Abstract

Archaeological and historical data show that pastoral systems in Anatolia over the last ten thousand years were characterised by a high degree of variability in degree of mobility, land-use and animal preferences, target products and herd management strategies, and political organisation. Long-distance pastoral nomadism was a historically late development in the region, occurring over the last 1,500 to 1,000 years. Ethnographic analogy currently structures the majority of archaeological conclusions concerning pre-modern pastoralism, but obscures the variability that recent archaeological work brings to light. Multi-disciplinary studies seeking empirical data on ancient pastoralism and mobility are critical for developing a more subtle and accurate picture.

KEYWORDS. Anatolia, Turkey, ancient pastoralism, ancient mobility, archaeology.

Introduction

This paper integrates archaeological and historical evidence to explore diverse forms of pastoralism in Anatolia from prehistory to the Ottoman era. Archaeologists in the Middle East have tended to ‘fill in the gaps’ concerning pastoralism in general and mobile pastoralist practices in particular through ethnographic analogies to twentieth-century groups. Such approaches inherently emphasise presumed continuities in pastoral practices and environmental imperatives that are assumed to reinforce these practices through time (e.g. Bernbeck 2008, 46). Here, we move beyond these analogies, and beyond characterisations of past pastoralists as existing timelessly in ‘marginal’ or ‘peripheral’ landscapes, by focusing on concrete material and textual evidence for variability in pre-modern pastoralism, systematically breaking down the presumed homogeneity of basic pastoral communities through time. In particular, we focus on evidence for significant variability in Anatolian pastoral systems in regards to several variables: scale of mobility, land-use practices, political organisation, and animal preferences, practices and management strategies. This type of analysis, targeting spe-
cific variables of pastoral systems that have often been lumped together and not critically explored, is necessary for understanding Anatolian pastoralism as a flexible and diverse set of adaptations to an ever-changing mosaic of ecological, economic, social and political environments.

In the pages that follow, we have attempted to synthesise an unwieldy combination of datasets developed by archaeologists, historians and political scientists in order to build pictures of pastoral practices in Anatolia. As a result of the breadth of this undertaking, there are necessary tradeoffs in regards to limitations on specific details, and moreover, the datasets available in various periods are not equal or in some cases very comparable. For prehistoric periods we have an ever-increasing abundance of faunal and isotopic data describing foddering practices, seasonality, and mobility. In later periods, especially post-Classical periods, we are primarily informed about pastoralists via historical texts with very little complementary archaeological evidence at all. The periods in between are represented by varying combinations of archaeological and historic data unevenly spread across the expansive geography of Anatolia. Despite these methodological challenges, our review represents a first attempt at piecing together a broad picture of Anatolian pastoralism as an important and heterogeneous lifeway as it evolved and responded to a myriad of influences over the past ten millennia.

Definitions and methodologies for the study of ancient pastoralism and pastoral mobility in Anatolia

In the context of this review, we define pastoralism as a set of subsistence systems that include the use of domesticated herbivores, without reference to specific management strategies, mobility patterns or number of animals (e.g. Meadow 1992, 262–263; Cribb 1991, 16–18). If archaeological analyses or historical records provide evidence for specific pastoral practices, adjectives such as ‘nomadic’, ‘vertically transhumant’ or ‘specialised’ can be added to describe certain varieties of pastoralism and mobility (e.g. Wendrich and Barnard 2008, 7–8). In the sections that follow, unless adjectives regarding mobility are added, ‘pastoralism’ refers to fully sedentary herding: i.e. herding in a local catchment zone immediately surrounding an archaeological site. Further, we use the terms ‘nomadic pastoralism/pastoral nomadism’ or ‘large-scale mobile pastoralism’ to refer to long-distance (regional) mobility between seasonal pastures by whole communities and their herds. Given that mobile and sedentary populations were not distinct or separate social, economic or political entities during Middle Eastern history (e.g. Porter 2012, 8–64), the development of both sedentary and mobile herding strategies in prehistory were
intertwined. Even though they are frequently conflated, the identification of pastoralism and the identification of mobility in the archaeological record are separate research questions involving different suites of methodologies (e.g. Howell-Meurs 2001a).

Recent archaeological research in Anatolia has used traditional and novel methodologies to investigate ancient pastoralism and mobility among ancient pastoralists. For pastoralism, the most significant methodologies include the analysis of faunal and paleobotanical assemblages collected during the course of excavation, which provide direct and indirect evidence of animal husbandry and both human and animal diets. Zooarchaeological methods for identifying and reconstructing pastoral economies are well established and are frequently applied to prehistoric, and increasingly, historic period sites in Turkey (e.g. De Cupere et al. 2013). The use of paleobotanical remains to draw conclusions about pastoralism, however, has been less widespread (Riehl 2006). Critical to these methods are several insights: that charred plant remains in archaeological contexts often derive from the burning of animal dung as fuel, and therefore are reflective of animal rather than human diets (Miller and Smart 1984, Miller 1984); that the ratio of cereals to wild plants in such contexts is reflective of the degree of emphasis placed on foddering versus grazing (Miller and Smart 1984; Miller 1996, 1997); and the characteristics of a wild plant assemblage are reflective of the relative quality of grassland available to animals (Marston and Miller 2014, Miller 2010, Marston 2012). Other important methods for the investigation of ancient pastoralism include the survey of ephemeral campsites and corralling areas in places where they have escaped destruction by modern agriculture (Hammer 2012, 2014; Ur and Hammer 2009), analysis of lake cores for evidence of long-term land-cover change that may be linked to grazing (e.g. Izdebski 2012, England et al. 2008), and the use of stable isotopes to investigate animal diets and grazing/foddering practices (Fuller et al. 2012, Henton et al. 2010, Henton 2012). Additionally, analysis of oxygen and strontium isotopes from human and animal remains provide the most direct way of demonstrating mobility among ancient pastoralists and their animals (Mashkour 2003, Pearson et al. 2007, Welton 2011). Other methodologies for indirectly investigating the possibility of human and animal mobility in archaeological contexts include the nature of sites’ stratigraphy and/or architecture (e.g. Bernbeck 2008) and various indicators of seasonality (e.g. Howell-Meurs 2001a).

Environmental Zones of Anatolia

The geographical term ‘Anatolia’ frequently denotes only the peninsula between the Black and Mediterranean Sea or the Anatolian plateau. Here we
follow recent archaeological syntheses (Sagona and Zimansky 2009, Steadman and McMahon 2011) in defining Anatolia as including the central and eastern portions of modern-day Turkey. This region contains at least seven environmental zones (Sagona and Zimansky 2009, 2; Dewdney 1971) that differ broadly in their topography, seasonal vegetation and water sources, and therefore also in their pastoral potential. In the discussion and synthesis that follows, we emphasise three zones within which archaeologists and historians have carried out recent investigation of pre-modern pastoralism: the central plateau, the eastern arc of the Taurus and anti-Taurus mountains, and the southeastern plains of the Tigris and Euphrates Rivers (Figure 1.)

At the heart of Anatolia lies an area commonly called the central plateau, an uplifted, folded massif bounded to the north by the Pontus Mountains, to the south by the Taurus Mountains, to the east by the high mountain zone known as the East Anatolian highland, and to the west by the east-west flowing river valleys and headwaters of the Gedriz and Büyük Menderes Rivers. The ‘plateau’ actually consists of areas with rough terrain interspersed with river valleys and internal basins. The four main valleys and basins are the volcanic area of Cappadocia, the Tüz Gölü (Salt Lake) basin, the Konya Plain and the Beşşehir Plain. The Kızılırmak and Sakarya Rivers drain large portions of the region. The elevation of the central plateau ranges from 600 to 1,200 metres above sea level. This is a semi-arid area encompassing some of the driest parts of Anatolia, and mean annual rainfall is 350 to 400 mm. Elevations above 1,000 metres regularly receive snow during the winter, but little rain falls dur-

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**Figure 1.** Physical geography of Anatolia with the features mentioned in the text. Topographic data from the Shuttle Radar Topography Mission.
ing the hot summer. Xero-euxinian and Indo-Turanian steppe vegetation characterise the drier lowland areas, while forest cover is limited to some areas of higher elevation above 1,100 metres (van Zeist et al. 1975).

To the south of the central plateau, the anti-Taurus mountains form a roughly 600-kilometre-long west-east arc across south-eastern Turkey. With peaks of 2,000 to 3,000 metres above sea level, and occasionally more, these mountain ranges are annually blanketed by snow and therefore generally unsuitable for winter grazing. Characterised by hardy steppe-forest vegetation and deciduous mountain woodland, little precipitation falls in this region during the summer, but spring rains and snow melt provide water that feed streams and ensure lush spring and summer vegetation in many areas, particularly in intermountain plateaus.

A set of broad, gently sloping plains lying 400 to 700 metres above sea level extends southwards from the Taurus and anti-Taurus mountain ranges. The Tigris and Euphrates Rivers transverse these plains, forming alluvial valleys in some areas and cutting steep gorges in others. Sets of low, rolling hills and one rugged volcanic massif (Karacadağ) separate the plains, which in terms of both geography and vegetation are extensions of the steppes of northern Syria and Iraq (Zohary 1973, 181). Along with the anti-Taurus foothills, these plains experience a pronounced summer drought. Almost all precipitation (annual mean 500 to 600 mm) falls as rain during the winter and spring, encouraging the growth of vegetation and providing rich pastures.

‘Tyranny of the Ethnohistoric Record’

Finding archaeological evidence for pastoralists and pastoralism is one of the great challenges in archaeology. As a result, archaeological datasets are often highly incomplete, and ethnographic studies of twentieth century pastoralists, particularly those in Iran, have served as the most significant source of data for interpreting archaeological evidence for pastoralism in the history and prehistory of Southwest Asia (Cribb 1991, David and Kramer 2001, Kramer 1982, Gamble 1991). Ethnographically-studied twentieth-century groups, however, often practiced a form of highly specialised and highly mobile nomadic pastoralism. These forms of pastoralism were the result of distinctive and unique historical trajectories, and represent a narrow cross-section of variation in pastoral strategies. There is a long tradition of historical and anthropological thought that emphasises how traditional Near Eastern societies were characterised by separate, distinctive agricultural and nomadic components (Rowton 1977). As a result of the availability of ethnographic data on nomads and focus on the ‘dimorphic nature’ of Near Eastern societies, archaeologists have tended to project the modern specialised systems known from ethnography back into
the deep past, often in the absence of conclusive archaeological and historical evidence for mobility or other pastoral practices. Although this ‘tyranny of the ethnohistoric record’ (Wobst 1978) is a well documented problem in understanding the history of pastoralism in the ancient Near East (e.g. Gilbert 1975), modern and recent historic examples continue to provide the dominant structure for most archaeological models of pastoralism.

Frequently, claims concerning the presence of (mobile) pastoralists in the ancient Near East and the predominance of pastoralism in ancient regional economies are based on negative evidence. Flawed general assumptions about past pastoral practices, including the static nature of land-use patterns in highland environments, unchanging pasture areas, and the tendency to eschew the use of pottery and fixed architecture, regularly and subtly creep into descriptions of ancient sites and landscapes. For example, archaeological studies of tell sites frequently assume the presence of mobile populations in the surrounding area because of the presence of twentieth-century nomadic tribes in the general area, and presume that mobile groups followed the same seasonality and migration patterns as recent pastoralists (Alizadeh 2010, 2003; see Potts 2008 and also 2014 for detailed criticisms of this approach in Iran). Moreover, archaeologists often deploy (mobile) pastoralism as the primary explanation for periods where archaeological surveys have identified a decrease in settlement numbers or area (Zagarell 1975, 1978; Hole 2003; Adams 1965); this is based on the assumptions that (mobile) pastoralists are ‘invisible’ (Cribb 1991, 65–68) and that nomads disrupt sedentary life and/or that pastoralism thrives in the absence of strong regional authority (Khaldūn 2005). Specifically in Anatolia, the presence of historical or archaeological evidence for an abundance of animals in arid regions with thin soils and twentieth-century mobile pastoral populations is frequently taken as an indirect indication of ‘nomadism’ without empirical demonstration of human or animal mobility and without questioning the scale, seasonality or nature of mobility patterns (e.g. Hopwood 1991, Yakar 2006). In short, ‘nomadism’ is often used as a de facto answer to explain an incomplete archaeological record.

Widespread historical evidence for mobile pastoralists in Anatolia in the Medieval and later periods following incursions of nomads from Arabia and central Asia, paired with historical evidence for spatially distinct ancient mobile pastoral tribes in areas immediately to the south of Anatolia (Luke 1965, Fleming 2004, Matthews 1978, Kupper 1957, Szuchman 2007) has led prehistorians to assume that mobile pastoral tribes were a constant feature of post-Neolithic Anatolia. Perhaps more critically, influential mid-twentieth-century ethnographies strengthened the idea that recent groups could be used as a model for historical and even ancient mobile pastoralists. One of the conclusions drawn from Barth’s seminal ethnography of the Basseri of Iran is that
the political organisation of the tribe is distinct from the ecology and economy of pastoral nomads (Barth 1964). Following Barth, it has been argued that, while larger political groupings such as tribes and confederations are artefacts of external, dynamic political and cultural relations in the last few centuries of Iranian history, basic pastoral communities have always been the product of the (more static) ecological conditions of pastoralism and internal demographic and cultural factors (Tapper 2002, 23). By naming ecology as the main factor structuring basic (mobile) pastoral communities, archaeologists have projected the ethnographic picture of communities occupying specific environments back in time. In this way, historically specific land-use strategies are essentially reduced to reactions to environmental imperatives.

Available ethnographic accounts for Anatolia (Bates 1973, Beşikçi 1969, Hütteroth 1959, Frödin 1943, Erhan 1992, Planhol 1958, Skogseid 1993) are compressed in time, covering the period of the 1940s to the 1980s when mobile pastoralism was in serious decline following centuries of Ottoman policy and forced sedentarisation by the Turkish Republic. The concentration of research on mobile pastoral communities during in this period has left us with a synchronic view of these communities struggling to maintain their lifeways under the spatial, economic and political restrictions placed on them by a territorial state. Similar disciplinary histories in various areas of the world have caused pastoral groups to be viewed as ‘immutably locked in a pastoral “mode of production”’, rather than as products of particular historical situations (Koster and Chang 1994, 2). Essentially, researchers have treated mobile pastoralism as a general ecological adaptation, rather than as a set of variable decisions and flexible strategies based on detailed knowledge of animal ecology and the local environment within specific historical contexts.

In order for the archaeology of pastoralism to continue to be relevant and contribute to the social sciences in the twenty-first century as it did in the twentieth, it must engage in breaking down the fictional homogeneity of pastoral communities. Real variability exists in how pastoralists met the basic needs of their animals (even in similar landscapes), and real variability exists in how they used and viewed the same species of herd animals (economically and socially) over time. Through the collection of empirical data in the context of interdisciplinary collaborative research projects, archaeologists are working to show that pastoral strategies and pastoral communities are just as historically contingent as the political histories of city-states and recent state-tribe relationships. Recent work has begun to employ concrete archaeological and historical data to define the parameters of past pastoral lifeways with an emphasis on variability, rather than projecting the ethnographic present into a timeless pastoral past (Makarewicz 2013, Howell-Meers 2001a, Marston and Miller 2014, Fuller et al. 2012, Arbuckle and Atici 2013, Peters et al. 2013). In the sections
that follow, we contribute to this effort by exploring the archaeological and historical evidence for 10,000 years of pastoralism in Anatolia, highlighting the rich variability that this narrative exposes.

History of pastoralism in Anatolia

*Neolithic (c. 9000–6000 BC) and the origins of pastoralism*

The origins of pastoralism can be traced back to the Neolithic period in Southwest Asia and Anatolia, when the domestication of livestock transformed animal economies from those based on hunting to those based on animal husbandry. This transformative process has long been a focus of archaeological attention, and recent research has resulted in an increasingly fine-grained picture of the development of the earliest economic systems exploiting sheep, goats, cattle and pigs (Arbuckle et al. 2014, Arbuckle 2014a, Peters et al. 2013, Vigne et al. 2011).

Recent work indicates that south-east and central Anatolia played key roles in the initial emergence and spread of the earliest pastoral economies, and has dispelled two commonly-held myths concerning the origins of pastoralism. First, despite continued lingering references to the Marxian (and pre-Marxian) notion that pastoralism was an early stage in the evolution of human society preceding agriculture (Meeks 1976, 161; Rigby 1998, 72), there is no evidence in Neolithic Anatolia, or Southwest Asia for that matter, for the development of pastoralism separate from plant cultivation (although for north Africa, see Gifford-Gonzalez and Hanotte 2011). Instead, the domestication of ruminant livestock, as well as pigs, occurred firmly within the context of sedentary hunter-cultivator societies.

Second, despite common use of Childe’s (1936) term ‘Neolithic Revolution’ to describe the origins of food-producing economies in the early Holocene of Southwest Asia, the development of early livestock economies took place over several millennia and exhibited an enormous amount of local- and regional-scale variation. Cultivator-herder communities likely experienced a variety of logistical and social difficulties during the domestication process (Arbuckle and Atici 2013). Recent zooarchaeological research has illuminated some of the characteristics of these earliest pastoral economies, and emphasises the idiosyncratic nature and diversity of these early attempts at pastoralism, as well as the appearance of greater homogeneity and standardisation in pastoral practices in the later eighth millennium BC.
Early Neolithic: Initial diversity in pastoral economies (c. 9000–7500 BC)

Identifying the earliest stages of the process of animal domestication in the archaeological record has proven difficult, since clear evidence for sustained control over the movement and breeding of animal populations is lacking prior to the ninth millennium BC (Zeder 2011). However, by the middle of the ninth millennium, there is firm archaeological evidence for the development of systems of livestock husbandry that included control over the movement, diet, and reproduction of animal populations.

Early evidence for the development of increasingly intensive control over sheep, goats, cattle, and pigs comes from sites in both south-eastern and central Anatolia. At Nevalı Çori, Çayönü and Cafer Höyük in south-eastern Anatolia, a combination of zooarchaeological and isotope data provide some of the earliest evidence for animal husbandry (Helmer 2008, Hongo et al. 2004, Losch et al. 2006, Peters et al. 2013) (Figure 2). At the first two sites, we see the first indications of reductions in body-size compared to wild animals from the region (sheep and goats at Nevalı Çori; sheep, goats, cattle and pigs at Çayönü), which are interpreted as evidence for long-term human control over animal movement, feeding and reproduction. At Nevalı Çori, nitrogen isotopes derived from animal bone indicate that the diets of smaller sheep and also goats differed from those of other taxa, such as gazelle, suggesting that caprines were either foddered or gained access to crops such as legumes being cultivated by the site’s inhabitants (Losch et al. 2006). Biometric data, however, do not indicate that early caprine husbandry at Nevalı Çori involved the selective culling of young males, a common feature of later pastoral management strategies (Peters et al. 2013, Peters et al. 2015). Further, early livestock management constituted only a small fraction of the animal economy, which continued to focus on hunting gazelles and wild equids. At Çayönü, isotopic data support claims of early management, showing that the appearance of gracile individuals coincides with changes in animal diets, likely reflecting human interference in the movement and feeding of captive animals (Hongo et al. 2009, Pearson et al. 2013). In the uplands of south-east Turkey, at Cafer Höyük, goats were the dominant taxon, and the assemblage is characterised by extremely high frequencies of juveniles, suggesting human control over these animals. But goats as well as sheep at Cafer maintain a wild phenotype in the ninth and eighth millennia BC, indicating that herded caprines were not reproductively isolated from free-ranging wild populations. In addition, Helmer (2008) has argued that cultivator-herders at Cafer continued to exploit rich populations of wild game, including wild caprines, while managing herds.

In central Anatolia, the site of Aşıklı Höyük shows a steady increase in sheep and goats, from 57 per cent of the faunal assemblage in the late ninth millennium
to 91 per cent in the mid eighth millennium BC (Buitenhuis 1997, Stiner et al. 2014). Moreover, high juvenile kill-off and high frequencies of neonatal and foetal remains, along with evidence for caprine dung within the settlement, suggest that caprines were regularly kept on site, at least during the spring lambing season. High frequencies of foetal remains suggest that the managed animals were under high stress-loads, and are indicative of the difficulties encountered during early attempts at developing technologies related to controlling and husbanding phenotypically wild animals. Despite strong evidence for management, caprines at Aşıklı also maintain a wild phenotype through a millennium of the site’s occupation, and biometrics do not provide clear evidence for the targeted culling of juvenile males (Peters et al. 2013). Moreover, isotope data indicate a narrow range of variability in both sheep and goat diet at Aşıklı (not seen in wild taxa at the site, including aurochs). This suggests that pastoralism was spatially limited, centred around the settlement itself, and did not involve extensive horizontal or vertical movements of herds to seasonal grazing camps, as was common among historic pastoralists in the region.

Together, the zooarchaeological evidence indicates that systems of control over the movement, feeding and breeding of sheep, goats and (on a more limited scale) cattle developed within communities of settled cultivators by the mid-ninth millennium BC in south-east and central Anatolia. The systems of animal management that emerged at Nevalı Çori, Çayönü, Cafer and Aşıklı, however, were all very different from one another, and do not look much like pastoral systems from later periods. These diverse and localised early systems
of pastoralism appear across Southwest Asia in the ninth and early eighth millennium (Arbuckle and Atici 2013) and provide the foundation for the development of more recognisable forms of sheep, goat and cattle pastoralism that emerge in the mid-eighth millennium BC.

Later Neolithic (c. 7500–6000 BC)

In Anatolia and Southwest Asia, the mid-eighth millennium BC represents an important turning point in the development of pastoral economies. It is at this time that sheep and goat management emerges as the dominant component of the animal economy, finally eclipsing hunting as an economic and social strategy on a regional scale. In contrast to the previous period of ‘initial diversity’, this is a time when herders over a wide geographic area began to consistently apply a range of productive animal management strategies, including young male culling, foddering and penning, all geared towards exploiting primary products (meat, fat, skins) and perhaps also secondary products (milk, fibre), comparable in some ways to the use of herds in later periods (Arbuckle and Atici 2013).

This shift towards a reliance on sheep and goat herding is seen in an increase in the frequencies of caprine remains and the spread of mixed sheep and goat herding into regions where it had not been previously practiced (Arbuckle and Atici 2013, Conolly et al. 2012, Arbuckle 2014a). In central Anatolia, this shift is seen in the change from the late ninth millennium BC occupation at Boncuklu, where caprines make up less than ten per cent of the faunal assemblage to the late eighth millennium BC occupation at Çatalhöyük, where they are the most abundant taxa (Baird 2012, Russell and Martin 2005). In southeast Anatolia, ninth-millennium BC caprines represent only twelve to fifteen per cent of faunal assemblages at sites such as Nevalı Çori and the early levels of Çayönü, but increase to greater than fifty per cent by the eighth millennium at Gürçütepe II and the later levels at Çayönü (Arbuckle 2014a, Peters et al. 2013, Hongo et al. 2004).

It is also at this time that livestock exhibiting clear morphological changes associated with domestication (reduction in body size, changes in horn morphology) become widespread across the Fertile Crescent region, including central and south-east Anatolia, signalling the widespread availability of large regional populations of livestock that were increasingly adapted to living under conditions of intensive human management. In addition to biological changes in livestock populations, faunal evidence indicates that new and productive management strategies also became widespread by the mid-to-late eighth millennium BC. Kill-off patterns indicate that the common pastoralist management strategy of culling surplus juvenile male caprines was widely practiced at this time (Arbuckle and Atici 2013), and demographic data further suggest that sec-
ondary products, including dairy and perhaps fibre, were exploited by the late eighth and seventh millennia BC (Vigne and Helmer 2007). The identification of dung deposits within settlements such as Çayönü, Çatalhöyük, and Aşıklı indicate that animals were frequently penned onsite (Stiner et al. 2014, Brochier 1993, Matthews 2005), while the identification of the remains of livestock within collapsed Neolithic structures at the site of Mezraa-Teleilat (south-east Anatolia) suggests that caprines were at least occasionally stalled, perhaps for milking and birthing (İlgezdi 2008, 87).

Isotopic evidence for an increase in dietary variability in the later Neolithic suggests that domestic livestock were increasingly provided with fodder and moved seasonally around the landscape to access more productive grazing (Pearson et al. 2007, Baird et al. 2011, Makarewicz and Tuross 2012). Such evidence, however, does not indicate the presence of long-distance seasonal mobility in these Neolithic pastoral regimes by the majority of a community’s population. Instead, Neolithic pastoralism seems to have been largely tethered to permanent settlements. For example, at the site of Gritille (8000 to 6500 BC), in south-east Anatolia, Meiggs (2010, 277) found ‘extraordinarily homogeneous’ strontium isotope values in caprine teeth dating to the eighth millennium BC, indicating that caprine herding was confined to the limestone plains surrounding the site and did not make use of nearby highland summer pastures outside of the Euphrates valley. In addition, oxygen isotopes identified only one individual that likely originated in the uplands regions to the north, likely representing the inter-site exchange of animals rather than pastoral mobility. Similarly, at Çatalhöyük, researchers have argued that Neolithic herders did not utilise uplands to the south of the site for summer grazing, but instead grazed their herds on the plains surrounding the settlement itself (Henton 2012, Bogaard et al. 2013). The scale of pastoral mobility on the Konya Plain seems to have been limited to within around two days’ walk from Çatalhöyük itself, as evidenced by the site of Pınarbaşı B, a rock shelter 24 kilometres from Çatalhöyük that was likely used as a spring herder camp by members of the Çatalhöyük community (Baird et al. 2011).

In addition to the increasingly intensive herding of sheep and goats, domestic cattle also become more widespread in the mid-to-late eighth millennium BC in Anatolia. Cattle consistently represent the second most important animal resource after caprines, and by the later Neolithic period they may have been used for traction and milk as well as meat (Helmer and Gourichon 2008, Evershed et al. 2008). Domestic cattle, however, were late to appear in central Anatolia, where aurochs hunting was deeply entrenched in the social and economic practices at Çatalhöyük (Arbuckle and Makarewicz 2009, Russell et al. 2013).

Although fundamentally local in nature, by the early seventh millennium
pastoralism began spreading westward into southern, western, and north-western Turkey (Arbuckle et al. 2014). Colonisation processes, movements into new environments and interactions with local populations of foragers associated with this expansion resulted in the development of increasingly divergent regional traditions of pastoralism adapted to local environmental and social needs and limitations (Conolly et al. 2012). It was these more regionally diverse late Neolithic lifeways as well as the increasing use of animals for secondary products and wealth accumulation that led to the systems we see in the following period, the Chalcolithic.

**Chalcolithic (c. 6000–3000 BC)**

Initially, zooarchaeological data concerning the Chalcolithic period show some degree of continuity with the animal economies of the late Neolithic, in that caprine herding continues to dominate, with a secondary emphasis on cattle. Over the three millennia represented by this period, however, the data suggest a widespread increase in the use of cattle, with a gradual displacement of caprines as the dominant livestock around settlements. In the Anatolian Chalcolithic there is isotopic evidence for the continuation of horizontal forms of local transhumance, first documented in the Neolithic (Meiggs 2010), and also for the development of vertical transhumance involving caprines and perhaps cattle in central and south-eastern Anatolia and the Pontic region. But there is virtually no evidence for the presence of large-scale mobile pastoralism ranging over large territories. Instead, pastoral systems seem to have been operated primarily at a local level. Many of these shifts seem to be linked with rising inequality, concerns with increasingly intensive agricultural production, wealth accumulation, secondary products and the provisioning of larger settlements and emerging political centres.

The Early Chalcolithic period in Anatolia (c. 6000 to 5000 BC) is not well documented, but where it has been explored, zooarchaeological data show evidence for an increasing intensity of sheep and goat pastoral production, accompanied by limited evidence for local-scale animal movement. At Çatalhöyük (West Mound), there is a shift towards increasingly intensive sheep and goat pastoralism. Although no isotopic data yet exists, researchers hypothesise on the basis of the settlement data that there were increased movement of herds to seasonal pastures on the Konya Plain (Baird et al. 2011, Russell et al. 2013). In addition, at Köşk Höyük, isotopic evidence suggests an early system of vertical transhumance was practiced in which uplands located within a day’s walk from the settlement were exploited for summer grazing (Meiggs and Arbuckle 2010, Makarewicz and Arbuckle 2009). Intensive, yet apparently localised systems of caprine pastoralism continued to flourish in central Anatolia in the
fifth millennium BC too, where settlements such as Köşk I and Güvercinkayası show evidence for increasingly specialised caprine herding activities, likely including management for a combination of primary and secondary products. Strontium isotope evidence indicates that herding was carried out on the plains and highlands immediately surrounding these settlements (Meiggs and Arbuckle 2010, Arbuckle et al. 2009).

Regional variation in animal economies is increasingly evident following their expansion outside of south-east and central Anatolia (Çilingiroğlu and Çakırlar 2013). This regional variability includes renewed emphasis on hunting big game, including wild equids, at some sites in central Anatolia like Köşk Höyük and Orman Fidanlığı (Arbuckle et al. 2009, Uerpmann 2001), and variable emphases on either sheep and goats or cattle. In south-east Anatolia, in the Halaf cultural area, sheep and goats were the focus of the pastoral economy in more arid regions, such as at Gırikılıçay (McArdle 1990), while cattle increased in importance in regions with greater moisture, such as at Çavi Tarlası and Domuztepe, where cattle represent twenty to thirty-five per cent of the faunal remains (Schäffer and Boessneck 1988, Kansa et al. 2009). In the humid, forested environments of north-west Anatolia, animal economies increasingly switched focus from caprines to cattle (Arbuckle et al. 2014, Conolly et al. 2012). At İlpinar VB and Menteşe, cattle represent approximately 45 per cent of the faunal remains, and chemical residues recovered from ceramics indicate the first widespread use of dairy (Evershed et al. 2008). Although mobility has not been well addressed in these contexts, pastoral systems emphasising cattle, which have high water requirements, were likely characterised by constrained mobility, especially in the semi-arid regions of south-east Anatolia where they would be limited to river valleys.

The increasing importance of cattle herding continued in many regions into the Late Chalcolithic (4000 to 3000 BC), where it is linked to the rise of complex and hierarchical societies and is likely associated with both elite wealth and increasingly intensive agricultural production. This increase in cattle is particularly evident in the Malatya region and in the uplands of eastern Anatolia, where cattle are among the most abundant taxa in archaeofaunal assemblages (e.g. Arslantepe, Tepecik, Norşuntepe, Sos Höyük; see Piro 2008, 2009; Howell-Meurs 2001b; Bartosiewicz 1998). High frequencies of cattle are also evident in Late Chalcolithic faunal assemblages in neighbouring regions of Armenia and Azerbaijan, suggesting a robust regional economy that emphasised cattle pastoralism (Piro 2009, Chataigner 1995, Monahan 2007).

During the Late Chalcolithic, lowland south-east Anatolia witnessed dramatic social changes in response to the rise of state-level societies in greater Mesopotamia (Algaze 2005, Stein 1999, Rothman 2004), changes that were accompanied by a shift towards intensive caprine pastoralism not practiced in
other parts of Anatolia. In the fourth millennium BC, indigenous settlements along the Turkish Euphrates including Hacnebi (B1 LC) and Arslantepe VII were characterised by reliance on a mixed economy, including a combination of caprines, cattle and pigs. High frequencies of cattle and pigs suggest that animal economies in this region were spatially limited and operated largely within the Euphrates valley. But with the expansion of southern Mesopotamian Uruk material culture and populations into this region, economies shifted increasingly towards caprines, with a steep decline in the number of pigs. This appears to reflect the establishment in south-east Anatolia of intensive, and likely specialised and mobile, caprine pastoralism from further south, where it was the dominant system on the arid plains of northern Syria (e.g. Tell Brak, Tell Rubeidheh, Kosak Shamali: see Gourichon and Helmer 2003, Payne 1988, Emberling et al. 1999).

Issues of Late Chalcolithic and Early Bronze Age mobility have been most extensively discussed for upland eastern Anatolia. Settlements in this area are associated with an archaeological horizon known as the Early Transcaucasian Culture (ETC; 3000 to 2000 BC). The ETC has long been associated with nomadic and transhumant caprine pastoralism, based on the presence of small, shallow settlements with ephemeral architecture and mobile material culture, the distribution of this material culture over a wide area, and location in a region historically dominated by nomadic caprine pastoralists (Piro 2009; Batiuik 2013; Sagona and Zimansky 2009, 163–166 and 186–191; Kohl 2009, Chataigner 1995; Rothman 2004). The direct evidence for nomadism and transhumance in the ETC, however, is very limited (Piro 2009: 26; Batiuk 2013; Cribb 1991, 220–223). In fact, faunal evidence for Late Chalcolithic and Early Bronze ETC settlements indicate the presence of a pastoral economy focused on cattle rather than more easily mobile caprines. Seasonality indicators at Sos indicate year-round occupation and a greater emphasis on agriculture than has previously been recognised (Howell-Meurs 2001a; Piro 2008, 2009).

Beyond the ETC, other arguments concerning Late Chalcolithic mobility centre on sites in the Pontic region and areas in northern Anatolia. Strontium isotope data from human remains from the fourth-millennium cemetery at İkiztepe indicate the presence of local (non-immigrant) individuals with lower and higher amounts of isotopic variability, and the individuals with higher amounts of variability (mostly men) are hypothesised to be transhumant pastoralists who moved seasonally to nearby uplands (Welton 2011). Other plausible interpretations exist for isotopic variability, however, and fauna from the slightly later (although poorly dated) Early Bronze Age levels of İkiztepe indicate an economy dominated by pigs, cattle and deer (Tekkaya and Payne 1988). Recent archaeological surveys in the region identified cave sites, including Okçular İnî, used during the Late Chalcolithic and Bronze Age, and argued
on the basis of ethnographic analogy to have been used by pastoral groups moving regularly between uplands and lowlands in this mountainous environment (Glatz et al. 2011, Düring and Glatz 2010). Direct evidence in support of this hypothesis is thus far lacking. In the Pontic-Caspian steppe zone north of Turkey, David Anthony (2007, 2013) has argued that the fourth millennium BC witnessed the emergence of systems of large-scale nomadic pastoralism, fuelled by the domestication and riding of horses and the use of heavy wagons by indigenous foragers. Although there is no sign of the infiltration of such a system south into Anatolia, the presence of horses (possibly domestic) in Late Chalcolithic sites in east and central Anatolia, including Norşuntepe and Çadir Höyük, suggests possible contact, perhaps via the ETC, with this region (Arbuckle 2009, Bökönyi 1978).

**Bronze Age (c. 3000–1200 BC)**

For the Bronze Age, zooarchaeology as well as texts from the Late Bronze Age Hittite Empire (c. 1600 to 1200 BC) and texts from Mesopotamian centres to the south provide valuable sources of information for reconstructing pastoral practices. Despite the fact that livestock were important sources of wealth and commodities in complex polities throughout the Bronze Age, there is currently very little direct evidence for the presence of large-scale mobile pastoralism in Anatolia that involved whole communities moving seasonally over long distances. Instead, pastoral economies increasingly focused on cattle and were likely primarily organised on a local scale, and tethered to settlements, nearby summer pasturage and permanent water-sources, as they had been in the preceding Chalcolithic. Although the lack of evidence for large-scale mobile pastoralism may partially be related to research practices that focus on large settlements at the expense of upland encampments, a combination of textual and archaeological evidence supports the general picture of Bronze Age pastoralism as a largely ‘local’ phenomenon linked to a framework of agricultural settlements and small herding catchments surrounding these settlements. Unlike northern Mesopotamia, where large scale mobile caprine pastoralism played a central role in structuring economies and political histories, the mountainous and more humid landscape of Anatolia, combined with the high degree of political fragmentation that characterised the Early and Middle Bronze Age in this region, appears not to have resulted in the development of systems of multi-regional pastoral mobility (Sarı 2012).

Although there was a high degree of regional and local variation in Bronze Age Anatolian animal economies, resulting from a combination of local geography, political economy and histories of animal management, cattle were the dominant livestock in most regions. In fact, the frequencies of cattle in faunal
assemblages increased dramatically in the Bronze Age compared to previous periods, from an average of circa ten per cent (based on Number of Identified Specimens [NISP]) in the Early Neolithic of central and south-eastern Turkey, to eighteen percent in the same regions in the Late Neolithic and Early Chalcolithic, and peaking at twenty-six to twenty-seven percent in the Early, Middle and Late Bronze Ages (Arbuckle 2014b). As was the case in the Late Chalcolithic period (fourth millennium BC), continuing into the third millennium, cattle dominated ETC animal economies in eastern Turkey, where they are often the most abundant taxon. The relatively low representation of cattle remains in Bronze Age faunal assemblages (an average of 26 percent, based on NISP, for the Bronze Age) has led to the misconception that Bronze Age animal economies in Anatolia were dominated by caprines, mirroring better documented examples from contemporaneous Mesopotamia (e.g. Matthews 1978, Postgate and Payne 1975). On account of their large body size and resulting concentration of primary products (meat, organs, blood), it was in fact cattle that represented the single most important source of animal products in Bronze Age Anatolian economies (circa 75 per cent of primary animal products based on meat weight; see Arbuckle 2014b).

The importance of cattle in Bronze Age Anatolia seems to be closely aligned with the rise of complex and hierarchical polities in the Early and Middle Bronze Age. Cattle formed the foundation of these early complex political economies as both a source of food and labour. Cattle became symbols of elite wealth, and were incorporated into cosmologies and religious practices. The connection between cattle and political complexity is supported by the abundance of cattle in high-status sites. At regional centres such Early Bronze Age Acemhöyük in central Anatolia, Early Bronze Age Karataş-Semayük in western Anatolia and Middle Bronze Age Sirkeli Höyük in southern Anatolia, cattle are the most abundant taxon (Arbuckle 2013, Hesse and Perkins 1974, Volger 1997). At Boğazköy, an important political centre throughout the Bronze Age in central Anatolia, cattle were the most abundant taxon in the lower town in the Middle Bronze Age (circa 43 per cent) and were also well represented in the Late Bronze Age levels (37 per cent) (von den Driesch and Pöllath 2004). In contrast, at small sites where political centralisation was likely weaker in the Early and Middle Bronze Age (Çevik 2007), such as Kaman-Kalehöyük in central Anatolia and Troy in western Anatolia (Hong 1996, Gündem 2010), cattle are less well represented, and caprine herding was a more important activity. The importance of cattle pastoralism is clear at the Early Bronze Age ‘Royal Tombs’ at Alacahöyük (Piggott 1962, Bachhuber 2011). Here elites were interred with bronze and silver statues representing cattle, as well as the partial remains (heads and hooves) of up to twelve bovines, thought to represent a funerary sacrifice and feast. These findings are
paralleled at several other Early Bronze Age cemeteries in central Anatolia (Zimmermann and Geniş 2011).

Although there is very little faunal evidence to characterise pastoral economies in the Pontic region of northern Anatolia, Late Bronze Age Hittite texts provide the earliest textual evidence for distinct pastoral groups in Anatolia in their description of the Empire’s Pontic neighbors and adversaries, the Kaska. From Hittite sources it is clear that although some Kaska lived in sedentary communities, others seem to have maintained a more mobile existence (Glatz and Matthews 2005, Mineck et al. 2006). The annals of the Hittite kings discuss disruptive Kaska people ‘occupying’ mountains, and a Kaska leader named Pihhuniya is reported to have attacked Hittite lands, conquered a region called Istitina, and ‘made it his place of pasturing’ (Mineck et al. 2006, 257). These references to the occupation of uplands and interest in securing pasturage suggest that a segment of the Kaska population was practicing a form of territorially bounded, seasonal and transhumant pastoralism. Hittite texts further clarify that the Kaska were incorporated into polities that were characterised by agricultural communities and fortified urban centres. Given the previously discussed zooarchaeological data demonstrating the central role of cattle on the Anatolian plateau, and textual references to Kaska as cattle rustlers (Bryce 2002, 85; Hoffner Jr. 2009), it is likely that cattle pastoralism was an important component of Kaska lifeways.

Both zooarchaeological and textual data point indirectly to constrained mobility among Bronze Age pastoralists in Anatolia. The emphasis upon cattle is suggestive of a less mobile pastoral economy that generally remained tethered to settlements and the permanent water sources to which cattle must have daily access. Hittite references paint a picture of animal economies on the Anatolian plateau as being fundamentally local in nature, tethered to agricultural settlements, and characterised by daily movements of livestock to pasture and seasonal movements to local summer pasturages (Bryce 2005, Miller 2013). In contrast to their Mesopotamian counterparts, the Hittites never mention the movement of large and politically powerful nomadic groups through their territories, suggesting that these groups were not a part of the Anatolian Bronze Age landscape.

In some parts of south-eastern Anatolia, where aridity limited the number of cattle that could be supported, caprine pastoralism continued to play a central role. This is seen in the caprine-dominated faunal assemblages at sites in the Euphrates valley such as Gritille (Stein 1987) and Kurban Höyük (Wattenmaker 1998). This feature of the animal economy is likely connected to developments in areas to the south of Anatolia. Numerous recent studies have argued on the basis of textual, survey and excavation data for the importance of mobile pastoral tribes and large-scale caprine pastoralism in Bronze
Age northern Syria (Porter 2012, Szuchman 2007, Fleming 2004, Danti 2000, Kouchoukos 1998, Lyonnet 1997, Wilkinson 2004) as well as southern Mesopotamia (Zeder 1994, Steinkeller 1995). There are no geographic boundaries between the plains of south-eastern Turkey and northern Syria, and it is possible that seasonally mobile pastoralists regularly crossed between these regions, but we currently have no direct evidence for these types of movements.

Caprine pastoralism, however, was not predominant everywhere in Bronze Age south-eastern Anatolia. While sheep and goats were the most important taxa at Tilbeşar in the Euphrates valley during the Early Bronze Age, cattle increased in importance (by weight and meat yield) during the Middle Bronze Age (Berthon and Mashkour 2008), a pattern also evident at Titriş Höyük and Lidar Höyük (Allentuck and Greenfield 2010, Kussinger 1988). Furthermore, the fauna assemblages of sites in the upper Tigris basin, including Ziyaret Tepe (Greenfield-Jongsma and Greenfield 2013) and Hibermerdon Tepe (Berthon 2010), show significant variation in the structure of their pastoral economies. A study of faunal material from seven small rural sites in the same region has revealed a diversity of animal exploitation patterns during the Bronze Age, with some sites showing a greater reliance on cattle and others on caprine pastoralism (Berthon 2010, 2011).

Outside of the plains of the south-east, the only other regions where potentially-mobile caprine pastoralism is likely to have flourished in Bronze Age Anatolia – although on a smaller scale – are the Konya Plain and the region around Lake Van. The Konya plain is a large steppic basin and one of the most arid regions of Turkey; archaeological surveys indicate that permanent settlements were extremely limited, especially in the drier interior portions of the basin (Bahar 2004, French 1972, Omura 2004). Based on a combination of faunal work at the site of Acemhöyük, located on the eastern margin of the Konya plain, and an analogy with land use in later periods, it has been suggested that this region was primarily utilised by mobile caprine herders cycling between basins and small upland plateaus (Arbuckle 2012). In the highlands surrounding Lake Van, a dearth of settlements combined with the appearance of cemeteries have been interpreted as evidence for occupation of this region by nomadic pastoralists in the second millennium BC (Özfırat 2005). Unfortunately, knowledge of pastoralism in this region is limited largely to analogies with later periods, and more detailed archaeological work is necessary to identify the details of pastoral mobility, land use and seasonality.

Iron Age (c. 1200–330 BC)

Iron Age pastoralism in Anatolia is characterised by the continuation and local adaptation of sheep, goat, cattle, pig and equid husbandry, with limited
concrete evidence for long-distance mobility. Tell sites with long stratigraphic sequences and analysed Iron Age faunal assemblages show a high degree of continuity with earlier phases of occupation in the Bronze Age, including Sos Höyük and Büyüktepe Höyük in north-eastern Anatolia (Howell-Meurs 2001b), and Gordion (Miller et al. 2009) and Kaman-Kalehöyük (Hongo 1996, 155–158) in central Anatolia. Despite a major political decline – the collapse of the Late Bronze Age Hittite Empire – there appear to have been no drastic changes in pastoral practices in the Iron Age. The differences that are visible through analysis of faunal remains appear to be attributable to changes in site function, such as at Gordion, where the site grew from a small settlement with a predominantly pastoral economy to become an urban regional centre of the Phrygian kingdom supported by intensive agriculture (c. 950 to 500 BC: see Zeder and Arter 1994), and at Çadir Höyük, which experienced ruralisation and changes in the goals of herd management in the Early Iron Age following the end of Hittite hegemony (Arbuckle 2009). But the assemblages at both Gordion and Kaman-Kalehöyük show a temporary increase in goat relative to sheep in the Early Iron Age, perhaps indicating a general deterioration in pasture quality in Central Anatolia (Hongo 1996, 155–158; Zeder and Arter 1994). Interestingly, different pastoral practices at Iron Age Gordion were also associated with different hunting practices. In periods where the wild-plant-to-cereal ratio was high, and sheep and goats were predominant, implying a more mobile (but still local) pastoral strategy focused on herding, deer were more prevalent among the small assemblage of wild animal taxa; in the period where the wild-plant-to-cereal ratio was low, and cattle and pigs became more important, implying a less mobile pastoral strategy focused on foddering, hare were more prevalent among the wild animal taxa (Miller et al. 2009).

In south-eastern and eastern Anatolia, a major theme of research has been the effect on local culture of the empires that came to dominate this territory in the Late Bronze and Iron Ages (Mitanni, Middle and Neo-Assyria, Urartu). Several of these empires had complicated relationships with pastoral groups either within or on the fringes of their territory. Through time, the Assyrians traded predominance with the Arameans in south-eastern Turkey and the Syrian steppes; these tribal groups are described in Middle Assyrian textual sources as pastoral nomads, but may or may not have actually been mobile, and were certainly largely sedentary by the time they formed small kingdoms in the Iron Age (Szuchman 2007), such as the Bit Zamani kingdom based at Diyarbakır (Szuchman 2009). The Urartian Empire unified, for the first time in history, large parts of mountainous eastern Turkey that would in the nineteenth and twentieth centuries AD be inhabited by mobile pastoralists. On the basis of the empire’s geography, ethnographic analogy and the frequency with which animals are listed in kings’ lists of booty, archaeologists typically assume that
the Urartians ruled over vast pastoral populations practicing short-distance transhumance (Zimansky 1985, Burney 2012). We lack, however, direct archaeological evidence of such pastoralists and evidence for specific pastoral practices. There are reasons to be sceptical of general claims that communities in eastern Anatolia must have practiced some form of mobile herding in all periods, including the Urartian period (such as in Yakar 2006, 56–58; 2011). A variety of seasonality indicators point to a fully sedentary-pastoral rather than mobile-pastoral economy in the Iron Age (and early Bronze Age) at Sos Höyük and Büyüktepe Höyük, which are also located in mountainous areas with harsh, long winters where twentieth-century mobile pastoral tribes were active, and researchers have frequently assumed that ancient populations must have practiced mobile pastoralism (Howell-Meurs 2001a). Recently, research on Iron Age empires has been expanded at the site of Ziyaret Tepe to include the study of the effect of these empires on pastoralism. Faunal and botanical assemblages analysed from the Neo-Assyrian town show the continued importance of pastoralism, despite imperial historical narratives that focus on agricultural intensification as part of imperial expansion (Greenfield 2014, Rosenzweig 2014).

**Roman Anatolia (ca. 200 BC–330 AD)**

Little archaeological data exists on rural economy in Roman Anatolia. Fortunately, the first systematic publication of Roman-era paleobotanical remains in Anatolia addresses two issues related to pastoral practices. The central Anatolian site of Gordion was a rural Roman military garrison and a civilian settlement dating from 50 AD to the early fifth century. Paleobotanists have argued that Roman animals were primarily pastured rather than foddered, as they were earlier in the Iron Age. The ratio of ‘favourable’ to ‘unfavourable’ grazing plants in the assemblage suggests that the area around Gordion was severely overgrazed (Marston and Miller 2014).

Near Sagalassos, another Roman site in south-west Anatolia, archaeological survey data integrated with paleobotanical evidence has led researchers to argue that populations living approximately 25 kilometres away in the Bereket Valley shifted from an economy focused on agriculture to one focused on (settlement-based) pastoralism in the first half of the fourth century AD. During this period, a continuation in pottery density from earlier periods indicated that population density likely remained fairly constant. Pollen cores from the valley, however, show a reduction in crop cultivation. Given that there is no archaeological evidence for a crisis at this time, and that the climate was actually becoming more humid, the researchers argue that this potential shift to pastoralism was a deliberate decision on the part of the local communities (Kaptijn et al. 2013).
Isotopic evidence indicates that while pigs, cattle, sheep and goats at Sagalassos and a nearby site were herded in the same area, or kept in enclosures and fed similar foods, as the preceding Hellenistic period, the Roman period witnessed the development of more specialised animal husbandry practices where different species had ‘specific and unique diets (fodders), grazing areas and care practices’ (Fuller et al. 2012, 163). Heavy metal data from goat bones suggests that in the Late Roman period they were grazed at greater distances, outside the polluted area around the settlement (Vanhaverbeke et al. 2011). The fourth-century shifts at Sagalassos foreshadowed a more complete post-Roman collapse of agriculture and a presumed turn to pastoralism in the mid-seventh century, again documented by pollen and charcoal data (Bakker 2012).

Summarising various contemporary authors’ descriptions of the Roman province of Cappadocia (central Anatolia), Gwatkin (1930) and Broughton (1959) report that this region was known for its livestock production, with much of the region ‘given over to grazing’ (Broughton 1959: 620). The modern province of Kayseri was known for its cattle, which were pastured on the wide plains and on the slopes of the largest peak in the region. Horses were also produced in large numbers in this region, from large agricultural estates owned by local elite families. To the north-west, Roman Galatia was known for its wool production, continuing a regional preference for caprines, and sheep in particular, that extends back to the Bronze Age (Zeder and Arter 1994). The Konya region, known as the Axylon, or treeless steppe, was also known for its emphasis on wool production in antiquity (Broughton 1959).

**Post-Classical Periods (c. 330–1923 AD)**

In post-classical periods, the nature of the data concerning Anatolian pastoralism drastically changes. Most significantly, the primary datasets come from history rather than from archaeological analyses, and they focus on political organisation and demography rather than on husbandry practices or patterns of provisioning and consumption. These differences stem from several factors. The archaeology of post-Classical periods is in its infancy, in Turkey and elsewhere in the Middle East. Where surveys and excavations of ‘late’ material have been undertaken, researchers have typically concerned themselves with architecture, art, inscriptions and artefacts rather than with the zooarchaeological, paleobotanical and isotopic analyses that are likely to provide the most direct data concerning pastoral practices, environmental change and mobility. The paucity of archaeology data on pastoralism is part of a broader lack of evidence concerning common people, especially rural and secular populations, in the Byzantine, Medieval and Ottoman periods (Cassis 2009, Baram 2009, Baram and Carroll 2002). Fortunately, this lacuna is somewhat balanced by
the broader array of historical records available for some post-Classical peri-
ods concerning the rural countryside, specific pastoral tribes’ engagement with
landed governments, animal markets, mobility patterns and tribal demography.
The sections below centre on several overlapping, historically-defined periods
as illuminated through the narrow range of available material evidence. The
summary of historical evidence is limited to information that furthers this arti-
cle’s goal of illuminating the dimensions of pastoral variability.

Zooarchaeological and Survey Data for Post-Classical Periods

Zooarchaeological data concerning animal preferences and herd manage-
ment strategies for post-Classical periods, comparable to the evidence pre-
sented for earlier periods in this article, has been published for quite a small
number of sites, including:

- Lidar Höyük (fourth to thirteenth centuries: Kussinger 1988), Tilbeşar
  (eleventh to thirteenth centuries, with excavated contexts: Berthon and
  Mashkour 2008), Gritille (twelfth to thirteenth centuries: Stein 1998a), Ki-
  net Höyük (twelfth to fourteenth centuries: Redford et al. 2001), Horum
  Höyük (twelfth to thirteenth centuries: Bartosiewicz 2005), and Ziyaret
  Tepe (thirteenth to fifteenth centuries: Berthon 2011, Matney et al. 2007,
  Matney et al. 2009) in south-eastern Anatolia;
- Korucutepe (thirteenth to fourteenth centuries: Boessneck and von den Dri-
  esch 1975) and Aşvan-kale (‘medieval’: Payne 1973) in the Taurus foothills;
- Çadir Höyük (sixth to eleventh centuries: Arbuckle 2009) and Kaman-
  Kalehöyük (sixteenth to seventeenth centuries: Hongo 1996, 1997) in cen-
  tral Anatolia;
- and Sagalassos (fourth century BC to thirteenth century AD: De Cupere
  Anatolia.

These analyses frequently incorporated a small number of samples, since
the excavation teams often were primarily concerned with earlier historical
periods underneath the medieval layers. The sites differ widely in their size,
function and ethnic composition. For these reasons, it remains unclear whether
the conclusions of the studies are reflective of site-specific, local or regional/
broader patterns in Anatolian pastoralism. Further, in all cases, the sites exca-
vated seem to be those of villagers who were primarily or entirely sedentary.
Researchers often expressed an interest in understanding the relationship of
these villagers to the nomadic tribes that we know from historical documents
existed in Anatolia during these times, but the extent of interaction between
mobile and sedentary populations remains entirely unknown archaeologically.

Following the influx of Muslim nomadic tribes from Arabia and Central
Asia in the late first and early second millennia AD, choices of herd animals can be interpreted as reflective of religious identities. Specifically, a decrease in pig production and consumption is seen as indicative of processes of Islamisation, and the presence and frequency of pig bones are seen as indicative of the presence of Christian or incompletely Islamised populations. The presence and importance of pig versus sheep and goats in faunal assemblages can also indicate possibilities in terms of herding strategies and mobility.

Diachronic research at Sagalassos, however, indicates that archaeologists should be cautious in making assumptions about pastoral practices on the basis of species preference, even over the last two thousand years. Stable isotope and heavy metal data on animal bones from Sagalassos and a nearby site show subtle changes through time in herding practices among pigs, cattle, sheep and goats. Sheep and goats do not appear to have been herded together all the time in certain periods (Fuller et al. 2012), and goats were herded more freely at varying distances from the settlements (Vanhaverbeke et al. 2011).

Among the sites analysed, several trends are visible. The Medieval levels of many sites show the same ranges of animals as in earlier (Bronze and Iron Age) strata – typically cattle, sheep, goats and pigs – but with two additional livestock taxa, the water buffalo and the camel, becoming increasingly important. Although the timing of their initial introduction to Turkey is unclear, water buffalo have been identified in medieval deposits from Lidar Höyük, Korucutepe and possibly also Kinet Höyük. Although camels first appeared in Anatolia in the Bronze Age in southern Turkey and were also used in the Roman period, Bactrian, dromedary, and hybrid camel bones are commonly encountered in Medieval assemblages, and have been identified at Korucutepe, Tilbeşar, Ziyaret, Lidar, Acemhöyük and in the Yenikapı excavations in Istanbul (Onar et al. 2013). Water buffalo and camels are also present in the Ottoman period assemblage from Kaman-Kalehöyük. Animals from Medieval levels at Korucutepe (goats) and Ottoman levels at Kaman-Kalehöyük (sheep, goats, some cattle) were larger than comparable individuals from pre-Medieval strata at these sites, suggesting improvement of breeds over time (Boessneck and von den Driesch 1975, 219; Hongo 1997, 290–293). Although the number of Muslims living in Anatolia increased over time, especially from the eleventh century onwards, pig remained a source of meat at all of the studied sites except for Korucutepe and Ziyaret Tepe. At Kinet Höyük (a Crusader-era port town), and Medieval Gritille and Lidar Höyük, which are also known to have had a significant Christian population, pigs were the dominant animal represented in the assemblage. Pigs were the second most abundant animal at Çadır Höyük after cattle (as opposed to earlier periods, when sheep and goat were dominant). Pigs comprised a notable proportion of the faunal assemblage at Medieval Tilbeşar and Medieval Horum Höyük. At Ottoman-period Kaman-
Kalehöyük, the number of pigs decreased in comparison to earlier periods, but they remained a significant part of the assemblage. Except for Kinet Höyük, a trade port where people where engaged in the large-scale breeding of pigs and the breeding of sheep and goat for secondary products rather than meat (Redford et al. 2001, 73–76), none of the excavated sites shows evidence for large-scale specialised pastoralism where communities of pastoralists would seasonally move long distances with their herds. Herd management strategies indicate that the populations at these sites were engaged in generalised subsistence herding and low-risk production for the local consumption of pastoral products. These final two trends could be due to two characteristics of the small number of studied sites. First, several of the sites were in areas controlled by Christian populations; second, the sites excavated were chosen on the basis of their significance and centrality to the Bronze and Iron Age landscape, rather than their significance and centrality to the Medieval or Ottoman landscape. In fact, historical texts tell us about commercialised herding for regional meat markets in these periods.

**Byzantine Period (c. 330–1200 AD)**

For the Byzantine period, the clearest picture of pastoralism comes from an archaeological and historical study of the Islamic-Byzantine border in southeastern Anatolia (Eger 2008). Various forms of pastoral transhumance were practiced in and around the Amuq Valley during this time, including: migrations between lowland villages and upland fortified sites; mobility involving temporary camps and/or seasonal raiding; and pasturing animals on marsh-land during the winter then spending the summers in Byzantine-controlled highlands. These various forms of transhumance were adaptations both to environmental and political conditions (Eger 2008, 329–333). Conflict at the Islamic-Byzantine border was framed around pastoral movement. It involved competition between groups during the migration to highland summer pastures for access to the best pasture and grazing land; migration schedules were linked with seasonal raiding (Eger 2008; Robinson 1996; Haldon and Kennedy 1980, 105, 114). Pastoralists secured migration paths through the construction of way-stations on north-south routes (some, called *thughur* forts, appeared mostly in the eighth century), which simultaneously afforded control of trade (Eger 2008, 416). Settlement patterns and historical documents for the broader region indicate that there were general waves of sedentarisation in the eighth to tenth centuries, including historical evidence of seasonal camps that eventually became permanent quarters of sedentary settlements (Eger 2008, 350–354), and opposing trends towards re-nomadisation in the tenth to eleventh centuries due to migrations out of Arabia (Eger 2008, 360–362).
This period of the ‘Arab incursions’ has recently been studied from a regional, interdisciplinary perspective. In the seventh and eighth centuries AD, historical evidence indicates a collapse of late antique agriculture following Arab raids and lake core data demonstrates a major decline in cultivated species. This correspondence has led scholars to argue that rural populations turned to pastoralism for several centuries in the Pontus and Paphlagonia regions (Izdebski 2012), Cappadocia (England et al. 2008), south-western Anatolia (Bakker 2012), and other parts of northern and western Anatolia (Haldon et al. 2014). Yet we have no direct archaeological data concerning the nature of the pastoralism that may have been practiced by these immigrants in their new surroundings, or by local populations who may have abandoned agriculture.

The relationship between borders, frontier conflict and pastoralism seen in Byzantine south-eastern Anatolia is in some ways paralleled a few centuries later on the fringes of the Greek Byzantine successor state in north-eastern Anatolia, the Empire of Trebizond (thirteenth to fifteenth centuries), as this empire clashed with the Türkmen groups that surrounded it (Bryer 1975). The Chronicle of Panaretos and other literature provide evidence for vertical pastoral transhumance in the Pontic mountain ranges in patterns that correspond to twentieth-century transhumance in that region (Bryer and Winfield 1985, 7).

**Arrival of the Turks (c. 1000–1200 AD)**

The most important historical event relating to mobile pastoralism in the second millennium AD is the eleventh-to-thirteenth-century incursions into Anatolia of the Seljuks, Mongols and other Turkic nomadic groups from the Central Asian steppes (Bosworth 1973, 315; Cahen 1968; Peacock 2010; Vryonis Jr. 1975). Many accounts dramatically present this event as a devastating one wrought by merciless raiding bands, resulting in the nomadisation and Islamisation of most of Anatolia (Vryonis Jr. 1971, 143–184; see also Khazanov 1984, 264). While this population influx clearly did result in major demographic change in eastern Anatolia, the transition has been largely unstudied archaeologically, and as the previous sections of this paper have shown, many forms of mobile pastoralism appear to have already existed in Anatolia. The arrival of the Turks may have resulted in significant changes in transhumance patterns as well as the sociopolitical organisation of transhumant pastoral groups. The eleventh and twelfth centuries offer the earliest concrete historical evidence for the large, powerful nomadic tribal confederacies that were to have a substantial impact on the Anatolian economy and society until the early twentieth century (Planhol 1959, 525; Şahin 2006, 89).

In a recent historical analysis, Peacock (2010, 128–163) has convincingly shown the strong correlation between the location of the most fertile east Ana-
tolian pastures and the areas first penetrated by the Seljuks, and has thus argued that the pattern and logic of the eleventh-century Seljuk incursions were driven by the desire to locate new summer and winter pastures for supporting a transhumant herding lifestyle (for more impressionistic versions of this idea, see Lindner 1983, 10–11; Vryonis Jr. 1975).

Predictable and consistent routes for seasonal migrations, which are a distinctive feature of recent pastoral nomads’ lives, are likely a modern phenomenon attributable to the unprecedented territorial control achieved for the first time by states from the seventeenth century onwards. Frequent shifts in migration routes appear before this point to have occurred spontaneously. For example, the Artukid Döger tribe originated in the Diyarbakır area of south-eastern Anatolia sometime before the end of the eleventh century, but by the fourteenth century the tribe was located substantially further west along the Euphrates (Cahen 1968, 315; 2007, 340–341). Tribes frequently appear under different names within the changing constellation of confederations, however, so it can be difficult to confirm the continuity of certain groups’ patterns (Cahen 1968, 315).

Even if the Central Asian incursions did not result in profound discontinuities in urban life and material conditions, they did result in a reorganisation of the countryside towards mobile pastoralism. By increasing the number of mobile pastoral tribes and the importance of pastoralism in the economy, the incursions set the stage for the establishment of polities where pastoral nomadic tribes constituted the base. Such polities characterised Anatolia (and Iran) in the fourteenth and fifteenth centuries (Cahen 1955).

Although the majority of the zooarchaeological evidence (discussed above) comes from the centuries just after the arrival of the Turks, very little other archaeological data concerning pastoralism exist, and there have been no scientific studies of mobility. Using survey data from the hinterland of Medieval Gritille, archaeologists argued that the clustering of sites around medieval springs indicated a focus on small-scale agriculture and a mobile pastoral economy (Stein 1998b). These sites near springs could have hosted camps of mobile pastoralists who annually moved between areas inside and outside the plain, perhaps grazing on post-harvest crop stubble for part of the year (Redford 1998, 277).

**Age of Nomadic Confederacies (c. 1300–1508)**

The fourteenth and fifteenth centuries are a fascinating and unique period for Anatolian pastoralism, because significant parts of the south-east and east were governed by Türkmen nomadic tribal confederacies, in particular the rival Akkoyunlu (‘White Sheep’ Türkmens) and Karakoyunlu (‘Black Sheep’ Türkmens), about whom there is rich indigenous, contemporary documentation in
many forms (Woods 1999, 215–234). This documentation provides the earli-
est historical evidence for specific long-distance vertical migration patterns in
eastern Anatolia, and some of these patterns continued to be followed, albeit
by different tribes, until the twentieth century. Unfortunately, archaeologi-
cal study of this period has been limited to the study of Akkoyunlu and Karako-
yunlu architecture and tombstones, and no archaeological evidence yet exists
to confirm or complicate the picture from historical documents. For several
decades in the fourteenth century until they emerged victorious in 1467, the
Akkoyunlu engaged in a territorial struggle with the Karakoyunlu. From their
original land holdings in east-central Anatolia, throughout the fifteenth
century the Akkoyunlu solidified control of a large area that eventually stretched across
north-west Iran, Azerbaijan, and eastern Anatolia (Woods 1999, 55, 94, 135).
Following the Akkoyunlu expansion, large numbers of Türkmen pastoralists
migrated out of Anatolia towards the east (Roemer 1986, 175, 188).

In this period there is ample evidence that the political hierarchy drew from
tribes consisting primarily of mobile pastoralists, and that polities expanded
with the goal of controlling certain pastures and migration routes. While the
Akkoyunlu ruling class had long been sedentary, and governed over large
indigenous settled populations of Armenians, Kurds, Arabs and Aramaeans
(Roemer 1986, 154), the majority of their tribal power base remained mobile
(Woods 1999, 15). Like the Seljuks, control of pastures and migration routes
appear to have been a major governing logic in Akkoyunlu territorial expan-
sion. An early political strategy of the confederacy was to consolidate control
of interdependent systems of both mountain pastures in eastern Anatolia and
winter steppes in the Tigris and Euphrates basins (Woods 1999, 54). Access to
summer and winter pasture areas depended upon Akkoyunlu control of both
major urban centres and numerous smaller strongholds, including castles.
These strongholds, collected protection and toll money but were also located
strategically along the principal migration routes (Woods 1999, 29). The corre-
spondence between the reported migration routes of the Akkoyunlu groups and
trade routes in this period is not coincidental, and probably indicates the inter-
twined dual-purpose nature of mobility: interregional trade and transhumance
for the purpose of animal needs.

Within the territorial range described above, there were at least four pasto-
ral migration patterns. The first three involved the Akkoyunlu Türkmen groups
themselves. Like later Ottoman and twentieth-century groups, some Akkoyun-
lu groups used the Diyarbakır area as a winter pasture ground and migrated
into the Taurus Mountains in the summer, a distance of one to three hundred
kilometres. Other groups followed a longer version of this route, between sum-
mer pastures in the Taurus Mountains as far north as Erzurum and Bayburt and
winter pastures in the Jazira as far south as Mosul and Raqqah, making the
Diyarbakır region a transient camping area (Woods 1999, 29–30). The distances of these routes could be more than five hundred kilometres. Among these were clans later called Bozulus by the Ottomans, from the area south of Mardin to Erzincan and Erzurum as well as Georgia and Iran (Sümer 1949, 39; Erhan 1992, 116–117). A third group of Akkoyunlu nomad groups followed ‘lesser’ migration routes from winter pastures west of Mosul to summer pastures on the slopes of the modern Karacadağ, south-west of Diyarbakır, a distance of two to three hundred kilometres (Woods 1999, 64).

Finally, one must consider the Kurdish tribes who were surrounded by and interspersed with the Türkmen groups. Some of these Kurds were also mobile pastoralists. A late sixteenth century Kurdish history, the Sharafname, describes a transhumant lifeway for some Kurdish groups. For example, Kurds lived in hills on the edge of the plain of Muş and migrated to summer pastures in the mountains above the plain (Sinclair 2001, 162). The sixteenth century Mahmudi and other mobile Kurdish clans in eastern Turkey, referred to as ‘tent dwellers’ in archival sources, were only distinct from agriculturalists part of the time and camped in the same lowland and highland locations every year. Great insecurity in the countryside due to frequent territorial wars and banditry forced pastoralists to settle around walled villages and upland forts. Sometimes tribes even had to spend winters in upland forts (Reid 2002, 12–14). This shows that transhumance was only possible in periods when rural security could be assured. While the social and economic organisation of the Kurds and the Türkmen was very similar, Kurdish groups were rarely incorporated into the larger Türkmen nomadic confederacies in the fifteenth century. Kurds maintained separate tribal hierarchies, territories and fortified strongholds (Woods 1999, 91–92).

**Ottoman Empire (c. 1300–1923)**

Historical sources concerning pastoral nomadism are much more abundant and detailed for the Ottoman period than for the Akkoyunlu and earlier periods. Further, the stability of Ottoman bureaucracy resulted in a robust set of records (especially tax records, called defters) that allow scholars to document historical events and processes in Anatolia at relatively fine spatial and temporal scales. Pastoralists feature prominently in many of these documents because they were a significant element of society: in the sixteenth century, transhumant pastoralists comprised roughly a quarter of the total Ottoman population and up to sixty per cent of the population in some districts of south-eastern Anatolia (Hütteroth 2006, 19–21; Kasaba 2009, 18). A very different picture of mobile pastoral groups emerges than that of the Akkoyunlu period: over time, pastoralist groups came to be completely enclosed by sedentary agriculturalists. Ottoman control led over several centuries to the widespread containment and decline of vertical-
ly and horizontally transhumant pastoral nomadism across the empire, through forced sedentarisation, shifts in territory, circumscription of migration paths to set, predictable routes and the imposition of heavy taxes.

Tribes within the Ottoman Empire engaged in a great variety of transhumance practices. Specifically in Anatolia, the Ottoman realm incorporated horizontally nomadic Arab Bedouin tribes in the south-east who herded either sheep and goats or camels, and in mountainous areas of southern, eastern, and central Anatolia, the Ottomans struggled with vertically transhumant pastoralists of both Türkmen and Kurdish ethnicity. These groups mostly herded sheep and goat, but occasionally horses or cattle instead, and practiced a wide array of transhumant patterns, ranging from movements of several dozen kilometres to higher summer pastures to migrations of more than three hundred kilometres. Ottoman sources recognised this variability through various terms, referring to nomadic tribes as ‘Türkmen’, ‘Yörük’ (wanderer), or ‘Kızılbaş’ (İnalcık 1994, 34). In general, there was a geographic and ecological distinction between Yörük and Türkmen. Yörük were found in western Anatolia and tended to practice shorter-distance vertical transhumance, while Türkmen were found in eastern Anatolia and tended to engage in longer-distance vertical migrations. The Yörük in the west tended to practice a greater degree of agriculture, while the Türkmen in the east tended to be more completely dependent on mobile herding for their livelihood (İnalcık 1994, 40). The rough geographical line separating these two groups was located in central Anatolia, around Kayseri and Kırşehir (Jennings 1978, 94).

These geographical distinctions, however, were not static, because there were several important long-distance relocations among mobile pastoral tribes within the empire. The most important of these involved the largest nomadic political group of the early Ottoman period, the Bozulus, a confederation of tribes formed by some of the descendants of the Akkoyunlu who still inhabited areas of eastern Turkey. In the sixteenth century, more than one hundred separate tribes formed the confederacy. These tribes collectively claimed more than 60,000 people and held around two million sheep. In the late sixteenth and early seventeenth centuries, some groups of the Bozulus were pushed by the Ottoman state to move to central and western Anatolia, due to increasing nomadic populations and a resultant shortage of pasture (Gündüz 1997; Şahin 2006, 110; Sümer 1949; Woods 1999, 190). The Bozulus may have been partially motivated to shift westward by commercial reasons, specifically to decrease the cost of moving their sheep to large urban meat markets (Faroqhi 1984, 223–224). This out-migration of large portions of the Türkmen confederation significantly reshaped nomadism in eastern Anatolia. The vacuum created by the displacement of the Bozulus was partly filled by Kurdish nomads (Planhol 1959, 528–529). The removal of the large Türkmen confederacies from eastern
Anatolia thus did not result in the end of long-distance mobile pastoralism, or of politically significant mobile groups.

The processes and actions that changed pasture situations and camping patterns for transhumant tribes included not only relocation at the hands of the government (as with the Bozulus) and sedentarisation programmes, but also taxes, wars, the assignment of specific migration routes and pasture areas, agricultural expansion, and changing conceptions of state territoriality and private property. Long-term state policies and taxes significantly reduced the flexibility of pastoral nomadic land-use.

Most literature on pastoral nomadism under the Ottomans argues that the Ottomans aimed to contain and control nomadic tribes from the beginning of their reign, but a recent analysis argues that they initially encouraged and even expanded pastoral migrations because mobile tribes were a source of strength to the empire. Only with the emergence of ideas in Europe about territorially sovereign states with clear boundaries, during the second half of the seventeenth century, did the Ottomans became concerned with ruling a settled society (Kasaba 2009, 19–20, 30, 57). Certain characteristics of the tribes themselves shaped Ottoman policy towards them. A historical study of four nomadic tribes near Ankara argues that geographically-bounded tribes and tribes with a strong internal hierarchy were settled via mediation between government officials and tribal authorities, but that geographically scattered tribes without a strong internal hierarchy faced coercion and even military action during their sedentarisation processes (Köksal 2006).

The independence of many mobile groups and their tribal structure presented a serious challenge to Ottoman state authority, but these same characteristics made pastoralists important to the empire’s local and regional networks of production, trade and administration. The tribes’ mobility lent them a threatening military capacity, an advantage that they seem to have frequently turned on vulnerable sedentary communities, travellers and trade caravans (van Bruinessen 1988, 35; Vryonis Jr. 1971, 268). Raiding in particular increased as pasture situations worsened for the nomads over time. On the other hand, the Ottomans found it convenient to employ this independence and military prowess in the defence of their borders and trade routes, essentially contracting nomadic groups on the frontier to serve as buffers against outside groups and to serve as the state guards of mountain passes (İnalcık 1994, 41; Quataert 1994, 816–817). Large-scale specialised herding can be extremely productive under the right environmental and economic circumstances, and the Ottomans needed to supply their growing urban populations with meat and other animal products. During the sixteenth century, pastoralists in south-eastern Anatolia supplied livestock to all of the major Ottoman cities, including İstanbul, Aleppo, Damascus and Jerusalem (İnalcık 1994, 161). Cooking throughout Anatolia used
clarified butter as its primary fat, and nomads were the main producers of this product (Faroqhi 1984, 213). Pastoralists also monopolised land transportation throughout the empire, and some individuals even hired shepherds in order to engage full-time in the transport and trade business (İnalçık 1994, 39; Kasaba 2009). Nomadic tribes and merchants sometimes made mutually beneficial arrangements whereby the tribes provided safe passage to caravans and pack animals for fees (Quataert 1994, 816–817).

The government attempted to generate revenue from the nomad tribes and to control their movements by taxing their possessions and migratory passage on certain routes, and by levying fines from those groups that left the boundaries of their assigned winter or summer pastures. As Lindner (1983) has argued in the case of the nomadic horse breeders of the Kayseri area, Ottoman registration of mobile people and imposition of taxes and fees may have removed the flexibility from systems that depended on plasticity and continued adaptation. The general effect of taxes was that they increased the minimum size of the herd needed for survival. Herds of less than one hundred animals were no longer viable, and three hundred became the typical minimum herd size across Anatolia. The government did not tax nomads for use of their assigned winter and summer pastures, but fees were assessed if flocks strayed from these pastures or from the assigned routes between them. Even minor fluctuations in climate and usage can have dramatic effects on pasture quality, quantity and distribution in a given year, and to maintain their herds, shepherds needed to retain the possibility to move the flocks onto better grazing areas, particularly on the migrations between winter and summer pastures. The effect of taxes on pastoral nomads may have been different in south-eastern Anatolia because of the more commercialised nature of herding in this area in comparison to central and western Anatolia (Faroqhi 1984, 223, 288; Salzmann 1995) and because of the existence of earlier tax codes, instituted by the Akkoyunlu ruler Uzun Hasan in the last quarter of the fifteenth century (Lindner 1983, 63). Furthermore, there are many other indications in the tax records that nomadic tribes were able to accumulate wealth, and (in particular) that many pastoral nomad households were better off than sedentary agricultural ones (Murphey 1984, 192–193).

Archaeological data on Ottoman pastoralism is limited to Kaman-Kalehöyük and to two other projects. Archaeologists have frequently dug hastily through the ephemeral layers on the tops of more ancient tells, where pastoralists frequently camped during the last millennium. One exception to this generalisation is the excellent excavation of a seasonal campsite in the top strata at Ziyaret Tepe, which was marked by stone alignments that were likely the foundations of tents and a variety of ceramics and small finds of the late Ottoman period (Matney et al. 2007, 25–29). Only kilometres away in the same part of south-east Turkey, an intensive survey of upland areas east of Hirbemerdon
Tepe also yielded evidence for Ottoman-period pastoralism. The remains of more than twenty campsites of various sizes and layouts lie on sloped terraces beside deeply-incised seasonal streams. The campsites were surrounded by other locales with evidence for pastoral activity, including cisterns, caves used as animal pens, stone-walled corrals, stone cairns and small dams. The characteristics of these campsites and the water collection features that surround them suggest that the area was used as a winter camping area (Hammer 2012, 212–291; 2014; Ur and Hammer 2009).

Discussion

This review has identified significant variation in the characteristics and organisation of pastoralism in Anatolia over the last ten thousand years, demonstrating that analogies drawn from modern ethnographies cannot do justice to the diversity of pastoral adaptations in the past. This variation exists in multiple dimensions of pastoral life: mobility, land-use and animal preferences; target products and herd management strategies; the political organisation of pastoral societies; and the social role of animals.

From the available data, it appears that pastoral mobility was surprisingly limited in prehistoric Anatolia (Figure 3). In the early Neolithic period, pastoral practices are difficult to reconstruct, because the reproductive isolation of developing livestock populations from wild animal populations was rare, and settlements seem to have developed unique and locally-variable systems of animal management. By the middle of the eighth millennium BC, domesticated populations of caprines, cattle and pigs, better adapted to living and producing with humans, had emerged, and and herders were applying recognisable management strategies such as young male culling, foddering and penning. Neolithic herding regimes, however, which were focused primarily on caprine and secondarily on cattle, seem to have been largely tethered to permanent settlements, exploiting relatively small, local catchment-zones. There is virtually no evidence for large-scale or long-distance movements of herds from summer to winter camps in this early period (but see Makarewicz and Tuross [2012] for evidence of mobility among Neolithic goat herders in the Levant). Although the early development and spread of intensive animal husbandry clearly took place within a social environment characterised by inter-site and inter-regional information (and livestock) exchange, there is currently no evidence that these social networks were facilitated by the presence of highly mobile nomadic pastoralists, which are cited as potential, yet invisible, vectors for inter-regional communication in many periods (Rosen et al. 2005, 775; see also Frahm and Feinberg 2013, 1875).
<table>
<thead>
<tr>
<th>Period</th>
<th>Major developments in pastoralism</th>
</tr>
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<tbody>
<tr>
<td>Earlier Neolithic (9000–7500 BC)</td>
<td>Domestication of sheep, goat, cattle, pigs in SE Anatolia; animals retain wild phenotype; ‘initial diversity’ in local pastoral practices – inconsistent application of selective male culling, penning, and control of animal diet; herding spatially limited around settlements; hunting remains important</td>
</tr>
<tr>
<td>Late Neolithic (7500–6000 BC)</td>
<td>Livestock husbandry eclipses hunting in importance; widespread application of young male culling, foddering, and penning; use of secondary products including dairy; appearance of domestic phenotype; isotopic evidence for local grazing and foddering; spread of livestock husbandry to South, West, and North-west Anatolia by early seventh millennium BC</td>
</tr>
<tr>
<td>Earlier Chalcolithic (6000–4000 BC)</td>
<td>Increase in the role of cattle; local scale movement to seasonal pastures in plains and highlands around settlements; regionalisation in livestock preferences</td>
</tr>
<tr>
<td>Late Chalcolithic (4000–3000 BC)</td>
<td>SE Anatolia develops intensive caprine (sheep) pastoral economies not seen elsewhere in Anatolia, associated with the development of state-level societies in neighboring Mesopotamia (Uruk culture)</td>
</tr>
<tr>
<td>Bronze Age (3000–1200 BC)</td>
<td>Cattle increase in importance in most regions are associated with the rise of hierarchical societies; emphasis on secondary products; herding practices remain local in scale and linked to agricultural settlements, unlike neighboring northern Mesopotamia, where long-distance mobile caprine pastoralism is evident; SE Anatolian sites show a mixture of cattle and caprine-dominant economies; Hittite documents document conflict with Kaska cattle pastoralists; domestic horses and donkeys appear in Anatolia</td>
</tr>
<tr>
<td>Iron Age (1200–330 BC)</td>
<td>The effect of empires – Mitanni, Middle and Neo-Assyrian, Urartu – on (mobile) pastoralists in SE Anatolia has been a theme of discussion, but there is limited concrete evidence for mobility</td>
</tr>
<tr>
<td>Roman (200 BC–330 AD) and Byzantine (300–1200 AD)</td>
<td>Some Roman provinces in Anatolia known for livestock and wool production; little archaeological data on rural economy. Pig an important source of meat at many Medieval sites and texts document regional meat markets. Texts and archaeology document Byzantine border transhumance in the Amuq and Trabzon regions; appearance of water buffalo in faunal assemblages and widespread use of camel</td>
</tr>
<tr>
<td>Arrival of Turks and Nomad Polities (1000–1500 AD)</td>
<td>This period is unstudied archaeologically. Arrival of Turkic mobile pastoralists from Central Asia utilising long distance migration routes; earliest historical evidence of powerful nomadic tribal federacies seen ethnographically; frequent shifts in migration routes show that consistent routes are a modern phenomenon</td>
</tr>
<tr>
<td>Late Ottoman (1500–1923 AD)</td>
<td>Ottoman state forced the sedentarisation of mobile pastoral groups, shifted their territories, circumscribed their migration routes, and imposed pastoral taxes – all resulting in a long term decline in the number and power of mobile pastoral groups</td>
</tr>
</tbody>
</table>

**Figure 3.** Chart summarising the date of the earliest evidence for certain ethnographically documented pastoral practices and characteristics in Anatolia.

Both vertical and horizontal forms of transhumance were practiced, probably widely, in the Chalcolithic and Bronze Age, but these systems appear again to have been characterised by only local-scale mobility. Sheep and goats remained important in Chalcolithic economies, but cattle-herding became increasingly significant in the Late Chalcolithic in south-eastern and central Anatolia, along with increasing evidence of political complexity and hierarchy. The importance of cattle continued to grow in the Early Bronze Age, especially in central and eastern Anatolia, where cattle herding became an economic and symbolic focus. Communities of the Late Chalcolithic/Early Bronze Age Early Transcaucasian Culture in eastern Anatolia, which have frequently been associated with pastoral nomadism in the archaeological literature, appear to have been only limitedly mobile and to have primarily herded cattle. Although Late
Bronze Age Hittite texts indicate that some groups (the Kaska) likely practiced more mobile forms of cattle and caprine pastoralism, their movements seem to have been limited to territories within relatively small polities, and there is no evidence for the regular movement of large numbers of mobile pastoralists like those documented in the Bronze Age texts of northern Syria. A lack of settlements and the appearance of highland cemeteries in eastern Anatolia near Lake Van have been taken as evidence for the presence of transhumant pastoralists in the second millennium BC, but currently no further information exists about these potential transhumant pastoralists or their practices, and data from the Bronze and Iron Age levels of sites in the eastern Anatolian highlands indicate that certain communities were practicing sedentary pastoralism.

In the Iron Age and Roman periods, Anatolian pastoral economies continued to be primarily based on caprines, cattle and pigs, and there continues to be a lack of empirical data for long-distance mobility by whole communities. Less zooarchaeological data are available for post-Bronze Age periods than for earlier ones, and it is thus difficult to draw broad regional conclusions. Cuneiform documents of several Iron Age empires, such as Assyria and Urartu, suggest that transhumant pastoral tribes formed an important part of the population in south-eastern and eastern Anatolia, but there is no direct archaeological evidence concerning these pastoralists and their pastoral strategies. Roman authors attest to the importance of several regions of central Anatolia in livestock and wool production.

One of our most significant observations is that long-distance sheep and goat mobile pastoralism, of the type practiced by some ethnographically studied groups and often projected into the deep past, appears to have been a historically late development in Anatolia. The earliest clear historical and archaeological evidence for large-scale, long-distance pastoral mobility dates to the Byzantine period in south-eastern Anatolia (eighth to tenth centuries AD), when both Byzantine and Islamic communities (some migrating out of Arabia) practiced seasonal transhumance that was intertwined with cross-border raiding and trade. Large-scale, long-distance pastoral mobility became widespread in Anatolia following the historically-documented incursion of mobile populations from Central Asia (eleventh to thirteenth centuries AD). Archaeological evidence dating to this period, however, has only been collected from sites whose communities were practicing sedentary village-based herding, where pig often forms an important part of the faunal assemblage.

The height of highly mobile long-distance pastoralism occurred in the thirteenth to fifteenth centuries AD, when powerful Türkmen nomadic confederacies ruled large territories in eastern and south-eastern Anatolia, controlling migration and trade routes. The first clear historical documentation of pasture zones and transhumance routes followed by mobile sheep and goat herders that
are similar to those followed in the twentieth century dates to the Akkoyunlu period of the fifteenth century AD in south-eastern Turkey, and to the period of the Empire of Trebizond of the thirteenth to fifteenth centuries AD in north-eastern Turkey. These medieval transhumance routes, however, were much more flexible and subject to dramatic changes than they were in later centuries under the Ottoman Empire.

The Ottomans ruled over many mobile pastoral populations engaged in a wide variety of pastoral practices. The medieval and Ottoman periods (eleventh to eighteenth centuries AD) saw an increase in pastoral variability through the widespread incorporation of non-native domesticated herd animals into pastoral economies, in particular camels and water buffalo, which had been rare in previous periods. Pastoral mobility was important to Ottoman networks of food production, trade, administration and defence, but governments in the late Ottoman period systematically worked to contain and sedentarise mobile pastoral tribes. Those groups that remained mobile into the twentieth century had seen their pasture locations, transhumance routes, herd sizes and political organisation dramatically transformed by centuries of Ottoman taxes and policies.

In terms of ancient pastoral social organisation, the evidence from Anatolia suggests a different historical trajectory than that seen in neighbouring areas of modern-day Syria. Pastoralism in Anatolia first emerged in the Neolithic within communities practicing agriculture. Animals and herding played important social and economic roles in Chalcolithic and Bronze Age Anatolian communities, which were increasingly hierarchical and oriented towards the production of commodities such as wool and oxen for labour. Until the first millennium AD, however, pastoralists appear to have been limitedly mobile, implying that agriculture and pastoralism were intertwined spatially and socially within individual communities. Contrary to this Anatolian evidence, documents from the site of Mari (to the south of Anatolia along the Syrian Euphrates) indicate the existence of distinct, spatially separate social groups related to Mari’s sedentary inhabitants, who solely or primarily practiced transhumant herding in the Middle Bronze Age. The mobile tribal element and sedentary people at Mari were ruled by Zimri-Lim, who refers to himself as a ‘nomad king.’ The influence of the rare picture provided by the Mari tablets has been enormous in Near Eastern archaeology, and a number of scholars have extrapolated from this evidence to make claims about the widespread existence of specialised mobile pastoralists across the Middle East, including Anatolia, in the Bronze Age and later periods (Arbuckle 2012). However, the Mari texts are exceptional in Near Eastern history, and the degree to which they are widely generalisable has been debated. Our arguments that clear historical evidence for specialised and independent groups specifically practicing mobile pastoralism in Anatolia does
not exist until the Byzantine period suggests that the evidence from Mari is not generalisable northward into Anatolia. It remains unclear whether the lack of evidence for early independent or semi-independent mobile pastoral groups in Anatolia is real, or merely due to the fact that archaeological and historical evidence are biased towards the narratives of sedentary groups.

Conclusion

Our synthesis of the available evidence leads to a number of conclusions concerning the social organisation of ancient and pre-modern pastoral groups in Anatolia, the historical time-depth of certain pastoral practices observed ethnographically, and the future of Anatolian pastoral studies. In agreement with Potts’ (2014) recent analysis of the history of nomads in Iran, and much earlier historical analyses concerning Anatolia (e.g. Planhol 1959), we argue that mobile pastoralism involving long-distance shifts to seasonal pastures by whole communities (i.e. nomadic pastoralism), a practice common among twentieth-century groups and one that has been frequently projected back into the prehistory and early history of the region, was a historically late development in Anatolia, occurring in the last 1,500 to 1,000 years. Both transhumant and non-mobile pastoral communities, however, had long, rich and variable traditions in this region reaching back to the Neolithic. Some of these pastoral communities were politically complex, and (mobile) pastoral societies rather than sedentary agricultural polities dominated parts of pre-modern Anatolia for periods during its post-Neolithic history. We emphasise the great limitations of ethnographic analogy for understanding pastoral lifeways in the past, and criticise the widespread tendency to resort to environmental imperatives when speaking about pastoral practices. Pastoralism is a flexible adaptation to changing environments and local historical contexts, not a timeless or homogeneous lifeway trapped in a Marxian framework of social evolution. We want to refocus the conversation away from ethnographic analogies and assumptions of long-term continuities in rural life, and towards the diversity of strategies, preferences and types of organisation that make pastoralism a heterogeneous set of adaptations through time and space.

Although many more questions remain, archaeologists have made particularly great strides in illuminating the origins of pastoralism in Anatolia. A variety of case-studies and comparative analyses indicate that early pastoral practices were diverse, variable and adapted to local environmental and social conditions. In order to continue to build on the detailed understanding of pastoralism emerging for the Neolithic and Early Chalcolithic in Anatolia, the high-resolution methods utilising faunal and human osteological materials that are
increasingly applied to these early periods must be regularly brought to bear on materials from later periods. Further, paleobotanical methods must be more systematically applied in early and late periods to address questions of grazing versus foddering and the relative health of pasturelands. Although the application of multi-disciplinary work is beginning to take hold in the exploration of the Anatolian Chalcolithic and Bronze Age, it is still rare for the exploration of later periods. More attention needs to be focused on pastoral diversity in the Iron Age and later periods (though one exception is the model of recent research concerning the Iron Age and Roman period at Gordion).

Beyond engaging in more zooarchaeological, paleobotanical and isotopic studies focused on pastoralism and mobility, other steps can increase our knowledge of ancient pastoral practices. Archaeologists investigating all prehistoric and historic periods should excavate a wide variety of sites (not just mounded tells) in all environmental zones of Anatolia. Corrals and campsites directly related to transhumant pastoralism are most likely to be preserved in highland areas, where they will have escaped destruction by modern agriculture. With proper excavation and study, they may also be found preserved in ‘abandonment strata’ on tells such as Ziyaret Tepe. More systematic survey and excavation are needed in upland landscapes and other agriculturally ‘marginal’ areas in order to overcome archaeology’s long-standing research bias towards larger sites in river valleys.

We stress that archaeologists must design collaborative, interdisciplinary research to directly test hypotheses concerning mobility and other dimensions of pastoral life, and that they must move beyond the disciplinary and methodological divisions separating studies of pastoralism in the ancient and medieval eras. During future research, archaeologists should avoid making statements regarding pastoral practices (e.g. mobility, seasonality, pasture locations, animal preferences) without proper investigation through coordinated survey, excavation, and zooarchaeological, paleobotanical and isotope analyses. Only by limiting conclusions to concrete evidence can we stop the unfortunate tendency to uncritically deploy ‘nomads’ as an explanation for times, spaces and movement processes that archaeology cannot yet otherwise explain. A major challenge going forward is to overcome the methodological and disciplinary divides separating the study of pastoralism in the prehistoric, ancient historic, Classical and post- Classical periods. This will involve not only the collection of comparable archaeological material for all periods (i.e. more faunal, botanical and survey data for the later periods), but also the resolution of the tensions that inevitably arise between purely archaeological and purely historical data in order to draw synthetic conclusions.

In short, there is exciting potential for continuing to rapidly expand our understanding of the role of pastoralism in the history and prehistory of Ana-
tolia. Identifying the historical depth of ethnographically documented pastoral practices and more fully documenting the variability present in pre-modern pastoral practices are essential for moving beyond the ‘tyranny of the ethno-historic record’ and developing a more detailed, subtle, and accurate picture of pastoralism in Anatolia.

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