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The ‘moving’ taskscape of the Late Bronze Age Argive Plain

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Abstract. Late Bronze Age monumental architecture in the Argive Plain consisted of a wide range of fortified structures, funerary monuments, and engineering works. Beyond these large-scale constructions, the Mycenaean landscape must have been dotted with domestic housing, farms, workshops and many others that must have housed every possible aspect of daily life. This paper examines how people in the Argive Plain and surroundings in the 13th century BC managed to build large-scale, while also taking care of daily agricultural and other activities. Ingold’s concept of the taskscape illustrates this very well: when comparing the building efforts and selected craft activity efforts with the agricultural activities and burdens, it seems that resources employed outside agricultural work were of sufficiently small numbers to allow such work alongside agricultural work, especially if elites would respect the pivotal agricultural calendar. Whether elites allowed people to prioritise agricultural tasks is not known, and the need for more labour forces was perhaps more concentrated in the last few decades of the 13th century BC. However, despite this period of possible labour pressure, people’s flexibility of moving between jobs (building, agriculture) could have grown their resilience enough to withstand further pressure towards 1200 BC.

Introduction

In the Late Bronze Age (LBA) Argive Plain, monumental architecture consisted of citadels, tholoi, and built chamber tombs, fortification walls, and engineering works such as roads, bridges, and dams. Next to these, domestic housing, farms, workshops, and many other structures must have housed a wide range of activities, which dotted the Mycenaean landscape. This paper examines how people, based in the Argive Plain and surroundings in the 13th century BC, managed to build on such a large scale, while also taking care of daily agricultural and other activities. During the past years, the SETinSTONE project investigated whether the efforts needed for building on such a monumental scale in the region were detrimental to the resources of the LBA communities in the Argolid, and whether potential resource exhaustion, if any, contributed to the so-called collapse of the Mycenaean polities.¹ While the project’s architectural results in terms of the cost of labour of monumental architecture and earthworks became apparent, and because of the complex role that such building programmes played in the cities in the Argolid, Attica, and Achaia (see figure 1), it became essential to investigate several other production lines beyond monumental architecture, such as domestic house building, pottery production, and agricultural subsistence activities. This would help to understand whether this prehistoric period of crises may have been influenced or

triggered by any, or a combination of, these factors, and what the specific role of prolonged building activities would have been. Tim Ingold’s concept of the ‘taskscape’ has been an essential contribution to the understanding of how people in the past managed, together, to spend efforts on both subsistence, crafting, and housing, while also constructing on a monumental scale.²

What *were* the minimum human, animal, and material resource requirements to build on a monumental and domestic scale and to produce the required agricultural produce? *Did* any of these resources become depleted towards 1200 BC, and if so, to which degree? And exactly *how* did people combine these very diverse labour-intensive tasks? In investigating these questions, it became clear that the energy spent by people, both actively in producing and in pro-actively planning ahead, showed patterns of people’s remarkable resilience strategies during potentially adverse times. Therefore, the results presented here combine labour-cost figures of monumental and domestic house construction and pottery production for the Argive plain on the one hand, with people’s agricultural activities on the other. By contrasting these, the largest labour-intensive efforts are placed in context, and multiple relationships, all loosely or tightly knit together into a true taskscape, become more visible.

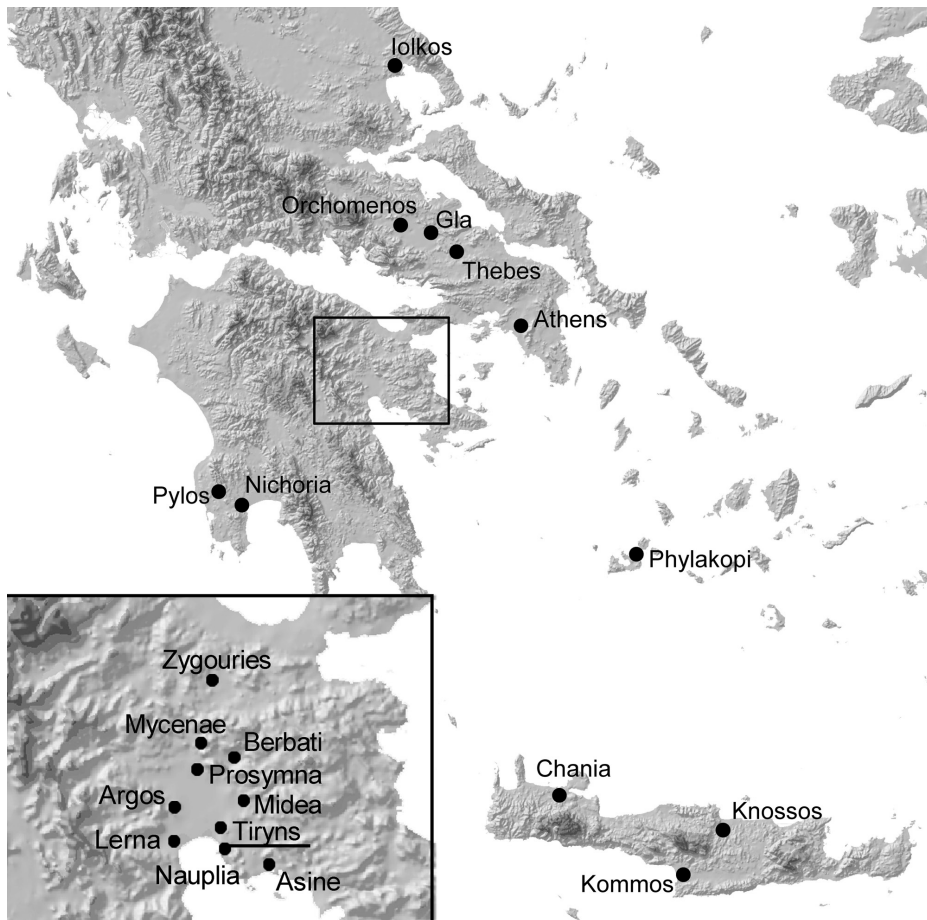


Figure 1. Map of Greece with inset of the Argive Plain and its most important sites (adapted by author from blank map by Anavasi editions/Hans Birk).

Approaches to labour and its costs

According to Ingold, labour is the common denominator of productive activities. Labour is measurable, and therefore quantitative and homogenous. In labour theory, the amount of value of something is determined by the amount of labour that went into producing it. A task reflects work practices, carried out by an (skilled) agent in a given environment as part of a person's daily life-cycle. Ingold does not see any separation between technical and social activities because technical practices are totally embedded in the current of sociality. He employs the concept of taskscape defined as the entire assemblage of tasks, in their mutual interlocking and relatedness, carried out by many people together, in a specific context, which gives it meaning. Landscape, too, consists of a series of many related features and, for Ingold, both taskscape and landscape are qualitative and heterogeneous.³

Labour is measurable and therefore has a currency: clock time of working hours.⁴ This stands in contrast to social time or the lived experience of work in rhythms, rites, feasts, and ceremonies.⁵ If time is linked to labour, and temporality is linked to the taskscape, it means that we are not there as spectators of time passing by, but as participants in the very performance of our tasks because we cannot be disembodied from these tasks. Temporality of the taskscape is social because in performing their tasks, people also attend to each other. In the taskscape

concept, no one works in a vacuum of time or space of sociality. The taskscape also comprises both animate and inanimate beings, and therefore the landscape and taskscape converge together.⁶ These specific points will be addressed later in the discussion section.

For the SETinSTONE fieldwork, architectural documentation on the monumental architecture and earthworks in the Argolid, Attica, and Achaia was carried out between 2016 and 2018 by Daniel Turner, Yannick Boswinkel, Elisa Sioumpara, and myself (see figure 2).⁷ It was the first time that such detailed recording of the architecture took place on almost 100 chamber and tholos tombs, and four citadels. Three-dimensional models based on photogrammetry are a very precise and fast way in the field to collect the needed volumetric data, which in turn can be employed in order to calculate labour efforts carried out in constructing some of the buildings discussed below. Details of the *chaîne opératoire* of this method have been described elsewhere (see also figure 3).⁸ For photogrammetry, we employed both handheld DSLR cameras (see figures 4a-b) and drones depending on which was most suitable for the task. The processed data lent themselves to the method of architectural energetics or labour cost studies. In this process, any effort in architectural production has been quantified based on labour input.⁹ While this method is established for architectural work, it can also be applied to other forms of



Figure 2. SETinSTONE team members Daniel Turner and Yannick Boswinkel carrying out the geo-referencing of the markers at the citadel of Mycenae by means of a Leica Differential GPS in 2017 (figure A. Brysbaert).

production.¹⁰ Values can be expressed in either energy or time, and we opted for time values.

Results

Monumental jobs

A recent reassessment of published and new data has indicated that building the six largest monuments of the late 14th and 13th century BC in the Argive plain,¹¹ together with the eight Mycenaean Highways,¹² and the construction of 5% of the needed chamber tombs in the region, would have taken together minimally 100 people at least 25 to 25.65 years of continuous building if they had been able to work all year round at a pace of 8 hours/day.¹³ Building at this scale depended on a substantial proportion of the available human and oxen resources. While more than 100 people could have been at work simultaneously for specific periods, other tasks needed to be performed as well for the builders to have access to food, tools, housing, and other necessary resources. Large-scale building activities were therefore likely to be spread out over the course of a year when agricultural pressure was low (see table 1), especially if the builders were also the local farmers. In discussing wall-builders,



Figure 3. Employing the reflectorless total station to measure geo-referenced photomarkers on site during the Tiryns fieldschool with colleague Alexis Gorgues in 2015 (figure A. Brysbaert).

an 'all-builder', and carpenters, Nakassis's Linear B study on individual craftspeople in Mycenaean Greece suggests a small specialised, perhaps travelling, workforce for certain building tasks.¹⁴ However, these large additional crews would have been locally recruited and possibly included local farmers.¹⁵ In order to understand how all tasks could have been accomplished, how they could have been spread out over the amount of available people, and how energy could have been spread out over the yearly agricultural calendar, we need to consider the absolute cost figures involved in each of these factors.¹⁶ Likewise we need to keep in mind that comparative labour costs by themselves, e.g. between monumental and domestic building, does not provide insights into how people multitasked. Moreover, how and when any individual building project was carried out was likely determined by the agricultural calendar throughout the 13th century BC, as to not endanger agricultural production that was essential to sustaining the workforce and population at large.

Mundane jobs

While working, people also needed housing. Pakkanen recently wrote: "The total cost of a single storey house with a flat roof would have been approximately the same as an annual salary of a craftsman". These costs are based on using mudbrick, timber, and flat clay waterproof roofs.¹⁷ Houses of 50-100 m², the most common house size range at the Mycenaean site of Kalamianos-Korphos, would have taken 75 or 150 person-days at 8



Figure 4a. The DSLR camera Nikon D7200, used for photogrammetry and conventional photography in the field. Visible here is a section of the stone-built stretch of the Mycenaean highway M1 in 2018 (figure A. Brysbaert).



Figure 4b. Detail of Mycenaean highway M1: two of the dozens of culverts along M1 facing the terraces or valley downslope in 2018 (figure A. Brysbaert).

Table 1. The agricultural calendar indicating which tasks were likely conducted throughout the year in prehistoric times and pre-industrial societies (based on Brysbaert 2020, table 2, with references). Winter months = grey, spring months = green, summer months = yellow, autumn months = brown. Light blue cells = 'free time' from intense agricultural activities.

Month	Tilling Ploughing	Sowing	Harvesting ¹	Crop processing ²	Land management ³	Animal husbandry/gathering	Building (B) Ceramic production (C) Chamber tomb digging (Ch) Road construction (R)
Jan.	Ploughing for sowing	Lentils, peas, bitter vetch			Grind daily Weeding Field clearing, extend/improve Fallow/Crop rotation/mix	Lambing and kidding Milking & processing milk	Ch?
Feb.							Ch?
March		Pulses, beans			Weeding	Shearing sheep Calving, milking & processing milk Sheep to mountains	Ch?
April					Cross-ploughing		C – Ch
May			Pulses, grain			Gathering leaves, shoots, fruits, seeds, nuts	B? – C – Ch – R?
June			Grain, then pulses	Threshing grain, then pulses	Weeding during harvest Manuring after harvest	Gathering leaves, shoots, fruits, seeds, nuts, harvesting figs	C – Ch
July					Ploughing of fallow fields Watering young trees and vines		Culling old sheep, goat, cattle, harvesting figs
Aug.			Pulses, beans			Spin, weave, hunt, fish, harvesting figs/olives	B – C – Ch – R
Sept.		Wheat, barley, oat, rye			Manuring before sowing, field clearing	Milking new lambs Lambing and kidding Harvesting olives	B – Ch – R
Oct.	Ploughing for sowing				Felling timber & wood seasoning		B – Ch – R
Nov.					Pruning, manuring and planting (fruit/olive) trees		B – Ch – R
Dec.							

1. Harvest includes reaping, binding, drying, and transporting.

2. Crop processing includes threshing, winnowing, transporting sheaves, sieving, grinding, and storing.

3. Land management includes fallowing/crop rotating, mixed cropping, manuring, weeding, and extending/improving.

hours/day, while substantially larger houses are known from Mycenae. For the Argive Plain's estimated population of 4000 five-member households, a ratio of 3:1 of smaller versus larger houses (50-100 m²) is not unreasonable. Building a house was achievable by two to four people who were likely family members and who spread out the labour and time required for this job between the time required for agricultural activities. If 100 people were building 365 days/year on the housing required for the estimated local population in that century, 20.6 years would be required. If well maintained, a house could be inhabited for two generations of 25 years. Within one century, the number of houses, serving 20,000 people, would have had to have been doubled in order to serve the estimated population of 20,000 who keep their houses for two generations.¹⁸

A labour-cost overview of the entire population's, and more specifically each specialized worker's, needs for metal and non-metal tools and weapons, pottery, fuel, cloth, cosmetic, aromatic, and other decorative production lines is beyond the scope of this short paper. I have decided to focus specifically on calculating the needs for domestic pottery by the present households.¹⁹ The potter's energy expenditure measured here refers to the efforts of fixed workshops.²⁰ Providing this calculation necessitates the generalization of the principal factors such as optimising kiln capacity, which is in line with calculating minimum costs.²¹ The entire *chaîne opératoire* of pottery production would take a full day with a team of five workers.²² This would have produced a range of vessels totalling approximately 50 mixed items/kiln load. It is estimated that 50-100 vessels per lower-income household, of which some pithoi remained in long-term use,

were likely consumed.²³ For the estimated 4,000 households in the Argive Plain, between 200,000 or 400,000 pots would have been consumed annually. If pottery making was limited to the six drier months of the year, a doubling of the final numbers would be needed to reach this estimate, especially if a household owned up to 100 vessels. Moreover, if people owned closer to 100 pots/household, 44 full-time workshops and 182 days/year or six months would be required to produce the estimated amount of vessels.²⁴

Agricultural jobs

The most crucial production line is agricultural subsistence activities since people need to be fed in order to work. A mixed crop regime of both pulses and cereals would have been required to sustain a household. I estimate that 1.5 ha would be sown for each crop type, while farmers would simultaneously maintain soil fertility, lengthen harvest periods, and spread the risk of any crop failure. Producing 3 ha of crops, the minimum to feed a family of five, minimally required two adults to cultivate and harvest the field(s). Due to the difficulties in estimating which animals were reared, and how many people reared animals, labour-cost figures for animal-rearing are not included here. The agricultural calendar (see table 1) shows that rearing animals is prominently present throughout the year and that some activities and processes are both time-consuming and very time-sensitive.

Discussion

The figures given above show that if the work was divided equally throughout the 100 years of the 13th century BC, in a typical year, a minimum of 9,000 adults would have

Table 2. Summary of labour cost figures for the 13th century BC, based on 365 working days/year at 8 hours/day.

Type of job	Length of year section	Number of people
Agriculture	2/3	9000
Construction (monumental and domestic)	Full-time	40
Pottery production	Full-time	55/110

been needed full-time, at least for two-thirds of the year in agriculture; approximately 40 persons would have been needed full-time in construction, for both monumental buildings and houses; and 55 to 110 persons in pottery making, all working for 365 days/year (see table 2). Additional workforces would have been required for many other craft activities.

Based on this summary alone, the importance of all the activities discussed in this paper is overshadowed by the labour requirements of agriculture, which needed to produce enough surplus to meet the population's energy requirements, while carrying out the other tasks was equally vital. Under stable conditions, an adult male/female workforce of ca. 6,000-10,000 from a population of ca. 20,000 people in the Argive Plain would have just managed the agricultural work, and some, if not most, people would work in other jobs for part of the year.

The life cycle calendar (see table 1) illustrates that there was very little idle time and that the crucial agricultural tasks, including processing/storing of crops ideally took precedence over any construction or other job. This is unsurprising if agricultural production is the main means of subsistence, and if people had to balance their energy expenditures carefully, based on seasonal requirements, and especially when faced with bad harvests.²⁵ All other labour-intensive activities should be, ideally, scheduled around the seasonally-bound agricultural cycle to avoid neglect or lack of available hands. Understanding energy expenditure and people's attending to each other, their animals and their material world from this perspective suggests large levels of responsibility and pro-activeness in the hands of the farmers and workers rather than allowing the elites to solely be in charge and delegate the workforce and tasks continuously. Subsistence activities, in fact, can be badly disrupted by both natural and human-induced actions,²⁶ such as prolonged (monumental) construction. Garnsey stated that the severity of subsistence crises varies with the incidence of war, piracy, civil strife, and the non-economic heavy exploitation of labour, producers, and consumers, by the powerful.²⁷ If the powerful elites were clever by respecting the agricultural cycle, they would employ people at the right time for the right jobs. According to L. Bendall, they certainly took this agricultural calendar into account.²⁸

The available adults of the Argive Plain and their suggested activities here suggest a strong central authority – Mycenae – who created and maintained alliances with

the less powerful citadels of Tiryns and Midea and who consolidated available labour force and other resources. If, however, each citadel would be more independent and perhaps competitive, each would have access to a much more limited pool of skilled and unskilled workers to carry out large-scale building activities. That people had to work *together* and with their animals to make these monuments, while also looking after each other for food, housing, clothing, and many other material needs, is beyond doubt. Pooling people and efforts from among all citadels therefore seem to be the best way to achieve this. It would group people for specific tasks that they would carry out together perhaps several times over. Such a strategy would have needed a strong centre to pro-actively foresee, plan, and organise all work, including the agricultural chores. The concentration of well-constructed M-highways to and from Mycenae seems to confirm its dominant political role in the region and (far-reaching) territories, and its exertion of political cohesion and authority, perhaps even over the other citadels.²⁹ It also illustrates the access to substantial and fit workforces that could also be conscripted for military efforts if needed. Their choice to spread all monumental construction efforts over time, or, instead, to use more people to finish the jobs at hand faster may have had very different effects on managing successful agricultural production and many other large-scale projects, while other tasks still needed to be done, as outlined before.

When faced with adverse times, such as the crises known in the 13th century BC, households would have needed to make crucial decisions to survive: crop selection, labour scheduling, and disposal of final produce. In addition, through the birth, death, and marriage of family members, a household shows its full dynamic and social nature, since any change therein affects both the family's economic potential *and* their labour potential over time, as both ethnographic studies show and Linear B documents seem to suggest. As Gallant has asserted: "simply stating that the average farm was on the order of 4 to 6 hectares does not go far enough because it omits the fact that land-holdings, like the household itself, do not remain static over time". The Linear B evidence suggests diversity in land tenure as well since plot sizes may have varied over time. This seems to be in line with Gallant's changing household structure: land fragmentation upon inheritance and dowry divisions seems to be a logical and useful strategy against the effects of bad harvests and it

distributes the risks better.³⁰ The Linear B tablets illustrate the diversification of the tasks carried out in the LBA Aegean by multiple people sometimes active in multiple jobs.³¹ However, while people had to work together and look after each other, social and economic inequality was certainly part and parcel of the Argive Plain taskscape. This shows especially in the ways energy is spent, land is distributed, and who directs (and controls) the labour force. The ownership of oxen clearly illustrates this point.

That people, their animals, their materials, and their many relationships were dynamic over time is beyond doubt, but the landscape itself also changed over time. This is where, for Ingold, the taskscape and landscape converge. Buildings were erected, roads crisscrossed valleys and hills, and terracing opened up more crop space. All these constructions required materials and therefore the above-ground quarried outcrops changed, became smaller or even exhausted, such as the conglomerate location along the Panagia ridge in Mycenae. Forested areas were cleared and their wood was used in construction sites or furnaces. Roads were constructed and rivers were diverted. The Argive Plain and its surroundings was a very 'moving' landscape indeed. In these dynamic conditions, people will have learnt from each other to make a living, through the various jobs they held. A striking example is visible in the very similar techniques and steps undertaken to construct the M-highways and how agricultural terraces were made because both features require the cut-and-terrace technique to cut a horizontal surface in a slope, resulting in either a road or agricultural land. The people who made up the workforces that constructed the M-highways and terraces likely met, shared knowledge and learned from each other over the generations; they may have also been the same groups of people doing both jobs. These exchanges all seem to fit very well with Ingold's taskscape. At the same time, while people worked, they looked after each other, and many tasks, such as using specific tools, techniques or materials, crossed over between different crafts.³²

In getting on with daily tasks, people needed to travel (nearby or far away), so journeying was an important part of daily sedentary life, and there was plenty of motivation for journeying between places. Starting a journey gave opportunities for communication and exchange, and created multiple relationships of various kinds. One could visit kin; herd animals; collect and sell produce; extract and transport a range of resources; or build a house. Linear B tablets indirectly show that roads were linked to local movement of people and goods, while also to more long-distance exchange networks of crafted, items and the dispersal of raw materials. The size and mass of materials, the distance to cross, and significant slope gradients in the topography, would have determined whether draft or pack animals would have been employed to transport building materials or agricultural

produce. I argued earlier that the palatial authorities at Tiryns, for example, likely depended on the local *dāmos* for their labour force needs, both to construct the citadel and for their agricultural needs.³³ Both agricultural and building activities thus seemed closely connected, and it is perhaps not too far-fetched to hypothesise that the same *dāmos* could resist palatial requests for more and more labour resources for building, if these were not well-planned in terms of the agricultural cycle.

Conclusions

What do these case studies and their labour cost figures tell us about how the 13th century BC people in the Argive Plain managed to build on a large-scale, while also taking care of daily agricultural and other activities? When comparing the building and selected craft activity efforts, on the one hand, with the agricultural activities and burdens, on the other, it seems that resources employed outside agricultural work were of sufficiently small numbers³⁴ to allow such work alongside agricultural work, especially if elites would respect the agricultural calendar, which is the pivotal element in this discussion. If people could tend to their own and family's nutritional requirements at the appropriate times (sowing, harvesting) and crops did not fail several years in a row, there would be no reason for people to become exhausted towards 1200 BC. However, while there seem to be indications that elites allowed people to prioritise, or at least follow, agricultural tasks,³⁵ perhaps the need for more labour forces was more concentrated in the last few decades of the 13th century BC with more building taking place then. Despite this period of possible labour pressure, people's flexibility of moving between jobs (building, agriculture) could have perhaps made them resilient enough to withstand further pressures towards 1200 BC. Around 1200 BC, the palatial centres suffered setbacks while people in the Argolid just went on with their jobs as before. The three Argive Plain centres showed several signs of continuity rather than total disruption. Perhaps *because* of people's ability to shift between jobs there, they survived the crises better than in other Mycenaean regions (Messenia, Lakonia) where building pressure was lower and less expertise and efforts were needed to be planned and coordinated, important skills in their own right, and useful beyond building. However, as no cost calculations have been produced for these regions in the same way as presented here for the Argive Plain, the thoughts expressed here can only be tentative. In working or journeying with each other and their animals, people of the past were constructing their own history, and likewise their own taskscape.

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Endnotes

- 1 This hypothesis was tested by a team of PhD and postdoctoral researchers and myself in six separate but linked work packages. The overall aim of SETinSTONE is to assess if and how monumental building activities may have impacted the socio-economic and political structures of the Mycenaean polities in the period between 1600-1100 BC, and how people responded to changes in these structures, especially in the century preceding the Mycenaean demise around 1200 BC.

- 2 Ingold 1993.
- 3 Ingold 1993.
- 4 Sorokin & Merton 1937.
- 5 Ingold 1993.
- 6 Ingold 1993.
- 7 Method developed by Pakkanen (2009, 2018).
- 8 Most recently: Boswinkel 2020, Pakkanen et al. 2020; Turner 2020.
- 9 For the detailed method description and its application in the Aegean LBA, see a selection of the SETinSTONE project work (each with further references to other relevant publications): Brysbaert 2015; Boswinkel 2020; Pakkanen et al. 2020; Turner 2020. Updates and new publications are regularly posted on www.setinstone.eu.
- 10 Brysbaert 2020, in press.
- 11 These are the citadels of Tiryns, Mycenae and Midea, the dam at Tiryns, the Treasury of Atreus and the tholos of Clytemnestra, and I am refining their final cost figures during the course of writing this article.
- 12 Steffen 1884; Lavery 1990, 1995; Jansen 2002; Iakovidis et al. 2003. Being fully aware that minor m-roads and paths existed and played an equally important role in the Mycenaean infrastructure, these calculations cannot be taken into account here. See Brysbaert et al. 2020 for details and references.
- 13 Brysbaert in press. Initially, Brysbaert 2020 gave a slightly lower number (17.6 person-years), but in the overall picture the difference is not significant.
- 14 E.g. Nakassis 2013: p. 331.
- 15 Brysbaert 2013.
- 16 Contra Boswinkel 2020, who maintains that comparative costing is the only way to give meaning to labour cost figures.
- 17 Taken into account are the excavation of the foundations, quarrying, transporting and constructing rubble foundations, stone threshold blocks and mudbrick walls, and the use of and construction with timber. This totalled to 350 person-days (8 hours/day) for a plot and floor area of 240 m², or ca. 12 person-hours/m²: Pakkanen in press.
- 18 Brysbaert 2020.
- 19 The needs for several other categories are being calculated at the time of writing.
- 20 Certainly, some pottery was also produced within the household or brought in by travelling potters, but this would lead us too far for this paper.
- 21 I assumed one kiln of 1 m diameter and 1 m in height, and this determines the amount of work to fill it up for one firing of undecorated, wheel-turned small, medium and large-sized vessels. See Brysbaert 2020 with further references.
- 22 From clay preparation to throwing, shaping, loading, firing and removing from kiln, from the cold kiln, over firing, and back to cooling for removal of the item. Pottery production likely took place in the summer months to allow for drying the clay before firing.
- 23 Whitelaw 2001.
- 24 Brysbaert 2020.
- 25 On the potential influences from the climate on LBA agricultural activities, see Timonen & Brysbaert in press.
- 26 Ingold 1993.
- 27 Garnsey 1988.
- 28 L. Bendall 2021, personal communication.
- 29 Brysbaert 2020, in press.
- 30 See Gallant 1991: p. 87; Lupack 2008: pp. 84-85; Zurbach 2017: pp. 88-89, 129-144, 211.
- 31 Brysbaert 2013, 2020, both with further references; Nakassis 2013.
- 32 For example the building of terraces and roads following very similar techniques, tools and materials, see Brysbaert et al 2020, Brysbaert in press.
- 33 Brysbaert 2013, 2020. The *dāmos* was the Mycenaean local political community structure. For full discussion on the function of the *dāmos*, see Lupack 2008.
- 34 In a different context, Harper (2016: pp. 310-311) came to a similar conclusion.
- 35 L. Bendall 2021, personal communication.