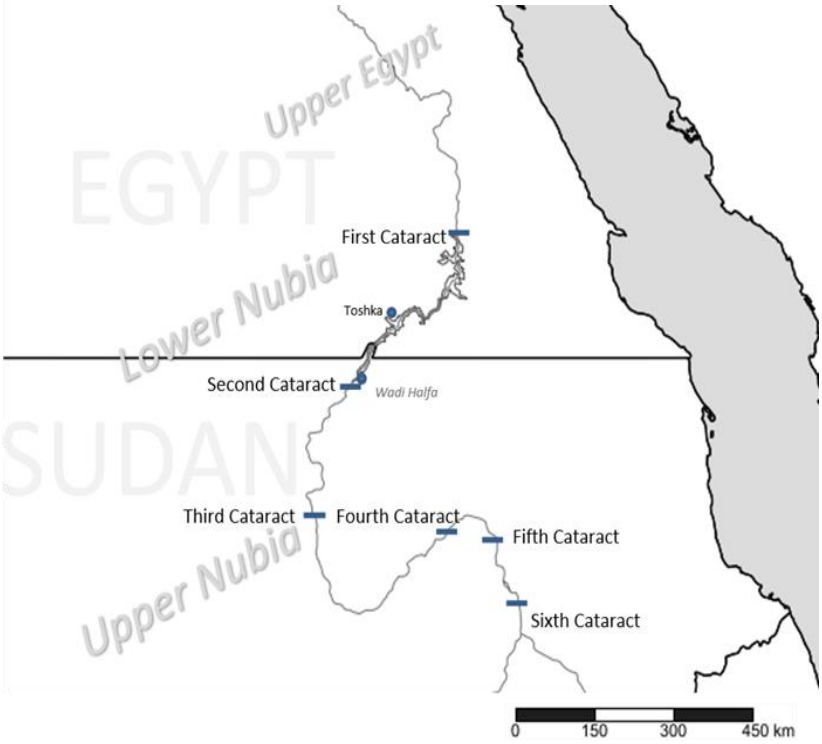
Chapter 1: The Political Ecology of an Ancient Military Frontier

1.1 Topic and Context

This is an archaeological study of colonialism, pastoralism, and ethnic interaction along a borderland between pharaonic Egypt and the inhabitants of Nubia in the ancient Middle Nile Valley. As I explore and interpret patterns of cattle exchange during Egypt's colonialist expansion into the Nubian territories to the south, I seek evidence of pastoralist agency in the archaeological record. Specifically, I analyze the osteological remains of animals excavated at Askut, an Egyptian fortress erected and occupied at the Egyptian-Nubian border in the Middle Kingdom, c. 1850 BC. Drawing on prior zooarchaeological models, as well as written records of the Egyptian state, of political dynamics between cattle pastoralists and non-herding, meat-eating populations in ancient state societies, this project assesses whether or not herders had the political economic autonomy to enact herd management strategies that protected reproductively valuable animals from exchange.

The political circumstances of Lower Nubian herding groups may have changed over time with the ebb and flow of empire. I am particularly interested in any differences in cattle exchange and meat consumption at Askut before, during, and after the massive conflict between Egypt and Kerma between 1680 and 1550 BC. This was a span during which Egyptian hegemony and boundary maintenance was impaired by serious internal troubles in the homeland (the Second Intermediate Period, 1680 to 1550 BC) before the new, Thutmosid pharaohs of the New Kingdom reimposed their military power on the Middle Nile, crushing the Kerma polity and controlling more of the pastoral hinterlands' people.

Figure 1.1 Map of the Middle Nile River Valley with cataracts marked.



The people of Pharaonic Egypt often looked to Nubia, or Kush, for one of their most symbolically and economically important animal resources: cattle (Lobban 1989; Spalinger 1980). Kush referrs to the land south of Egypt, from the Middle Nile to the Upper Nile Valley (see Figure 1.1 above). Sometimes these cattle were acquired through recognized forms of exchange, while other times cattle were taken by force, as when the Egyptian pharaoh Snefru (2613-2589 BC) led a military campaign against Nubia and is recorded as returning to Egypt with 20,000 cattle as spoils of war (Smith 1997). Kerma (ca. 3000-1550 BC) was one of several state level societies located in Kush. When Kerma grew into an expansionist state (c. 1680-1500 BC), it controlled an extensive network of cattle exchange often associated with cattle-centered rituals related to the death of its kings. The magnitude of this network is attested by the displays of sacrificed cattle in the royal cemetery of Kerma (Chaix 1986, 1988, 1992). One king's tomb in particular boasted an awe-inspiring display of

over 400 bucrania from cattle sacrificed upon his death. Earlier displays of bucrania at royal tombs were even more impressive, with another king's display consisting of over 4000 cattle (Chaix et al. 2012). No single pastoralist community could have afforded to sacrifice that many animals, especially since some of the animals were females and calves, which constitute the core of a herds' breeding and survival potential. The magnitude of cattle sacrifices associated with royal burials led Louis Chaix to postulate that Kerma's control of regional cattle exchange networks was authoritative and far-reaching (Chaix and Grant 1992, Emberling 2015).

As tensions steadily grew between Egypt, Kerma, and non-state actors such as the Nubian C-Group, a mainly pastoralist group in the Nile hinterlands, the Egyptians built a series of fortresses in the Second Cataract region (map). While settlement patterns of local Nubians appear to be unaffected by the presence of the fortresses (Smith 2003), documentary evidence mentions fortress residents acquiring cattle from local herders (Trigger 1976). In this dissertation, I seek to understand how cattle exchange plays out in the relationship between Egyptians and Nubians in this political borderland. Ultimately, Kerma was defeated by a series of pharaonic military campaigns circa 1550 BC, but for a span of almost 2000 years before, these two polities coexisted in varying levels of dominance along the Nubian-Egyptian borderlands.

Between and around Egypt and Kerma, the so-called C-Group, a complex pastoral society, used their mobility to engage in interregional trade— either as facilitators or marauders, depending on the period (Hafsaas-Tsakos 2008). Trading routes between Egypt and Kush became increasingly important to C-Group herders as their chiefs used Egyptian luxury items to compete for followers and power (Trigger 1976; Hafsaas-Tsakos 2008).

Towards the end of their long existence tin Lower Nubia, material evidence of class stratification emerges (Anderson 1996). While archaeological and historical evidence suggests that at least one paramount chiefdom rose to power in C-Group-occupied, Lower Nubia, their political structure did not centralize to the degree of a state-level society (Hafsaas-Tsakos 2008; Trigger 1976).

The Askut faunal assemblage was collected from an Egyptian imperial fortress, built on an island near the Second Cataract of the Nile River. After its construction during the Middle Kingdom (c. 1850 BC), the site was occupied by military and administrative personnel from Egypt (Smith 1995). Over this time, Kerma and Egypt participated in large-scale trade, periodically disrupted by military posturing by one side or the other. Egypt's conquest of Nubia during Middle Kingdom times brought the C-Group into pharaonic Egypt's geopolitical and economic domain. Cattle raised by local pastoralists may have played an important role in provisioning this and other Egyptian garrisons and later colonial communities. If the garrisons were not directly provisioned with meat by pharaoh's administration, its residents would have to acquire meat from local Nubian herders via exchange or some other means, possibly including coercion.

Linguist-archaeologist Rilly (2012) and other scholars (e.g. Buzon 2011; Trigger 1976) have argued for a common ancestral relationship between the C-Group and the Kermans, based on linguistic reconstructions, ceramic styles, and dental affinities. Even though these groups were distantly related, they likely had competing economic interests in the borderlands between Egypt and Nubia. Subsequent interpersonal alliances between elite Kermans and colonists at Askut, including lucrative trading and intermarriage, seem to point to an allegiance that to an extent bypassed C-Group pastoralist interests (Smith 2003).

Nonetheless, it was strongly suspected that C-Group herders continued to trade with Askut, which depended upon them for much of the animal products consumed.

1.2 Focus and Scope

To explore the nature of these relationships, I monitor changes in cattle provisioning and meat consumption at the ancient Egyptian-Nubian borderland site of Askut over the span of three centuries, which saw critical shifts in power relations between Egypt and the Kerma (1850-1550 BC). Askut is unique because it was created as an Egyptian colonial fort but was later occupied by residents of various ethnic groups as Egyptian power ebbed, during the span known in Egyptology as the Second Intermediate Period (1680-1550 BC). Thus, Askut emerged as a multiethnic settlement supported by a hinterland that included pastoralists (Smith 1995). This study considers evidence of cattle acquisition among various groups interacting at Egyptian-Nubian border: soldiers, administrators, colonists, traders, C-Group herders, and Nubian mercenaries patrolling the Egyptian frontier. I compare evidence for C-Group herd management strategies during times of relative peace with times of intensified political aggression from Egypt. Archaeological evidence and historical records indicate that the daily lives of Lower Nubian elites seemed to go on without disruption after 1550 BC, particularly at Askut (Smith 1995, 2003). Changes in daily life may have been more significant for people less well represented in Egypt's historical records, such as the herding peoples who lived on the margins of these states. Several questions arise. How can we unearth? the strategies employed by Nubian herders and Egyptian administrators in the course of daily and yearly livestock transactions? Can we see changes in exchange patterns once the region is under Kerman control? How can we determine if a difference in political power influences the outcomes of cattle exchange? During the height of Egyptian hegemony,

regional administration was controlled by the central office of the Vizier in Thebes, with local representatives based in ports and storerooms near Egyptian forts in Lower Nubia such as Kuban, Aniba, Buhen, Mirgissa and Semna –see map in Chapter 5 (Smith 1998; Michaux-Colombot 2014). This thesis offers the first comprehensive analysis of fauna from any of the fortresses in the region.

To explore these questions, I propose several hypotheses concerning the provision of cattle to inhabitants of Askut during different chronological phases of occupation. I test these hypotheses using conventional laboratory analysis of faunal remains aimed at recognizing the regional origins of cattle acquired at Askut. Morphological differences make possible discernment of whether the Askut cattle population has tall and gracile skeletons, similar to Kerma cattle, are shorter at the withers and more robust, similar to pharaonic Egyptian cattle, or resemble other documented populations in northeastern Africa.

The results of the analysis contribute to understanding of ancient Africans' experience raising and trading cattle. In the case of Askut, that experience is entangled with colonialism, imperialism, and with collective human responses to climate change. Pastoral peoples moved their cattle through a landscape where rivers were drying up, formerly fertile soil turning to dust even as pharaohs erected enormous stone monuments to inscribe their claim to land that was ancestral, sacred, and economically crucial to a variety of cultural groups. Gaining or maintaining access to pasturage and water is more than an economic problem, it is a political one as well (Chang and Koster 1986). Thus, much of this dissertation is not so much about people eating cattle as it is about the politics of raising and trading cattle before, during and after Egypt's colonialist expansion. The sections on climate change are less about simple human responses to changing rainfall, and more about how one

group can constrain the ways and the extent to which another group can respond to such changing weather patterns.

1.3 The Rationale for Zooarchaeology

Faunal analysis can shed light on the impacts of the larger geopolitical struggle between Egypt and Kerma on the lives of herders, but it can also illuminate the choices that herders made to maintain their herds, while dealing with Egyptian colonists. As with other archaeological specialties, relational analogies are pervasive in zooarchaeology, where analogical relationships are linked to causal and systematic inferences. The identification of zooarchaeological specimens and inferences about animal life history, behavior, and ecology, are based upon complex relational analogies (LeFebvre and Sharpe 2017:39; Gifford-Gonzalez 2018).

1.4 Relevance of the Research

This project contributes concrete faunal evidence to an ongoing discussion about the role of cattle, and of the people who raised them, in the economies of Middle Nile Valley cultures (Chaix and Grant 1992; Emberling 2014; Hafsaas-Tsakos 2008; Lobban 1989; Wengrow et al 2014). Besides the royal cemetery at Kerma, well-preserved – and well-documented – collections of animal bones with which models drawn from this literature can be tested are rare. Many site reports from salvage excavations remain unpublished and inaccessible, and early excavations in the region did not systematically collect faunal remains, if at all. Torok (1997) reports on a large body of unanalyzed survey and archaeological data from the Middle Nile Valley, such as reports and preliminary analyses from the Aswan High Dam Salvage Campaign. In terms of zooarchaeology, faunal remains

from Middle Nile Valley sites tend to display high levels of fragmentation due to taphonomic processes (El Mahi 1982; Peters and Pollath 2004; Pollath 2011). Analysis of the Askut assemblage is therefore a crucial cpntribution: excavation of the assemblage was well-documented, and the state of preservation is quite exceptional. It is presently the only assemblage of its kind recovered from Lower Nubia and thus offers a chance to test several hypotheses concerning Nubian pastoralism that would otherwise be impossible. My research questions are appropriate for this assemblage because the finely tuned provenience data could show changes in certain variables over time, including species ratio, age and sex markers, and even bone element size and shape. This assemblage may also provide a key for later work with the region's less well-preserved samples mentioned above.

While prior studies of cattle exchange provide a cursory examination of exchange within Egypt, or exchange within Kerma, the exchange of cattle at the Egyptian-Nubian border, and the political economic nature of that exchange, has gone largely unstudied. No other systematically collected samples from Lower Nubia represent a continuous record that spanns the critical transitions between Egyptian and Nubian control of the region. The results of this study offer a fresh viewpoint for assessing the intergroup relations involved in cattle transactions, which other regional scholars can use to interpret their own faunal evidence.

The political economic structure of cattle exchange and distribution in the Middle Nile has largely gone unstudied (but see Emberling 2015 for the role of cattle in Kerma's internal political structure, Smith 2003: Loc. 1709 and 2938 for the political economy of cattle tributes to Egypt from Nubia, and Moreno-Garcia 1999 for the role of cattle as a commodity in Egyptian institutions). Much of the research on cattle in ancient Egypt and Nubia has focused on either original domestication and spread of specific cattle breeds

(Gifford-Gonzalez and Hanotte 2011; Grigson 1991; McDonald 1998; Marshall and Hildebrand 2002; Smith 1996; Wendorf and Schild 1994) or on the ideological and ceremonial significance of cattle in Nile Valley cultures (Barich 1998; Hassan 1998; Richards 1999; Wengrow 2001).

Chaix interpreted the vast displays of bucranea sacrificed at the royal tombs of Kerma as representing "living" herds in terms of age and sex ratios (Chaix 1986). The proportion of productive females and young calves in the sacrificial "herds" led Chaix to interrogate the power relations between pastoralist groups and the Kerma state. He postulated that a tribute system cast over a vast regional territory would be the most likely way for the royals of Kerma to acquire so many cattle without devastating any one portion of the regional cattle economy (Chaix and Grant 1992). However, Chaix and Grant (1992) confess that the hypothesis could not be supported by existing evidence. The Kerma state possessed institutionalized means of food redistribution, but lacking written records, mechanisms of this redistribution are unclear (Smith 1998). Middle Nile Valley researchers have been forced to speculate about the cattle trade without a significant amount of faunal evidence on which to base their models (Bradley 1985; Emberling 2015). Some researchers argue that pastoralism was vital not only to the economic structure of Kerma, but also to the economies of the successive Sudanic kingdoms including Napata and Meroe (Ahmed 1998, Emberling 2014). The Askut excavations uncovered the evidence we needed to test some of these theories.

The political relationship between the Nubian C-Group and the Egyptian state should be examined more thoroughly through the lens of political ecology, as well as anthropological theories of culture contact. Political structures among cattle pastoralists vary,

but some common qualities include moving through the landscape with different aims, perceptions and needs from those of specialized agriculturalists, while having a different conception of territoriality and land ownership. Ethnographic studies of African pastoralists illustrate a different relationship or attitude to centralized and hierarchical authority (Salzman 2004:125-127).

One pattern observed in study of the Nubian C-Group identity is the long-lived continuity of their ornamental bodily display constituting a material ethnic performance (Smith 2003; Buzon 2011). For 800 years, C-Group burials display a consistent style of dress that defies assimilation into either of the powerful state-level societies of pharaonic Egypt or Kerma, both of which whom the C-Group had prolonged and intimate contact. Archaeologically, we can recognize their signature dress and clothing over long distances and across a long span of time, even when they migrated far from home in smaller numbers. C-Group communities that migrated to Egypt proper from Lower Nubia maintained this C-Group material performance, according to both their burials and Egyptian artwork depicting their clothing. Smith emphasizes that C-Group style of dress and ornamentation set them apart from members of other groups interacting in the region (Smith 2003, Location No. 1973). He argues that it was "cultural solidarity," as evidenced by this consistency in adornment, that allowed the C-Group people in the Wawat region to resist Egyptian dominance for centuries (Smith 2003, loc.1609).

The 800 years of C-Group cultural continuity included both spans of climate stability and those of supra-regional environmental crises. Such climate crises have been seen as the engine for economic chaos and major sociocultural changes (Gatto and Zerboni 2015). It is

my hope that this dissertation lays the foundation for a more comprehensive study of the relationship between climate crises and Lower Nubian responses to colonialism.

1.5 Interpretive Frameworks: Time Scales and Analogy

Wallace Budge (1899, 1969) called the Sudanese/Gash Delta tribes the "living fossils" of Egypt (Schwabe 1978:31). Hopefully, Budge's view on ethnoarchaeology is extinct, as Wengrow (2001) and others have heavily criticized it and pushed the discourse beyond frameworks that conveniently and uncritically find living peoples "unchanged" after 6000 years. Drawing heavily from Dahl and Hjort (1976) and other ethnographic sources on African pastoralism, I do consistently employ ethnoarchaeology to seek more limited analogies, often associated with climate, ecology, or animal species requirements (e.g. Dahl and Hjort 1976; Dyson Hudson 1962) Analogies I present are frameworks for testing, from a perspective that respects both the ingenuity of. and the diversity among. African pastoralists.

1.6 Political Ecology and Archaeology

The study of Askut's fauna brings the relationships among cattle, colonialism, and climate change together in the nexus of political ecology. As an alternative to an 'apolitical' cultural ecology, political ecology seeks to situate human-environmental relationships within the currents of broader political circumstances. (Morehart et al. (2018) argue that the origins of political economy in Western philosophical thought are markedly environmental, especially in terms of power and property, and that the "consequences of environmental crises on the social fabric" have a central and pivotal political component.

The politics of northeastern African pastoralism are best understood by foregrounding the differential political positioning of separate groups of cattle keepers. From the very

beginning of social complexity in the Nile Valley, competing interests between pastoralists and farmers created political complications that had to be dealt with collectively. This is the foundational trajectory for the ongoing relationship between farmers and herders as "proximate others." If, from the very beginning, politically stronger groups were more able to impose their will on other groups physically and ideologically, the subsequent constraints on decision-making would factor into any cultural responses to climate change.

Political ecology in archaeology is founded on a long and diverse history examining issues of environment, human-nature relationships, ontology, property, power, and inequality (Morehart et al. 2018:5). Ontology, the study of being, or the *nature* of being, is the domain that shows the relationships between a set of concepts or categories in a subject area. Environmental archaeology focuses on the "systemic relationships among people and their environments" (Reitz and Shackley 2012, Albarella 2001; Branch et al 2014; LeFebvre and Sharpe 2017). Like other branches of environmental archaeology, zooarchaeology often uses environmentally derived data as a primary point of inquiry and material reference (LeFebvre and Sharpe 2017). I follow this point of inquiry with an examination of how relations between groups, or classes, affect these practices of animal and environmental exploitation.

1.7 Overview of the Structure and Objectives

One of the central foci of this project isthe ways in which Egyptian colonialism may have disrupted the everyday lives of Lower Nubian pastoralists. I seek evidence of cattle herd management practices during a certain historical-ecological moment when "natural" life histories were on a collision course with colonial expansion and military frontiers.

Chapter 2 of this dissertation explains the unique relationship between *Bos taurus* and *Homo sapiens* in northeastern Africa, one of the most enduring examples of entanglement between human adaptation, ideology, nature, and culture. The ways in which cattle factor into the ongoing human struggle with fluctuations in humidity and aridity require a long durée perspective of cultural responses to climate change in the Nile Valley.

Chapter 3 explains the relationships among cattle-keeping, incipient agriculture, and complexity in the Nile Valley. In Chapter 3, I aim to explain the sociopolitical aspect of cattle-keeping and group interaction during the rise of the Egyptian and Kerman states. The chapter highlights how subsistence pastoralists interacted with the series of polities that developed into the pharaonic Egyptian state. I argue that cattle-keeping, with its social entanglements and its conflicts, is key to understanding the roots of pharaonic Egyptian social identity as well as Egyptian attitudes towards nomadism.

Chapter 4 accounts for the emerges of cattle-centered institutions in the pharaonic Egyptian state. Ancient Egypt developed systems for raising, distributing, and transporting cattle throughout its bounded territory. Chapter 4 also reviews the literature on cattle taxation and ownership in pharaonic Egypt in relation to temples and state-owned farms.

Chapter 5 maps the political ecology of the Second Cataract region leading up to the Egyptian Middle Kingdom. I look to Givens (2004) for a bottom-up approach to the archaeology of colonial relationships, and I modify his approach, as needed, to accommodate pastoralist/non-pastoralist interactions. Chapter 5 continues the theorization of cattle as property begun in Chapter 4, while following with a study of how labor, taxation, and surplus, are all moving parts in mechanisms of interaction between the Egyptian state and Lower Nubian pastoralists. These mechanisms are placed in their historical-ecological

context as a foundation for the presentation of my central research questions and hypotheses in Chapter 6.

In Chapter 6, I discuss previous zooarchaeological studies that use faunal analysis to examine competing interests between groups, in hopes that Askut can yield similar, specific correlates such as mortality and sex profiles that researchers, namely Zeder (1988; 1991) and Reid (1996), used to examine similar questions. Also Hesse & Wapnish on military settlements I describe the methods I will employ to identify the variables and the correlates needed to address the research questions as I transition into Chapter 7.

Chapter 7 presents a graphical story of the analysis results with explanations for these, as well as their relation to the central hypotheses presented in Chapter 6. A series of charts illustrates and contextualizes how each set of variables change over time and often differ according to contexts. Some results, such the actual sizes of the cattle found at Askut, were a bit surprising, but these unexpected results are placed in historical context as I compare my findings to my previous predictions and a broader, northern African dataset. I will address each research question and hypothesis in light of the data presented in the chapter.

Chapter 8 will briefly summarize and discuss the results of my research, along with the implications of this research to the broader study of the cattle trade and intergroup relations in the Nubian Nile Valley and surrounding deserts. While the ultimate per-element sample sizes for individual correlates needed for analysis were a bit disappointing, the data collected and analyzed here do offer compelling and previously unknown information about cattle management practices in ancient Lower Nubia. The chapter concludes with a

discussion of the original goals of the project and the findings in the context of the broader region's political ecology, especially the fate of the C-Group after the defeat of Kerma.

Chapter 2: Climate and the Development of Cattle Pastoralism in Northern Africa

Dramatic climate change in the early Holocene brought three major changes to human subsistence across North Africa: a decline in the gathering of wild plants, an increased reliance on pastoralism, and the development of intensified agriculture (Gatto and Zerboni 2015). In this chapter, I review the archaeological evidence for these changes and their cultural implications in the Middle Nile Valley region. First, I discuss the environmental factors that led to major changes in human subsistence and social organization. Second, I discuss the gradual development of pastoralism and the social implications of increased human mobility across the Sahara region. Finally, I describe the development of sociopolitical complexity in the Sahara and the Nile Valley, with an emphasis on the role of pastoralism. The final desertification of the Sahara brought large groups of people with cattle-centric ways of thinking into contact and conflict with people who privileged intensified, sedentary agriculture. These conditions of contention during times of environmental stress formed the baseline for long-term relations between the Egyptian state and Nubian pastoralists, the nature of that relationship being the topic of this thesis.

2.1 *The Sahara and the Nile*

The human settlement history of the Nile Valley is closely tied to human activity in the Sahara, including the proliferation of Saharan cattle pastoralism. This section briefly explains the climatic processes and geological contexts that enabled and stimulated the movement of people between the Sahara and the Nile, bringing sweeping changes to subsistence, ideology, and cultural practices. The emergence of food production and

population aggregation are not determined simply by environmental processes, but they are intimately connected to the geological setting and environmental conditions that create the landscape in which people live. Although some major cultural developments emerged simultaneously with climate events across northern Africa, the nature of the human responses to climate crisis varied across the affected regions (Gatto and Zerboni 2015).

2.1.1 *The Sahara in the Late Pleistocene Climate and Human Migrations*

Today the Sahara is one of the hottest regions of the world, formerly reaching temperatures of 113˚F (Grove 1980) and, recently, up to 158˚F (Gautier 2019). “Evaporation and transpiration losses from vegetation areas in the Sahara are greater than anywhere else in the world; it is the world's greatest desert” (Grove 1980:11). The Sahara is bounded by the Mediterranean and Atlas Mountain ranges on the north and bordered on the South by the Lower Senegal River, the great northward loop of the Niger River, Lake Chad, and the Sudd (a large swamp in South Sudan). The far eastern edge of the Sahara ends in Ethiopia and Somalia.

Figure 2.2 Graphic depiction of changes in settlement across NE Africa during the Holocene. Reproduced from Kuper and Kropelin (2006: 804).

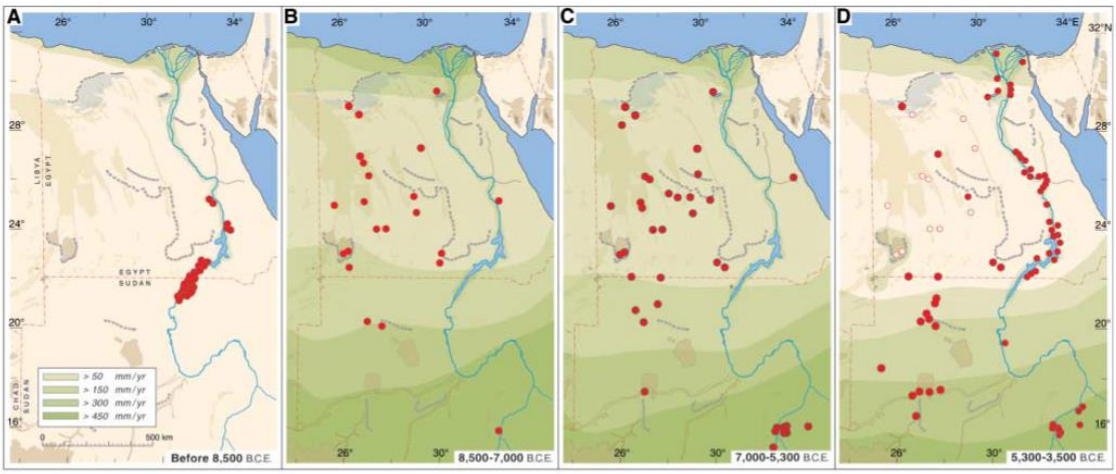


Fig. 3. Climate-controlled occupation in the Eastern Sahara during the main phases of the Holocene. Red dots indicate major occupation areas; white dots indicate isolated settlements in ecological refuges and episodic transhumance. Rainfall zones are delimited by best estimate isohyets on the basis of geological, archaeozoological, and archaeobotanical data. (**A**) During the Last Glacial Maximum and the terminal Pleistocene (20,000 to 8500 B.C.E.), the Saharan desert was void of any settlement outside of the Nile valley and extended about 400 km farther south than it does today. (**B**) With the abrupt arrival of monsoon rains at 8500 B.C.E., the hyper-arid desert was replaced by savannah-like environments and swiftly inhabited by prehistoric settlers. During the early Holocene humid optimum, the southern Sahara and the Nile valley apparently were too moist and hazardous for appreciable human occupation. (**C**) After 7000 B.C.E., human settlement became well established all over the Eastern Sahara, fostering the development of cattle pastoralism. (**D**) Retreating monsoonal rains caused the onset of desiccation of the Egyptian Sahara at 5300 B.C.E. Prehistoric populations were forced to the Nile valley or ecological refuges and forced to exodus into the Sudanese Sahara where rainfall and surface water were still sufficient. The return of full desert conditions all over Egypt at about 3500 B.C.E. coincided with the initial stages of pharaonic civilization in the Nile valley.

The Nile Valley has never existed in isolation from the regions around it, and it has had an especially strong articulation with the Sahara Desert. Extreme swings in weather cycles brought peoples from the Sahara and the Nile into regular contact for thousands of years throughout the Pleistocene and Holocene. The size and aridity of the Sahara changed between 2.58 million to 11,700 years ago, according to glacial cycles. During times of glacial growth, the Sahara was drier and larger than it is today. During interglacials, times when glaciers melted and sea levels rose, the Sahara was moister than it is today. During the Last Glacial Maximum (LGM), 26,500 to 20,000 years ago, residual water sources in the Sahara dried out completely, and the Nile Valley became of a refuge for people and animals (Gatto and Zerboni 2015, see Figure 2.1). The hyperaridity ended in 12,000 BC when the Intertropical Convergence Zone (ITCZ) spread towards Africa's Mediterranean coast, expanding the Sahel zone and its flora 800km to the north (Darnell 2007). In the ensuing

African Humid Period, the Nile Valley was intermittently inundated with extremely high floods, and Nilotic populations probably moved into what is now the Sahara (Kuper and Kropelin 2006). Such climate shifts and human movements played out within a supraregional geographic setting, meaning that people are moving between the Sahara, the Sahel, and the Nile Valley which, in some contexts, are three different geographic regions. To fully grasp human history in the Nile Valley, the relationships among these regions must be understood. It is necessary to consider three northern African regions, all of which respond to climate change. The Sahara is a vast east-west band of arid land in Africa, which expands or contracts according to rainfall on it. The Sahel, the east-west band of semiarid grassland and wooded grasslands south of the Sahara, which expands or contracts according to the same rainfall regimes that affect the Sahara. Finally, there is the Nile Valley, containing the northward flowing waters of the river Nile. This is more or less inhabitable according to rainfall in the Ethiopian highlands, the source of the Blue Nile, and the east-central African sources of the White Nile. As Figure 2.1 shows, human habitation of the Nile Valley has an east-west relationship with the eastern Sahara, with times of extreme rainfall causing Nile Valley dwellers to move into the Sahara, while times of extreme aridity in the Sahara, draws people from there into the Nile Valley.

Evidence for strategic plant use in the Sahara dates back to 15,000 BC, but plant domestication below the Sahelian belt did not develop before 2500 BC (Marshall and Hildebrand 2002). At sites like Wadi Kubanniya, paleobotanical evidence of intensified foraging and plant processing, along with an abundance of grinding stones, show populations staying in the area for more than one season while hunting, fishing, and processing wild plants more intensively (Wendorf et al. 1989; Marshall and Hildebrand 2002; Gatto and

Zerboni 2015). In the region of Aswan, Egypt, we see evidence of seasonal foraging in short-range movements along the wadis connected to the Nile. The hyperaridity ended in 12,000 BC when the Intertropical Convergence Zone, or ITCZ, spread towards Africa's Mediterranean coast, expanding the Sahel zone and its flora 800km to the north (Darnell 2007).

2.1.2 *The Creation of the Nile River*

The Nile River as we know it was created in several major stages, beginning 30 million years ago with the volcanic activity in the Afar region of Ethiopia creating the uplift of the Ethiopian highlands (Williams 2018:9). The Afar depression in Ethiopia is one of the most unstable parts of the world; it sits against the fault of the Atlas plate and contains several active volcanoes (Grove 1980). This volcanic activity created a formation call the Afro-Arabian dome. The dome fractured, leading to the formation of the Red Sea, the Gulf of Aden and the East African Rift. This fracturing created what we now call the Ethiopian Highlands, and from these high elevations from which the Blue Nile flows downward toward Sudan (Williams 2018:41-42). The Blue Nile cut a deep gorge across the Ethiopian Highlands between Lake Tana and the modern border of Sudan, to eventually become the primary contributor to the main body of the Nile (Williams and Williams 1980:212; Williams 2018:25).

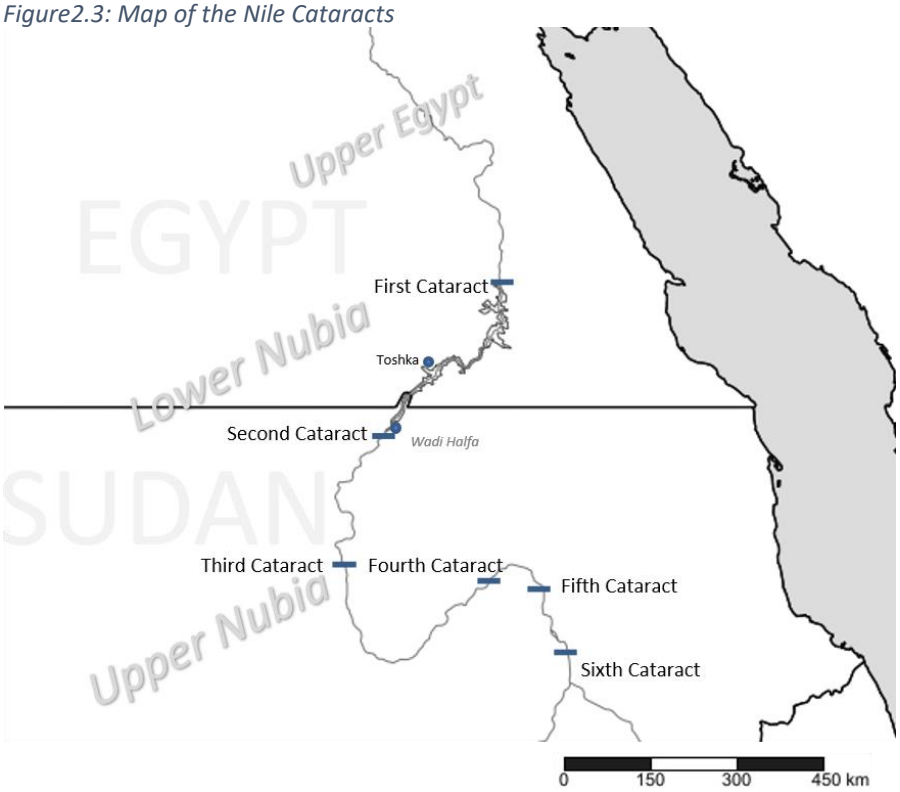
The fluvial canyon that forms the riverbed of the Nile River was created about 6.5 million years ago, when the expansion of the ?Arctic and ?Antarctic ice cap led to a world-wide drop in sea level. The paleo-Mediterranean Sea was a body of freshwater, but it changed to saltwater when it was cut off from all its major contributing sources except the paleo-Atlantic Ocean, leading to what is known as the Messinian Salinity Crisis around 5.9 to

5.3 million years ago (McKenzie 1999; Williams 2018:24). The paleo-Mediterranean Sea became a low-lying salt desert traversable by wildlife (Williams and Williams 1980; Williams 2018). During this time, the proto-Nile River cut a deep gorge into the salt desert floor. When ice at the poles melted in the early Pliocene, around 5.3 million years ago, the sea levels rose, and the sill separating the Mediterranean and the Atlantic was breached. The influx of marine water that abruptly covered the Mediterranean salt desert is known as the Zanclean Flood (Fielding et al. 2018; McKenzie 1999; Williams and Williams 1980:219). This Pliocene sea mixed with the Miocene salts, and its water flowed into and mixed with that of the Nile as far as the First Cataract at Aswan. As the saltwater receded, around 3 million years ago, the proto-Nile became the Nile River we know today (Williams and Williams 1980:219; Williams 2018).

2.1.3 *The Nile Floods*

Even Herodotus knew that the annual summer floods in Lower Egypt came from seasonal rains at the Nile sources (Williams and Williams 1980:208). The historic and modern Nile's three major tributaries, the Blue Nile, the White Nile, and the Atbara, make stronger contributions in summer (Williams 2018:53; Grove 1980), when monsoon rains over the Ethiopian highlands and the Ugandan lake plateau increases the flow these tributaries into the main body of the Nile (Gatto and Zerboni 2015:309). Each year, the Nile floods its banks, irrigating the surrounding flood plain, enriching ir with new silt. The Nile rises at the end of June and reaches its height around mid-August; the river then recedes in the middle of October (Park 1992:102).

Figure2.3: Map of the Nile Cataracts



Nile conditions were the same from the Middle Holocene until the completion of the original Aswan Dam in 1890, which preceded the High Dam built in the 1960s (Park 1992; Williams and Williams 1980). The range of Nile floods varies frequently and unpredictably. Geologists have been aided in calibrating Nile floods by human recordkeeping going back to the 4thMillenium BC. The Roda Nilometer kept a continuous record of Nile flood levels from 641 AD to 1890 AD, ending when the original Aswan Dam was completed (Williams and Williams 1980). Another Nilometer that was eventually damaged and/or abandoned, dated as far back to 3000-3500 BC (Williams and Williams 1980). In the historic Nile Valley, truly catastrophic floods were rare, except during the Early Dynastic and the Middle Kingdom periods (Hassan 1985: 95; Park 1992). Historically, the annual floods were not exactly "predictable" because their intensity and alluvial effects can vary greatly from year to year, changing the amount of optimally irrigated land available annually (Park 1992). Periods of consistently high Nile floods correspond with high rainfall periods in equatorial East Africa

(Park 1992), and the period cycles of high and low floods is also associated with the ENSO, or El Nino-Southern Oscillation phenomenon (Williams 2018; Ortleib 2004). Lower Nile flood variation today is less dramatic because of the Aswan High Dam.

The Nile Valley can be broken into three main segments along its length: The Lower Nile, the Middle Nile and the Upper Nile. The Lower Nile Valley begins at the Mediterranean Sea and ends at Aswan and is associated with the modern and ancient states of Egypt. Aswan has the first of the six cataracts of the Nile River; these are granite outcroppings with rapids that constrict the river's flow. The Upper Nile Valley, arguably, lies near the confluence of the Blue and White Niles, and spreads southward, placing it beyond the geographic focus of this thesis. The Middle Nile Valley was home to the cultural spheres of Lower and Upper Nubia. Lower Nubia lies between the First and Second Cataracts (Figure 2.1). This region, known as Wawat in ancient times, was intermittently incorporated into ancient Egypt's political territory and was eventually home to the Nubian C-Group, pastoralists inhabiting the zone between Egyptian and Kerman spheres of influence.

Upper Nubia lies between the Second and Fourth Cataracts, while Kerma, the heart of the Nubian Kushite civilization and state, was located at the Third Cataract, the location of the modern city of the same name. The Third Cataract marked a transition in the ancient Nubian environment; the landscape changed from the drier, rugged terrain of the Lower Nubian desert to the grassier, open plains of the Kerma basin on the east bank, and a wider alluvial plain and the Wadi el-Qa'ab on the west forming natural boundaries within the Kushite kingdom (Edwards and Osman 1993). These plains are historically significant because they would have supported larger herds of cattle than the much narrower pasturelands of Egypt and Lower Nubia. To the south of the Kerma Basin is the Butana

region, where Bradley (1990) argues that the plains around the Blue and White Nile confluence would have supported the highest pastoral production capacity of northern Sudan. The Kerma Basin and the Butana regions' cattle production would have potentially given the Kerma polity an advantage over Egypt in control over a highly valued and ideologically important animal resource.

Hassan (1997) made a detailed and convincing argument that Ancient Egypt was a "riverine civilization," in which people, politics, and economic strategies had to respond to the environmental dynamics unique to the Nile River's character and landscape (Hassan 1997). Honnegger and Williams (2015) undertook a broader study of the relationship between successive archaeological cultures and the riverine environment of Upper Nubia. Gatto and Zerboni (2015) and Wengrow et al. (2014) have employed extensive sets of occupation dates around the Lower and Middle Nile regions, to temporally constrain the succession of human movements between the Nile Valley and the Sahara in response to the Holocene climate changes outlined above. The next section describes the Terminal Pleistocene and Early Holocene African Humid Period and it gradual yet episodic cessation, which necessitated a vast, more permanent exodus of pastoralist populations from the Sahara and into the Nile Valley, via traditional routes of transhumance in the Libyan Desert.

2.2 *The Holocene Sahara and the African Humid Period*

At the end of the Pleistocene, the Saharan climate became much moister but increasingly unpredictable to its inhabitants (Marshall and Hildebrand 2002). Around 10,000 – 9,500 BC, people on the Nile plain experienced a series of exceptionally severe floods, sometimes referred to as the Wild Nile phase (Williams 2018:224, after Butzer 1980:272; Butzer 1997). The human response to unpredictable rainfall set the stage for delayed return

foraging, centered on intensively harvested and stored seed from wild plants. Seasonal migrations in the Saharan grasslands gave people the opportunity to follow animal populations. Eventually, in marginal environments where migrating herds were less vulnerable to localized, short-term droughts than plants were, Saharan people learned to "manage" wild bovid populations as part of a larger subsistence strategy (Marshall and Hildebrand 2002).

Between 6400-6200 BC, the African Humid Period was interrupted by a crisis of aridity. A drying and cooling spell moved across the Sahara and the Mediterranean Coast. We do not yet have enough data to know how uniformly aridity spread across the Sahara to the Nile Valley (Gatto and Zerboni 2015), but we can see that some of the more extreme effects were localized. Before the arid spell, Nabta-Kiseiba in the Western Desert and Atbai in the Nubian Eastern desert both had high water tables with seasonal lakes and grasslands, but the cooling spell put an end to the intensive gathering of plants at these places. Lake levels fell and springs dried up in the Central Sahara and western Nubia. Areas east of the Nile, a rugged, mountainous region dissected by wadis, could retain more plant life (Anfinset 2010:56). Human populations migrated into the Egyptian oases and the Red Sea Mountains (Gatto and Zerboni 2015; Hassan 1997, 2000, 2002). To the south, in Lower Nubia, people aggregated closer to the river and moved to the south of the Third Cataract, as seasonal occupation of the desert was no longer possible (Gatto and Zerboni 2015). Throughout Nubia, the cooling spell meant that people shifted their focus from intensive plant gathering to animal husbandry.

The period of hyperaridity was relatively brief, perhaps 600-900 years, and it was followed by an increase in rainfall, allowing people who were aggregated into the Nile

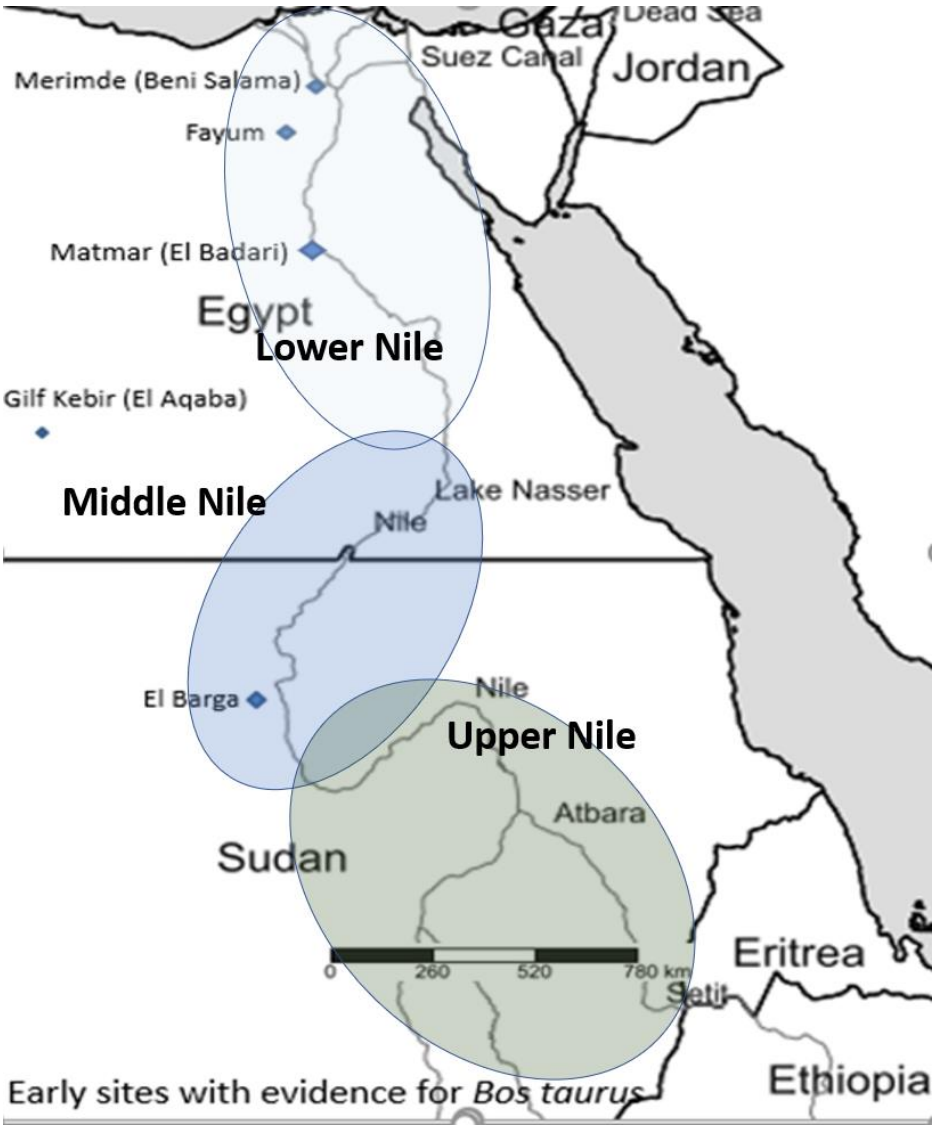
Valley and major oases of the Egyptian Western desert to venture out into the Sahara once again on a seasonal basis. Rainfall did not return across the whole of the Sahara evenly. Generally, the Eastern part of the Sahara remained more arid than the central and western portions (Marshall and Hildebrand 2002). Archaeological sites in the desert dating to this period are numerous, especially to the east and west of the Middle Nile Valley (Gatto and Zerboni 2015:314). During the time that the Sahara was repopulated, we see evidence of a cultural horizon associated with highly mobility, called the Khartoum Mesolithic, characterized by distinctive pottery motifs known as "wavy-line" (Marshall and Hildebrand 2002).

During desiccation pulses of the Terminal Pleistocene, populations increasingly concentrated in the area to the west of the Nile, known as the "Eastern Sahara" or the "Western/Libyan Desert." There, evidence for strategic plant use dates back to 15,000 BC, but physical evidence of plant domestication below the Sahel is not available before 2500 BC (Marshall and Hildebrand 2002). At sites such as Wadi Kubanniya, paleobotanical evidence of wild plant foraging and an abundance of grinding stones, show populations staying in the area for more than one season while hunting, fishing, and processing wild plants more intensively than in earlier times (Wendorf et al. 1989; Marshall and Hildebrand 2002; Gatto and Zerboni 2015). In the region of Aswan, Egypt, we see evidence of seasonal foraging in short range movements around the landscape and along the wadis connected to the Nile (Gatto and Zerboni 2015).

Archaeological evidence suggests that the people of the early Holocene Sahara participated in broad social networks marked by rituals and seasonal population aggregations (Garcea 2004; Gifford-Gonzalez 2005). Around 5000 BC, community-built monuments

containing animal burials are spread across the Sahara (di Lernia 2002; Gatto and Zerboni 2015). Cattle were particularly prominent in funerary culture, but it must be emphasized that the ritual use of wild cattle bones predates domestication. The veneration of wild cattle, *Bos primigenius africanus*, in northeastern Africa began millennia before the introduction of *Bos taurus* from the Near East (Marshall and Hildebrand 2002). As rituals emerged in the Messak-Murzuq region of the central Sahara, an emphasis on cattle-centric subsistence developed involving transhumance in response to strong variations in rainfall with other environmental restraints (Gatto and Zerboni 2015).

Figure 2.3 Regions of the Nile River Valley with sites mentioned in the text.



At the Upper Egyptian site Toshka, dating between 12,000 and 9,000 BC, a complex symbolism and ritual centered on the hunting of aurochsen. At Toshka, graves are crowned with the skulls of wild cattle (*Bos primigenius*) (Ikram 2012). Later, at Nabta Playa, rock art depicting wild cattle is accompanied by displays of bucrania (cattle skulls) on human graves (Wendorf 1968; Gatto and Zerboni 2015). This custom continues on through Middle Nile Valley history after the introduction of domesticated cattle, with the fifth millennium BC graves at al-Ghaba marked by bucrania, as well as some of the tombs at fourth millennium

BC al-Kadada (Ikram 2012). The First Dynasty mastabas at Saqqara also bore displays of cattle skulls along the sides of each monument's superstructure (Morris 2007).

Of all the ungulates available to hunter-gatherer populations, wild African aurochsen would have had the combination of physical and behavioral traits most amenable to human management (Marshall and Hildebrand 2002). Marshall and Hildebrand further argue that if domestication were motivated by building abundance or surplus rather than ameliorating unpredictability, populations would have been driven to manage animal and indigenous plant populations much earlier, in places where the climate was predictable, even if extreme. Instead, animal management clearly takes place in locations and circumstances where the Saharan climate was the most erratic. These unpredictable conditions provided enough rainfall for wild cattle to propagate, but not enough to ensure plant food security and stability for local hunter-gatherers (Marshall and Hildebrand 2002).

The management of aurochsen populations and the experimental domestication of cattle in the Sahara Desert were closely tied to issues of dramatic climate change, risk management, and rituality. Economic and ritual/ideological motivations for investing in the management of wild cattle are not mutually exclusive; there are compelling models supporting each incentive. Using ethnoarchaeology and mortuary analysis to examine the symbolism of social power in Saharan cattle rituals, Brass (2007) argues that the timing and the origin of social complexity in the Sahara is linked to managing and domesticating cattle. Marshall and Hildebrand (2002) note that the enduring consistency of cattle rituals long before evidence for domestication would have been a strong impetus to learn how to manage wild cattle populations, thereby enhancing access to the animals for ritual purposes. As the next section explores the transition from herd management to cattle pastoralism, it is

important to keep in mind that the possible motivations for investing in cattle-centric ways of living can be simultaneously? ideological, social, and economic.

Not only has agriculture in the Nile Valley been made possible for some 5000 years by the annual inundation of the Nile's flood plain, but also the valley contains a diversity of environments that can be exploited by foragers and food producers (Haaland 1992). Archaeological finds show a pattern in Upper Nubia indicating that before 5300 BC, people tended to settle away from the alluvial plain. The flood plain was rich in Nile resources, so people probably went there to fish and collect mollusks, but they did not build settlements along the banks (Honegger and Williams 2015).

2.3 *Experimental Pastoralism and Proto-pastoralism*

A debate developed in the 1990s in which scholars proposed two competing theories explaining the origins of cattle pastoralism in Africa. One group (exemplified by Andrew B. Smith, e.g. Smith 1992) argued that cattle came to Egypt along as part of an entire "Near Eastern Package" closer to 6000 BC (Gifford-Gonzalez 2005), with sheep, and goats as well. Honegger and Williams (2015) also date the Northeastern African "Neolithic" to 6000 BC, and attribute it to "Near Eastern diffusion." The other group (following Wendorf and Schild, e.g. 1994, 1998) believed that cattle domestication processes began in the Eastern Desert of Egypt 10,000 years ago (8000 BC). Arguments relied on the analysis of morphological traits meant to distinguish the skeletal remains of wild cattle (*Bos primigenius africanus*) from domesticates (*Bos taurus*), as well as artistic evidence from ancient Egyptian depictions of domesticated African cattle (i.e. Grigson 2000). The debate over the earliest appearance of *Bos taurus* in Africa has been reviewed several times (Gifford-Gonzalez 2005; Brass 2007; Stock and Gifford-Gonzalez 2013. di Lernia (1998, 1999) uncovered experimental attempts

at domesticating Barbary sheep, *Ammotragus lervia,* in the Acacus mountain region during the beginnings of Saharan desiccation. A binary of "pure" pastoralist vs. non-pastoralist does not fully acknowledge the complicated processes of delayed-return animal management, experimental domestication, and contingent pastoralism.

Domesticated African cattle share some DNA with cattle from Southwestern Asia, but the genetic differences between them are enough to suggests *Bos taurus* may have entered the continent as early as 7500 BC, following periods of wild cattle management (or experimental domestication). African Y-chromosomal data shows that indigenous North African male aurochsen were likely bred with female domesticates of Southwestern Asian ancestry (Decker et al. 2014; Pérez-Pardal et al. 2009), and this strongly supports the hypothesis that Saharan people could manage aurochsen herds well enough to facilitate this type of admixture. Archaeological, genetic, and climatic evidence places the earliest concentration of strategic wild cattle management in the area between northwest Sudan and northeastern Chad (Marshall and Hildebrand 2002). This area is alternately referred to as the Eastern Sahara (in relation to the whole of the Sahara), or the Western Desert (in relation to the Nile Valley). It is the oases of the Eastern Sahara that played an important part in the development of Nile Valley pastoralist patterns, rituals, and culture.

Early herding spread sporadically across the Sahara, with cattle-keepers harvesting wild-plants and traversing the region between 6000 and 3000 BC before spreading out into the Sahel and surrounding zones (Linseele 2010; Marshall and Hildebrand 2002). Di Lernia argues that cattle pastoralism did not spread throughout the Sahara as a response to an aridity crisis, but instead, spread along an east-west axis during a "wet phase" that enabled intensified human innovation and creativity. Indeed, Di Lernia is joined by Garcea (2004),

Gatto and Zerboni (2015), and Wengrow et al. (2014) in arguing that Saharan/Nilotic hunter-gatherers, pastoralists, and forager/experimental pastoralists generally responded to increased aridity by becoming more mobile. Di Lernia argues that since human mobility increased dramatically during the desiccation of the Sahara, that it is *mobility* then, and not pastoralism itself, which is the "dry-land adaptation" (Di Lernia 2006, 2014). Within the Nile Valley, the increase in human mobility was concentrated between the Second and the Fifth Cataracts. The conditions in the Nile Delta and in the Gezira (Blue and White Nile Confluence) did not require the same types of mobility strategies employed in the regions affected by hyperaridity (Wengrow 2006; Wengrow et al. 2014).

The archaeologically well-studied oases in the Eastern Sahara and Libya Desert connected human mobility cycles between the Sahara and the Nile. Gatto and Zerboni (2015) describe oases as nucleated ecosystems formed around residual water reservoirs. Pastoralists and proto-pastoralists moved between these oases, including Bir Kiseiba, Dakhleh Oasis and Nabta Playa, until the reservoirs were insufficient to support their needs. The Egyptian Western Desert is a plateau and escarpment with large-scale sand depressions in a gravel desert (Afinset 2010). Nabta Playa is a large internal drainage basin in the driest part of the Egyptian Western Desert, home to reliable seasonal lakes during the wet periods (Wasylikowa 2001). The ceremonial complex excavated at Nabta Playa consists of 40 tumuli and 3 "gigantic" hearths (Gatto and Zerboni 2015). The earliest cattle burial (dating from 5500-5300 BC, a period of higher rainfall), but not the earliest cattle remains (see Gautier 2001, 2002), was found along the western edge of the largest wadi entering Nabta Playa (Anfinset 2010; Wendorf and Schild 2001; Gatto and Zerboni 2015). The bovines found at Nabta Playa were likely the result of intensified wild animal management that stopped just

shy of "true" domestication. This animal management was probably associated with the intensified local horticulture also evidenced at Nabta Playa (Anfinset 2010; Gatto and Zerboni 2015:315).

At Nabta Playa, site E-75-5 (7700 – 5500 BC) contained the greatest amount of plant remains, including wood charcoal, seeds, and fruits, as well as several wild, edible grasses (Wasylikowa 2001). Archaeobotanical studies of the Western Desert reveal savannah-type vegetation during the Early and Middle Holocene, and some species later went extinct due to a series of prolonged droughts and desiccation (Boulos 2008). Evidence from its sites suggest that Nabta Playa had rainfall until about 4800-4700 BC. After that, the Western desert became significantly drier than the Eastern Desert, with the result that plant life of the Eastern Desert during that time span appears to have been much richer than that west of the Nile (Boulos 2008).

Similar to Nabta Playa, Dakleh Oasis is another Western Desert site showing repeated occupation as part of transhumant cycles. The earliest occupation is dated to 6000 BC and evidence of herding at Dakhleh dates to 5000 BC. Anfinset (2010) argues that the pastoralism at Dakhleh had a distinctively “African character,” in that it was less tied to farming. I would clarify that it is most likely a mixed pastoralist economy with closer ties to hunting populations rather than farming ones. McDonald (1998:137) describes Dakhleh as home to pastoral nomadism with hunting and gathering and speculates that milk and blood pastoralism might have been practiced (Anfinset 2010).

Some researchers, such as Stock and Gifford-Gonzalez (2013), have expressed an openness to scenarios in which elements of both diffusion and indigenous development are not mutually exclusive. As Garcea points out, the flow of domesticates from the Southwest

Asia to northern Egypt was never actually a "flow" (Garcea 2004). Garcea examines the long-held diffusionist models of African pastoralism (the "Near Eastern Package") and contends that archaeological evidence for the movement of domesticates from the Northern Sinai Peninsula to the Nile Delta is lacking. A survey of northwestern Sinai revealed no evidence of herders bringing domesticates to the Nile Delta via that route, although evidence could have been destroyed by taphonomic factors (Garcea 2004). It is not until later (6100-5850 BC) that the Near Eastern domesticate package of pigs, sheep and cattle appears at the Merimde and Benisalame sites in the Nile Delta (Garcea 2004). She follows P. E. L. Smith in describing the process as more of an "intermittently leaky faucet" (Garcea 2004; Smith 1976).

However it began, Saharan stock-keeping was likely a strategy to mitigate unpredictability, rather than increasing food yield for surplus (Marshall and Hildebrand 2002). Conditions in which animals were a slightly better bet as a predictable food source led to delayed-return strategies, which would have changed social conceptions of "ownership," perhaps already instituted regarding stored plants during the AFH settlement of the Sahara (Marshall and Hildebrand 2002). Shifting notions of ownership would have likely affected communal beliefs about status, obligation, and leadership.

2.4 *Human Settlement of the Middle Nile Valley*

Two "Neolithic" ceramic traditions developed out of the Khartoum Mesolithic style. The first is the Undecorated Northern style, called Capsian, or Nilo-Nubian, attested by 9000 BC at the site of Regenfeld, 7600 BC at Dakhleh Oases, and 5500 BC at Nabta Playa (Darnell 2007). The second tradition developed from the Khartoum Mesolithic is called Decorated Southern Style, or the Saharo-Sudanese tradition. This style is attested from 7000

BC at sites around the region of modern-day Khartoum, Sudan (Darnell 2007:31). After these two ceramic traditions spread throughout the region, two distinctive food production traditions developed in the Nile Valley. To the north, and associated with Nilo Nubian ceramics, people focused on caprines and barley from 6000 BC, in settlements with strong influence from Mediterranean weather systems. To the south, and more under the annual monsoons of the ITCZ, people focused on cattle, millet, and sorghum (Anfinset 2010; Bard 1994).

2.4.1 *Agriculture and Social Complexity*

The Lower Nile Valley was relatively near the early Neolithic centers of domestication and settled village-based farming of southwestern Asia, and, as Park (1992:106 notes, was climatically suitable for Southwest Asian crops such as soft wheat (*Triticum aestivum*) and barley (*Hordeum vulgare*). Wheat cultivation developed and intensified in Egypt between 7000 to 5000 BC. More specialized agropastoralist production developed in the Upper Nile Valley after 4000 BC (Park 1992; Anfinset 2010). Gatto and Zerboni (2015) describe a Late Holocene pattern in which favorable climatic conditions saw the development of complex polities, while ensuing arid phases saw their contraction or collapse (Gatto and Zerboni 2015). Darnell (2007, following Hassan 1988) argues that, as farming and stock-keeping directly supported social complexity, the Neolithic traditions of the Sahara, the Sudan and Southwest Asia combined in the Nile Valley and its surrounding desert oases to create the nascent pharaonic civilization.

2.4.2 *Pastoralists and Farmers*

Interaction between pastoralists and farmers appears to be one of the initial stimuli of Egyptian state formation (Fage 1978:67; Park 1992; Lobban 1990). Sedentary population

growth in the Nile Valley seems to have begun very gradually around 5000 BC and then accelerated after 3000 BC, when relatively moist conditions became more arid and became more similar to the modern climate (Park 1992; Sadr 1991). While mobile pastoralists had already been moving through the Nile Valley since 6000 BC, the political conditions that enabled Egyptian state formation also established asymmetrical power relations between settled farmers and mobile pastoralists in the region. Asymmetrical power between sedentary and mobile populations in the Nile Valley was first demonstrated with the "expulsion" of the Nubian A-Group during the Early Dynastic era. This section, I hope to demonstrate that the labor requirements of flood recession agriculture create a relationship between sedentary farming and mobile pastoralism that is both codependent and fraught with a tension inversely related to the amount of predictable rainfall.

Recession, or *decru*, agriculture describes the practice of farming in a flood plain, planting after the summer floods recede (Park 1992). The amount of land inundated varies dramatically from one decade to another. According to Nilometer records, flood values in one decade are of very little value in predicting the flood values of the next decade (who says this? Need a citation). Park (1992) argues that the yearly flooding of the Nile River creates "chaos," which he describes as flooding that is irregular and unpredictable in terms of volume, but not timing. This "chaos" posed certain risks for which Nubians and Egyptians employed different cultural and political responses. In this way, the river played a central role in Nile Valley social complexity, including human responses to flood inundation and the adaptive use of the river for political, societal, and economic infrastructure.

Weak floods inundate little if any land, and without significant investment in irrigation infrastructure, such as canals and levies, lack of cultivatable land is a risk to

populations made up solely of farmers. Weak floods will leave most of the farming population without a portion of irrigated and silt-refreshed land to cultivate. Park (1992) argues that, by scenario, social order requires that land be allocated to farmers on a yearly basis according to rites established by social hierarchy. Those who do not receive land to farm must "fission off" from the sedentary community and focus on another subsistence strategy. Strong floods can inundate more land than can be cultivated by a long-term resident population, unless they have large-scale storage or trade in foodstuffs (from Park 1992:101). Strong flood years present an "all-hands-on-deck" situation, in which flood recession farmers are incentivized to have wide social networks from which they could pull available contingent labor. According to Park's model, re-allocating arable land on an annual basis is an adaptation to ecological risk of unpredictable floods (Park 1992:95; Bard 1994), comparable to the way that mobility is an adaptation to the risk presented by unpredictable rainfall. If we apply Park's model to early pastoralist activities in the Nile Valley, there would have likely been a delicate and sensitive balance of social power between people with claim to farmland and people who migrated with livestock to farm on a contingent basis. After a few consecutive years of weak floods, those contingent farmers could have transitioned into full-time pastoralists.

Butzer (1976) explains that understanding the early Holocene demographic developments along the Nile River Valley is made difficult by the sheer number of skeletons that were damaged in early, misguided studies. Relevant variables such as population density and are of cultivatable land are better known and understood from the Greco-Roman era sources and cannot be uncritically projected back into the early or middle Holocene. Butzer (1976) also argues, perhaps counter to Park (1992), that it was increasingly

sophisticated technology, not flood variation, that was most influential on how much land the ancient Egyptians could manage to cultivate. Whereas Park focuses on the decisions Nile Valley made, seemingly at the mercy of flood fluctuations, Butzer (1976) proposes that Nile Valley farmers were capable of using technology to adapt to expand farming areas, rather than passively suffering a lack that would lead to the automatic expulsion of people without a holding.

Long before Park's (1992) proposal, Robert McCormick Adams (1978) put forth a similar scenario for both modern and ancient pastoralists and farmers in Lower Mesopotamia, in which extended families serve as the building blocks for labor networks and organization. When drought, or unbearable taxation, fell upon the farmers, they went to live among pastoralist cousins until the "climate" for farming improved. Adams was one of the first to describe this arrangement as a resilience strategy. With full-time pastoralists in the region, two subsistence strategies were employed in the same landscape, and, as Lobban argues, population aggregation appears to have exacerbated a growing tension between herding and farming (Lobban 1990).

2.5 *The Primary Pastoral Community in the Nile and Its Hinterlands: Burials, Landscape. Mobility*

During the 6200 BC cooling and drying spell, the rearing of domesticated animals in the Eastern Sahara was associated with a change in material culture and practices (Gatto and Zerboni 2015). In addition to cattle inhumations, rock art from around the Sahara reveals a complex system of symbolism and rituality involving cattle, in particular (Di Lernia et al.

Figure 2.4 Early presence of Bos taurus *in the Nile Valley.*

2010; Di Lernia et al. 2013). Some of the desert monuments and cultural centers contain cattle inhumations and will be discussed briefly in the next section.

Archaeological evidence from this time in the Nile's history? favors funerary spaces rather than domestic ones (Gatto and Zerboni 2015:318). The emphasis on funerary spaces may illustrate a shift in ideological emphasis, archaeological bias due in part to regional cemeteries having better preservation than settlements, or both. Egyptian desert dwellers adopted the "southern Nubian cultural and economic lifestyle" of nomadic pastoralism, with seasonal movements towards the Egyptian Nile Valley (Gatto and Zerboni 2015). Simultaneously, what Gatto and Zerboni (2015) call "the Nubian lifestyle" also culminated in the first appearance of domesticated animals in the Upper Nile region. One early example includes a bucranium found on top of a tomb at the Third Cataract site of El Barga. El Barga is in the vicinity of Kerma and dates to 6000-5500 BC. The skull found at El Barga was determined to be from a domesticated cow, based on Linseele's (2004) establishing that no aurochsen existed south of the Second Cataract during the Neolithic (Honegger and Williams 2015). By 5500 BC, cattle pastoralism was an established

component of various economies across the Sahara and throughout the Nile Valley. By 5000 BC, archaeological evidence of domesticated animals is abundant across Egypt and Libya. The Fayûm Oasis, home to an ancient lake in northern Egypt, was occupied by livestock herders from 5450-4000 BC (Anfinset 2010:63). At Fayûm, Hassan (1986) found evidence of sedentism, nomadic herding, and hunting and gathering all existing synchronously. The Gilf Kebir is a massive plateau in the southwestern Egyptian desert and southeastern Libyan desert, contains has a central, narrow corridor, called El-Aqaba, which is home to Neolithic paintings of cattle dating to 4500 BC, as are many smaller wadis around the highland. Merimde (Beni Salama), on the edge of the Nile Delta, was occupied from 4800-4400 BC and yielded the remains of domesticated sheep, cattle, pigs dogs, and wild ungulates; Anfinset (2010) argues the latter indicates a mixed economy that still included hunting.

As full-time cattle herding gained momentum in the Nile Valley and its surrounding deserts, pastoralists and pastoral-foraging groups become more extensively mobile (Kuper and Reimer 2013; Wengrow et al 2014). The influx of full-time mobile cattle herders brought a new cultural horizon to the Nile Valley. Social interactions, as well as means of bodily display, material performance of identity, and ways of marking the landscape, all changed drastically and simultaneously, against the backdrop of a changing climate and shifting ways of life. In a series of articles beginning in 2003, Wengrow (2003, 2006; Wengrow et al. 2014) has named this phenomenon the *Primary Pastoral Community*.

Table 2.1 Early evidence of Nile Valley pastoralism.

Site	Region	`Date	Type of Evidence
El Barga	Kerma	6000 – 5000 BC	Bucrania
Nabta Playa	Egyptian Western Desert	5500 – 5300 BC	Animal Bone
El Aqaba/Gilf Kebir	Libyan Desert	4500 BC	Neolithic paintings

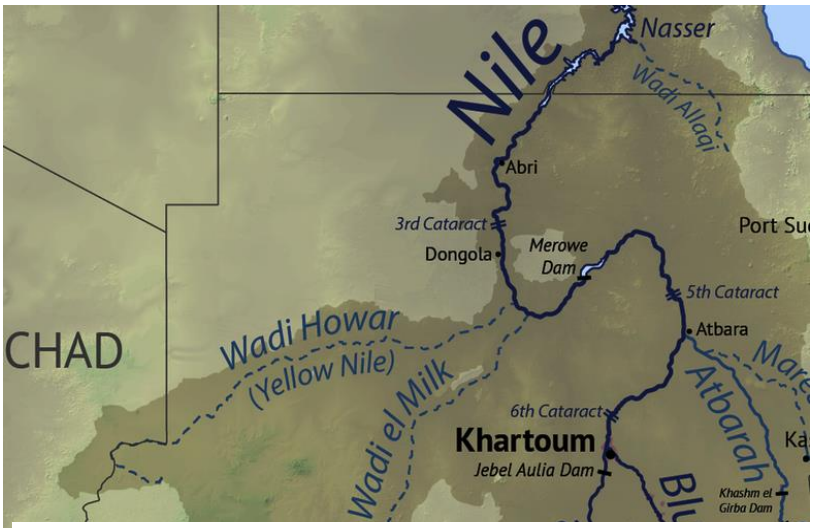
Merimd /Beni Salama	Nile Delta	4800 – 4400 BC	Animal Bone
Fayum	Egyptian Western Desert	5450 – 4000 BC	Animal Bone

The suite of material changes appears to have swept through the Nile Valley, moving from south to north. At the southern end of this phenomenon, Honegger and Williams (2015) claim that the influx of pastoralists is accompanied by a change in human skeletal morphology as well as material culture. Individuals in Khartoum Mesolithic burials have more robust morphology and fewer personal adornments. Later Neolithic skeletons are more gracile and have grave goods including tools and jewelry. Based on its impression styles and burnished surfaces, pottery appears to have spread from the Western Desert to following the 6500 BC flow of "Neolithic diffusion" (Honegger and Williams 2015: 148). What Honneger and Williams call "Neolithic diffusion," Trigger calls the "C-Horizon," an influx of Saharan pastoralists into the Nile Valley, bringing with them a cohesive and distinct set of material products and practices that were ancestral nor only to the later cultures of Nubia, Kush, and but also to those of the Eastern Desert, including Ethiopia and Eritrea (Trigger 1976). Because of the inherent challenges of using the term *Neolithic* in the Nile Valley, I prefer to use Wengrow's *Primary Pastoral Community*, or PPC.

Archaeological evidence shows that changes in burial practices were associated with more extensive social networks and increased mobility. The spatial composition and arrangements of the burial grounds changed, with burials becoming clustered together in ways that likely represented changing social structures (Wengrow et al. 2014). Because the bodies of the dead can be used to maintain community relationships over time and space (Nanoglou 2012), mobile groups become invested and attached to places of interment in the

landscape. Groups returned to their established burial grounds repeatedly, creating a unified sense of landscape, ancestry, and kinship. These changing burial practices were accompanied by new types of materials found within the graves, some of which — such as metals — are only found in the Eastern Desert. Archaeologists have been able to source these, in an effort to study early herding groups' mobility patterns (Anfinset 2010). The sheer quantity of materials, such as marine shells, finely finished ceramics, and semi-precious stones in these burials suggests regular cycles of movement and contact, rather than single instances of intercultural trade (Wengrow 2006, after Majer 1992).

Figure 2.5 Map of the Nubian Desert featuring Wadi Howar and Wadi el Milk.



Map by "Shannon1", Wikimedia Commons.

Animal burials and the well-established practice of bucrania display became pervasive at the PPC burial grounds in the Middle Nile Valley region (Gatto and Zerboni 2015). Within the graves, animal remains are often buried directly with the human deceased. Wengrow (2006: 59-60) outlines two different types of explanation for this new practice. On one hand, Marxist explanations see an economic message and an emphasis on the control over food production. On the other hand, religious explanations emphasize mystical interaction with the non-human world. Because these hypotheses are not mutually exclusive, I propose that these ritual animal burials could have had both economic and religious motivations.

As was also in the Arabian Peninsula, the climate crisis that ended the early Holocene in Africa had long-lasting social implications in the widespread use of domesticated animals and relations with settled peoples (Gatto and Zerboni 2015). From 5000 to 3500 BC, as their former grazing lands transformed into deserts, the vast majority of Saharan pastoralists made their final migrations out of the central Sahara, some moving west to the Niger River drainage (Manning 2008, 2011), others south toward Lake Chad (Breunig et al. 1996), and yet others into the Nile River Valley. Between 4000-3000 BC, two paleochannels, the Wadi Howar, or "Yellow Nile," and Wadi Milk, that formerly fed the Nile between the Third and Fourth Cataracts and served as transhumant pastoralist routes between the river and western hinterlands stopped flowing into the river. Simultaneously, many tropical plant taxa disappeared or were confined to ecological enclaves (Gatto and Zerboni 2015), and it became increasing difficult for mobile pastoral communities to subsist on the gathering of wild plants. The difficulties of

Figure 2.6 Sites important for the early establishment of pastoralism in the Nile Valley.

harvesting sufficient wild plants during the dry spells likely made pastoralism an attractive option to communities in the Middle and Upper Nile Valley, but only if they could obtain plant foodstuffs from farmers along the Nile. At a time when people needed new strategies for procuring food, the Primary Pastoral Community entered the Nile Valley in numbers strong enough to change the Nile Valley economically, socially, and culturally.

The northernmost border zone of the PPC begins with the Badarian culture at Matmar in Egypt, while the southernmost edge is around El Barga in Sudan. Ceramic assemblages in Upper Egypt and the Libyan Desert at this time suggest abundant culture contact and group interaction between the Badarians, and two other cultures, the Tasians and the Abkan (Darnell 2007:32). The Tasian group, another herding group culture with closely associated pottery, slightly predates the Badarians, and is concentrated further north, closer to Fayum. The Tasians are as strongly associated with the PPC horizon as are the Badarians and the Abkan. The Abkan were the furthest south. Producing pottery so similar to that of Nabta Playa, it seems they had contact with or incorporated members of other groups in the region (Anfinset 2010:60). A map in the next chapter shows the geographic range of each culture and is accompanied by an explanation of each group's contribution to incipient Nile Valley social complexity.

Archaeological cultures such as the Abkan show evidence of mixed economies, indicating that human populations employed multiple subsistence strategies within the same landscape (Sadr 1991). Sadr notes that foragers continued to live in the same areas after the introduction of domesticated animals and interacted with farmers and pastoralists. Semi-sedentary life continued with a different economic basis (Anfinset 2010). At the Badarian site at Asyut, Sadr (1991) provides evidence of cattle, small stock, hunting, and foraging.

Anfinset (2010) cites the Badarian levels at Asyut as proof that several modes of subsistence existed side by side in Late Neolithic Egypt. Badarian archaeology shares residential patterns, burial practices, material culture, and similar evidence of long-distance trade with the Khartoum Neolithic horizon which is located around the confluence of the Blue and White Niles. Fairly recent excavations of Neolithic sites at the Fourth Cataract, however, have provided finds similar enough to Badarian and Khartoum Neolithic material culture to link these two "ends" of the PPC continuum (Wengrow 2006:50; Smith 2018).

Attested at sites like Hemamia, the Badarian culture illustrates how the centers of cultural development shifted to the Nile Valley from the Sahara (Darnell 2007). The Badarians appear to have followed both transhumant pastoral and agropastoral strategies (Schwabe 1978). From 5000 BC, they kept cattle, sheep, goat, and pigs, with an artistic and symbolic emphasis was placed on cattle and bulls in particular (Schwabe 1978). Lobban (1989) offters that the tall Badarian vases from 4000 BC may have been milking pails. Cattle remains were found in human graves from Badarian cemeteries reported by Lobban (1989) and have now been contextualized in terms of Wengrow's Primary Pastoralist Community (Wengrow et al. 2014).

Badarian culture grew from three main settlement centers: Naqada, Hierakonpolis, and Abydos. All have exceptionally large cemeteries and larger residential areas (Anfinset 2010). The seasonal Badarian site at Mahghar Dendera is located where the alluvial plain is narrow. People could be close to the river but out of the way of the inundation, even at its highest point (Hendrickx and Vermeersch 2000). Zooarchaeologists found evidence of targeted offtake at the seasonal Badarian settlement of Mahgar Dendera, which was occupied during the part of the year when the river was at its lowest levels, and the livestock

slaughtered here were disproportionately young and male (Hendricksx and Vermeersch 2000). As stated earlier, flood recession agriculture can require a segment of the population to serve as contingent farmers or contingent pastoralists, depending on the volume of flooding in a given year. I will refer again to this model in the next chapter, as I discuss the seemingly contradictory evidence of relatedness and contention between desert dwellers (contingent pastoralists) and riverine farmers. Tensions would arise if this contingency, developed as a response to unpredictable floods, became unsustainable during times of additional environmental stress, such as prolonged drought.

The environmental factors that led to major changes in human subsistence and social organization in the early Holocene are crucial to understanding the context of the relationship between the ancient Egyptian state and the pastoralists at the margins of their bounded world. Specialized pastoralism in the Sahara relied on patterns of mobility and social organization that encountered competition with social developments associated with sedentary, flood recession agriculture in the Nile Valley. The next chapter details the cycle of contention between farmers and pastoralists in Upper Egypt and Lower Nubia, from the transition into the proto-state Naqadan culture until the reign of Egyptian pharaoh Senwosret I. These conditions set the stage for the asymmetrical relations between the pastoralist Nubian C-Group and Middle Kingdom Egypt, after the pharaoh Senwosret I colonized Lower Nubia circa shortly after his reign began in 1971 BC. It is within the long-term, tense sociopolitical entanglement that follows that the central questions of this project concerning power, pastoralism, and the provisioning of animal food in Lower Nubia arise.

Chapter 3: Pastoralists as Traders in a Contested Landscape

This chapter traces the development of power relations between the incipient Egyptian state and the succession of pastoralist trading cultures culminating in the Nubian C-Group. The narrow ribbon of agricultural land along the Nile Valley cutting through the North African desert is called the Black Land (Darnell 2007:29). The desert expanses outside of the agricultural plain were called the Red Land, and for the Ancient Egyptians, the people's traversing the Red Land in yearly and seasonal circles constituted an enduring Proximate Other. Desert people were a continuing presence at the boundaries of Ancient Egyptian society, entangled and proximate, and yet, not "Egyptian." It is the sustained interaction of these proximate others helped to make an Ancient Egyptian ethnic identity possible (sensu Smith 2003).

Around 3800 BC, Nile Floods weakened, and Upper Egypt experienced dramatic climate change accompanied a cultural transformation (Hassan 1988). Pastoralism became increasingly important as climate change continued to affect the availability of plant foods in the Nile Valley. The trajectory of interactions between sedentary and mobile groups up until the reign of Senwosret I (circa 1971 BC) was influenced by three factors: drought, the pastoralist role in long-distance trade, and the centralization of political power in Egypt and Kerma.

The dawn of the Ancient Egyptian state was a violent time. The tension between cattle producers and cattle consumers increased during incipient Nile Valley complexity. For cattle pastoralists and other food producers, disputes over territory were akin to disputes over survival. Cattle ownership eventually became a component of wealth or political power.

Increasingly mobile pastoralists came to play a significant role in trade, with pastoralist patterns of movement influencing the routes of exotic materials through the desert margins (Anfinset 2010:58). While the relationship between the founders of the Ancient Egyptian state and the transhumant Nubian A-Group was not always hostile, the growing tension and eventual expulsion of the A-Group set a precedent for pharaonic strategies dealing with the "threat" of political complexity at the margins of Egyptian society. The Nubian A-Group disappeared archaeologically from Lower Nubia around 2800 BC and the Nubian C-Group appeared in the same region around 2400 BC.

While the questions in this thesis deal with the Nubian C-Group, it is important to understand earlier, foundational power relations between the Egyptian state and mobile pastoralist groups. The Nubian A-Group shared material culture traits with the Pre-Kerma people, and the Nubian C-Group shared material culture and ritual practices in common with the Kerma people, suggesting long-term links between these cultures and shared origins (Bangsgaard 2014; Honegger 2018). Bangsgaard (2014) argues for continuity between the A-Group and the C-Group, and, demonstrating dental affinities, Johnson and Lovell also argue for a relationship based on biological relatedness and descent (Johnson and Lovell 1995). In addition to their commonalities with Kerma and the C-Group, the A-Group engaged in intensive trade and shared symbolic resources with the Predynastic cultures of the Middle Nile. Archaeological evidence from the periods preceding the rise of the pharaonic state show ethnic relations throughout the region to be entangled.

At the outset of this chapter, I follow Smith (2003: loc.636) in acknowledging that "an archaeological culture is not an absolute and direct reflection of ethnicity," and, therefore, concede the limits of tracing intergroup interaction based solely upon the first/last

appearance of pottery styles and material culture. Whenever possible, I cite several lines of evidence supporting the arrival and apparent departure of different groups participating in regional exchange and contact.

Climatic realities imposed limits and restraints on human movement and practice; within those constraints, however, cultural and ideological variation proliferated. The dynamic interaction between people and the Nile Valley environment became imbued with cultural and ideological meaning.Following David and Thomas (2016), I see the Nile Valley *landscape* as a field of engagement in which sedentary groups and mobile groups practiced different ways of being in the world. I use Bender and Winer's (2001) description of a *contested landscape* to illustrate how people share a landscape while holding violently opposed ways of understanding its significance. This ongoing, cyclical, conception and re-conception of the physical world that humans inhabit is what I intend to explore through the concept of *landscape.* Understanding these boundaries is necessary to understanding the history of cattle exchange within the region, since not all of these territories were equally suitable to raising cattle.

To share a landscape is to acknowledge a constant, proximate other. To share a contested landscape means defining self and other as belonging and/or not belonging, or perhaps, as with Ancient Egyptian perceptions of C-Group Nubians, *belonging with imposed conditions.* The Nubian C-Group had to adapt to the political economic framework of a landscape marked by territoriality in the Sahara as well as Nile Valley political boundaries, and their adaptations enabled and constrained their responses to extreme climate change.

3.1 Cattle and The Origins of the Egyptian State

3.1.1. *Pastoralists and the State*

Political complexity in the Egyptian Nile Valley developed in three transformative phases: the two Predynastic phases, the Badarian and the Naqadian, and the Protodynastic phase, Late Naqadian otherwise known as Dynasty 0. The Naqada culture developed from the Badarian culture, and both the Badarians and the Naqadians appear to have engaged in prolonged contact with other cultures in the region (Gatto 2001). Desertification to the east and the west of the Nile created a melting pot of herders and cultivators in the Nile Valley and Hassan argues that this was also the time when Egyptian societal identity developed (Hassan 1988; Anfinset 2010). As archaeological evidence shows that political complexity increased gradually throughout these phases, Anfinset describes the societal leaders in this context as "entrepreneurs," individuals able to maximize on wide, flexible social networks to facilitate incipient long-distance exchange (Anfinset 2010:13).

With each successive period in prehistory, pastoralists and farmers who shared the Middle Nile Valley landscape also appear to have shared some sort of overarching regional culture that contained subgroup variation and differentiation (Gatto 2016). Each culture living there imbued the landscape with culturally specific meaning. As each group brought dynamic ideologies, ecologies and political frameworks to the same river valley, these different landscapes existed simultaneously. As the population increased in the Nile Valley, the lifeways of hunting and animal husbandry pushed out to the deserts (Gatto and Zerboni 2015:317). While areas where farming populations grew rapidly could not accommodate them, some hunting and herding communities moved south to places such as the Fourth Cataract, where they likely shared a landscape in tandem (Monroe, n.d.).

With each archaeological investigation of Middle Nile Valley prehistory, the supposed boundaries between sedentary groups and mobile groups are further problematized and broken down. In Mesopotamia, origins of nomadic pastoralism have been described as an adaptation to state formation, as opposed to in Africa, where mobile pastoralists were crucial to the processes of early state formation (Chang and Koster 1986:106). From the perspective offered by Deleuze and Guattari (1988), history abounds with narratives describing nomads perceived as the original enemy of the state, but that narrative is specific to Asia. Salzman (1980) argued that nomadic herdsmen probably existed on the periphery of African state organization, but in actuality, African pastoralism precede African state formation by at least a thousand years. Cattle pastoralism was integral to Predynastic traditions in which Northeastern African pastoralists are influencing, rather than simply responding to, the development of sociopolitical complexity. The influence of these pastoralists on state formation has been explored by Honeychurch (2016), diLernia (2014), Emberling (2014) and Lobban (1998). To an extent, pastoralist mobility was built into the state structures of Egypt and Kerma, as it developed in the Sahara before state level organization.

The “Deleuzean” tension at the incipient development of the Egyptian state necessitated a strategy for dealing with mobile pastoralists. The most stereotypical form a state exists at odds with the pastoralist practice of transhumance. States have difficulty dealing with people who are forced by ecology to disregard political boundaries. Pastoralists in the historic era often emphasize their political independence from the central government (Dahl and Hjort 1976: 18). Negative state attitudes towards pastoralist persist, with views of pastoralists being people who are "not yet settled, "; this attitude is ironic in that

pastoralists quite often occupy areas that are only suitable for grazing (Dahl and Hjort 1976: 17). Egyptians took advantage of this by controlling pastoralist mobility within their borders (Moreno Garcia 1999). Kerma likely took advantage by wielding cultural sway over pastoralist groups rather than physical or military modes of constraint. Emberling argued that pastoralist mobility was then built into the Kerma state on a large scale (Emberling 2014) but built into the Egyptian state on a smaller scale.

Table 3.1 Sequence of interaction between sedentary and mobile cultures in the Nile Valley

Dates	Sedentary Subsistence	Sedentary Nile Valley Groups	Mobile Saharan Herders
5000 BC	Foraging and Farming	Badarians	Tasians Early A-Group Abkan
3800 BC	Foraging and Farming	Naqada I	Early A-Group
3600 BC	Farming	Naqada II	Early A-Group
3400 BC	Farming	Naqada II-III	Middle A-Group
3200 BC	Farming	Naqada III / Dynasty 0	Terminal A-Group
3100 BC	Farming	Early Egyptian	Nubian C-Group phase I
2686-2181 BC	Farming	Egyptian Old Kingdom /FIP	Nubian C-Group phase II
2055-1650 BC	Farming	Egyptian Middle Kingdom	Nubian C-Group phase III
1650-1550 BC	Farming	Second Intermediate Period	Nubian C-Group phase III
1550 BC	Farming	Egyptian New Kingdom	Terminal C-Group

3.1.2 The Badarians

El Badari was a very early center for sociopolitical complexity in the Nile Valley. Located in Upper Egypt, the Badarian culture is known from the excavations of forty settlements found with 600 graves. Based on a synthesis of new radiocarbon dates from across the region, a major revision of the Predynastic timeline (Dee, et al. 2014) has recently

extended the Badarian period and shortened the succeeding Naqada period. The Badarian culture is now dated from 4400 to 3800 BC, launching a trajectory of developments associated with what Gatto (2001) calls “the Nubian Neolithic tradition.” One Badarian settlement, Mosteggeda, was occupied throughout almost all periods of Egyptian history, yielding early evidence of agropastoralism, hunting and fishing (Anfinset 2010:65).

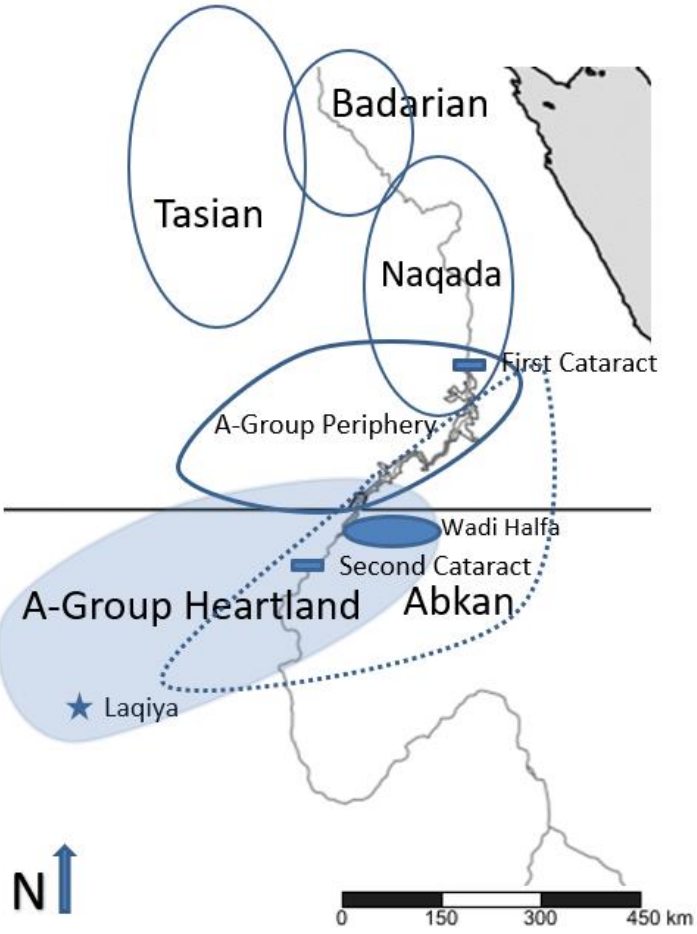
The Badarian culture is considered to be socially complex because Badarian cemeteries, located in the low desert, include "wealthy graves" (Midant-Reynes 2000). These wealthy burials were interpreted as evidence of social stratification; their grave goods included bone, ivory objects, and make-up palettes (Anfinset 2010:64). Badarian material culture included an abundance of status objects made of turquoise, copper, steatite, and seashells from distant locations (Anfinset 2010).

Badarian Pastoralism

Badarians had a relatively mobile existence based on the annual flood cycle, agriculture, pastoral and hunting activities (Anfinset 2010). The seasonal Badarian site at Mahghar Dendera is a place where the alluvial plain in small. At Mahghar Dendera, people could be close to the river but out of the way of the inundation, even at its highest point. Zooarchaeologists found evidence of seasonal slaughter, interpreted as young male stock being slaughtered while the land is flooded (and crops, hence, unavailable). People who leave to go farm once the flood waters receded (Hendricksx and Vermeersch 2000). At another Badarian site, El-Omari, archaeologists found evidence of agriculture and fishing along with the remains of sheep, goat, cattle, pigs (Hendricksx and Vermeersch 2000). Here, Hassan (1988) describes Badarian animal enclosures and Midant-Reynes (2000) found evidence of domesticated donkeys (2000).

Recently, more nuanced ways of looking at cultural relatedness and identity have led to new interpretations of Badarian interactions with pastoralists. Previous generations of archaeologists separated archaeological cultures based on subsistence, with the assumption that people with different subsistence patterns would see themselves as culturally separate, especially is one group spent more time out in the desert areas on transhumant passages. Now, discourses on entanglement have allowed archaeologists to the see the possibilities that ancient peoples had complex, contingent, and contested culturally identities, similar to the way that cultural identity works today. Whereas before, each settled culture was considered to be completely distinct from their mobile contemporaries, now, archaeologists are testing the idea that the desert-dwelling Tasians were actually a mobile component of a larger Badarian culture.

Figure 3.1 Spheres of Culture Contact



Darnell believes that the cattle-herding portion of Badarian society has long been mislabeled as a separate ethnic group (2007). The Tasians served as middlemen in the incipient Nilotic cultures and other Nubian desert dwellers (Darnell 2007). Evidence of

Tasian activity is abundant along routes in the Eastern and Western deserts. Darnell proposes that the Tasians may have been a desert component of Badarian culture based on the strong Libo-Nubian traits in their ceramic traditions (Darnell 2007).

Newell argues that cattle herding duties were carried out by particular age sets among men within Badarian society (2012). Some areas of Badarian cemeteries are segregated by biological age and sex and Newell found that variation in grave goods and material wealth differed by age / sex categories, with certain individuals of all ages bestowed with precious goods that Newell characterizes as "elite" (2012). Newell found significant variation in the types of grave goods given to young adult males, and from an ethnoarchaeological perspective, he interprets these data as supporting his idea that for Badarians, age-set identity was more prominent than family group identity for males that under the age of 30. Newell's proposed age group structures are based on ethnographic data from historic era pastoralist groups, such as the Nuer (Newell 2012). The possibility that herders within a society may have formed a "subculture" or ethnic faction does not preclude Newell's argument that age and gender factored into to herd-keeping responsibilities.

3.1.3 *The Naqada and the Nubian A-Group*

The awareness that desert dwellers and settlement dwellers can not only share a cultural landscape, but identify as kindred divided by labor roles, casts new light on the successors of the Badarians, the Naqada, and their relationship with their contemporary pastoralist contemporaries, the Nubian A-Group. Since the discovery of the Egyptian Predynastic, mobile groups were known to live in proximity to the Badarians and the Naqadians. Reisner's original sequencing and classification of the appearance and disappearance of the desert groups is centered on his assumption that the sedentary

Predynastic populations were the nucleus of culture change within the region (Gatto 2016). It was an intellectual decision to make farmers central while portraying herders as marginal; that marginalization was actually crystallized by the named designation given to the groups. Egyptologist George Reisner assigned letters to different archaeological cultures he found in his excavations. He designated the herding cultures A-Group, B-Group and C-Group, although B-Group is now considered to be a variation of A-Group. Excavations continued to focus on the sedentary communities of the Egyptian Predynastic because of the wealth of material and the assumption that sedentary people were the lone drivers of sociopolitical complexity.

The Naqada era is divided into Naqada periods I, II, and III. Naqada I had an economy of farming, cattle pastoralism, hunting, and fishing; some Naqada burials contain both the bones and clay models of domesticated animals (Anfinset 2010). This society may have subsumed whatever remained of the Nile Valley's original foraging cultures and communities. During Naqada II and III, gradual changes in burial practices appear. The more Nubian practice of wrapping the dead in animal skin disappears as wooden coffins become prevalent (Hoffman 1982; Anfinset 2010:68). Naqada II and III were also periods in which graves became large with a more pronounced emphasis on luxury goods (Anfinset 2010). In terms of societal structure, grave goods from Naqadian cemeteries show even more markers for intense social stratification than those of the Badarian era. The growing social stratification in the Naqada era is widely recognized as providing the roots for incipient state formation in Egypt. By the Naqada II Period, the political association of the cosmic and social order appears with the advent of a cycle of scenes that foreshadow the Jubilee Cycle of pharaonic kingship (Darnell 2007). Changing political systems in the region placed power in

the hands of a few. By 3500 BC , Naqada had become a complex chiefdom, if not an early form a state (Fattovich 1997). The king was justified in his role by a complex system of religious rituals (Gatto and Zerboni 2015). Sadr (1991) studied pastoralism on the peripheries of Predynastic and Dynastic Egypt and he found that nomadic societies are often closely related to settled societies and their relationships often involve cooperation rather than conflict, which he demonstrates using Naqada III and the Nubian A-Group (Sadr 1999: 129; see also Anfinset 2010).

As some point, the herder-traders stepping into the role previously occupied by the Tasians developed into the Nubian A-Group. The relationship between the Naqada and the A-Group represents a turning point in the relationship between mobile and sedentary populations. The Nubian A-Group are known archaeologically as a semi-nomadic, agro-pastoralists people with a complex political structure. Gatto (2016) considers the Nubian A-Group to be a primarily mobile pastoralist culture that left a smaller portion of their population behind at the Nile River to practice agriculture.

The term *agropastoralism* is sometimes vague in that it does not indicate who is doing the farming and who is doing the herding. It could mean that everyone is doing a bit of farming and a bit of herding, or it could mean that a designated segment of a given society is fissioning off to graze and tend herds seasonally. As scholars such as Gatto (2005, 2011) explore the societal implications of different labor factions in the Predynastic, this ambiguity calls for a reassessment of ancient ethnic boundaries. In this, her characterization of the A-Group is distinct from descriptions of A-Group as “agropastoralist” (such as Nordstrom 1972; Newell 2014; Anfinset 2010, etc.) which could be interpreted as a farming culture in which a small segment breaks away seasonally to pasture cattle. What Newell (2014) and

Gatto (2016) seemed to agree on is the likelihood that the pastoral segment (be they the majority or minority) skewed male, while the farming segment of A-Group society skewed female. Both scholars use burials to support this claim, with Newell pointing out that males tend to be buried in specific “age sets”, similar to social age sets of Nilotic and East African pastoralist groups.

The A-Group reached their political "climax" circa 2900 BC, around the same time as Egyptian unification. The material culture of the Nubian A-Group shows affinities with the Abkan culture and Badarian culture. It is possible that one degree of relatedness they shared with the Naqada was a descent from the Badari, or a common origin in the Primary Pastoral Community. Some Predynastic sites, such as Naqada, el Adaima, el Mamariya and Hierakonpolis, actually contain materials that are a mix of Naqadian and A-Group material culture, making it difficult to determine whether the site should be classified as “Naqada” or “A-Group” (Gatto 2001, 2015). The confusion supports the idea that the boundaries between the two groups of people are not as clean or discrete as previous generations of archaeologists had hoped.

As opposed to the sites where a combination of material culture from both groups is found, the sites that contain only A-Group materials are overwhelmingly simple camp sites with no permanent structures (Gatto 2016). It must be noted, however, that the material culture by which archaeologist recognize the Nubian A-Group is not exactly homogenous across their spatial distribution (Gatto 2016). There appear to be two sub-regional spheres within the spatial distribution of the A-Group: the northernmost sphere was centered around the First Cataract and the southernmost sphere was centered around Wadi Halfa and the Second Cataract (Gatto 2016). A-Group cemeteries in the First Cataract sphere show some

practices that would later be categorized as “Egyptian” (such as laying the deceased on a mat or linen), and overall, early populations in the northern sphere show material affinities with the Badarians.

The Lower Nubian A-Group have an archaeological signature from 3800-2900 BC (Gatto 2016). The Early A-Group is contemporary with Naqada I-II. A-Group cemeteries in the Second Cataract sphere tend to show bodies buried on animal skin, a practice later associated with C-Group Nubians and Kermans (Gatto 2016). Sites from the Second Cataract sphere also show a more cattle-centric material culture in general, including more cattle bones in the faunal refuse, and much more widespread use of cow hide and leather (Gatto 2016). For Gatto, the area between Wadi Halfa, the Second Cataract, and the Libyan Desert site of Laqiya, represent the bounded cultural heartland of the Nubian A-Group, with Laqiya being the seasonal destination for cattle pasturage, trade, and later on, large cattle rituals (Gatto 2016; Jesse et al. 2013 for the rituals at Laqiya).

Concerning pastoralist involvement in this political complexity, Anfinset proposes that Saharan pastoralists may have provided an external differentiation that stimulated social complexity in two ways. The first is that the merging of the Saharan and Nile Valley populations at throughout the Naqada periods would have placed pressure on existing resources (Anfinset 2010:70). The second is that via their mobility, cattle pastoralists were uniquely positions to facilitate long-distance trade. As Upper Egyptian farmers engaged in flood recession agriculture, full-time pastoralists likely facilitated trade between the Nile, the Western Desert, and settlements beyond (Anfinset 2010). If they gained social status from their importance as traders, they might have been less incentivized to accept a subjugated social position.

The Naqada II economy developed long distance trade relations with people in the Eastern and Western deserts, Nubia, and Southwest Asia (Anfinset 2010:71). Anfinset argues that the Nubian A-Group facilitated this increase in trade and that, furthermore, trade in the Badarian and Naqada eras would not have been possible without the mobility of herders. Anfinset goes on to claim that "pastoralists are useful mediators between the settled world and resources in the periphery that they [settlers] desire" (Anfinset 2010:13). The increasing importance of long-distance trade could have been another factor in the ongoing struggle for social power between pastoralists and farmers.

The people of Hierakonpolis, during the Naqada II period (3800 – 3200 BC), had caprines and pigs but no cows (Midant-Reynes 2000; Anfinset 2010). The Nile Valley was affected by an abrupt climatic deterioration around 4000 BC. If the A-Group had been raising cattle for the Naqada at that time, and climatic deterioration was severe enough to cause herd collapse for the A-Group, this would explain why there are no cattle in the faunal assemblages of Naqada II. Even a severe decline in cattle population may not have effected A-Group elites directly, as the cemetery at Qustul shows evidence of the enduring wealth of those at the top of A-Groups social hierarchy (Williams 1986). Herd collapse due to drought might have impacted staple elements in the A-Group economy, but any political consequences are not so readily apparent. It remains to be seen if a potential herd collapse adds anything to existing explanations of how and why the newly patriotic Egyptians expelled the A-Group from the Nile around the time of unification.

3.1.4 *Desert and River: Marking the Landscape*

By Naqada III, circa 3200 BC, we find a proto-hieroglyphic writing system in the deserts, recording historical events and revealing the spread of royal hegemony (Darnell

2007). By the late Predynastic, tableaux were transforming desert sites into cosmological treatises within the landscape (Darnell 2007). Rock art as Egyptians labeling and creating space in the deserts, transforming the desert landscape into an interactive component of human society (Darnell 2007:32). Semi-mobile and mobile people were gathering at sites seasonally, at specific times (Gatto and Zerboni 2015). To the east of the Nile a site known as Vulture Rock (Rocher aux Vautours) is located along the Wadi Hilal near Elkab. Vulture rock contains pictures of animals (such as giraffes) and boats, depicted as "carriers of the sun." Generations of Elkab visitors created and updates a marriage of geology and art to create a model of the cosmos, around which human visitors could walk, thereby partaking in the solar cycle (Darnell 2007).The iconography takes the form of narrative pictures and includes proto hieroglyphs in the Naqada III period (Darnell 2007:33; 2009).

With the royal hegemony that developed under Naqada III, the soon-to-be Egyptians moved to control the deserts for their own purposes (Darnell 2007). Many rock inscriptions reveal religious motives and relate to a peculiarly Egyptian approach to annexing and "Niloticizing the deserts" (Darnell 2007:30). The deserts were "fully integrated into the cultural topography of the pharaonic mind" (Darnell 2007). Gatto and Zerboni (2015) assert that, particularly in Nubia, communities, were probably seasonally split between the river valley and the desert. The desert is marked by stone structures and stone tumuli as people monumentalize and ritualize the desert (Gatto and Zerboni 2015).

Contemporaneous culture groups used rock art, burials, stone structures, and monuments, to ritualize a landscape that included the Nile River and the adjacent deserts. The cemeteries of successive desert groups are mostly along the Nile, with the exception of Gebel Ramlah (Gatto and Zerboni 2015:318). By 3000 BC, large sedentary settlements

appear from Central Sudan to the Delta. Interregional exchanges were increasingly facilitated by boat transport (Anfinset 2010).

3.1.5 *After the A-Group: Deserts in the Old Kingdom*

The A-Group's archaeological signatures disappear from Upper Egypt and Lower Nubia sometime in the 1st Dynasty, around 2900 BC. Royal burials at the A-Group cemetery of Qustul suggests that leadership was stable and strong (Williams 1986), so it is likely Early Egyptian aggression sought to eliminate a growing political rival. Morris argues that Early Dynastic rulers chose to "drive the indigenous A-Group off their land to claim it for themselves (Morris 2018:79). A-Group territory would serve as a buffer zone to the south, as well as a base for securing Lower Nubian resources and trade routes.

The Egyptian state's earliest form is sometimes referred to as Dynasty 0. Dynasty 0 dates to around 3100 BC, when a leader called Horus Scorpion used desert routes in his campaign to subdue the Naqada region (Bard 1994; Darnell 2007). The concentration of desert routes intersecting at the Qena Bend in the Nile led to the rise of Thebes, which alone could directly control tracks through the Eastern and Western deserts (Darnell 2007). Dynasty 0 "armies" travelled the deserts at the time of Upper Egyptian unification (Spalinger 2013).

For early Egyptian leaders, unreliable rainfall was a strong incentive to gain and maintain political control of the Nile Valley's natural resources, ushering an era of geopolitical dynamics. The First Dynasty unified Egypt around 2850 BC (Butzer 1960). Rulers of the Early Dynastic state had secured the Nile from the Mediterranean to Aswan, and, from the Eastern Delta to the Western Tract (Spalinger 2013). By the 5th Dynasty, the

state of ancient Egypt had secured control of environment on both sides of the Nile up to the 1st Cataract and could manipulate the flow of certain segments of the Nile via built canals and controlled irrigation (Gatto and Zerboni 2015).

Maintaining control of the deserts on either side of the Nile Valley was crucial to the Ancient Egyptian economy. The Western Desert routes allowed for the transport of mineral resources and trade goods from Libya and Nubia (Darnell 2007). Stones and minerals mined Egyptian Western Desert were crucial to the physical foundations for the monumental architecture and the economy of the pharaonic state (Darnell 2007). Many major and ancient routes traverse the desert and these routes to the quarries were the source of Egyptian and Nubian mineral wealth (Darnell 2007).

While less structured than a standing army, the pharaohs had enough martial power to systematically monitor the movements of desert peoples. The Theban Desert road survey found Old Kingdom campsites, such as what might have belonged to travelers like the Old Kingdom leader Harkuf whose autobiography attests to these desert routes, including the Oasis road (Darnell 2007). During this time, private inscriptions increase at the desert sites; many were memorials to expedition members (Darnell 2007).

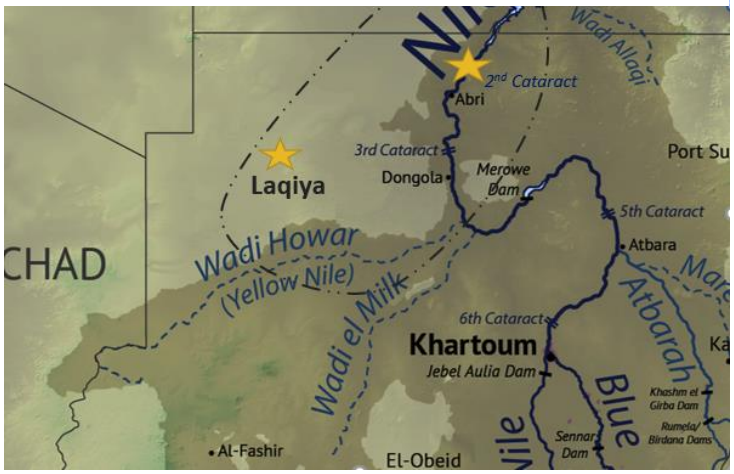
Old Kingdom pharaohs did not suffer many outside threats and they only had minor economic interests abroad (Spalinger 2013). Once the Old Kingdom was established, Egyptian pharaohs managed to control their desert territories through hegemony rather than through violent conflict (Spalinger 2013). The pharaohs' hegemonic strategy increasingly relied on large burial monuments to permanently mark their presence on the landscape. Pyramid building enforced territorial and social boundaries while connecting people through a national ancestor -- reinforcing associations between ancestry and landscape. The

symbolism, ideology, ancestry and landscape link Egyptian civilization with its Neolithic and pastoralist predecessors (Gatto and Zerboni 2015). Spalinger argues that the foundations for this Egyptian patriotism lie in Dynasties 0 and 1, when what he describes as "chauvinistic loyalty" was expressed when leadership was under duress (Spalinger 2013).

3.2 *Between the Sahara and the Nile: The Pastoralist Heartland*

During much of the Badarian era, 4000-3400 BC, the Kerma Basin portion of the Nile River was unoccupied, but the wadis of the Libyan Desert were the center of intensive and prolonged culture contact. Saharan pastoralist groups flourished in the Wadi Howar region. Increased occupation in Wadi Howar from 7000-5500 BC and 5000-4000 BC -- these are both part of the arid phase that bookends the Late Neolithic Wet interval (Anfinset 2010). Wadi Howar and Wadi Malik had diminished flow after the desiccation around 5300 BC, and they went completely dry between 4000 and 3000 BC (Gatto and Zerboni 2015), although Kroeplin (2017) maintains that Wadi Howar was active until 2500 BC. From the entangled material record of the wadi sites in the Libyan desert, there appears to be a web of relatedness connecting the Nubian A-Group, the Nubian C-Group, and the Kerma culture. These material and biological affinities appear in the archaeological record well before the development of the Kerma state.

Figure 3.2 The Wadis of the Pastoralist Heartland



The Wadis

The major wadis leading into the Nile Valley played an important role in pastoralist mobility. The desert areas directly West of the Middle Nile were lined with wadis and oases. These wadis were seasonal water courses within the Nile Valley River basin. Wadi strength was significant from 15,000 to 3000 BC, with the exception of three dry interludes of 9500 BC, 5500 BC and 4500 BC (Anfinset 2010:58). As a physical framework for traveling and exchanging information, the wadis were a vital part of the landscape.

3.3 *The Desert Dwellers: The Nubian C-Group*

The C-Group people are believed to have been among the last wave of Saharan pastoralists who entered the Nile Valley during the late phases of the Saharan desiccation (Hafsaas-Tsakos 2009). The descriptor "Saharan" is used loosely here, because Edwards argues that the Nubian C-Group heartland was actually to the south, in the Dongola Reach, citing an apparently close relationship between the Nubian C-Group and the Kerma culture to the south (Edwards 2004). Honneger's most recent analysis (2018) of the Kerma cemetery supports C-Group presence from the earliest phases, not only confirming early C-Group presence in the Dongola Reach, but allowing for the possibility that the C-Group and Kerma began as related lineages within a common, mother culture. C-Group pottery, material culture, and distinctive burial practices bear close resemblance to other groups associated with the pastoralist heartland centered at Laqiya (see Figure 3.2). The Nubian C-Group arrived in the Lower Nubian territory of Wawat around 2400 BC (Gratien 1995; Edwards 2004). Archaeological estimates using mortuary, settlement data and catchment analysis, suggest that the C-Group population within Wawat eventually peaked at about 20,000 people (Smith 2003, loc. 1939). The Nubian C-Group is known for the cattle iconography that decorates their pottery, grave stelae, and rock art (Adams 1977; Shinnie 1996: 62-63;

Bangsgaard 2014). The central role of cattle and livestock among the C-Group people was called "the pastoral ideal" by Adams (1977: 152-154) and Bangsgaard (2014: 347).

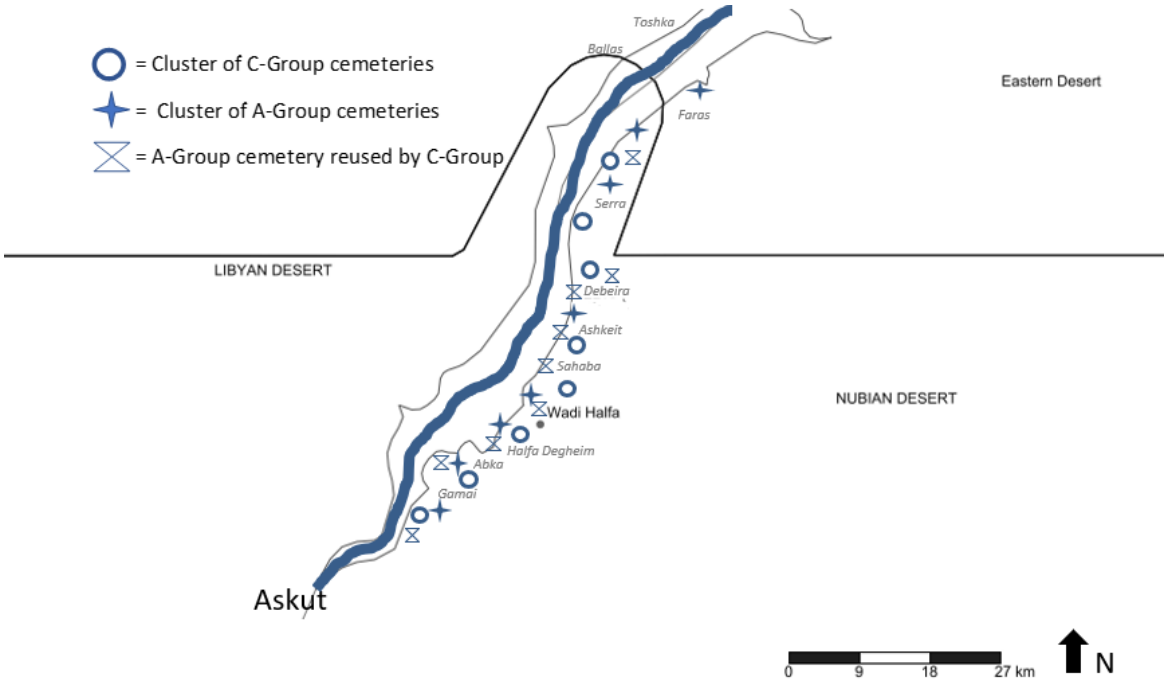
3.3.1 First Appearance

C-Group pottery and distinctive burial traditions are present at the earliest levels of the Kerma's main cemetery, leading Honnegger (2018) to posit that the C-Group and Kerma represent two lineages from the same cultural origins. In addition to the Red and Black Top Ware pottery tradition produced by Pre-Kerma, Kerma, C-Group and A-Group (Honegger 2018), several other lines of evidence point to a relationship between the Nubian A-Group and the Nubian C-Group. Non-metric dental morphological traits indicate a biological continuity between the Nubian A-Group and the Nubian C-Group. The two groups of people are distinguishable via their material culture, but bioarchaeologists Johnson and Lovell (1995) argue that they show a high probability of relatedness. As illustrated in Figure 3.3, C-Group people often reused the cemeteries of the Nubian A-Group. This changes the idea of the C-Group as "late comers" to the Nile Valley, since they likely have an ancestral connection that predates Egyptian state formation.

The geographic extent of C-Group cemeteries stretches from Hierakonpolis in the north to just below the Second Cataract in the south. Egyptian documents describe communities of C-Group people moving across the Lower Nubian landscape with enormous herds of cattle (Bangsgaard 2014). Even when archaeological evidence points to periods of high human mobility for the C-Group (as reviewed in Hafsaas-Tsakos 2006), the Nubian C-Group still returned to their Nile Valley cemeteries, generation after generation, indicating a profound relationship between cultural memory and landscape. People associate features in

the natural and built landscape with their own memories and meanings and emotions (Given 2004: 18, after Alcock 2001, Knapp and Ashmore 1999).

Figure 3.3 Pastoralist Cemeteries in Wawat



Much of the archaeological evidence on Nubian C-Group cemeteries comes from the Scandinavian Joint Expedition to Sudanese Nubia (SJE) 1961-1964, which included excavations along the Eastern bank of the Nile, immediately south of the Egyptian-Sudanese border (Bangsgaard 2014). The primary publications from these excavations do not include any formal faunal analysis nor any detail about the location, species or skeletal parts of the animals present (Bangsgaard 2014). Bangsgaard's (2014) analysis of six C-Group cemeteries revealed a remarkably stable tradition of funerary rituals with two types of animal deposits: cut bucrania on the grave surface and complete sheep buried with human interments.

3.3.2 *The Proximate Other in and out of Egypt*

The dichotomy of "desert dwellers" versus "Egyptians" is complicated by a long history of entanglement. Nubian people were present in Egyptian society from the first era of political unification, known as the Early Dynastic. Evidence shows that even while Nubian people lived within Egyptian borders and settlements, a variety of Nubian identities, while fluid, were salient and enduring within Egyptian society.

Manfred Bietak argued that Nubian ethnic-cultural identity and differentiation from natives persisted despite their long-standing roles serving in the Egyptian military (Spalinger 2013). This is supported by Smith's argument that ethnic identity is "legitimated by long and continuous tradition" (Smith 2003). Nubian burials, dress, and depictions in Egyptian art make it clear that a significant portion of Nubians living in Egypt did not fully assimilate into a purely Egyptian identity. Even with their composite identities, Nubians could and did participate in elite Egyptian life, through all the levels up the ancient Egyptian social order, up to and including the household of the pharaoh (Spalinger 2013:448).

Nubians were integrated into Egyptian society as warriors, and moreover, they were particularly associated with the pyramid cities (Spalinger 2013). One of the most abundant images of Nubians in the Egyptian Old Kingdom was the image of the Nubian as a soldier. Nubian soldiers were already known in the Old Kingdom as the Dashur decree of King Pepi I indicates (Spalinger 2013). Michaux-Colombot (2014) reports on Nubian mercenaryism in the 3rd millennium BC stating that, "hardy, virile warriors from the south were employed within Egypt." Some Nubians served as elite archers in the Nile Valley as far north as the Nile Delta. Depictions of plumed archers are interpreted as Nubian because Egyptian soldiers did not wear feathered head gear (Michaux-Colombot 2014).

Archaeology in the Egyptian nome of Asyut has yielded a variety of images depicting Nubian soldiers in Egyptian society. Elite Nubian archers are depicted in First Intermediate Period tombs such as that of Iti-Ibi-iqier in late 10th Dynasty Asyut, where they are shown wearing distinctive protective arm bands (Spalinger 2013). Also found at Asyut is an enduring image of Nubian soldiers in the form of a wooden model depicting forty soldiers in the tomb of Prince Mesehti. The wooden figurines are dated to the late 11th Dynasty and they are divided into two corps: Nubians and Egyptians (Spalinger 2013). The tomb paintings document changes in Nubian apparel over the course of the Old Kingdom, but the clothing is still distinguishable as "Nubian" (Spalinger 2013).

The settlement of Gebelein was an important site for Nubians serving in the Egyptian military. The graves there are marked with stelae carved with images of the deceased soldiers. Gebelein stelae show Nubians with bushy hair, a sash, and a pendant piece, the latter two items of clothing possibly worn only by soldiers (Spalinger 2013). South of Gebelein, at Aswan, a tomb painting portrays a Nubian mercenary in Egypt shown dying with an arrow in his side and one passing through his legs (Spalinger 2013).

The home of the Nubian C-Group, Wawat, was the most convenient population from which Egyptians could recruit mercenaries. Egyptians also reported handing over large amounts of grain and gold to the C-Group, which even though portrayed as donations, might actually have been bulk payment for mercenary service (Trigger 1976). Nubian C-Group settlements were closest in proximity to the Second Cataract military fortresses. If the Nubian C-Group's pastoralist had a stereotypically Northeastern / East African social structure, that would have allowed for younger, unmarried men to leave and serve as mercenaries. When cattle populations were abundant, young men would most likely have engaged in

transhumant pasturage. In times of herd collapse, this group could still leave for months at a time to engage in military activity, without drastically changing the social structure of the culture and settlements.

3.3.3 *The Nubian C-Group and trade up to the Middle Kingdom*

Archaeological evidence shows that the economic sphere of the Nubian C-Group had multiple components; pastoralism was only one part of the C-Group economy that also including horticulture and trade. As with the A-Group before them, C-Group mobility enabled them to play a significant role in regional trade. We have both documentary and archaeological evidence of their participation in regional exchange. Nubian C-Group were said to both facilitate and hijack Egyptian caravans traveling through Lower Nubia to Kerma and the African interior. Both Trigger and Hafsaas-Tsakos cite Egyptian luxury goods found in C-Group graves as physical evidence that C-Group marauders may have, indeed, robbed Egyptian trade caravans. Trigger also reports written stories of C-Group peoples raiding and harassing Egyptian settlements (Trigger 1976:62). Later, reports of Nubians in Wawat raiding Egyptian cattle proliferate in the New Kingdom, but Morris (2018) argues that the Nubians of New Kingdom Wawat were likely only stealing back the cattle that New Kingdom Egyptians had *stolen from them first*.

Several scholars employ ethnoarchaeological analogies to sketch hypothetical patterns in C-Group trading. Anfinset (2010) contends that non-state actors played a major role in the formation of complex economies and regional spheres of economic interaction. Anfinset (2010) cites Barth (1967), who uses the Fur in historic era Sudan as an example of "entrepreneurs" influencing "spheres of interaction" (socially patterned flow of goods and services). Using an ethnoarchaeological approach, Hafsaas-Tsakos explains the ways in

which pastoralist practices and strategies involving group mobility would have impacted interactions between the C-Group and their state-level neighbors. Hafsaas-Tsakos uses documented trade routes between Egypt and surrounding polities in Nubia and beyond to show how the C-Group would have been perfectly positioned to facilitate and/or disrupt trade between Egypt and their partners in the African heartlands. Hafsaas-Tsakos frames the presence of Egyptian luxuries in C-Group mortuary contexts as the result of choices and actions made by the C-Group people themselves. As an analogy, Hafsaas-Tsakos cites ethnographic examples of raiding practices among East African pastoralists to illustrate the ways in which C-Group people could harass or extort trading missions going in and out of Egypt. She then suggests that C-Group chiefs were exacting luxury goods from caravans and trading missions by force and/or coercion (Hafsaas-Tsakos 2006:138). The artistic renderings, grave goods, and Egyptian documents combine to portray a complicated relationship between C-Group Nubians and Ancient Egyptians.

3.4 *Between two Empires: Inter-imperiality in Wawat*

During the reigns of the first three pharaohs of the Middle Kingdom, violent conflict escalated between the Nubian C-Group and Egyptians. Montuhotep was the first pharaoh of the Middle Kingdom; his reign ended the First Intermediate Period. Montuhotep claimed to have defeated the “desert dwellers” of Wawat, Lower Nubia, and the Western Desert, with an emphasis on the act of decapitating their leaders (Spalinger 2013:443). The Ballas inscription of his successor, Montuhotep II, recounts troops' successes against Nubians and the people of the Western Oases. Montuhotep II effectively reunited Egypt and began the subjugation of Wawat (Spalinger 2013:445). Montuhotep and his successor continued to unify Egypt under Theban rule, but they did not push further south than Lower Nubia.

Amenemhet I, the founder of the 12th Dynasty, extended Egypt's boundaries down to the Third Cataract. By this time, Nubia south of the Third Cataract was called “Kush” (Spalinger 2013). Amenehmet I was born to a Nubian mother whose name was Nefret, from a lineage outside the royal family. He was assassinated around 1962 BC, and he was succeeded by Senwosret I (Snowden 1991). Senwosret was the pharaoh who first commissioned the Second Cataract fortresses, and Senwosret III eventually commissioned the fortress of Askut.

Three concepts are important to help summarize the political position of the Nubian C-Group during the Middle Kingdom. The first is the concept of a *heartland,* in that while the Nubian C-Group is considered “marginal” to the society of Egypt, they would not have been marginal to themselves. The center of their political, spiritual, and social world (sensu Joyce 1992) was not Ancient Egypt, but arguably, to the south in the Dongola Reach (Edwards 2004). The heartland concept is important to understanding how C-Group Nubians saw their own cultural identity and motivations to resist any forced assimilation into Ancient Egyptian culture. Attempts at Egyptian hegemonic dominance would have been complicated by the fact that Egypt was not geographical the source of C-Group religious frameworks, ideals, or norms

The second concept is that of a segmentary social structure. Here, I do not wish to invoke the full structuralist-functionalist model of a “segmentary lineage”; I only mean to describe the likelihood that C-Group communities could shed portions, or age sets, within their populations on a regular basis. Using social hierarchy, a pastoralist economy can shed human populations in orderly ways during times of stress. They can also reverse this strategy and add in populations with client or subservient status in times of prosperity. Poor

pastoralists might have to stop the practice of raising cattle, but they can return in better times, re-entering the economy as the client of wealthier pastoralists (Park 1992). As this thesis moves forward to discuss settlement patterns and intercultural interactions in Lower Nubia, it is possible that must be emphasized C-Group experiences with Egyptian colonization would have been quite different for "sedentary" versus "mobile" segments of C-Group communities varying along the lines of age, gender and labor roles.

The third concept to summarize relations at this time is *inter-imperiality*, brought to bear here in its most literal sense in that the Nubian C-Group lived and operated in between the territories of two expansionist states. The study of inter-imperiality examines two lines of inquiry: 1) the field of interaction and engagement between two empires and, 2) a critical, bottom-up acknowledgement of how laborers contribute to imperial achievement (Doyle 2014). The first sense of inter-imperiality appears in the early part of the Middle Kingdom. The conflict between the early Middle Kingdom pharaohs in Wawat and Nubia allow us to position the Nubian C-Group on the field of cultural and economic interaction between Egypt and expansionist era Kerma. The second sense of inter-imperiality y is becomes prevalent in the latter half of the Middle Kingdom and beyond, when the Nubian C-Group mercenaries repeatedly serving as the embodied means by which Egypt defended imperial boundaries.

The goal is to relate that cultural and economic circumstances to the Nubian C-Group's physical position in a contested landscape between imperial *and* colonial boundaries. One obvious factor in the Nile Valley's contested landscape was the Egyptian state's tendency to periodically expand its physical territory. Distance, topography and ecology place natural limits on empire building (Spalinger 2013:410; Stein 1999). Expansionist policy is more than subjugation, it means that you have the ability to hold,

administer and defend foreign territory (Smith 2003; Stein 1999). Nubians put a check on Egypt's "expansionist tendencies" even without equal military technology (Spalinger 2013).

To summarize, an examination of the relationships between pastoralism and state formation requires a thorough understanding of ecology, political power, and the nature of cross-cultural participation in trade. One's place within the Greater Nile Valley landscape was a central part of ascribed and self-ascribed identity. The expulsion of the Nubian A-Group changed the long-term course of farmer-herder interaction. In later years, C-Group Nubians lived both within and beyond the boundaries of the Ancient Egyptian "made world." These boundaries were policed according to Egyptian requisites for citizenship and ethnic ascription (Smith 2003; Liszka 2012).

The next chapter traces the development of mobile pastoralism sanctioned within the boundaries of the Egyptian state. Egyptian pastoralism eventually produced a system of cattle production that I call the Pharaoh's Herd. The Pharaoh's herd includes cattle that were ultimately owned by the ancient Egyptian state in the form of bureaucratic institutions established for the care, breeding, and distribution of Egyptian cattle. Because the robustness of the Pharaoh's herd likely depended on a periodic influx of Nubian cattle, cattle pastoralism at ancient Egypt's geographic margins, was in actuality, vital to Egyptian cattle production.

Chapter 4: Colonizing Cattle – Building the Pharaoh's Herd

> "The love of animals had one feature peculiar to Egypt, — of all domestic animals the ox was the dearest to the heart of the Egyptian. Cattle-breeding takes up a very large space in the representations on the monuments; in almost every tomb of the Old Empire we meet with the herdsman and his animals; the latter are either swimming through the water or being fed and milked. The Egyptians talked to their oxen as we talk to our dogs; they gave them names and decked out the finest with coloured cloths and pretty fringes; they represented their cattle in all positions with an observation both true and affectionate, showing plainly how dearly they valued them…" (Erman 1971: 436)

Cattle held a central place in the economic and ideological development of the Nile Valley's first state level societies. The Middle Nile Valley is not unlike most other regions of the world where cattle have religious, social, and economic value (de France 2009; Hassan 1998; Ikram 1995; Wengrow 2001, Wengrow et al. 2014). In Meroe, Kush, and Ancient Egypt, the *w3s* scepters wielded by state leaders became an icon of power associated with the bull (Lobban and Sprague 1997). In Ancient Egypt, religious feasts sponsored by the pharaoh often included the temple sacrifices of hundreds of cattle, which were cooked as offerings to the gods and then distributed to the masses in celebration (Ikram 1995; Smith 2003). The ideological emphasis and economic dependence on cattle had direct bearing on Egyptian-Nubian relations at several key points in the Nile Valley's political history. While Chapter 3 focused on the mobile and semi-mobile pastoralism of the "Red Lands" outside the Nile Valley, this chapter focuses on state-sponsored pastoralism which, in form, appears different than that of the non-state groups. Building on the understanding of Nile Valley state power, I will now explain how cattle fit into that state power economically, ideologically and ecologically.

Cattle in Lower Nubia were regularly exchanged between ethnic and cultural groups practicing different economic systems, as well as among groups holding differing religious

and social values (Hafsaas-Tsakos 2008). While Lobban (1989) argues that cattle wealth, especially that acquired from foreign raids, provided the capital to finance monument construction in Ancient Egypt, the value of cattle varied depending on the origin, and for later periods, Lower Nubian gold would have been more valuable than Lower Nubian cattle (Smith 2003). Cereal cultivation and cattle breeding became twin pillars of the Middle Kingdom economy; both commodities were crucial to the monarchy's tax system (Moreno-Garcia 2017). These economic pillars were connected by the value of oxen, prized for their ability to greatly increase agricultural yields. Oxen, castrated males, were cost prohibitive to own; working oxen were fed grain to increase their strength. Oxen provided accelerated returns because elites who owned oxen could then afford, through greater yields, to feed the oxen (Moreno-Garcia 1999). This chapter begins with a review of pastoralism in archaeology and anthropology and then explains 1) how the societal value pharaonic Egyptians placed on cattle rearing, trading, and sacrifice culminated in an infrastructure concerning cattle, and 2) how this cattle infrastructure articulated with the colonial economy and the political ecology of the Egyptian-Nubian borderlands.

4.1 *Pastoralism in Anthropology and Archaeology*

4.1.1. *Defining Pastoralism and "Pastoralist Ideals"*

"It is one of the paradoxes of Western, 20th Century life that although we have access to more information than ever before, the nature of our industrial society makes it harder to perceive other cultures except through categories that are largely inappropriate" (Sherratt 2014).

The anthropological practice of categorizing people according to their primary mode of subsistence has, unfortunately, at best, lacked necessary nuance and, at its worst, leaned toward vulgar or crass. Change and Koster (1986) consider the theoretical concept of pastoralism to be "amorphous." The definitions of pastoralism gathered here all reference some sort of human dependence on animals, be it economic or socio-political. This chapter discusses the choices of recent African *subsistence pastoralists*, that is, groups that rely upon their herds for sustaining their family survival, as possible contrast with practices of Egyptian state. By this, I mean those with reliance both on the products of their herds for food *and* the exchange of herd animals or their products for food and other items necessary for survival. The prosperity and prestige that are associated with cattle are secondary to the ecological imperatives of herd sustainability; whereas Chapter 3 explained that at the subsistence level, Chapter 4 explains the institutions within Egypt responsible for this sustainability, long term and on a large scale.

In the 20th Century, Africanist ethnology has given rise to an archetypal society that W. Y. Adams (1971) referred to as the Pastoral Ideal. The Pastoral Ideal includes a set of traits that work to explain how people build strategies and ideologies around cattle that are fundamentally different from strategies employed by people more dependent on plant agriculture. The Pastoral Ideal includes stereotypical cultural attitudes and attributes assigned to African pastoralist groups like "fierce, independent, and stoic" (Adams 1971). While in reality, pastoralist lifeways do not preclude agriculture, the ethnographically based Pastoral Ideal is strongly associated with groups like the historic Maasai, famous for their apparent, long-term disdain of farming (Spear and Nurse 1992).

However, Lattimore (1962) argues that "the only pure pastoralist is a poor pastoralist." Dahl and Hjort's massive ethnological summary (1976) found no examples of people with "pure" ideological commitments to nomadism to the exclusion of agriculture; in the groups they studied, they found a general agreement that people would farm if it works. Salzman (1972) argues that most herders are multi-resource pastoralists (in Change and Koster 1986). Pastoralists supplement their diet with agricultural produce by keeping seasonal gardens are bartering skins and meat (Dahl and Hjort 1976).

In addition to practicing agriculture, pastoralists can also forage and hunt part-time. In contexts where hunting and herding strategies overlap, archaeologists often aim to figure out the economic identity of groups that leave behind evidence for both activities (Chang and Koster 1986; for exemplary comparisons see Prendergast and Mutundu 2009; Prendergast 2010, 2011; Mutundu 2010). While some have stressed the "archaeological invisibility" of pastoralist encampments, due to their frequent mobility, portable structures, and low degree of landscape modifications, compared to farmers (Bradley 1985; Cribb 1990; Sadr 1991), archaeological researchers have defined a number of lines of evidence that can be used. In Africa, wild ungulates vary greatly in their size, strength, speed, and ease of capture. Archaeological assemblages for communities that hunt part-time tend to favor animals that are easier to obtain, differing from the assemblages left behind by full-time hunters which are more likely to contain larger, stronger bovids that require exceptional skill and dedication to hunting. Anthropological designations of full-time versus part-time pastoralism, however, do not determine how strongly a people culturally and religiously identifies with pastoralism from an emic perspective. Bangsgaard (2014:348) explains that present day East African pastoralist groups are defined by a social, rather than a dietary, dependence on livestock.

Chang and Koster (1986:99),define pastoralism as the dependence upon domestic herd animals as property, a definition that I find lacking because it does not contain any implication for scheduling or organization of labor.

The faunal assemblages of part-time and full-time pastoralists may differ in the mortality profiles of their domesticated animals. Estimates of age and sex at death leave information on how herds are managed and culled. Pastoralism leaves traces in the material record beyond animal bone assemblages. Habitation sites should appear as places to sleep and prepare food (Chang and Koster 1986). Pastoralist housing can be fixed, in isolated homesteads or villages. Herders can also live in more temporary housing, like tents, or in structures made of reed or brush (Chang and Koster 1986:112). Animals can be kept in stables, folds, corrals, pens, and behind wind screens. Everyone has to gather their animals and manage them at some point (Chang and Koster 1986). Fodder for animals and harvested animal products may be kept in storage units, including barns and bins (Chang and Koster 1986:114). Animals can be watered at rivers and wadis, but also at archaeological visible sites like wells, cisterns, and modified springs. Wells are dug, but natural springs might show archaeological evidence of being cleaned or improved (Chang and Koster 1986:113). More recently, Marshall et al. (2018) have shown that pastoralists can enduringly and positively alter savanna landscapes by enriching soils and encouraging ecological diversity, creating "islands" of higher plant and animal through their herding practices.

4.1.2 *The Ideology of Herd Growth: Labor, Ecology, and Risk*

Among pastoralists, social and ritual demands requiring cattle cannot be ignored without political and economic consequences. Social relationships are a matter of survival for an individual pastoralist, who must have potential access to additional cattle from either a

social group, kin group, or political network in case his or her household faces disaster. Dahl and Hjort argue that herders have an awareness of ecological cycles that constitutes a body of intergenerational knowledge incorporated into the cultural heritage of a pastoralist people; knowledge of risks and the inevitability of cyclical events, such as drought or disease, drives the imperative to increase herd sizes (Dahl and Hjort 1976). After a severe drought, it takes 10 years for the growth rate of the female herd to return the herd to a normal level. This is the first long-term effect, with a secondary long-term ripple effect through time, as the yearly growth rate continues to fluctuate as a consequence of the disaster (Dahl and Hjort 1976: 119). That herd managers' understanding of long-term, ecologically conditioned herd growth and contraction contrasts strongly with Herskovits' (1926) idea that valuation of cattle and herd growth was largely an arbitrary cultural feature of African pastoralists.

Herd collapse occurs when the herd in question loses too many reproductively viable animals to be able to recover. Once there is no way for the remaining number of adult females to have enough calves to replace dying animals, even under the best rates of fertility, the rapid, irreversible decline in population is described as a "collapse." Because herd collapse can have shattering ramifications for the survival of both individual households and larger cultural groups, social mechanisms develop to mitigate such risks (Dahl and Hjort 1976). In modern times, Sudanese nomadic herds increase at about 4% a year (Dahl and Hjort 1976: 69), a marginal rate in the face of unpredictable climatic conditions. Before pastoralists can strive for prosperity and social status, however they define it, they must employ full-time strategies to avoid herd collapse and sustain their households.

Risk management is a constant, driving force in herder decision-making (Dahl and Hjort 1976; Mace 1993; Mace and Houston 1989). Many pastoral cultural traditions share

viewpoints on beneficial rates of growth, culling practices, herd productivity, the numerical target for a family's subsistence herd, etc., all of which are embedded within the social meaning and psychological security that come from a healthy herd of cattle (Dahl and Hjort 1976: 128). Herd growth represents an economic increase, while the circulation of cattle often serves to redistribute wealth (Dahl and Hjort 1976: 70). Pastoralists groups exchange animals between herds for many reasons. Female animals are circulated between non-lactating and lactating ("subsistence") herds to reduce ecological risks (Dahl and Hjort 1976). No household's herd grows or declines independently of other herds. Animals are gifted and received, borrowed and loaned (Dahl and Hjort 1976:23). To facilitate herd growth, pastoralists can trade animals between families within their communities, or they can trade animals across cultural, political, and ethnic boundaries. The herd increase means more opportunities to build social bonds, the ability to add new members to households via marriage, the confidence that the herd owner can fulfil social obligations, and general social capital.

4.1.3. *Choosing Cattle versus Caprines*

Caprines are referenced in Ancient Egyptian literature as "small cattle" (Moreno Garcia 1999), an interesting linguistic development, since domesticate caprines were introduced to the Nile Valley before domesticated cattle (REF). Perhaps it was the veneration of wild cattle before the introduction of domesticated caprines that led to the term for cattle being the linguistic baseline. Throughout the Nile Valley, caprines had an economic and ideological importance separate from that of cattle, but nonetheless a strong one. Several "ram-headed" gods or god manifestations existed in the Ancient Egyptian and Kushite pantheons, including Mendes, Amun and Khnum (Kakosy 1966).

Caprines have higher rates of increase than cattle, so they are less precious; cattle are a much more expensive investment. Caprines, especially goats, are more adaptable to arid environments, having lower water requirements, than cattle, and can reproduce more reliably. Thus, they do not require the infrastructure and care that cattle do. Their resilience permits them to be accorded less attention, especially in the Nile Valley itself, where they can be herded in zones above the irrigable farming zone, but where water is readily available.

4.1.4 *Products of pastoralism*

Primary products can only be extracted from an animal once — upon the animal's death. The first primary product of pastoralism is meat consumed as food, and other primary products include unprocessed and processed bovid skins, hides and leather. Hides and skins can be traded and provide other sources of income (Dahl and Hjort 1976). The value of hide and leather reflects the fact that, like meat, it can only be obtained after an animal's death. These products became important for a variety of uses, including the manufacture of weapons and defensive gear for combat. In the Middle Kingdom, troops carried large, ox-hide shields, simple axes, and javelins (Spalinger 2013). Tanning processes sometimes, but not always, extended the use life of cowhide shields (Nibbi 2003).

Secondary products can be extracted multiple times from an animal before its death. The most important secondary product of bovid pastoralism is milk, in which I include all milk products such as cheese and yoghurt. Cows produce fatty milk under good conditions. Typical milking subsistence herders in Africa had a year-round diet that is 3/4 milk and 1/4 meat (Dahl and Hjort 1976:177). Storing milk not only requires physical preparation of the product, but also strategies for transportation and theft prevention (Dahl and Hjort 1976: 161). Other secondary products include blood, taken from living animals by tapping the

jugular vein, a distinctively African practice, and also the animal's physical labor used in traction and transport via oxen.

The first unequivocal chemical evidence for the adoption of dairying practices by prehistoric Saharan African people, based on the $\delta^{13}C$ and $\Delta^{13}C$ values of the major alkanoic acids of milk fat, dates to the fifth millennium BC (Dunne at al. 2012). Residues of milk fats (lipids) were collected from Saharan ceramic samples and checked against a new database of modern ruminant animal fats collected from Africa (Dunne et al 2012). Genetic markers for lactase persistence are found in a variety of African populations, crossing boundaries between linguistic groups, and these markers date back at least 7000 years (Tishkoff 2007).

4.2 *Cows on the Ground: Theorizing Cattle as Property in Ancient Egypt*

Cattle herding provides a prime opportunity to study the nexus of labor, property, and taxation, all of which, according to Morehart et al. (2018), articulate with the environment. Because domesticates are living creatures, intimately embedded in regional ecology, understanding cattle as property requires holistic reasoning. In Ancient Egypt, as with the pre-capitalist world in general, concepts such as *labor* and *taxation* do not always fit cleanly into their modern definitions and connotations. An Egyptian citizen's land was, rhetorically at least, a perennial gift from Pharaoh to them and their children; certain types of property were *held* by Egyptian citizens as evidence of their relationship to the ruler, rather than *owned* in the sense of the how we understand ownership today. In this section, I attempt to illustrate that cattle ownership operated in a similar manner.

Cattle ownership was one of the first forms of primary wealth among individuals, temples, and the state in Ancient Egypt (Schwabe 1976). Cattle-raiding expeditions by early

Egyptian kings into adjacent areas, Nubia especially, are well documented (Adams 1977). Cattle were numerous in Old Kingdom Egypt, so much so that the Second Dynasty pharaohs implemented a biennial cattle count (Morris 2018:33). The cattle count is also attested in the Middle Kingdom, with models such as the one found in the tomb of Meketre (Gilbert 1988; Arnold 2006). Large herds of livestock represented prosperity. In almost all of the known tombs with paintings from the Old Kingdom, we see depictions of herds and herders with livestock being watched, fed, or milked.

The collapse of the Old Kingdom monarchy led to a proliferation of tomb paintings portraying the livestock wealth of private individuals. These depictions placed a heavy emphasis on cattle, even though zooarchaeological evidence shows the widespread consumption of pigs during this period. Moreno-Garcia interprets this disparity between art and the faunal record as evidence that cattle were ideologically important as well as an indicator of wealth, whereas pigs were not (Moreno-Garcia 1999).

Pastoralism and Status

Among specialized herders, domestic organization of labor is required for the production and reproduction of individually owned herds (Chang and Koster 1986). Since Egyptian ownership of cattle was associated with high social status, it is worth asking if providing the labor involved in cattle-rearing carried any social meaning. Even though there is some evidence that cattle herders within Egypt proper constituted their own social category (Moreno Garcia 1999), there is no evidence that this social group was subjugated or "disenfranchised." Ancient Egyptian leaders' rhetoric and political aggression against proximate others showed bias against uncontrolled mobility, rather than against cattle pastoralism itself, which was crucial to the economic health of the state.

4.3 *The Pharaoh's Herd*

> "Wherever the domestic herds form the means of production, the herds of the whole region may well be regarded as one large reproducing herd" (Dahl and Hjort 1976: 70).

Dahl and Hjort's quote stresses the central reason why livestock are unique as a commodity: their place as living beings in a regional ecology. Biology and ecology thus complicate the interpretation of cattle as inheritable or inalienable property. Ingold (1976) argues that herd animals are the accumulated, live resources of individual herdsmen, but Dahl and Hjort (1976) disagree with Ingold about the nature of cattle ownership.

In Africa, the question of ownership of livestock among traditional pastoralists can be as complicated as the delineation and the quantification of the herd itself. In terms of political economy, ownership of the cattle can be definitive, with individuals and groups of people appointed to manage "sub herds" through the land. A herd can be identified as a management unit (who *cares* for these), a property unit (who *owns* these), or both (Dahl and Hjort 1976: 140). Dahl and Hjort (1976) emphasize that a herd is not a closed system or a finite unit. Because pastoralist societies exhibit a constant redistribution of wealth in which animals are gifted and received, borrowed and loaned (Dahl and Hjort 1976:23), no household's herd grows or declines independently of other herds. Further, because cows loaned into herds have offspring, herd managers are obliged to memorize not just the original loan or gift obligation (what, when, from whom) but also the offspring of the original cow, as the obligations of a loan or a gift pass from generation to generation, of both humans and cattle.

From an ecological perspective, it makes sense to consider all the cattle within the borders of the Ancient Egyptian state to be one large, fluid herd, even when cattle are

brought in from and transported to adjacent territories. Cattle were brought into Egypt from Nubian groups required to pay taxes during and after the Middle Kingdom. Cattle also entered Egypt via trading and diplomatic expeditions to Punt, as well as cattle taken from Libyans during disputes and skirmishes with pastoralists at the western borders of the Egyptian state. I consider the whole of cattle accounted for by the Ancient Egyptian states as part of the "Pharaoh's Herd", to which all the sub herds of Egypt proper belonged.

For documented pastoralists, labor is always a consideration (Dahl and Hjort 1976). Animals in stock friendship systems can be moved to areas where more people are available to help herd, assuming that the climate is amenable in places where labor is abundant. People send the animals to where the labor is and then bring more labor to that place as needed. There are "threshold situations" when a sub-herd becomes so large that it is hard to manage, and yet people cannot muster enough available labor to split the herd up into more manageable portions (Dahl and Hjort 1976). Here, cultural institutions such as marriage and adoption provide means to acquire more labor. Herders can also use a client system in which herd owners hire other people, often those with few to no livestock, to care for their cattle, usually with recompense in livestock at the end of a term of service. According to the pharaoh Snefru's scribes, slavery was also a means to acquire herding labor. Snefru's reported theft of 20,000 cattle, described in the next section, allegedly included a number of prisoners he took from Nubia specifically to accompany and care for the stolen cattle.

4.3.1. *Acquiring Cattle for the Pharaoh's Herd*

4.3.1.1 The Long History of Stealing Cattle

Rather than just being a matter of ecology, the growth of Pharaoh's Herd was a political strategy, supported by ideology. In addition to obtaining other resources and commodities, the acquisition of foreign cattle was considered a notable accomplishment for a pharaoh. T New Kingdom pharaohs documented the widespread "plunder" of Nubian cattle. Although the documentation becomes less specific earlier in time, reports of Egyptian leaders taking Nubian cattle by force stretch all the way back to Dynasty 0 (Moret 1972). Rulers of Naqada III / Dynasty 0 supposedly stole cattle and prisoners from Libya and Nubia, from 3300 BC to 2900 BC (Chaix and Grant 1992, after Moret 1972).

Pharaonic Egypt's long-term policy of taking cattle by war or taxation, or trading for cattle to supplement Pharaoh's Herd, supplemented the predictable results of extant reproduction, and it may have led to Egypt's having secured a robust enough population of cattle to survive the same drought era that likely decimated Kerma's herds to the south circa 1750 BC (see Honnegger and Williams 2016 for the Kerma's cattle decline). The response of domesticated cattle populations to environmental circumstances is mediated by human skill and strategy. The life histories of domesticated cattle are highly dependent on human decisions, and those decisions are quite often dependent on sociopolitical circumstances. Even if the environmental events affected the health of Lower Nubian herds, the Ancient Egyptian state's strategy of amassing herds in the Nile Valley region mitigated the impacts of the same events in Egypt. Thus, geopolitical power, and an ideology of herd growth, was subtly and hegemonically woven into the structure of Egypt's social hierarchy, external relationships, and control of water sources and pasturage.

Snefru's supposed mass theft of cattle from greater Kerma has also not been fully appreciated in the literation for its regional impacts on Kerma's infrastructure. Around the

year 2720 BC, Egyptian annals claim that Pharaoh Snefru basically stole 10,000 -20,000 cattle from Nubia (Chaix and Grant 1992). Even if this number is a massive exaggeration, and Snefru's forces only took a fraction of that number, even 2000 or 3000, this would have been devastating to pastoralists in the region who had been coping with dead and dying streams and wadies for more than 400 years, due to the Sahara's final expansion.

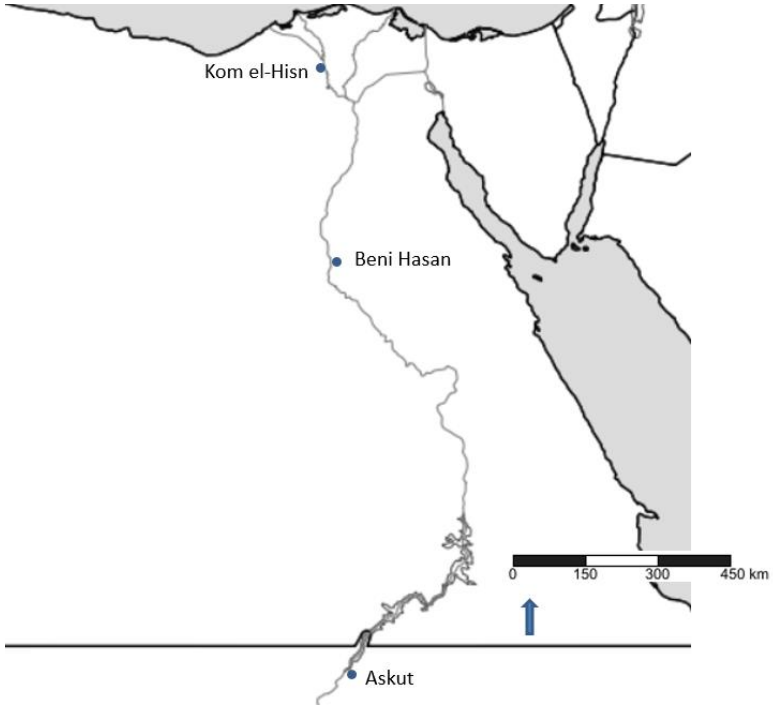
4.3.1.2 Importing cattle across borders

Tomb paintings provide depictions of cattle being imported from regions surrounding Egypt. The tomb wall of Djehutihotep shows cattle bring brought in from the Levant (Moreno Garcia 2017). The tomb wall of Beni Hasan governor, Imeny, shows Libyans driving cattle to the Nile Valley to present in for trade and tribute, and the tombs of the Imeny and his successor, Khnumhotep II, depict Beni Hassan as a nexus for the movement of cattle herds around the region (Moreno Garcia 2017).

4.3.2 *The Development of State Cattle-Keeping Institutions and Administration*

The Pharaoh Snefru enacted measures that had a lasting influence on regional organization and rural landscape of the kingdom (Moreno-Garcia 2013:95). It is under Snefru's reign that the pastoralist institutions of the Ancient Egyptian state took shape. Large numbers of cattle were possessed by the temples; the annual cattle census became an important national event (Schwabe 1978). One tomb biography of a man named Methen says that he served in official capacity as *Palace Ruler of the Cow Stronghold* during Snefru's reign (Schwabe 1978:80). There are slight discrepancies in the dating and the nature of Methen's biography, but this office appears to have been inaugurated sometime during or after Snefru's lifetime (Schwabe 1978:80).

Figure 4.1 Locations in this chapter



Sixth Dynasty inscriptions provide the earliest descriptions of sizable cattle herds kept in the Egyptian provinces; this was a period in which the state was further developing its provincial administrative structure (Moreno Garcia 1999). In his tomb, an official named Paheri was described by the scribe Pentwere as a successful overseer of cattle, horse teams and crops (Moreno-Garcia 2013:740). Ultimately, the act of herd management was seen as a service to the pharaoh; an official's success in cattle breeding was equated with administrative competence (Moreno-Garcia 1999).

Biographical tomb inscriptions throughout the Old Kingdom tell of the private acquisition of cattle herds that were eventually supported or subsidized by the state (Moreno Garcia 1999). Moreno Garcia argues these documentations of cattle ownership are prevalent amongst officials with personal ties to the royal bureaucracy (Moreno Garcia 1999), but given that the textual record is heavily biased towards the bureaucracy, we cannot take this to mean that private cattle transactions among non-elites were not also prevalent.

Cattle ownership conferred a certain prestige because the animals were economically *and* ideologically valuable (Moreno Garcia 1999). Moreno Garcia argues that the prestige of

keeping cattle in the Old Kingdom carried over into the First Intermediate Period, in which people of high status emphasized their role as cattle keepers to “legitimize both their new social position and their role as the head of a district or region” (Moreno Garcia 1999).

The process of cattle distribution illustrates the capability of the Egyptian state to manage animal resources from production to consumption, across several political and ecological zones, in order to provision thousands of workers and staff for state projects (Papazian 2013). The state created a structure of scribes and officials dedicated to the administration of cattle to keep track of cattle production and distribution. While, for obvious reasons, the record is biased toward the accounting of cattle belonging to the state, I cannot rule out the existence, possibly widespread existence, of private herds.

4.3.3. *Titles Associated with Royal Cattle-Keeping*

Eventually, the bureaucracy of cattle-keeping necessitated a host of offices and titles identifying its administrators. Given the number of bureaucratic titles related to the raising, counting, and slaughtering of cattle, it seems that the proliferation of the Pharaoh's Herd was calculated over the course of generations. The titles of *Overseer of Cattle* and *Overseer of Horses* were given to specialists who possessed knowledge of the several animal species that formed a prominent part of Ancient Egypt's wealth. These title holders are often depicted instructing herdsmen and animal keepers (Schwabe 1978:80).

Certain civil servants —marked by the word *sš*, or *sesh* for scribe—were designated for their particular departments dealing with “cattle” or “gold”; this designation operated in Egyptian-run colonies in Nubian (Morkot 2013). In the New Kingdom, we see a continuation of the title of *Overseer of Cattle*, sometimes specified as "of Amun" (Morkot 2013:938). The

tomb of Amenemhet at the temple of Amenhotep III, a man named Surero was called the *Overseer of the Cattle of Amun* (Schwabe 1978). In addition to the three main titles attached to the pharaoh's house, Moreno Garcia (1999) lists a litany of lower titles associated with state-level stock keeping (e.g. "steward of horned animals and hooves", "director of the shepherds of the spotted cows of Lower Egypt", and "shepherd of the bulls", etc.).

In the Ramesside period, meaning the second half of the New Kingdom, we see the title *(j)m(y)-r(3)jhw*, or, the *Director of Cattle*; this position was appointed by the Vizier, as these duties were part of his functionary role (Grandet 2013:868-870). The person had to maintain an up-to-date inventory of cattle, particularly the breeding bulls, and collect their hides. Another title from the Ramesside period was the *Chief Steward of the Two Lands*: this person was the legal custodian of lands lacking heirs or lands newly brought under cultivation (at the edges of the drylands or alluvial islands recently appeared). This official was also in charge of war booty, including land, prisoners and livestock (Grandet 2013:873). As seen by the addition of the title, *Overseer of Horses*, the state structure of livestock management was created with cattle, and then expanded when the Egyptian state acquired and built a population of horses, the Pharaoh's *Other* Herd.

4.4 *The Religious Role of Cattle and Temple Sacrifice*

4.4.1 *Cows in the Cosmos*

This section provides an overview of the more prominent examples of cattle symbolism present in Ancient Egyptian religion. This section is followed by an introduction to the ancient Egyptian temple system that housed the intersection of ideological and economic interest in cattle. The earliest outside commentary on the prominence of cattle in

Egyptian religion comes from Herodotus, who claimed, “The Egyptians, one and all, venerate cows much more highly than any other animal” (Schwabe 1978). Early Dynastic and Predynastic material culture contains female figurines raising their arms above their heads to resemble cow horns (Hassan and Smith 2002). Even while we use Herodotus’ observations judiciously, this reflection has proven consistent over time. Ancient Egyptian narratives sometimes exalted cattle symbolically, like in the “Tale of Two Brothers,” in which a wise cow speaks to and warns people in need of guidance (Schwabe 1978:54). Budge (1899) also remarked that “The bull and the cow were principle objects of worship… as deities in predynastic times” (Schwabe 1978:86). While Budge’s subtext here resonates with contemporary evolutionary views of religion (animism to anthropomorphism to monotheism), the discipline now understands cattle imagery to be more complex, in line with later theologies of aspect, manifestation and incarnation (Stuart Tyson Smith, 2021, personal communication).

Bull imagery in Ancient Egypt was masculine and political. Our earliest surviving image of an Ancient Egyptian state ruler, Narmer, shows him wearing a bull’s tail attached to his waist (Wengrow 2001). The succeeding pharaohs followed suit, taking up the moniker of “Mighty Bull”, and this symbolism was complemented by that of the Heavenly Cow, a bovine form taken by Bat, Hathor, Isis and other Egyptian goddesses (Hassan and Smith 2002; Wengrow 2001, 2006). Cows in ancient Egypt represented fertility, bulls represented virilty (Watterson 2003). Hassan and Smith (2002) describe the early use of cow goddesses and bull gods as conceptual prototypes with roots reaching far back into Nile Valley prehistory and legacies extending all the way into the Roman Egypt era. In the Pyramid Texts, some of Ancient Egypt’s oldest literature, the god Re is identified with a “sun bull”

and the “Great Wild Bull” (Schwabe 1978). During the Middle and New Kingdoms, we start to see the sun god Atum referred to as a bull, although Atum took the form of a bull called Merwer (also Mnevis or Nemur) from Predynastic times.

Cow goddess imagery was used to depict Nut, Mehetwertet, Neith, and Isis; these goddesses, and several others, could be drawn as a cow, or a woman with cow horns coming from her head. Even though cow goddess imagery was not exclusive to any one deity, by far, the goddess most frequently associated with cow imagery is Bat/Hathor (Hassan and Smith 2002). Bat and manifestations of Hathor as Bat have the cow ears, otherwise Hathor most commonly appears with the horned sun disk or as a cow, sometimes as a cow headed woman. In Predynastic times, the proto-Hathor was portrayed with a sun-disc between her horns (Van Lepp 1990). During the Old Kingdom, Hathor is rendered consistently with the properties of an earlier bovine proto-goddess, probably an early form of Bat (Sparavigna 2008).

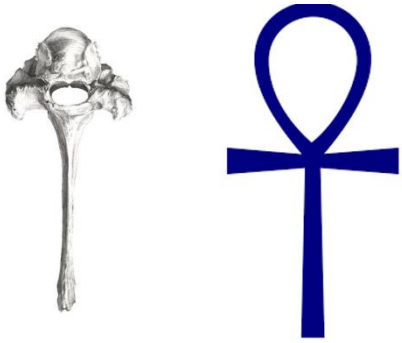
In royal symbolism, the adult pharaoh is portrayed suckling from the teat of the cow goddess, illustrating perhaps that milk-drinking had an ideological component connected to beliefs of the cow mother of humankind (Schwabe 1984, 1991). Elaborate milk offering rituals are attested in both Egypt and Lower Nubian temples (Ashby 2019). Perhaps this harkens back to ecology, and the pastoralists’ reliance on milk which lies at the base of all else – this, rather than meat-based pastoralism. This reliance is the logical outcome of having to maximize the recovery potential of the herds, in case of disaster. That is, herders favor the health and survival of female cattle over that of all but a very few males, and using cow milk as a key dietary component is what African pastorals societies have in common.

4.4.2. *Cattle and Cosmology*

The Egyptian association of cattle with the heavens, or as a solar symbol, goes back to Predynastic rock art (Schwabe 1978; Winkler 1937). The celestial herd, or Herd of Heaven, of Ancient Egypt was made of seven goddesses represented by seven cows and Ra Atum as a bull (Schwabe 1978; Sparavigna 2008). The Bull of Re was the male counterpart to the cow goddess, Hathor, and could also be called the Bull of Heaven. The Herd of Heaven was also called the Pleiades, and these stars were linked to the season cycles of aurochsen (Sparavigna 2008). The moon God, Khonsu, was also referred to as a bull, with his horns taking the shape of a crescent moon. The Ursa Major constellation was believed to be the bull's forelimb (Schwabe 1978). When bulls in ancient Egypt were sacrificed, the first part of the body to be amputated was often the forelimb. Because of the muscles it contains, the limb could be stimulated to contract and move after the animal's death (Schwabe 1978).

The ancient Egyptian word "ka" could mean "cow" or "soul". Schwabe proposes a relationship between the hieroglyphic symbol of arms raised (meaning "ka", or *soul*) resembling a set of cow horns (Schwabe 1978:54).

Figure 4.2 Thoracic vertebrae of a cow compared to the ankh symbol



One of the most prominent symbols in Ancient Egyptian religion is the *ankh.* Schwabe identifies the *ankh* as a thoracic vertebra of an ungulate, because he argues that because ancient Egyptians thought sperm was produced in the thoracic spine. The spinal column was thus related to one's ability to survive after death (Schwabe 1978). The shape and meaning of the *ankh* also incorporated virility and sexuality.

Schwabe's more animal-focused interpretation differs from the usual explanation that the sign represents a knot/sandal strap (sensu Allen 2000).

4.4.3 *Medical Care for Cattle*

The care of the large domesticates, cattle and horses, is expensive and time consuming. A culture of medical care must develop in any society that has communal, personal, and state investments in viable large animal herds. Schwabe (1978) gives an overview of cattle medicine among African pastoralist groups in the historic era with the intent to provide a comparison to ancient Egyptian medicine.

Veterinary knowledge in Ancient Egypt was passed down through several priesthoods. *Swnw* priests served as animal healers; they were expected to supervise cattle and inspect the dissections of sacrificed animals and the sacrificial meat — see figure 4.3 (Schwabe 1978). Some *swnw* were also *wab* priests, like Heryshefnekht, a priest of Sekhmet (Schwabe 1978). Wab, meaning "pure", was a title in general for members of the priesthood, or more specifically as "healer" for those associated with the temples of the goddess Sekhmet (Sauneron 2000; Zuconi 2006), as some of the priests of Sekhmet functioned as physician-veterinarians. An animals healer named Ahanakht

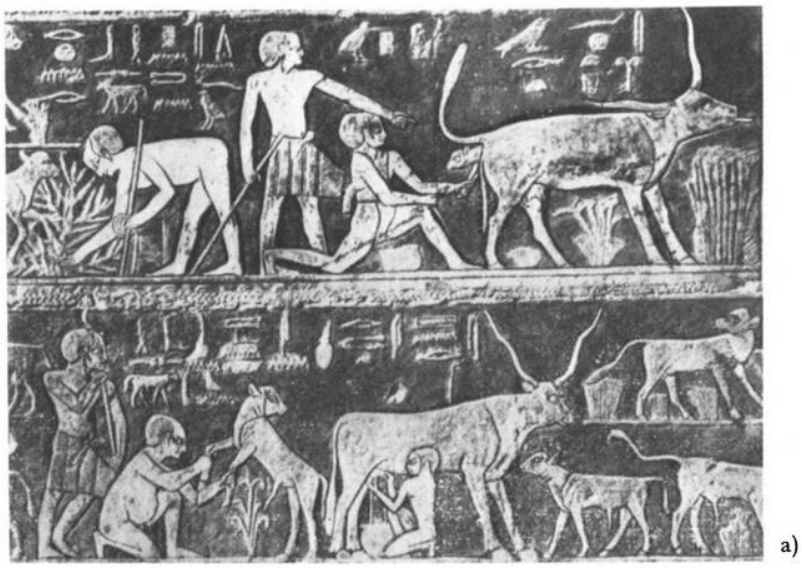

a)

Figure 4.3 Charles Uht -- Brooklyn Museum: images of Egyptians delivering calves(Schwabe 1978).

was described as a "priest of Sekhmet, powerful and clever in his art…who treats oxen" (Schwabe 1978:76-77).

Egyptian artworks show the removal of the placenta from cows, attendants performing vaginal and rectal examination, and the delivery of calves manually with obstetric cords. Bleeding as a form of therapy for animals was practiced in Egypt from at least the 12th dynasty (Schwabe 1978). Schwabe (1978) describes a cattle scene in which a *swnw* priest named Nakht is shown taking notes; this illustration shows priests passing their veterinary knowledge down by training apprentices. Another scene, from the tomb of Wenen-nefer, shows a priest giving orders to a dissector of sacrifices who replies, “I am doing” (Figure 4.2). The healer Irenakhty is shown smelling the blood of a sacrifice (on the fingers of the priest who performed the sacrifice) saying “it is pure” (Ghalioungui 1973; Schwabe 1978:78-79).

4.4.4 *Cattle Sacrifice*

The economic value of cattle in Ancient Egypt was entwined with the ideological importance of cattle in Egyptian thought. The priests of the Egyptian temple system were responsible for cattle that were sacrificed, cooked, and distributed for public consumption (Ikram 1993). Since cattle in Ancient Egypt were distributed through a complex temple system, understanding their religious role helps to clarify how and why the temples came to be responsible for much of the cattle belonging to pharaonic state.

Live bovines were kept in the temples (Watterson 2003; Schwabe 1978; Brass 2003; Wengrow 2001). Some large-scale animal sacrifices (using multiple animals) were documented in the historical record, such as the funeral feast of Pharaoh Mentuhotep IV

(Schwabe 1978:85). These sacrifices were documents for major festivals like the New Kingdom Festival of the Opet at Thebes (Smith 2003). Accounts from Dier el Medina document meat redistribution from these sacrifices (Ikram 1993).

Figure 4.4 Animal care activities (disputed meaning) in Schwabe 1978

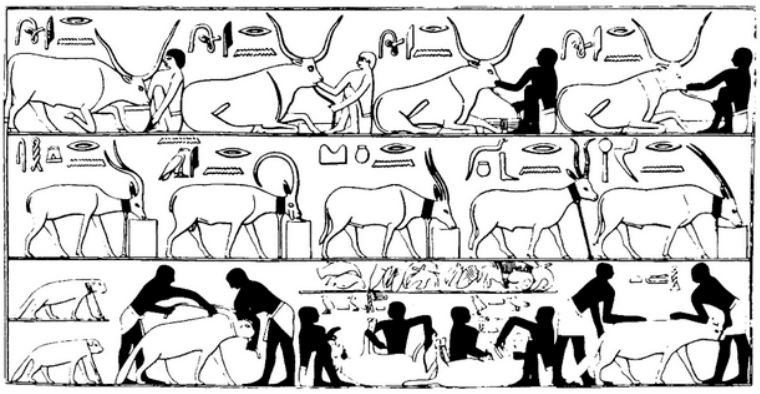


Figure 2.3 Feeding or medication of young cattle by a priest or attendant, Old Kingdom Tomb at Sakkara, Egypt. (From Zeuner, 1963.) J. G. Wilkinson (1841) considered that this scene represented treatment of sick animals; Smith (1913) cited Macalister (personal communication) to the effect that the accompanying text indicated the scene depicts force-feeding; C. Keller (1976, University of California at Berkeley, personal communication) translated this cattle text simply as "a young bovine animal." It describes the type of animal only, not the activity.

A Twelfth Dynasty contract between the prophet Hepzefi and a prophet for the temple of Wepwawet. shows Hepzefi asking for "the roast of meat which is due upon the altar, which is placed upon the oblation table, for every bull which is slaughtered in the temple" (Schwabe 1978:85). The Annals of Thutmose contain a passage that says, "Give me shoulders of beef for I endowed the beginning of the season with bulls. Fill the altar with milk" (Schwabe 1978). Here, the sacrificial reference contains both male and female cattle (but the female is not being killed, only milked). Schwabe argues that Egyptian temple sacrifices were restricted to bulls and steers; he says that Egyptians forbade the eating of [female] cow meat, perhaps in connection to the cow goddesses (Schwabe 1978).

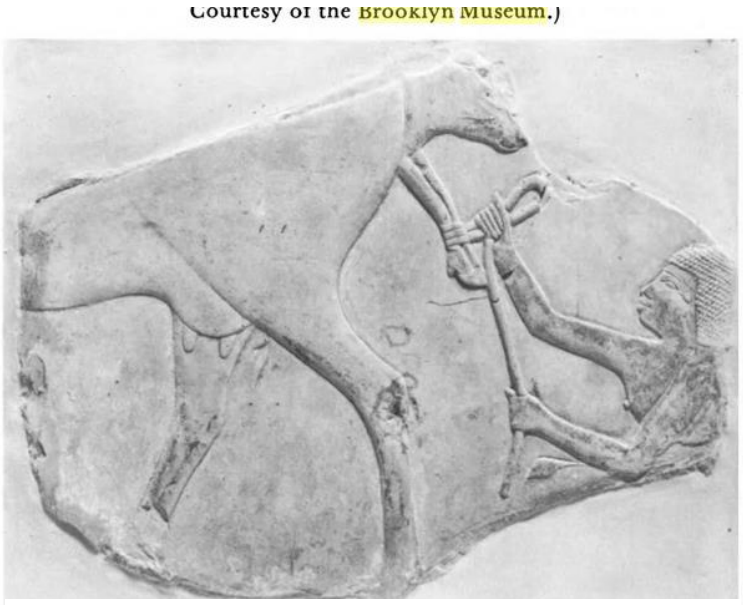


Figure 4.5 Charles Uht -- Brooklyn Museum: images of Egyptians delivering calves (Schwabe 1978).

Cattle sacrifice does not require an ecological "explanation", but Chang and Koster (1986) argue that in environments of low rainfall predictability, greater numbers of male stock are likely to be kept into maturity as a hedge against adversity (Chang and Koster 1986). This observation stands in contrast to the widespread pastoralist practice of culling male bovids between two and three years of age (Dahl and Hjort 1976). Ethnographic records attest that some groups consider it poor economic planning to slaughter males for food, and among those groups, bull calves can, however, be castrated and fattened for sale, stored for meat, and used in rituals or

emergencies (Dahl and Hjort 1976). Other groups, especially in southern Sudan, castrate those males who become "name oxen" or, as Francis Mading Deng called them, "personality oxen" (Deng). Beef is seen as security against starvation (Dahl and Hjort 1976). Culled animals are not always consumed as food; they were often inhumed as animal sacrifices across Nubian cultures (Bangsgaard 2014; Chaix 2007). Given the ideological importance of sacrificing young, male animals throughout the Nile Valley, it could be that the reasons for using male animals for temple sacrifices are at least in part "practical" in nature.

4.4.5 *Temple Estates and Land Allocation*

Pastoralist specialization is ultimately dependent on sociopolitical means of obtaining pasture, as the control of space can be a means to regulate pastoral production of other classes (Chang and Koster 1986:106). Ancient Egyptian state land allocation was the ultimate expression of this strategy. While the structure of land allocation for rearing cattle is more clearly documented in the New Kingdom, the foundation of the infrastructure dedicated to the care of the Pharaoh's Herd was created during earlier periods. The holdings of the temple estates included personnel, cattle, fields, storerooms, workshops and ships, well as capital assess and their produce.

While some animals were raised on royal estates, other Egyptian cattle were raised on temple-owned farms called *bekhen.* Since these cows were often destined for temple slaughter, it was logical for them to be raised and fed on location. Land was donated to a temple by the pharaoh. The pharaoh's gift of land and income held in an official temple capacity were inalienable, meaning that nobody could come and take or reclaim temple lands. Land, tenants, and cattle inherited by an individual from a paternal estate were all

alienable, as ownership could be transferred to or claimed by the state (Moreno-Garcia 2013:759).

At Abydos, the Temple of Millions of Years (built by Seti's son and successor Ramses II in the 13th century BC) held animals that were butchered as divine offerings, or *hetep-netjer*. Sacrificed animals also included the First Bull of Kush, sacrificed to Osiris. As with the *behken*, it was illegal for animals on Osiris' estates to be taken away from the estate or sacrificed to any other deity but Osiris (Haring et al. 2007). Merwer-Atum, the bull incarnation of the deity Atum, was kept in a temple in Heliopolis; these bulls were cared for and appeared in rituals until their deaths (Schwabe 1978:90).

4.5 *Feeding Cattle: Ecological Strategies and Constraints*

Pastoralists' encouragement of herd growth is intended to help mitigate the consequences of cyclical climatic or disease disaster. The goal is to produce as many animals as possible, given the constraints of the environment, such as available water and fodder, and labor organization (Dahl and Hjort 1976: 129). Precautions against drought and epidemics are taken by spreading animals across the landscape into various ecological zones, which are likely to be differently affected by disease or climate shifts (Dahl and Hjort 1976: 114). Herders disperse their herds also because too many cattle crowded together increases the risks for transmission of disease, overgrazing, and theft.

Like other African herders, Ancient Egyptians had to master the ecology of cattle in order to maintain such prolific herds in an arid climate. Pharaoh's Herd was divided into management units that could overlap with property units. Ethnographies indicate that herd viability is more sustainable when the decision-making is local, internal, and immediate

(Dahl and Hjort 1976). Administrators could feed and pasture cattle in one part of Egypt and then transfer the animals to another area where beef was required. Livestock was sometimes dispatched throughout Egypt in accordance with the requirements of the state, and then slaughtered only when they reached the recipient site (Papazian 2013).

Cattle were herded in the parts of pharaonic Egypt's territory not optimal for crop production: the marshes, the drylands borders, the bush between settlements, and the wadis. Such marginal areas were occupied by hunters, and herders, as well as people harvesting commodities like honey, wood, and salt (Moreno-Garcia 2017). A substantial amount of cattle pasturing took place in the Nile Delta region, taking advantage of a salt marsh ecosystem found between marine water and fresh tides. The plants that grow in this area are tolerant of salt water, and some saline vegetation species can actually respond favorably to the stimulation provided by grazing animals (Ditetova 2016). The movement of the animals disturbs the soil in a way that encourages herbs, grasses, and shrubs in this category to proliferate after the herds move on. Herds benefit from lightly salty vegetation in place of salt licks. Lobban (1989) argues that intense plant cultivation in the Nile Delta developed in part to produce fodder for the expanding cattle population as the surrounding grasslands dried out. The optimal locations for pasturing in Ancient Egypt would have likely changed seasonally in response to the yearly inundation of the Nile.

An institutional structure of cattle rearing was built into the Egyptian state that maximized the herding potential of the Nile Valley environment. Cattle were reared on a large scale in regions suitable for their development (Ghoneim 1977:241-50; Moreno-Garcia 1999:241-4; Papazian 2013:48). The material infrastructure for ancient Egyptian pastoralism included cattle boats, raising and transporting food for the animals, marketplaces, and river

ports. The ancient Egyptians had specialized riverboats designed for moving cattle along the Nile, referred to in the literature as ‘cattle ferries’ or ‘cattle barges’. These vessels are depicted in Middle and New Kingdom tomb paintings and they are associated with wealth and elite social status (Hagseth 2015).

4.5.1 *Kom el-Hisn*

Kom el-Hisn was a locus of specialized, centralized cattle and sheep herding, probably a royal estate. Located in the Nile Delta, Kom el-Hisn was centered in a nome, or major administrative territorial unit, that was home to the cult of the cow goddess, Hathor, and the site illustrates the degree of state-controlled management of Pharoah’s Herd. Cattle at Kom el-Hisn were reserved solely for export; they remain absent from the site’s zooarchaeological record. The cattle from Kom el-Hisn likely served to provision the pyramid-building operations at Giza (Papazian 2013). According to the El-Lahoun Papyrus, written between the 12th and 13th Dynasties, city managers were responsible for tending to state-owned herds within their jurisdictions. Local leaders were obligated to deliver animals for temple offerings and for provisioning troops (Moreno Garcia 1999). Since cattle at Kom el-Hisn were raised for state-sponsored distribution, while pigs and goats were reared for local consumption (Redding 1992; Moreno Garcia 1999), I will refer to Kom el-Hisn in the coming chapters as an example of one possible strategy for provisioning meat to soldiers on Egypt’s military frontier. This model serves as a counterpoint to Bangsgaard's assumption that that absence of cattle bones in C-Group settlements equates to an absence of cattle in C-Group territory. Kom el-Hisn shows how the food remains of a cattle-raising site can fail to reveal the strategy of raising cattle for the purpose of distribution or exchange.

Chapter 4 Summary

Ancient Egyptians developed a sophisticated infrastructure for producing and managing populations of cattle. Not only were cattle important to Egyptian temples and settlements, cattle were also important as a source of food for troops engaged in Middle Kingdom Egypt's extensive war campaigns (Moreno Garcia 1999). The extent to which Egypt used animals from the Pharaoh's Herd to provision Middle Kingdom troops at the outpost of Askut versus Egyptian officials acquisition of cattle from the Nubian C-Group is framed as a testable hypothesis in Chapter 6. Since both methods of provisioning were precedented and documented in Ancient Egypt's historical record, an analysis of the cattle bones found at Askut will illuminate which method of provisioning was most relevant at the fortress.

Chapter 5: Centering the Margins —The Political Ecology of Lower Nubia

This chapter explores ways in which the Nubian C-Group might have maintained themselves economically under changing political circumstances. Trade seems to have been at least part of the designated functions of the Second Cataract forts (Smith 1995). With the construction of the Second Cataract fortresses, pharaonic Egyptians gained physical access to the Egyptian-Nubian borderland and gained control over exchange and the regional economy. The forts served as nodes on at least two trade networks: 1) the network of Egyptian state distribution of goods to colonial Egyptians, and 2) the wider, regional exchange of material goods, including gold and animals, in between Egypt and Nubia.

In Lower Nubia, the C-Group appears to have participated in regional trade until their archaeological disappearance sometime during the New Kingdom. Exchange is another form of risk buffering with cultural and economic implications. Pastoralists can extract primary and secondary products from their animals and trade these products for grain; or, they can have farmers invest grain into a return of livestock (Given 2004). Through exchange, herders can convert meat into vegetables, grain, imported food, and non-food products (Dahl and Hjort 1976). From the 6th Dynasty on, C-Group Nubians were present in the Egyptian settlement of Hierakonpolis — *Nekhen* in the Egyptian language. Hierakonpolis was the earliest Upper Egyptian site for centrally controlled, intensified cereal production (Friedman and McNamara 2012). The presence of C-Group Nubians at this site may have created a foundational nexus between pastoralist and agricultural trade networks, because, as Dahl and Hjort (1976) report, agropastoralists and semi-pastoral societies depend on agriculture in times of milk scarcity. If a family has a reserve of milk-giving cows, it is

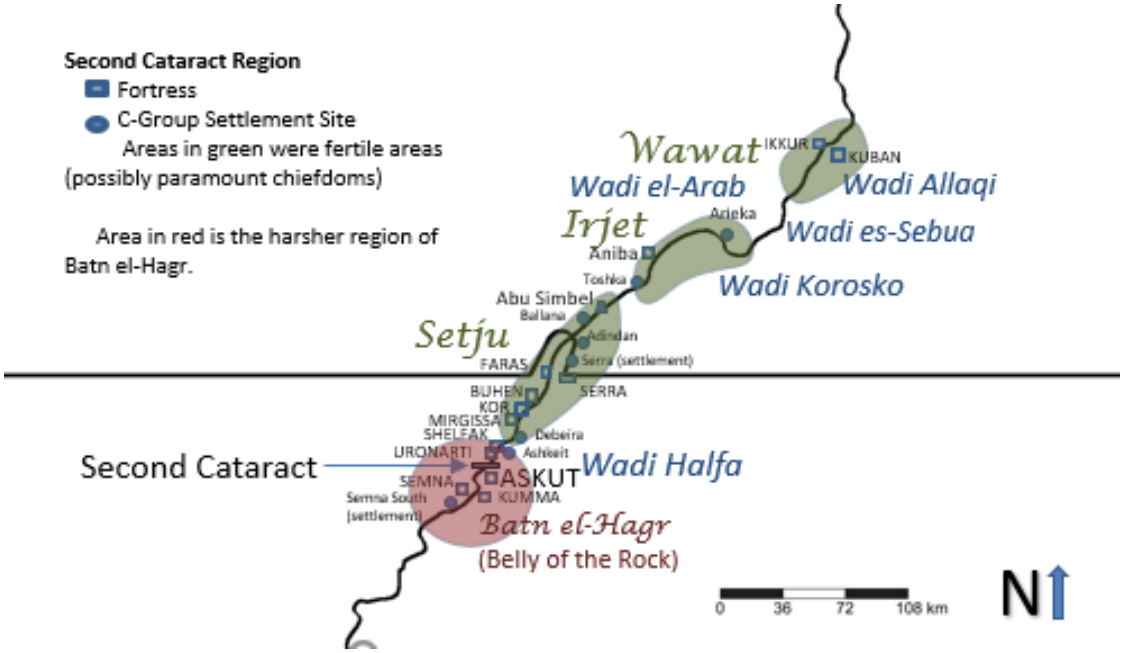
nutritionally more economic to sell an animal and buy grain than it is start eating through the herd (Dahl and Hjort 1976: 164). In this chapter, I hope to illustrate that several forms of exchange with colonial Egyptians at the Second Cataract became an integral part of the Nubian C-Group's strategy for surviving harsh environmental and political conditions.

5.1 *Lower Nubia in the Middle Kingdom*

The pharaoh Montuhotep II (2061-2010 BC) initiated a process of absorbing Lower Nubia into Egypt's southern political boundary (Smith 2003). Following the lead of Montuhotep II, pharaohs from Amenemhet I (1939-1910 BC) to Senwosret I (1920-1875 BC) waged four punitive campaigns against Nubia. As they expanded their southern territory, Egyptian forces controlled who could move through the occupied portions of the Lower Nubian Desert and how (Smith 2003; Liszka 2012). By the time the Second Cataract fortresses were complete, the C-Group people were faced with colonial rule by the pharaonic Egyptian state. Between 1956 and 1911 BC, Lower Nubia rebelled, and Egypt responded with force (Morris 2018:79). Senwosret I and his successor, Intefiqer, both claimed to have slaughtered people in Wawat, even going as far as to set settlements, and people, on fire (Morris 2018:79).

In Given's *The Archaeology of the Colonized* (2004), he theorizes the experience of colonialism and its material ramifications from the bottom up. Given proposes a complex relationship between landscape, monumentality, subjugation, and resisting colonial rule. Given (2004) proposes four analytical categories for the archaeological study of colonized landscape: economic, social, political, and cultural.

Figure 5.1 C-Group Settlements and Second Cataract Fortresses (modified from Hafsaas-Tsakos 2006).



This chapter will use Given's categories to parse the archaeological literature concerning ancient Egyptian colonialism in Nubia. Given's economic analysis includes an archaeological examination of farms, mines, quarries, and trade posts. The evidence of C-Group presence in Egypt's Nubian mines has been the subject of some disagreement, largely centered on how many C-Group laborers worked Egyptian mines and whether the labor was consensual or forced (Trigger 1976; Hafsaas-Tsakos 2006).

Given's (2004) framework for political analysis begins with archaeologically charting the relationship of fortresses and palaces to the settlement patterns of the indigenous populations. In Middle Kingdom Lower Nubia, it appears that the Nubian C-Group did not change their settlement or mobility patterns to avoid the Lower Nubian fortresses. As the C-Group interacted with Egyptian colonists for economic gain, and maybe survival, I argue that the presence of the fortresses became part of Lower Nubia's political ecology. C-Group Nubians continued to live close to the fortresses in the succeeding periods (Adams 1977;

Smith 2003). As with the rainfall patterns, the floods of the Nile, and the differential quality of the soil and fodder across the region, C-Group Nubians incorporated pharaonic Egyptians and their resources into their overall subsistence strategies.

5.1.1 *Trade and Taxation in Egypt*

Given (2004) emphasizes taxation as a means of control and domination in colonial relationships. In general, colonizers extract surplus food and work from the colonized through taxation and forced labor, but in Egyptian Lower Nubia, parts of this pattern are pervasive until the New Kingdom. This section examines the infrastructure of collecting taxes in Egypt proper versus comparable protocols in Egypt's Nubian colonies. Taxation systems in Ancient Egypt were tiered and complex. Egyptian citizens paid taxes as individuals, but also paid taxes as part of the occupational class to which they belonged. The taxes collected according to occupational class were paid into the temple system, and temple taxes supported state finances and were fiercely protected by law. The most privileged of pharaoh's vassals could have their taxes reduced as a reward or favor from the pharaoh (Morris 2018: 24,135).

Theorizing taxation in Egypt requires a consideration of the roles that temples played for the state. Herders, both sedentary and semi-sedentary, within the bounded territory of the pharaonic Egyptian state could be taxed. Livestock given to temples as taxes would be redistributed via feasting or given as live gifts (Ikram 1993; Lobban 1989), a prime example of the process by which rulers give back a portion of tax wealth in order to legitimize the paternalist ideology of their dominance (Given 2004: 30). While temples were not always built with the storage capacity to hold taxation proceeds, they would have the rights to a

portion of the harvest from lands they managed directly or allocated to sharecroppers (Smith 2021, personal communication).

In the ancient world, nobody threw a tax collection party like an Egyptian pharaoh; tax collection could take the form of a full-fledged parade with costumes and all manner of extravagance (Smith 2013). The *Opet* festival celebrated the rejuvenation of the land, Amun, and kingship, with the arrival of the inundation. The *Presentation of Inu* was the event that featured "tribute," framed as reciprocity, a gift to the king for maintaining order by both Egyptians and foreigners: this was an important religious event in which high-ranking officials and overseers would present the pharaoh with revenues (Smith 2017; Spalinger 2013:394). The vizier, who served at the top of a hierarchy of functionaries beneath the pharaoh, would be followed by the intimate officials of the court, or the King's House, who were followed by the military with security aides (Spalinger 2013). *Inu* resources were paid into the royal treasury, from which some revenues would be donated to the temples by the pharaoh (Smith 2017).

Morris points to two eras in Ancient Egypt's history in which taxes were collected frequently in such a spectacular manner: Dynasty 1 (3100-2900 BC), and the beginning of the New Kingdom / 18th Dynasty (ca. 1550 BC). Smith notes that spectacular tributes occurred throughout the New Kingdom into the Ramesside Period, as evidenced by the model letter "From a Viceroy to a Prince" (Smith 2017). Tax collection became associated with spectacle when it was necessary to establish pharaonic hegemony and regional authority, and ritual processions legitimated the very act of taxation (Morris 2018:213-214). Given (2004) argues that taxation is legitimized through ceremony as deities and religious

symbols made taxation seem divinely ordained. When periods of turmoil gave way to established social order, tax collection routines became more mundane (Morris 2018:144).

5.1.2 *Taxing Nubia*

> "Taxation lies at the heart of being ruled. The extraction of surplus, of course, takes many different forms"(Given 2004:26).

Taxation in ancient Egypt's colonies was also complex. Morris (2018) explains that imperial taxation could be practical, in terms of financing the imperial infrastructure, or it could be more security-oriented, designed to prevent occupied peoples from building their own wealth. Taxation designed to prevent the economic growth and independence of a subjugated group could afford to be more symbolic than profitable, although the two strategies are not mutually exclusive (Morris 2018:128). "Above and beyond any practical purpose, however, one suspects that Egypt may also have taxed its subjects simply to tax them," states Morris, arguing that taxation demonstrated the right of the Egyptian state to requisition whatever they wished (2018: 259-260).

Given (2004) proposes that archaeologists should examine the material culture of taxation, including stamps and seals, measuring jars, offices, and warehouses. In the context of Ancient Egypt and Nubia, I would add the temple system and trade posts to Given's list. In Lower Nubia, the material evidence of taxation might include seals, documentation, the temple tax collection ceremony, funerary feasts, and altar contexts serving as the foundation for "The Ruler's Table" apparatus, discussed below. Through the prolonged trade activities and cultural entanglements at the Egyptian-Nubian border, there developed a segment of the Nubian population who learned to speak Egyptian as well as read and write administrative documents in the Egyptian language. Egyptians strategically used literate Nubian officials to

facilitate the extraction of taxes from Nubians (Morris 2018:109). Whether and how Nubians paid taxes to the Egyptian pharaoh has been discussed in terms of the written sources available. Clear documentary evidence of Egyptians extracting taxation from the C-Group is rare (Morris 2018:81). Depending on the time period and location, Nubian herders may have paid cattle taxes to Egypt or Kerma. Whether by force or choice, when Upper Nubia was under Kerma's control, regional Nubian herders gave the king of Kerma an abundances of valuable animals (Chaix 2001, 2003, 2007). When former Kerma territories came under the control of Egypt, documentation shows that these pastoralists were required to pay tribute in cattle to the Egyptian pharaoh, after which the animals were distributed into the temple administrative system (Lobban 1989; Smith 1995; Morris 2018).

5.1.3 *Tributes versus "Work Products"*

The issue of taxation in Lower Nubia during the Middle Kingdom is fraught with debates over ambiguous terminology. In the New Kingdom, Thutmose III extracted taxes from Nubia in the form of gold, ivory, ebony and palm wood, cattle, and captive people, as well as other precious resources. Depending on the era, and also the point of view, the movements of these resources are sometimes referred to as *gifts to pharaoh* rather than *taxes* (Morris 2018:128). Spalinger argues that some scholars have misinterpreted gifts given to Egypt from Nubian leaders as "taxes." Citing a description of the prince of Kush delivering his *h3kw* (produce), minerals and incense, Spalinger (2013) argues that *jnw* was a "tribute" that was not the equivalent of *h3kw*, which means "work product / produce". *H3kw* was the word that Thutmose III's scribes always used for what he received from Lower Nubia and Wawat, and the context would lend itself towards being propogandist in nature (Spalinger 2013:430). Smith argues that *inw* was a critical source of state income in which paying

parties had to meet a minimum yearly expectation. Because territory leaders could be punished for failing to meet that expectation, Smith contends that despite the ideological and symbolic aspects, *inw* indeed functioned as a tax on subordinates of the pharaoh (Smith 2003: location 3622-3645).

In the 12th Dynasty, Kush was outside of Egyptian control and could not be forced to provide tribute (Spalinger 2013). In the Annals of Amenemhet, Nubians bring their "work products;" physical labor is implied but that need not be associated with war (Spalinger 2013). South of the Second Cataract, independent kingdoms were under no obligation to provide Egypt with costly items, although they were familiar with and resistant to Egyptian military influence (Spalinger 2013). Peace gifts were given, but this does not necessarily mean that Nubians were being extorted, particularly because, unlike other periods, the early Middle Kingdom did not see children of Nubian and Kushite princes being held in “soft captivity” in pharaoh’s court (Spalinger 2013).

Records from the New Kingdom detail the cattle taxes extracted from Nubia by Egyptian pharaohs. According to Thutmoses III’s annals, New Kingdom pharaohs requisitioned hundreds of heads of cattle from Nubia every year. For Morris (2018), the purpose of taxing Nubian cattle was to display symbolic power. Morris compares the yearly extraction of cattle resources from Nubia to that of Syro-Palestine. Though the Egyptian state was exacting cattle from both regions, the extraction of Nubian cattle as tax was more prominently displayed in artworks, such as the tomb painting of Merye II (Morris 2018: 259-260). In Merye II’s tomb painting, Egyptian cattle are shown to be “overfed” and fat, while the Nubian bull is small in stature. Morris argues that this shows that the levy on cattle in Nubia was not a practical measure to supplement cattle populations in Egypt, but an

expression of power in that Egyptians could extract that which Nubia's cattle-centric cultures held dear (Morris 2018:259-260). In contrast, Smith explains that the economic value of cattle coming into New Kingdom Egypt from Nubia was considerable (Smith 2003: location 1876). Smith emphasizes that both the gold and the cattle extracted from Wawat and Kush during the were redistributed through the pharaonic state administration to support projects and labor forces throughout the empire (Smith 1995: 166-168, 173).

While the ancient Egyptians developed specialized boats for cattle transport, and certainly had the ability to transfer cattle from pasturelands to temple locations, it would have been faster and cheaper for bureaucrats and military personnel on the frontier to acquire cattle locally. By extracting cattle as taxes, the Egyptian state could significantly offset the cost of occupying the Second Cataract region (Smith 1996:168; Morris 2018:148). The systematic collection of cattle taxes in Nubia by pharaonic Egypt is much better documented in the New Kingdom. Modern cattle herders living in state societies or under their authority have had to convert cattle into taxes, consumer goods, and other necessities as mundane as school tuition, for instance. Historically, in addition to exchange, pastoralists have paid their state taxes in cattle. As these herders well understand the economics of cattle taxation, they calculate the size of an ideal herd under such a taxation regime – what cattle are "worth" in the exchange system as well as for supporting substance and herd recovery (Dahl and Hjort 1976:180).

While some state governments in the modern/historic era have encouraged nomads to sell their "surplus" (Dahl and Hjort1976), Morris (2018: 81) uses the analogy of the British colonial administration taxing Nuer cattle in which the British extracted a minimal number of cattle simply to remind the Nuer of the existing political order. Morris compares this strategy

to that of Egypt taxing C-Group cattle. Most C-Group taxes were paid in gold, so the taxing of cattle might have had a more symbolic impact in Lower Nubia, but in Upper Nubian Kush, cattle had higher, tangible economic value (Smith, 2021, personal communication). Both the pharaonic Egyptians and the British would have had to recognize the biological and economic consequences of taxing, or over-taxing, an economy based primarily on cattle. In both cases, the colonizing parties also recognized that, if you cannot tax a community's products, you can extract taxes from their bodies through physical labor (Morris 2018:81).

State governments may miscalculate, or may fail to understand, the minimum number of animals needed for subsistence and herd growth. For subsistence herders, their actual minimum number must include a certain number of milk and meat producers, a sufficient number of young, and a "risk margin" to cover "normal crises"; these requirements are all in relation to the labor capacity and nutritional needs of a given community (Dahl and Hjort 1976). Based on their long-standing knowledge of cattle ecology and the regional landscape, it is not likely that Egyptian pharaohs would have chosen to tax Nubian cattle herds into oblivion. With cattle specialists serving within the state apparatus, it is safe to say that Egyptian state strategies would have considered the complexities of pastoralism, even as state officials viewed unregulated transhumance with animosity and disdain.

There is also the question of how Egyptian authorities would even know the quantitative extent of Nubian cattle populations. Modern era pastoralists generally do not trust surveyors or census takers because the process of counting herds has been linked historically to taxation. The act of counting livestock can be considered a cultural offense (Dahl and Hjort 1976: 132). The Turkana believe that counting cattle is bad luck or an attempt to harm the animals via witchcraft (Dahl and Hjort 1976). It seems as if, even though

the intention and motivation may vary on behalf of the census takers, subsistence herders do not like having their cattle counted by people whose business it is not. A natural conflict could arise between Nubian herders, wanting their cattle numbers to be their own business, and Egyptian bureaucrats, an entire professional class of officials who loved counting *any and everything* more than life itself, glory to Seshat (the Egyptian goddess of wisdom, knowledge and pencil-pushers).

5.1.4 *Exchange in the Borderlands*

Exchange takes place between groups of people not morally bound to each other in terms of kinship and friendship, thus, exchange requires "the ability to function in and between two different social systems" (Anfinset 2010:13). During culture contact, two groups can bring different conceptions of worth, value, and ownership to the act of trading. Regulation and the legitimation of social order can differ greatly between neighboring societies, with emic thoughts, cultural mores, and interests, influencing agents and groups participating in even very large regional trade systems (Azarya 1980). During the Middle Kingdom, Kerma and Egypt participated in large-scale trade that was periodically disrupted by military posturing from one side or the other. As evidenced by their funerary items, the Nubian C-Group pastoralists seem to have opportunistically served as intermediaries for this interregional trade (Hafsaas-Tsakos 2009). Stein (1999, after Azarya 1980) argues that many agrarian and pastoral societies view exchange as a suspicious activity best left to outsiders and inferiors. Anfinset disagrees, arguing that "pastoralists are useful mediators between the settled world and resources in the periphery that they (settlers) desire" (Anfinset 2010:13). The ethnographic literature on African pastoralists has documented a few widespread elements in the ways that pastoralists trade, sell and exchange cattle in the modern era. While

African pastoralists cannot be stereotyped, and these elements cannot be projected uncritically onto ancient time periods, we can draw loose analogies based upon the economic motivations rooted in the same ecological restraints and conditions of livestock biology and life history.

5.2 *Colonial Tensions at the Second Cataract*

This section provides an overview of the economic relationships between fortress administrators and the indigenous residents of Lower Nubia. In reference to the historic era, the word *colonialism* carries an abundance of value-laden implications. The pain and the human cost of historic era colonialism is as yet un-healed, and the wounds often feel fresh. Not all of the modern definitions and characteristics of colonialism, however, are appropriate in the study of archaic states. Definitions of ancient colonialism are varied, contested and contingent upon their cultural and historical context. Sinopoli's (1994) study of archaic empires describes a process of political economic "consolidation" that must occur after a state's territorial expansion. During this period of consolidation, local elites are often used to extract taxes and facilitate the flow of resources towards the center of the empire (Sinopoli 1994). Archaeological frameworks for studying colonialism often focus on the extraction of resources and physical control of landscape using the remnants of settlement patterns and land use (Given 2004:50), but do not ignore the human and emotional cost of a foreign power living in close proximity. Given (2004) consistently emphasizes the extraction of food and labor products from subjects and how this entails a natural struggle for dignity on behalf of the laborer. Smith's (2003) definition is more focused on the extraction of Nubia's mineral wealth, as well as the strategic position for defense of Egyptian interests, but does not ignore the sustained effort on behalf of C-Group Nubians to resist assimilation into hegemonic

Egyptian culture (Smith 1995; 2003). My working definition of *colonialism* centers on the extraction of resources from the political ecological lives of other people and the impacts of imperial control on their landscape.

5.2.1. *Building the Forts*

Spalinger (2013) argues that expansionist policy is more than subjugation— it means that you have the ability to hold, administer and defend foreign territory; the Second Cataract fortresses of Lower Nubia were built to accomplish these aims. Colonial expansion must be physically sustainable and profitable enough to be worth the effort. The fortresses enabled long-term strategies as Egyptian officials invested in the Lower Nubian economy at the end of the 11th Dynasty/beginning of the 12th Dynasty (Smith 1991; Michaux-Colombot 2014). The fortress of Askut was built on an island near the Second Cataract in the Middle Kingdom (c. 1850 BC) and occupied by military and administrative personnel from Egypt (Smith 1995). Cattle raised by local pastoralists may have played an important role in provisioning the garrisons and later colonial communities. If the garrisons were not directly provisioned with meat by pharaoh's administration, its residents would have to acquire meat from local Nubian herders via exchange. The political ecology of Batn el-Hagr and the political economy of the Second Cataract forts reveal a complex set of problems facing C-Group herders and Egyptian bureaucrats in their interactions at Askut.

The experience of travelling through a colonial landscape is punctuated by points of control: garrisons, forts, checkpoints, and custom posts (Given 2004:51). The Egyptian pharaohs built the Second Cataract fortresses as part of a strategy aimed at geopolitical control. The forts served as the basis for mining operations and desert campaigns, as well as providing a line of defense against possible attacks from the south (Smith 1995, Smith 2003;

Williams 1999). The pharaonic Egyptian state created an entire system of surveillance and control by employing Nubians to patrol the Second Cataract region, placing eyes-for-hire in those places in the landscape beyond vantage points of the fortress towers.

Colonial boundaries are often designed to be visible and dominating; they "overturn the way people experience their own landscape" (Given 2004:76). The Second Cataract fortresses were meant to be imposing and intimidating (Smith 2003). These immense structures were a means of inscribing Egypt's raw military power on the Lower Nubian landscape, but the question remains: did the C-Group Nubians "read" Askut and the other fortresses the way they were "written"? In other words, why does the material record fail to indicate that the C-Group was properly imposed upon and/or intimidated, as planned? In the following sections, I argue that the fortresses, and their inhabitants, simply became another fixture within the political ecology of Lower Nubia. Documentary and archaeological evidence indicates that C-Group Nubians navigated around, adapted to, and then exploited the Second Cataract fortresses, both while they were occupied by Egyptian military and colonists, and after the state of Egypt abandoned the structures (Smith 2003; Trigger 1976; Adams 1977). Instead of scaring away the locals, *the Lower Nubian Fortresses became another resource in Lower Nubia's environment that the Nubian C-Group could learn to manipulate for survival.*

The scale and the proliferation of Egyptian mining operations, as early as the Old Kingdom, make it clear that the pharaohs were interested in the mineral wealth of Nubia. Michaux-Colombot (2014) reports of a quarrying expedition to the amethyst mines of Wadi el-Hudi that included one thousand able-bodied men, two hundred braves [sic] of Elephantine (near the First Cataract), and one hundred braves of Kom Ombo; she argues that

the "thousand able-bodied men" were Nubians. Michaux-Colombot contends that the fort administrators focused on mining expeditions, not military contexts. While Michaux-Colombot treats the military and mining contexts as mutually exclusive, I would argue that she might be underestimating the practical connection between military and mining. As for the forts themselves, they were designed with features such as broad ditches, thick walls reinforced to discourage climbing, and fighting platforms (Williams 1999). The forts seemed designed to work in concert to repel an invasion from the south (Smith 1993, 1996; 2003; Williams 1999).

5.3 *Political Ecology in The Belly of the Rock*

Ethnographers have also recorded pastoralist responses to modern state interventions aimed at controlling the landscape and pastoralist activity. Government attempts to adapt Sahelian pastoralism to the modern world through various forms of privatization (i.e. fences, boreholes, etc.) "failed spectacularly" (Park 1992, citing Nyerges 1982). The biological realities of bovine life history require certain concessions from a herding society's structure and organization, and these concessions may come into conflict with the strategies of state governments or colonizing authorities.

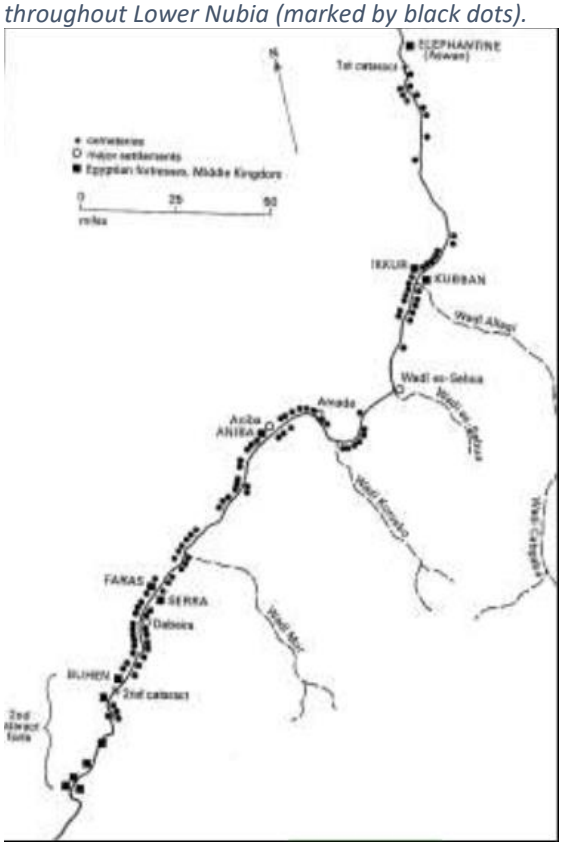
5.3.1 *The Nubian C-Group and "The Belly of the Rock"*

Colonialism and the modern age have been built upon unequal, dependent relationships (Morehart et al. 2018). There is a chance that this kind of positioning early on in Nile Valley history led to the foundational conditions for the ongoing relationship between the Nubian C-Group and all of their "proximate others." Bruce Trigger was the first to remark that Nubian C-Group settlement patterns did not change significantly after the

erection of military fortress across their territory. Trigger's interpretation of C-Group persistence in Lower Nubia was later expanded by Smith (2003), Edwards (2004), and Hafsaas-Tsakos (2006). Two of the largest C-Group tumuli sites were located quite close to the Egyptian fortresses of Aniba and Ikkur (see Figure 5.2). Morris interprets this proximity as evidence that the Egyptian relationship with the C-Group was more cooperative than predatory (Morris 2018:95). Morris suggests that the relationship between the Nubian C-Group and Egyptians, in terms of rewards for cooperation and punishments for inciting rebellion, may have been distinct from Egyptian relationships with other groups in Nubia (Morris 2018:79).

5.3.2. *C-Group Resistance*

Figure 5.2 Map from Adams (1977: 146) showing archaeologically known C-Group settlements throughout Lower Nubia (marked by black dots).



Given (2004) argues that colonialism is embodied in daily experiences; it is in practice that people dominate, resist, negotiate and compromise (Given 2004). Given's (2004) scale of resistance goes from outright rebellion to subconsciously going against colonizer expectations, with discrete acts of defiance such as tax evasion and pilfering as moderate forms of protest. Written sources from ancient states are hostile towards groups that resist taxation (examples in Given 2004). It is important to consider the possibility that the Nubian C-Group did not take the "fact" of Egyptian colonial

authority at face value. Historic era East African pastoralists often have decentralized structures of authority — and they have often rejected the notion that land can ultimately belong to a limited group of people (Dahl and Hjort 1976). Because cattle pastoralists are driven primarily by the needs of their cattle, Nubian pastoralists would almost certainly privilege their bovine idiom over Egyptian colonial law if conflicts were to arise between the two.

5.3.3. *Seasonal Mobility and Restricted Movement*

The Nubian C-Group lived and moved through lands ranging from arable to arid. Wadis provided water, wild flora, and places to cultivate seasonal plants, away from the politically fraught areas of the Nile Valley. A *wadi* is usually associated with a dry drainage system filled by rare and unpredictable floods that sometimes affect only a part of the collecting basin (Fossati 1995; Fossati et. al 1999). It is likely that the most active wadis were centers of plant cultivation and plant gathering activities. Paleobotanical studies of plants (past and present) in the Wadi Halfa region found 194 different species of plants, 25 of which had been cultivated there by human beings. In addition to the plants deliberately managed by people, 70% of the wild species present were anthropochores — plants that proliferate because of human-related manipulation or disturbances — speaking to the heavy usage of Wadi Halfa by past Nile Valley populations (Ahti et al. 1973).

I suspect that these wadis, well away from forts and easy to defend, could have been used to avoid direct conflict with Egyptians. Subsistence herders typically give the best grazing, closest to main settlements, to the bulk of the milk-giving cows. Bulls, dry cows, and a couple of milk-givers are kept farther away in “reserve” or “fallow” herds, sustaining only their herders with limited milk (Dahl and Hjort 1976: 135). Female animals are

circulated between fallow and subsistence herds to reduce ecological risks. Several fallow herds can be kept together so that young people from several households can cooperate in their care. If C-Group Nubians employed such a strategy, safety in numbers would have made them easier to follow but harder to raid. Recent cases show that fallow herds are usually moved more frequently to protect them from wild animals and from raiders (Dahl and Hjort 1976), and this could have been a driving force in the documented changes in C-Group mobility. A dearth of natural predators or raiding from other cattle-herding groups could have meant that the C-Group did not have to move fallow herds as frequently to protect them. Moving cattle from one pasture and water source to another suitable locale runs down the condition of the animals Coppolillo 2000), so if their fallow herds remained somewhat secure, even as C-Group communities came to more thoroughly rely on grain (both Egyptian and Nubian grown), these factors might have combined into a strong impetus for decreased mobility.

Dahl and Hjort (1976:16) argue that cultural change among pastoralists is impacted by external political factors. By the time of Senwosret III, Nubians were no longer allowed to travel across the Egypt's southern border without expressed permission (Smith 2003: location 1976). While some other factors, such as increasing reliance on small stock, may have also hindered C-Group mobility — small stock cannot travel as far nor as fast as cattle. Regional political circumstances might have encouraged portions of the Nubian C-Group communities to keep moving, especially considering the possibilities that they were forcibly blocked from settling on arable land.

The C-Group's seasonal mobility must have influenced their relationship with expansionist Egypt. Nomads generally have a widespread notoriety for ignoring political

boundary lines and disregarding colonial regulations (Given 2004: 72). Morris points to an example of a Bedouin sheikh whose people occupied the oases of the Western Desert in historic Egypt. Tensions spilled over between the Egyptian state and these pastoralists, who refused to either assimilate or adopt agriculture as a primary means of subsistence (Morris 2018:43). Textual sources attest that the pharaonic Egyptian state was motivated by the same impetus to control the movements of pastoralists and, occasionally, with consequences for the Egyptian state's expansionist reach. Military actions intended to exert control over the deserts were often met with force by nomads, rendering desert travel unsafe for Egyptian traders (Morris 2018: 49-50). Morris uses an example of Ancient China to demonstrate how war with nomads can be quite costly for states. The political and economic structures of the Mongolian nomad societies were much more amenable to prolonged warfare, and in the end, it was more effective for the Han Dynasty to just pay the nomads to stay away (Morris 2018, citing Barfield 2001). Given (2004) gives similar examples of the high cost paid by Italians attempting to colonize Bedouin groups in North Africa (after Atkinson 2000). The bottom line is that the process of colonizing mobile people is different than colonizing farmers permanently tied to the land; an attempt to control the movements of mobile pastoralists comes with at a cost to state powers in resources, bloodshed, and, often limitation of long-distance trade.

At some point, pharaohs concluded that no one could patrol the Nubian deserts on their behalf better than actual Nubians. Spalinger (2013) explains that Nubians themselves were likely involved in desert patrols, and their presence is further documented by Liszka (2011), Kraemer and Liszka (2016) and Liska and Kraemer (2016). The term "Medjay" seems to take on slightly different meanings in different contexts (Liszka 2011), but in the

context of the Middle Kingdom fort system, it referred mainly to patrolmen on guard around the defensive structures of Lower Nubia (Liszka and Kraemer 2016). Teams composed of Egyptian soldiers and Medjay made daily patrols that were documented in the so-called Semna Dispatches, in which dedicated scribes would send reports from the patrols to the other Lower Nubian fortresses, and also to officers based at the fortress of Semna (Kraemer and Liszka 2016). The Semna Dispatches describe skilled trackers trailing travelers through the desert and bringing people into the forts for questioning. Lower Nubia was home to indigenous hunters and herdsmen, equipped with dogs, bows, and arrows; the young men of these cultures were ideally suited to act as warriors (Spalinger 2013). Depictions of Nubian mercenaries show them with dogs wearing collars; the dogs are depicted as remarkably large, and Spalinger (2013) argues that the Nubians own and greatly prized dogs in a way distinct from "ordinary Egyptians."

The use of Nubians to patrol areas occupied by Nubians is somewhat analogous to other colonial developments in the borderlands mentioned in this chapter, such as literate Nubians becoming colonial scribes and Nubian priests being trained as temple personnel. What does this mean in terms of "colonial relations'? The personal advantages to working with Egyptian forces seem clear, but can an opportunist perceived as a "sell-out" actually influence group-wide assimilation? To answer this question, Morris (2018) constructs an analogy based on Nuer political economy. Wealth and status for a Nuer person was based on cattle, spiritual capital, and personal character. These components of public standing would be diminished if one became a known collaborator of British colonizers (Morris 2018:80-81). With this analogy, Morris sketches an interesting conundrum for C-Group Nubians seeking opportunities as facilitators for Egyptian imperialists. As mentioned above, she also argues

that the relationship between C-Group Nubians and colonial Egyptians along the border was more cooperative than predatory. For a variety of reasons, including a shared cultural milieu and a long-history of proximate otherness, the attitude of C-Group Nubians towards Egyptian colonists could have been quite different than how the Nuer viewed the British in general, thus not necessarily condemning Nubian facilitators to an ostracized status within their communities.

Within the fortresses, material culture tells a story of more intimate relations. Smith (1996,2003) details the various types of local Nubian artifacts found inside of Askut, including cookware, jewelry, and religious paraphernalia, among other things. Starting in the Second Intermediate Period, Nubian cookware increases significantly at Askut, pointing to the likelihood of intermarriage between Egyptian expatriate men and local Nubian women becoming more common (Smith 2003). In my discussion chapter, I will point to how the increasingly intimate nature of Egyptian-Nubian interaction is followed by a period in which —previously resistant— C-Group communities become more open to adopting Egyptianized dress, bodily performance, and religious practices (Smith 1996: 19, 148-149, 175). For now, I use Smith's description of these relations to contextualize the complexity of C-Group individuals and families cooperating with Egyptian expatriates.

5.3.4 *Archaeological evidence of C-Group Diet*

> "The very mobility that characterizes pastoral life presents an archaeological challenge. Pastoralists normally carry their homes with them, curate their tools, and reside in one area for short periods, all of which contributes to their low archaeological visibility (MacDonald 2000; Smith 1992). Moreover, pastoralists preferentially situate their camps away from areas liable to flooding (Gifford 1978). This virtually assures that faunal remains discarded in such sites will be more liable to destruction through weathering than to preservation through rapid deposition by water-borne sediments…" — Gifford-Gonzalez 2005: 189

During the Middle Kingdom, the Nubian C-Group would likely have subsisted on some combination of meat, milk, and blood from their animals, as well as acquiring agricultural products like grain and beer. The archaeological evidence of everyday meat consumption at C-Group habitation sites does not show cattle as the primary source of meat (Bangsgaard 2014). According to faunal analysis conducted in C-Group settlements, the main sources of meat were sheep, goat and hunted gazelle (Bangsgaard 2014). The assemblage at Site SJE 18 yielded a Number of Identified Specimens (NISP) of 402, and of these, only ten were identified as Bos (Bangsgaard 2014). The lack of cattle bone at C-Group habitation sites led Bangsgaard to conclude that the C-Group were more cattle pastoralists in ideology rather than in material reality.

While Bangsgaard acknowledges that the discrepancy could be explained by a milking and/or milk-and-blood strategy, she argues that settlement sites should still show more evidence of cattle remains than they do, even if with a strong emphasis on dairying (Bangsgaard 2014:348). Hafsaas-Tsakos (2006) argues that there are more caprine remains than cattle remains in C-Group assemblages because caprine flocks produce more skeletal remains over a given length of time, given their much shorter life spans. Bietak (1986) contends that cattle might have been disposed of differently, meaning that they were transported farther away for disposal. Bangsgaard (2014) responds that the proximal long bones should have been found at the habitation sites where meals were consumed, and also, that only bones disposed of during butchering, like legs and feet, would have been left at the kill site. To this debate, I would add that meat curing techniques used by pastoralists in dry lands suggest that the locations of bone deposits alone might not paint a complete picture of

where and how beef was consumed. Meat can be cured by salting, drying and smoking, with smoking being the most effective, and such dried meat can keep up to two years and will be boiled before consumption (Dahl and Hjort 1976: 169), something to consider before concluding that the C-Group diet did not contain beef.

There are two other possibilities for the surprisingly low frequency of cattle bones found in the SJE C-Group settlement excavations: sampling bias and/or a cultural shift away from cattle. Sampling bias may have occurred due to the expedient nature of the salvage campaigns that produced assemblages from Bangsgaard's study. The archaeology of pastoralism in Kenya followed a similar pattern, in which the most accessible sites along the Central Rift were assumed to be the norm, until the excavation or harder-to-reach hinterland sites revealed more variable patterning (Gifford-Gonzalez 2021, personal communication). Also, as I explained in Chapter 3, the C-Group sites along the Nile had been re-used and repeatedly reoccupied for centuries. The sites that are the most archaeologically "visible" might not represent the totality of C-Group patterns and life.

The second possibility, a cultural shift away from cattle-rearing, could be an indicator of the C-Group adapting to circumstances and reorganizing their subsistence on a larger scale. Heads of household in the C-Group settlements could have reoriented their priorities towards the Egyptian fortresses and the burgeoning borderland economy. This shift could have been an extension of an existing dry-season pattern of young people (perhaps just young men) pasturing cattle at a distance during the dry season, while older and younger members of society focused on homestead activities. This pattern could have become more consistent throughout the year, especially during periods in which young C-Group men were fighting in

Egypt's internal and external wars. Following this pattern, the observed increased in C-Group grain cultivation, as mentioned below, is expected.

An increasing reliance on small stock may have affected C-Group mobility. Goats are often kept close to the home compound, when herds of cattle are taken to faraway pastures and wadis (Dahl and Hjort 1976:200). This provides the homebound family members with goat milk and cheese. Moreover, a slaughtered caprine can be consumed by a single family by itself or stored a couple of days without time-consuming preparation (Dahl and Hjort 1976). In terms of meeting their nutritional needs, the Nubian C-Group could easily acquire iron, protein, and animal fats from their small stock and their hunted prey. Even under everyday circumstances, historic era pastoralists needing meat slaughter and consume sheep or goat more commonly than they slaughter a cow (Dahl and Hjort 1976). C-Group kept goats and sheep in Lower Nubia that were used for food as well as ritual and ceremonial purposes (Bangsgaard 2014).

If the C-Group raised small stock for meat and cattle for "currency", this could help explain some of Bangsgaard's (2014) findings. Cattle bones were rare in the assemblages that Bangsgaard (2014) analyzed, but, if they are abundant in the Askut faunal assemblage, then the baldest assumption from the two archaeological contexts would suggest that the local people of Lower Nubia were not eating cattle, but, the Egyptian colonists hundreds of miles from the nearest Egyptian herds were eating plenty of cattle that *must have come from somewhere*. I suspect that Trigger's (1976) description of fort residents acquiring cattle from local herders was the norm. My conjecture is that at some point the cattle raised by the C-Group from Middle Kingdom came to be used as medium of exchange more so than sustenance. I will be testing for the possibility that some or most of any cattle imported from

Egypt to Askut are discernible based on clinal differences in the skeletal morphology of Nile Valley cattle (*sensu* Chaix 2007)

5.3.5 *Milk, Blood, and Nutrition*

In dry conditions, East African pastoralists tend to have greater reliance on milk and blood (Dahl and Hjort 1976). Blood can be used to alleviate hardship during seasons when milk is scarce. Most East African pastoralists bleed their cattle occasionally; even the Nuer, who are only part pastoralist, see it as medicinally beneficial to the cow (Dahl and Hjort 1976). The ancient Egyptians also believed that bloodletting was therapeutic for cattle (Schwabe 1978). If C-Group herders were not consuming the meat of their own cattle, but instead, raising them for trade, exchange, and eventually, taxes, milking and bloodletting might have allowed them to extract some nutrition from the cattle they raised before the animals were traded or submitted to collectors.

Both milk and meat are high protein foods, but meat contains iron that is not present in milk (Dahl and Hjort 1976: 171). Even ritual consumption of blood has nutritional importance — with African pastoralists, blood feasts tend to occur in times when milk production is low (Dahl and Hjort 1976: 162). The concept of "milk scarcity" is subjective because milk availability is seasonal in any case, especially in drier climates when cattle breed seasonally according to rain cycles (Dahl and Hjort 1976: 160). If this milk and blood pastoralism was practiced by the C-Group, it may not have been practiced uniformly across the region, but only used in the driest microclimates or harshest ecological systems across C-Group's home ranges.

5.3.6 *Consumptions of Grains: Wild vs. Domestic*

As discussed in Chapter 3, about 600 years passed between the archaeological disappearance of the Nubian A-Group (2900 BC) and the appearance of their apparent descendants, the Nubian C-Group in the Nile Valley around 2400-2300 BC (Gatto 2015; Hafsass 2021). Beckett and Lovell (1994) compared dental wear and dental caries between the C-Group and the Nubian A-Group and found that even though both groups practiced a mixed economy, the Nubian C-Group relied more on cultivated cereals. Thus, it appears that the Nubian C-Group was at least partially reliant on grain and grain products from the Nile Valley such as sorghum, millet, and barley. While the C-Group used small jars for the short-term storage of liquids, larger pots used for the conservation of dry goods are almost absent (Hafsaas-Tsakos 2010: 389-90; Smith 1995: 35-39; Michaux-Colombot 2014). While it is possible that the C-Group did not become dependent on Nile Valley grain until after the 12th and 13th Dynasties of the Middle Kingdom, transhumant people are known to store grain in other ways. Among the Inkoria Dassanetch pastoralists of Kenya, women were observed storing sorghum and millet wrapped in caprine hides. The same women also explained that they would prefer to eat as much grain as they could, rather than deal with problems, such as pests and theft, that can accompany long-term grain storage (Gifford-Gonzalez, 2021, personal communication). Cereal cultivation within and around C-Group settlements, in fertile stretches of the Nile Valley, increased over time. By the New Kingdom, the Nubian C-Group was growing enough grain that their yields were taxed by the Egyptian state (Morris 2018:147). However, Morris uses an ethnographic analogy with the Nuer to deduce that "C-Group wealth would have been measured in cattle, not grain" (Morris 2018:79). Hafsaas-Tsakos (2006), Bangsgaard (2014), and Adams (1977), all seem to agree that even practical,

dietary shifts toward more grain consumption did not diminish the outward-facing ethnic identity as "cattle-keepers" so prevalent in C-Group burials, figurines, and pottery scenes.

An increased reliance on grain also does not preclude the consumption of wild plant foods in ecological niches such as Wadi Halfa (see Figure 5.1). During wet spells, the moderate vegetation in the wadis around the Nile provided a seasonal source of food for both people and herd animals (Butzer 1960). Studies of the grasses in the Eastern and Western deserts of Egypt include a long history of collecting and processing wild sorghum (Boulos and Fahmy 2007). Wild grasses were the staple food of forager societies in the Sahara before the spread of agriculture, and so-called desert grasses played a major role in the daily lives of ancient Egyptians, being used in building materials, agriculture, and artwork, among other things (Boulos et al. 2007).

Table 5.1 Timeline of Political and Ecological Influences on Lower Nubian cattle populations.

Time Period	**Political Events**	**Regional Cattle Herd Scenarios**
2900 BC	A-Group leaves Nile Valley	Low cattle population in Lower Nubia?
2720 BC	Snerfu's Theft	Lower Nubian herds collapse?
2400-2300 BC	C-Group becomes archaeology visible	Herds rebuilding, in recovery?
2181 BC	Old Kingdom ends, political disintegration of Egypt	Prolonged drought in Middle and Lower Nile. Herd rebuilding?
2181-2055 BC	First Intermediate Period	Lots of C-Group men engaged in warfare and not herding. Herds collapse or in recovery?
2055 BC – 1650 BC	Middle Kingdom	Drought is over but normal conditions are still drier than before. Lower Nubian herds in recovery.

5.3.7 *Stock keeping in Troubled Times*

Around 2181 BC, internal political collapse led to the end of the Egyptian Old Kingdom dynasties. The years following the Old Kingdom's collapse are known as the First Intermediate Period (FIP), and this era saw increased warfare between regional factions vying for power during the collapse of the pharaonic state apparatus. The idea that this period was correlated with a widespread, long span of exceptional aridity and climatic unpredictability (Bell 1971) is supported by the fact that, by 1700 BC, cattle populations of the Kerma Culture had undergone a dramatic decline (Honegger and Williams 2015). Honneger and Williams are posing an environmental cause to explain the faunal analysis as reported by Chaix (2007), showing that while cattle bones were abundant in earlier phases of Kerma's past, towards the latter part of Kerma's history, after 1750 BC, cattle remains declined rapidly until they become "rare." In Egypt, regional strong men built private armies that commonly employed young men from the C-Group as mercenaries (Fischer 1961). Since it is unlikely that groups of young C-Group Nubians were fighting in private armies within the borders of FIP Egypt while *also* moving herds of cattle throughout C-Group territories, I suspect that peaks of C-Group mercenary service overlapped with spans of very low cattle populations for the C-Group. Once Middle Kingdom pharaohs reunified Egypt politically around 2040 BC, some C-Group Nubians settled in Egypt near their former employers, while others went back to their territories throughout Lower Nubia. While Egyptian pharaohs worked to rebuild the geopolitical order of the Lower and Middle Nile Valley, the Nubian C-Group would likely have attempted to rebuild their herds during this period.

From the Nubian point of view, climate crises would necessitate strategies for supporting household nutrition and exchange for animals or foodstuffs. If the primary desire

of a subsistence herder is an increase in the herd's population (bounded by the herder's ability to organize labor), how would this have operated in the increasingly arid environment of ancient Lower Nubia? Theoretically, it takes more than ten years before the fertile cows of an African herd (the potential milk producers) double their number, assuming that there is no introduction of outside cattle into the herd network (Dahl and Hjort 1976: 61). In modern times, Sudanese nomadic herds increase at about 4% a year (Dahl and Hjort 1976: 69), not exactly a reassuring rate when faced with unpredictable climatic conditions. Weakened herd numbers in Lower Nubia at this time could have easily affected the way in which C-Group herders approached livestock transactions with colonial Egyptians.

Bangsgaard's (2014) analysis of SJE C-Group settlement faunas shows a diet focused on caprines supplemented by hunting and fishing. Even though caprines need less water than cattle, drought would have made it difficult to maintain high levels of small stock in Lower Nubia during the First Intermediate Period. While water from the Nile would have been accessible, edible plant biomass would have been reduced. Likewise, drought would have also affected the availability of wild prey, so C-Group hunters would have sought access to parts the river most attractive to wild bovids as well as the best watered wadis. More common than dramatic cattle herd collapse due to starvation, herds can dwindle away gradually, due to the effects of slow and incremental environmental changes on animal biology, in terms of survival and reproduction. For example, in modern Western Sudan, insufficient grazing leads to high lamb mortality. When male lambs are slaughtered, the chances for ewe survival are greatly improved (Dahl and Hjort 1976).

The sale of cattle is a last resort during droughts; it is a way of ameliorating loss, and gaining at least some value from animals that may eventually die of starvation (Dahl and

Hjort 1976). The historic era saw the practice of third-party traders buying up starving animals at low prices in order to fatten them up to sell them at higher prices elsewhere (Dahl and Hjort 1976). In pharaonic Egypt, this practice might involve Egyptian bureaucrats buying up starving C-Group cattle and putting them on cattle boats to ship downriver towards the Delta, where better environmental conditions could lead to the animals' recovery. A drought in Lower Nubia, a disaster for Lower Nubian herders, might thus have been an opportunity for Egyptian bureaucrats to provision Askut from a more favorable standpoint, and possibly provide the Pharaoh's Herd with an influx of Nubian cattle, even before the later period of New Kingdom and Ramesside taxation.

5.4 The Benefits: Why the Nubian C-Group would remain at the Second Cataract.

Stochastic processes that can affect herd health and size include the length of the dry season, rains, quality and quantity of grazing, and human decision-making/management. These were covered in detail in Chapter 4. Risk reduction strategies are embedded within the societal norms of African pastoralist cultures in the historic era. Such strategies include sharing and generosity, which are important for enhancing the family's social standing and prestige (Dahl and Hjort 1976: 163). Thinking of the many risk factors and social obligations that African pastoralists must consider when planning their survival, here, I explore what C-Group Nubians stood to gain economically from remaining on the borderlands and interacting with colonial garrisons on pharaonic Egypt's military frontier.

Cattle products can be bartered and traded for agricultural goods (Dahl and Hjort 1976). In northern Kenya, cattle are sold when a herd owner needs money for taxes, school fees, etc., or to buy grain and other foods (Dahl and Hjort 1976). Trigger (1976) claims that the Nubian C-Group traded meat with at least some of the Second Cataract fortresses.

Egyptians had logistical experience with provisioning soldiers and non-food producing specialists; acquiring meat for fortress residents might have been negotiated by offering products that the C-Group wanted and needed, such as grain and beer.

In the historic era, beef has had a greater "cash market value" over that of milk and blood (Dahl and Hjort 1976: 141). Although I will note Sherratt's (2004) objection to using "cash crop" concepts in the analysis of ancient economies, I believe the arrival of Egyptian garrisons in Lower Nubia created a demand for cattle meat; trade and exchange might have created opportunities from the point of view of pastoralists living in colonial borderlands. The relationship between the people of Lower Nubia and Egyptian military occupants, and eventually settlers/colonists, seemed to be in certain contexts mutually beneficial. The forts at the Second Cataract also gave some local Nubians access to Egyptian grain products, as well as gainful employment as guards, patrollers, and mine workers (Smith 2003). Inside and outside of the fortresses, the lives of Egyptian expatriates and C-Group Nubians become more intimately entangled over time. Smith's (1995) analysis of the pottery uncovered at Askut reveals that Nubian cookware found within the fortress households becomes more abundant over time, beginning in the Second Intermediate Period. Concurrently, C-Group burials at cemeteries, like the one close to the fortress of Mirgissa, show a bodily display that is increasingly influenced by Egyptian aesthetics (Smith 1995: 189). Overall, this means we must recognize that the economic decisions made by C-Group herders may have been strongly impacted by an increasingly intricate web of personal relationships that developed between groups in the borderlands over time.

Table 5.2: Chronology of Askut Occupations

Period	**Political Control**	**Date**
Middle Kingdom (garrison)	Egyptian Empire	c. 1850-1782 BC
Middle Kingdom (with colonists)	Egyptian Colony	c. 1782-1680 BC
Second Intermediate Period	Kerman Kingdom of Kush (Nubia)	c. 1680-1550/1500 BC*
New Kingdom	New Kingdom Colony	c. 1550/1500-1070 BC*
Napatan Period	Napatan Kingdom of Kush (Nubia)	c. 1070/747-656 BC#

*Conquest of Lower Nubia/Upper Nubia. #End of New Kingdom Empire/Conquest of Egypt by the Nubian Dynasty

5.5 *Askut's First Residents*

5.5.1 *Feeding Askut in the Middle Kingdom*

Did the residents of Askut requisition cattle meat, purchase it, trade for it, receive it in the form of taxes, or have it centrally distributed from cattle reserves under the purview of the pharaonic Egyptian state? The official state position on military "requisitioning" apparently changed over time. Goedicke's (1998) analysis of laws concerning proto-military conduct in Old Kingdom Egypt reveals an expressed condemnation of military requisitioning. Perhaps this was frowned upon not only for being unethical, but because the Egyptian state may not have had the bureaucratic apparatus for recording and quantifying resources acquired by troops throughout the countryside. In contrast, by New Kingdom times, Thutmose III and his successors had systems in place to track every head of cattle from the edges of the imperial boundaries, throughout the temple system, to the centralized bureaucracy (Smith 2003: location 3639).

Several C-Group communities could have worked in concert to provide meat for Askut —they could have been negotiating with each other in order to meet supply for the

fortresses. Any differences between meat acquisition and meat processing pathways found between the Middle Kingdom and Second Intermediate Period may shed light on provisioning strategies. While cattle bones are abundant in the Askut assemblage, so are those of sheep and goat. Small stock may also have been provided to Askut's residents by nearby Nubian C-Group inhabitants. The Askut assemblage has also yielded some remains of very small bovids, which had to be wild. Consumption of such very small bovids and their contribution to the diet of Nubian peoples may have been overlooked and underestimated. Faunal remains from the sites of Hannek, Shemkhiya, and El Ginefab suggest that very small bovid consumption was common and consistent throughout ancient Sudan (Monroe n.d.).

The Askut assemblage also contains the remains of domesticated pigs. The 3rd Dynasty biography of Methen mentions pigs, and the title Overseer of Swine existed in the time of Senwosret, circa 1971 BC (Ikram 2001). In pharaonic Egypt, pork was more commonly consumed in densely populated areas by people of low socioeconomic status (Moreno-Garcia 1999). Pigs are easier to raise and hide and therefore harder for the state to monitor, maintain and tax (Moreno-Garcia 1999). Unlike cattle, pigs in pharaonic Egypt did not seem to be associated with significant ideological value. Because pigs do not need the same type of pasturage, it is possible that pork was an independently renewable food source for Askut's residents. The Workmens Village excavated at Amarna, the 14th century BC capital of the pharaoh Akhenaten, offers an example of Egyptians cooperatively rearing pigs in a harsh climate. The food remains in Amarna's Workmens Village heavily favored pig and, to a lesser extent, goat, and these remains were accompanied by the material remains of pens and intensified husbandry (Kemp et al. 1994). While the pig remains at Askut were not as common as those from Amarna, the possibility of small-scale pig rearing is noted.

5.6. *Research Questions and Correlates*

5.6.1 Changes over Time at Askut – Expectations

The earliest specimens of animal bone from Askut were found in stratigraphic contexts dated to Egypt's Middle Kingdom. I will create mortality profiles for later periods to analyze changes in these over time. Due in part to the changes in the identity of Askut's residents, as well as fluctuations in cattle populations and changes in the political positioning of the Nubian C-Group, I expect the mortality profiles to vary through time. During the initial Middle Kingdom occupation, Askut residents acquired cattle from C-Group during a time of symmetrical political positioning. The C-Group could have culled herds according to their own herd management needs and exchanged these animals for the things they needed or desired. As the general composition of Askut's residents changed over time, a chronological analysis of the food remains should reflect that.

During the Second Intermediate Period, Askut became home to a community of Egyptian expatriates; the material culture of this chronological era indicates the presence of elites (Smith 1996). I expect to see several variables change during the Second Intermediate Period because of the breakdown in centralized distribution reflecting the disintegration of Egypt's bureaucratic apparatus. In the Second Intermediate Period, I expect to see increased variation in domestic specimens and skeletal elements, more along the lines of individual choices and variable transactions, and less evidence of bulk provisioning "via policy" (sensu Zeder 1988, 1991). Since fine ceramic serving vessels and documentary evidence suggest that elite Kermans and Egyptians hosted each other for aristocratic meals during the Second Intermediate Period (Smith 2003), the cuts of meat acquired should reflect social positions of those hosting such events. The types of meat cuts found should reflect the social positioning

of elite Egyptian colonists using foodways as a political arena. Patterns of age and sex ratios should shift in subsequent phases, becoming more varied to incorporate the more individualized tastes of elites not subject to bureaucratic meat distribution policies (sensu Zeder 1988, 1991).

The New Kingdom marked the reintegration of the Second Cataract Fortresses into Egypt's state infrastructure. As Egypt's New Kingdom administration moved to dominate Kerma's former trade networks, there may have been a disruption or change in beef supply. The inhabitants of the fortress may have been provisioned with meat purchased locally or they may have participated in the formerly Kerma-controlled cattle network, now controlled by a new Egyptian colonial bureaucracy.

After Kerma's defeat circa 1550 BC, New Kingdom pharaohs levied significant taxes in the form of cattle against Upper and Lower Nubia (Morris 2018). In this case, the cattle consumed at Askut could have been imported from Upper Nubia. Clinal differences in morphology that make Upper Nubian (Kerman) cattle distinct from cattle in the Lower Nile Valley should make them visible via biometric analysis if they are present in Askut's assemblage. The New Kingdom begins a century and a half after Honnegger and Williams (2018) and Chaix (2007) argue that cattle populations of the Kerma Empire began to dwindle. If cattle consumed at Askut are shown to be of Upper Nubian origin, this would indicate a political economic control over Nubian herders whose cattle populations were already depleted due to climate change. Askut's well-preserved faunal assemblage offers an opportunity to compare local cultural responses to several distinct colonial/imperial and cultural scenarios.

Chapter 5 Summary

C-Group herders and other pastoralists living and moving through the Egyptian-Nubian frontier would have had to negotiate dynamic and dramatic fluctuations in political ecology. The evidence of a mixed economy for the Nubian C-Group does not contradict the cattle-centric ideals and symbolic ideology found in their art and material culture. At the same time that the climate was becoming inhospitable to cattle, the influx of Egyptian soldiers into Lower Nubia created a new demand for beef. During the Middle Kingdom (2040 – 1650 BC) and the New Kingdom (1550–1050 BC), the exchange of livestock across the border would have been monitored and controlled by Egyptian administrators (Smith 1996, 2003). Instead of avoiding the Egyptian military frontier, it appears that C-Group people treated the Lower Nubian forts as sites of economic opportunity and negotiation.

Intermittent hostility and colonial expansion on the part of the pharaonic Egyptian state would likely have constrained C-Group responses to environmental stress; those constraints, however, could have been partially mitigated by the ability of C-Group to provide Egyptian colonists with beef in exchange for foodstuffs and other goods. With a holistic synthesis of all these factors in mind, Chapter 6 lists frameworks for zooarchaeological study of provisioning on an ancient military frontiers and presents my hypotheses concerning the acquisition of cattle for food at Askut. The hypotheses are followed by possible Egyptian strategies for provisioning beef, first to soldiers, and then to non-military colonists via-a-vis the probable herd management and trade strategies of the Nubian C-Group. In Chapter 7, I will assess my hypotheses with results of my analysis of Askut's faunal assemblage.

Chapter 6: Soldiers and Food — The Zooarchaeology of Military Frontiers

Like the other fortresses at the Second Cataract, Askut was originally built to house military garrisons. Soldiers in Ancient Egypt did not often write their own stories (except, perhaps, in their graffito). The archaeology of their food can help us understand an important aspect of their lived experience. Some aspects of diet are military in nature, reflecting site function in addition to culture contact. The data collected from the Askut faunal assemblage will be analyzed using different models for understanding military provisioning and the dynamics of cattle distribution between pastoralists and the inhabitants of Askut. Over time, however, Askut became home to a series of non-military populations, so understanding the economic and power relationships between herders and settlers is critical to this study.

6.1 Feeding an Army: The Problem of Military Provisioning in the Ancient World

The expansion of pharaonic Egypt's bounded territory required a certain functional level of military mobility. Egyptian combat strategy within the Nile Valley employed boat travel whenever possible, but even with the advantage of swift river travel, Egyptian combatants would inevitably have to secure political territories on foot. Spalinger (2013:405) highlights the relationship between military mobility and diet when he argues that "the Egyptian army could not move faster than 25km a day," and provisioning was always a problem because "an army marches on its stomach." As with other ancient and pre-industrial states, territorial expansion required a strategy for provisioning frontier troops with food, particularly meat or protein.

Egyptian soldiers were provisioned with beer and grain through a centralized system (Kemp 2006). Records reveal that seals and symbols were used so that each soldier could keep track of his allotment of beer and grain, but meat and other foodstuffs are not mentioned

as part of centralized rations (Kemp 2006; Liszka and Kraemer 2016; Smith 1990). Because the faunal remains reveal that these soldiers did not live by bread (and beer) alone, the question remains as to what role the bureaucracy played in the acquisition of meat at Askut. Egyptian administrators may have employed a variety of strategies to provision military personnel with meat, and the material results of those strategies should be distinguishable from the methods by which later inhabitants acquired livestock for food.

6.1.1. *Two Models of Military Provisioning: Sidebottom and Hesse and Wapnish*

Two relevant models in the literature analyze military frontier provisioning in the ancient world. In the first, Sidebottom (2004), highlights three possible strategies for provisioning militaries on ancient frontiers: 1) centralized provisioning, 2) localized provisioning through trade, purchase and exchange combined with foraging, and 3) "requisitioning," in which soldiers take livestock and resources without asking (Sidebottom 2004). Since Goedicke (1998) highlights written prohibitions against Egyptian soldiers and militia men "requisitioning" livestock, the official policy for provisioning soldiers likely relied Sidebottom's first or second strategies, or some combination of the two. Within this model, I will look for evidence indicating the centralized provisioning of cattle.

The correlates for centralized provisioning come from Zeder's (1988, 1991) "Feeding Cities" model for meat distribution in ancient settlements. In the context of an ancient military garrison, a large group of men requires protein; the soldiers might not require the most sumptuous cuts from young or valuable animals. If the distributor is acquiring meat (or receiving tribute) on behalf of non-elites, the goal may be to get the most meat per transaction. If the distributor is acquiring meat (or receiving tribute) to provision elites, then

we might find an emphasis on higher quality cuts from younger animals, with the consumer tastes/preferences being prioritized over maximum meat yield per transaction (Zeder 1988; Reid 1996; Russell 2011). Further details of Zeder's model will be discussed in a following section. Combining Sidebottom's model with Zeder's model permits one to assess evidence of a "top-down" strategy for meat distribution that might be visible in Askut's faunal remains.

6.2 The Problem of Provisioning (Non-food-producing) Colonists

As described in the previous chapter, Askut was located in a microclimate known at *Batn el Hagr*, a small dryland inhospitable to intensified food production (Smith 1991; Bangsgaard 2014). The residents of Askut, including colonial administrators, soldiers, and support staff, would have been provisioned with some foodstuffs via the pharaonic state. Michaux-Colombot (2014) argues that Egyptian expatriates in the Second Cataract region, "seeking exotica but not competing for land exploitation," had to rely on food rations from a central administration in Egypt, and she bases this argument on the large number of Egyptian storage jars in the fortresses containing cereals, oil, beer and wine (Michaux-Colombot 2014:22).

While Hesse (1982) states that patterns of human consumption are not the same as patterns of animal production (Chang and Koster 1986), we can expect that Askut's residents would have acquired cattle, either through purchase or as tribute, with specific provisioning strategies in mind. Zeder (1988, 1991) presents a framework in which transactions of livestock/meat exchange contain a tension between the desires of the herder and the community being provisioned. Pastoralists want to employ the most optimal strategies for

herd reproductive viability while the consumers, in case of Askut, colonial bureaucrats, need to efficiently provision a group of non-food producers.

The models presented in the next section are designed to trace power relationships through the exchange of meat from one group or class to another. In each model, herd management strategies are considered, and presume that herding classes/groups want to protect the long-term stability of their herds. If the Nubian C-Group were supplying cattle to Askut, their aims in doing so would be rooted in the subsistence strategies outlined in Chapter 3. This is necessarily two groups seeking a balance of differing aim. While the herder wants to obtain various material or nutritional advantages, without depleting the viability of the herd, the consumer's needs may change according to the presence and structure of their general food distribution system.

In the preceding chapters, I outlined the political and environmental constraints on the range of survival strategies the Nubian C-Group might have employed to flourish across the different ecozones in their home range. Circumstances may have permitted or required the C-Group to employ multifaceted strategies with multiple goals that were flexible and contingent.

6.2.1 Two Models of Animal Distribution: Zeder and Reid

Melinda Zeder (1988, 1991) created a model for meat exchange at urban settlements in ancient Iran. She theorized the zooarchaeological correlates using faunal assemblages that resulted from two systems of meat acquisition. The first type of distribution was a centralized system in which settlement leaders acquired animal portions in bulk and then distributed them to urban dwellers. Under the second system, individual households acquired meat

portions for themselves, which in the case of her main study site, was a public market system. She used principal species, age and sex ratio, body segment utility, and butchery mark patterns to compare herd management strategies employed by mobile pastoralists to the assemblages produced via by centralized provisioning strategies within the settlements. Zeder found that skeletal elements and species consumed were less variable in contexts based on a centralized system of meat distribution, meaning that portions present, taxonomic and age groups represented, and butchery marks all showed significant uniformity. The increased uniformity of the elements was suggestive of choices made as a matter of "policy" for efficient bulk feeding of a non-food-producing population (Zeder 1988, 1991). In contexts where individuals and households acquired their meat directly, rather than through a centralized system, the characteristic of the assemblages were more variable, suggesting that members of households made choices based on a variety of needs and preferences (Zeder 1988, 1991).

Andrew Reid (1996) created a model for understanding administrative cattle distribution in early East African state societies of the Zimbabwean Plateau. His overall goal was to test the assumption by previous scholars that state strategies of provisioning the Shona elite with the meat of young animals was inimical to the optimal herd management strategies of the pastoralist class (Reid 1996). After analyzing the faunal remains of cattle to determine the age and sex ratios of the animals acquired in elite residences, Reid determined that elite provisioning strategies did *not* undermine herd management strategies because the herders gave the elite consumers the young bulls that they would have culled anyway as a practical measure. Reid also postulated that the transactions benefited both the elite provisioners and the herding class in that the young bulls were slaughtered and consumed before they were old

enough to ruin the peace of the herd, but *after* they were large enough to provide the most meat to the king's elite kinsfolk.

6.2.2 *Modelling Meat Exchange at Askut: Expectations*

In some cases, cultural tastes of elites may indeed be prioritized over the ecological pressures faced by livestock keepers (Chang and Koster 1986). Several characteristics of a faunal assemblage can indicate whether herders or settlers had the political-economic advantage in the transaction (de France 2009; Zeder 1988). Since I do not fully understand the political relationship between herders and non-herding colonists in Middle Kingdom Lower Nubia, I will look for and examine these indicative characteristics in order to explore power dynamics in meat exchange at Askut. Mortality profiles are used to analyze the culling patterns of cattle keepers. The aggregate ages at death can be compared to a hypothetical herd comprising the ideal demographic makeup for stockkeepers, depending on their aims and concerns. For East African herders, a viable herd of cattle is made up mostly of prime age females between the ages of 4 and 10 (Dahl and Hjort 1978). The female population of the herd is more influenced by natural processes than deliberate human offtake. When castrated males (oxen) are present, their numbers generally increase with the herd size, and in very large herds, oxen may outnumber females (Dahl and Hjort 1976:30). The fact that male bovids are culled young does not mean that they are considered disposable. There are ecological and religious reasons for having a surplus population of males aside from those needed to reproductive success. In environments of low rainfall predictability, greater numbers of male stock are likely to be kept into maturity as a hedge against adversity (Chang and Koster 1986).

6.3 Hypotheses

For each phase of Askut's occupation, cattle bones from the food refuse can reveal patterns in slaughter, butchery, distribution, and by extension, consumption. What follows is a list of hypotheses proposing different possibilities for meat provisioning and consumption at Askut. Each hypothesis is followed by archaeological correlates /variables that I must compare.

Research Question 1: What species (and which skeletal elements) were consumed at Askut, and by whom?

Research Question 2: Is there evidence of centralized meat distribution?

Research Question 3: Where did the cattle come from?

Research Question 4: Do patterns in the faunal remains contain any evidence of power dynamics between meat producers and meat consumers?

Hypothesis 1:

In the Middle Kingdom, the Egyptian military pursued a provisioning strategy that included centralized rations combined with foraging, with soldiers sometimes hunting their own food. Localized provisioning would also be indicated by cattle that look more Nubian than Egyptian.

Archaeological Correlates: Evidence of provisioning will be measured by observing uniformity versus variability. Skeletal elements should show uniformity in body part representation and culinary preparation. Animals should all be close in age at death and I expect to see signs of standardized butchery (Zeder 1988:39). Morphological, biometric measurements should fall into clusters that either match or more closely resemble the taller, gracile cattle of Kerma rather than the shorter, robust cattle of Egypt.

Hypothesis 2:

In the Middle Kingdom, cattle acquired at Askut were raised in C-Group territory. In the Second Intermediate Period, elites are acquiring cattle from Lower and Upper Nubia, being cut off from centralized provisioning via the pharaonic state. During the Second Intermediate Period, local cattle should predominate at first, but some cattle may have been transported from deeper within Upper Nubia. In the New Kingdom, the C-Group disbursed, and analysis should show cattle coming from further away.

Archaeological Correlates: Using stature and morphology data derived from osteological measurements (Von den Driesch 1990; Albarella 2002), I expect the stature data from the Middle Kingdom to show that the cattle from this period have a more Egyptian robusticity. The markers of Egyptian robusticity should disappear by the Second Intermediate Period. I expect the stature to vary the most during the earlier years and to vary less in later contexts, meaning that most of the cattle consumed at Askut would come from Lower Nubia at first, and then Upper Nubia (the South) later on.

Hypothesis 3:

In the Middle Kingdom, the C-Group should have enough freedom of movement and economic independence to dictate some terms of the exchange. Askut is on an island where the inhabitants cannot raise their own livestock, perhaps with a few pigs as the exception. The earliest phases of Askut's assemblage will contain animals that reflect the herd culling strategies of Lower Nubian herders. The frequency of young male cattle (ages 6 months to 4 years) will follow.

Archaeological Correlates:

The percentage of subadults consumed during the Middle Kingdom, marked by unfused elements and immature morphology, should be lower than the percentage of subadults consumed during the Second Intermediate Period. The percentage of subadults will remain high throughout the New Kingdom contexts.

6.3.1 Summary of Research Questions and Hypotheses

Table 6.1: Summary of questions, methods and expectations.

Research Question	**What animals were eaten at Askut?**	**Evidence of Centralized Meat Distribution?**	**Where are the cattle coming from?**	**Is there evidence of asymmetrical power relationships?**
Method	Species identification, age estimation and sex determination	Statistical analysis of body part representation and butchery	Osteometric analysis	Estimates of sex and age at deathx
Correlates	Taxa present, ratio of wild-to-domestic bovids, ratio of small to large livestock .	Frequency /variation in taxa present, uniformity of cutmarks	Stature for Egyptian (short, robust) vs. Upper Nubian (tall, gracile) cattle	Adult versus subadult animals.
Hypothesis / Expectations				
Middle Kingdom (early)	Soldiers eating both wild and domestic animals. Assemblage should have more cattle than caprines.	Yes, domestic animals should show uniformity.	Stature will show mixed results, with the presences of skeletal elements that are more robust	No.
Middle Kingdom with colonists	More domestic animals, less wild game.	Yes, but less than in the initial period of soldiers only.	The taller, gracile Kerma type predominates.	Yes.
Second Intermediate Period	More caprines than cattle.	More variation.	Upper Nubia (tall, gracile)	Yes.
New Kingdom	More caprines than cattle.	More variation.	Upper Nubia (tall, gracile)	Yes.
The Late Period	More caprines than cattle.	More variation.	Upper Nubia (tall, gracile)	No.

6.4 *Research Materials and Methods*

Askut was excavated in the late 1950s by University of California Los Angeles archaeologist, Alexander Badawy. A total of 2573 animal specimens have been in the care of the Fowler Museum of Archaeology at UCLA. This collection was studied preliminarily in the 90s, but analyses remained unfinished and/or unpublished. The bones are mostly in good surface condition, except for some minor problems with preservation slightly exacerbated by handling during the first analysis. The collection is on loan from UCLA to Professor Stuart Tyson Smith (UCSB), with permissions from all of the proposed methods of analysis.

Like the other artifacts at Askut, the faunal remains were meticulously excavated and labelled with good provenience information, including the room number within the fort structure and the depth of the deposit in meters. The faunal specimens were dated associated archaeological finds, thus, most bags of bone are labelled with a chronological phase, e.g. Middle Kingdom, Second Intermediate Period, Late New Kingdom, etc. Because different groups of people lived in Askut at different times in its history, I will use the chronological phases to help me control for different categories of meat consumers.

Laboratory analysis began with sorting specimens by species and element. Reference collections at UC Santa Barbara, UC Santa Cruz, and the Los Angeles County Museum of Natural History (Vernon Mammal Warehouse) were used for species identification. Most domestic specimens fell into the categories of *Bos taurus* (cow), *Capra hircus* (goat) or *Ovis aries* (sheep), shortened to *Bos*, *Capra*, and *Ovis*. Caprine specimens that could not be identified to *Capra* or *Ovis* are simply referred to as caprine

or *Caprini*, a category that includes both species. Other taxa present include equids, suids, and canines. While pork was avoided by the priest class of ancient Egypt, pigs are commonly found in non-elite contexts from Egypt's Predynastic to Christian times (Ikram 1993; Lobban 1998). Fish, bivalves, and aquatic reptiles are also present in Askut's food refuse.

6.4.1 *Element and Species Identification*

More experienced zooarchaeologists show greater consistency in their judgment calls when analysis calls for some degree of subjective assessment (O'Connor 2002). I have calibrated my recorded observations on these types of judgments with those of Professor Diane Gifford-Gonzalez (UCSC) and Professor Sarah McClure (UCSB), two analysts with more experience. In terms of species and skeletal part identification, I routinely picked difficult-to-identify specimens and asked Professor Gifford-Gonzalez identify them independently from me, so that I could "check my answers".

Some elements within the full assemblage could only be identified as *small, medium*, or *large* mammal. Other specimens could only be categorized as extra small, small, medium, or large bovid within the family Bovidae, the category that contains nearly all wild African ungulates, cattle, sheep, and goat. The size and morphology of domestic cattle and caprines is different than that of most wild bovids encountered in Middle Nile Valley faunal collections, thus, size is important when identifying species in this taxon. I sometimes encountered elements that, because of mechanical damage or erosion, I could not confidently assign to *Bos taurus*. Specimens that I could identify with about 85% confidence were recorded as cf. *Bos taurus*, and those for which I was less

certain were only assigned to *large bovid*. Similar treatment was given to the few elements that, because of erosion or damage, may have been either a caprine or a species of gazelle/antelope. For ambiguous specimens, if I could not say with 85% confidence that it was a goat or a sheep (cf. *Caprini*), the specimen remained in the category of *small-medium bovid*.

As could be expected from a fortress on a river island, the fauna assemblage from Askut contains a healthy proportion of fish remains. The fish were sorted and recorded with the help of colleague, Hugh Radde; I mention them here only for what their presence indicates about the recovery methods employed at Askut. Some 260 artifact bags contained at least some amount of bivalve shell, fish bone, or aquatic reptile bone. Those 260 bags contained over 1250 specimens. The presence of delicate fish and reptile bone indicates two things. First, recovery methods were thorough enough to collect fish species ranging from *small* (e.g., *Synodontis clarias* and *Clarias spp.*) to *large* (e.g., *Lates niloticus*). Second, the presence of very small fish bone serves to highlight the absence of rodent bone. I do not know if this was a recovery decision on the part of Badawy and his excavators, but screens that caught small fish bone should have caught at least some skeletal elements from commensal rodents. Furthermore, bags containing a significant amounts of soil and "bone dust" were sifted through fine mesh over glass jars in my ongoing attempt to make sure no small bones were missed. Only one specimen from the family Rodentia was uncovered, a complete skeleton that was not from any of the sifted bags of soil or dust. However, the presence of at least some rodents at Askut is attested by the teeth marks they left on the bones of other taxa.

Before moving into my cattle-focused analysis, I recorded and examined the propotion of bones from all taxa present in the refuse in order to understand the general character of the full assemblage. My first goal was to look for traits within this assemblage that would help characterize the food remains as "military" in nature. The idea here is that the food remains of ancient military settlements look different than faunal assemblages collected from non-military settlements. Hesse and Wapnish (1985) introduced several indices for measuring the military character of ancient Old World settlements including:

1. ratio of transport animals to barnyard stock, which would indicate the regular and mass moving of supplies;
2. ages at death of each category of animal, which would indicate that herd animals are purchased in their prime rather than raised from infancy at the fort, with the inevitable attrition of very young animals reflected in deposits;
3. higher than expected ratio of wild game to livestock as soldiers entertain themselves and supplement their diet by hunting.

One factor to consider in these analyses was the primacy of river transport in the ancient Nile Valley. Animals used for terrestrial transportation Transport animals may have been less important compared to Southwest Asian contexts. The following table shows the number of transport and security animals compared to animals normally that would have been eaten for food in the Askut assemblage. Transport animals include horses and donkeys, securitiy animals would be dogs, while food animals, in this context, include cattle, sheep, goats and pigs. The low ratio of transport animals to food animals at Askut does not appear to fit Hesse and Wapnish's (1985) rubric. The most obvious

reason for this is that Askut is on an island in the Nile River. Supplies and goods would have been brought in by boat, as well as the fact that most of the livestock supply would arrive at the fort under their own power.

Table 6.1: Taxonomic correlates for military provisioning faunal assemblages. All figures as Number of (taxonomically) Identifiable Specimens (NISP). "Caprini" refers to sheep and goats, not otherwise differentiated.

Transport & Security Taxa		**Food Taxa**
Equidae	13	
Canidae	6	
Bos	0	712
Caprini	0	671
Suidae	0	20
Total	**19**	**1403**

Hesse and Wapnish's second feature of Old World military faunal assemblages is evidence of more animals purchased than raised, indicated by a higher frequency of adult specimens accompanied by a lower frequency of subadults. Determining the ratio of wild-to-domestic fauna for each phase of the site's occupation should help us understand the role of wild fauna for military provisioning.

The following table presents a preliminary breakdown of adult versus subadult specimens in each category. It simply compares "adult," vs. "subadult," elements based upon unfused epiphyses and/or visibly immature/neonate morphology.

Table 6.2: Animals purchased vs. animals raised in place. All figures as Number of (taxonomically) Identifiable Specimens (NISP).

Taxon	**Prime Age**	**Subadult**
Bos	296	92
Caprini	398	78
Suidae	9	1
Canidae	3	3
Equidae	13	0

Here, the only taxon to yield no subadult specimens at all was *Equus*. While Askut residents would not have been able to raise caprines and cattle on the island itself, it is clear that through trade or distribution, Askut's suppliers had access to young and neonate animals nearby. The samples of immature pigs and dogs are negligible. One might have expected more canid specimens, but it makes perfect sense that deceased service canines would be disposed of somewhere on the banks of the river rather than included with the food refuse on the island.

Wild animals are also present in Askut's assemblage and may point to Egyptian soldiers occasionally hunting their own meat or trading for/purchasing hunted animals from local folk. The following table presents a preliminary breakdown of wild-to-domestic bovid ratios. In African archaeological contexts like Askut, separating wild bovid taxa from domestic bovids is complicated by the few wild bovid species that overlap in size with domesticated bovids. This table does not represent all of the bovid specimens found at Askut; bovids that could not be attributed to species or to a size category that fully eliminated caprines and cattle are not included here.

Table 6.3: Wild-to-Domestic Species Ratio

Time Period	Wild Bovids	Cattle	Caprines	Pigs	Total Food Domesticates
Middle Kingdom	12	107	80	5	204
Second Intermediate Period	6	74	58	1	139
New Kingdom to Late 18th Dynasty	28	365	331	8	732
Ramesside and Late Period	6	73	84	2	165
Undated	11	104	105	4	224
Totals	**63**	**723**	**658**	**20**	**1464**

Although the sample sizes for wild bovids are small, wild bovid remains are present in every chronological period, suggesting that hunting or trading for gazelle, in particular, took place up until the end of Egyptian occupation in the New Kingdom. Based on these preliminary data for transport animals, subadult domesticates, and wild bovids, the faunal assemblage of Askut does not resemble the faunal assemblages of the military forts analyzed by Hesse and Wapnish (1985), not even in Askut's initial occupation period. I will discuss my proposed reasons for the differences in Chapter 8.

6.4.2 *Quantification*

My next goal was to quantify cattle bones compared with other species present in the assemblage. I sought to differentiate between the frequencies of cattle in samples dating to different periods of time. Other variables I measured are related to other taphonomic aspects of the assemblage, such as degree fragmentation and bone mineral density. The Completeness Appendix shows the portions preserved, as well as the scan sites present and the corresponding volume density according to Lam et al. (1999).

Only 36 of 2573 fragments, or 1.3%, could not be identified to any taxa other than mammal. Of the 2315 elements, or 89.9%, could be identified and attributed to some taxonomic level. I calculated the percentage identification rate for the total assemblage. Out of 2573 bones, 222, or 8.6%, were "minimally identifiable", or MID. The number of MID includes 131 specimens identified as "long bone fragment," "long bone fragment, femur/humerus", and "long bone fragment, tibia/metapodial"; these fragments were not calculated into Number of Identified Specimens (NISP).

I also calculated the overall *percent completeness* for the cattle specimens, using a formula for from Morlan (1994). The portions defined come from Dobney and Reilly (1988). In the Askut assemblage, 723 of the 2573 specimens were identified as *Bos taurus*. The *percent completeness* was calculated as the *Portions Preserved* divided by the *NISP*, divided by the *Portions Defined*: (PP ÷ NISP) ÷ PD. I based this only on elements for which portions had been recorded, so the count excludes teeth, cranial fragments, horns, carpals, and tarsals. (1067 (PP) ÷ 471 (NISP)) ÷ 108 (PD) = 21% completeness.

The Minimum Number of Individuals, or MNI, is an estimate of how many individual animals, at a minimum, it took to yield the most frequently found element of each species (Gifford Gonzalez 2018:188; Reitz and Wing 2008:210). Calculation of the Minimum Number of Individuals often includes using the age information from each specimen in order to diminish the possibility of counting elements from the same individual (Uerpmann 1973). Gifford-Gonzalez (2017) emphasizes that MNI should be used with a landmark system to avoid overlap. I used the Dobney and Reilly (1988) zoning system to define the bone portions and avoid overlapping /double-counting. Another measure of secondary data, MNE, or Minimum Number of Elements, estimates the number of skeletal elements that had to be present to produce the number of fragments assigned to that element (Gifford-Gonzalez 2018:190; Reitz and Wing 2008: 227). Since bone mineral density differs within each bone, Minimum Number of Elements should ideally be calculated separately for portions of major elements using diagnostic zones that correspond to specific density scan sites. For elements with more

than one scan site present, an average is given for the volume density values of all sites present.

Table 6.5 NISP, Number of Individual Specimens, alongside Minimum Number of Elements, right and left side of the body.

Element	NISP	MNE Left	MNE Right
Astragalus	16	9	7
Atlas	10		
Axis	6		
C3	1		
C4	1		
C5	2		
C6	1		
C7	1		
Calcaneus	19	5	7
Carpals	31	2	9
Caudal Vertebra	5		
Cervical Vertebra (not identified to number)	18		
Cranium	30	7	4
Femur	37	9	8
Humerus	25	7	7
Innominate	20	4	4
Lower Molar 3	11	3	10
Lumbar Vertebra	14		
Mandible	38	11	16
Maxilla	17	7	3
Metacarpal	13	6	3
Metapodial (not identified forelimb or hindlimb)	25	1	
Metatarsal	9	5	
Phalanx (not identified to number)	1		
Phalanx 1	27		
Phalanx 2	22		
Phalanx 3	13		
Radius	17	3	5
Rib	46		
Sacral Vertebra (unattached)	2		
Sacrum	6		
Scapula	13	1	5
Teeth (not Lower Molar 3 and not attached to Mandible)	47	4	13
Thoracic Vertebra	30		
Tibia	21	8	8
Ulna	8	4	
Vertebra indet.	30		

Chapter 6 Summary

In this chapter I present several theoretical models for examining political economy and intergroup relations through food remains used in archaeological contexts in Southwest Asia and East Africa. I followed these models with a description of my research materials and methods. I finished by presenting preliminary data from my analysis concerning the general nature of the assemblage, including an analysis of assemblage traits that would characterize this assemblage as "military" in nature. While the Askut assemblage does appear to differ from the military fort assemblages of Southwest Asia, described by Hesse and Wapnish (1985), I offer the role of riverine transport as a plausible explanation in Chapter 8. In Chapter 7, I present a detailed analysis the *Bos taurus* specimens found at Askut. I offer visual representation of the collection's composition and illustrate changes in collection's composition over time. I address my research questions with the data, and present the results of testing the hypotheses I presented in Chapter 5.

Chapter 7: Data and Results

This chapter begins with a descriptive summary of the collection of *Bos taurus* specimens found at Askut. After presenting my general findings, and interpreting the implications of these analyses, I use these archaeological data to address my research questions and hypotheses. In Chapter 8, I discuss the implications of my results and what I believe to be the contribution of this research to the field.

Table 7.1 Identified Bos taurus quantified according to Number of Identified Specimens, and Minimum Number of Elements.

Element	**NISP**		**MNE**	**MNE**
			Left	Right
Cranium	30		7	4
Maxilla	17		7	3
Mandible	38		11	16
Lower Molar 3	11		3	10
Teeth (not Lower Molar 3 and not attached to Mandible)	47		4	13
Atlas	10			
Axis	6			
C3	1			
C4	1			
C5	2			
C6	1			
C7	1			
Cervical Vertebra (not identified to number)	18			
Scapula	13		1	5
Humerus	25		7	7
Radius	17		3	5
Ulna	8		4	
Astragalus	16		9	7
Calcaneus	19		5	7
Metacarpal	13		6	3
Carpals	31		2	9
Phalanx (fragment indet.)	1			
Phalanx 1	27			
Phalanx 2	22			
Phalanx 3	13			
Thoracic Vertebra	30			
Lumbar Vertebra	14			
Rib	46			
Sacral Vertebra (unattached)	2			
Sacrum	6			
Innominate	20		4	4
Femur	37		9	8
Tibia	21		8	8
Metatarsal	9		5	
Metapodial (not identified forelimb or hindlimb)	25		1	
Caudal Vertebra	5			
Vertebra indet.	30			

Of the 2573 specimens in the Askut assemblage, 723 were identified as *Bos taurus*. Elements discussed in this section are the specimens identifiable to element, side, and portion (*sensu* Dobney and Riley 1988). The bones discussed here are also the bones that yielded osteometric data used to aid in sex estimation and compare to other regional cattle assemblages. Some of these data stand alone, and tables compare the Askut cattle data with specimens from Chaix's (2007) osteometric study of Kerma cattle. Table 7.1 lists the number of identified *Bos taurus* specimens in the collection. Minimally identified elements, as well as horn fragments, horn core fragments, and keratin hooves, are included in the appendix but not given here.

7.1 *The assessment of element representation.*

In order to examine body segment representation, I grouped elements into anatomical regions chosen by Chaix (2007). The *head* category includes the maxilla, the mandible, and Lower Molar 3. Other cranial fragments are included in the appendices, but not here. *Rachis* includes the atlas and the axis (C1 and C2). *Forelimb* includes the humerus, the radius, and the ulna. *Hindlimb* includes the femur and the tibia. *Hand/foot* includes the carpals (lunates, cuneiforms, unciforms, and magnums), the metacarpal, the metatarsal, the astragalus, and the calcaneus. Chaix's (2007) body segment representation chart did not include the axial skeleton below C2.

Figure 7.1 illustrates body segment representation in the Askut assemblage. Discrepancies between them can illustrate the effects of fragmentation as genuine under or over-representation (Orton 2010). The distribution of body segments in the Askut assemblage seems to show that recovery of archaeological bone was thorough. The presence of cranial and hand/foot elements suggests that the whole animals were

acquired, transported to, and butchered on the island. There does seem to be some differential destruction of the long bones, but this was likely due to carcass processing decisions and not transport decisions. Depending on their function, skeletal elements are composed of different proportions of cancellous, or spongy, bone, and cortical, or smooth, bone. Some elements, like vertebrae for example, have only a thin layer of cortical bone surrounding cancellous bone, and this makes these delicate bones less likely to survive taphonomic conditions intact (Reitz and Wing 2008:56). Four specimens bones show signs of rodent gnawing: two moderate and two severe. One specimens showed probable carnivore gnawing, bringing the number of specimens showing visible evidence of gnawing to five.

Figure 7.4: Askut body segment summary.

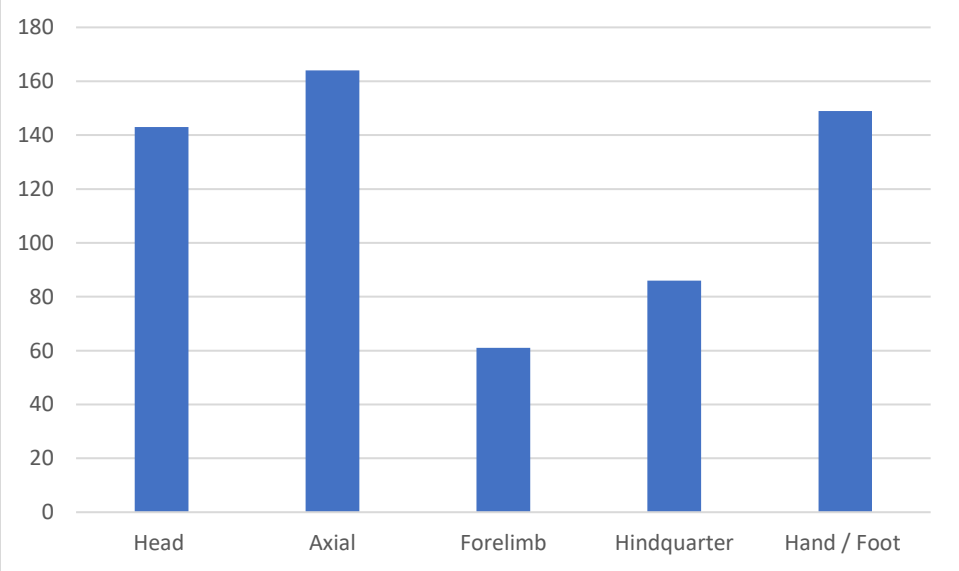


Table 7.2 describes the condition of the Askut assemblage in terms of how complete the bones are compared to a whole, unbroken or undeteriorated specimen. Elements are listed from most to least abundant. The first column gives the Number of Identified Specimens for each element. The second and third columns give the Minimum

Number of Elements that could be attributed to the right or left side of the body. The fourth column gives the number of bones expected based on the highest MNE for paired elements on either side of the body. The "Expected" and "Percent Completeness" columns help reveal any irregularities in preservation or attrition.

Table 7.2 Number of Individual Specimens, Minimum Number of Elements,Observed versus Elements Expected, and Percentage Completeness

Element	**NISP**	**MNE Left**	**MNE Right**	**Expected**	**% Completeness**
Teeth (excluding Lower Molar 3 and teeth attached to Mandible)	47	4	13		
Rib	46				60.1
Mandible	38	11	16	17	24.7
Femur	**37**	**9**	**8**	**17**	**15.0**
Carpals	31	2	9		
Cranium	30	7	4	8.5	
Thoracic Vertebra	30			117	
Vertebra (indet)	30				47.9**
Metapodial (not identified forelimb or hindlimb)	28	1		136	31.5***
Humerus	25	7	7	17	26.5
Tibia	21	8	8	17	23.5
Innominate	20	4	4	17	19.1
Phalanx 1	20			136	88.2
Calcaneus	19	5	7	17	63.0
Phalanx 2	19			136	95.6
Cervical Vertebra (not identified to number)	18				
Maxilla	17	7	3	17	
Astragalus	15	9	5	17	92.2
Radius	15	3	5	17	16.7*
Lumbar Vertebra	14			54	
Scapula	13	1	5	17	25.4
Phalanx 3	12			136	100
Lower Molar 3	11	3	10	17	
Metacarpal	11	6	3	68	
Atlas	9			8.5	83.0

Metatarsal	9	5		68	
Ulna	8	4		17	
Axis	6			8.5	42.8
Sacrum	6			8.5	
Caudal Vertebra	5			72	
Phalanx indet.	5				
C5	2			8.5	
Sacral Vertebra (unattached)	2				
C3	1			8.5	
C4	1			8.5	
C6	1			8.5	
C7	1			8.5	

*radio/ulna PP given as radius PP
**all vertebra PP given as vertebra PP, excluding axis and atlas
***all metatarsal and metatarsals are included in metapodial PP

7.2 Estimating Age

Zooarchaeologists use tooth eruption and epiphyseal fusion to estimate an animal's age at death. While I have included tooth eruption data, I privilege post-cranial elements to estimate age at death for the cows consumed at Askut. Bones are pre-formed in cartilage before they ossify — growing from primary centers of ossification. The age of an animal can be determined by noting the regions in which ossification has occurred, with a fully fused skeleton being considered an adult (Silver 1969). Epiphyses may be closed but not fused. Even closed epiphyses might not be strong enough to withstand the taphonomic stress that archaeological assemblages are exposed to over the course time (Silver 1969).

Bones and teeth can behave in very different ways. Even though better housing and nutrition lead to earlier tooth eruption (Silver 1969:295), tooth eruption ages tend to be more conservative and therefore less affected by environmental factors as well as age and sex variation (Degerbøl 1963; Payne and Bull 1988). Epiphyseal fusion is affected by

nutrition, sheltered conditions, and castration (Davis 2000; O'Connor 2002:4; Silver 1969), with castration delaying fusion and high nutrition/excellent shelter accelerating the fusion process.

For cattle, Premolars 2 and 3 erupt at 30 months, Premolar 4 erupts before or at 42 months. Molar 1, Molar 2 and Molar 3 are absent in deciduous teeth, while Molar 1 comes in by 9 months, Molar 2 comes in by 30 months and Molar 3 comes in by 30-36 months (Silver 1969:296). At Askut, six mandibles and two maxillae contained teeth in place that could be recorded, and they are presented in Table 7.3.

Table 7.3 Tooth eruption data from Askut

Context	Assemblage No.	Element	Side	Age in months
765-1161	1573	mandible (m2, m3)	R	>30
765-2025	1529	mandible (m3, m2, m1)	R	>30
765-1415	2333	mandible (m2)	R	>30
765-2000	1999	mandible (m2 and m3)	L	>30
765-2080	1886	mandible with (p2,m1,m2)	R	>30
765-2080	1870	mandible (p4 and m1)	L	>42
765-2037	1017	maxilla (m2,m3)	L	>30
765-2080	1867	maxilla (p2,p3, p4)	L	>42

Age Estimation of Post-Cranial Elements

Table 7.4 presents age estimation data of *Bos* post-cranial elements from Askut, based on epiphyseal fusion. Uerpmann states that the distal ends of cattle metapodia fuse between the ages of 2 and 2 1/2 years (Uerpmann 1973). I use Lespré (1867) post-cranial fusion estimates for Bos in order to have a consistent scale for the entire skeleton. The full data, including element, proximal or distal epiphysis, and side of the body, are included in the Fusion Appendix. The epiphyses that fuse earlier, starting at 12 months and ending at 20 months, are the proximal radius, the distal humerus, and the middle

phalanx. The next group of epiphyses to fuse, between 20 and 30 months, are the metacarpal, the metatarsal, the distal tibia, and the proximal phalanx. The last group of bones fuses between 40 and 48 months, and this ncludes the distal radius, the proximal humerus, the distal femur, and the proximal tibia (Lespré 1867:53).

Table 7.4 Age estimates of Bos *post-cranial elements at Askut, based on epiphyseal fusion MK: Middle Kingdom; SIP: Second Intermediate Period; NK: New Kingdom.*

Period	**Neon-< 15 mos**	**=/>15 mos**	**<24 mos**	**=/>24 Mos**	**< 36 mos**	**=/ 36 mos**	**< 40 mos**	**=/> 0 mos**	**<42 mos**	**=/>42 mos**	**< 48 months**	**Imm. Morphology**
MK		5	2	3			1	1	1	1		1
Early SIP			1						2			
Late SIP to NK	1	2										
NK		18	12	22	8	2			2	1	1	1
NK Early 18th			1									
NK Mid 18th			3		3				1	1		
NK Late 18th		1	2	6		2		1		3		
NK Ramesside to Late Period					1	1				1		
Late Period		1	3	2	2	2	1	1				
Christian				1							1	
Totals	**1**	**27**	**24**	**34**	**14**	**7**	**2**	**3**	**6**	**7**	**2**	**2**

7.3 *The Analysis of Visible Human Modification*

7.3.1 *Burning*

Fifty-three pieces of identifiable bone were burned, although the burning varied in severity. There were also several bags of scrap bone (small, highly fragmented and unidentifiable) that shows signs of consistent burning. I could not discern any taxon-specific differences in burning. Only two specimens showed partial burning that may have come from roasting or food preparation. The flesh of cuts of meat exposed to high heat draws back from the bone, exposing the bone surface to regular patterns of burning according to the element. The other 51 specimens were burned more thoroughly in a manner consistent with trash disposal.

Table 7.5 Severity of Burning by Taxa

Severity of burning	**# of elements burned this way**
Partially burned, perhaps from roasting.	2 (suid and caprine)
Burned black overall, more consistent with trash treatment.	25 (various taxa)
Burned to ash, consistent with either long-term or repeated burning.	6 (various taxa)
Calcined, consistent with either long-term or repeated burning.	19 (various taxa)
"Reverse burning" – burned white on the outside and dark on the inside	1 (medium-sized vertebrate, possibly non-mammalian)

The bag of burned and fragmented bone was collected from the front entrance gate of the fortress and associated with artifacts dated to the New Kingdom. The contexts containing burned bone do not appear to contain multiple elements easily matched to the same animal, as in the case of a small group of people consuming an animal in one sitting

and discarding the remnants to be burned in one place immediately (Gifford-Gonzalez and Parham 2009:313-353). Instead, a variety of taphonomic scenarios come to mind, including animal bones being burned and deposited in small amounts over various areas.

Burned specimens were found in every time period, but the largest cluster came from one context, Rm 4 SE 0.4m, dated to the Middle Kingdom, Late 13th Dynasty, not long after the initial occupation of the fort. Four specimens in this room were burned black and eight specimens were calcined, indicating that this room might have been used to burn food remains or trash repeatedly. This cluster contained mammalian bone ranging in size from "medium" to "large", two elements identifiable as medium large bovid, two specimens identifiable to Caprini and one *Bos taurus* element.

Table 7.6 Summary of burned bone by taxa.

Number of burned specimens	**Taxa / Grouping**
16	Caprine, goat, ovis, and medium mammal
15	*Bos taurus*
3	Medium bovid
3	Fish
2	Medium-large mammal
1	Suid
1	*Equus sp.*
1	Unidentifiable bone
1 bag…	Many burned pieces too tiny to count, all from one context…

7.3.2 *Cutmarks and Butchery*

This section summarizes cutmarks and associated modifications found on the bones of the Askut assemblage. Following Orton (2010:326), I focus on the number of fragments with cutmarks rather than the number of actual marks themselves, though every mark, chop, and impact notch is accounted for in the Butchery Appendix. Sixty-

seven specimens, or 9.5% of this assemblage, bore visible cutmarks. Cutmarks are recorded using Binford's (1981:136-142) cutmark coding system, which I am using in conjunction with the Dobney-Reilly zones (please see Chapter 6, page 9, for details). As should be expected, butchery marks on the Askut assemblage often varied from Binford's illustration. The cutmarks on the Askut bones were often lower or higher than Binford's examples, and in several cases, the cuts are either not illustrated at all in Binford's examples, or they are located on the opposite side of the bone from where Binford's model expected the cut to be.

The earliest butchered bone is from the Middle Kingdom, but three contexts with the highest concentration of butchered bones, Rm 32 0.3m, Rm 20 SE 0.2m, and Rm 35 0.2m, are all dated from the New Kingdom to the Late Period. Cutmarks are attributed to specific culinary activities such dismemberment, skinning, and filleting, using the Binford (1980) system. Forty-one specimens bear marks associated with dismembering an animal that was relatively fresh. Two additional specimens bear markers of dismemberment on a carcass that has gone "stiff." Two more specimens bear markers related to both dismemberment and filleting; one specimen showed only evidence of filleting and nothing else.

Specimens in this assemblage bear at least two types of cutmarks: razor thin cutmarks that appear to be made by stone tools, and thicker cutmarks that be to be from metal tools. The majority of cutmarks on the bone appear to have been made by a sharp metal blade. Two bones from the Late Period were cut with a broader blade, apparently metal, as indicated by the ridging at the edge of the cut (Gifford-Gonzalez 2018:286). Changes in cutmarks over time could be due to the butchers having different ethnic

backgrounds and culinary practices, changes in the preparation and distribution of beef, or changes in the types of tools they had in hand, depending on the occupants of the fort at the time.

7.3.3 *Marrow Processing*

Evidence of bone processing spans from the New Kingdom to the Late Period at Askut, and I have provided the raw data in the Butchery Appendix. Chops and impact notches were most prevalent on long bones, femurs, innominates, and phalanges, indicating marrow or grease extraction. From the New Kingdom on, bone processing focused on metapodials in particular: 10 of the 17 butchered metapodials were split longitudinally down the middle. An additional two metapodials, from the same New Kingdom, Late 18th Dynasty context, were partially split down the middle, but not from proximal to distal end. The practice of splitting Bos metapodials longitudinally is not evidenced in this assemblage in the Middle Kingdom nor the Second Intermediate Period, though the absence of evidence may be due to a small sample size.

7.4 *Osteometry: Measuring Bones*

I had three main reasons for measuring the cattle bones at Askut: sex estimation, confirmation of species identification, and stature calculation for comparison with other cattle populations in the region. Normally, an analyst finds that only a relatively small percentage of retrieved bones can be aged or measured according to international standards (Albarella 2002:52). Out of 143 specimens, 724, or 19.7%, of the Askut assemblage were measurable according to international standards. Even when scaling techniques are not adopted, small assemblages of animal bones, as mentioned above, should not be dismissed (Albarella 2002).

I made certain decisions based on my goal of comparing this assemblage to the one excavated at Kerma by Louis Chaix and Charles Bonnet. Chaix's (2007) osteometric study of Kerma cattle shows the size, proportions, and stature of prehistoric cattle, the most economically and religiously important domesticate in Northeast Africa at the time. Chaix illustrated the morphological distinctness of Kerma cattle by comparing their skeletal measurements with those of different archaeological cattle population samples throughout the Nile Valley, and to a lesser extent, prehistoric Europe.

7.4.1 *Sex Profiles by Species*

As explained in Chapter 6, the sex of the animals acquired at Askut can help us understand certain aspects of the trade relationship between the residents of Askut and the Nubian C-Group. Measurements were taken from specimens according to the protocols in von den Driesch (1976), with an eye to assessing whether a bimodal distribution within each measurement could be observed. Bimodality in recorded measurements can be an indicator of sexual dimorphism, but it may also reveal the possible presence of individuals from two morphologically distinct populations (O'Connor 2002). Prehistoric cattle matured more slowly than modern cattle populations, and bull metapodia tended to broaden, becoming distinct from those of females, sometime during their fourth year of life (Uerpmannn 1973).

Overall, my efforts to acquire a robust sample of sex attributions were disappointing. The first method of sexing was an osteometric analysis of the acetabulae following protocols given in Greenfield (2002). Eight specimens yielded at least some diagnostic measurement from the acetabulum, but only two specimens were whole enough for me to take all five measurements. Table 7.7 shows that from eight specimens,

I was able to attribute sex to six, based on osteological measurements. I made qualitative assessments on two specimens that could not be measured but displayed sexually distinctive morphology. According to Greenfield's data (2002), an H1 measurement of 12mm is large for a European female. For the measurement designated as H1, one specimen measured at 7.71mm (in the female range) and the other at 15.05mm (in the male range).

Unlike Greenfield's H1 measurement, the H2 measurement shows considerable overlap between male and female (Greenfield 2002). The LA and LAR measurements are from von den Driesch (1976). Von den Driesch (1976) and Greenfield (2002) agree that the overlap in both of these measurements makes them poor indicators for sex.

Table 7.7 Sexing Innominates

Assemblage Number	pubis vs ilium	H1 (with range)	H2 (with range)	LA	LAR	Femoris vs edge	Attribution	Qualitative assessment
1697	pubis prominent -- male	15.05 male	9.86 female	62.8 male	49.74 overlap	thick male	male	
232	even -- female	7.71 female	9.29 female	62.7 male	67.70 overlap	thin female	female	
2104			10.78 female	65.02 male	50.67overlap	thin female	female	
1165			11.26 female				female	
1109			10.29 female				female	
318			11.4 female				female	
2130						thin female	female	
844							male?	Angle of inner pubis curve looks male

Greenfield's (2002) final measure is an assessment of the distance between the rectus femoris fossa and the medial edge of the ilium. For the Askut specimens, the distance between these features was often quite narrow, taking the shape of a thin ridge, with measurements mostly in the female range. Only one specimen had a ridge that was significantly thicker — this specimen also had a prominent pubic outline and an H1 measurement in the male range.

Metapodials are the most studied anatomical elements for sexing cattle. One must be careful to determine that the variation is due to sex rather than breed or regional type (Albarella 2002). Chaix did not use these in Kerma because culinary processing almost always left metapodials split down the middle. As mentioned in the butchery section, metapodials at Askut were processed in a manner similar to that found at Kerma. I was only able to obtain four proximal breadth measurements for metacarpals, and three corresponding measurements for the metatarsals. The measurements were not enough to ascertain the bimodal distribution one would need to assign the values into clusters of "male" and "female." Chaix contends that the greatest breadth values (GB) for naviculocuboids should correlate well with the sex of the animal. Twelve *Bos taurus* naviculocuboids were present in this assemblage. For the Kerma population, the values clustered into two groups: 48-58mm for females and juveniles, and 60-70mm for adult males (Chaix 2007). I was only able to make eight GB measurements from the naviculocuboids, not enough to illustrate bimodality. Only one naviculocuboid at Askut fell within the range of Kerma males (at 61.92mm).

Table 7.8 Greatest Breadth measurements of Naviculocuboids, s.d.:standard deviation.

N=Kerma	N=Askut	Kerma Min	Askut Min	Kerma Max	Askut Max	Kerma Mean	Askut Mean	Kerma s.d.	Askut s.d.
166	8	44.2	42.45	70.5	61.92	55.7	50.72	5.4	6.74

The following table summarizes the few sex attributions I was able to make by element and time period. While it is clear that 11 specimens collected over 200 years cannot represent the composition of any "herd", finding more females than males was absolutely expected in terms of demography.

Table 7.9 Sexing Naviculocuboids and Innominates

Time Period	**Male**	**Female**	**Element**
Middle Kingdom	0	2	Pelvis (2)
Second Intermediate Period	0	0	
New Kingdom	2	5	Pelvis (4) Naviculocuboid (3)
Late Period	0	1	Naviculocuboid
No associated dates	0	2	Pelvis (1) Naviculocuboid (1)
Totals	**2**	**9**	

7.4.2 *Stature*

Osteological measurement was my primary method for calculating the size and shape of the cattle, but calculating stature is not a straightforward process. After accounting for age and sex, stature data can allow an analyst to detect the presence of morphologically distinct strains of the same species co-existing in one assemblage. Scholars of cattle pastoralism have used these data to study breeding practices, acquisition of new strains, land use, and trade in the form of animal markets (Albarella 2002). African livestock often show specific morphological adaptations to heat and aridity. Fluctuating environmental conditions, and the selection/breeding choices herders made as a result, may show up in the osteometric data. Bones and teeth vary in size according to age, sex, genotype, environmental conditions and other factors. Such variation does not occur homogeneously on all anatomical elements, not even on different sections of the same bone (Albarella 2005:54).

Stature is calculated and charted from measurable specimens and frequencies will be compared across Askut's different phases of occupation. I will record variation in stature over time using these correlates and follow up with a statistical analysis when sample size permits. Stature measurements should tell us whether the cattle look "Sudanese" or "Egyptian." Archaeological assemblages may not allow for control for sex and age, but they offer a better comparison with other archaeological materials, from which standards can be calculated from large samples (Albarella 2002). Astragali are more durable and they can add supplementary information when the metapodials recovered are few (Albarella 2002).

7.5 *Comparing Askut and Kerma*

Table 7.10 Comparison of Askut and Kerma Number of Identified Specimens

Skeletal Element	Kerma NISP	Askut NISP
Maxilla	4	17
Mandible	37	37
Lower M3	43	10
Atlas	3	9
Axis	19	5
Scapula	91	14
Humerus	103	23
Radius	41	13
Ulna	10	7
Lunate	126	1
Cuneiform	76	5
Trapezoid and Magnum	112	2
Unciform	182	2
Metacarpal	33	12
Phalanx 1	293	19
Phalanx 2	404	14
Innominate	12	18
Femur	163	35
Patella	88	0
Tibia	38	18
Distal fibula	82	0
Astragalus	230	15
Calcaneus	25	19
Naviculocuboid	166	11
Intermediate and lateral cuneiform	35	(5)
Metatarsal	48	9
Phalanx 3	125	11
Metapodial (indet)	0	26
Total	**2589**	**347**

One of the largest and best-studied collections of archaeological cattle bone in the Nile Valley comes from the site of Kerma. Because large cattle assemblages are so rare in the region, I felt it was important to compare Askut and Kerma for several reasons. First, the comparison helps me understand what the cattle bone assemblage should look like overall. Second, the osteometric measurements from the Kerma assemblage help me

compare the size of Askut cattle to other cattle assemblages in the region. I do not have much detail about the nature of the other assemblages, other than the published bone measurements that Chaix used in his (2007) regional comparisons. The intention here is to establish a comparative relationship between the Askut and the Kerma assemblages, and then insert the Askut measurements into Chaix's regional comparisons. From there, I can compare the size of the cattle at Askut to all the other sites simultaneously.

The comparison between the Askut assemblage and the Kerma assemblage focuses on specific elements. N is the number of specimens from which I could get at least one measurement according to protocols published by von den Driesch (1976). Chaix (2007) focused on elements that were the most diagnostic for sexual dimorphism and regional differences in the stature of different cattle populations. In the sections that follow, I demonstrate similarities and differences between Askut and Kerma cattle.

Figure 7.5 Graphic representation of elements present. The top graph is from the settlement of Kerma, reprinted here from Chaix (2007). The bottom graph is from Askut.

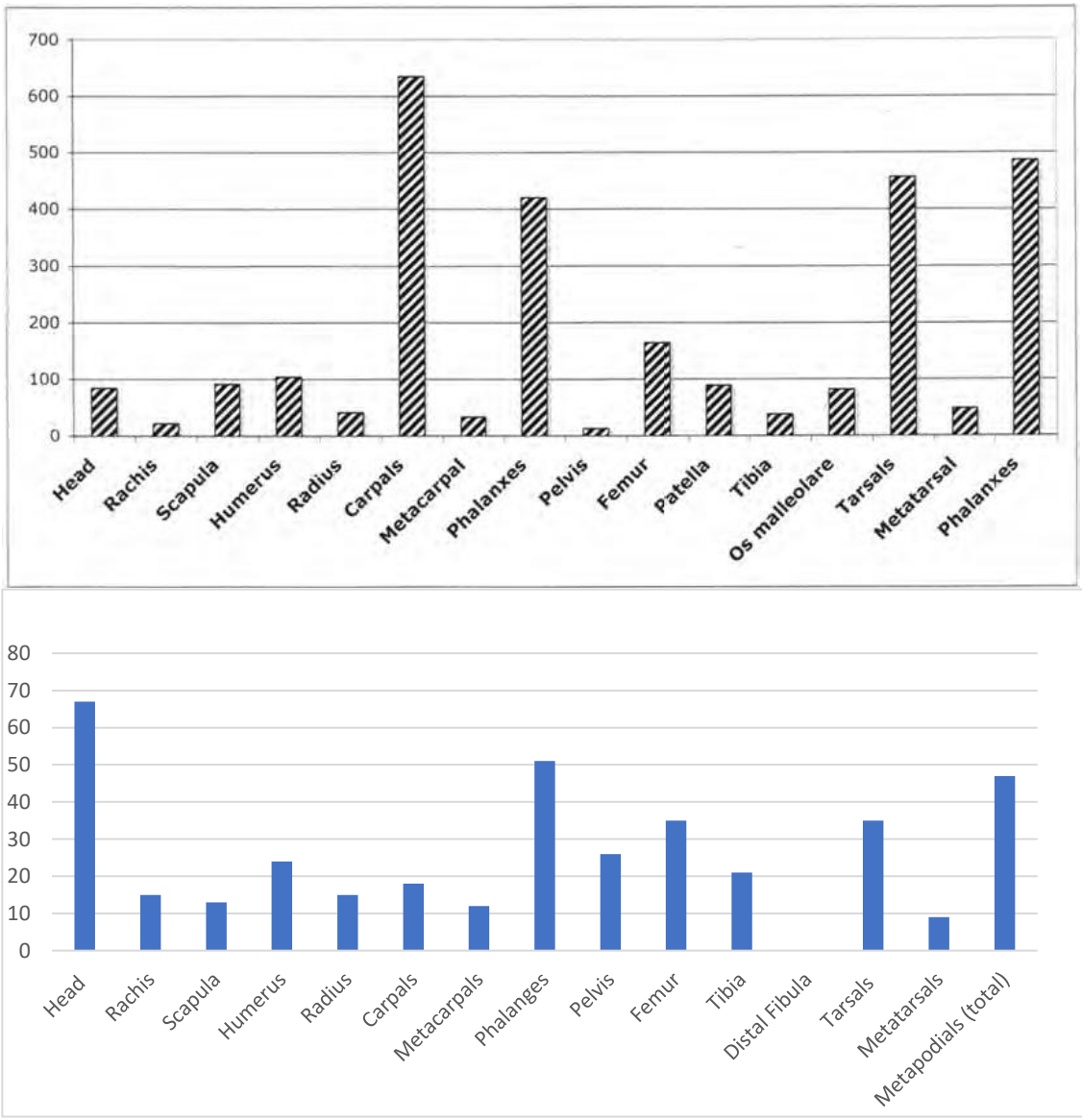
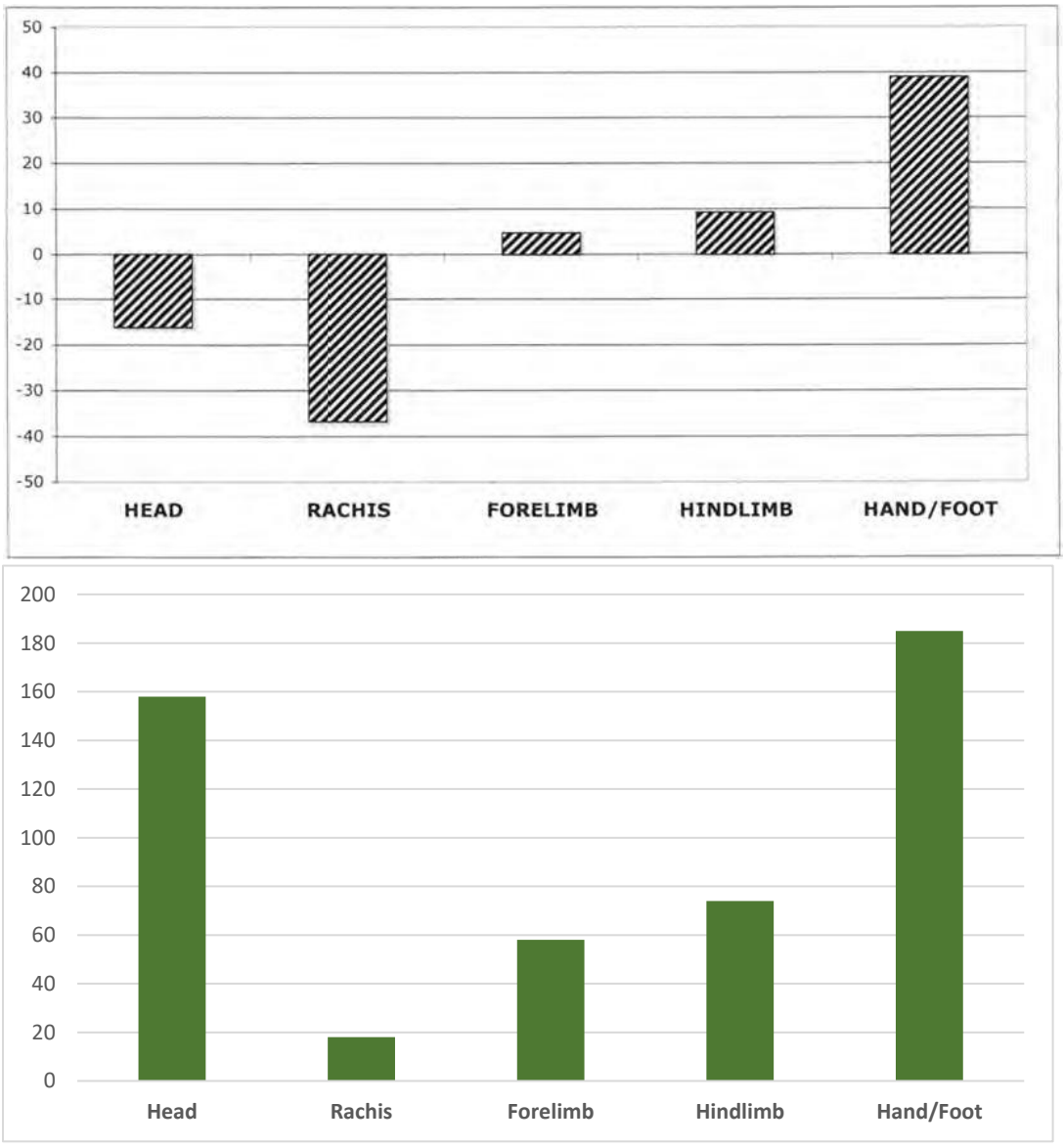


Figure 7.3 Graphical Representation of Body Segments present. The top graph is from the settlement of Kerma, reprinted from Chaix 2007. The bottom graph is from Askut.



7.6 Addressing Research Questions

7.6.1 Research Question 1: Which animals were being consumed at Askut and by whom?

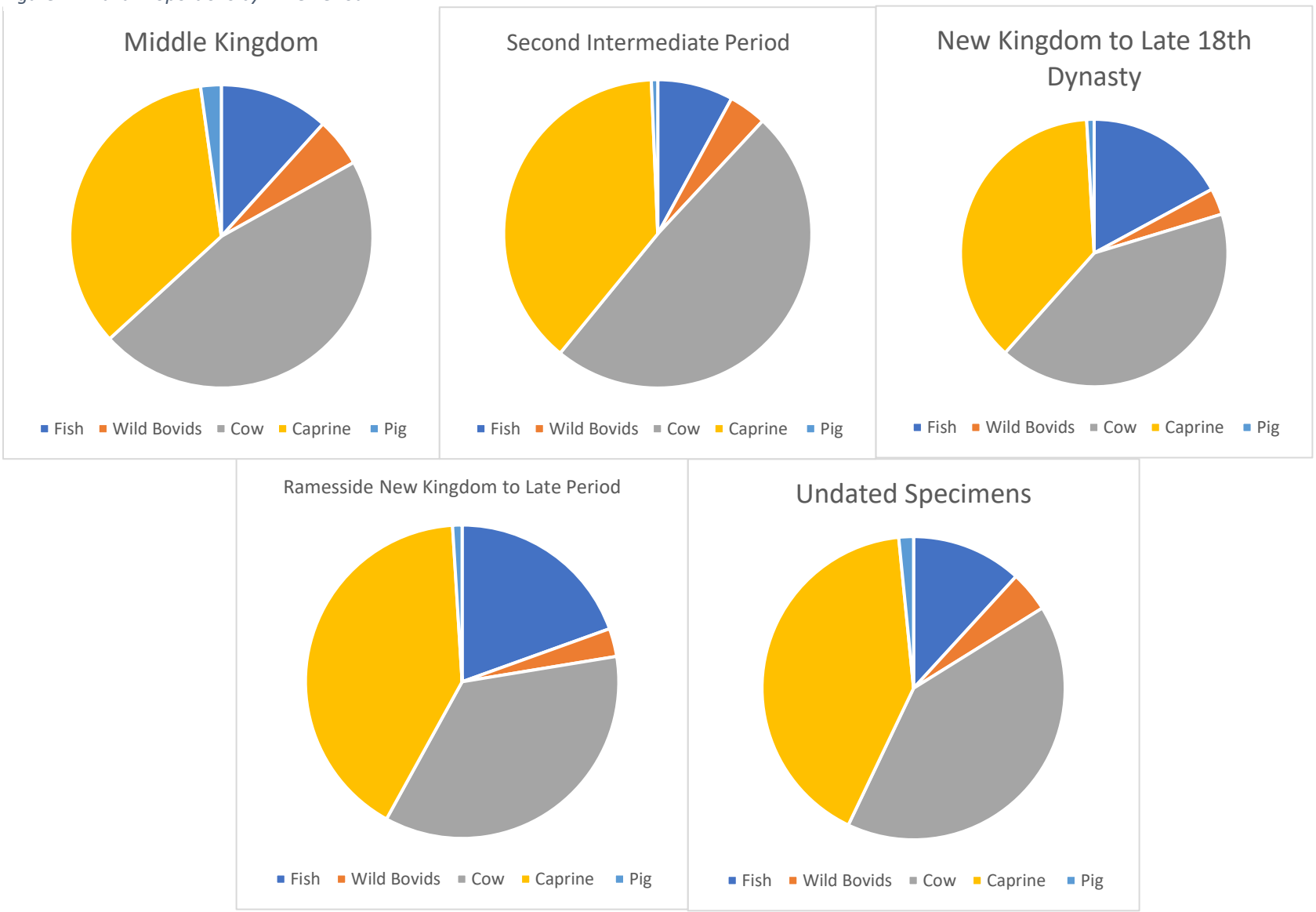
In this section, I return to the Research Questions and Hypotheses that I presented in Chapter 6. I begin with my overarching research questions, followed by the archaeological correlates found in the analysis.

Since some of the correlates and variables found were used as a means of testing more than one hypothesis, I summarize the hypothesis testing towards the end of the chapter. My first research question sought to answer which animals were being consumed at Askut and by whom. Table 1 illustrates that from the Middle Kingdom up until the Late 18th Dynasty of the New Kingdom, cattle are the predominant taxa, followed by caprines. Fish and reptiles consistently come in third place, followed by much smaller frequencies of wild bovids and pigs. By the Ramesside Period, caprines pull ahead of cow bones to become the most prevalent taxa. For undated specimens, the count for caprines was slightly higher than for cattle, but they are essentially evenly represented. As demonstrated from Table 7.11 and Figure 7.4, the proportion of each taxa remains fairly consistent throughout Askut's history of occupation, and, the proportion of undated specimens mirrors that of specimens that could be dated.

Table 7.11 Percentages of animal Remains by taxa across all time periods.

Taxa	Middle Kingdom	%	SIP	%	New Kingdom up to Late 18th	%	Ramesside NK to Late Period	%	Undated	%
Fish	27	11.70	12	7.95	151	17.10	40	19.51	30	11.81
Wild Bovids	12	5.20	6	3.97	28	3.20	6	2.90	11	4.33
Cow	107	46	74	49	365	41.30	73	35.61	104	40.95
Caprine	80	34.60	58	38.41	331	37.50	84	41	105	41.34
Pig	5	2.20	1	0.67	8	0.90	2	0.98	4	1.57
Totals	**231**	**100.00**	**151**	**100.00**	**883**	**100.00**	**205**	**100.00**	**254**	**100.00**

Figure 7.4 Taxa Proportions by Time Period



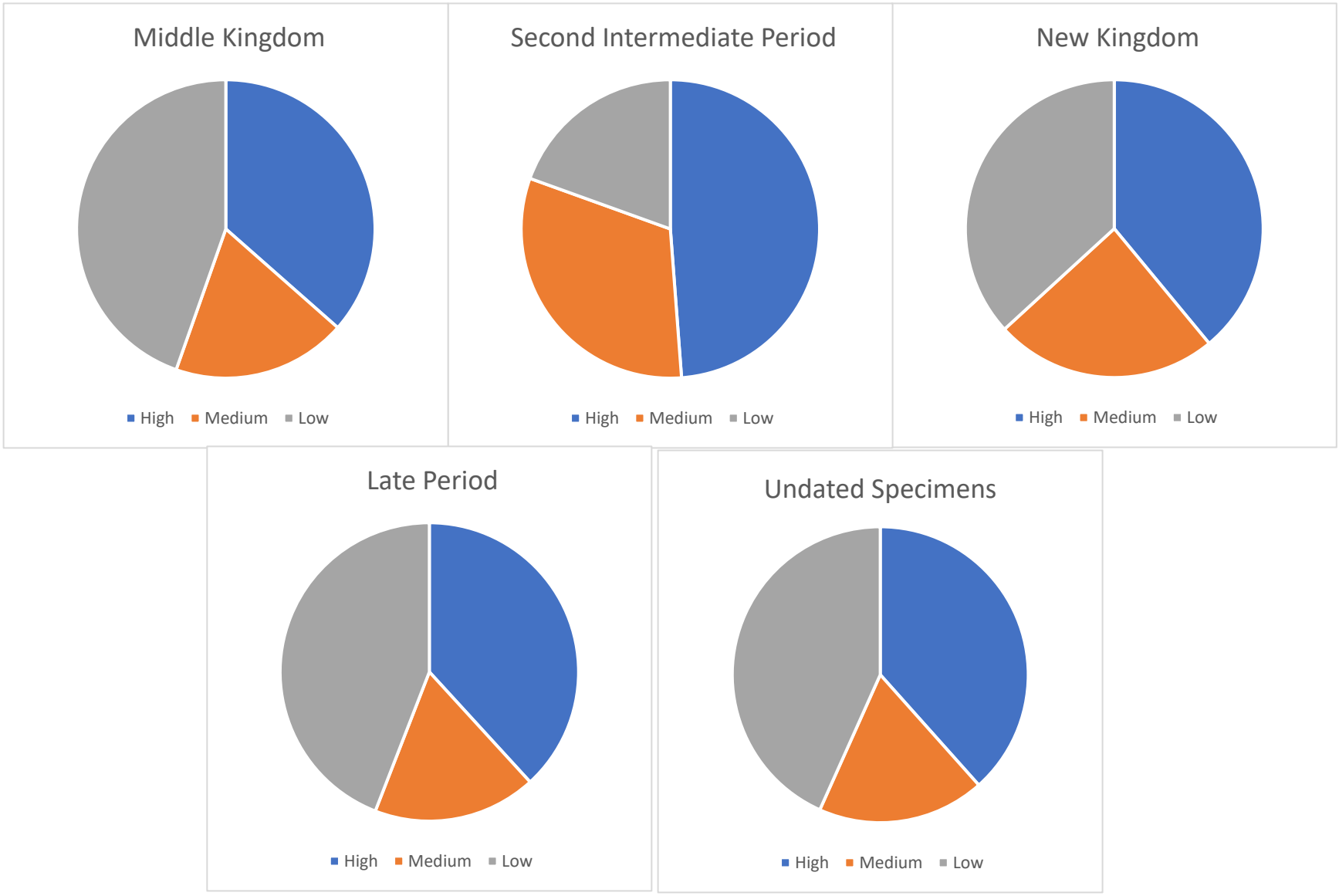
7.6.2 Research Question 2: Is there evidence for centralized meat distribution at Askut?

This section seeks to answer my second research question focused on the material evidence of centralized meat distribution. First, I will assess whether the "value" of the meat cuts (*sensu* Uerpmann 1973) changes over time at Askut. Uerpmann (1973) breaks portions of the carcass into three different levels of meat value. According to Uerpmann, "high value" meat is represented by the remains of femurs, humeri, innominates, and vertebrae. Tibiae, mandibles, and ribs represent "medium" value meat, while bones of the tail, ankles, and feet represent the lowest value meat (Uerpmann 1973). I would agree but note that the focus on stewing in Nile Valley cooking means that, in this case, "low value" meat does not equal "no value" meat. 41.5% of the total *Bos taurus* specimens at Askut fall into the category of "high value" meat. 21.5% of specimens represent "medium value meat" and 37% of specimens are what Uerpmann's model considers to be "low value" meat. As illustrated in the Butchery Appendix, many of the "low value" specimens, including metapodials and phalanges, were chopped or hammered open for the marrow inside.

Table 7.12 Meat Value of Bos specimens at Askut by time period

Meat Value	MK	%	SIP	%	NK	%	Late Period	%	Undated	%
High	27	36.5	20	48.8	105	39	13	38.2	23	38.4
Medium	14	18.9	13	31.7	65	24.2	6	17.7	11	18.3
Low	33	44.6	8	19.5	99	36.8	15	44.1	26	43.3
Totals	74	100	41	100	269	100	34	100	60	100

Figure 7.5 Meat Value by Time Period



As illustrated in Table 7.10 and Figure 7.5, proportions of high/medium/low meat value appear to be similar in all time periods except the Second Intermediate Period, when Low Value elements decrease, while Medium and High Value elements increase. The differences appear between the percentages of Medium to Low Value Meat over time. The Middle Kingdom, the New Kingdom, and the Late Period all have a percentage of Low Value Meat that is higher than Medium Value Meat, but in the Second Intermediate Period, the percentage of Medium Value meat is higher than the percentage of Low Value Meat. It is important to note that the number of specimens dated to the Second Intermediate Period is small. Another fact to consider is the higher proportion of fine serving vessels at Askut dating to the Second Intermediate Period (Smith 2003). Even with the small sample size, the larger proportion of High Value meat may support Smith's (2003) description of elites hosting politically motivated culinary events at Askut in the SIP.

7.6.2.1 Element Uniformity vs. Variability

Zooarchaeologists examine the proportion of anatomical regions or butchery units present in an assemblage to understand taphonomy and the contextual ways in which people decide to use an animal's carcass (Reitz and Wing 2008; Gifford-Gonzalez 2018). Body Segments, or skeletal portions, are based on anatomical regions and/or the butchery units that past people would use to dismember a carcass and divide up the meat. One measure that indicates whether or not meat is being centrally distributed is "uniformity vs. variability." If a specialized butcher is distributing meat via systematic means, the meat cuts found should be uniform along several axes: species, element, animal age and sex, and butchery. In Zeder's (1988) study of the sites at Tal-e Malyan, she could see that

some sites had larger proportions of hindlimb segments, and that led her to interpret that as one correlate of indirect meat distribution. In the case of Askut, we want to know if the animals were butchered before distribution, with select parts being transported and distributed to Askut's residents, or were animals brought onto the island alive, slaughtered, and then used whole by the Askut community.

Figure 7.6 Distribution of Body Segments over Time by Number of Identified Specimens.

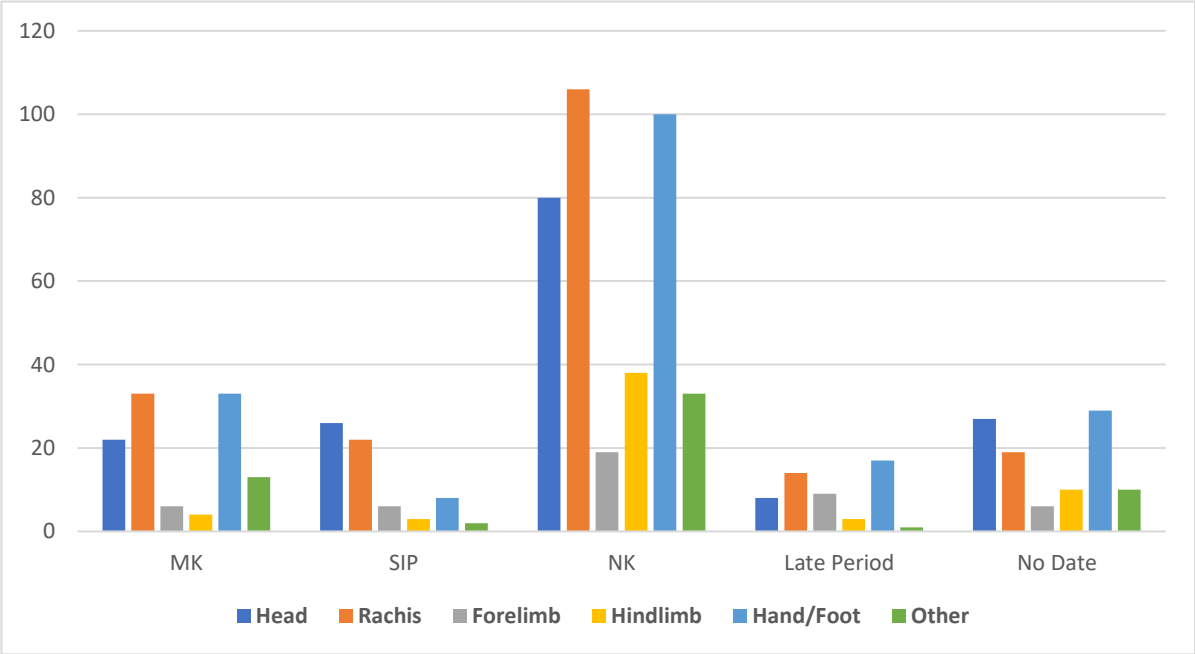


Figure 7.6 above and table 7.11 below illustrate the body segment representation at Askut over all time periods. At Askut, there are no periods of time in which forelimbs or hindlimbs are disproportionately represented. During the Middle Kingdom and the New Kingdom, body segment representation favors the axial column and the hand/foot region. During the Second Intermediate Period, body segment representation favors the head and then the rachis, with a smaller proportion of hand/foot elements than the other time periods. We do see that during the New Kingdom, hindlimbs are found more frequently

than forelimbs, but the Head, Rachis, and Hand/Foot segments are all more abundant than both Forelimbs and Hindlimbs at that time, suggesting that the residents of Askut are receiving and butchering whole animals. Feet, hooves, horns, and hide were present throughout all periods of Askut's occupation. These parts might have been less abundant if animals were being butchered elsewhere only to have butchered units distributed to the island residents.

Table 7.13 Percentage MAU per body segment by time period. Head elements in this table do NOT include teeth.

		MK	SIP	NK	Late Period
Head	MNE	8	14	45	4
	MAU	8	14	45	4
	% MAU	**97.00**	**100.00**	**100.00**	**88.89**
Rachis	MNE	33	22	106	14
	MAU	0.57	0.28	1.85	1.5
	% MAU	**6.91**	**2.71**	**4.11**	**33.33**
Forelimb	MNE	6	6	19	9
	MAU	2	2	19.5	4.5
	% MAU	**24.24**	**14.28**	**21.11**	**100**
Hindlimb	MNE	4	3	38	3
	MAU	2	1.5	14	1.5
	% MAU	**24.24**	**10.71**	**31.12**	**33.33**
Hand/Foot	MNE	38	8	100	17
	MAU	8.25	2	25	4.25
	% MAU	**100**	**14.28**	**55.56**	**94.44**

7.6.2.2 Cutmark Uniformity vs. Variability

Centralized distribution from a specialized butcher should also show uniformity in the marks that result from skinning and dismembering a carcass. Table 7.11 shows the number of cutmarks found in each skeletal element category element, followed by the number of elements in each category in parentheses (e.g. 8 humeri had cutmarks, and there were a total of 62 cutmarks found on humeri). The bottom row shows the total

number of cutmarks found / elements with cutmarks found within each time period. The small number of cutmarks from the Middle Kingdom makes it difficult to speak to cutmark uniformity. I would need to compare cutmarks on the same element within the time period to show evidence of uniform marks *sensu* Zeder (1988; 1991), and my sample size was simply not large enough. The number of specimens with cutmarks increases in the SIP. New Kingdom levels yielded the most cutmarks and the most specimens with cutmarks by far, and this may be a function of the fact that there are more specimens coming from those levels in general.

Table 7.11 also allows us to compare how each element was butchered over different time periods. There are no parts of the skeleton for which we have cutmarks present in all time periods; this may be because some of the butchered bone could not be dated. Butchery at Askut during the Middle Kingdom seems to be more precise, with each mark-bearing specimens showing four or fewer cuts. Looking at mandibles and metatarsals, for example, Middle Kingdom elements bear less cuts than the same elements in later periods.

Table 7.14 Cutmarks by Element and By Time Period

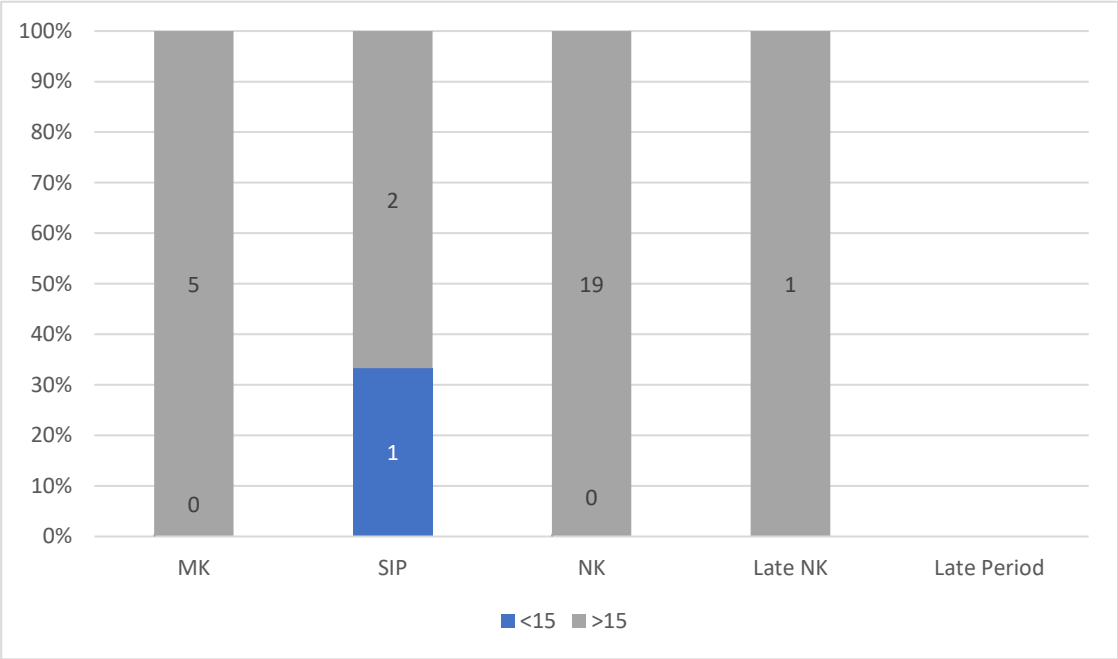
Element	**# of Cutmarks (# of Elements Cut)**	**MK**	**SIP**	**NK**	**Late Period**	**No Date**
Humerus	62 (8)		16 (2)	46 (6)		
Atlas	41 (4)		7 (1)	34 (3)		
Scapula	31 (4)		11 (1)	16 (2)	8 (1)	
Femur	31 (6)			31 (6)		
Astragali	29 (5)		8 (1)	9 (3)		12 (1)
Radius	28 (5)		2 (1)	18 (4)	8 (1)	
Naviculocuboid	19 (4)			8 (1)	7 (1)	4 (2)
Metatarsal	17 (3)	2 (1)	5 (1)		10 (1)	
Ulna	17 (3)		11 (1)	3 (1)		3 (1)

Innominates	16 (6)		3 (1)	8 (3)		5 (2)
Phalanx 1 Posterior	14 (2)			3 (1)	11 (1)	
Mandible	12 (5)	1 (1)	4 (2)	7 (2)		
Calcaneus	12 (3)				9 (2)	3 (1)
Phalanx 1 Anterior	12 (4)	4 (1)		5 (3)		3 (1)
Metacarpal	7 (3)	1 (1)		4 (2)		
Metapodial indet.	5 (1)					5 (1)
Tibia	1 (1)		1 (1)			
Totals		**8 (4)**	**68 (12)**	**192 (37)**	**53 (7)**	**35 (9)**

7.6.2.3 Age at Death: Uniformity vs. Variability

Assessing herder-consumer power relations from herd mortality profiles was made difficult by the fact that very few of the specimens at Askut could be confirmed as male or female. One problem with aging from epiphyseal fusion is that the fusion correlates to above or below a certain age, but not the

Figure 7.7 Cattle bones ages under / over 15 months

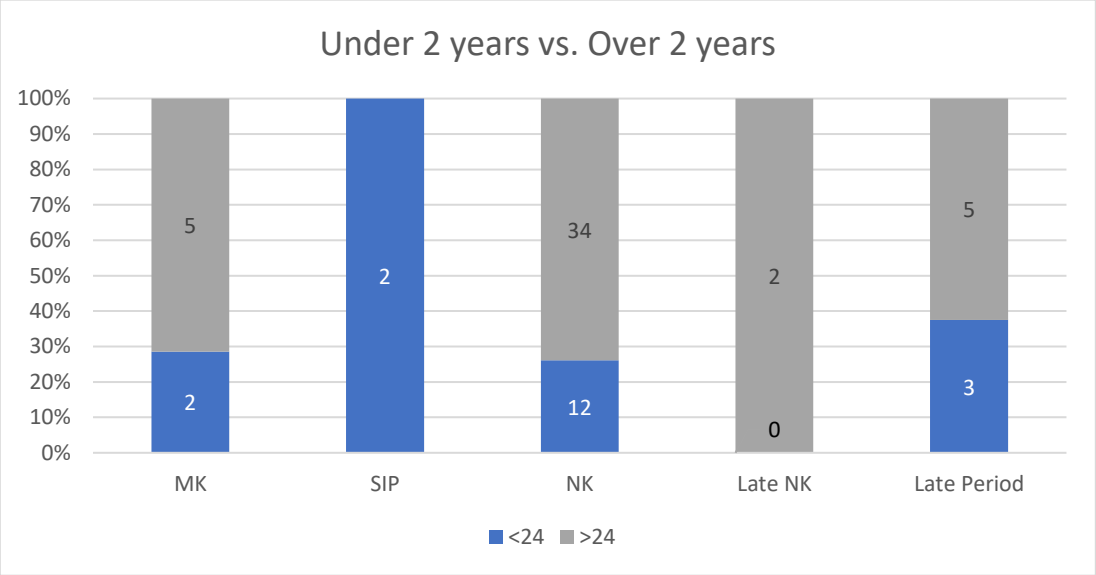


precise age itself. Therefore, the following charts demonstrate how many animals were above or below a certain age range and how that changes over time. In each of the following graphs, the grey bars represent older animals and the blue bars represent younger animals.

Figure 7.7 shows the proportion of animals over and under the age threshold of 15 months, based on the fusion of the second phalanx. Although several other elements in the assemblage showed neonatal morphological traits, only one animal was determined to be under 15 months in age solely through an examination of epiphyseal fusion. The animal in question would have been newly weaned and is an outlier in the overall assemblage.

Figure 7.8 shows the proportion of cattle over and under 24 months, or 2 years of age, based on the fusion of tibiae, proximal phalanges, and metacarpals. Figure 7.7 and 7.8 show that for the Middle Kingdom, New Kingdom, and Late Period, the proportion of subadults to adults

Figure 7.8 Cattle bones aged under / over 2 years



was consistent based on the elements that could be aged. In both graphs, the Second Intermediate Period shows a different proportion of subadults but, as shown from the data labels, the number of ageable bones was very small.

During the New Kingdom period, for the first two thresholds we have 12 animals under 2 and 53 animals over 2. Charts for the last three fulcrums show the bulk of the animals were between 3 and 3.5 years of age at the time of death. This is a normal, and optimal, pastoralist culling pattern. Figure 7.9 shows the proportion of cattle under and over 3 years of age, based on the fusion of calcanei and proximal femora. Three years is an important age in the life history of *Bos taurus*. Up until three years, most African herds will have an equal number of bulls and heifers among their calves. At three years, most males are either castrated or culled, and female members of the herd predominate

(Dahl and Hjort 1976:31). In terms of biology, a heifer can become pregnant before the age of three, but her body is not finished growing, and some herders prefer to wait until the heifer's body is heavier and more mature. The last bones in a cows skeleton do not fuse until around the 48th month of life. At the age of 40 months, or 3 years and 4 months, the radius has grown and fused, as illustrated in Figure7.10. Two months after that, the

Figure 7.9 Cattle bones aged to under / over 3 years

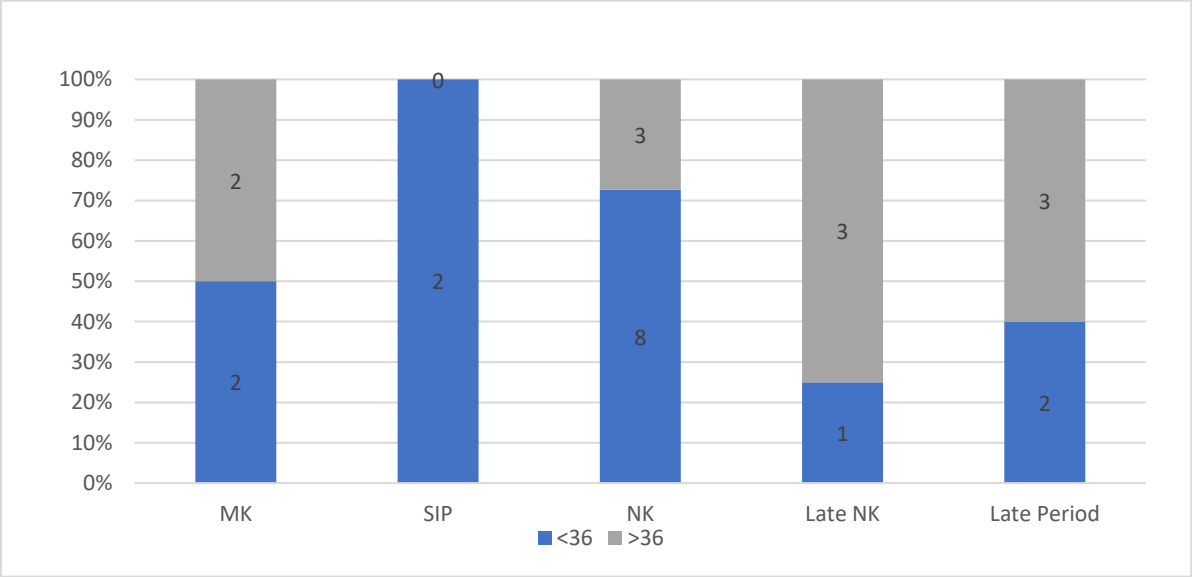


Figure 7.10 Cattle bones aged to under / over 40 months

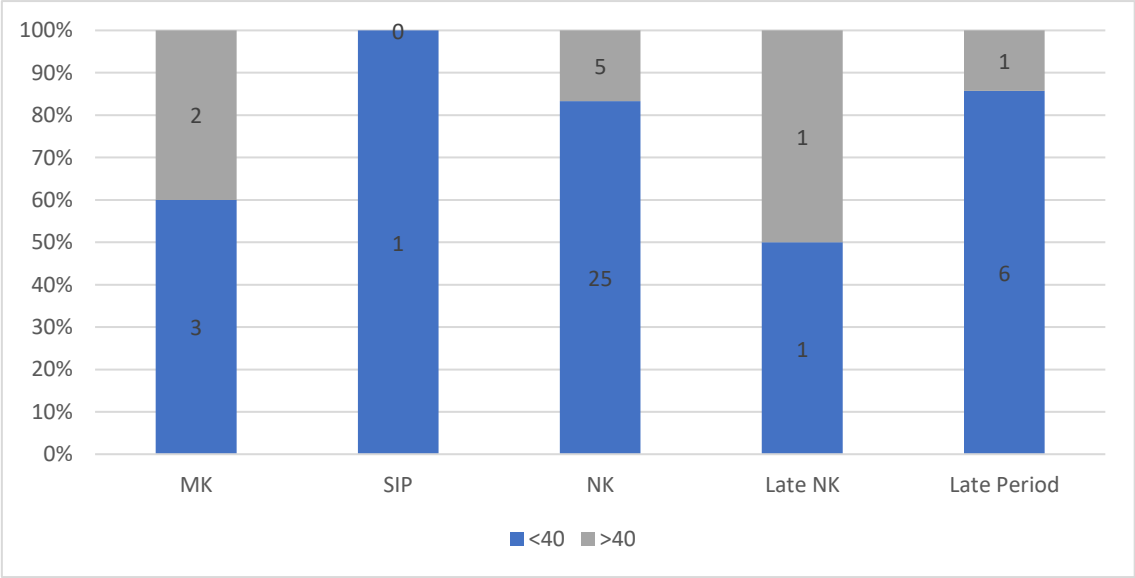
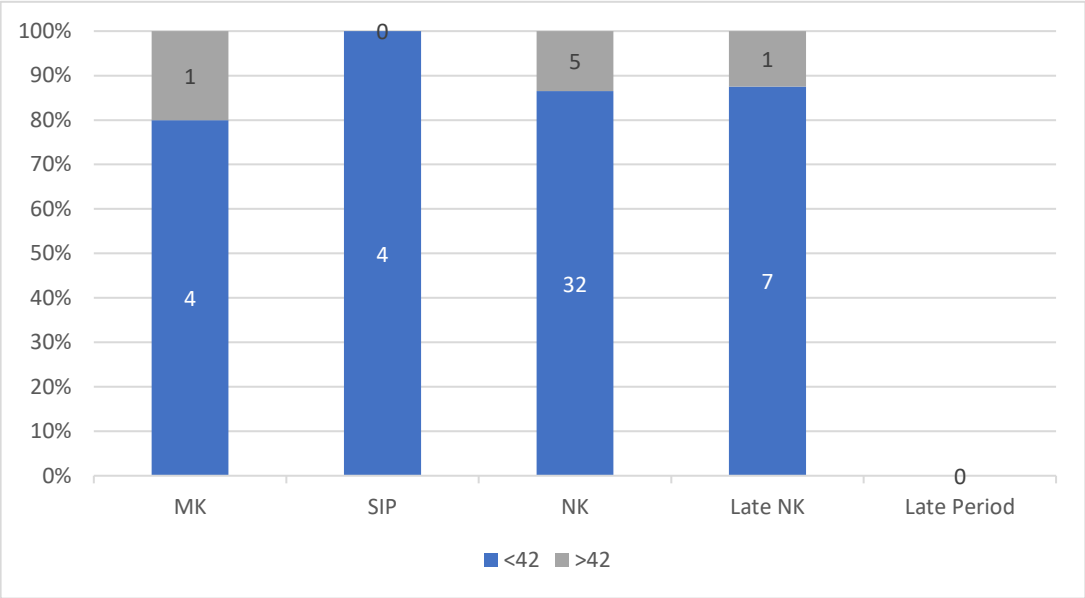


Figure 7.11 Cattle bones aged to over / under 42 months



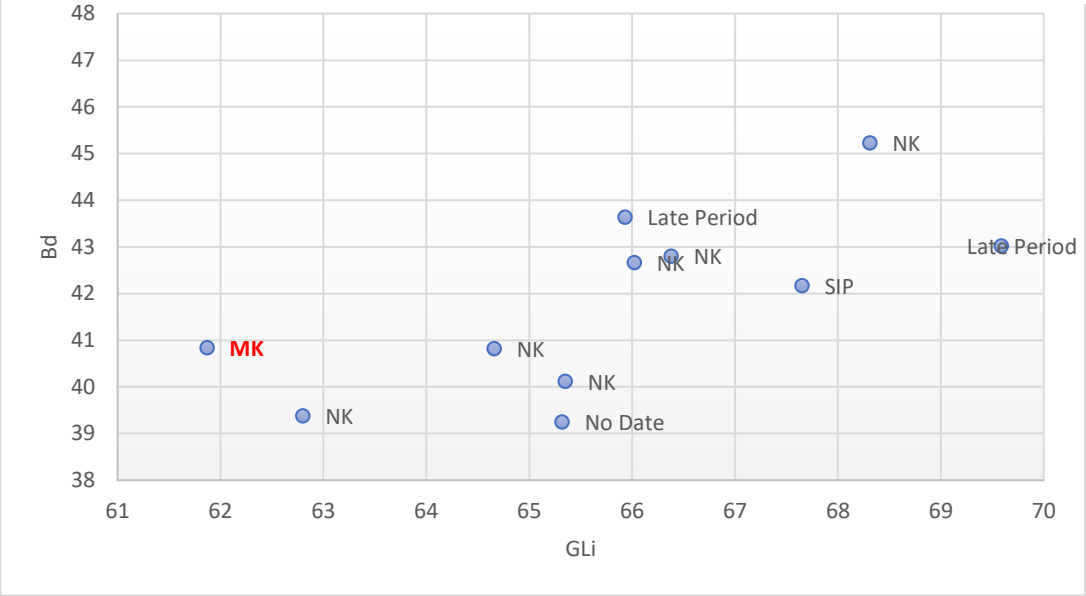
humeri and distal femora are complete, shown in Figure 7.11, followed by the last epiphysis to fuse, the proximal tibia.

The New Kingdom levels up to the Late 18th dynasty contain more ageable cattle bone than the other periods, but consistently show a larger proportion of younger to older ageable specimens across all the age thresholds presented. Numbers of ageable specimens drop off in the New Kingdom contexts following the Late 18th Dynasty, but I found very little evidence of neonates or younger subadults in the later New Kingdom levels. With the exception of during the SIP, data suggest most cattle acquired by Askut provisioners were 42 months or slightly younger. This implies the animals are at full growth and probably surplus males, plus possibly some barren females, which is a pattern conducive to herd sustainability. The SIP, with younger animals, may suggest different social relationships/entanglements with the herders, including the possibility of more staying nearby through the yearly cycle.

7.6.3 Research Question 3: Where did the cattle recovered at Askut come from?

My third research question focused on figuring out where the cattle acquired at Askut were reared. To answer this question, several skeletal elements were measured in order to compare them to other archaeological cattle populations in the Nile Valley region. All tables and graphs in this chapter are given in millimeters. The following charts are designed to illustrate changes in cattle size over time. Bone measurements that characterize the cattle as tall and gracile should indicate an affinity with the cattle of Kerma and Upper Nubia. Bone measurements that characterize the cattle as a bit shorter but still tall, and more robust, should indicate and affinity with the cattle of Upper and Lower Egypt. Measurements are presented by element according to its prevalence in regional osteometric comparison, beginning with astragali, and followed by the naviculocuboids, the third Lower Molar, the humeri, and finally the first (proximal), second (middle), and third (terminal) phalanges. Some of these elements are not optimal for measuring stature, but they have been useful in regional comparisons because they are dense enough to be commonly found in abundance at archaeological sites.

Figure 7.12 Plot of astragali measurements of distal breadth (Bd) against greatest length (GLi). Specimens are labeled by time period.



The astragalus is a fairly dense bone that holds up well against processes of attrition at archaeological sites. While astragali often hold up well enough to be identified, like all bones, they can be subject to mechanical damage around the edges that obscure or prevent accurate measurements of all dimensions. Only one fully measurable astragali from Askut dated to the Middle Kingdom, but it was indeed the smallest. In contrast, other measurements did not appear to show a discernible increase or decrease over time. Table 7.12 and Figure 7.15 show that the range of the Askut astragali fall within the overall range of the Kerma astragali. Unlike phalanges, this element does not seem to illustrate any differences in morphology table between the two populations.

*Table 7.15 Comparison of **astragali** measurements: Kerma vs. Askut. Standard deviation is noted as "S.D."*

	Kerma N	Askut N	Kerma Min	Askut Min	Kerma Max	Askut Max	Kerma Mean	Kerma S.D.	Askut Mean	Askut S.D.
GLl	216	11	59	61.87	77.5	69.59	67.7	3.7	65.8	2.1
GLm	196	13	52.9	57.02	71.5	68.97	62	3.5	61.7	2.9
Dl	204	13	31.7	34.31	43.2	42.31	37.3	2.3	37	2.1
Dm	191	9	29.7	34.9	44.5	43.4	37.6	2.8	36.1	2.6
Bd	212	14	34.6	39.25	53.8	46.7	44	3.7	41.9	2.1

Chaix (2007) explains that the naviculocuboids in Kerma cattle were similar in size to those of African Neolithic cattle, but comparatively larger than early European specimens. Table 7.13 and Figure 7.16 show that Askut naviculocuboids are smaller than those found at Kerma, with some overlap.

Figure 7.13 Bd, greatest breadth of distal end, and GLl, Greatest length of the lateral half

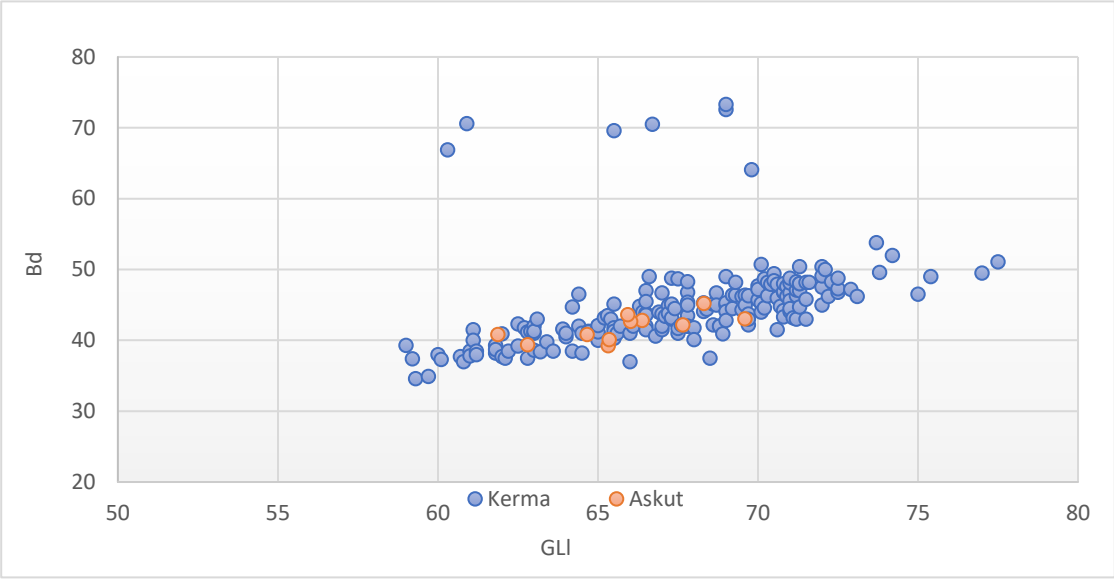
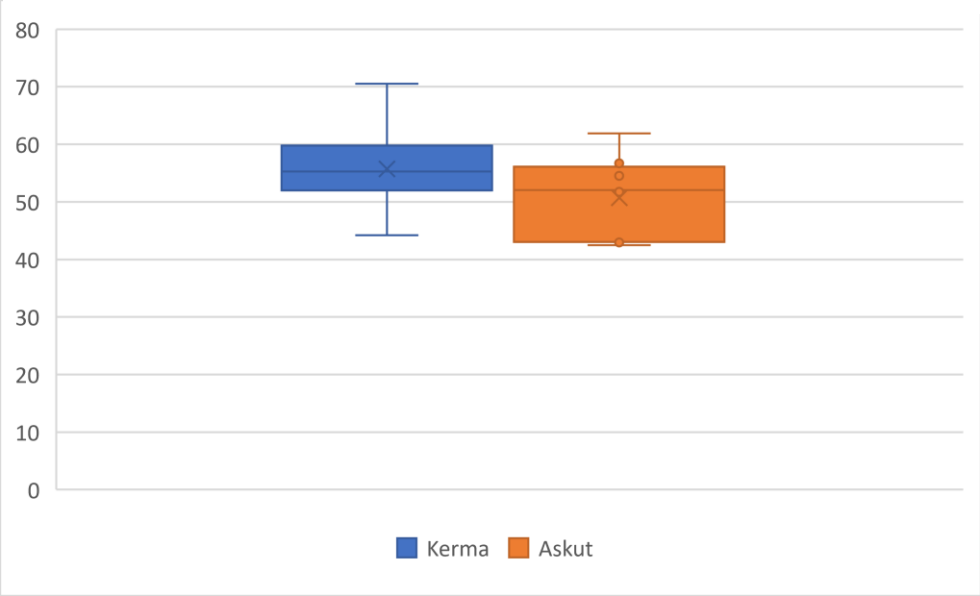


*Table 7.16 Greatest Breadth Measurements for **Naviculocuboid**: Kerma vs. Askut. S.D.= Standard Deviation*

	N=Kerma	N=Askut	Kerma Min	Askut Min	Kerma Max	Askut Max	Kerma Mean	Askut Mean	Kerma S.D.	Askut S.D.
GB	166	8	44.2	42.45	70.5	61.92	55.7	50.72	5.4	6.74

Figure 7.14 Box plot of Greatest Breadth measurements for Naviculocuboids in Kerma and Askut

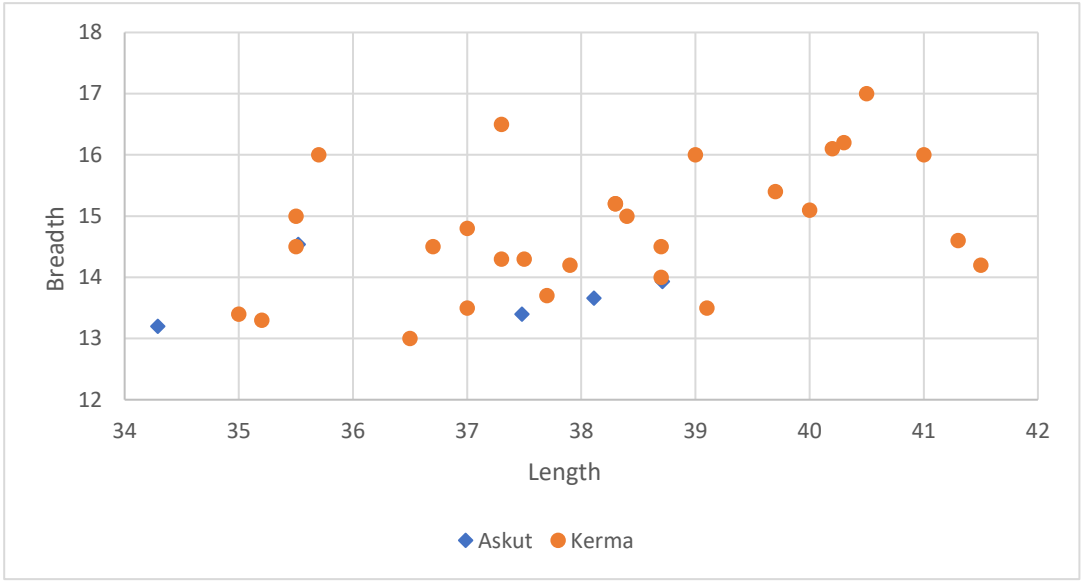


Chaix (2007) used the length and breadth of 3rd Lower Molars as a proxy for animal size. Table 7.14 and Figure 7.17 below compare the measurements for Askut specimens against those of Kerma. Here, the range of LM3 measurements for Askut is shown to be lower that than of Kerma, another line of evidence that Askut cattle were smaller than Kerma cattle overall.

Table 7.17 Comparison of Lower Molar 3 measurements: Kerma vs. Askut. S.D.= Standard Deviation

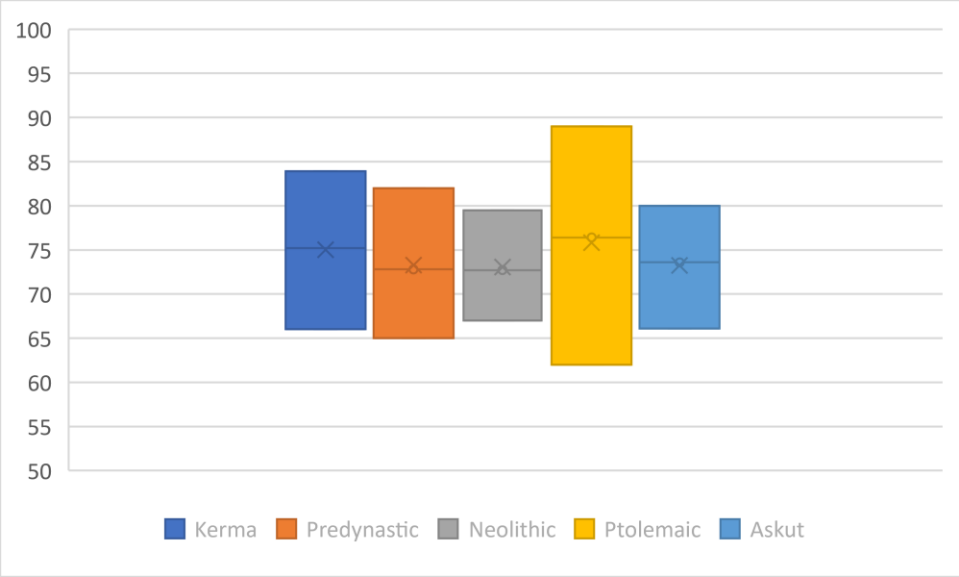
Element	N=Kerma	N=Askut	Kerma Min	Askut Min	Kerma Max	Askut Max	Kerma Mean	Askut Mean	Kerma S.D.	Askut S.D.
L.M3	37	5	38.2	34.29	41.5	38.17	38.2	36.82	1.8	1.66
B.M3	29	9	14.8	13.05	17	14.74	14.8	13.85	1	0.56

Figure 7.15 Plot of Length x Breadth of Lower Third Molar: Askut vs. Kerma



I was able to measure only six humerus distal breadths in the Askut collection, but humeri measurements are an important indicator of stature in cattle. The measurement taken here, "BT", is the greatest breadth of the distal trochlea (von den Dreisch 1976). The greatest breath of the distal humerus, "Bd", is rarer in archaeological assemblages because the outer edges of the distal humerus are prone to breaking off under pressure or attritional processes. The top range for

*Figure 7.16 Box plot comparing **distal trochlea (humerus)** measurements for ancient cattle in the Nile Valley.*



Neolithic, Predynastic, and Askut cattle measurements all sit below the top ranges for Kerma and Ptolemaic cattle. As I explain at the end of this section, larger stature is more prevalent under intensive breeding programs encouraged and overseen by the early states.

Table 7.18 Regional comparison of measurements on the distal trochlea of the humerus.

HUMERUS BT	N	m	min	max	St. dev.
Kerma	28	75.2	66	83.9	5.1
Predynastic	16	72.8	65	82	4.5
Neolithic	11	72.7	67	79.5	4.3
Ptolemaïc	38	76.4	62	89	5
Askut	6	73.6	66.1	80	5

Most of Chaix's (2007) comparative stature data comes from measurements of the various dimensions of first, second, and third phalanges. By comparing all of the measured dimensions of the anterior first phalanx, Chaix (2007) found statistical differences between Neolithic Nile Valley cattle, Predynastic Egyptian cattle, and Kerma cattle. Figure 7.19 plots the length and width of the Askut proximal phalanges with labels indicating the time period to which each specimen is dated. Table 7.16 shows that the maximum dimensions of the Kerma proximal phalanges are larger than the Askut phalanges for all of Askut's time periods. Based on the proximal phalanges measurements, the cattle acquired at Askut came from a population that was decidedly smaller than Kerma cattle.

Figure 7.17 Plot of first phalanx dimensions, length and proximal breadth, labeled by time

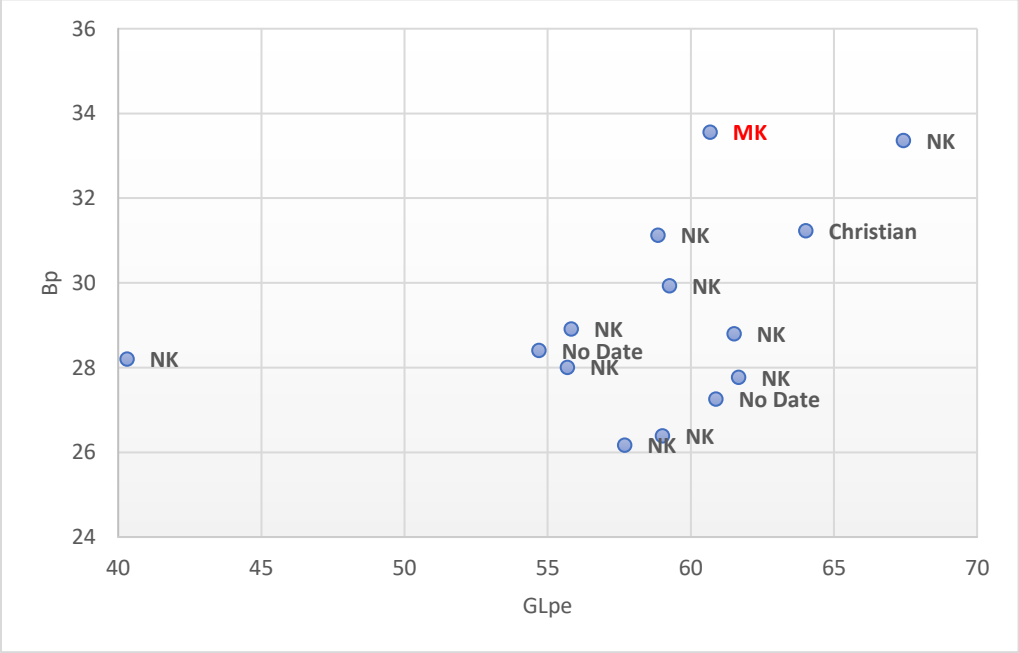
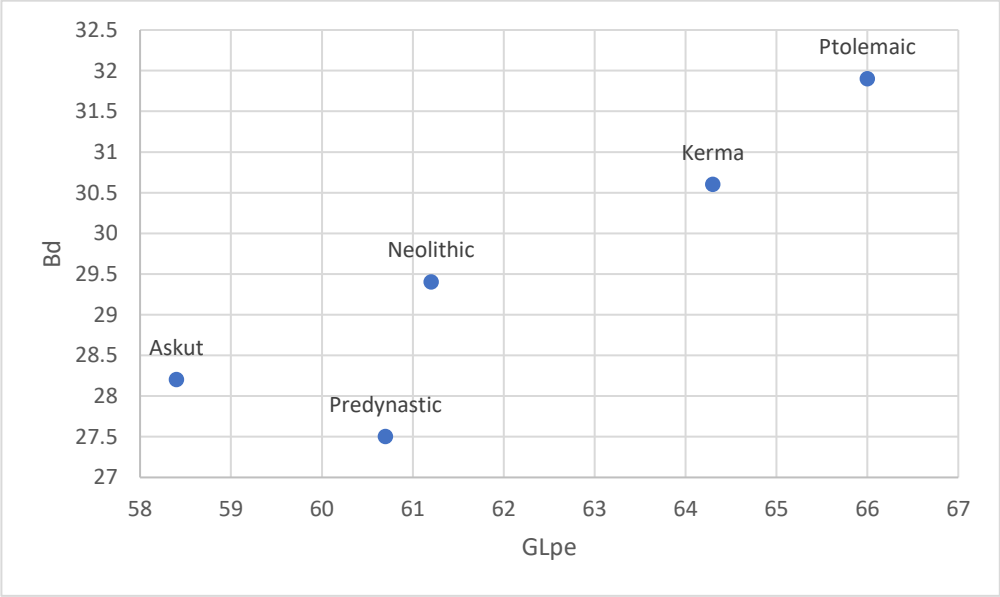


Table 7.19 Osteometric comparison of Phalanx 1: Kerma vs. Askut. S.D.= Standard Deviation

Dimension	Kerma N	Askut N	Kerma Min	Askut Min	Kerma Max	Askut Max	Kerma Mean	Askut Mean	Kerma S.D.	Askut S.D.
Glpe	177	14	54.6	40.31	72	67.43	64.3	58.4	3.5	5.9
Bp	183	14	27.2	26.17	38	33.56	32.9	29.2	2.6	2.2
SD	171	13	21.7	21.18	32.6	28.42	24.1	23.8	2.3	1.9
Bd	164	13	25.9	23.67	39.4	33.24	30.6	28.2	2.5	2.6

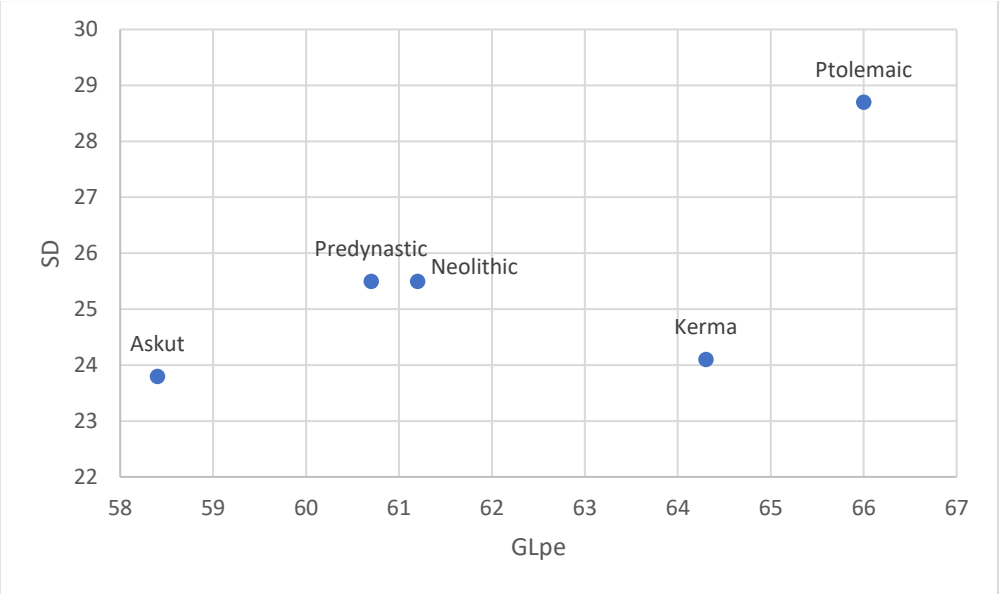
*Figure 7.18 Plot of proximal phalanx mean **distal breadth** x mean length for 5 cattle populations*



The next set of graphs take the mean of Askut's phalanges measurements, accounting for several dimensions, and compare

Askut's mean measurements with those of other archaeological cattle populations. Figures 7.20, 7.21, and 7.22 show that the proximal phalanges found at Askut were shorter in length than at least four other Nile Valley cattle populations described below, and narrower in proximal width than those of the other groups, with the exception of Egyptian Predynastic cattle.

*Figure 7.19 Plot of proximal phalanx mean **narrowest diameter** x mean length for 5 cattle populations*

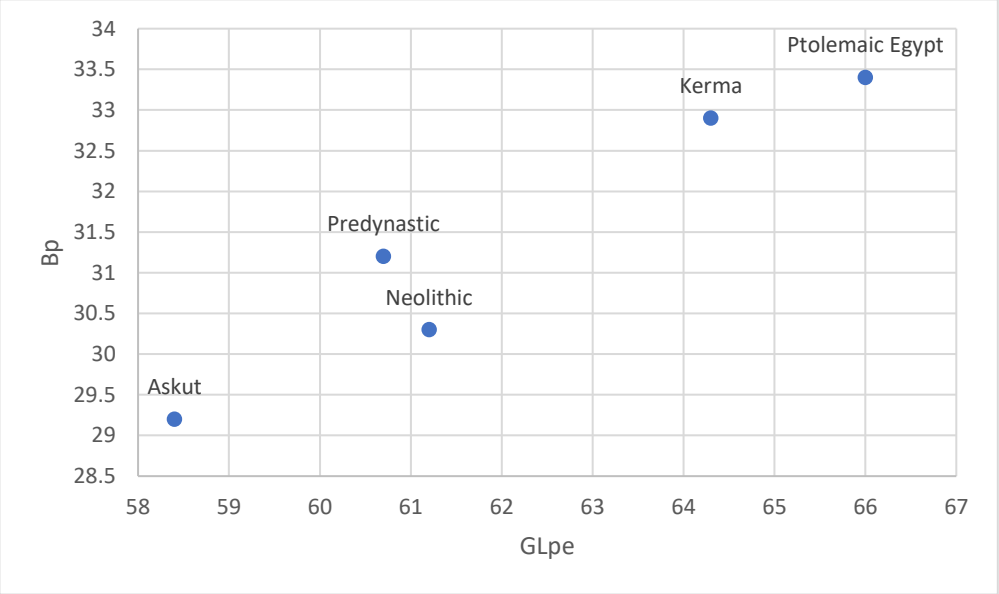


The sample populations that Chaix used for his (2007) comparisons come from sites that represent a variety of different time periods including, in chronological order, Neolithic, Predynastic, Kerma, and Ptolemaic. I have added Askut data to the regional comparison, knowing that there is some slight overlap in time between the Askut and Kerma samples. The Predynastic and the Neolithic samples represent the earliest examples of domesticated cattle in the Nile Valley. The Ptolemaic cattle represent the latest cattle samples from Nile, and as illustrated in the graph, the later cattle are much larger than the earliest populations. Compared to the Neolithic and Predynastic cattle

populations, the phalanges of the Kerma cattle are much longer, slightly wider across the bottom, but narrower towards the middle of the bone; this is in agreement with the general "shape" of Kerma cattle, which were taller, yet more gracile, than ancient Egyptian cattle in general.

The next set of measurements were the length and proximal breadth of the middle phalanx. Figure 7.23 plots the middle phalanx dimensions by time period and shows no discernible changes over time. Regionally, comparative measurements of the middle phalanx followed the same general pattern. The

*Figure 7.20 Plot of proximal phalanx mean **proximal breadth** x length for 5 cattle*



regional comparison of length against proximal breadth of the middle phalanx shows that Askut specimens are similar in size to those at the Predynastic settlement of Adaima. What is interesting here is that the mean measurements of each site clustered into pairs, even when the paired sites are not contemporaneous. The largest dimensions belong to Ptolemaic Egyptian cattle, a group that appears to be larger than every other Nile Valley population according to every available measurement. The similarities between the C-Group cattle and Askut cattle are important because, being situated between Hierakonpolis and Gebelein, Adaima was situated within a geo-cultural sphere that was historically important to the Nubian C-Group.

Figure 7.21 Plot of middle phalanx dimensions, length and breadth, labeled by time period at Askut.

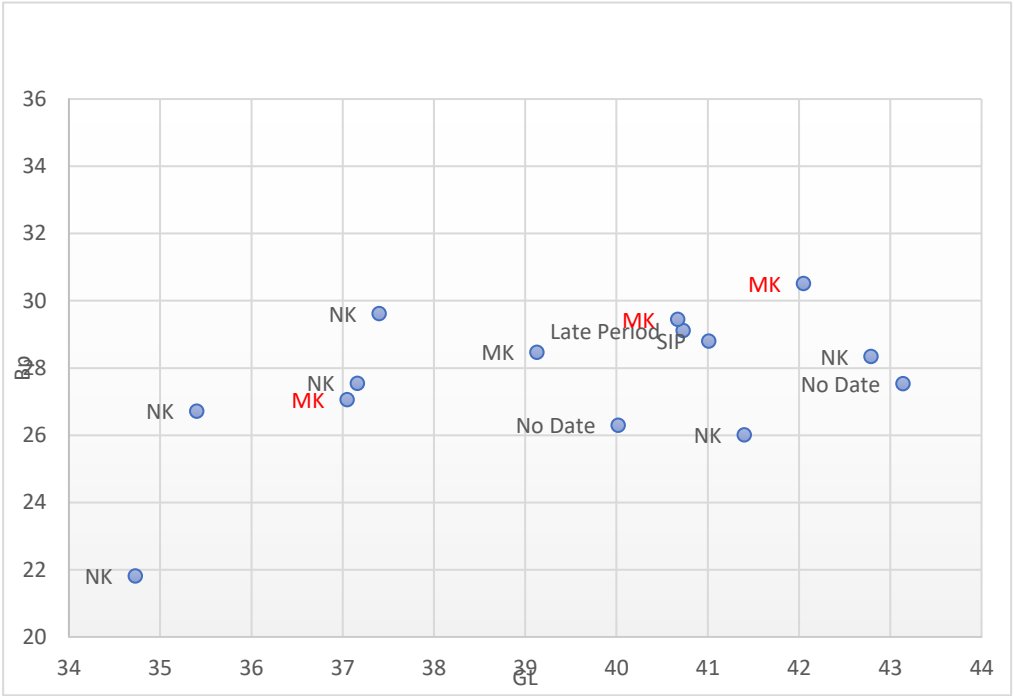
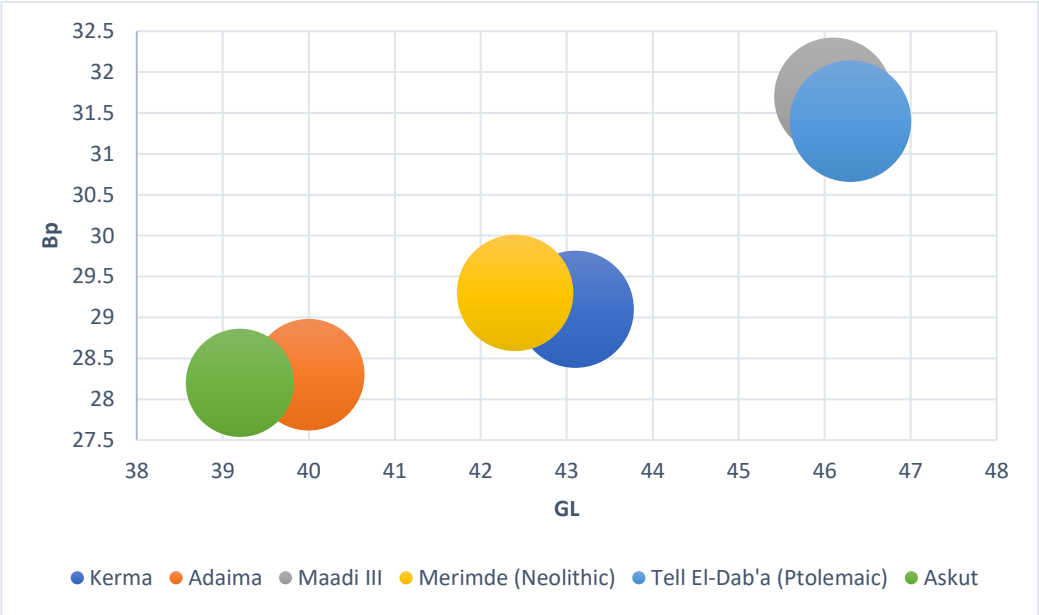


Figure 7.22 Plot of mean middle phalanx dimensions, length and proximal breadth, for six archaeological cattle populations in the Nile Valley.



Measurements of the terminal phalanx were less interesting. "MBS" measures the middle breadth of the sole on the terminal phalanx in ungulates (von den Dreisch 1976: 101). Figure 7.25 illustrates the individual measurements of terminal phalanges arranged from smallest to largest at Askut. While I only had one definitive measurement from the Middle Kingdom, this illustration does not appear to suggest change in the size of this element over time.

"DLS" measures the diagonal length of the sole of a terminal phalanx (von den Dreisch 1976:101). The DLS measurements presented here compare only specimens from Askut and Kerma. Figure 7.26 shows that, like every other set of measurements, the DLS range for the Askut cattle falls below that of the Kerma cattle. In terms of the regional comparison, the middle phalanx measurements were much more informative due to sample size and preservation.

Figure 7.23 Graph of the middle breadth measurement of terminal phalanges found at Askut.

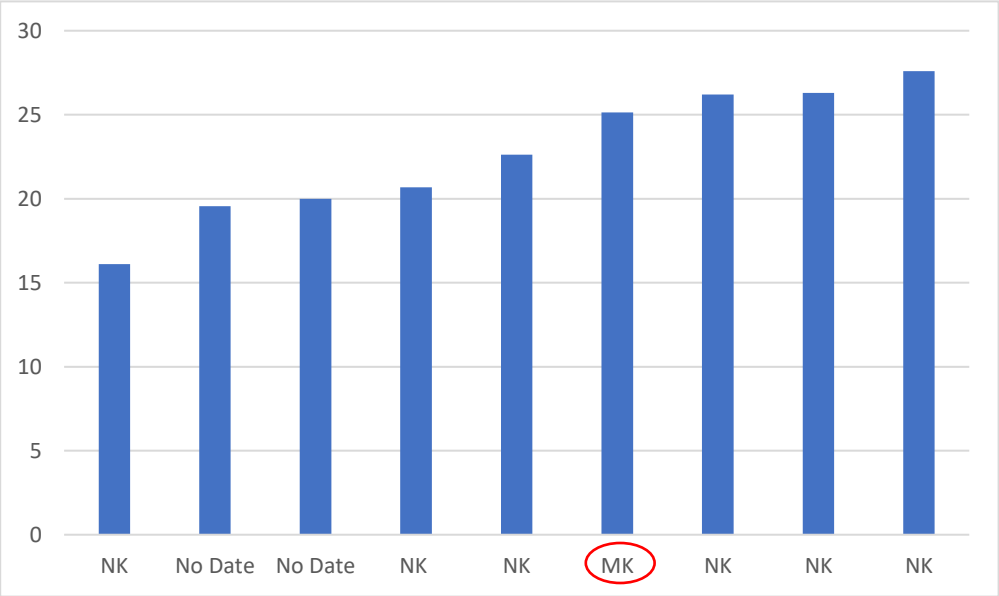
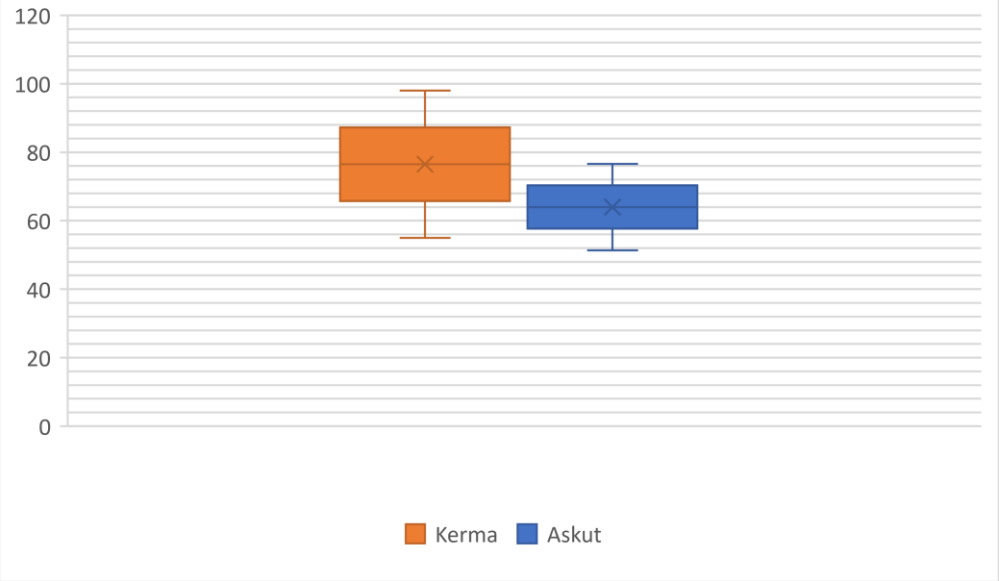
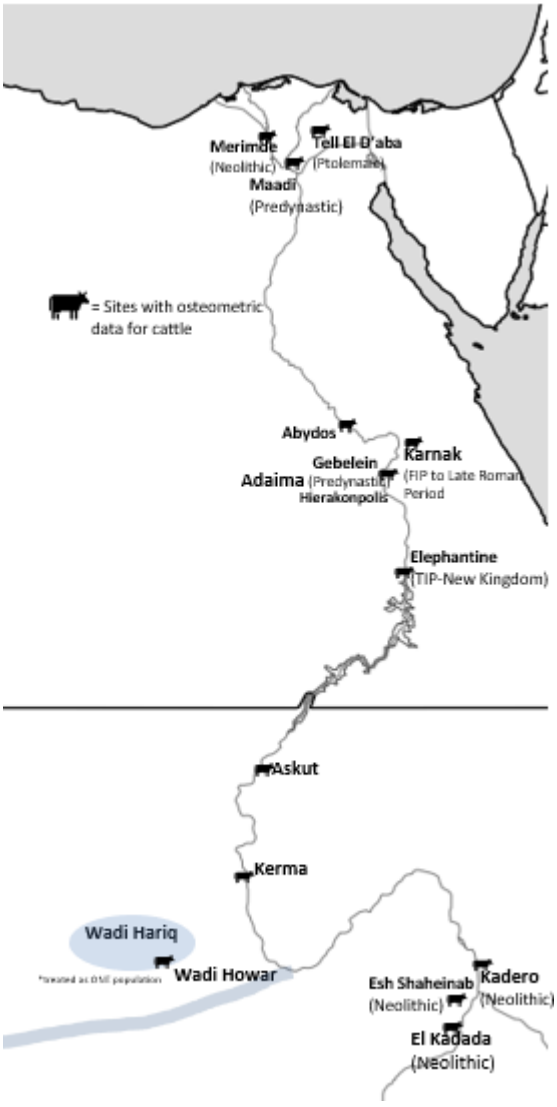


*Figure 7.24 Box plot of **diagonal length measurements** comparing terminal phalanges in Askut and Kerma.*



The small size of the Lower Nubian cattle when compared to other regional populations may have a parallel in an earlier study of regional cattle. Figure 7.27, from Pollath and Peters (2005), shows the LSI values for phalanges from sites representing seven northeastern African cattle populations. Karnak Nord, Abydos, and Elephantine are Egyptian sites, while Kadada, Kadero and Esh-Shaheinab are Upper Nubian sites. Phalanx measurements from the Egyptian sites form one cluster, while those from the Upper Nubian sites form another cluster. While there is some overlap with both of the other groups, Pollath and Peters argue that the black circles in the lower left quadrant show that phalanx measurements from the Wadi Hariq / Wadi Howar region form their own cluster. Essentially, the cattle from the Wadi Hariq /Wadi Howar region are smaller than both Egyptian and Nubian cattle.

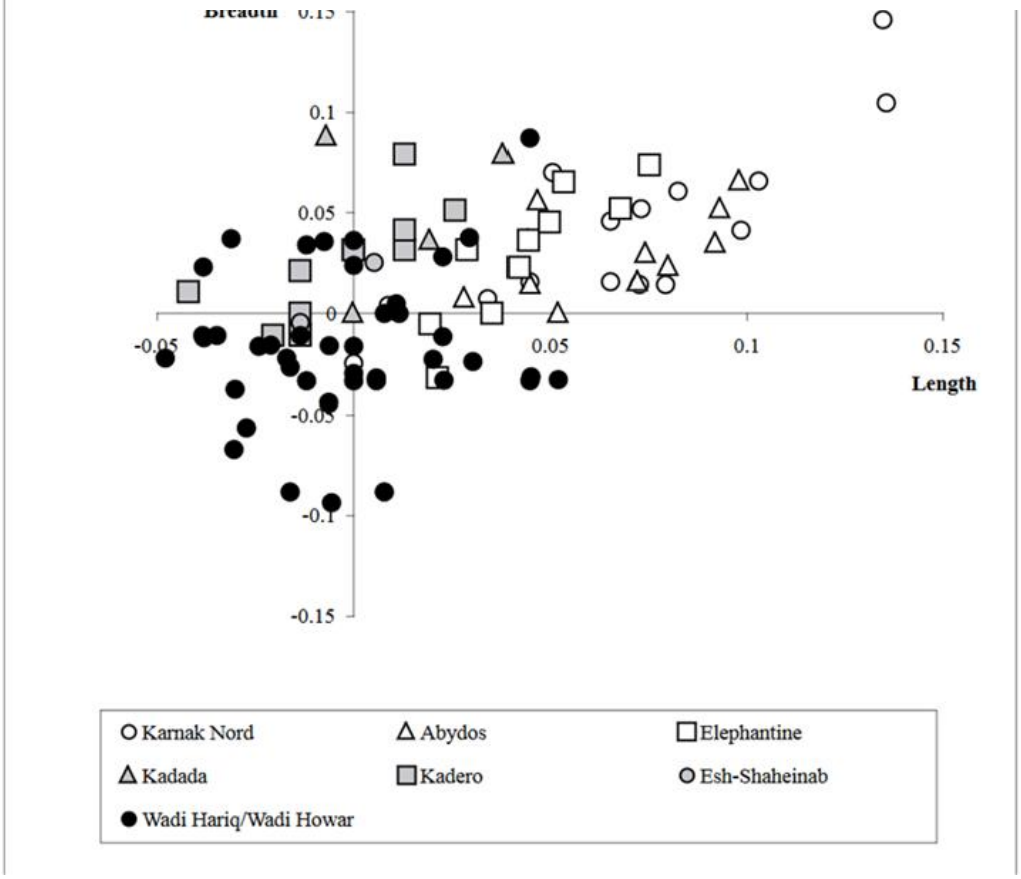
Figure 7.25 Map of Nile Valley sites with osteometric data for archaeological cattle populations.



The Wadi Howar region was the center of the Leiterband cultural horizon lasting from 4000 to 2900 BC. This is a context of intense interaction between the groups the descendants of whom would eventually differentiate into Kerman, Nubian, and Egyptian. It is in this time and place that linguists Rilly (2012) and Dimendahl (2012)

independently placed the genesis of the Nubian language family. In addition to a body of well-established material and linguistic linkages between Nubian peoples and the Wadi Howar region, I would contribute the following suggestion. Since the cattle raised in C-Group territory during the active years of Askut are decidedly smaller than Egyptian or Kerman cattle of the same period, it may be that upon closer examination, they would best resemble the archaeological cattle populations from Wadi Howar/Wadi Hariq, the common homeland shared by Kermans and the Nubian C-Group. The only other similarities are the aforementioned middle phalanges, of which Askut's specimens overlap with the Predynastic site of Adaima. Adaima's position on the Nile River in Upper Egypt is bookended by Gebelein and Hierakonpolis which, as mentioned in previous chapters, would become significant cultural enclaves for the Nubian C-Group. While these connections are preliminary, it creates a new question for the osteometric analysis of Nile Valley cattle: how morphologically distinct are archaeological cattle populations found within the Nubian C-Group's territorial range? Will a comprehensive study of cattle stature in the ancient Nile Valley and the surrounding deserts yield evidence that early states had an effect on cattle size?

Figure 7.26 Regional comparison of cattle stature according to LSI calculations, from Pollath and Peters (2005)



Morphological similarities between the C-Group and Wadi Howar cattle may have two equifinal causes: relationships of common biological descent and convergent environmental effects on cattle undergoing transhumance in an increasingly rough climate for the species. One feasible reason that cattle in Kerma and Egypt were larger is centuries of selective breeding in a fertile environment where seasonal movements were probably slight. Cattle that move across the landscape, especially during drought or harsh conditions, tend to be smaller as an adaptation to such conditions. It can also be argued that the smaller, hardier breeds able to survive harsh conditions are better able to deal with drought than larger breeds with higher water requirements (Stein 2011; Epstein

1971). Studies of breed diversity and "hardiness" sometimes divide African cattle into smaller, taurine breeds (*B. taurus*) that tend to deal better with harsh climates, and larger, zebu breeds (*B. indicus*) that tend to be more productive in terms of milk and offspring (Stein 2011; Epstein 1971). Knowing they did not have access to the best pasture and water, C-Group may have selected for smaller newborns resulting in reduced stature in general over time (e.g. Manning et al 2015). The environmental effects on the skeletal morphology of *Bos taurus* would have to be addressed while exploring the idea that various groups within the ancient Nile Valley were raising cattle that might have been physically, and visibly, distinctive.

7.7 *Addressing Hypotheses 1 and 2*

7.7.1 *Hypothesis 1*

In the Middle Kingdom**, I predict that the Egyptian military pursued a strategy of localized provisioning combined with foraging, and that soldiers hunted their own food.** Localized provisioning would also be indicated by cattle that look more Nubian than Egyptian. The archaeological correlates of Hypothesis 1 include evidence of provisioning measured by uniformity versus variability. Skeletal elements should show uniformity in body part representation and culinary preparation. Animals should all be close in age at death and I expect to see signs of standardized butchery (Zeder 1988:39). Morphological, biometric measurements should fall into clusters that either match or more closely resemble the cattle of Kerma rather than the short, robust cattle of Egypt.

7.7.2 *Hypothesis 2*

In the Middle Kingdom**, cattle acquired at Askut were raised in C-Group territory.** In the Second Intermediate Period, elites are acquiring cattle from Lower and Upper Nubia, being cut off from centralized provisioning via the pharaonic state. During the Second Intermediate Period, local cattle should predominate at first, but some cattle may have been transported from deeper within Upper Nubia. In the New Kingdom, the C-Group disbursed, and analysis should show cattle coming from further away. The archaeological correlates for this hypothesis include: Using stature and morphology data derived from osteological measurements (von den Driesch 1990; Albarella 2002), I expect the stature data from the Middle Kingdom to show that the cattle from this period have a more Egyptian robusticity. The markers of Egyptian robusticity should disappear by the Second Intermediate Period. I expect the stature to vary the most during the earlier years and to vary less in later contexts, meaning that most of the cattle consumed at Askut would come from Lower Nubia at first, and then Upper Nubia (the South) later on.

7.7.3 Results for Hypothesis 1 and 2:

The graphs of bone measurements labelled by time period do not show distinct clusters by time period, nor do they show an increase or decrease in average size over time. I interpret this to mean that the range of cattle size at Askut was at least fairly consistent over time, and that range is distinct from contemporary measurements taken from both Egyptian and Sudanese cattle populations.

Compared to the SIP and New Kingdom levels, the Middle Kingdom contexts at Askut show a higher proportion of Low Value Meat and a lower proportion of High Value meat. Compared to the later, non-military residents of Askut, soldiers appear to receive less-desirable cuts of meat overall. Yes, the strategy for feeding Askut's military

residents included localized provisioning combined with foraging. Based on the percentage of wild fauna (17%) vs. domesticated fauna (82%) in the Middle Kingdom, foraged foods, including fish, were a small but important supplement to soldier diets at Askut.

The cattle were local, but no, the origin of the cattle acquired does not seem to shift based on political developments. Based on their distinctive size, I believe the cattle acquired at Askut were of local origin, and I believe they remained of local origin throughout all phases of Askut's occupation, rather than transported from Egypt proper or Upper Nubia.

7.8 Addressing Hypothesis 3

7.8.1 *Hypothesis 3*

In the Middle Kingdom, the C-Group should have enough freedom of movement and economic independence to dictate some terms of livestock exchange. Askut was on an island where the inhabitants could not raise their own livestock, perhaps with a few pigs as the exception. The earliest phases of Askut's assemblage will contain animals that reflect the herd culling strategies of Lower Nubian herders. The frequency of young male cattle (ages 6 months to 4 years) will follow. The archaeological correlates for Hypothesis 3 include the percentage of subadults consumed during the Middle Kingdom, marked by unfused elements and immature morphology, which should be lower than the percentage of subadults consumed during the Second Intermediate Period. The percentage of subadults will remain high throughout the New Kingdom contexts. 7.7.2

7.8.*2 Results for Hypothesis 3*

Middle Kingdom age patterns show specimens within the optimal age for culling according to East African herder preferences, with most of the animals being above 3 years of age at the time of death. Yes, the percentage of subadults was lower in the Middle Kingdom than it was for the Second Intermediate Period. The sample size for the SIP was much smaller, but the proportion of younger animals was higher for each fulcrum (15 months, 2 years, 3 years, 40 months, and 42 months). Comparatively, the animals' age at death seems to favor the herders more than the consumers during the Middle Kingdom, and favor consumers more than herders during the Second Intermediate Period.

The percentage of subadults was not as high as expected for the New Kingdom. Once we reach the New Kingdom contexts, the number of ageable specimens was higher. Most of the animals were between the ages 3 and 3.5 years, at which age both heifers and bull calves could be reproductively viable. Despite the consequences of intensified colonial control of Lower Nubia, local herders are still providing animals **within their own optimal age for culling**. It does not appear that they are being forced or coerced to cull or sell animals at ages that would be disadvantageous to their own purposes.

At the outset of this study, I hoped to say something about agency and power in Egyptian/C-Group relations. I was not able to gather enough sex data to speak to herd management practices, but I do believe that the morphological data offer some insight about the political ecology of cattle rearing in the borderlands. Several of the ecological explanations that I can think of for the size of these cattle all have political factors: access to pasture, access to water, and socio-economic stability versus precarity. The diminutive

size of these cattle may very well be a feature of the C-Group's larger battle with a changing climate within these larger political restraints.

7.9 *Summary of Results*

In this chapter, I described Askut's *Bos taurus* assemblage in terms of size, composition, and preservation. I explained the methods I used to assess the qualities and variable traits visible on the bones. I also discussed the methods I used to record and measure the variables that serve as the archaeological correlates for my analysis. I applied those data to each of the hypotheses I presented in Chapter 6. Next, I will summarize my results and my conclusions about meat supply, meat acquisition, and intergroup relations at the fortress of Askut.

Chapter 8: Discussion and Conclusion

Cattle have occupied a special role in the human past of Northeastern Africa since 10,000 BC. From Pleistocene times to the emergence of social complexity, the Nile Valley and the adjacent Sahara were dynamic settings, tectonically and climatically, to which plants, animals, and people had to adjust and adapt. Dramatic shifts in climatic conditions meant that groups across this supraregion each had to respond to survive. The cultural practices that developed through a human-*Bos* relationship, like cattle rituals and transhumance, are foundational to the cultural trajectories of the region. Dependence on cattle increased at the same time that the Sahara desert's expansion made settlement in

Nile Valley attractive to a variety of groups that had been traveling between the Sahara and Nile for generations. The influx of Saharan pastoralists into the Nile Valley stimulated conflicts with the indigenous occupants and, as noted by others before me (Hassan 1997; Smith 2018; Lobban 1997), were to have a profound effect on the emergence of social complexity along its banks, from the Delta to Kush.

Two types of pastoralism in the ancient Nile Valley, subsistence pastoralism and state-supervised pastoralism, elucidate the evolving political relationships between dedicated agriculturalists within the Nile Valley and specialized pastoralists operating at the edges of the Nile Valley's agricultural zone. The relationship between groups specializing in agriculture and specializing in pastoralism became more fraught with the incipient statehood of pharaonic Egypt, while the incipient Kerma state incorporated pastoralist political structures differently. The development of cattle-centered institutions within the Egyptian state reveals the motivations and incentives for the acquisition of cattle from outside of Egypt's borders. Cattle were integrated into Egypt's systems of taxation, worship, and land ownership.

When compared to military instillation faunas studied by Hesse and Wapnish, animal exploitation at Egypt's Lower Nubian Fortress differs from that of Southwest Asian military forts in several ways. Although the biggest factor in Askut's zooarchaeological uniqueness seems to be the role of the Nile River in pharaonic Egypt's military infrastructure, a second factor is the relatively late proliferation of horses in Egypt, which, along with donkeys, are much more prevalent in the Southwest Asian fortresses. Even though grain was imported to Askut from Egypt proper, protein was acquired locally from the very beginning of Askut's occupation, speaking to the long-

term familiarity of Askut's residents and communities within the vicinity of the Nubian fortresses. All time periods yielded evidence of hunting and fishing, but wild bovid remains are more prevalent during the New Kingdom. During the Middle Kingdom, fishing seems to take prevalence over terrestrial hunting as a means of supplementing protein distributed at the fort. Further research should highlight and explore if, how, and why military contexts in ancient Egypt produced faunal assemblages distinct from military contexts in places like Mesopotamia.

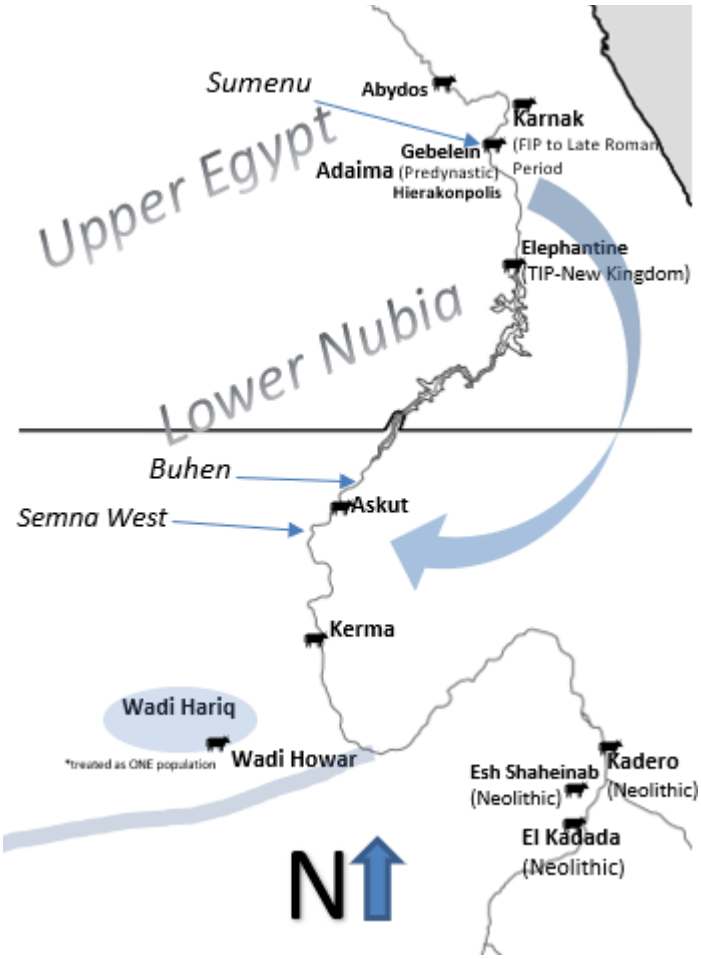
The political ecology of the pharaonic Egypt's southern border in Nubia required the C-Group to simultaneously adapt to changing weather patterns and the intermittent presence of the Egyptian military in Lower Nubia. Bioarchaeological indicators from other regional research show that C-Group Nubians' consumption and reliance on grain increased over time, a development associated with their increased sedentarism and their intensified economic entanglements with pharaonic Egyptians in the Middle Nile Valley. Based on mortality profile data, the culling patterns disadvantaging pastoralists appear only in the Second Intermediate Period, when was in political control of Lower Nubia. It may be that local C-Group herders experienced a more exploitative relationship with Kerman political elites than they had with Egyptian expatriates who lived at Askut before and after the SIP. In light of Vercoutter's (1957) evidence of a Second Cataract-Upper Egypt relational network, mentioned below, it makes sense that the livestock would be provided to the new, foreign rulers on different terms.

When compared to the cattle assemblages of the ancient settlement of Kerma, the nearest comparable dataset, the cattle bone assemblage at Askut differs in several ways. The Askut sample is smaller, which is to be expected given that it was collected over a

shorter period of time. Also expected was the higher proportion of fragmentary cranial elements in the Askut subsistence assemblage. The Kerma assemblage, of course, has a body segment composition that is skewed by the prolific use of bucrania in Kerma mortuary rituals. Butchery patterns differed in that the Askut assemblage contained a higher number of measurable metapodials.

My analysis found that the morphological dimensions of the cattle at Askut do not closely resemble those of the populations from Kerma or from Egypt proper. Almost every morphological metric from several elements demonstrated that Askut cattle are smaller than any other archaeologically documented cattle population, except, significantly, those documented by Pollath and Peters' for cattle from Wadi Hariq/Wadi Howar. Two possibilities for the similarity, size diminution due to harsh climate/transhumance, and biological descent, are not mutually exclusive. A possible relationship of biological descent between Nubian C-Group cattle and the cattle of the Wadi Howar region is both highly plausible and intriguing, given earlier linguistic and archaeological assertions of a linkage between these human groups. Future research should make both a detailed comparison of the Askut and Wadi Howar osteometric measurements and an analysis of the geopolitical conditions influencing herder interaction and mobility between the Wadi Howar and the Nile Valley.

Figure 8.1 Map of a possible migration connecting family groups in Lower Nubia with Nubian enclaves in Upper Egypt. The curved arrow illustrates the movement of families from Sumenu to the Second Cataract Region, as proposed by Vercoutter (1957).



As mentioned at the end of Chapter 7, measurements of the middle phalanges of Askut cattle overlap with the Predynastic site at Adaima, a location nestled between would become Gebelein and Hierakonpolis, two significant cultural enclaves for the Nubian C-Group in Upper Egypt. Vercoutter (1957) describes a set of Egyptians in the Old and Middle Kingdoms who went by the bureaucratic title of "Interpreter"/"Overseer of Interpreters"; these people traveled to and lived in Nubia to further Egyptian political economic interests. Vercoutter examines a set of stelae from Buhen, Semna West, Uronarti, and Sai Island, dating to the 13th Dynasty. These stealae invoke the name of the crocodile deity Sobek, who was known to be commonly worshipped in Nubia (citation). However, these stelae mention Sobek as the "Lord of Sumenu", referring to him as the patron deity of the town of Sumenu, which was just north of the previously mentioned C-Group enclaves at Gebelein, Adaima, and Hierakopolis (see map).

Vercoutter proposes that the five stelae in the Second Cataract region would referring to the town of Sumenu suggest that some of the Egyptian ex-patriates settled around the Nubian forts had direct ancestral ties to Sumenu. Vercoutter (1957) makes a case that has since been developed by Smith (2003) and others (Friedman 2007; Ejsmond 2017) that certain enclaves in Upper Egypt show Nubian-Egyptian cultural entanglements (and almost, hyrbridity), since the First Intermediate Period. Vercoutter (1957) proposes that is Egyptians from these enclaves with longstanding C-Group ties, and to an extent, some Nubian cultural affinities, that moved from the Theban region down to Lower Nubia to serve as a diplomatic-colonial class.

Familial connections between mixed C-Group-Egyptian communities at the Second Cataract and the mixed C-Group-Egyptian communities at Nubian enclaves in the Theban region could be grounds for a more extensive study of similarities between cattle remains in the two locales. Descent relations would also add another layer to social and political incentives for the communities around the Nubian fortresses to supply fortress residents with livestock.

8.1 Climate change, Cultural Fragmentation, Survival and Assimilation

The consequences of Egyptian imperialism changed Nubia forever, and while monuments at Kerma stand as a testament to the memory of the scale and complexity of the Kushite state, the pastoralists who lived between the Kerman and Egyptian worlds are still somewhat of a mystery. After the fall of Kerma (circa 1550 BC), the C-Group becomes archaeologically ephemeral. Although some Nubian traditions and cultural features survived, for some, “Egyptianization” might have been either their only chance at social security or upward mobility or, perhaps, even their only chance for survival

(Smith 2020). *Egyptianization*, as a process, likely had an extensive precedent in the presence of local families that had traveled from the mixed C-Group/Egyptian enclaves in the Theban region. Here, the long-standing Proximate Otherness that characterized Egyptian-Nubian relations becomes particularly contextual. C-Group identity in the heart of Wawat cannot be assumed to be the same lived experience as C-Group identity of people buried in C-Group tradition within Egypt's Nubian enclaves. Like modern colonial and imperial encounters, we are now understanding the existence of what might have been an Upper Egyptian / Lower Nubian "buffer class", a group of people that could navigate both the Egyptian and C-Group Nubian cultural spheres so well, that it becomes difficult to identify them solely based on proper names, pottery, and burial costumes.

Increasing desertification made the Middle and Upper Nile Valleys less amenable to raising large herds of cattle. The C-Group may have found themselves at a crucial parting with their traditional way of life, brought on by the combined effect of climate change on their grasslands and the presence of a dominant political entity offering new terms for survival to a people losing their means of sustenance and social identity. Among subsistence pastoralists, economic shortfalls and intergroup conflicts are resolved because individual risk management is subsumed into the collective political and ecological response to environmental risk (Park 1992). Toward the end of their time in Lower Nubia, many C-Group households likely lacked sufficient livestock to fulfill their social obligations within their own social group, creating a social problem in need of strategic solutions. In the New Kingdom, Egypt's colonial strategy may have begun to offer incentives for individuals and their families, as opposed to previously negotiating at the group or community level, as described by Morris (2018). Egyptianization might have

been either C-Group members' only chance for food security and even upward social mobility or, in some cases, mere survival. Some interdisciplinary research suggests a dispersal and migration of C-Group members as far away as Eritrea (Rilly 2012). At the same time, archaeological evidence also suggests that some C-Group communities may have found it advantageous to assimilate under the New Kingdom's harsh new policies toward Nubians that nevertheless provided incentives for collaboration (Smith 2001; Edwards 2004; Hafsass-Tsakos 2008). Egyptianized Nubians adopted new social values and institutions (Smith 2003). Their relationship to the landscape changed by becoming "Egyptian." Egyptianization, one could argue, was a form of adaptation, the last cultural mechanism available for coping with a land that could no longer support sizable herds of cattle upon which their identities and social power had been based.

Pastoralist labor is not only a means of subsistence, it is also a meaningful occupation and participation in community (Dahl and Hjort 1976: 24). For Nubian C-Group people to replace their "pastoralist ideal" with an Egyptian way of life, the meaning of being a pastoralist would have to have been replaced with some new meaning in being Egyptian. In many ways, the Nubian C-Group serves as an early model for later non-state pastoralist actors in Africa. There is also, of course, much to be said about the reciprocal effects of C-Group culture on pharaonic Egyptian society as a whole. From Egypt's conquering armies to the sanctuaries of Hathor, C-Group Nubians served the political and cultural institutions of ancient Egypt with distinction (Smith 2003; Ashby 2018). Their insistence on maintaining elements of their distinctive dress over generations (Buzon 2011), is likely evidence of their pride in a unique and charismatic collective social identity. Even as the traditional C-Group lifeways at the edge an ancient

of empire faded away, Nubian communities have persisted through Egypt's modern history, where they still exist today. What can story of their persistence, their fate, their survival, teach us about the politics of complex pastoral societies and states?

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