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## Malthi in Media: Peopling an Ancient Village in Virtual Space

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## **Malthi in Media: Peopling an Ancient Village in Virtual Space**

**Abstract:** Digital applications have increased the possibilities for the visualization of archaeological material. Here are presented two reconstructions of the Bronze Age settlement Malthi, created using *Minecraft* and *Twine*, both readily accessible programs. These recreations draw on data from archaeological work at the site and are intended to depict alternative interpretations of the settlement, allowing for the uncertainty inherent in archaeology. They are likewise intended to invite interaction with the site beyond physically visiting, with the goal of increasing participation in the formation of knowledge about Malthi. The approach advocated here is applicable to other projects struggling with ambiguous data.

**Keywords:** Ancient Demography, Bronze Age, Digital Humanities, Malthi, *Minecraft*, *Twine*, Virtual Reconstruction

### **Introduction**

Malthi is a fortified Middle to Late Bronze Age (ca. 2000-1400 BCE) village located in southwestern Greece, in the northeastern portion of historical Messenia (Fig. 1). The full area of the settlement within the fortification wall was excavated in the 1920s and 30s by Swedish archaeologist Natan Valmin, and from 2015 to 2017 saw renewed work under the aegis of the Swedish Institute in Athens.<sup>1</sup> A large part of the more recent project was devoted to the collection of spatial data, partially to correct the plans created by Valmin, as well as to preserve digitally a largely unprotected site. Toward this end, the remaining exposed architecture was

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<sup>1</sup> Valmin 1938; Worsham, Lindblom, and Zikidi 2018.

mapped using a differential GPS and later a total station, while 3D models of the settlement were also created using a terrestrial laser scanner, as well as aerial photogrammetry.<sup>2</sup> The abundance of data has made Malthi into a useful case study for considering how archaeological material can be productively presented in a virtual space, especially for a site that is somewhat remote and not easily interpretable on the ground (Fig. 2).



Figure 1: Location of Malthi (also known as Dorion) within Greece. Map created by authors from the Ancient World Mapping Center, “À-la-carte” (<http://awmc.unc.edu/awmc/applications/alacarte/>).

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<sup>2</sup> Worsham, Lindblom, and Zikidi 2018, 7-11. Terrestrial laser scanning was carried out by the Spatial Archaeometry Research Collaborations program (<https://sparc.cast.uark.edu/>).



Figure 2: Overgrown architecture of the central terrace at Malthi in 2012. Photo by the authors.

The Malthi in Media Project was created to approach this abundance of data creatively—the goal, in short, is to allow access to a complicated series of remains in a way that helps to bridge the conceptual gap between ruins and a living community. Because no single model can claim to be authoritative—an outcome of human diversity and the many variables of day-to-day life in the ancient world—we have instead chosen to embrace a variety of ways of recreating this community, ranging from traditional data-driven methods to gaming platforms such as *Minecraft* and *Twine*. *Minecraft*, a highly popular game with between 90 and upwards of 100 million players, offers many opportunities for explorable recreations of archaeological sites.<sup>3</sup> *Twine* is an open access tool for creating branching narratives, which can be explored like a text-based game.

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<sup>3</sup> Warren 2020; “*Minecraft* Franchise Fact Sheet” 2021.

Both tools are easy to use and widely available, with outputs that can be downloaded and opened with minimal expertise, and both have been used previously in the presentation of archaeological materials.<sup>4</sup>

Here, we outline some of the methods employed in this ongoing project, as well as some goals for the future. Like so many digital projects, it is unclear how long this one will be accessible or relevant; to that end, the aim here is not to emphasize the product, but the ways it has allowed us to think about the settlement at Malthi and archaeology more broadly.<sup>5</sup> We hope to demonstrate that this sort of broad approach has applications in pedagogical and public presentations of archaeological material, especially in its invitation to co-create knowledge.<sup>6</sup> This work is scalable and has largely been carried out by a small group of undergraduate students—with some adaptation, similar projects could easily be done in the classroom or at the high school level, for instance. Moreover, in its implementation of different tools to create and display a variety of reconstructions, this method could easily be applied to other subfields of classics,

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<sup>4</sup> Projects in *Minecraft* include: the VALUE Foundation’s RoMinecraft (2018), Jessie Craft’s Forum Romanum (2016; 2022), and James Schwaderer’s reconstruction of Fort St. Joseph in Michigan (2017). Projects in *Twine* include Tara Copplestone and Luke Botham’s “Buried” (2014; 2017).

<sup>5</sup> See Meneses and Furuta (2019) for an outline of the “shelf life” of projects in the digital humanities.

<sup>6</sup> Atalay (2008; 2012) has stressed the importance of “democratizing knowledge *production*” in archaeology, particularly in collaboration with local communities, but also with the broader public (2012, 3).

including textual problems. Indeed, it is not dissimilar in its approach to digital efforts such as the Homer Multitext Project (<http://www.homermultitext.org>).<sup>7</sup>

Below we first outline some common issues with virtual presentations of archaeological sites. We then turn to the data from the work at Malthi, focusing especially on the idea that a successful reconstruction should be centered on the people that inhabited the site, rather than an empty shell divorced from the messy existence of day-to-day life.<sup>8</sup> After outlining the two versions of Malthi created using these two different programs, we weigh the potential contributions of each. Finally, we briefly discuss how these reconstructions will be made public, as well as plans for soliciting feedback and creating opportunities to contribute to creative reconstructions of the site. We conclude that such a multi-pronged approach is well-suited to humanizing ambivalent data.

### **Limitations of Traditional Methods**

The robust collection of digital spatial data for Malthi makes it an apt candidate for virtual representation, as well as for consideration of methods and standards for virtual

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<sup>7</sup> Dué and Ebbott 2020. Van Dyke and Bernbeck (2015, 5) note how textual commentaries, like Homeric scholia, can accumulate over time, becoming networks of associations, explanations, and reconstructions that are not unlike modern efforts in archaeology to create flexible “hypertexts.”

<sup>8</sup> Emele (2000, 224), weighing the merits of a “less sacred, less sterile, more animated” reconstruction, notes that even inserting virtual livestock presents challenges in representation (what kind of pigs?) that could “predetermine the viewers’ imagination.” Obviously, this is even more true of adding people into a recreated archaeological space.

archaeological recreations. Indeed, a 3D model of the site as it may have looked during the early part of the Late Bronze Age was completed in 2017, produced by Disir Productions AB (<https://www.disir.se/>), a professional company specializing in archaeological visualization and augmented reality (Fig. 3). This reconstruction is a veristic model of the site at a major moment in the history of the settlement, shortly after the village was reorganized to accommodate the construction of a large-scale fortification wall, ca. 1600 BCE.<sup>9</sup> It has been made publicly available (and downloadable) on Sketchfab, a major repository for 3D models, and has been successful in disseminating information about the site. To date, it has been viewed around 800 times, significantly more than a model of Malthi in its current ruined state.<sup>10</sup>

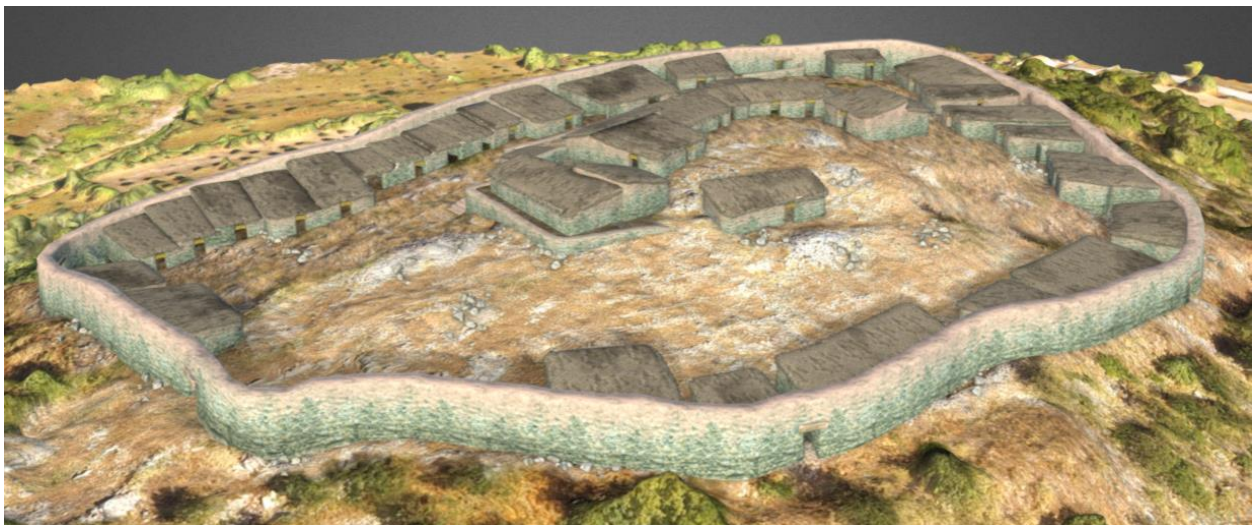


Figure 3: Reconstruction of the village of Malthi as it may have looked ca. 1600 BCE. Model by Disir Productions (2017), image by the authors.

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<sup>9</sup> Valmin 1938, 22; Worsham, Lindblom, and Zikidi 2018, 23-24.

<sup>10</sup> Reconstructed model: <https://skfb.ly/orXCI>; Ruined model: <https://skfb.ly/6wDv7>. The ruined model had been viewed around 250 times as of writing, though another model including the landscape around the ruined settlement had been viewed around 750 times.

It is nevertheless challenging to keep models like this available on platforms that require payment to host high-quality 3D imagery—see also, for example, the well-known but ultimately doomed reconstruction of Neolithic Çatalhöyük on Second Life, discussed further below.<sup>11</sup> Beyond logistical concerns, this recreation presents a static and unchanging perspective on a single moment in the life of a vibrant site, with buildings in use at different time periods alongside already abandoned spaces. It is likewise completely unpopulated—it is a ghost town, which creates additional challenges for non-professional viewers as far as envisioning it as a living space. Although this model has many strengths and is obviously created by specialists, then, other models, even those produced by individuals with lower-level skill sets in virtual reproduction of archaeological material, may help to fill in some of these gaps. Opening the past to multiple interpretations, especially those that emphasize its past as a dynamic community, leads to greater understanding of these sites. Similarly, when the models can be made interactive in different ways, they allow for various levels of engagement.<sup>12</sup>

Both *Minecraft* and *Twine* present opportunities to populate reconstructed archaeological space—*Minecraft* through the incorporation of non-player characters (NPCs), or characters that are not controlled by the player, and *Twine* through creative narrativization. Effectively, however, this requires visualization of the inhabitants of the site in conjunction with the site itself. Recreating a population in addition to the architecture presents a number of challenges, not

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<sup>11</sup> Lercari 2016. The Center for Digital Humanities at Uppsala University

(<https://www.abm.uu.se/cdhu-eng/>) provides a premium account to host the models of Malthi.

<sup>12</sup> Lercari 2018, 479 - 481.



all of which will be addressed here.<sup>13</sup> In any case, the starting point in such an endeavor must be the archaeological evidence itself.

### **Reconstructing a Population**

Gathering clear information on the population of a settlement using only archaeological data—in other words, ancient demography—is notoriously difficult for a variety of reasons.<sup>14</sup> Here we drew on published work on Malthi, as well as Valmin’s unpublished journals, although the journals themselves were of limited use because of unclear and inconsistent naming conventions for architectural features prior to the final publication.<sup>15</sup> This work focused on the identification and measurement of likely houses, the location and quantification of facilities for food storage, and a close consideration of more than fifty burials at the site.<sup>16</sup> The goal in all

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<sup>13</sup> Populated reconstructions of the ancient world are often, unfortunately, subjected to criticism based on issues and (often bigoted) assumptions surrounding representation (of race or gender).

<sup>14</sup> Whitelaw (2001, 15) observes that “population estimation seems to be viewed as a particularly dangerous inference by many Aegean prehistorians,” noting, however, that anxiety about establishing misleading or erroneous narratives does not keep archaeologists from discussing other difficult subjects, such as religion.

<sup>15</sup> Valmin’s journals, covering the years from 1927-1934, were transcribed and provided by Michael Lindblom.

<sup>16</sup> Especially useful was Valmin 1938—this represents Valmin’s final publication of the excavation and provides some idea of what Malthi looked like at the time of Valmin’s excavation in the 1920s and ‘30s, particularly considering objects and architecture that have since been lost.

cases is to come to terms with how “full” the settlement at Malthi might have been, and what day-to-day life at the site may have looked like as an inhabited space. As Whitelaw argues for Minoan Knossos, understanding urban contexts requires “that we have some idea of the scale, in human terms, of the phenomenon we are dealing with.”<sup>17</sup>

Population was first assessed through the examination of residential spaces. Although the characteristics of the house in the ancient world, particularly as regards how such a structure should be identified on the ground, are debated, the multifunctional nature of architecture of this period means that most roofed structures could be used as living space (Fig. 4). Certainly those spaces containing hearths, storage jars, food preparation equipment, or other debris related to day-to-day life seem likely to have served at least in part as residential spaces—and these are the criteria used by Valmin to identify domestic architecture. Nevertheless, such criteria are often too limiting—for instance only about half of the probable roofed spaces at Malthi had any indication of a hearth, but those without a hearth were probably still fulfilling domestic functions (with, perhaps, communal cooking areas, for instance). For the purposes of our recreations, rough numbers are, however, sufficient, and a close examination of the published plans of the site allowed us to suggest roofed, potentially private, spaces in contrast to more public and accessible areas.<sup>18</sup>

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<sup>17</sup> Whitelaw 2001, 15.

<sup>18</sup> Valmin 1938, esp. Plans II, III and IV.



Figure 4: Tentative estimate of roofed space at Malthi. Plan after Valmin 1938, modified by Anna Gudnadottir. Image by authors.

Based on this work, we were then able to turn to models predicting population based on room size—the most commonly applied model is that of Naroll, who suggests about 10 square meters of roofed living space would have been necessary per person.<sup>19</sup> To get a quick estimate of the sizes of rooms, we imposed a map of Malthi’s ruins over their current location in Google

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<sup>19</sup> Naroll 1962, 587-588.

Earth and used the measurement feature to find the area of each room.<sup>20</sup> Through this process, we determined that based on square footage, about 160 people could have lived in Malthi (Fig. 5). This number is fairly low, but compares well with earlier estimates of the population of Malthi by McDonald and Hope Simpson for the Minnesota Messenian Expedition, at about 140 people.<sup>21</sup> They have noted, however, that the large number of rooms for the site—320—although not all likely to be in contemporary use, suggests that this number is too low, leaving perhaps two rooms per person. Similarly, in his studies on the population of Knossos, Whitelaw has argued that Naroll's 10m<sup>2</sup>/person figure is unrealistic, based on faulty evidence that fails to account for culturally variant attitudes toward space.<sup>22</sup> He proposes that where houses are fairly consistent in size, it is reasonable to assume a standard household size—typically a nuclear family of about 4-5 individuals, based on ethnographic evidence.<sup>23</sup> This number can then be multiplied by the total number of houses. Valmin's initial investigation gives a figure of around 56 houses—including all periods together, Valmin identified around 80 houses. Many of the structures as they are preserved are small, and, though they do range in size from around 10m<sup>2</sup> to 90m<sup>2</sup>, most cluster around 29-32m<sup>2</sup>. They are, then, more or less consistent with Whitelaw's

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<sup>20</sup> The plan of Malthi was imposed over the current settlement in Google Earth, using landmarks such as the fortification wall to ensure that it was placed correctly. Then, the measurement feature in Google Earth allowed us to draw polygons over each room and view the area of each of these shapes, thus giving us a workable estimate of the size of each room.

<sup>21</sup> McDonald and Hope Simpson 1972, 136.

<sup>22</sup> Whitelaw 2001, 15-16.

<sup>23</sup> Whitelaw 2001, 17-21; 2004, 152.

identification of dwellings for nuclear families of about 4-5 people (if a bit small, but see below), putting the population at about 220-280, significantly higher than the previous estimate.

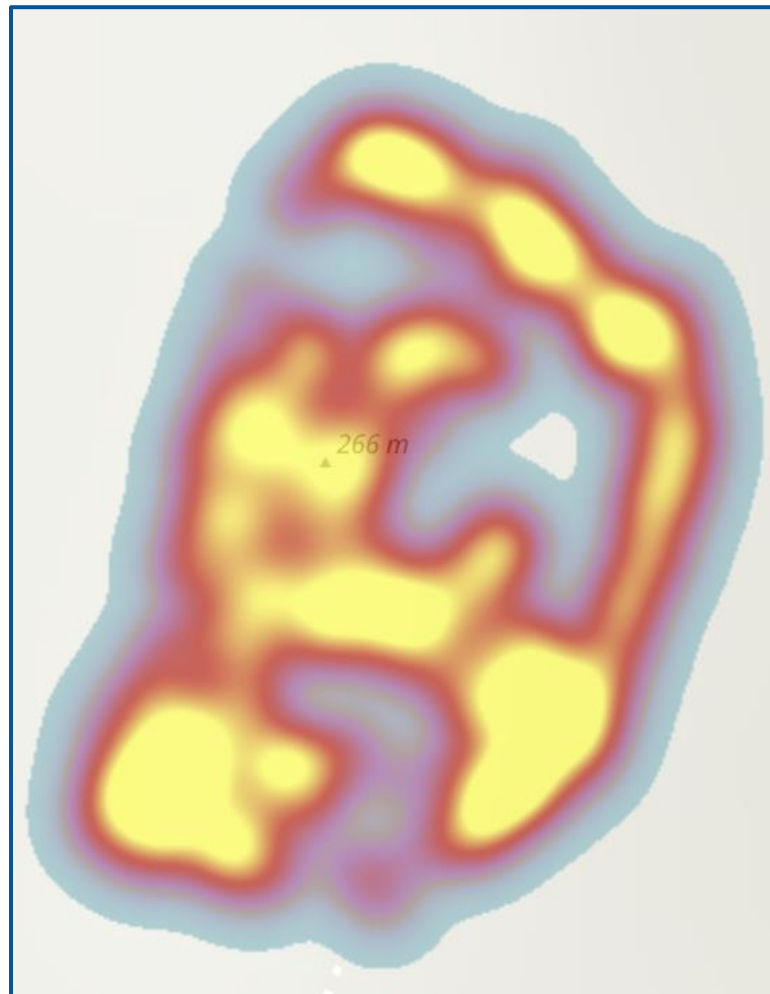


Figure 5: Population density map at Malthi, loosely based on Narroll's model in its reliance on the quantification of built rooms. Yellow is representative of greater concentrations of living space, while blue suggests low potential for living space. This map was created by the authors using ArcGIS® software by Esri. ArcGIS® and ArcMap™ are the intellectual property of Esri and are used herein under license (© Esri, all rights reserved).

We then attempted to assess the total numbers of pithoi, or large storage jars, at the site, and used this to estimate a sort of baseline storage capacity for the settlement.<sup>24</sup> The total capacity for storage, which of course could also include more perishable facilities like baskets, or less detectable ones like pits, should in turn provide a low estimate for the population that could be sustained on this quantity of stored food, in this case assumed to be grain. Unfortunately, this method was reliant on a number of suppositions based on comments made in passing by Valmin, in part because of his disinterest in meticulously recording pithoi. Estimated size is provided for only one pithos, a relatively early example, about 1.18m in height (Fig. 6).<sup>25</sup> This jar had a volume of about 300 liters, and so theoretically could have held enough grain for about one adult for one year.<sup>26</sup> There was some evidence for almost 200 pithoi (some were shattered into so many fragments that it was difficult to determine whether they were one pithos or multiple pithoi, particularly as no indication of the fragment size was given).<sup>27</sup> Cautiously, then, the

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<sup>24</sup> Valmin 1938, 16-185. To find the number of pithoi, we looked to Valmin's documentation of what objects were found in each room. In some cases, pithoi were broken into many pieces, necessitating an estimate of how many pithoi were represented originally from poorly-documented fragments.

<sup>25</sup> Valmin (1938, 285) assigns to this pithos a date significantly earlier than the preserved architectural remains (ca. 2200 vs ca. 1600 BCE). Nevertheless, he notes that the other pithoi found at the site were similar.

<sup>26</sup> See Christakis (2011, 200-205) for a discussion of pithos capacities and annual subsistence needs.

<sup>27</sup> A recent re-study of pithos sherds at the comparably dated site of Aspis-Argos argues that a deposit with 556 pithos fragments likely represents only five or six pithoi, suggesting that our

settlement had storage sufficient for a population of between 150 and 200 people—a number of course more consistent with the earlier “low” estimate of the population. Nevertheless, these numbers are comparable, and should represent a fairly conservative estimate of the population given 1) the general disregard for pithos fragments characteristic of archaeological practice in the Aegean at the time and 2) the failure to account for additional space on upper floors or even roofs, which seems likely at Malthi. A populated reconstruction should, therefore, account for perhaps 180-200 people. While such numbers have the potential to become overwhelming in a virtual setting, the impression of Malthi as a crowded space is conceptually useful, discussed further below.



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numbers may be inflated, though it is difficult to assess to what degree this might be true for the reasons outlined above (Philippa-Touchais and Touchais 2011, 203, 213).

Figure 6: A recreation of a pithos found at Malthi in *Minecraft* (on the right), alongside a more loosely inspired jar. Image by authors after Valmin 1938, Fig. 63.

Can details about the population beyond a general idea of scope be established and integrated into a reconstruction? Although burials give direct evidence of the population, they also represent a curated subset of the total.<sup>28</sup> In the case of Malthi, fifty graves within the settlement have been published, some containing more than one burial, and some with no preserved remains.<sup>29</sup> The vast majority of these were for children and infants—less than ten adults were confirmed through skeletal remains.<sup>30</sup> Two tholos tombs found outside the settlement prompted Valmin to identify a possible cemetery in this area, and it is likely that many were buried outside the city wall (especially the bodies of adults) and remain unexcavated.<sup>31</sup> The mortuary material can therefore hardly act as a representative sample of the living population. On the other hand, materials like grave goods can give some idea of the general access to wealth and/or imported goods. While several of the graves (perhaps 8) included objects like pottery and even ivory, the general impression based on the low overall quantity of goods in graves where

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<sup>28</sup> The lack of a straightforward relationship between burials and population is handled extensively by Morris (1987).

<sup>29</sup> Valmin (1938, 186-235) published 48 graves within the settlement, and Worsham, Lindblom, and Zikidi (2018, 19-20) an additional two.

<sup>30</sup> Some graves have fragments of several bodies, and it is difficult to determine the exact number. Other graves have few or no bone fragments, raising the question of whether the grave was used, or the body was moved or is not preserved. This number is therefore an estimate.

<sup>31</sup> Valmin 1938, 207-225



they were included is one of limited means—this is likely therefore a small, somewhat insular farming community. And it is this overall sense of the town’s population, more than detailed life histories, that can best be rendered in a virtual context.

These more or less traditional approaches to the study of the ancient population at Malthi can and do inform the following digital recreations of the site, particularly as regards “peopling” the more static architectural remains. All reconstructions must reckon with basic structural questions, such as the function of rooms and the presence of roofs, and are important tools for considering the living settlement, as opposed to the academic site. As Atkinson has emphasized in his discussion of the (physical) model of Myrtos Phournou Koryphi on Crete, however, the inclusion of people, constructed of clay and matchsticks, lends a certain “timeless” quality to the reconstructed space, allowing viewers to empathize with them and narrativize their actions.<sup>32</sup> Indeed, he refers to them as “characters” and elaborates particularly on a figure of a man bent under his burden of firewood. Although in the case of virtual reconstructions, populating the site—or in other words, filling it with NPCs—can give a reductive view of complicated cultures (more on which below), it also provides an opportunity to connect with past peoples on a more emotional level than merely reading about them. Moreover, this can include not only the original population at the site, but also other people who made use of the space after the abandonment of the settlement, including the intermittent “population” of archaeologists.<sup>33</sup> In other words, the creative reconstructions we present now allow us to take this population data and turn them into people, insofar as such a thing is possible.

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<sup>32</sup> Atkinson 2011, 37-38.

<sup>33</sup> A portion of the project for which Valmin’s journals were especially useful.

## *Minecraft*

*Minecraft* is a popular sandbox video game with the capacity to build almost anything, limited only by the block palette and imagination.<sup>34</sup> It is widely accessible, and the controls are simple and easy to learn, making it a natural choice for archaeological reconstruction (versus a more complicated program like Unity). This is true not only of the production stage but also of the end product—exploring the reconstruction is intuitive even for those with limited experience with the game. Although the blocky appearance of the reconstruction is unnatural, it is not an impediment to understanding the space of the site. Similarly, the distance from the “real” appearance of the settlement forces the viewer to consider what decisions go into archaeological reconstructions – what is known, and what is extrapolated? The project’s goal with *Minecraft* is to present two models of the prehistoric village of Malthi: the first as it stands today and the second recreated to look as it may have appeared during the Bronze Age—a living space, but also one that is clearly constructed and heavily interpreted (Fig. 7). To that end, we do not rely on one “authoritative” reconstruction—though naturally we are dependent on the site

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<sup>34</sup> Brazelton (2020, 492) has argued that *Minecraft* is also a “foundational digital text of settler colonialism,” noting that the gameplay hinges on the “colonial fantasy” of exploiting the abundant resources of a “new and unknown land,” which is already populated by NPCs. These criticisms are valid, and the colonial connotations of the game are particularly regrettable in an archaeological context, where they are compounded by the history of the discipline itself (see Graham 2020 on this). We argue, however, that much of this issue is overcome in the reconstruction by shifting the focus from the “mine” to the “craft,” so to speak. That is, the reconstruction sets aside the exploitation of the digital landscape and prioritizes the user’s experience of the existing built space.

archaeology—but rather promote multiple narratives or means of approach to a set of specific material remains.



Figure 7: Images of the restored settlement of Malthi in *Minecraft*. Image by the authors.

There are numerous ways to integrate maps and plans, and even landscape data, into *Minecraft*.<sup>35</sup> Logistically, we began by tracing the outline of the settlement using the output from the *Minecraft* Image Converter with “dirt” blocks, then used a series of “fill” commands to fill in the outline with dirt, giving us the base of the map (Fig. 8). This process is aided by a pre-existing standard scale in *Minecraft*, where one block equals one meter, though we adapted this

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<sup>35</sup> Graham 2014.

somewhat in the case of Malthi.<sup>36</sup> Then we traced each wall rendered on the plans of Malthi into the *Minecraft* build, using a combination of cobblestone blocks (which take up a full block's space, used for where the outlines were dark) and cobblestone walls (which take up less space, used for where the pixel art was somewhat ambiguous about whether a block should be space or wall). Efforts were made wherever possible to emulate the materials used in the settlement within the space of the game, within the constraints of the program. Topographical information was rendered to scale using a *Minecraft* map editor (WorldEdit) from a topographic map created from elevation data collected on site, allowing some experience of the local landscape, although Malthi is currently presented in isolation from the surrounding valley and ridge to the south for practical reasons. That said, the settlement was constructed approximately 25 "blocks" above the ground level to accommodate the addition of landscape elements as desired. This process has allowed us to present the ruins of the settlement largely as they are preserved today, though some of the walls recorded by Valmin and no longer visible are also included.

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<sup>36</sup> In the case of Malthi the curvilinear forms of the architecture are not well-supported in *Minecraft* by nature, making a 2 blocks : 1 meter scale necessary to capture more detail.

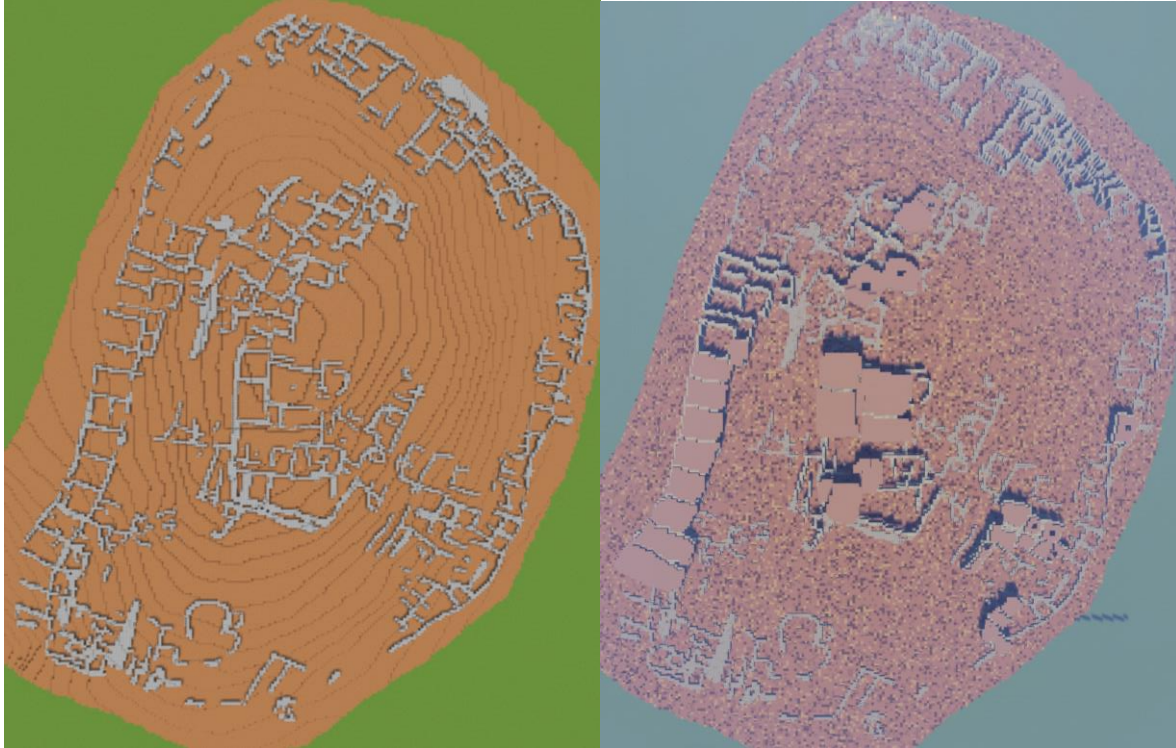


Figure 8: Two stages of the recreation of Malthi in *Minecraft*. On the left is the basic topography and architecture, and on the right is the partially restored settlement constructed on this base.

Images by the authors.

Once the foundations of the walls were in place, we were able essentially to copy-paste this base plan and begin to consider how a reconstruction of the living settlement might best be approached in *Minecraft*. *Minecraft* is not a space for realism, but information about materials, lighting, and the physical space, among other details, can still be conveyed. For example, a series of so-called magazines lining the interior of the fortification wall on the west side of the settlement has been recreated incorporating very specific choices about material and house architecture. Here the walls are stone rather than mudbrick, as few remains of mudbrick were discovered at the site—though of course these could have been lost in the original excavation, or not preserved. Similarly, the flat clay roofs are possible, but differ, for instance, from the thatch

shed roofs chosen for the visualization through Disir. The easy modification (and re-modification) of *Minecraft*, however, encourages experimentation with the house form. At the central part of the site, where there are several very robust walls, for instance, we chose to build two-story houses and incorporate more wooden elements. Outside the site, we have also provided examples of additional types of houses, including an attempt at mudbrick construction and informal outdoor pens for animals. Although there is a high degree of uniformity apparent in the architectural approach to the houses at Malthi in general (including stone used, wall width, etc.), everything above the foundations is lost. Presenting these alternatives encourages consideration of the fundamental createdness of the digital space, distancing the reconstruction from any objective truth.

Likewise, the creative visualization of the settlement can exist alongside the presentation of the modern ruined foundations, making apparent what evidence, exactly, any reconstruction must be based on, as well as the obvious limitations of this evidence.<sup>37</sup> Viewers can easily “travel” between the two models, which are presented within sight of each other in the *Minecraft* world, inviting direct comparison. It is therefore clear that all architecture above the level of the foundations, not to mention the contents of the buildings, is imaginatively reconstructed. Other phases of the settlement can also be added, or even layered, to give an impression of change over time, not unlike Lercari’s work at Çatalhöyük.<sup>38</sup> Such a presentation embraces a multiplicity of equally possible realities for Malthi, empowering the viewer to make their own interpretive choices, and to select their own avenues of exploration. In this way, our approach is able to take

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<sup>37</sup> This is consistent with the principles for virtual reconstructions established by the London Charter for the Computer-Based Visualisation of Cultural Heritage ([www.londoncharter.org](http://www.londoncharter.org)).

<sup>38</sup> Lercari 2018.

advantage of the virtual medium while also disavowing the restrictive authority of a more static model.

Returning to the idea of the peopled reconstruction, we have at this point added only very basic NPCs, but in quantities meant to represent the established approximate occupation of the site (Fig. 9). The “full” settlement is in itself a useful visualization, as noted above.<sup>39</sup> Similarly, although NPCs have fairly limited capabilities in *Minecraft*, they do have additional potential to aid in the interpretation of a complex site, and we are currently working on adding “characters” to perform commands and deliver dialogue when viewers interact with them. It is worth noting that very few archaeological reconstructions in virtual spaces, especially those not produced for commercial franchises (for example, *Assassin’s Creed*), make use of NPCs at all.<sup>40</sup> There is in fact a real question about how useful NPCs are to a virtual archaeological experience. Morgan, for instance, argues that “turning people of the past into mere mouthpieces for their architecture diminishes the rich potential of reconstructions to impart information about complex lifeways.”<sup>41</sup> While this is a legitimate concern, the flattening of human experience is in some ways mitigated by the already restricted capacities of *Minecraft* NPCs, as well as their distance from something

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<sup>39</sup> The NPCs are at the typical “scale” in *Minecraft* rather than the adapted one used in this model, so they are approximately half of the expected size relative to the reconstructed space.

<sup>40</sup> A notable exception is *Craft 2022*, a virtual reconstruction of the Roman Forum (also in *Minecraft*), which includes a number of NPCs, although the primary intent of this reconstruction is language acquisition. This reconstruction is, of this writing, unavailable for maintenance reasons.

<sup>41</sup> 2009, 480-481. See also Tringham (2019) and Van Dyke and Bernbeck (2015, 10-11, 14) on this issue, with more ambiguous conclusions.

like a real human appearance. On the one hand, then, they cannot be interpreted as an “authentic” representation of the population of Malthi. On the other hand, like Atkinson’s matchstick people, they can model human actions and engage the viewer in imaginative play about day-to-day life at Malthi, creating a connection to people who are otherwise hardly represented in the archaeological record. Ultimately, this reconstruction will be presented on a website and on ScholarWorks with contextual information as an accessible and downloadable world, with the hope that others will participate in creative narrative-making and alternative constructions and reconstructions of the space.<sup>42</sup>



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<sup>42</sup> Links to the current models are here: [finalized stable link forthcoming] for the model without NPCs, and [finalized stable link forthcoming] for the model with non-interactive NPCs representing the population.



Figure 9: A population of about 200 NPCs roams the partially finished settlement. Image by authors.

In this we are inspired by several archaeological reconstructions that have been made in *Minecraft* to date, generally with the express purpose of public outreach and pedagogy. For example, the RoMinecraft Project has built a large-scale recreation of the landscape of portions of the Netherlands in *Minecraft* to explore the edges of the Roman world in educational events that are open to the public.<sup>43</sup> This same group has also hosted an event on the protections afforded to cultural material at which the Temple of Bel at Palmyra was recreated in *Minecraft*.<sup>44</sup> Moving beyond reconstructions of architecture and landscapes, *Minecraft* has also been used as a platform for virtual excavations, both of real sites (such as Fort St. Joseph in the United States) and of the virtual space itself.<sup>45</sup> *Minecraft* is indeed well-suited to these approaches, and more quantitative research is already being done on especially the educational applications of the program, particularly following the apparent success of games like *Assassin's Creed* in classroom contexts.<sup>46</sup>

### ***Twine***

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<sup>43</sup> The VALUE Foundation 2018.

<sup>44</sup> Politopoulos et al. 2019, 167.

<sup>45</sup> For Fort St. Joseph, see Schwaderer 2017. For the virtual space, in this case also in *Minecraft*, see Graham 2020.

<sup>46</sup> Craft 2016.

*Twine* is an open-access tool for designing non-linear narratives and games. While this program is less clearly useful for archaeological reconstruction, it also has much to offer in the way that it can accommodate different stories about the settlement operating at multiple levels—for instance, both Valmin’s conclusions and the implications of the more recent work at the site, alongside more imaginative fictions considering day-to-day life at the settlement. Our approach with *Twine* is focused on suppressing a static interpretation of the settlement remains to engage with a variety of possible archaeological narratives.<sup>47</sup> Here, we have crafted a branching, multilinear (hi)story exploring Malthi from different perspectives, including a mythological figure known from the *Iliad* (2.594-600) and associated with Homeric Dorion, which Valmin believed to be Malthi, as well as fictional figures we have created, in this case a contemporary farmer and invader (Fig. 10).<sup>48</sup> These stories, alongside those of historical figures such as Natan Valmin, are informed by past and current interpretations offered for the settlement. Valmin’s 1938 publication of the site and the translations of his field journals enhance the stories with details and anecdotes that make the experience more vivid, along with liberal use of images and other media.<sup>49</sup>

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<sup>47</sup> The utility of *Twine* in creating and sharing “active, multilinear” archaeological narratives is emphasized by Coplestone and Dunne 2017.

<sup>48</sup> Valmin 1938, 13-14, based largely on Pausanias 4.33.6-7. The link to the current version is here: [finalized stable link forthcoming].

<sup>49</sup> Many of these plans and images can be found in Valmin 1938.



Figure 10: Malthi's *Twine* homepage. Image by authors.

By way of example, one of the (shorter) possible paths through the story is outlined below—this is a single path of a branching narrative, so only the outcome of the selected (bolded) responses are shown.

Welcome to Malthi! This is a choose-your-own adventure program you can use to explore Malthi as people through history would have experienced it. You can be:

>A Homeric Hero!

>A Messenian farmer

>**An invader**

>20th century amateur archaeologist

>21st century archaeologist

>Sources and Contributions

You are an invader! Good for you!

Malthi is located on an imposing hill and clearly visible from the valley below. That's probably why you decided to attack it! It is, however, also heavily fortified these days. You can see the thick walls from some distance. Do you climb the steeper hill to get to smaller, less well protected gates on the north side or do you climb the easier hill on the south side of the town and attack the main gates?

>**Smaller gate**

>Easy hill

You try to climb the hill, but it is too steep! Is this settlement really worth the effort?

>**Try the smaller hill!**

Or try a different settlement in the area. Say, if you beat the legendary Griffin Warrior, you'll be remembered for generations . . .

>Off to Pylos! [*Links to information on the Tomb of the Griffin Warrior at Pylos*]

You attack the southern wall [*image of the southern wall*]. That makes sense! There is a major gate there, after all, and it wasn't too hard to climb the gentler slope on this side. Residents walking home after completing chores in the valley see you and run up towards the settlement.

You give chase!

Like your fathers and grandfathers before you, who also wanted control of this well-located ridge, you attack the southwestern gate with vigor. Just when you almost have the gate down, the defense tower pelts you and drives you off. Gosh, Malthi was easier to raid in the good old

days.

>Home

The *Twine* presentation of Malthi is, then, essentially choose-your-own-adventure archaeological fanfiction—the viewer decides how to navigate the site, and can move between different interpretive frameworks easily. Although, as with *Minecraft*, there are acknowledged issues with providing this sort of inner monologue for past peoples, it also evokes empathy and a feeling of shared humanity.<sup>50</sup> Similarly, use of humor can, like the blocks of *Minecraft*, alert the user to the interpreted, creative nature of the presented narrative, while also actively engaging audiences. In the example above, images and links to outside information are also incorporated to augment the information available in the *Twine* narrative. While links and images can be integrated into any digital text, the *Twine* narrative is also able to accommodate an interactive map of the site, which, like the *Twine* itself, can be explored in any order, based on the interests of the reader. The game is designed for accessibility, to be easily navigable and understood by people with any level of background knowledge. Here, there is of course a potential language barrier, made more serious by the heavy reliance on written text (versus *Minecraft*). But unlike *Minecraft*, *Twine* is entirely free to use, and outputs an html file that is easily accessible with or without the actual software. It can also be made more or less complex, depending on how it is

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<sup>50</sup> Tringham (2019, 338) comments on the issues with assigning dialogue to peoples of the past in reconstructions, suggesting that (like reconstructions in general) “such words create a misleading certainty that conceals the ambiguities of archaeological data.”

coded—for instance, in the case of the interactive map. But no coding skills are strictly necessary.

Here again we aim to encourage a frank assessment of how archaeological information comes to be made “canon,” and to question this process of academic ossification. As with *Minecraft*, the easy operability of *Twine* offers an opportunity for modification and engagement from non-professional users. The game blends story and history, facts and anecdotes, proof and conjecture. These aspects make experiencing Malthi more dynamic, emphasizing the depth of alternative narratives and avoiding the tendency to canonize a single interpretation as the exclusive authoritative story.

## **Conclusions**

Though this work is still very much in progress, it has been displayed at two events open to the public so far—once in a small fair showcasing student research and another time at a celebration in honor of the Archaeological Institute of America’s International Archaeology Day. On both occasions only informal feedback was solicited, but the approachability of both “reconstructions” in *Minecraft* and in *Twine* was well-received, particularly in comparison to the more traditional poster presentation. While users at these events were able to navigate the site on *Minecraft*, in most cases interest was principally in making additions to the settlement (including spawning axolotls, the accuracy of which must surely be questioned). A more constructive, activity-centered approach could be accommodated with more framing in future events, perhaps geared toward specific age groups. Similarly, once the NPCs are finalized, they could potentially provide guidance on likely materials (and animals) used at the site. These sorts of engagement are very much the goal of the project—this work will therefore be showcased at additional

events, but the products are also already available to a small online community. They are likewise currently being accessioned on ScholarWorks.<sup>51</sup> We hope to make these generally available on a public website as they are finalized, with built-in opportunities for moderated feedback, either through comments or through submission of new products in *Minecraft*, *Twine*, or otherwise.

And this project is intended to be expandable in a number of different ways, from additional creative narrative-making like fanfiction to more robust gaming platforms like Unity—some of this has already been started in separate projects run by Rachel Opitz and Megan Kasten at SPARC<sup>52</sup> and the University of Glasgow,<sup>53</sup> using the terrestrial laser scanner data set to invite students to create their own reconstructions of Malthi.<sup>54</sup> But such resources, as well as our own work in *Minecraft* and *Twine*, present opportunities for engagement/creation by

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<sup>51</sup> The project link on ScholarWorks is here: [finalized stable link forthcoming]. We also created a website with information gathered from the Malthi excavations (<https://sophia.smith.edu/multiple-pasts/>) for a more traditional way to access the same information, and a more easily accessible mode of communication for people who aren't well-versed in the world of online games. This is currently available to the local college community, but should be public in the future.

<sup>52</sup> Spatial Archaeometry Research Collaborations. For more on this organization, see Klehm 2021, 26-24.

<sup>53</sup> Digital Archaeology 2022. This research program finds innovative ways to study the past given quickly evolving technology. The program focuses on collaboration as well as considering the impact of technology and archaeology's current role in society.

<sup>54</sup> For the work of Opitz and Kasten, see: [https://github.com/ropitz/sparc\\_teaching](https://github.com/ropitz/sparc_teaching).

non-specialist audiences outside the academy, creating new paths toward multivocality in archaeology and embracing the production of archaeological knowledge from people who have traditionally been excluded from this work. Multivocality and non-authoritative, non-linear presentation of archaeological data has long been a goal of digital work, though efforts to produce larger-scale digital narratives projects are limited by the inherent transience of the web, demonstrated, for instance by projects like Rosemary Joyce's *Sister Stories*<sup>55</sup> or Ruth Tringham's *Chimera Web*.<sup>56</sup> Indeed, one of the more successful iterations of a multivocal archaeological reconstruction, a virtual presentation of Çatalhöyük in Second Life, lasted for (what seems to be an unusually long) five years (2007-2012) before it was removed as a result of prohibitive costs.<sup>57</sup> But perhaps permanence is not something to be desired with the ever-changing possibilities presented by digital archaeological work. As Van Dyke and Bernbeck note, there are inevitable limitations and fictionalizations imposed by the medium in which archaeological information is presented, traditional or non-traditional, concluding that "archaeology should not mindlessly multiply the media at its disposal" to account for this issue.<sup>58</sup> The transience of virtual worlds, then, encourages constant renegotiation of the data and its presentation, which should in turn help to shape the intentionality of each successive iteration.

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<sup>55</sup> Joyce 2000. *Sister Stories* was an immersive introduction to Aztec society that allows readers to consider their own beliefs and thoughts about this ancient society and its customs.

<sup>56</sup> Joyce and Tringham 2007; Tringham 2012, 105-107. *Chimera Web* was a "hypermedia web of narratives" about the burning of a house at Opovo, later absorbed into another of Tringham's projects *Dead Women Do Tell Tales* (Tringham 2012, 107).

<sup>57</sup> See Lercari (2016) for the history, as well as Morgan 2009 for an outline of the project.

<sup>58</sup> Van Dyke and Bernbeck 2015, 19.



With this project, it is our hope to continue the exploration of new methodologies in presenting archaeological material as a body of evidence with abundant and shifting interpretive possibilities. We do not wish to suggest that archaeological data cannot offer facts about the ancient world, but rather that these facts can accommodate a range of possible narratives. Digital media offers a unique opportunity to allow this range of interpretations to be presented together in an ultimately temporary form. It embraces the ambivalences presented by archaeological material not as a weakness, but as an invitation to consider the multiplicity of the lived experiences of the ancient world.

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