INTRODUCTION

In the ancient Near East the rise of complex societies characterized by significant, stable, and, in many cases, oppressive inequalities, is closely linked with the reorganization of economic systems through increasing specialization and intensification in the production and exchange of many products and services (Algaze 2008; Wattenmaker 1998; Wright and Johnson 1975; Zeder 1991). With an emphasis on exchange and surplus, commodity production and even product branding became central considerations of Late Chalcolithic and Bronze Age elites as they sought to reify and even expand the material and symbolic foundations of their ascendancy (Rothman 2000; Wengrow 2008, 2010). Although studies of the dramatic economic changes associated with the rise of complex societies have tended to focus on features such as agricultural surplus, external trade, and prestige goods, animals also played an important role in these processes.

Research into the role of animals in the prehistoric Near East, however, has overwhelmingly focused on questions of paleoeconomy (e.g., Uerpmann 1973), particularly on issues surrounding the process of animal domestication. Comparatively little attention has been paid to the role of animals in the development of increasingly hierarchical, prestate societies of the Chalcolithic (6000–3000 BC)—the period that witnessed the rise of the first complex societies in the greater Mesopotamian world. Part of this problem lies in the widespread notion that systems of animal management are fundamentally conservative, ecologically adapted, and focused on risk reduction, and were therefore fundamentally peripheral to the processes
involved in the emergence of social differentiation in the late prehistoric Near East (Esin 1998; Frangipane and Siracusano 1998; Redding 1984; Stein 1989). Moreover, turning to a large body of ethnographic work focusing mostly on egalitarian, pastoral nomads in Iran and central Asia (Bates 1973; Irons 1975; Salzman 2002; Tapper 1979), archaeologists have tended to accept the model that herds are not a good basis for long-term wealth and power differences because of the fickle nature of the growth and decline of herds (although see Borgerhoff Mulder 1999). As Irons (1994:192) comments, among the Yomut, “there were vast differences in wealth, but the wealth of individual families could be expected to change. For the wealthy to become poor or the poor to become wealthy was not unusual” (also see Bates 1973:134).

However, recent trends in zooarchaeology have focused attention on the social rather than strictly subsistence uses of animals, and the chapters in this volume attest to the wide range of nonsubsistence roles played by wild and domestic taxa alike. With the rise of increasing inequality in the Chalcolithic Near East there is evidence for the increasing use of animals outside of the traditional subsistence economy for social gain, wealth acquisition, and commodity production (Arbuckle 2012b; Ben-Shlomo, Hill, and Garfinkel 2009; Helwing 2003; Kansa and Campbell 2004).

In the ancient Near East caprines (i.e., sheep and goats) were the dominant livestock and sheep, with their ability to produce high-quality meat, milk, and most importantly wool, quickly became an important focus within growing commodity economies in the Late Chalcolithic and Early Bronze Age. Although third and even late fourth millennium BC texts from Mesopotamia reveal an early interest in the production and administration of woolen textiles (Algaze 2008; Green 1980; Nissen 1986), we know little about the development of wool production in Anatolia, despite the fact that this region was likely the earliest center of sheep domestication and has a rich history of wool production in the Bronze Age (Michel and Veenhof 2010; Veenhof 1972; Zeder 2008).

In this chapter, I explore evidence for the rise of intensive wool production in central Anatolia during the Chalcolithic, the period that witnessed the rise of increasingly complex, prestate societies. The primary aim is to address the context in which sheep management was transformed from a “Neolithic” system of household production of primary (e.g., meat, hides, bone, etc.) and secondary (e.g., milk) products (Sherratt 1983) into a “Bronze Age” system of commodity production focused on wool. Although I review multiple types of evidence for the use of wool, I focus on zooarchaeological data from five sites in central Anatolia spanning the period from the Neolithic to the Bronze
Age in order to reconstruct trends in sheep management consistent with the development of intensive wool production.

ARCHAEOLOGICAL EVIDENCE FOR WOOL

Wool and woolen textiles were critically important commodities in early Near Eastern states, a fact amply documented in ancient texts (Waetzoldt 1972). But as textiles are perishable materials, both the origins and extent of their use remain difficult to assess in prehistoric and early historic periods (Good 2001). The term wool refers to the fine fibers, which, along with coarser hairs and kems, make up the coat of domestic sheep (Ovis ammon) (Ryder 2007). Wild sheep (Ovis orientalis) have a coat consisting mostly of the very coarse outer kems and hair fibers with the fine “wooly” fibers limited to a short undercoat (Barber 1991; Ryder 1960, 1983). This undercoat is molted each spring and cannot be spun, although it can be collected or plucked and used to produce felt (Barber 1991). However, at some point following the initial domestication of sheep, somewhere in the southern and eastern regions of Anatolia in the early ninth millennium BC (Zeder 2008), the short, fine fibers of the undercoat of domesticates became more developed and eventually became the dominant component of the outer coat, which could then be spun into thread and thence woven into textiles (Barber 1991). The techniques for spinning and weaving wool required virtually no technological innovations, as they were identical to those involved in the spinning of flax, which has been used in textiles since the late Pleistocene (Kvavadze et al. 2009). The transition from wild-type coat to wooly fleece is important, because woolen textiles were not possible before this innovation, but the precise timing of the transition has been the subject of some speculation (see Ryder 2007).

Evidence for early wool comes from multiple sources. Direct evidence for wool is rare, but the earliest woolen textiles have been identified on the northern margin of the Near East, dating to the mid-fourth millennium BC Maikop culture (Shishlina, Orfinskaya, and Golikov 2003). Wool and goat hair were used to make textiles in eastern Iran by the late fourth millennium at Shahr-i Sokhta (Good 1999) and both wool and goat-hair textile fragments have been found in Bronze Age contexts at Arslantepe in Anatolia (Frangipane et al. 2009).

Iconography depicting either sheep with a wooly fleece or the manufacture of textiles is another useful source of information, and Algaze (2008) has summarized much of the evidence for the Late Uruk period (late fourth millennium) in Mesopotamia. Furthermore, the third millennium “Standard of Ur”
clearly depicts sheep with wooly staples (as well as “hairy” goats) (Roaf 1990). Characteristics of spindle whorls (pierced weights used in the process of spinning fibers into thread) have also been used to identify the spinning of wool, which as a very light fiber requires light-weight spindle whorls. Multiple studies have suggested that spindle whorls appropriate for spinning wool thread were present by at least the mid-fourth millennium BC in the Near East and eastern Europe (Chmielewski and Gardynski 2010; Keith 1998; Kimbrough 2006), and Sudo (2010) has pushed this back into the fifth millennium (Ubaid period) in northern Mesopotamia. Furthermore, a peculiar figurine from the late sixth millennium site of Sarab, in Iran, may depict a sheep with wooly “staples” (Bökönyi 1977) (although see Good 1999:59).

However, the European mouflon, a feral sheep thought to be descended from primitive Neolithic domesticates, exhibits a wild-type coat, indicating that Neolithic sheep could not have been exploited for wool (Barber 1991:24; Chessa et al. 2009). Moreover, wool seems not to have been part of the Neolithic agropastoral economies that moved from the Near East into Europe in the late seventh millennium; for example, even by the late fourth millennium, the clothing of “Oetzi the Iceman,” a mummy preserved by glacial ice in the Italian Alps, included no woolen textiles (Hollemeyer et al. 2008; Ryder 1983).

Although Neolithic domestic sheep did not possess spinnable wool, the seasonally molted fine undercoat could have been plucked and felted. Although there are no archaeological remains of felted textiles from the Near East prior to the Bronze Age (Barber 1991:217), a controversial method of dating the origins of the Indo-European language family, which contains a common root perhaps referring to felt, suggests that its use may have a Neolithic origin (Anthony 2007; Gray and Atkinson 2003).

Finally, faunal evidence has been brought to bear on the origins of wool production in a variety of ways. Perhaps the most frequently cited method for identifying the management of sheep for wool was devised by Payne (1973), who developed models relating the age at which sheep are slaughtered to the goals of herd production. Accordingly, when the preferred goal of herd management is wool, herders will delay slaughter of females and, especially, males to maximize the off-take of fiber before culling. This creates a unique demographic profile dominated by the remains of adult rams and ewes.

Building on Payne’s model, Helmer (Helmer, Gourichon, and Vila 2007; Vigne and Helmer 2007) has interpreted an unusually high frequency of mature caprines at the late Neolithic sites of Tell Soto and El Kowm 2 in Syria as representing management intensively focused on fiber production. Other
Evidence for the use of wool in the late Neolithic, however, is sparse. The initial spread and then steady increase in sheep in assemblages in the Zagros and southern Levant in the seventh and sixth millennia BC, well after systems of goat management had developed in these regions (Zeder 2008), suggests a specific interest in the products of sheep (perhaps wool?) despite the superior biological adaptations of goats to the climate and geography of these regions. The Neolithic “wooly” sheep figurine from Tepe Sarab, mentioned above, is also significant in this context.

However, most faunal studies point broadly to the Chalcolithic for the initiation of widespread management of herds for wool. For example, high frequencies of adult sheep suggest that wool production was practiced at Late Chalcolithic Hacinebi (Southeast Anatolia) and Rubeidheh (Iraq) (Gil Stein personal communication, 2010; Payne 1988). In western Iran, Davis (1984) has identified a general increase in the age at which caprines were slaughtered, suggesting increased use of wool in the Chalcolithic and Bronze Age.

Pollack has summarized faunal evidence for wool production in Chalcolithic Mesopotamia, where she interprets the high frequency of sheep at northern Uruk sites and colonies (e.g., Hacinebi, Hassek, Zeytinlibahçe) as evidence for wool production (for similar arguments see Anthony 2007). She cites biometric evidence for the appearance of a new “breed” of large-bodied, presumably wool-bearing, sheep in the region in the fourth millennium (also see Bökényi 1974; Buitenhuis 1985; Chmielewski and Gardynski 2010; McCorriston 1997). In an impressive review of sheep biometrics in northern Mesopotamia, Vila (2002) suggests that important increases in the size of sheep took place in the Ubaid and Uruk periods. Although these increases in size may be related to the development of new “breeds,” they may also be caused by the increase in adult males to be expected with widespread management of sheep for wool.

This brief summary shows that although indirect evidence may suggest the use of sheep fiber by the seventh or sixth millennia BC, evidence for the widespread and intensive production of wool and woolen textiles increases dramatically in the Near East and surrounding areas by the mid-fourth millennium (Payne 1988:114), corresponding to the rise of complex societies whose economies and elites were invested in the production of commodities such as woolen textiles for both internal use and external trade (Algaze 2008).

That wool production should be linked to the appearance of complex societies and inequality should not come as a surprise. Adams (1981:11) has stated that Bronze Age Mesopotamian civilization would not have been possible without the production of woolen textiles, and Algaze (2008) has argued that the centrality of the wool industry was also present in the earliest states in the
fourth millennium (also see Anthony 2007; Keith 1998; McCorriston 1997; Pollack 1999:109), when the earliest texts refer specifically to “wool sheep” (Green 1980; Nissen 1986; Szarzynska 2002).

It is well documented that in the Middle Bronze Age wool and woolen textiles were a central component of the Old Assyrian Colony system operating between central Anatolia and the northern Mesopotamian city of Assur (see Atici, chapter 11, this volume; Michel and Veenhof 2010; Veenhof 2010). Texts recovered from the houses of traders in the Karum, or trading “port,” of the city of Kanesh in central Anatolia, describe the importation of high-quality woolen textiles from Assur and other parts of Mesopotamia as well as a brisk business in local Anatolian woolen textiles, particularly one called pirikanum (Atici, chapter 11, this volume; Michel and Veenhof 2010).

Although largely invisible archaeologically, the local trade in Anatolian wool was a major economic enterprise with contracts mentioning Anatolian palaces and Assyrian traders who moved quantities of wool in the tens of tons (Atici, chapter 11, this volume; Michel and Veenhof 2010), indicating just how large the fulling industry was by the Middle Bronze Age. The fact that Anatolian palaces were involved in controlling and taxing the movement of large amounts of wool again supports the intimate connection between commodity production and elites and the central role of wool within Near Eastern complex societies. Clearly the individual, institutional, and class-based systems of status, prestige, and wealth acquisition that developed in Chalcolithic and Bronze Age societies, including both states and complex prestate societies alike, were structured around controlling the production, distribution, and/or marketing of textiles and raw wool (Algaze 2008).

METHODS

Although a variety of methods have been employed to identify the production of wool from faunal remains (see above), the most influential has been Payne’s (1973) modeling of the relationship between production goals and age of slaughter. These models show how maximization of wool production results in extreme delays in the age of slaughter of both rams and ewes, as visible through the aging of mandibular teeth. However, demographic patterns by themselves have limitations (Halstead 1998). Ethnographic work by Makarewicz (2011) with Mongolian pastoralists has shown that the delayed culling of adult caprines corresponds to the availability of winter graze rather than intensive wool production. In addition, Halstead (1998) has shown that sheep management that relies on traditional methods, such as the kill-off
of young males, produces enough wool, of good-enough quality, to meet household and local needs among subsistence pastoralists in rural Greece. In addition, Ur III texts studied by van Driel (1993) show that wool was certainly taken from sheep (shearing dates being a major calendrical referent) but recorded husbandry methods show no special emphasis on keeping adult males or especially aged animals. Thus Payne’s model for identifying intensive wool production, or at least its typical application to faunal assemblages, is useful for identifying only a small portion of management systems that likely exploited wool and hair.

Because of the problems inherent in looking at only one zooarchaeological variable (e.g., frequency of sheep, survivorship, etc.), multicomponent analyses are needed to address faunal evidence for wool management. In this case, I focus on a combination of species-specific survivorship curves and biometric data. The importance of survivorship curves for identifying the delayed culling of sheep associated with wool production has already been described. In addition, analysis of the distal breadth of fused and unfused metacarpals, measurements that can be used to differentiate males and females (even among young sheep), can help us to identify the sex composition of those individuals slaughtered at younger (unfused) and older (fused) ages (Zeder and Hesse 2000). This use of both age and sex data is critical because it is the combination of elevated survivorship plus the presence of large numbers of adult males that Payne (1973) has shown is the key to identifying intensive wool production.

WOOL PRODUCTION IN CENTRAL ANATOLIA: THE FAUNAL DATA

Both survivorship curves and biometric data are presented for five sites in central Anatolia including Neolithic Çatalhöyük, Köşk Höyük (which includes both Early Chalcolithic [EC] and Middle Chalcolithic [MC] phases), MC Güvercinkayaşı, Late Chalcolithic (LC) Çadır Höyük, and the Middle Bronze Age levels of Acemhöyük (Figure 10.1; Table 10.1). These sites span a period from about 7400 to 1750 BC and reflect the transition from Neolithic and EC household-based societies, to increasingly complex and hierarchical cultures in the MC and LC, to the appearance of urban states in the Bronze Age.

At Neolithic Çatalhöyük, located on the Konya Plain, sheep were the most abundant domesticate. Survivorship values are low, with only 36 percent of sheep surviving past two years, indicating an interest in the primary products
of lambs as well as perhaps some milk (Evershed et al. 2008) (Figure 10.2). In addition, biometric data show a moderate imbalance between adult (fused) males and females with relatively few large males surviving to adulthood (Figure 10.3).

At EC Köşk, located on the eastern side of the Konya Plain, and where sheep were also the focal point of the pastoral economy, the culling of young sheep is even more intensive, with only 21 percent surviving past two years.
Figure 10.2. Survivorship for sheep (all caprines for Çadır Höyük), based on mandibular–wear stages. EC KSK = Early Chalcolithic Köşk Höyük, MC KSK = Middle Chalcolithic Köşk Höyük, GK = Güvercinkayası, Acem = Acemhöyük, LC Cadir = Late Chalcolithic Çadır Höyük, and Catal = Çatalhöyük. (After Payne 1973.)

(Figure 10.2). Biometric data indicate that adult males are strongly underrepresented, whereas the culling of young males is further supported by the large size of most unfused (young) specimens. Data from both the Çatalhöyük and EC Köşk reflect sheep-herding economies focused on household-level production of a combination of products, including meat and (probably) milk for local consumption.

The MC of central Anatolia is characterized by significant changes in the organization of the pastoral economy, as well as more broadly in the organization of society as a whole. Archaeologically, new settlement patterns emerge, with villages showing more centralized internal planning and variability in house size (Gülçur 1997; Öztan 2010). A portion of Güvercinkayası, a small MC site located just north of Köşk, functioned as a specialized storage facility complete with an enormous wall separating it from the rest of the settlement. Çaylı (2009) has suggested that the site functioned as a small, chiefly estate, and
the storage complex, along with the presence of Ubaid-like stamp seals, copper, and imported painted ceramics, suggests the presence of a surprisingly complex and hierarchical political economy with elites capable of controlling significant agricultural, and perhaps pastoral, surpluses (Kiper and Gülçur 2008).

These changes in the MC social system are paralleled by changes in the organization of the animal economy. At MC Köşk and Güvercinkayaşı, sheep (and secondarily goats) increase in importance, dominating the animal economies at both sites (Table 10.2). Detailed analysis of the fauna suggests that the pastoral system became more specialized and mobile in the MC with herding activities increasingly taking place away from the settlement (Arbuckle 2012a; Arbuckle, Öztan, Gülçur 2009).

At MC Köşk, sheep survivorship was comparable to that at Çatalhöyük (Figure 10.2) and the size of unfused specimens indicates that males were
disproportionately targeted for slaughter (Figure 10.3). However, biometrics for fused specimens show that, for the first time, a significant number of large, adult males were allowed to survive to adulthood, indicating an increased interest in the products of mature rams. Although it is possible that impressive, large-bodied rams were preferred for gift-giving or public sacrifices, it is equally possible that this change in management is related to an increased interest in harvesting wool.

Interestingly, at contemporary MC Güvercinkayası we see slightly different patterns. Survivorship data indicate a dramatic and significant \( (\text{Kolmogorov–Smirnov, } p < 0.05) \) increase in the age at which sheep were slaughtered, with 58 percent surviving past two years (Figure 10.2). Biometrics show that young males were again the target of the cull, but adult rams are not as well represented as at MC Köşk (although differences in the biometrics from MC Köşk and Güvercinkayası are not statistically significant, \( t\)-test, \( p > 0.05)\). Although this pattern may reflect biases related to the smaller sample size from Güvercinkayası, it may also reflect the fact that, given the extended survivorship of both ewes and rams, herders had sufficient opportunity to pluck the relatively small quantities of wool that they needed from their herds. Therefore, although wool was likely a product of increasing interest to MC herders at both Köşk and Güvercinkayası, it was certainly not a focal point of the pastoral economy. This is supported by the presence of modest, but not overwhelming, numbers of spindle whorls at both MC sites.

### Table 10.2 Frequencies of the main mammalian taxa at five sites in central Anatolia.
(Data for Çatalhöyük from Russel and Martin 2005.)

<table>
<thead>
<tr>
<th>Site</th>
<th>sheep/goat ratio</th>
<th>sheep/goat</th>
<th>cattle</th>
<th>pigs</th>
<th>equids</th>
<th>deer</th>
<th>other</th>
<th>total</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Çatalhöyük</td>
<td>7.0:1</td>
<td>61</td>
<td>17</td>
<td>4</td>
<td>12</td>
<td>1.0</td>
<td>5</td>
<td>–</td>
<td>583</td>
</tr>
<tr>
<td>EC Köşk Höyük</td>
<td>3.5:1</td>
<td>59.9</td>
<td>11.1</td>
<td>0.6</td>
<td>23.2</td>
<td>1.4</td>
<td>3.8</td>
<td>1938</td>
<td></td>
</tr>
<tr>
<td>MC Köşk Höyük</td>
<td>3.3:1</td>
<td>83</td>
<td>6.2</td>
<td>0.2</td>
<td>4.8</td>
<td>1.4</td>
<td>4.4</td>
<td>2444</td>
<td></td>
</tr>
<tr>
<td>MC Güvercinkayası</td>
<td>4.3:1</td>
<td>81.4</td>
<td>6.3</td>
<td>1.6</td>
<td>2.6</td>
<td>1.7</td>
<td>6.4</td>
<td>1783</td>
<td></td>
</tr>
<tr>
<td>LC Çadır</td>
<td>1.3:1</td>
<td>48.2</td>
<td>12</td>
<td>10.7</td>
<td>1.9</td>
<td>1</td>
<td>26.2</td>
<td>693</td>
<td></td>
</tr>
<tr>
<td>MBA Acemhöyük</td>
<td>1.9:1</td>
<td>68</td>
<td>13.5</td>
<td>9.9</td>
<td>1.6</td>
<td>0.8</td>
<td>6.2</td>
<td>4771</td>
<td></td>
</tr>
</tbody>
</table>
Data representing the LC of central Anatolia derive from the site of Çadır Höyük. Located in the Kanak Su basin of the Yozgat region of north central Turkey, LC Çadır represents a small emerging political and/or ritual center with evidence for public architecture, an enclosure wall, domestic and non-domestic structures, and a rich artifact inventory that suggests residents were involved in bead, lithic, and textile production (Branting 1996; Steadman, McMahon, and Ross 2007).

At Çadır we see evidence for changes in both types of faunal evidence relating to sheep management. Although the survivorship curve includes both sheep and goat mandibles, a result of small sample size, the data indicate a dramatic increase in the culling age, with 83 percent of both sheep and goats slaughtered after two years—the highest value sampled in this study. In addition, biometric data, in this case generated from a range of skeletal elements (as a result of the small number of metacarpals), indicate the presence of a significant number of adult rams, which account for approximately 40 percent of the adult specimens.

These patterns of extended survivorship, combined with the abundance of adult males, fit Payne’s predictions for intensive wool production. They are also virtually identical to the patterns seen at MBA Acemhöyük, an urban settlement located just west of Güvercinkayası, where involvement in the wool economy is documented by both texts and a large sample of faunal data, which similarly fit the predictions of Payne’s model (Arbuckle 2012b; Michel and Veenhof 2010:233) (Figures 10.2, 10.3). This suggests that in the fourth millennium BC, herders at Çadır organized their management strategies first and foremost around the intensive production of wool.

**DISCUSSION AND CONCLUSION**

Although the initial use of animal fibers may extend back to the Neolithic, the data presented in this chapter suggest that it was the fifth and fourth millennia BC that witnessed an increasing emphasis on the production of wool, with truly intensive production schemes evident in central Anatolia by the Late Chalcolithic. Thus in central Anatolia, as elsewhere, the emergence of wool-exploiting economies seems to be intimately linked with the rise of persistent and significant social inequalities.

In the Middle Chalcolithic the first hints of interest in wool are represented by increases in survivorship of adult-male sheep as well as an increase in the frequency of sheep at both MC Köşk and Güvercinkayası. These changes have been interpreted as reflecting the development of an increasingly intensive...
and large-scale caprine pastoral system, and plausibly reflect a new interest in the production of wool, although there is no evidence to suggest fiber was a primary goal of herd management (Arbuckle 2012a; Arbuckle, Öztan, Gülçur 2009).

These changes also coincide with the replacement of the Neolithic-style, household-based system of the EC, as represented at Köşk II–IV, with a new social system characterized by the appearance of centralized planning, social differentiation, and emergent managerial elites. Although the scale of MC settlements remained small, they possess architectural and artifactual representations of hierarchy and inequality, and clearly represent an increase in organizational complexity that had not previously been seen on the central plateau. In particular, the specialized storage area at Güvercinkayası suggests that a new class of MC elites, possessing exotic artifacts such as metals and stamp seals, were able to control a significant amount of surplus agricultural production (see Çaylı 2009). In this context, it can be suggested that sheep, the dominant domestic animal in Chalcolithic central Anatolia, were also mobilized and controlled as symbols of prestige and status, and were actively used to produce wealth, including storable and easily transportable commodities such as wool (Algaze 2008).

If the fifth millennium marks the subtle emergence of a wool-exploiting economy in central Anatolia, it is likely that this transition did not occur in isolation. Data presented by both Vila (2002) and Sudo (2010) suggest that increased wool production may have been a feature of contemporaneous Ubaid-period economies in northern Mesopotamia. The fact that the few faun al samples from southern Mesopotamia dating to this period do not exhibit the dominance of sheep seen in northern sites suggests that the initial development of wooly sheep may have taken place in neighboring highland regions, perhaps in Anatolia (Algaze 2008; Anthony 2007; Davis 1984; Desse 1983).

Moreover, the fact that central Anatolian Chalcolithic sites share stylistic elements with both the northern Ubaid and the preceding Halaf traditions (Özkan 2001) suggests that the first stage of the emergence of wool production in the fifth millennium extended over a wide geographic area and was characterized by regular interaction between societies with increasingly complex social systems. This pattern of association between wool production and the rise of new social institutions across multiple regions foreshadows the emergence of intensive wool production in the fourth millennium.

The fourth millennium BC was a time of dramatic social and economic changes characterized by the rise of increasing inequality and interregional connectivity (Algaze 2008; Anthony 2007; Wengrow 2008). These social
changes, which include the appearance of the first state-level societies in Mesopotamia as well as hierarchical but less-centralized political systems in neighboring highland regions, seem to have had at least one broad feature in common. From eastern Europe to the Pontic region to central Anatolia and Mesopotamia there arose an increased interest in the production of wool. This “wool horizon” indicates that the production of wool and woolen textiles quickly became a central part of complex and hierarchical social systems characterized increasingly by emergent elites and inequality.

In Mesopotamia the spectacular rise of state-level societies on the southern alluvium is accompanied by the development of a specialized wool-textile industry (Algaze 2008; Pollack 1999). Wright (1989) has even suggested that the expansion of Uruk culture into northern Mesopotamia may have been at least partially stimulated by a desire for increasing access to wool. In the Pontic region, where the earliest direct evidence of woolen textiles has been found, the Maikop culture reflects the emergence of chiefly elites laid to rest in richly ornamented burials (Anthony 2007; Shishlina, Orfinskaya, and Golikov 2003).

Despite the less-spectacular evidence for social complexity on the central Anatolian plateau, the appearance of three tiered settlement hierarchies, the rise of small centers with public architecture, and the development of local manufacturing industries in the fourth millennium is also associated with a major reorganization of the pastoral economy toward the production of commodities, especially wool. The faunal pattern at Çadır Höyük, characterized by the slaughter of adult sheep and an abundance of adult rams—which both fits the predictions of Payne’s (1973) model for intensive wool production and parallels the patterns seen at the Bronze Age center of Acemhöyük, with its documented links to the textile industry—suggests that wool production was a major goal of herd management in LC central Anatolia. This suggests the presence of sophisticated economies in this “peripheral” region and shows that the dynamic and competitive social contexts necessary for intensive wool production (i.e., intensive exchange networks and markets for wool and woolen textiles) were not limited to the urban sites or colonial enclaves in Greater Mesopotamia but were also present deep in the Anatolian heartland.

Perhaps surprisingly, this suggests that societies on the Anatolian plateau, a region long considered to be a cultural backwater in the Chalcolithic (Steadman, McMahon, and Ross 2007), were in the vanguard of some of the most consequential economic and political transformations taking place in the Near East in the Late Chalcolithic. It also suggests that sheep, with their unique combination of valuable primary and secondary products, played a unique and prominent role in the restructuring of inequalities that occurred
during the rise of complex societies in Anatolia and elsewhere in the Near East in this dynamic period.

Acknowledgments. I would like to thank Aliye Öztan, Sevil Gülçur, Sharon Steadman, Greg McMahon, and Ron Gorny for their support for the analysis of faunal remains from Köşk Höyük, Güvercinkayası, and Çadir Höyük. Pınar Çaylı, Gil Stein, Emanuelle Vila, and Giovanni Siracusano kindly provided copies of papers and shared unpublished data. Richard Meadow, Levent Atici, Hitomi Hongo, Cheryl Makarewicz, David Meiggs, and the Niğde and Aksaray Museums also supported the research that this chapter is based on. Financial support was provided by National Science Foundation Grant BCS-0530699, the American Research Institute in Turkey, and the Vice Provost for Research at Baylor University.

WORKS CITED


