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Beyond City and Country at Mycenae: urban and rural practices in a subsistence landscape

Lynne A Kvapil, *Butler University*

Jacqueline A Meier, *University of North Florida*

Gypsy Price, *Appalachian State University*

Kim Shelton, *University of California - Berkeley*



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Country in the City

Agricultural Functions in Protohistoric Urban Settlements
(Aegean and Western Mediterranean)

edited by

Dominique Garcia,
Raphaël Orgeolet,
Maia Pomadère
and
Julien Zurbach

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Beyond City and Country at Mycenae: Urban and Rural Practices in a Subsistence Landscape

Lynne A. Kvapil

Butler University

Jacqueline S. Meier

University of North Florida

Gypsy C. Price

Appalachian State University

Kim S. Shelton

University of California, Berkeley

Introduction

Approaches that explicate the role of cities as participants in the agrarian systems of the Late Bronze Age (LBA) Aegean frequently subscribe to paradigms that strongly dichotomize urban and rural populations, and thus inherently contrast the activities that take place within them. While core-periphery models serve as valuable heuristic devices for studying exchange, they have the unfortunate consequence of divorcing the practices of urban and rural agents (Kardulias 1999; Parkinson 2010). This dichotomy is compounded when paired with models that favor redistributive exchange mechanisms enacted at palatial centers during the LBA that are contingent upon an ‘us’ (elites) versus ‘them’ (provincial rural population) mentality (Finley 1957; Killen 1985, 2008; Parkinson 2010; Polanyi 1957; Voutsaki and Killen 2001). Through this lens, resources are often conceptualized as materials to be gathered through taxation or mobilization towards the urban center for consumption by the ruling elite and associates (Halstead 1992a, 1992b, 1995, 1999b; Killen 1985, 1998; Morris 1986; Palmer 1992). The emphasis on redistribution also highlights the current research focus on palatial practices, which has led to exclusive cultural profiles established chiefly on evidence gleaned from urban centers, rather than taking into account the wider rural practices and geographies with which the palace may have interacted.

This focus on palatial practices is largely a consequence of available archaeological evidence, especially since palaces have historically been the favored locations for large-scale excavations. Moreover, models for the Mycenaean economy often rely heavily on Linear B texts from palaces where large deposits of clay tablets, usually regarded as archives, have been found. Linear B texts, primarily from Pylos and Knossos, were used by Halstead, along with ethnographic analogies, as the basis

for his model of economic change—namely a shift from previous models focused on labor-intensive cultivation to a model that promotes extensive cultivation schemes that made use of more land and animal labor—which has served as a key exploratory mechanism for Mycenaean economic studies (Halstead 1992a). Archives like those at Pylos and Knossos, however, have not yet been found at every Mycenaean palace; therefore models relying heavily on these texts may not apply universally; and, because palatial texts, by definition, record information of interest to the palace, large portions of the Mycenaean economy are absent from them. Halstead himself found discrepancies between textual and archaeological evidence of subsistence that highlight the need for more combined studies (1988, 1992a, 1992b, 1999a, 2001). This discrepancy emphasizes the need to explore different lines of evidence, especially for palaces with less textual evidence, such as Mycenae, that can explain the high level of economic variation currently noted among different palatial areas that shared cultural traits (Shelmerdine 1999; Shelmerdine and Bennet 2008).

We aim to reconceptualize Mycenae as an urban center situated within the broader agricultural geography of the northeastern Peloponnese, a view that will be utilized thereafter to refine the picture of subsistence activities at this palatial settlement during the LBA. Our vision of what is considered ‘urban’ for this time period casts off the notion of a built-up city or walled settlement. Instead, our definition of urban is informed by an investigation of subsistence practices enacted across a range of social and political spheres that transcend binary divisions. Mycenae and the surrounding region offer a unique opportunity for this kind of study due to its rich history of archaeological exploration and the wide range of archaeological data therefore available. By combining a variety of independent lines of evidence—settlement patterns

and landscape modification, archaeological evidence from various artifact and ecofact categories, and textual evidence — we illustrate that it is more informative to examine the landscape as one of highly integrated social and economic interests with effects extending beyond our perceived confines of ‘city and country’ or ‘palace and hinterland’.

Background

Current models and interpretations

Many models have been constructed to understand complex economic interactions across the Aegean during the LBA. The model most relevant to a reconsideration of the subsistence economy at LBA Mycenae is that of Halstead, who proposed one based on a combination of textual and archaeological evidence for centralized surplus accumulation (1992a). Building upon prior models proposing that agricultural specialization and redistribution drove state formation in the Aegean Bronze Age (Gamble 1979; Renfrew 1972), Halstead emphasized the importance of surplus as a safeguard against agricultural failure (1981). In putting forth this model, he also proposed that extensification was likely due to changes in agricultural land use, sources and deployment of labor, and animal management over time, which previously seemed to support a model of increasing specialization (1992b, 1995). These changes included the practice of loaning labor animals, as suggested in Linear B texts, and the focused production of sheep (Halstead 1999a, 2001: 40–41; Killen 1993, 1998). While sharing labor animals and trading wool would ideally create social capital and reciprocal risk buffering opportunities, clear evidence for these practices was not born out in the data. Halstead (2003) found instead that increasingly specialized production of sheep was not entirely supported by abundances of domesticated animals. These findings do not suggest a complete shift towards large-scale specialized production over time in the Peloponnese, based on the available diachronic studies of faunal remains from Tiryns and Nichoria, which reveal little change in taxa before and after the rise of the major palaces (Late Helladic (LH) IIIA–C) (Halstead 2003, von den Driesch and Boessneck 1990, Mancz 1989).

Halstead concluded that the overall evidence did not support a wholesale shift to large-scale herding or specialization for exchange over time as earlier models expected (Renfrew 1972); rather, he proposed that the texts suggest that palaces practiced large-scale herding and specialization, but, in non-palatial contexts, small-scale agriculture was more likely practiced with diversified agricultural goods, which would shield small farmers from risk and which could be mobilized upwards to palaces specializing in the production of wheat (Halstead 1996, 1995, 1999b). This model of

small-scale, diversified, non-palatial production as opposed to large-scale, specialized, palatial production is problematic for several reasons, as Halstead himself acknowledged (Halstead 2011). First and foremost, it positions subsistence strategies as strictly palatial or non-palatial, which is a distinction that does not hold for data from Mycenae, as we will show especially in the realm of animal management practices, wild animal acquisition, and the gathering and cultivation of botanicals.

In general, it is difficult to test certain components of this model with the current evidence. For example, given the dearth of faunal remains studied from extra-palatial areas, excluding unique feasting or ritual deposits (Dabney *et al.* 2004; Hamilakis and Konsolaki 2004), studies of the scale of animal management practices are limited to a narrow part of Mycenaean society. The current zooarchaeological perspective of animal-based subsistence in the Peloponnese is derived from largely spatially aggregated faunal assemblages. Combining animal bones from multiple contexts to comprise a general-Aegean faunal economic baseline is informative (Trantalidou 1990), yet neglects to separate fauna from palatial and extra-palatial areas of the same site in ways that expose differential access to animal resources. In the area of plant use, text-based assessments describing the cultivation and distribution of plants at Mycenaean sites do not reflect a diversity that is visible in the archaeological record (Halstead 1992a, 1995; Hansen 1988). This conflict between textual and archaeological evidence for botanicals is illustrated by the presence of legumes, for instance, in the archaeobotanical record for LBA Greece as opposed to their total absence in the Linear B texts (Hillman 2011; Sarpaki 1992). Texts from Mycenae also suggest that aromatic and condiment plants were not limited to hinterland production and palatial consumption; instead, they likely were consumed in and out of palace centers but also cultivated or gathered and exchanged within and beyond the palatial sphere.

These issues, which will be discussed below, illustrate that a more holistic approach, such as we present here, is needed to develop the full picture of the subsistence economy. We focus our study on the site of Mycenae to better understand the role of agriculture in its regional context. Our aim is that this study will provide a means of shedding light on the wide variety of possible plant and animal production and acquisition practices that were employed with differing degrees of palatial involvement across the Aegean.

The site of Mycenae

The fortified citadel of Mycenae occupies a limestone hill nestled between two low mountains at the northern end of the Peloponnesian plain of Argos (Figure 1). It is

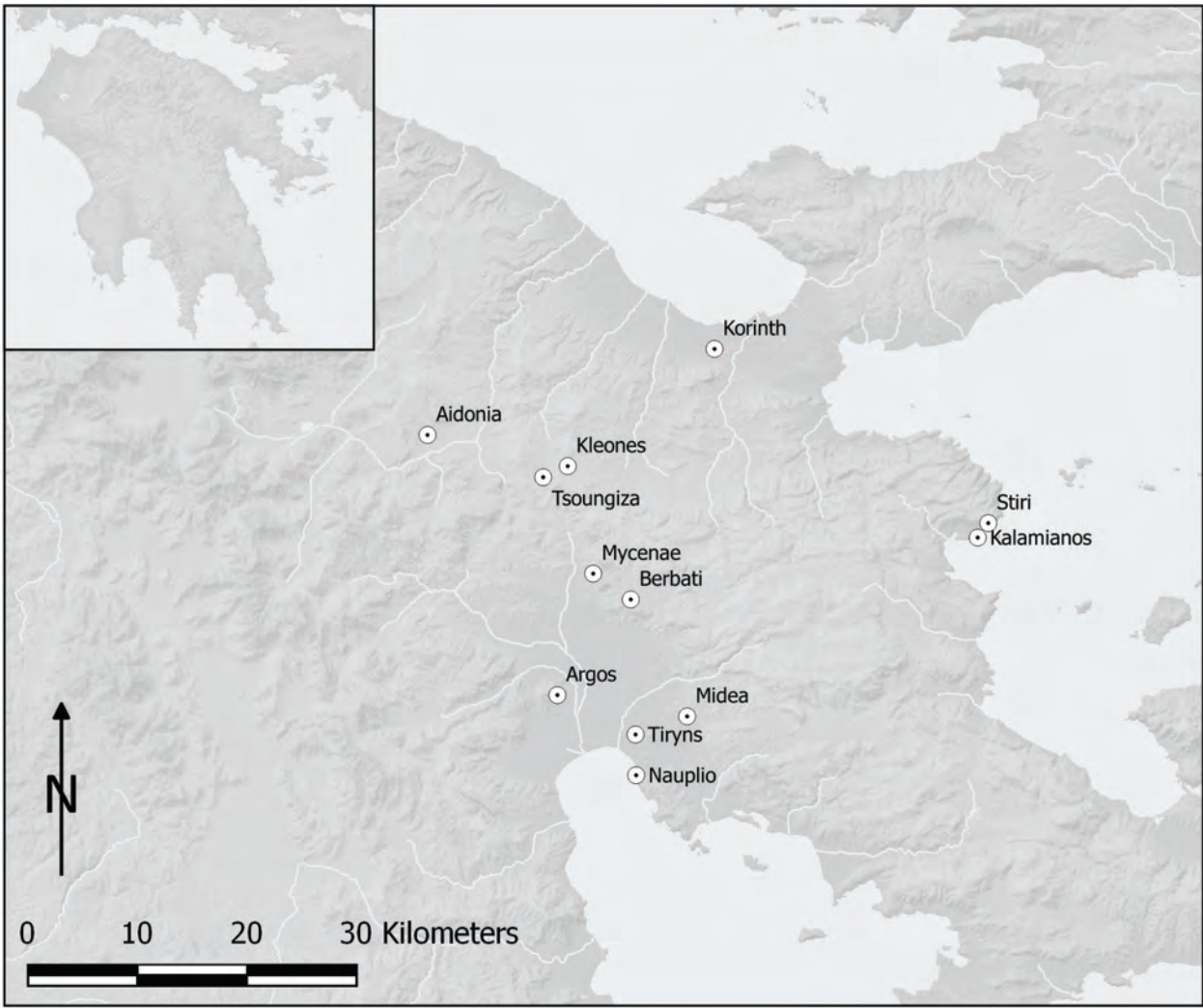


Figure 1: Map of study area including sites mentioned in text. (Figure compiled by Price using QGIS software)

uniquely situated to dominate all the area it oversees and to exploit upland pastures, lowland fields, and routes to and from the shore approximately 20 km to the south. The palace of the fourteenth to thirteenth centuries BC (LH IIIA–B) was built and rebuilt during a long and prosperous phase with ever-increasing signs of centralized control, such as organized building programs that would have required a large workforce—used to create the structures on the acropolis and its fortification, on the one hand, and extramural burial monuments and regional infrastructure, on the other (Iakovidis 1983; French 1989; 2002; Iakovidis and French 2003).

The dataset we utilize here is derived primarily from houses in the extensive settlement on the lower slopes of the ridges and hills surrounding the citadel to the north and west (Iakovidis and French 2003), including Petsas House, a 14th century BC residence

and ceramics workshop (Shelton 2010; 2015), and the Ivory Houses, four domestic and industrial structures destroyed in the 13th century BC (Tournavitou 1995), thus spanning most of the palatial period at Mycenae. We utilize new extra-palatial data derived from a large deposit of material, including preliminary analysis of one quarter of the massive animal bone assemblage of over 60,000 fragments total, excavated between 2002 and 2007 from a well, located within Petsas House. Additionally, excavations at the Ivory Houses yielded the largest number of Linear B tablets from Mycenae, which inform our reevaluation of the site economy. While these tablets were not found in a large enough quantity to constitute an archive, the texts inscribed on them included reference to the acquisition of oil, wool, and, more importantly for this study, edible plants (Bennett and Chadwick 1958; Tournavitou 1995, 257–276). Because these houses were located outside of the fortified citadel, they may have played some role in the

palatially-administered economy, but there is the equal likelihood that they also participated in extra-palatial economic activities.

Overview of mycenaean subsistence activities

Primary production activities at Mycenae illustrate the integrated nature of this landscape in that a series of decisions regarding the management of land, and other resources, were certainly made at the administrative level by officials who may not have been actively involved in farming or herding; yet production itself took place outside the main administrative center. These decisions are attested in the agriculturally-focused landscape management installations, monuments that must have been built with palatial support and still survive throughout the immediate hinterland of Mycenae (Iakovides and French 2003), and in Linear B texts that discuss the management of animal products and food resources (Bennett and Chadwick 1958; Chadwick *et al.* 1962; Tournaïtous 1995; Ventris and Chadwick 1973). At the same time, we estimate that activities carried out beyond the Cyclopean fortification walls, such as the acquisition of wild game and the gathering and household cultivation of edible plants and aromatics would have been less regulated and therefore, carried out according to choices outside of palatial administrative control. The results of those independent choices would have resonated in and out of the urban core. Such activities also may have set the stage for the circulation and exchange of goods across socio-political boundaries, as well as market-type activities, that may have taken place in houses which functioned independently or semi-independently of the palace center (Aprile 2013; Hruby 2013; Parkinson 2007; Whitelaw 2001). Therefore, an agricultural model centered on extensive palatial production of wheat, barley, and sheep does not fully account for the production of other goods, which were integral to processes of economic change over time.

Because of the broad array of evidence for food production and acquisition available from Mycenae, extending from the palace center to the hinterland, we have the opportunity to view the palace as more than a 'consumer city' (Weber 1969; Finley 1973) or the final destination of upwardly mobilized goods (Gamble 1982). Reassessment of the role of the palace beyond consumption is particularly warranted in this case considering the active part the palatial administration seems to have played in supporting agricultural production in the form of landscape infrastructure, which was substantial enough to have controlled water (Iakovides and French 2003), for example, and facilitated movement throughout the hinterland (Jansen 1994). Therefore, we argue that it is more constructive to imagine Mycenae as a whole, palace and beyond, which encompassed a variety of interwoven regional

and micro-regional economic networks that aided in sustaining the palace but did not entirely stem from it and were by no means controlled by it.

Agricultural geography

Before looking closely at these networks, it is advantageous to reexamine what we term Mycenae's agricultural geography. Agricultural geography, as we define it, includes not only lines of connectivity between inhabited centers of various sizes or site hierarchies but also centers connected through the surrounding productive landscape. In the case of Mycenae, we can envision the whole landscape as one interwoven with diverse social, economic, and political networks but organized on the whole through subsistence activities and defined by competition, cooperation, and negotiation.

Competition in the agricultural landscape is most immediately apparent to the west and south of Mycenae over the Argolid Plain. Within this area are located Tiryns, Nauplio, Argos, and Midea, all of which were substantial settlements that matched or rivaled Mycenae for the status of palace center. It has been proposed that, among these settlements around the plain, there was differential access to imported goods (Burns 2010), a variety of exchanges between palace centers and non-palace centers (Sjöberg 2004), and the visibly competitive use of natural resources like architectural stone (Wright 1987, 2009), as opposed to a single, dominant palace that controlled exchange networks in the region (Voutsaki 1995, 2001, 2010). This diversity of interactions suggests that an environment in which competition and negotiation among and between centers would have been much more the norm than dominance by one or more central palaces.

By analogy, then, we can speculate that the environment of social and political competition and negotiation apparent in the exchange of goods and the deployment of natural resources extended to the physical environment as well. The arable land of the Argolid Plain, which was located in the periphery of each of the abovementioned centers, would have been a valued natural resource. Geological investigations of the plain suggest that the soil was fertile and well-drained, and therefore would have been readily cultivated (Finke 1988; Philippson 1959; van Andel, Zangger, and Demitrac 1990; Zangger 1992, 1993). Even though the land of the plain may not have been farmed as aggressively in the LBA as it is today, surely each of the Argolid centers would have relied to some extent on the nearby arable fields where cultivators could have sown grain crops that contributed significantly to the agricultural economy. Given that large tracts of fertile flat land are atypical in southern Greece and that the land of the plain was of limited availability,

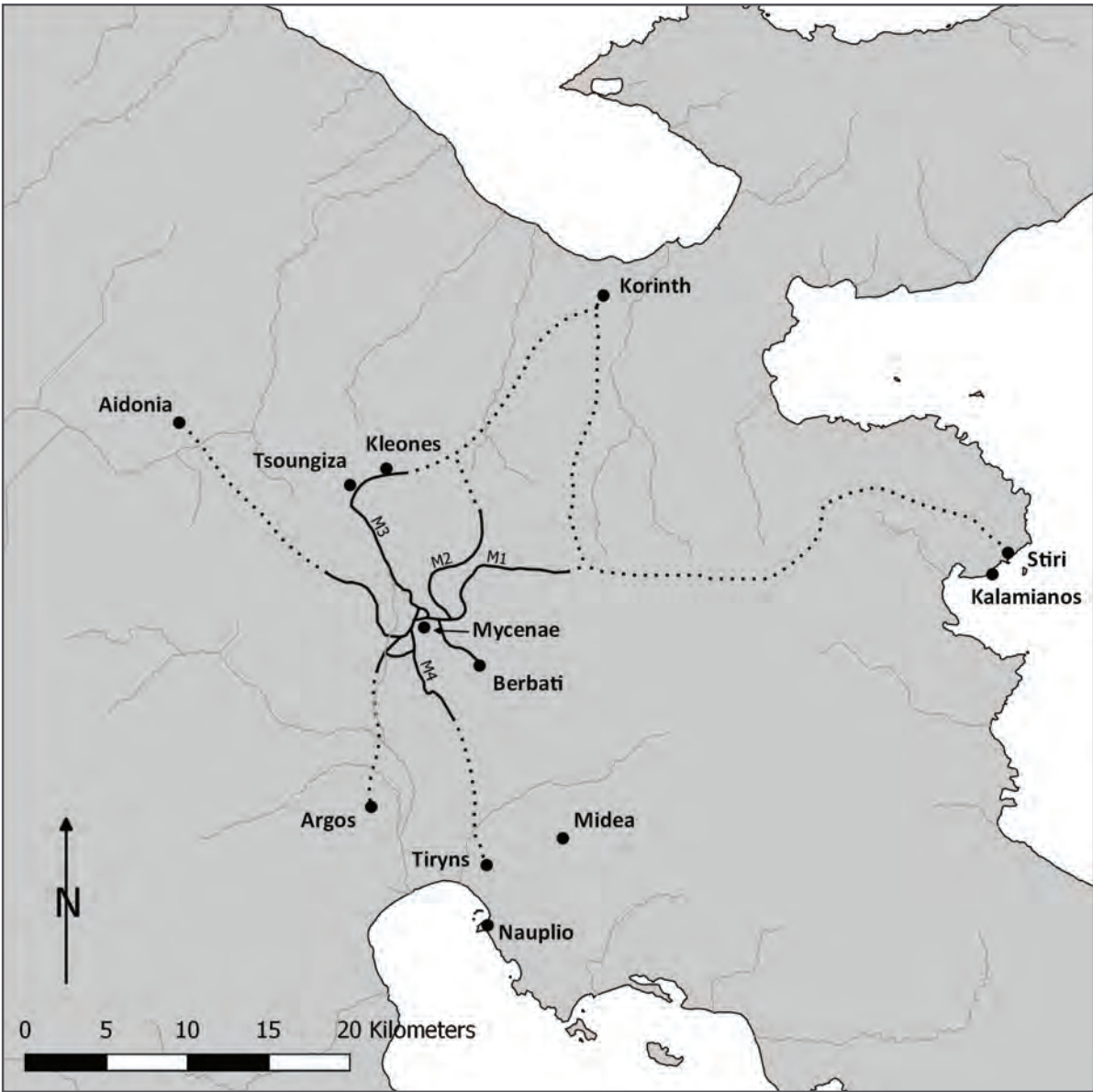


Figure 2: Map of Mycenaean roads. (Figure compiled by Price using QGIS software)

it is reasonable to suggest that the Argolid centers competed for access to these fields or even to crops grown on it.

Traces of this sort of competition are certainly difficult to identify, especially since the Argolid Plain remains a valuable piece of agricultural land and for this reason has been deeply plowed for many years. But, the remains of Mycenae’s road system (Figure 2) and associated installations (Iakovides and French 2003; Jansen 1994; Lavery 1990; Mylonas 1966: 86-87) provide some clues to their approach to the agricultural landscape. Three roadways, with preserved traces of ruts and paving, extended to the north and east of the palace (M1, M2,

and M3) beginning at the Lion Gate. Although these roads appear to have headed towards non-palatial settlements in the Corinthia, such as Tsoungiza and Aidonia, their immediate purpose seems to have been to open up access to farmland just outside the settlement of Mycenae and to the upland fields around Berbati. These hilly areas preserve the best evidence for their routes in the form of installations built into the roadways for the purpose of controlling the seasonal flow of water through *remata*. Road terraces with drainage culverts and weirs, built in Cyclopean masonry, mark the path of the roads. These landscape features would have mitigated soil erosion and aided in the control and conservation of precious water. The

remains of agricultural terraces — probably Mycenaean — were also identified by the Mycenae survey in hills surrounding the acropolis and by the Berbati-Limnes survey (Iakovides and French 2003; Schallin 1996: 172). Terraces would have created flat land for farming but also would have helped drain excess water while retaining moisture in the facade and interior packing of the retaining wall.

All of these water and soil conservation features would have been critical to successful cultivation, and they also illustrate multiple perspectives on the land north and east of Mycenae. The investment of labor and resources needed for paved roadways, Cyclopean water management installations, and systems of agricultural terraces was substantial enough that they could only have been constructed with palatial resources; and, to invest in these constructions, the palace must have seen land tenure as stable and their need for agricultural goods as somewhat predictable. The farmers, too, who may have contributed labor in return for more productive fields, may also have maintained some confidence in their attachment to the land and their ability to produce enough to support themselves and return something to the palace as well. For these reasons, the heavily managed landscape surrounding Mycenae and the upland basins of Berbati does not seem to have been contested, nor does there seem to have been rivalry for access to it.

The Berbati-Limnes survey also noted an increase in the number of settlements scattered throughout the survey area during the palatial period at Mycenae (Schallin 1996: 170-172). An increase in dispersed settlements, as opposed to a single centralized settlement, suggests that cultivators were living closer to their land. The changes in settlement patterns, in conjunction with the aforementioned investments in landscape modification, indicate changes in the organization of agriculture in the Berbati region at this time. Terracing would have created more land for farming and would have varied the cultivation environments by adding fields that would have been suitable as much for arboriculture and horticulture as wheat or barley. The presence of terracing in areas where farmers had easier access to some fields than others reinforces the idea that land was being farmed in multiple ways (from extensive to intensive or something in between) and that a variety of crops were cultivated to meet the wide range of palatial needs suggested in part by Linear B texts (Kvapil 2012).

The promotion of stability in landholding through their palatial support of the construction of terraces and water management installations along with the investment in a road system that made fields more accessible and facilitated the movement of agricultural goods, illustrates the role that the palace played in the development of a regional agricultural network.

While it may not be possible to determine the type of role Mycenae played, the seeming lack of competition, appearance of stability, and increase in cultivation suggest that the settlement pattern changes came with the cooperation of regional inhabitants.

Mycenae's interest in landscape modification appears less significant to the south, where roads stemming from the acropolis headed in the direction of the plain but ultimately towards the other Argolid centers. The M4, for example, seems to have had the purpose of linking Mycenae to Tiryns, in which case it may have been used as much for the competitive exchange of luxury goods between palatial elites or negotiated access to the sea as it may have been for facilitating access to agricultural land. If there was competition between Mycenae, Tiryns, and Midea for the scant arable land of the plain, as suggested above, perhaps there was not enough stability of land tenure in areas beyond the southern Mycenaean roadways to support a serious investment in infrastructure and landscape modification. Instead, roadways connected palaces to palaces rather than palaces to stable landholdings. This difference in the itineraries and ultimate goals of the roads may be a sign that the Argolid Plain was more of a contested landscape between the palaces that surrounded it.

In the Corinthia north of Mycenae we can see possible evidence for cooperation rather than competition and indications that aspects of primary production may have been negotiated features of the agricultural economy. At Kalamianos (Tartaron *et al.* 2011), Tsoungiza (Dabney, Halstead, and Thomas 2004), and Aidonia (Demakopoulou 1996), there are signs of local elites who defined themselves as such in part through the use of Mycenaean material culture, including fine, decorated pottery. The absence of a palace structure in these areas has raised questions (Pullen and Tartaron 2007), however, about the overall status of these sites in a scheme where palatial centers seem to have been more powerful, regional entities. Yet, the palace at Mycenae in particular would have had reason to be involved in these areas. Tsoungiza (Cherry and Davis 2001; Wright *et al.* 1990) and Aidonia (Hachtmann 2013) may have controlled important land routes to the western Corinthia and interior of the Peloponnese, respectively, while Kalamianos had a deep sea port that allowed access to the Saronic Gulf and sea lanes beyond (Tartaron *et al.* 2011). Mycenae, especially in view of the potential competition for access to similar routes to the south mentioned above, might have relied on negotiated relationships with all of these centers, and those negotiations might have been to some extent structured around and related to agricultural production that, in turn, contributed to palatial development. The agricultural land surrounding each of these Corinthian settlements makes it possible that

they were, as Pullen has suggested for Kalamianos (this volume), agriculturally self-sufficient, which likewise indicates that the offer of surplus subsistence goods from a palace center might not have been a powerful bargaining chip on the part of Mycenae.

What Mycenae could have offered in return was help in structuring and enhancing the agricultural landscape, with an eye towards increasing overall production to the benefit of local residents and with the possibility that some of the surplus might ultimately be returned to the palace at Mycenae. In return, the palace may have received favorable access to Corinthian land and sea routes. Evidence of this can be found in the draining of the Nemea Valley, which has been noted as a sizeable endeavor that could only have been completed with assistance from an entity like the palace at Mycenae (Cherry and Davis 2001). Additionally, at Kalamianos, the organization and construction of the LBA terraces discovered within and outside the settlement of Kalamianos and at the nearby upland settlement of Stiri reflect knowledge and understanding of large-scale construction projects and a broad perspective on the surrounding landscape that has so far been detected only at palace centers (Kvapil 2012); and, of all the Mycenaean palace centers, this sort of large-scale program of landscape management aimed at increasing agricultural production appears particular to Mycenae. The high degree of control over land use suggests that Mycenae may also have had a hand in cultivation strategies at these sites to their own benefit. Indeed, the absence of evidence for landscape management around the cemetery site of Aidonia coupled with Aidonia's decline throughout the LH period (Hachtmann 2013), at a time when settlements like Kalamianos were flourishing, might suggest that agricultural negotiations in this area were not always successful.

Agriculture and degrees of palatial control

If we turn our attention back to Mycenae itself and the immediate hinterland, evidence points to many subsistence activities that were performed outside of, or on the outskirts of, palatial control; and yet these activities had broad resonance on the palace economy and those associated with it. Based on the predominance of Linear B records with a focus on counts of sheep and wheat (Killen 1964; Palmer 1992), palatial control over different sources of subsistence provisioning and redistribution was likely not equal among all of the species utilized, especially when wild taxa are also considered. We explore zooarchaeological, archaeobotanical, and textual evidence to illuminate variation in the degree of control practiced by palatial authorities over the plants and animals to better understand the economies which functioned at Mycenae.

Animal acquisition

Estimates of the proportion of wild game utilized in extra-palatial areas provide an avenue to assess the type of animal access available outside of the palace at Mycenae. Even though there are limited references to wild animals in Linear B texts (Halstead 2003; Ventris and Chadwick 1973), a range of wild species have been recovered with good preservation at Late Bronze Age sites, including Mycenae. Although there are few comparative sources specifically for small wild animals at LBA Aegean sites, the percentage of small game taxa represented in faunal assemblages (hare, wild carnivores, and hedgehogs) is higher from the well in room Π at Petsas House at Mycenae (3.5%) (Meier *et al.* In Press) than at Lerna (0.3%; Early and LBA), Pevkakia (0.4%; Early, Middle and LBA), and Kastanas (1.9%; Early-LBA) (Halstead and Isaakidou 2013). This suggests that small wild animals were more frequently acquired for a variety of uses, likely for food or skins, in the LH IIIA2 period of Petsas House than at other sites with multiple periods combined. Birds, fish, and shellfish remains comprise an additional 9.3% of Petsas House fauna, indicating that other small wild species were a noteworthy part of animal subsistence at the site. Such supplementation of the diet with hunted or caught wild game is expected to reflect incomplete consumer dependency on state-regulated, specialized animal production with centralized distribution based on models of early state-level agriculture in the Near East (Zeder 1991). Overall, the high proportion of small, wild game at Petsas House suggests that wild animal resources were used to supplement the diet, and, thus, these extra-palatial occupants were not completely dependent on palatially-regulated subsistence resources.

We further explore the degree of self-provisioning of subsistence practiced at Petsas House by focusing on shellfish and deer exploitation. Shellfish made up a considerable portion of the wild game diet at Mycenae. Of the shell remains, 24 species have been identified thus far in the Petsas House assemblage and shells make up 5.3% of the assemblage currently under study — the majority of which are the edible *Arca noa* variety. Interestingly, these shells are as highly represented in the assemblage as cattle, although they were not nearly as calorically valuable. Still, if brought to the site with fresh meat, shellfish represent a salient portion of the diet at Petsas House.

This preliminary observation sheds light on the marine component of the diet available inland at this time, possibly as a supplementary resource used for independent provisioning of Petsas House. Alternatively, it may reflect that Petsas House had access to an organized system that mobilized marine resources and made them available, such as a market.

Access to mobilized marine resources also may denote a similar diet at Petsas House to earlier elites from the Grave Circle A and B, as isotopic studies indicate bone collagen from some of the adult burials to be enriched in nitrogen, suggesting a greater contribution of marine resources to their general subsistence diet (Richards and Hedges 2008).

Rarer wild species used at Petsas House include the three types of deer most commonly found in the Aegean (Trantalidou and Messeti 2014). Red, fallow, and roe deer were identified as a rare part of the Petsas House assemblage (<1%). These taxa likely represent hunted animals, because they were identified based on the bone and tooth remains present, rather than antler, which could have been gathered.

The presence of deer in the Petsas House assemblage can be interpreted as evidence of limited deer use, potentially reflecting hunting outside of the realm of more specialized production controlled by the palace. However, Linear B texts suggest that some deer populations may have been monitored by some palatial authorities (Palaima 1992). Also, deer have been connected to elite Mycenaean hunting practices (Hamilakis 2003, Bennet 2001), such as at Pylos where deer use was associated with feasting (Stocker and Davis 2004). It has even been speculated that deer parks may have been maintained as elite hunting grounds by the Mycenaeans just as in Medieval periods (Hubbard 1995; Halstead 1998-1999; Hamilakis 2003).

Overall, assessment of the level of palatial control over wild animal subsistence at Mycenae is especially complex, because it may vary for reasons other than the scale of centralized control over select animals. First, hunting/obtaining wild resources could have served to create surplus (i.e., O'Shea 2004; Halstead 1990). Wild game also likely served as a buffer in times when herd production goals focused on maintaining herd security, limiting animal kill-off to increase the size of the herd, and also when catastrophic losses of animals occurred due to climatic factors or disease (Redding 1981). Similarly, increases in wild game use may reflect times of greater economic collapse, as has been argued for Tiryns (von den Driesch and Boessneck 1990). Wild game hunting also may vary for social reasons, because it is important for negotiating the social and political roles of hunters that provisioned elite activities with animals (Hamilakis 2003; Halstead 1998-1999; Morris 1990).

Although interpretations of the wild animals exploited at Petsas House in the settlement of Mycenae involve many factors, the presence of a high proportion of small wild game, marine resources, and some deer suggest that not all subsistence provisioning at the site was strictly under palatial control, even at a structure

immediately outside of the citadel. Yet, use of these specific wild taxa may also hint at the potential high status of the Petsas House occupants, given that deer and marine foods have been connected to elite Mycenaean hunting activities and diets. This view of the animal economy from Mycenae suggests that some supplementary animal acquisition was practiced outside of the palace, although possibly due to privileged status at the house. Even so, this supports the supposition that not all subsistence acquisition was under control of the palace and therefore, cannot be explained through a traditional center-periphery redistributive model.

Plant acquisition

Our best evidence for the acquisition of edible plants — excluding those that seem to have typically been distributed as rations like wheat, barley, or figs — is the Ge series of tablets from the House of Sphinxes at Mycenae. The House of Sphinxes is one of the so called Ivory Houses located outside the citadel wall to the west of the acropolis. This series of tablets and fragments, found in Room 6 of the House of Sphinxes, was part of a larger group of tablets that had been damaged by the excavation of a latrine during the Hellenistic period (Bennett and Chadwick 1958: 11; Tournavitou 1995: 54-55). Several of the surviving tablets contain lists of aromatic plants that may have been used for medicinal purposes, but they could also have been consumed fresh, dried, or in seed form (Small 1997; Wylock 1972). Regardless of their use, reference to the distribution of edible plants in Linear B texts indicates the point at which they entered an administered economic network, although there is some ambiguity as to who was administering this network — the palace or the residents of the house with some independence from the palace, or some other entity. Although the conditions under which these plants grew might be even less clear, there are clues that suggest some plants were purposefully cultivated, while others were gathered wild; either way, they were likely produced or acquired outside the control of the palace.

Eleven identifiable plants are named in the Ge texts (Bennett and Chadwick 1958; Ventris and Chadwick 1973: 104-107), the use of which would have ranged from food to medicine. Some of these plants could have been eaten fresh; others, used as dried or fresh aromatics, may not necessarily be considered strictly subsistence plants, but they would have added variety to an otherwise bland diet. Some, such as cumin (*ku-mi-no*), sesame (*sa-sa-ma*), white and red safflower (*ka-na-ko re-u-ka* and *ka-na-ko e-ru-ta*), and coriander (*ko-ri-ja-da-no*) are known to have been domesticated in the LBA (Gallant 1985; Wylock 1972; Zohary, Hopf, and Weiss 2012: 112-113, 163-165, 168). Growing and harvesting these aromatic plants would have been labor intensive, requiring more work than was needed for the wheat,

barley, and olives that are prominent in the extensive agricultural model. Coriander (*Coriandrum sativum*), for example, requires much more sunlight, regular watering and weeding, and deep, well-drained soil (Small 1997: 222-223; Wylock 1973: 136). With careful tending by hand, this fresh herb, could have been sown multiple times a year and would have produced coriander seeds at the end of its life cycle. For the seeds to be edible, the umbels containing them had to be dried and winnowed to remove unwanted material, and then dried again (Small 1997: 223; Wylock 1972: 116). Similar labor-intensive processing would have been required of each of these aromatic plants. The labor intensive cultivation and processing needed for coriander, as well as cumin, safflower, and sesame, would have made these plants ideal for kitchen gardens or terraced environments close to the Mycenaean home from which they could be readily tended, harvested, and processed; this also means that the production of these plants would not fit with the extensive model of farming practiced at the palatial level.

There is no clear evidence, on the other hand, that the other aromatics mentioned on the Ge tablets — fennel (*ma-ra-tu-wo*), celery (*se-ri-no*), pennyroyal (*ka-ra-ko*), cress (*ka-da-mi-ja*), mint (*mi-ta*), or sweet rush (*ko-no*) — had yet been domesticated in the LBA (Wylock 1972; Zohary, Hopf, and Weiss 2012: 112, 160-161). Each of these particular plants thrives in some kind of aqueous condition. Wild celery (*Apium graveolens*), for example, prefers water-saturated soil, as does garden cress (*Lepidium sativum*) (Huxley 1992: 1.511, 557; Small 1997: 123; Wylock 1972: 133). Many types of *mentha*, the species that includes mints but also pennyroyal (*Mentha pulegium*), grow well in moist environments (Huxley 1992: 3.220; Small 1997: 355; Wylock 1972: 139). Water-rich environments may have existed naturally in Mycenae's hinterland as a result of fall or winter rains or near water sources beyond the acropolis, but, the unpredictability of the weather would have made deliberate cultivation in these environments difficult to control artificially, and cultivators would surely have struggled to ensure a regular harvest. It is much more likely, given the conditions needed for these plants, that they were gathered wild.

The ways in which the commodities were listed in the Linear B texts reinforces the notion that there were differences in the ways these plants were produced. There are only a handful of tablets, so it is necessary to acknowledge that the data set is small, but that does not preclude it from being informative. From this group of tablets, MY Ge 605 (Figure 3) serves as an instructive example (Melena and Olivier 1991: 61). This tablet shows a column of names on the left side. To the right of each name is written a list of commodities in different quantities. The commodities listed first are the most standardized. They include red safflower, measured

in bunches and white safflower, coriander, and cumin all measured in seed form. Even though the right side of the tablet is quite damaged, it is apparent that the recording of the commodities becomes less orderly towards the end of the list following each name. Sesame, fennel, and mint are present but in irregular locations compared with the commodities listed earlier, such as *ka-na-ko e-ru-ta-ra*, *ka-na-ko re-u-ka*, which is repeated three and possibly four times.

MY Ge 605 is not the only tablet to display this sort of standardization followed by a less regular order. On MY Ge 603 (Melena and Olivier 1991: 59) (Figure 4) the plants are referred to more frequently by their ideograms, but the standardization of the list also breaks down as the text moves from left to right. *Ko-ri-ja-da-no* and *ku-mi-no* begin each list, but the regular amounts of coriander and cumin are followed by various quantities of fennel, mint, sweet rush, and red safflower. The regularized recording and repeated quantities of safflower and coriander on MY Ge 605 and coriander and cumin on MY Ge 603 support the notion that some of these commodities seem to have been cultivated and harvested on a regular basis, while plants like fennel, mint, and sweet rush may have been gathered and, therefore, may not have been available with the same regularity. It is also worth noting that some plants that may have been cultivated, such as red safflower, are listed with regularity on one tablet, but appear in a less standardized way on other tablets. The irregular recording of plants that were likely cultivated further emphasizes painstaking cultivation and uncertain results associated with these types of crops.

A tally of the total amounts of each quantity listed on each tablet in this series also suggests that some items were more regularly attainable than others. Coriander appears in the greatest quantity, followed by red safflower, cumin seed, sesame, and white safflower, all of which were recorded in some kind of standardized fashion on MY Ge 603 or MY Ge 605. In comparison, pennyroyal and garden cress occur only once and the amounts do not survive, while sweet rush is recorded in a variety of unquantifiable amounts. Fennel and celery appear in sizable quantities, but they are not recorded in a standardized way. Since there is little evidence that they were cultivated in the Mediterranean in the Bronze Age, it seems reasonable to suggest that the amounts recorded in the texts indicate that celery and fennel were gathered in abundance the year the texts were written.

Given that plants like fennel, celery, garden cress, pennyroyal, and rush are not known to have been domesticated during the LBA and would have required high maintenance growing environments, it is reasonable to suggest that these plants were gathered wild and that they would have been available only in

MY Ge 605

| | | | | | | | | |
|----|---------------------|-----------------------------|---------------------------------|--------------------------|-----------------|--------------|---------------------------|-----------------------|
| 0 | <i>vacat</i> | | | | | | <i>vacat</i> | |
| 1 | pe-še-pō | | | |] ka-na-ko M 2[| | ka-]ra-to | *155 ^{vas}] |
| 2A | | [ka-na-ko] e-ru-ta-ra M 3 | | ka-na-ko re-u-ka V 1 | | ma[-ra-tu-wo | mi-]ta PE 1 | ša[-pi-de |
| 2B | pu ₂ -ke | |] na T 2 | | ku-mi-na V 1 | sa-sa-[ma | |]da 14[|
| 3A | | ka-na-ko e-ru-ta[-ra | |]ka-na-ko re-[u-ka] Z 2[| | | | <i>inf. mut.</i> |
| 3B | pe-ke-u | | ko-ri-ja-da-na T 2 [| ku]-mi-no Z[| | | | |
| 4A | | ka-na-ko e-ru-ta-ra M 2 P 1 | | ka-na-ko re-u[-ka | | | | <i>sup. mut.</i> |
| 4B | ka-e-se-u | | ko-ri-a ₂ -da-na T 2 | | ku-mi-no Z [| | |] <i>vacat</i> |
| 5 | ke-po | | ko-ri-a ₂ -da-na T 2 | | | |] *155 ^{vas} 1 [|] <i>vacat</i> |
| 6A | | | ku-mi-no Z 2 | | | | ka-ra-[- |] sa-pi-de 12 |
| 6B | i-na-o | |]ka-na-ko re-u-ka[| |] sa-ša-mia Z 2 | | mi-ta PE 1 | |
| 7 | | | <i>vacat</i> | | | | | <i>inf. mut.</i> |

Figure 3: Transliteration of tablet MY Ge 605.
(Adapted by Price and Kvapil from Melena and Olivier 1991)

MY Ge 603

| | | | | | | | | |
|----|---------------|-----------|--|----------------------|---------------|-------------|-------------------------|-----------------------------------|
| 1A | | | | | | |]ka-ra-to | *155 ^{vas}] |
| 1B | ke-po | ko AROM 2 | | ka-na-ko re-u-ka V 1 | da-ra[| mi-ta-qe 20 | ka-na-ko e-ru-ta-ra M 1 | |
| 2A | | | | | | | ka-na-ko M 1 | *155 ^{vas}] |
| 2 | pu-ke-o | KO T 2 | | KU V 2 | MA Z 2 | SA Z 2 | ko-no 10 | e-ne-me-na 1[|
| 3 | i-na-o | KO T 2 | | KU V 2 | [MI 20] | ko-no 10 | E 1 | ka-na-ko e-ru M 1 [<i>vac.</i> |
| 4 | ra-ke-da-no | KO T 2 | | KU V 2 | [MI] ko-no 12 | E 1 | | *155 ^{vas}] |
| 5 | a-ke-re-wi-jo | KO T 2 | | KU V 2 | MA V 1 | ko-no 10 | DE [] | *155 ^{vas}] |
| 6 | pe-ke-u | KO T 2 | | KU V 1 Z 2 | MA V 1 | ko-no 10 | E 1 | ka-na-ko |
| 7 | pu-wo | KO T 2 | | KU V 2 | | | | *155 ^{vas}] |

Figure 4: Transliteration of table MY Ge 603.
(Adapted by Price and Kvapil from Melena and Olivier 1991)

season and under the proper growing conditions. Those plants that were known to have been domesticated and which appear with greater regularity in the text may have, alternatively, been carefully grown in kitchen gardens or on terraces that could have been located near the houses of the settlement or on hillsides at some distance from the acropolis. The differences in methods of recording commodities and the overall quantities for each plant suggest that some of these plants were being cultivated intensively on a small scale in controlled environments that allowed for regular harvests, while others were being gathered when they were available in season. In neither case does it appear that the palace was a controlling force in the cultivation of these aromatics. The availability of coriander or cress, for instance, would have depended on the willingness of a small-scale producer who could devote time to either intensive cultivation or gathering. Considering that there were so many factors affecting the reliability of the production of these plants, one begins to wonder whether the tablets were records of taxation, as Killen has interpreted (1981). Because of the likely method of production and acquisition, perhaps it is more reasonable to say that producers circulated these plants

extra-palatially, through trade or exchange networks along kinship lines, by means of market-style activities, or the like.

Food, goods, and market exchange

Market-exchange on some scale is one possible type of exchange that might reconcile the diverse lines of evidence available at a site like Mycenae while at the same time integrating the surrounding agricultural landscape. Indications of market-style activity can include specialized production and the organized and predictable mobilization of goods in such a way that allows households and palaces alike both to have access to specialized goods (Shelton 2010) and to provision themselves. While we cannot at this point say that these are certain indicators for the existence of markets, if one defines market activities as any negotiated exchange of goods, it is not hard to imagine that specialists residing at or near the palatial center might take advantage of non-regulated exchange opportunities to fulfill subsistence needs. Such market exchanges would also have facilitated vertical mobilization among non-elites that transcended the geographical and political

boundaries of production and consumption that are imposed by binary models of exchange (Earle 1977, 2002; Price 2015).

At Mycenae, we can detect some signs that market-type exchanges might have occurred. The formalization of road networks around Mycenae certainly would have aided in the regular circulation of goods within the settlement and immediate hinterland and between Mycenae and other centers. Faunal data from Petsas House, roughly contemporary to the construction of the Mycenae road system, shows the presence of diverse types of wild game in conjunction with evidence for local stock-keeping (Meier *et al.* In Press); together these data indicate that households in the settlement likely had broad access to a variety of food types consistent with market availability. Textual records for diversity in the production of edible plants and their accessibility to consumers both within and outside the citadel, suggest that this trend continued at least until the Ivory Houses were destroyed at the end of LH IIIB1 (middle of the 13th century BC). Comparing botanical and faunal data with that for the distribution of pottery over a similar geographic area might be a fruitful way to further explore this question.

Conclusion

In this paper, we have redefined how we conceptualize urban centers, such as Mycenae, within their broader agricultural economy. We suggest that in this case, even though Mycenae was ‘the’ palace center, it was simply ‘a’ center for the myriad networks through which subsistence goods moved, of which none can be strictly defined as palatial or non-palatial. Nor can subsistence practices in general at the site be defined as distinctly palatial or non-palatial. Within the grayed realm of food provisioning, we see the involvement of a multitude of agents, each of which had varying degrees of control over the process. Cooperative efforts between palatial administrators and cultivators shaped parts of the natural landscape into series of interconnected fields that were constructed according to a shared vision of future production; in other areas, the agricultural economy may have been enmeshed in political and social networks that were more fluid and changeable. In these cases, it is important to remember that small-scale agricultural producers needed to protect themselves from more than just agricultural failure (i.e. Halstead and O’Shea 1982). Instead, their capacity to produce and exchange agricultural goods may have been limited to some degree by inter-palatial rivalries, parleys between elites, and the failure or success of the palatial authority.

Regardless, faunal remains and textual evidence hint at the existence of an underlying web of subsistence networks in which there were numerous independent

centers of production and acquisition and through which the circulation of goods may have been enacted along kinship or community lines or through informal or occasional market activities. Some form of redistribution of upwardly mobilized goods from the palace to people like corvée laborers surely took place; but, people cannot live on wheat, barley, or figs alone. Strategies like hunting deer and gathering shellfish or fresh aromatics were still important means of food provisioning but also were social levelers in that an elite might feast on seafood and red deer with fresh herbs like a resident of the greater settlement or a rural farmer, but the farmer might have the best access to these foods, which are sometimes labeled as elite.

Through this lens emerges an inter-and intra-regional economic network that contributed to sustaining the palace and the people, who inhabited and navigated a highly integrated social, political, and agricultural landscape and whose participation in subsistence activities extended beyond our perceived confines of city and country.

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