

# Ancient Greek Agricultural Terraces: Evidence from Texts and Archaeological Survey

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## Abstract

Although agricultural terraces and terrace walls are a conspicuous feature of the modern dissected terrain of the Mediterranean, it is unclear how extensively the Graeco-Roman rural landscape was terraced. Some scholars have assumed that the past landscape was very like the present one, while others have denied that agricultural terracing was much used in classical antiquity. This article explores two ways of detecting ancient terraces and terrace walls. First, it looks carefully at ancient terminology, using texts drawn from the full array of ancient Greek linguistic registers (both literary texts and inscriptions). The claim that there are no, or almost no, ancient written references to terraces is false, because it looks only at a range of texts that is limited in both date and linguistic register. Second, the article investigates the evidence of archaeological fieldwork, drawing mainly on our own fieldwork in Sphakia. In some cases, scholars have denied that the physical remains of terraces are ancient. This sceptical claim is exaggerated; there are cases where the remains of terraces are Graeco-Roman in date.\*

## INTRODUCTION

Agricultural terraces and terrace walls are a prominent feature of the dissected terrain of the

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Mediterranean where many archaeological surveys have been carried out; indeed, they perhaps epitomize the kind of rural feature that archaeological surveyors rightly undertook to make visible in the investigation of ancient life outside cities.<sup>1</sup>

Agricultural terraces and terrace walls in traditional-modern landscapes are often strikingly obvious and have begun to be the subject of archaeological investigation.<sup>2</sup> But there is controversy over the existence of their ancient equivalents. There are two ways of detecting ancient terraces and terrace walls: first, by looking carefully at ancient terminology; and second, by doing fieldwork appropriate for landscape archaeology. We shall discuss each of these in turn, using texts drawn from the full array of ancient Greek linguistic registers (both literary texts and inscriptions from different Greek cities) and drawing mainly on our own fieldwork in Sphakia for archaeological evidence. Both types of evidence are controversial. Some scholars have claimed that there are no, or almost no, ancient written references to terraces.<sup>3</sup>

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<sup>1</sup>For studies of ancient terraces in Greece, see Moody and Grove 1990; Rackham and Moody 1992, 1997, 140–5; French and Whitelaw 1999, 173–5; Grove and Rackham 2001, 112–3.

<sup>2</sup>For medieval-modern terraces, see Blanchemanche 1990, 19–41 (on terraces as one option in southern France, Italy, and Spain); Provansal 1990; Whitelaw 1991, 405–10 (Kea); French and Whitelaw 1999 (Amorgos); Grove and Rackham 2001, 107–19 (the best account of Mediterranean terracing); Lee 2001, 57–9 (Messenia); Frederick and Krahtopoulou 2000, 2003; Bevan et al. 2003 (Kythera). See also page 7 (Kythera).

<sup>3</sup>Foxhall 1996, 45–52 (using only classical Greek sources). Campbell (2000, 322 n. 13) claims that *supercilium* is used by the Roman land surveyors to refer to partly human-made “terraces,” but this claim is refuted by texts (Thulin 91.19–92.2, 107.3–107.13) that define *supercilia* as (natural) flat areas with sloping land running down from them.

We seek to show that this claim is false, because it looks only at a range of texts that is limited in both date and linguistic register, and thus ignores crucial epigraphic evidence. In some cases, scholars have gone on to deny that the alleged physical remains of terraces are in fact ancient in date.<sup>4</sup> We think that this sceptical claim is exaggerated; there are, we hope to show, some cases where the remains of terraces are probably Graeco-Roman.

#### TEXTS

The ancient literary and documentary evidence for the existence of terraces is thin. Indeed, the alleged lack of an ancient word for “terrace” has been part of the case against the actual existence of ancient Greek terraces. However, as various scholars have noted, there was at least one Greek word (αἶμασιά) that could mean terrace;<sup>5</sup> there may also have been others.<sup>6</sup> What follows is a selective account of the testimonia, based in part on a thorough study of the evidence in the *Thesaurus Linguae Graecae* and the Packard Humanities Institute CD-ROM of Greek inscriptions (see appendix). We note, however, that one of the most interesting Greek texts (text 27) does not appear in the *Thesaurus*, as it is transmitted in Justinian’s *Digest*.

The earliest meaning of αἶμασιά, as found in Homer, is of stones for building a dry-stone wall. In the last book of the *Odyssey*, Odysseus goes out into the hinterland of Ithaka to find his father. Laertes was alone because the servants had left “to assemble *haimasiai* which would protect the cultivated land” (text 2). The usage puzzled ancient commentators, but they took the passage to refer to the building of a freestanding wall.<sup>7</sup> The activity of “assembling *haimasiai*” for agricultural purposes was normal in the Homeric world (cf. text 1).

Subsequent to Homer, αἶμασιά refers to at least three different physical objects: (1) a freestanding dry-stone wall; (2) an area of land enclosed by a dry-stone wall; (3) an area of land bounded (but not enclosed) by a dry-stone wall, such as a terrace.

<sup>4</sup>Foxhall 1996. Criticized by (among others) Brunet (1999, 24–7, on Aegean islands) and Jameson (2002; arguing for moderate terracing in Attica).

<sup>5</sup>Robert (1945, 79–81; 1946, 137–8) established the basic linguistic data. Baladié 1974; Rackham and Moody 1997, 143; Grove and Rackham 2001, 113.

<sup>6</sup>Jameson (2002) suggests that in Attica, ἐσχατιά can refer to “property that requires terracing or other attentive land management.” Ταῖνία in the Hierapytna-Laton treaty (*SEG* 26.1049; Chaniotis 1996, no. 59, line 70) may be a strip of land formed by terracing (Chaniotis 1999, 187). However, the passage derived from Theophrastus (Sen., *QNat.* 3.11.5; Plin., *HN* 31.53) does not seem to presuppose terracing.

#### *Freestanding Dry-Stone Wall*

In many, perhaps most, cases it is clear that αἶμασιά refers to a freestanding dry-stone wall,<sup>8</sup> which often enclosed a particular area of land. Such walls ran around sanctuaries (as is well known archaeologically); an inscription records that at Ephesos (text 13; fig. 1) the sanctuary of Artemis was bounded by a αἶμασιά.<sup>9</sup> According to Herodotus (text 4), the Athenian Miltiades broke his leg when impiously jumping over one such wall.

Αἶμασιά also enclosed particularly valuable cultivated land (i.e., orchards, gardens), to keep animals (and people) out. For example, in two Hellenistic poems, by Theocritus (text 9) and Leonidas of Tarentum (text 10), αἶμασιά refers clearly to a wall enclosing a vineyard or vegetable garden.<sup>10</sup> Building such walls was of course extremely hard work; a slave in a comedy by Menander (text 6) plans to do some walling, as part of the general round of agricultural work (an arduous task, but slightly less difficult than the work with a mattock that another character embarks on), because plants might grow next to a αἶμασιά. According to Theophrastus (text 8) and Dioscurides Pedanius (text 14), particular plants such as thyme and *Dracunculus vulgaris* grow especially well at the foot of a αἶμασιά (which could be either an enclosure or a terrace). According to Aristotle (text 7), snakes, which have a taste for wine, could be caught by placing a saucer of wine in a αἶμασιά and waiting for the snakes to get drunk. In Longus’s novel *Daphnis and Chloe* (text 19), there is a wonderful garden with fruit trees, birds, and springs, which would have been mistaken as a grove were it not for the αἶμασιά, designed to keep people out.<sup>11</sup>

Freestanding αἶμασιά were also built not just to enclose land but also to mark property lines. In a property dispute that is the subject of a Demosthenic speech (text 5), a αἶμασιά was allegedly moved in order to usurp property. The difficulty of interpreting the terminology of the speech is characteristic of general problems with the word

<sup>7</sup>Apollonius Sophistes (Bekker 1833, 17.30–18.2; 76.24–76.28), citing Apion Grammaticus [fr. 13 Neitzel], who offers an etymology for ἀβαοία, something one cannot cross Eust. (van der Valk 1971–1987, 3.325.22–25). In the context, ἀλωή must be a synonym for ὄρχατος (and is so taken by modern commentators).

<sup>8</sup>Aelius Dionysius, text 18 (all citations in this format are in appx.); Pausanias Atticus, text 17; Pseudo-Zonaras, text 22.

<sup>9</sup>Cf. Robert 1946, 138.

<sup>10</sup>Cf. Robert and Robert 1948. Brunet (1999, 26) wrongly takes both passages to refer to terracing.

<sup>11</sup>Cf. also Procopius, text 20; Theophylactus, text 21 (wall around field).



Fig. 1. Map of the Aegean, with Sphakia indicated. (After Bayerischer Schulbuch-Verlag 1972, 22–3)

αἵμασιά. The relevant Athenian law relating to the boundaries of properties is not quoted in the speech, but in text 27 αἵμασιά is used in the sense of terrace wall. Nonetheless, αἵμασιά in the speech must refer to a boundary or enclosure wall, rather than a terrace wall;<sup>12</sup> debris (presumably stones not used in the construction of the wall) was allegedly thrown into a public road, partly blocking it and raising its level.<sup>13</sup> Αἵμασιά also formed the boundary on either side of some routes. The accounts of the sanctuary of Didyma (text 11) record expenditure on the building of the αἵμασιά; they specify the precise size of the walls (up to 1.18 m high and 88.5 cm wide) that ran on either side of the first

section of the Sacred Way running out of the city of Miletus to the sanctuary of Didyma.<sup>14</sup> A fictional version of this type of route running between two αἵμασιά occurs in two first-century A.D. Greek versions of the biblical story of Balaam and his ass. Both Philo (text 15) and Josephus (text 16) tell how Balaam was confronted by an angel of the Lord while on a narrow path with αἵμασιά on each side.<sup>15</sup> The word was used for fortification walls only when they were very poorly built.<sup>16</sup>

The etymology of αἵμασιά is unclear. A folk etymology was offered in terms of αἷμα (“blood”), which would be drawn from too close an encounter with a prickly barrier.<sup>17</sup> Αἵμασιά, therefore, was used for a

<sup>12</sup>Cf. Foxhall 1996, 46–8.

<sup>13</sup>The very rare word for debris (χλῆδος) is defined variously by ancient scholars, but one definition was a heap of stones (Gennadius, *Grammatica* 2.496.2; Hsch.χ 510).

<sup>14</sup>On the remains of the road, see Gödecken 1986; Schneider 1987.

<sup>15</sup>The Septuagint of *Numbers* (22.24–22.25), which both

authors were following, does not use the word αἵμασιά here, but φραγμός and τοῖχον.

<sup>16</sup>Procopius, text 20. Cf. also Procop. *Aed.* 2.6.13 (poor construction); 2.9.18 (fortification wall like a αἵμασιά).

<sup>17</sup>Orion Grammaticus, *Etymologicum* alpha p. 8; Pseudo-Zonaras, text 22. See also Snell (1955–, I:308–9) for more details of the ancient etymology.

boundary made of thorny branches.<sup>18</sup> Such fences would of course keep animals in or out of a particular area. Prickly cuttings were laid on the top of dry-stone walls to act as an extra deterrent to animals.<sup>19</sup> Αἰμασιά was even used occasionally to refer to a thicket.<sup>20</sup>

A second word, τεχνίον, is sometimes defined in relation to αἰμασιά. For lexicographers it was often used as part of the definition of αἰμασιά.<sup>21</sup> It obviously refers to dry-stone walling, especially in the countryside.<sup>22</sup> A beautiful garden in another Greek novel, Achilles Tatius (text 37), was surrounded, like the grove in Longus's novel, by a τεχνίον. Inscribed land leases make reference to τεχνία, as they do to αἰμασιά.<sup>23</sup> Again, the term normally refers to freestanding dry-stone walling. One document, from Arkesine on Amorgos, specifies in text 34 (lines 17–19) that the lessee “build up again at his own expense all τεχνία that are falling down; if he does not build them up, let him pay a fine of a drachma per *orguia* [ca. 1.75 m].” Though some have suggested that these τεχνία are terraces, it is more probable that they are freestanding walls.<sup>24</sup> They are much more likely to suffer extensive damage than terrace walls are (in most conditions of land use). The same document goes on to deal with what is probably a subset of the former τεχνία, namely τεχνία by the road (text 34, lines 19–20): the lessee was, it seems, to ensure that branches placed on top of the walling by the road to keep out animals were replaced if necessary.<sup>25</sup>

#### *An Area of Land Enclosed by a Dry-Stone Wall*

By extension, αἰμασιά could refer not to the enclosure wall but to the area enclosed. Ancient purists complained that this usage was improper, but the complaint itself attests that the usage was common.<sup>26</sup> This definition is securely attested in epigraphic evidence of the Hellenistic and Roman periods, from places all over the Greek world.<sup>27</sup>

The key type of document is the inscribed sale of land, which of necessity had to be precise about the

landscape to be conveyed. In a long document about land sale on Tenos (text 23) two entries refer to αἰμασιά in contexts that show they are areas of land, presumably bounded by dry-stone walls. Someone bought “the four αἰμασιά at Sapethos which are above the land which is below the land near the garden, bounded by the road above and the river below.” As “the four αἰμασιά at Sapethos” are an item in a sale, they cannot simply be freestanding walls but must be areas of land, enclosed by dry-stone walls. In other words, there was a series of enclosures, sited on sloping ground. Another item in the same document from Tenos records the purchase of “the αἰμασιά at Neukleion, called Limenaia, which they bought . . . for 400 silver drachmai.”<sup>28</sup> Again, “the αἰμασιά at Neukleion” must be an area of land; it could be another enclosure, or it could be a single terrace. A sadly fragmentary document from Olymos in Caria (text 24) talks of a sale of land “in those places, on the one side up to the long αἰμασιά which is entirely beside [name is lost],” with all its “trees, olives and fig and the adjacent reeds, and on the other side up to the whole mountainous area above.” Here the document clearly refers to an elongated area of land bounded by a long enclosure or terrace wall. A few lines later the same document (text 12) shifts back to a different meaning of αἰμασιά: “he fixed the boundary as far as the road to Euromos and to all the contiguous αἰμασιά.” These latter αἰμασιά seem to refer to enclosure walls rather than the land enclosed.

#### *Terraces*

The reference of αἰμασιά to an area of land bounded by dry-stone walls was paralleled by a similar usage: an area of land bounded, but not enclosed, by a dry-stone wall, that is, a terrace. The most striking text is an extract from a law ascribed to Solon, which carefully distinguishes between αἰμασιά or embankment and τεχνίον (text 27). There is a problem with the text at this point, but the law probably

<sup>18</sup>Aelius Dionysius, *Attika Onomata* alpha 51 (boundary that is thorny); Aelius Herodianus (boundary made of thorns); Nicephorus Basilaces, *Progymnasmata* 50 (from thorny things); *Suda* ai no. 190; Eust. (van der Valk 1971–1987, 3.325.21) takes this to be an ancient usage. Cf. Eust. *Od.* (Stallbaum 1970, 2.58.6).

<sup>19</sup>Cf. App. *Libyca* 559.

<sup>20</sup>Nic. *Ther.* 143 (with Eutecnius, *Paraphrases in Nicandri Theriaca* 29:20). Modern scholars reject this folk etymology. But the best modern authority states that the actual etymology of αἰμασιά is unknown, and that it would be surprising if a word of this sort had an Indo-European origin (Chantraine 1968–1980, s.v. “αἰμασιά”). He rejects the suggested connec-

tion with the Latin “saepes.” We are grateful to Prof. A. Morpurgo Davies for advice on this point.

<sup>21</sup>Pausanias Atticus, text 17; Aelius Dionysius, text 18; Pseudo-Zonaras, text 22; Photius, text 25; *Suda*, text 26.

<sup>22</sup>Herennius Philo, text 36.

<sup>23</sup>Tenos, text 35. Cf. Etienne 1990, 25.

<sup>24</sup>See discussion in Brunet et al. 1998, 222–31.

<sup>25</sup>Cf. Foxhall 1996, 49–50.

<sup>26</sup>Photius, text 25; *Suda*, text 26.

<sup>27</sup>Robert 1945, 79–81; 1946, 137–8. Cf. Robert and Robert 1976 (summarizes Baladié 1974).

<sup>28</sup>Cf. Etienne 1990, 25.

referred to αἶμασιά as well as to an embankment (using a form of the word ὄφρυς, brow or embankment). According to this law, a αἶμασιά or an embankment can be built right up to the property line, while a τεχνίον has to be set back at least one foot. The difference between the permitted location of the two types of structure is most easily explained if the lawgiver is distinguishing between αἶμασιά as terrace wall (and ὄφρυς as an embankment without walling) and τεχνίον as freestanding wall.

At Mylasa in Caria, according to the fragmentary text 31, a field boundary was placed “on the brow (ὄφρυς) of a specified αἶμασιά.”<sup>29</sup> The word ὄφρυς refers to features of the landscape that have vertical or at least abrupt edges leading up to a level area. Here it is clear that the area of land, the αἶμασιά, must have ended in a clear drop (no doubt formed by a dry-stone wall). This usage explains why the lexicographer Hesychius (text 33) offers αἶμασιά as one of his definitions of ὄφρυς

At Rhamnous in northeastern Attica, a decree of a local religious association records the dedication to the local god of “the αἶμασιά where the cistern is” (text 28). The αἶμασιά were on land belonging to the local donor and were not necessarily adjacent to the sanctuary. The territory of Rhamnous produced grain, grapes, pulses, olives, and honey. Annual income derived from the sale of produce from the αἶμασιά was to be used to pay for annual sacrifices.<sup>30</sup> The first two meanings of αἶμασιά (freestanding wall; enclosure) are unlikely. The association would not give boundary walls to the god, and it is improbable that there was a series of discrete enclosures around the cistern. Therefore, the gift was a series of terraces around the cistern that grew crops whose sale paid for sacrifices each year.

Epigraphic evidence also proves that αἶμασιά was used for terraced areas in sanctuaries. A decree of Anaphe (text 30) records the granting to Timotheos of a place in the sanctuary of Apollo Asgelatas, “so that he can buil[d] a temple of Aphrodite using timber, stones and earth from the sanctuary what-

ever he needs in the place in the αἶμασιά where there is the olive tree by the Eudoreios building and Meidileios building.” The topography of the sanctuary perhaps helps to make the meaning clear. The sanctuary of Apollo (the main sanctuary of the island) is at the east end of the island (linked by a sacred road to the main town in the center). It stands on a ridge approximately 100 m above the sea, at the top of a series of terraces, on a high artificial podium.<sup>31</sup> If these terraces are contemporary with the sanctuary, the spot designated for the temple of Aphrodite might have been on one of the terraces below the temple, within the curtilage of the sanctuary.

In southern Attica, just northeast of Sounion, a sanctuary of the Salaminioi was defined on the north side as running “up to the first αἶμασιά” (text 29). There is much terracing in the landscape referred to in this text, which was used for growing grain into the 20th century. The terracing is held up “by retaining walls, perhaps built upon the ancient ones, which serve to hold back the earth along the winter stream-beds. At least in one place such an ancient wall still appears.” This suggests that “the first αἶμασιά” in the text refers to terracing as one boundary of the sanctuary.<sup>32</sup>

The type of land denoted by αἶμασιά must be considered; it did not include buildings. Robert suggested that it was distinguished from gardens or areas of olives, figs, or vines because there were other words for them; instead, it would refer to uncultivated land, with grass, maquis, and isolated trees.<sup>33</sup> Though Robert is almost always right, on this occasion his view seems unlikely to be correct. The philological point about the existence of other, specialized terms is not strong, and αἶμασιά were worth the investment in energy that is required of building enclosure walls or terracing. Their contents needed protection from animals and yielded revenues to the owners. Αἶμασιά were areas of land of real economic value, bought and sold on the open market.<sup>34</sup>

<sup>29</sup>Cf. Mylasa, text 32, where the word αἶμασιά, also fragmentary, appears in the context of land sales (Hellenistic). Cf. Baladié (1974) for the meaning of ὄφρυς (“le rebord d’une plate-forme surélevée, puis cette plate-forme elle-même, le bord abrupt d’une terrasse, puis cette terrasse elle-même”).

<sup>30</sup>Pouilloux (1954, 97–8) and Petrakos (1999, 1:311) assume that the λάκκος is a basin whose water plays a role in cult and treatment of illness. In fact, a λάκκος is a pit, often dug out (e.g., Heph. *Apotelesmatica* [Pingree 1973–1974, 3.15]; *Epit.* 1.38, 2.3.13, 4.90), usually to hold water (hence λάκκος ὕδωρ, cistern water; e.g., Strabo 3.5.7); cf. Hellmann 1988, 252. Here the λάκκος must have an agricultural/pastoral function. Rob-

ert (1945, 80 and 81) takes the sale of water from the λάκκος as the source of revenues, but this seems less likely to us than the sale of produce. Cf. Jameson (1982) and Petrakos (1999, 1:417–8) on local agriculture.

<sup>31</sup>McNeal (1967, 258–9) offers the only brief, modern investigation of this site.

<sup>32</sup>Young 1941, 177; 190 (cat. 8a): “A small preserved section of ancient terraced wall, which once went across the brook bed; it is of heavy untrimmed stones carefully laid.”

<sup>33</sup>Robert 1945, 80–1.

<sup>34</sup>The price (400 drachmas) for one of the Tenos plots was quite modest (Etienne 1990, 25).

In short, the written evidence shows that the word αἰμασιά could be used to denote walls other than freestanding dry-stone walls. The contexts indicate that in some cases those words could mean either enclosures (enclosed by dry-stone walls) or terraces (constructed with dry-stone walls); in some cases we cannot be sure which is meant because we lack knowledge of the full ancient context.

Our problem of matching words and objects is a general one in relation to ancient Greek. There are other examples where one word refers to a range of objects and, conversely, where a variety of words is used to refer to a single object. For example, not every ancient tower was called a πύργος, and πύργος could refer to things other than what archaeologists call “towers.” The lack of a precise technical vocabulary in relation to the countryside is paralleled in many other topics.<sup>35</sup>

#### MATERIAL EVIDENCE FROM ARCHAEOLOGICAL SURVEY

Dating surviving terraces to any given period is difficult, and many dating criteria have been suggested. We synthesize the existing criteria for dating surviving terraces under nine headings (table 1). Frederick and Krahtopoulou have a similar list of 13 “methods,” in three groups of ascending reliability: (1) surrounding landscape; (2) riser and wall attributes; (3) deposit attributes.<sup>36</sup> Our criteria overlap with theirs, but we have left them ungrouped, because several often work in combination with one another. Our list of criteria, in roughly descending order of strength, is:

1. Datable material in fill.<sup>37</sup>
2. Age of trees on terraces.<sup>38</sup>
3. Construction style of terraces.
4. Same construction style as adjacent ancient structures.
5. Terraces built against ancient structures.
6. Extent and type of lichenization of terraces in relation to the extent of lichenization of adjacent structures.<sup>39</sup>

<sup>35</sup> Cf. Hellmann (1988 and 1992) on architectural vocabulary; see also Morris and Papadopoulos 2005.

<sup>36</sup> Frederick and Krahtopoulou (2000, 89–92) discuss most of these arguments.

<sup>37</sup> See French and Whitelaw (1999) on Amorgos. Morris (2002, 23–44) uses a combination of pottery and <sup>14</sup>C to date terraces near Karphi (Crete) to the period of the site; his conclusion may be right, but his use of the pottery is not sound (a point we owe to Jennifer Moody).

<sup>38</sup> This criterion, often ignored by other scholars, we owe to Jennifer Moody and Oliver Rackham. For preliminary statements, see Moody and Grove 1990; Rackham and Moody 1992;

7. Extent of degradation of terrace.
8. System of terraces in area with ancient sites and no later constructions: “relict landscapes.”
9. Antiquity likely on other grounds to be the (or a) period of greatest pressure on agricultural resources.

The first two of these nine types of criteria can work independently. Datable material in the fill and the ages of trees on terraces can give clear termini ante quos for the period of construction. But such evidence is rare. Normally, criteria 3–8 come into play, and these usually work in conjunction with each other. It is also useful to draw comparisons with terraces in the same area dated to the more recent past (because of their relation to ancient sites, their lesser extent of lichenization, or their condition).

#### *Previous Archaeological Work*

In many cases, terracing, although common across Crete and mainland Greece, is not easily datable.<sup>40</sup> But in some instances detailed work has permitted good arguments to be made for some of the visible terracing to be ancient.

On Delos, in the southeastern and northern parts of the island, there is extensive terracing, in one case protected by enclosure walls presumably to permit concurrent pastoral use of the area. The terracing is similar in construction style to ancient houses on the island (criteria 3 and 4). Some of the terraces have been partially excavated and dated on the basis of pottery in the fill to the Classical and Hellenistic periods (criterion 1). The terraces are accompanied by and associated with 16 small, ancient farm sites (criteria 4 and 7). As it is hard to imagine a later period when extensive agriculture needed to be practiced on this island (criterion 9), it is likely that all the terraces in this area date to those periods.<sup>41</sup> In other words, Delos is a clear example of an ancient “relict landscape,” of Classical or Hellenistic farms set among agricultural terraces (criterion 8).

1997, 143–5; Grove and Rackham 2001, 112–3. A full statement of the arguments will appear in ch. 3 of the final print publication of the Sphakia Survey.

<sup>39</sup> We do not attempt absolute dating of lichens, as is sometimes done (e.g., Maas and Macklin 2002, 1089–91), because it is essential to obtain controls over the growth rates of lichens in the same environment (a point we owe to Jennifer Moody).

<sup>40</sup> Brun (1996, 64–71) argues for ancient terracing on the Aegean islands.

<sup>41</sup> Brunet 1990; 1999, 12–23, 43–50; Brunet and Poupet 1997 (abridged in *Archaeological Reports for 1996–1997* 1997, 95). The final publication will appear as a volume of Exploration

Elsewhere, the arguments do not rest on excavation but on a combination of the other points. Some scholars have argued based on stone size and treatment, lichenization, and condition of the walling. Hayden dates in this way traces of terraces and also field walls in the territory of Oleros in eastern Crete to antiquity, and possibly the Archaic period (criteria 4, 6, 7).<sup>42</sup> Similarly, large boulder walls in the Berbati area of the Argolid are quite different from the usual terraces built perhaps in the last 200 years; they should date to either the Mycenaean or Classical periods (based on periods of likely population pressure: criterion 9); as there are only Classical-period sherds in the area, they are probably Classical in date.<sup>43</sup>

On Keos, Greek survey work has identified numerous ancient terraces in association with Classical and Hellenistic sites.<sup>44</sup> The arguments are based on construction style (pseudo-isodomic or even pseudo-trapezoidal terraces should be Classical: criterion 3); some terraces are associated with dated sites and have similar construction to adjacent buildings (criterion 4). The Classical period is the only time before the 19th century when there was great pressure on agricultural resources (criterion 9). An additional argument, put forward by Whitelaw, concerns the physical nature of the landscape.<sup>45</sup> He assumes that plowing is possible on slopes greater than 10 degrees only if they are terraced and, therefore, that when Graeco-Roman sites are found in steeply sloping areas and when there was also need to maximize agricultural production, there may have been ancient terracing in the area. Whitelaw has hypothesized ancient terraces in the territory of Classical Koressos on Keos, whose likely population, he says, could not have been supported unless there was extensive terracing.

On Lesbos a different combination of arguments has been used to date to antiquity patches of ter-

racess in the territory of Eresos.<sup>46</sup> The terraces were mapped from aerial photographs and then visited on the ground. They are extremely degraded, in comparison with other terraces in the area (criterion 7); they cannot have been built after the foundation of modern Eresos in the 18th century, as they were already very degraded in 1885 and there is no likely period after antiquity when extensive terraces were needed (criterion 9). The terraces may have been used for grape cultivation for the Lesbian wine that was widely exported in antiquity.

Two field surveys are investigating terraces on Kythera; one project (the Kythera Island Project [KIP]) started sooner than the other (the Australian Paliokhori-Kythera Archeological Survey [APKAS]).<sup>47</sup> The KIP has paid special attention to the processes of terrace construction.<sup>48</sup> The post-medieval landscape on Kythera (later Venetian, 1600–1808, and British, 1808–1863) has been studied in some detail. The KIP project found that the most important predictor for the location of terraces was geology: villages tended to be in areas with soils appropriate for Kytheran crops.<sup>49</sup> Slope and aspect are other important variables. In certain areas, terraces increase up to slopes of 12 degrees; land over 12 degrees is also terraced, however, especially when it is near villages and other permanent structures such as churches and monasteries. Bevan et al. suggest that possible Classical and definite Byzantine terraces influenced later agricultural strategies in at least three distinct areas on Kythera.<sup>50</sup>

The association of ancient sites and degraded terraces has been illustrated elsewhere.<sup>51</sup> In Attica some scholars have noted the association of abandoned terraces with ancient sites, and have suggested on the basis of style and stone condition that they are contemporary (criteria 4, 8, and 9).<sup>52</sup> In the case of Karystos, a Classical farmstead is surrounded by abandoned terrace walls, several of

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Archéologique de Délos. Cf. the similar farms on the adjacent island of Rhenea (Charre and Couilloud-Le Dinahet 1999).

<sup>42</sup> Hayden 1995, 105, 121–2. See also Hayden 2005, 21, 82, 117, 152, 178, 212, 261, 323–4.

<sup>43</sup> Zangger 1992, 143–6.

<sup>44</sup> Mendoni 1994; Doukellis 1998. Data in Mendoni 1985–90, 313–19; Georgiou and Faraklas 1985.

<sup>45</sup> Whitelaw 1991, 405–10; 1994, 166–7; 1998, 234 (Keos). Similar argument for Lakonia in Cavanagh et al. 1996–2002, 1:197, 432–3.

<sup>46</sup> Schaus and Spencer 1994.

<sup>47</sup> Johnson et al. n.d.

<sup>48</sup> Frederick and Krahtopoulou 2003; Frederick et al. 2003 (abstract only).

<sup>49</sup> Bevan et al. 2003, 221–6.

<sup>50</sup> A major difference between Kythera and Sphakia is that

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Kythera has much more flat or flattish land and, therefore, far more field enclosures, including a significant number that are some distance away from villages (Bevan et al. 2003, 230 and fig. 11). We suspect that in the 18th century, the time of maximum population in Sphakia, there were more, and farther, terraced areas in relation to villages, but we cannot quantify this statement at present. For the relationship of structures such as churches to resources marked by terracing, see Nixon (forthcoming).

<sup>51</sup> A field survey of the Akamas peninsula on Cyprus has suggested that patches of terracing are ancient, probably Hellenistic (Fejfer 1995, 22, 23, fig. 9), but this is simply because of some surface scatter of ancient pottery.

<sup>52</sup> E.g., Bradford 1956; 1957, 29–34 (Mount Hymettus); Lohmann 1992; 1993, 166–73, 196–219 (southern Attica), rejected by Foxhall 1996, 62–3.

Table 1. Sites in the Sphakia Survey with Evidence for Graeco-Roman Terraces

Site Name and No. <sup>a</sup>	Dating of Site (based on pottery)	Slope Angle (degrees)	Architecture
Gourounokephalo/ Siopata (3.12)	LR (possibly R phase)	8	building complex; 76 m NS x 64 m EW; 34+ rooms in 3 sections (area 4,864m <sup>2</sup> ) (fig. 7)
Terrace Site (4.17)	H/R	7	dry-stone structure; 3+ rooms; buried in own rubble; possibly L-shaped
Cistern Site (4.34)	R/LR	8	main structure 47.2 x 14.4 m; 7+ rooms, terrace area, and pear-shaped cistern; smaller rectangular structure 75 m to NW (7 x 6.6 m, filled with stone tumble); area=680 m <sup>2</sup> (fig. 9)
Revelo (4.35)	H/R/LR	8	large structure; 5+ rooms; area (tumble)=2,200 m <sup>2</sup>
Prinaka/ Tsi Gonia (4.36)	R/LR	13	large structure; 8+ rooms; area (tumble)=1,900 m <sup>2</sup>
Prinaka SE (4.37)	H/R	13	2-roomed building?
Livaniana Akropolis (5.01)	A/C/H	–	major settlement
Ag. Athanasios Structure 2 (5.05)	H/R	18	structure; 10 x 6 m; possibly field house; area=60 m <sup>2</sup>
Phoinix-Loutro (5.11, sector 6)	–	6	–
Phoinix-Loutro (5.11, sector 8)	H or earlier	15	none
Ergastiria (6.25)	H/R/LR	15	house with ancient bee enclosure
Trochali (8.23)	LR	2	planable buildings survive at S end of site, along contour; much other tumble elsewhere; area (tumble)=21,000 m <sup>2</sup>
Patsianos Ag. Ioannis Vokolos S (8.44)	R/LR	1	structure 1 (house?); faces SW; consists of L-shaped room (max. 12.5 m long x 6 m wide); second room (4.6 x 5.9 m) built onto foot of L (stone 40 x 50 x 20 cm); area=160 m <sup>2</sup>
Patsianos Olive Grove (8.45)	A/C/H?	8	house?
Ag. Ioannis Vokolos Revma Section (8.47)	–	1	–
Possible Ancient Boundary Walls at Other Sites			
Limnia Basin (4.41)	H/R/LR	8	4+ houses
Limnia Slopes (4.60)	H/R	16	structure's dry-stone walls preserved (12 x 5 m); area=60m <sup>2</sup>
FK Limekiln (8.36)	LR	1	3 houses (stone piles)
Ag. Astratigos (8.38)	R/LR	1	large nucleated site; area (stone piles)=32,700 m <sup>2</sup>

<sup>a</sup> Photographs of the sites can be viewed on the survey Web site (<http://sphakia.classics.ox.ac.uk>).

Table 1 (continued)

Site Name and No.	Terracing	Criteria for Dating Terraces
Gourounokephalo/ Siopata (3.12)	shallow terraces built into E end of complex on gently sloping ground	5, 8, 9
Terrace Site (4.17)	sinuous perimeter walls on either side of site (cf. 4.34); very eroded terrace walls (might go with site)	7
Cistern Site (4.34)	terrace system abuts walls of main structure, running EW; as size and lichenization of stones are similar to that of house walls, some terracing may be contemporary with house; old EW terraces above and below site (6 m N, 6 and 24 m S); large, ruined perimeter wall W of structures runs ca. NS (cf. 4.17) (2.05 m wide at most (or 1.25 m); suspect wall is later than site (B/V date) or is W boundary wall of site	5
Revelo (4.35)	terraces do not seem to overlay or rob out ancient structure; ancient?	weaker version of 5
Prinaka/ Tsi Gonia (4.36)	terrace walls do not cross structure (may be contemporary); large enclosure wall 50 m W of site, between here and 4.34	weaker version of 5
Prinaka SE (4.37)	terraced, possibly in 2 orientations (later one has partly destroyed site)	weaker version of 5
Liviana Akropolis (5.01)	terracing mostly B/V/T date (ancient sherds in fill), but on NW slopes, some terraces with large boulders (ancient?)	3
Ag. Athanasios Structure 2 (5.05)	structure with tumbled enclosure of similar size; adjacent ruined boulder terrace wall (80 x 60 cm stones); both may be ancient (but not PH)	3
Phoenix-Loutro (5.11, sector 6)	lines of ruined terraces in NW of sector may be ancient	7
Phoenix-Loutro (5.11, sector 8)	terraces have ca. 1.5 m drop; made of medium-sized stones	2
Ergastiria (6.25)	series of terraces of large boulders (60 x 50 x 40 cm) in small valley over little ridge 100 m NW of main site; construction different from ordinary V/T terraces, thus tempting to suggest these are ancient; may/may not be contemporary with main site	3
Trochali (8.23)	structure 1 has terrace wall bonded in on W side (28 x 18 x 80 cm; wall 80 cm, stones 25 x 30 cm)	5
Patsianos Ag. Ioannis Vokolos S (8.44)	terrace wall abuts E corner of structure 1; boundary wall 1.1 m wide, 2 faces (stones 35 x 20 x 20 cm), filled with small stones; max pres. ht. 1.1 m	5, 6
Patsianos Olive Grove (8.45)	terracing and enclosures generally not ancient; a few have boulders up to 80 cm and could be older	3
Ag. Ioannis Vokolos Revma Section (8.47)	in revma (stream bed) section, no. 6 may be R/LR wall or terrace wall	version of 1
Possible Ancient Boundary Wall at Other Sites		
Limnia Basin (4.41)	possibly ancient perimeter wall upslope (much ruined); sherds drop off dramatically beyond	association with site
Limnia Slopes (4.60)	perimeter wall to NW	association with site
FK Limekiln (8.36)	ruinous perimeter wall, visible on aerials; possibly associated with LR phase	association with site
Ag. Astratigos (8.38)	E side of site; coursed perimeter wall (1.2 m wide, stones 30 x 25 x 15 cm)	association with site

which are bonded into a perimeter wall enclosing an area of 9 ha around the farmstead; the whole assemblage is plausibly claimed as Classical (criteria 4, 8, 9).<sup>53</sup>

Some scholars have claimed that the abandonment of the countryside and cultivation on the terraces in antiquity (the Hellenistic or Roman periods in mainland Greece), accompanied by careless pastoral practices, led to the collapse of terraces and consequential erosion of hillsides.<sup>54</sup> This claim has then been used to argue for ancient terracing: erosion in later antiquity is evidence for abandoned terraces. However, this is not a compelling argument. The dating evidence for the processes of erosion is not strong. Erosion has many causes, and in any case, terraces, even if trampled by sheep and goats, do not normally collapse to such an extent that they cause major erosion.<sup>55</sup>

### *Sphakia*

In Sphakia (fig. 2), terracing and enclosure walls are characteristic features of the landscape in four of our environmental zones (Coastal Plains, Lower Slopes, Basins and Mountain Plains, and Middle Slopes).<sup>56</sup> Most of the terraces that survive in Sphakia are probably Venetian or Turkish in date. We assume that because of the steady decrease in population from the 19th century onward, it is unlikely that there is much terracing using stone walls newly created in the 20th century. Such Venetian–Turkish terracing is very extensive, and dating it to the Venetian or Turkish period is possible on five main grounds.

First, the presence of datable pottery in the fill (criterion 1). For example, at Livaniana Akropolis (5.01; fig. 3) some of the terraces have unstratified ancient sherds in the fill and are, therefore, later in date, probably contemporary with the Venetian–Turkish village of Livaniana (5.08).<sup>57</sup> No terraces seen by us in Sphakia have stratified ancient pottery in the fill. That is, any visible Prehistoric or Graeco-Roman pottery is there as a result of the disruptive process of terrace building.

Second, ages of trees (criterion 2). In several places in Sphakia trees, especially olives, date ter-

aces to (at least) the Venetian or Turkish period. At Prophitis Ilias (3.14) each of four old olive trees has its own terrace; as two of these could be 600–700 years old, the terraces are at least Early Venetian in date. And as one of these old trees is certainly older than the large enclosure wall surrounding it, the wall could be Venetian/Early Turkish in date. Near the village of Komitadhes (8.02) the olive terraces have trees maybe 500 years old, which again date the terraces to at least the Venetian period. At Ta Livadhia (8.05A), south of the village of Vraskas, olives planted between 1400 and 1550 sit on terracing. At Ag. Ioannis Revma Olive Stool (8.19; fig. 4), two old trees, an olive stool, and a carob stool, each about 500 years old, grow out of and hence post-date some terrace walls. At Patsianos Village and Patsianos Playground (8.42, 8.43) olives 100–300 years old sit on terraces; in the olive terraces up behind the village Archaic–Hellenistic pottery in a section also suggested a Post-Antique date (criterion 1). At Ag. Marina Enclosure (8.81) there are terraces with 350-year-old olive trees.

Third, the relation of the terraces to ancient sites (criterion 5). In some cases terraces run across and destroy ancient sites. A group of four sites in the southeast of the Anopolis plain is a good example of this phenomenon (Peartree, 4.40; Structures, 4.41; Kambia Lime Kiln, 4.50; Klonias, 4.64 [fig. 5]; cf. Skaloti Terraces, 8.69 [fig. 2]). They all have Prehistoric or Graeco-Roman phases (extending into Roman or Late Roman), but the building remains consist mainly of stone piles, without any surviving ground plans. The building of terraces destroyed the sites: in one case the fill behind the terrace walls includes Prehistoric sherds down to 64 cm and Graeco-Roman sherds down to 50 cm. The combination of the pottery fill, the fact that the terraces must postdate the Late Roman period, and the physical appearance of the terraces date them to the Venetian–Turkish period.

Fourth, the condition of the terraces. Sharper, cleaner, and relatively unlichenized terraces are unlikely to be ancient in date (criteria 6 and 7). A useful control over this claim is given by two adja-

<sup>53</sup> Keller and Wallace 1988, 154, 157.

<sup>54</sup> Forbes and Koster 1976, 117–20; Pope and van Andel 1984; van Andel and Runnels 1987, 146; van Andel et al. 1997; accepted by Jameson et al. 1994, 398–9.

<sup>55</sup> Moody 1997; Whitelaw 2000, 143–6.

<sup>56</sup> The other four environmental zones are Gorge and Cliffs, Upper Slopes, Mountain Desert, and Madhares (high summer pastures); in other words, in Sphakia there is terracing in nearly every environmental zone where it is actually possible. Tech-

nically you could have terraces in the Madhares where there is some depth of soil, but we have seen no terraces in this zone. We surmise that people did not build any because the growing season is very short, and until relatively recently, the Madhares were not used for agriculture; after World War II the flat ground in some of the small basins was used for growing potatoes.

<sup>57</sup> All references in the form of 1.22 are to Sphakia Survey sites. Further details about them and photographs can be found on our Web site (Nixon et al. 2000).

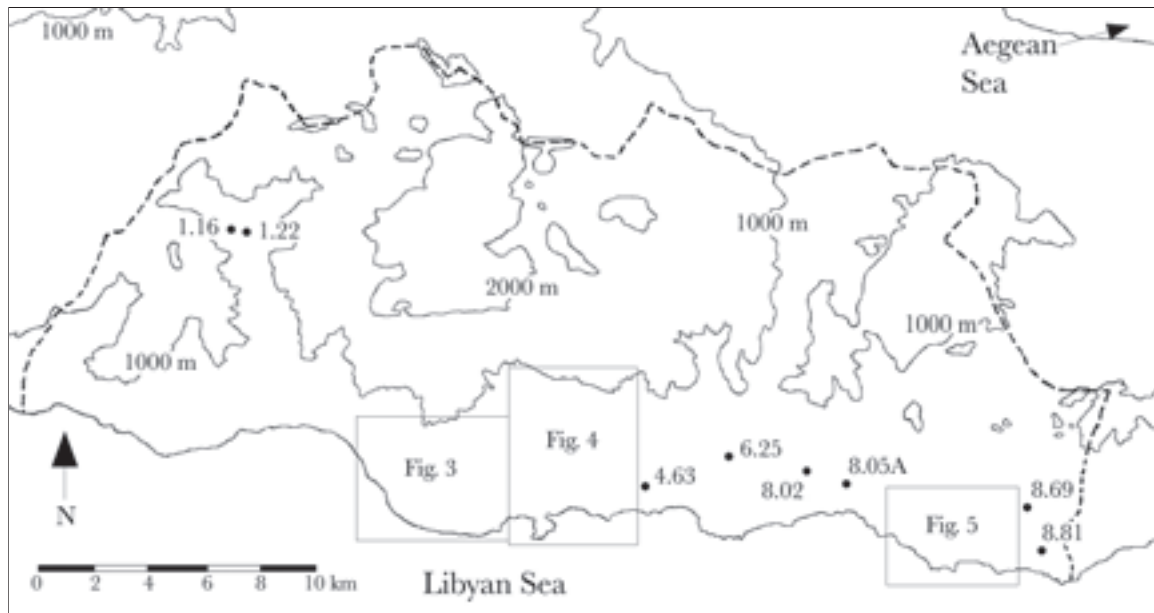


Fig. 2. Map showing Sphakia, with selected sites: Pano Khora (1.16), Samaria (1.22), Xerovothonas (4.63), Ergastiria (6.25), Komitadhes (8.02), Ta Livadhia (8.05A), Skaloti Terraces (8.69), Ag. Marina Enclosure (8.81)

cent bee enclosures at Xerovothonas (4.63).<sup>58</sup> The upper enclosure (ca. 33 x 19 m) is well preserved, with unweathered and unlichenized stones, and was in use into the 20th century. The walls of the lower enclosure (ca. 35 x 25 m) are more derelict, with weathered, heavily lichenized stones, an ancient cistern, and fragments of ancient beehives.

Fifth, strong association with settlement sites of the period (criterion 9). The center of the Samaria Gorge offers a good example. There are terraces on the east side of the gorge above the neighborhood of Ano Samaria, up to a height of 480 m, and 540 m on the Pyrgos ridge; on the west side of the gorge there is also terracing, up to 460 m (though it is not possible to estimate its extent because of regrowth of trees). There are only two periods when this part of the gorge was settled: the Late Roman/Early Byzantine period (Pano Khora 1.16) and the Venetian–modern period (Samaria 1.22). The terraces must be connected with these sites (the longer abandoned ones on the west side could be associated with the adjacent site of Pano Khora, while those on the east side could be associated with Samaria).

In Sphakia there is good evidence that some of the other terracing is ancient in date. In some cases it is closely related to ancient buildings, in one case it predates an ancient olive tree, and in others the

evidence is less strong on its own but suggestive in association with the firm data. There are also ancient “relict landscapes,” where terraces and other features have not been significantly modified by more recent land use. In addition, there is evidence for probable ancient perimeter walls. Table 1 presents the evidence in outline, arranged from west to east. The following discussion presents the material in terms of the strength of the evidential basis for the dating, as given in the list of criteria above. The criteria provide three main types of argument.

The first is based on the date of an ancient tree (criterion 2). The slopes rising up from the bay on the northwest of the Phoinix-Loutro peninsula are heavily terraced (5.11, sector 8; fig. 5). The terraces are on fairly steep slopes (15°); in order to create spaces ca. 2 m deep, they have quite large drops (ca. 1.5 m). These terraces can be dated not by a building but by an enormous olive tree sitting firmly at the edge of one of the terraces (fig. 6). The tree is 4.5 m in diameter, and its tree rings are faintly visible, being on average less than 1 mm. The tree is probably old for its size because it is growing in an especially arid environment. It dates, therefore, to the Hellenistic or Roman period (the range is a result of the variation in tree-ring sizes), and the terraces must be at least that old. The terrace on which the olive sits is part of a system of terracing

<sup>58</sup>Bee enclosures were often built in Sphakia, to protect beehives from animals and winds. For more information, see Nixon 2000.

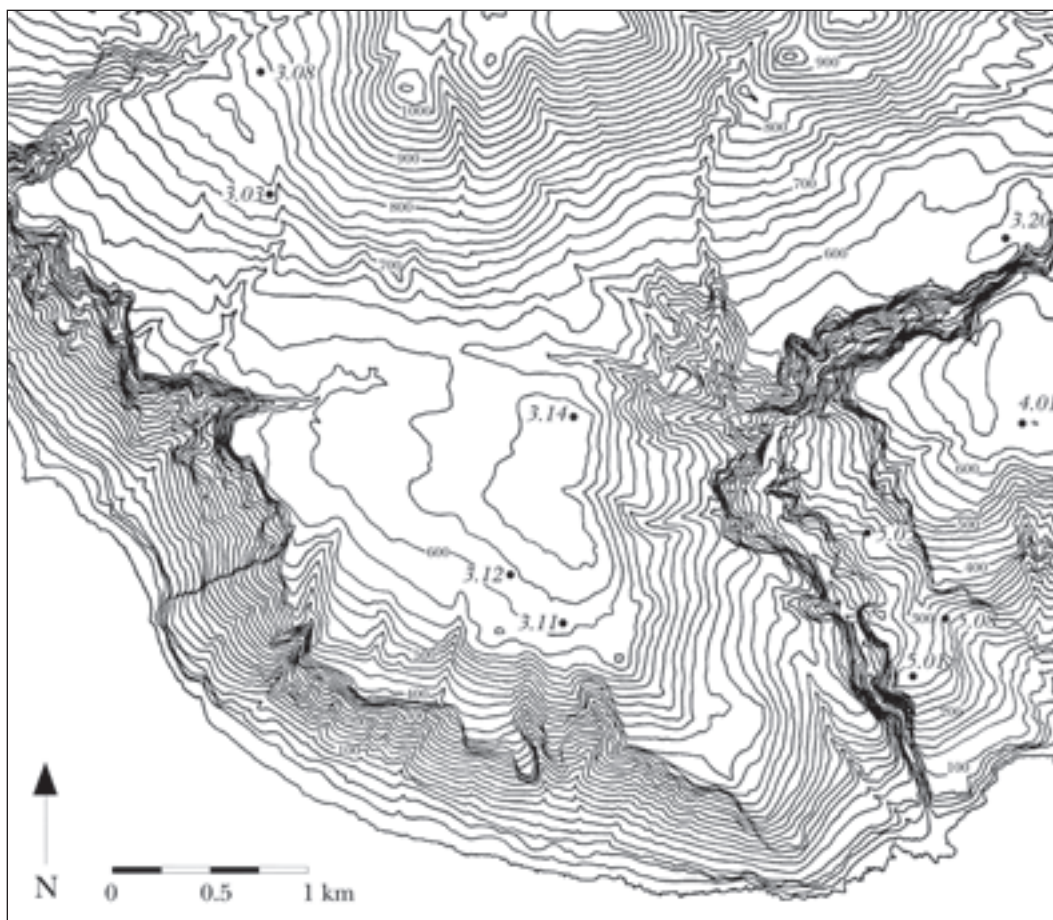


Fig. 3. Map showing Panagia (3.03), Papadhiana (3.11), Gourounokephalo/Siopata (3.12), Ts'Asi Basin (4.01), Livaniana Akropolis (5.01), and Ag. Athanasios Structure 2 (5.05), as well as the modern villages of Ag. Ioannis (3.08), Aradhena (3.20), and Livaniana (5.08). Contours at 20 m intervals.

that extends around the northwestern side of a basin. The terraces could have been built for trees (the location of the ancient olive at the edge of the terrace is normal, as it ensures the maximum depth of soil for the roots), but they could also have been used for grain or pulses (though not for grapes, because of the unsuitable microclimate).

The second type of argument is the construction style (criterion 3). In a number of cases there are traces of terraces built out of large stones (faces of 60 x 80 cm), much larger than those used in the usual Venetian–Turkish terraces (faces of 20 x 30 cm) (Livaniana Akropolis [5.01]; Ag. Athanasios Structure 2 [5.05]; Ergastiria [6.25]; Patsianos Olive Grove [8.45]). For example, in a small valley 100 m northwest of the site of Ergastiria (6.25) terraces are built of large boulders. They are quite different from the other terraces in the valley (which are characteristic of the Venetian/Turkish period), and may, therefore, be ancient and associated with the nearby site of Ergastiria. Field archae-

ologists often claim antiquity for such terraces, but meet with skepticism from others. It is true that in some cases more recent terraces have been made by rolling large stones into place to form the lowest course of a new terrace. To claim antiquity for a particular type of construction, one needs to show that such terraces are unusual in the landscape, often occurring near areas of obviously medieval–modern terracing, and seem to be residual traces of a more extensive terrace system of this type of construction. They are often very degraded, and there are obvious ancient sites in the vicinity with which the terraces can be associated.

The third basis for ascription of terraces to antiquity is a combination of the remaining criteria (4–9). There are three sites, or clusters of sites. First, there are extensive remains of old terraces and enclosures on the sloping plateau south of the modern village of Ag. Ioannis (fig. 3). It is worth emphasizing that they have been built on land whose slope is quite gentle (8°). In the midst of

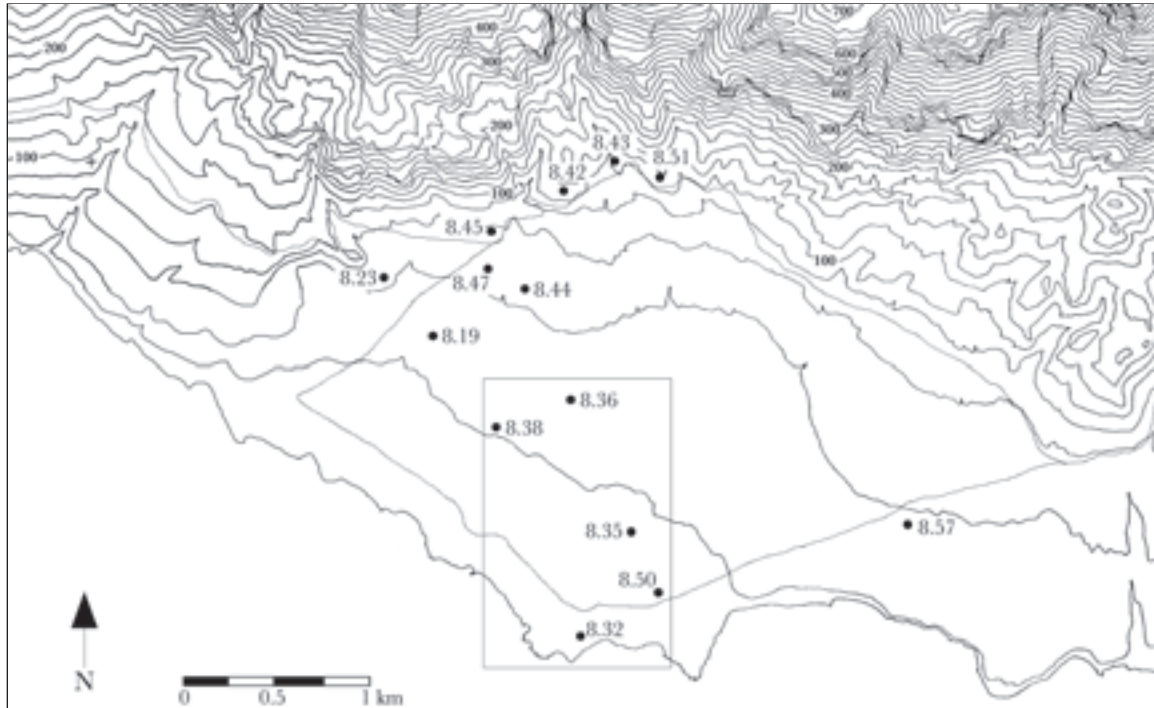


Fig. 4. Map of Frangokastello Plain: Ag. Ioannis Revma Olive Stool (8.19), Trochali (8.23), the fort of Frangokastello (8.32), Frangokastello Vitex (8.35), FK Limekiln (8.36), Ag. Astratigos (8.38), the village of Patsianos (8.42), Patsianos Playground (8.43), Patsianos Ag. Ioannis Vokolos S (8.44), Patsianos Olive Grove (8.45), Ag. Ioannis Vokolos Revma Section (8.47), the church of Ag. Nikitas (8.50), the village of Kapsodhasos (8.51), and Frangokastello Koulis Lakkoï (8.57). Contours are at 20 m intervals.

this extensive old field system is the site of Gourounokephalo/Siopata (3.12), a major Late Roman estate center. This site is almost equidistant between two other Late Roman sites, Panagia (3.03) and Aradhena (3.20), and lies toward the southern end of the hammerhead plateau that stretches south from the modern village of Ag. Ioannis. Much of the site is a sea of stone tumble, but a plan of most of the complex has been recovered whose associated pottery is largely Late Roman in date (fourth–seventh centuries A.D.), though there may also be a Roman phase (fig. 7). The complex at Gourounokephalo/Siopata as a whole measures 76 m north–south x 64 m east–west. There seem to be three main sections: (1) at the north a group of 3+ rooms, with a clear, short wall running to the west (to form a courtyard?); (2) in the center, separated by shallow ancient terracing, a group of 11+ rooms; (3) at the south a group of 20+ rooms (this group is very different in feel because half the rooms have curvilinear walls; some rooms are preserved to 1–2 m depth without any sign of windows). In between sections 2 and 3 is an ancient cistern with opus signinum plaster. The walls are well built, with two faces, 1.10 m wide, with

large stones. Individual rooms measure about 5 x 2.50 m; one has a niche or small cupboard built into the wall. The pottery at Gourounokephalo/Siopata is a good domestic assemblage of the Late Roman period.

The terrace walls running to the east of Gourounokephalo/Siopata are built into part of the site and are hence contemporary with the complex (criterion 5). This association is important evidence for the dating of terracing, and shows that at least one phase of the terracing on this whole hillside (just visible on aerial photographs, fig. 8) is ancient, and presumably Roman/Late Roman (criterion 8). The terracing shows that the site had a strong agricultural basis. It is tempting to relate the terracing to the group of 20+ rooms in section 3 of the site: their curvilinear walls and seeming absence of windows suggest not domestic architecture but storage. If this is right, the storage capacity of these 20+ rooms was large, far more than necessary for one nuclear family. As the rooms in sections 1 and 2 of the site are presumably housing, their agglomeration suggests that the site could have been the home of one family that acquired a significant amount of land in this area and sold its surplus agricultural

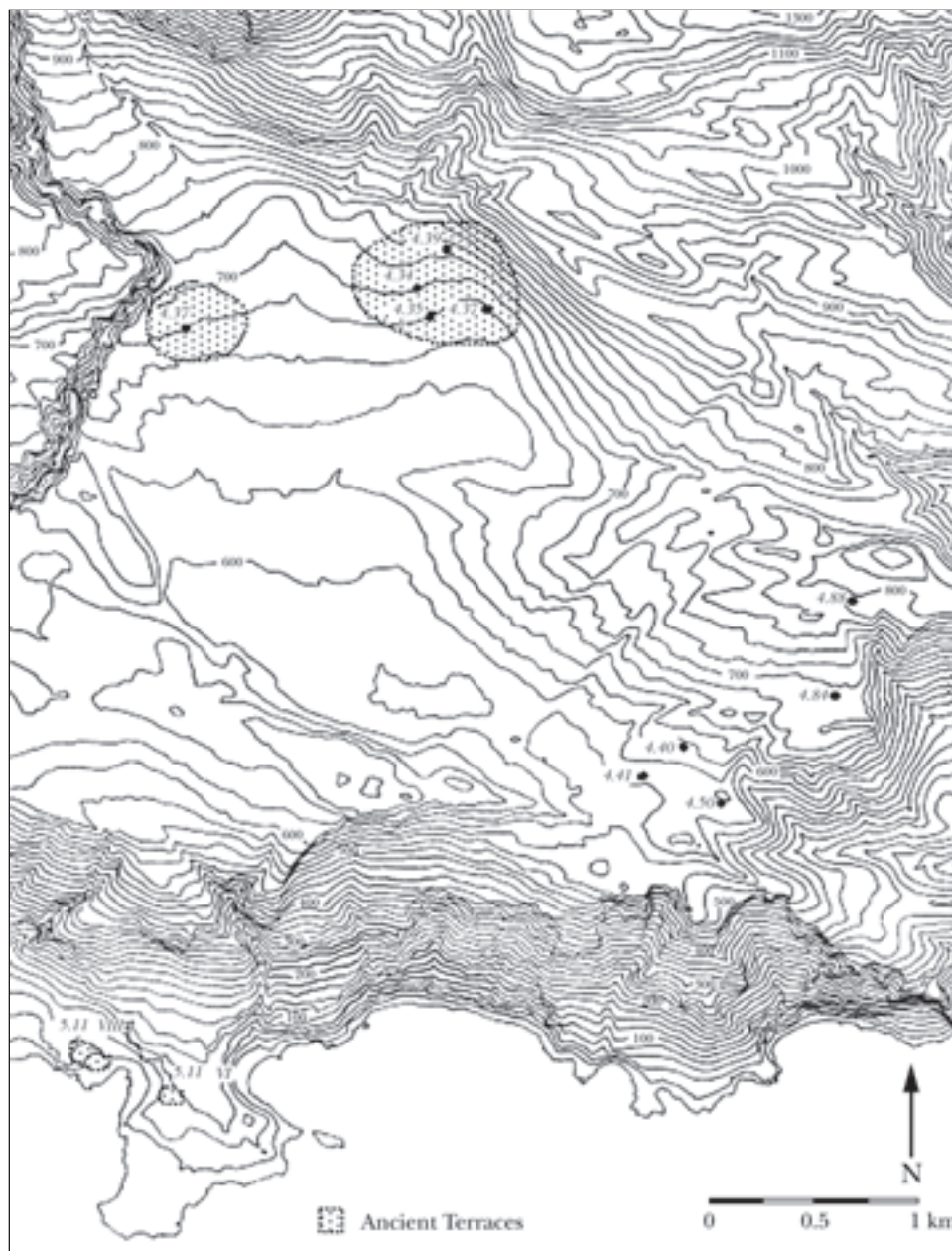


Fig. 5. Map of Anopolis Plain and Phoinix-Loutro. Sites mentioned and areas of likely ancient terracing (stippled): Terrace Site (4.17), Cistern Site (4.34), Revelo (4.35), Prinaka/Tsi Gonia (4.36), Prinaka SE (4.37), Peartree (4.40), Limnia Basin (4.41), Kambia Lime Kiln (4.50), Klonias (4.64), Kastri (4.66), Phoinix-Loutro (5.11, sector 6), and Phoinix-Loutro (5.11, sector 8). Contours at 20 m intervals.

produce (Phoinix [5.11] will have been a possible local market).<sup>59</sup>

The example of Gourounokephalo/Siopata is an important one, because it reveals an approach to

the local landscape that is very different from that of the Venetian–Turkish period. There was a small settlement at Papadhiana (3.11), only 350 m away, and yet the areas terraced in the Roman period seem

<sup>59</sup> Gourounokephalo/Siopata is comparable in scale and perhaps function to one of the Ts'Asi sites (4.03) a little to the east, on the other side of the Aradhena Gorge. The terraces at nearby Ag. Ioannis Revma (3.07) might also be ancient, but the case is based mainly on proximity.



Fig. 6. Phoinix-Loutro (5.11, sector 8), ancient olive growing over the brow of a terrace at the right; the terrace must antedate the planting of the olive. July 1987. (O. Rackham)

not to have been cultivated, even though these relatively gentle slopes were easily within the radius of convenience for walking to fields or terraces. This part of the landscape was left in place, or “relict,” by later inhabitants who built rectangular enclosures to the south and west of the ancient site and its terraces.

Second, the Anopolis Plain is also extensively terraced, again on quite gentle slopes (7–8°; fig. 5). Some of the terracing toward the northern end of the plain (at 680–730 m) is probably ancient. The best evidence is from the Cistern Site (4.34; figs. 9–11). This is a Roman–Late Roman house with its own cistern and a peripheral structure 75 m away. It seems to have been part of an organized agricultural landscape. Crucially, the terracing abuts the walls of the main structure. Such a relationship usually means the terracing postdates the construction of the building, but in this case they were contemporary: the stones of the terrace are similar in weathering and lichenization to those of the building, and the construction of the terrace

did not efface the ancient building (whose ground plan is still visible). There were also large perimeter walls east and west of the house, but these might be later in date (Byzantine–Venetian).

Another Hellenistic/Roman house in the Anopolis plain (site 4.17) lies among highly eroded terraces. The extent of erosion is so unusual for Sphakia that the terraces might be contemporary with the house (criterion 7). In addition, long-abandoned terraces avoid three other nearby ancient structures (Revelo, 4.35; Prinaka/Tsi Gonia, 4.36; Prinaka SE, 4.37), and may also be ancient.<sup>60</sup> It looks as though there is a pattern of ancient terracing on these slopes; the traces of sinuous perimeter walls on either side might be later in date. Together these sites on the northern side of the Anopolis plain constitute another good example of a relict landscape, an area left alone by subsequent settlement and relatively undisturbed by later land use.

Third, although the Frangokastello plain looks barren today, crops were grown here until a generation ago (fig. 4).<sup>61</sup> The plain is largely covered with

<sup>60</sup>Cf. also Ts’Asi Basin, 4.01 (abandoned agricultural terraces, not crossing the ancient buildings); Kastri, 4.66 (terracing does not cut across Roman structure, but unclear if Roman or Vene-

tian/Turkish in date).

<sup>61</sup>Fielding (1953, 285–6) notes women harvesting in the plain.



Fig. 7. Plan of Gourounokephalo/Siopata (3.12). The interior wall lines of rooms have been mapped where possible within the stone tumble (shaded gray). Two sets of three shallow agricultural terraces run off to the west (1, 2); other low walls (3, 4) form steps within groups of rooms. A cistern (5) is in the middle of the site. (Drawing by S. Donovan and S. Price)

terrace walls, despite its very low angle of slope (1–2°). These terraces are of two kinds: conventional, with stone walls a little less than 1 m high; and very faint, narrow terraces with walls often only one stone high. They have been mapped (fig. 12) and are also visible on aerial photographs (fig. 13).<sup>62</sup> Their presence on a plain that is practically flat is very striking. The plain is subject to periodic and potentially disastrous floods, and the terraces may be designed to reduce the resulting sheet erosion and gullying.

The ordinary terraces are in the more stony parts of the plain, between the stone tumbles of the Ro-

man sites. They are semi-regular, not quite parallel to the contours. They are interrupted by very irregular, often more massive stretches of wall that wander about independently of the slope; one wall seems to be contemporary with a Roman–Late Roman house constructed of stones of the same size and degree of lichenization, which it abuts (Patsianos Ag. Ioannis Vokolos S, 8.44; fig. 14).<sup>63</sup> They also run up to the Late Roman site of Ag. Astratigos (8.38). Where the narrow terraces abut on these interrupting walls, they often curve into them in a way that avoids acute angles; this shows that the interrupt-

<sup>62</sup>See Rackham and Moody 1997, 143–4 (fig. 12.3).

<sup>63</sup>At the nearby site of 8.47 possible terrace walls (Roman/Late Roman?) are visible in section. Presumably 8.44 was just

far enough from the revma, or stream bed, to avoid being buried in the mud that covered 8.47.

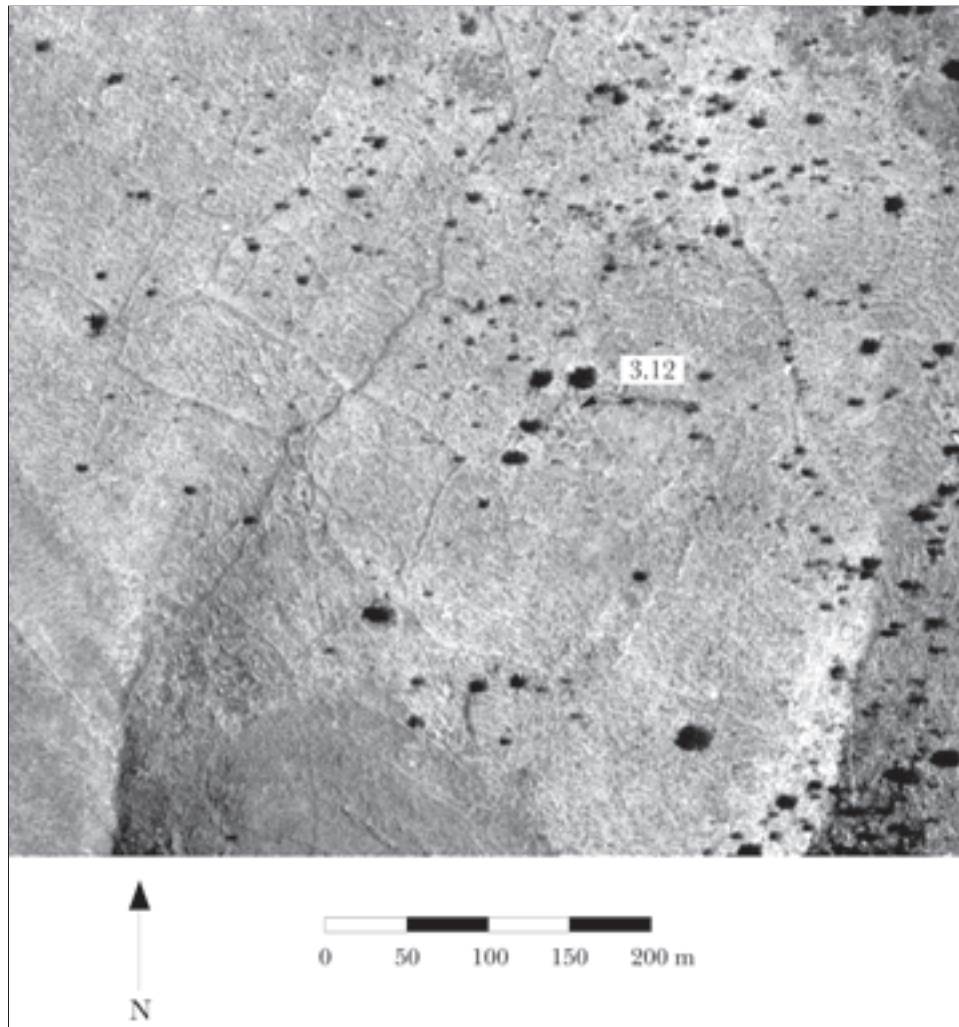


Fig. 8. Aerial photograph of Gourounokephalo/Siopata (3.12). Three large trees stand on the west side of the site. Extensive traces of rectangular enclosure walls are visible farther to the south and west; these are probably Venetian in date. (Enlarged detail of Greek Ministry of the Environment and Landuse photograph 124796, taken July 1980 at 1:14,000)

ing walls are older. Some of the narrow terraces overlie the less stony Roman sites (e.g., Frangokastello Vitex 8.35; Frangokastello Koulis Lakkoi 8.57). It seems that the Roman farms had small, irregular, non-terraced fields defined by walls. These fell into a period of disuse in which most of the walls collapsed. On reuse, presumably in the Venetian/Turkish period, the stones of the walls were recycled into a terrace system, except for stretches of wall that survived in a reusable condition, implying quite different property rights. The faint, narrow terraces represent a different philosophy of terracing and are, therefore, of a different period, presumably much younger. On the whole, they are in less stony parts of the plain. They seem not to be attached to earlier enclosure walls.

In conclusion, sites of all sizes in the Roman–Late Roman periods are associated with terrace walls; the Phoinix-Loutro area may have had terrace walls as early as the Hellenistic period. The increased number of dispersed residential sites of various sizes in the Roman–Late Roman periods marks a different philosophy of land use, with more terracing and presumably more exploitation of the territory immediately around those residences. In other words, the increase in the number of sites was accompanied by an intensification in agricultural production. These Roman–Late Roman terraces are generally on far gentler slopes than the characteristic steep hillsides of Venetian–Turkish terraces in Greece. They were presumably constructed to facilitate the growing of crops such as



Fig. 9. Plan of Cistern Site (4.34), which records walls visible in the stone tumble, often overgrown by heavily browsed prickly oak (seen in fig. 10). Stippling indicates stone tumble. In the center is a round cistern, with a level area to the east; terrace wall abuts at east end. (Drawing by S. Donovan and S. Price)



Fig. 10. Cistern Site (4.34), looking northwest at the junction of north–south wall running up from cistern with east–west rear wall of house. Simon Price is at point 1 on fig. 9. September 2004.



Fig. 11. Cistern Site (4.34), looking north at terrace walls below the site. Simon Price on upper wall (6 m below site) and notebook (in the foreground) at 24 m south of site. Site itself is marked on right. September 2004.

grains or legumes, and in some cases trees; they are not in obvious locations for grapes. The boundary walls that we have detected in some cases were presumably exclusion walls, to keep animals out of the crops (rather like the αἶμασιά on which the boy was sitting to keep watch in the poem by Theocritus, text 9).

On steeper slopes, where there is Venetian/Turkish terracing, we also find some traces of terrace walls that are different in construction and appearance (Liviana Akropolis, 5.01; Ergastiria, 6.25; Patsianos Olive Grove, 8.45). They are presumably ancient and earlier than the Roman–Late Roman terraces; Liviana Akropolis and Patsianos Olive Grove are likely to be Archaic–Hellenistic (the date of the associated sites). These terrace systems were investigated by the Sphakia Survey just in time. The modernization of agriculture, which is affecting even the sparsely populated area of Sphakia, especially the use of bulldozers, is in the process of de-

stroying ancient field systems. In some cases our relict landscapes will soon disappear.

#### IMPLICATIONS

The difficulties of handling both linguistic and material evidence in relation to classical antiquity are not peculiar to the evidence for that epoch. For modern Greece, where terraces are such a common feature of the landscape, the issue of terminology is no less difficult. The ancient terminology had changed by the Byzantine period. Eustathius, a philologist writing in the 12th century, notes that αἶμασιά, meaning wall built out of stones, as a fence was an “ancient” (i.e., non-current) usage.<sup>64</sup> At least three different words can be used today for terraces (ξερολιθιά, πεζούλα, τοίχος). The first two refer generically to dry-stone walls, while the third is still more general and can refer to any sort of wall; but all three can also be used for terraces in particular. As with the ancient words αἶμασιά and τειχίον, only

<sup>64</sup> Eust. *Od.* (Stallbaum 1970, 2.185.2). According to a 10th-century commentator on Herodotus, the current word was ἐρμακιά (*Glossae in Herodotum* [Stein 1965, 1, no. 50]).

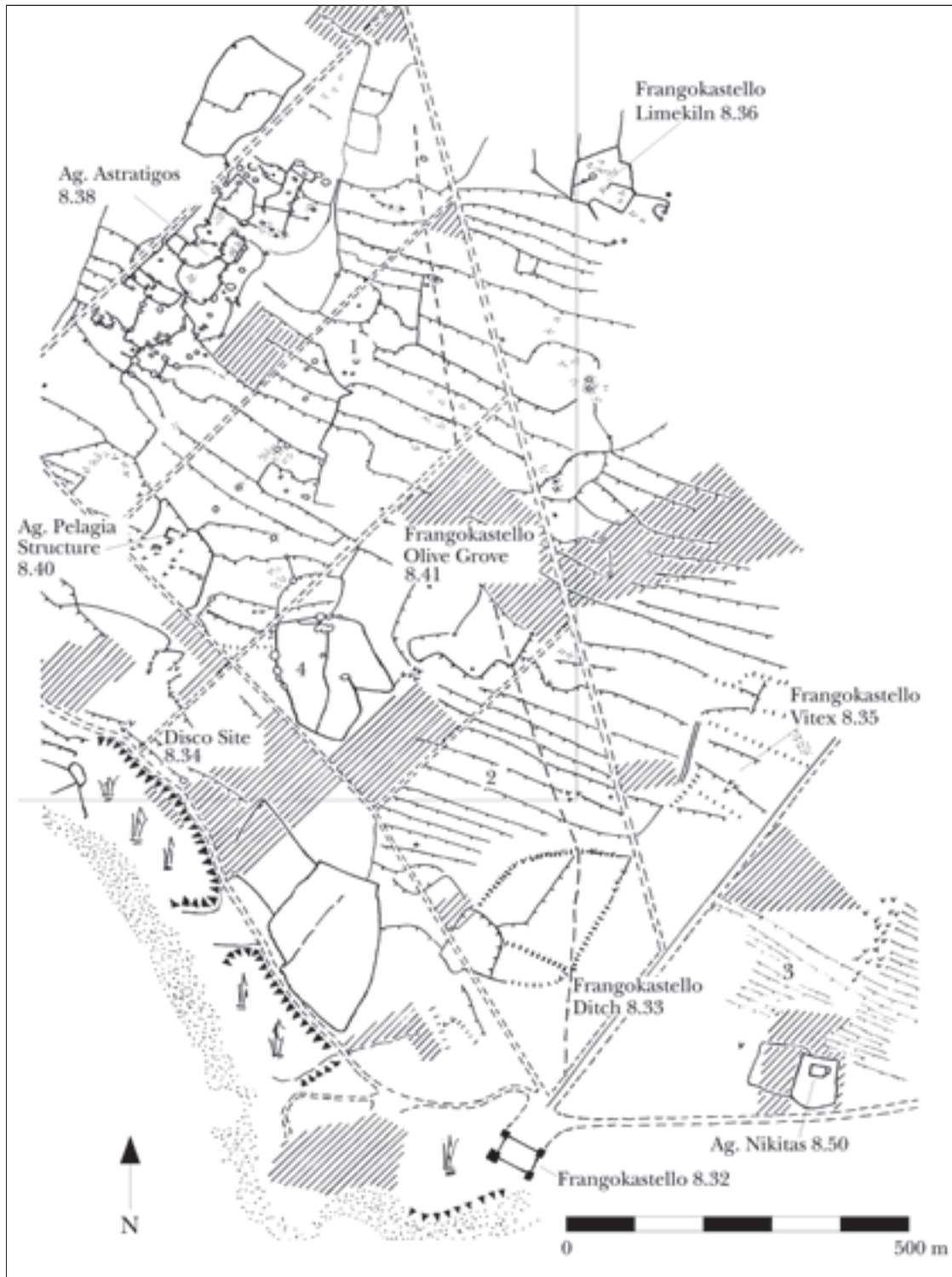


Fig. 12. Terraces in the southern Frangokastello Plain: all the sites identified by the Sphakia Survey in the area just north of the Venetian fort of Frangokastello (8.32). Southeast of the Roman–Late Roman village site of Ag. Astratigos (8.38) are irregularly spaced terraces (1 on map), dotted with carobs, which may be contemporary with the site. At 2, there are more regularly spaced terraces of roughly the same orientation. At 3, tiny terraces no more than one stone high seem to overlie the ancient site in this area. At 4 is an example of a large irregular enclosure. The straight roads were built in the late 1970s; the hatched areas were bulldozed in the 1980s. A box marks the area of fig. 13. (Drawing by O. Rackham)



Fig. 13. Aerial photograph of the northwestern section of fig. 12. The remains of the site of Ag. Astratigos (8.38) lie among the concentration of carob trees visible as black dots. Ag. Pelagia Structure (8.40) lies to the south, Frangokastello Olive Grove (8.41) to the east, and the Disco Site (8.34) to the south. Suspected ancient terracing east of Ag. Astratigos is marked as 1; 4 is a large irregular enclosure. Some details of land use marked on the map postdate the aerial photograph. (Enlarged detail of Greek Ministry of the Environment and Landuse photograph 136500, taken July 1981 at 1:16,000)



Fig. 14. Patsianos Vokolos (8.44), looking northwest. Arrow marks junction of house wall on left and ancient terrace wall running up to it from the right; notice the similar degree and type of lichenization on the two sets of stones. July 1992.

the context makes clear what the referent is. Again, as with *αίμασιά*, the reference to terrace walls is not specified in any modern Greek lexicon that we have seen.<sup>65</sup> Thus dating the terraces of the modern landscape can be as challenging as dating ancient terraces.<sup>66</sup>

In relation to antiquity, the textual evidence makes it clear that terracing is something the Greeks did have a word for (though not a word that applied uniquely to terraces) and that terrace walls were a familiar enough part of the landscape to be referred to without further explanation in legal documents. The reference (or denotation) of the two words *αίμασιά* and *τειχίον* was made clear in the context of use. The archaeological evidence, mostly from survey but in some cases also from excavation, suggests that terraces did exist in the Graeco-Roman period and that it is possible to propose dates for them by association with trees and with dated sites, taking into account the nature and condition of the stones. The traces of ancient terraces should be seen as part of the assemblage of specific sites or groups of sites and are worth look-

ing for in the landscape as evidence of the exploitation of territory in particular periods. Terrace walls offer one way of delineating landscapes, including relict landscapes.

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## Appendix

The following are texts illustrating the usages of *haimasia* (freestanding wall; enclosure wall; terrace wall) and *teikhion* (freestanding wall). Texts within each usage are in chronological order.

<sup>65</sup>The *Λεξικό της Κοινής Νεοελληνικής* (1998) lists only the more general meanings for these words. There are no

relevant entries on most of these words in other lexica.

<sup>66</sup>French and Whitelaw 1999.

## HAIMASIA (αίμασιά)

*Freestanding Wall*Text 1. Hom. *Od.* 18.357–359 (eighth century B.C.)

Ξεῖν', ἢ ἄρ κ' ἐθέλοις θηπευέμεν, εἴ σ' ἀνελοίμην,  
ἀγροῦ ἐπ' ἐσχατιῆς,—μισθὸς δέ τοι ἄρκιος ἔσται,—  
αἰμασιάς τε λέγων καὶ δένδρεα μακρὰ φυτεύων;

Stranger, I wonder whether you would like to work  
my land, if I took you on,  
on some marginal fields, at a proper rate of course,  
assembling haimasiai and planting tall trees?

Text 2. Hom. *Od.* 24.222–225 (eighth century B.C.)

οὐδ' εὖρεν Δολίον, μέγαν ὄρχατον ἐσκαταβαίνων,  
οὐδέ τινα δμῶων οὐδ' υἱῶν· ἀλλ' ἄρα τοί γε  
αἰμασιάς λέξοντες ἀλώης ἔμμεναι ἔρκος  
ὄιχοντ', αὐτὰρ ὁ τοῖσι γέρων ὄδον ἠγεμόνευε.

As he went down into the great orchard, he did not  
find Dolios,  
nor any of the servants or his sons; they had gone  
with the old man at their head to assemble haimasiai,  
which would protect the cultivated land.

Text 3. Hdt. 1.180 (fifth century B.C.)

τὸ ὦν δὴ τεῖχος ἐκάτερον τοὺς ἀγκῶνας ἐς τὸν  
ποταμὸν ἐλήλαται· τὸ δὲ ἀπὸ τούτου αἱ ἐπικαμπαὶ  
παρὰ χεῖλος ἐκάτερον τοῦ ποταμοῦ αἰμασιῇ πλίνθων  
ὀπτέων παρατείνει. τὸ δὲ ἄστυ αὐτὸ ἐδὸν πλήρες  
οἰκίῶν τριροδῶν καὶ τετροδῶν κατατέμνεται  
τὰς ὁδοὺς ἰθείας, τὰς τε ἄλλας καὶ τὰς ἐπικαροῖας τὰς  
ἐπὶ τὸν ποταμὸν ἐχούσας. κατὰ δὴ ὦν ἐκάστην ὄδον  
ἐν τῇ αἰμασιῇ τῇ παρὰ τὸν ποταμὸν पुलίδες ἐπήσαν,  
ὅσα περ αἱ λαύραι, τοσαῦτα ἀριθμόν· ἦσαν δὲ καὶ  
αὗται χάλκεαι, φέρουσαι καὶ αὐταὶ ἐς αὐτὸν τὸν  
ποταμόν.

The (fortification) wall is brought right down to the  
river [Euphrates] on both sides, and at an angle to it  
there is a haimasia of baked bricks running along  
either bank of the river. In the town there are a great  
many houses of three and four stories. The main  
streets and the side streets that lead to the river are  
all dead straight. For every one of the side streets or  
alleys there were gates in the haimasia by the river;  
the gates were bronze and they led to that river.

Text 4. Hdt. 6.134 (fifth century B.C.)

πρὸς τῆσι θύρησιν τε γενέσθαι καὶ πρόκατε φρίκης  
αὐτὸν ὑπελθούσης ὀπίσω τὴν αὐτὴν ὄδον ἴεσθαι,  
καταθρόσκοντα δὲ τὴν αἰμασιῇ τὸν μηρὸν  
οπασθῆναι.

When he [Miltiades] reached the doors [of the tem-  
ple], he was seized with a sudden fit of trembling, ran  
back the way he had come, and, in jumping down  
from the top of the haimasia, broke his leg.

Text 5. Dem. 55 *contra Calliclem* 11, 14, 22, 27, 28, 30  
(fourth century B.C.)

διὸ δὴ ταῦθ' ὁ πατὴρ ὀρών, ὡς ἐγὼ τῶν εἰδότην  
ἀκούω, καὶ τῶν γειτόνων ἐπινεμόντων ἅμα καὶ

βαδιζόντων διὰ τοῦ χωρίου, τὴν αἰμασιῶν  
περιφοδομήσεν ταύτην (11). . . . ταῦτα τοῖσιν  
ἀμφότερ', ὡς ἄνδρες δικασταί, συμβέβηκεν· καὶ γὰρ  
ἐκ τῶν δένδρα πεφύτευται πρότερον ἢ τὸν πατέρα  
περιοικοδομήσασιν τὴν αἰμασιῶν, καὶ τὰ μνήματα  
παλαιὰ καὶ πρὶν ἡμᾶς κτήσασθαι τὸ χωρίον  
γεγεννημέν' ἐστίν (14). Οὐκ οὐκ δεινόν, ὡς ἄνδρες  
δικασταί, τούτους μὲν μηδὲν ἐγκαλεῖν μοι τοσαῦτα  
βεβλαμμένους, μηδ' ἄλλον μηδένα τῶν ἠτυχηκότων,  
ἀλλὰ τὴν τύχην στέργειν, τουτοῖσι δὲ συκοφαντεῖν;  
ὄν ὅτι μὲν αὐτὸς ἐξημάρτηκεν πρῶτον μὲν τὴν ὄδον  
στενωτέραν ποιήσας, ἐξαγαγὼν ἔξω τὴν αἰμασιῶν,  
ἵνα τὰ δένδρα τῆς ὁδοῦ ποιήσῃ εἴσω, ἔπειτα δὲ τὸν  
χλῆδον ἐκβαλὼν εἰς τὴν ὄδον, ἐξ ὧν ὑψηλοτέραν  
τὴν αὐτὴν καὶ στενωτέραν πεποιήσασιν συμβέβηκεν,  
ἐκ τῶν μαρτυριῶν αὐτίκ' εἴσοσθε σαφέστεραν (22).  
ἵνα δ' εἰδῆθ' ὅτι καὶ τὸν χλῆδον εἰς τὴν ὄδον  
ἐκβεβλήκασι, καὶ τὴν αἰμασιῶν προαγαγόντες  
στενωτέραν τὴν ὄδον πεποιήκασι, ἐτι δ' ὡς ὄρκον  
ἐδίδου ἐγὼ τῇ τούτων μητρί, καὶ τὴν ἐμαυτοῦ τὸν  
αὐτὸν ὁμόσαι προῦκαλούμην, λαβὲ μοι τὰς τε  
μαρτυρίας καὶ τὴν πρόκλησιν (27). Εἴτα τούτων  
ἀναισχυντότεροι γένοιντ' ἂν ἄνθρωποι ἢ  
περιφανέστερον συκοφαντοῦντες, οἵτινες αὐτοὶ τὴν  
αἰμασιῶν προαγαγόντες καὶ τὴν ὄδον ἀνακεχωκότες  
ἑτέροις βλάβης δικάζονται, καὶ ταῦτα χιλίων  
δραχμῶν ἀτίμητον, οἳ γ' οὐδὲ πενήκοντα δραχμῶν  
τὸ παράπαν ἅπαντ' ἀπολωλέκασι; (28) δηλον γάρ  
ὅτι μεγάλοις λίθοις ἀποικοδομηθέντος πάλιν τὸ  
ὑδωρ εἰς τὸ ἐμὸν ἤξει χωρίον, εἴθ' ὅταν τύχη  
καταβαλεῖ τὴν αἰμασιῶν ἀπροδοκίῳ (30).

For this reason my father, when he saw what was hap-  
pening (so I am informed by those knowing the cir-  
cumstances), and because the neighbors at the same  
time were grazing their animals on the field and walk-  
ing through it, built this haimasia around it (11). . . .  
Well, both these things have happened, gentlemen of  
the jury. For not only were the trees planted before my  
father built the haimasia, but the tombs are old, and  
were built before we acquired the field (14). Is it not,  
then, an outrageous thing, gentlemen of the jury, that,  
while these people have made no complaint against  
me, although they suffered such heavy damages, nor  
has anyone else of those who suffered misfortune, but  
they have accepted their lot, this man should bring a  
malicious suit? But that he is himself at fault, first in  
that he made the road narrower by extending the hai-  
masia beyond the property line, in order to enclose  
the trees of the road, and second, in that he threw the  
debris into the road, from which actions it resulted  
that the road became higher as well as narrower—of  
this you will presently gain clearer knowledge from the  
depositions (22). However, to prove to you that they  
have thrown debris into the road, and by advancing  
the haimasia have made the road narrower; and fur-  
thermore that I tendered an oath to their mother, and  
challenged them to have my mother swear in the same  
terms [Clerk], take, please, the depositions and the  
challenge (27). Could there, then, be people more  
shameless than these, or more plainly malicious petti-  
foggers—men who, after advancing their own haima-  
sia and raising the level of the road, are suing others  
for damages, and that too for a fixed sum of 1,000  
drachmas, when they have lost 50 at most? (28) For it is

evident that, since you have built your obstructing haimasia with large stones, the water will flow back upon my field, and when it so chances, may with an unexpected rush throw down my haimasia (30).

Text 6. Men. *Dys.* 376–377 (fourth century B.C.)

τὴν αἵμασιαν ἐποικοδομήσω γὰρ τέως  
ἐγώ. ποιητέον δὲ καὶ τοῦτ' ἐστί.

I'll spend the time mending the haimasia;  
that's got to be done too.

Text 7. Arist. *Hist. an.* 7(8).4.594a9–12 (fourth century B.C.)

Οἱ δ' ὄφεις καὶ πρὸς τὸν οἶνόν εἰσιν ἀκρατεῖς, διὸ  
θηρευούσιν τινες καὶ τοὺς ἔχεις εἰς ὀστράκια  
διατιθέντες οἶνον εἰς τὰς αἵμασιὰς· λαμβάνονται γὰρ  
μεθύοντες.

But the snakes are also immoderate in regard to wine,  
and so some people hunt even vipers by setting out  
wine in pieces of pottery in the haimasiai; they are  
caught while drunk.

Text 8. Theophr. *Hist. pl.* 6.7.5 (fourth century B.C.)

Τοῦ δὲ ἐρπύλλου ἴδιος ἢ αὐξησις ἢ τῶν βλαστῶν·  
δύναται γὰρ ἐφ' ὅσονοῦν προϊέναι κατὰ μῆκος  
χάρακα λαβῶν ἢ πρὸς αἵμασιαν φυτευθεὶς ἢ κάτω  
καθήμενος·

The growth of the shoots of thyme is peculiar. If it has  
a stake, or is planted against a haimasia, it can send  
them out to any length, so also if it is let grow down-  
ward.

Text 9. Theoc. 1.45–48 (third century B.C.)

τυτθὸν δ' ὅσον ἄπωθεν ἀλιπρῦτοιο γέροντος  
περκναῖσι σταφυλαῖσι καλὸν βέβριθεν ἄλωά,  
τὰν ὀλίγος τις κῶρος ἐφ' αἵμασιᾶσι φυλάσσει  
ἦμενος·

And a very little way from the sea-worn old man  
there is a vineyard  
with a fair load of reddening clusters, guarded by  
some little boy who  
sits upon the haimasiai.

Text 10. Leonidas of Tarentum (*Anth. Plan.* 236  
[Gow and Page 1965, no. 83]) (third century B.C.)

Αὐτοῦ ἐφ' αἵμασιᾶσι τὸν ἀγρυπνοῦντα Πρίηπον  
ἔστησεν λαχάνων Δεινομένης φύλακα.  
ἀλλ' ὡς ἐντέταμαι, φῶρ, ἔμβλεπε. “Τοῦτο,” δ' ἐρωτᾷς,  
“τῶν ὀλίγων λαχάνων εἶνεκα;” τῶν ὀλίγων.

Here on the haimasiai did Deinomenes set me up,  
wakeful Priapos, to guard his greens.  
And look, thief, how excited I am. And is this, you say,  
all for the sake of a few greens? For the sake of  
these few.

Text 11. *SEG* 2.568–569; *Inscriptionen von Didyma* 40  
(Miletus) (Hellenistic)

[τῆς οἰκοδομίας τῶν αἵμασιῶν  
of the building of the haimasiai

Text 12. *Inscriptionen von Mylasa* 814.11 (Olymos)  
(Blümel 1987–1988, vol. 2) (second century B.C.)

[. . . ὡς τὰ ὄρια πέπ]ηγεν μέχρι τῆς ὁδοῦ τῆς ἐπ'  
Εὐρώμον φερούσης καὶ εἰς τὰς προσοῦσας αἵμασιὰς  
πάσας αἵτινε[ς]. . . .

that he fixed the boundary as far as the road to Euro-  
mos and to all the contiguous haimasiai, which. . . .

Text 13. *Inscriptionen von Ephesos* 1525.2–3 (Ephesus)  
(Wankel et al. 1979–1984, vol. 5). The restorations  
are uncertain. (Augustan period)

[καὶ προελθόντες ἐστήσαμεν ἐκκαιδεκάτην | στή]λην  
πρὸς το[ῖς] ἱεροῖς, ὡς ἡ αἵμασιὰ, ἀν[ὰ λόγ]ον τῆς  
σταθείση[ς] πρότερον] δεκά[της] στήλης]

[and advancing we established the 11th ste]le by the  
sacred buildings, at the haimasia, proportionate to  
the [previously] established 10th stele.

Text 14. Dioscurides Pedanius, *De materia medica*  
2.166.1 (first century A.D.)

δρακόντιον· φύλλα ἔχει κισσοειδῆ, μέγала, σπῖλους  
ἔχοντα λευκοὺς, καυλὸν δὲ ὀρθόν, δύπηχυν, ποικίλον,  
ὄφιοειδῆ, διαπόρφυρον τοῖς σπῖλοις, βακτηρίας τὸ  
πάχος· καρπὸς δὲ ἐπ' ἄκρου βοτρυοειδῆς, χρώματι  
τὸ μὲν πρῶτον χλωδῆς, πεπανθεὶς δὲ κροκίζων,  
ἐπιδάκνων τὴν γεῦσιν, ρίζα ποσῶς στρογγύλη,  
βολβοειδῆς, ὁμοία ἄρω, φλοῖον ἔχουσα λεπτόν.  
φύεται ἐν ουσκίοις <τόποις> περὶ φραγμοὺς καὶ  
αἵμασιὰς.

*Dracunculus vulgaris*: it has big ivy-like leaves, having  
white flecks, and an upright stem, two cubits long,  
variegated, snake-shaped, deep purple in the flecks,  
the thickness of a staff. The fruit on the end is shaped  
like grapes, first pale green in color, and when ripe,  
turning yellow, pungent in taste, the root fairly round  
and bulb-like, like cuckoo-pint, having a thin skin. It  
grows in shady spots around fences and haimasiai.

Text 15. Philo, *De vita Moses* 1.271 (first century A.D.)

τῶν <γὰρ> παρ' ἐκάτερα χωρίων ἦσαν αἵμασιαι καὶ  
φραγμοὶ πλησίον·

For the fields on either side had haimasiai and fences  
close by.

Text 16. Joseph, *AJ* 4.108 (first century A.D.)

κατὰ δὲ τὴν ὁδὸν ἀγγέλου θείου προσβαλόντος αὐτῷ  
κατὰ τι στενὸν χωρίον περιελημμένον αἵμασιᾶς  
διπλαῖς ἢ ὄνος, ἐφ' ἧς ὁ Βάλαμος ὄχεϊτο, συνείσα  
τοῦ θείου πνεύματος ὑπαντώντος ἀπέκλινε τὸν  
Βάλαμον πρὸς τὸν ἕτερον τῶν τριγῶν ἀναισθήτως  
ἔχουσα τῶν πληγῶν, ἃς ὁ Βάλαμος ἐπέφερεν αὐτῇ  
κακοπαθῶν τῇ θλίψει τῇ πρὸς τὸν τριγῶν.

But on the road a divine angel confronted him in a  
narrow field, enclosed by haimasiai on either side,  
and the ass on which Balam rode, conscious of the  
divine spirit approaching her, turning aside thrust  
Balam against one of the barriers, insensible of the  
blows with which Balam belabored her, in his pain at  
being crushed against the wall.

Text 17. Pausanias Atticus, *Attika Onomata* 47.156 (Erbse 1950) (second century A.D.)

<αίμασιά>· ἐκ χαλίκων οἰκοδομή, τειχίον, θριγκός.  
(Extracted from Eustathius)

haimasia: built from stones, teikhion, *thringkos*.

Text 18. Aelius Dionysius, *Attika Onomata* 51.101 (Erbse 1950) (second century A.D.)

<αίμασιά>· τὸ ἐκ χαλίκων ὠκοδομημένον τειχίον, ἦν τινες ἄρπε<ζα> ὀνόμαζον (cf. Nic. *Ther.* 393, 647), ὡς καὶ Ἴωνες. δηλοῖ δὲ Ἡρόδοτος ἐν τῇ πρώτῃ. φάσι δὲ οἱ πολλοὶ τὸ χωρίον αὐτὸ τὸ ὑπὸ αἰμασιῶν περιεχόμενον αἰμασιῶν καλοῦσιν. (Extracted from Eustathius)

haimasia: teikhion built of small stones, which some call *harpeza* (cf. Nic. *Ther.* 393, 647), like the Ionians. Herodotus is evidence of this in Book 1 [text 3]. Colloquially, many people refer to a field surrounded by haimasiai as a haimasia.

Text 19. Longus, *Daphnis and Chloe* 2.3.5, 4.2.4, 4.7.3 (second/third century A.D.)

Εἰς τοῦτον τὸν κήπον ὀρνίθων ἀγέλαι συνέρχονται τὸ ἔωθινόν, τῶν μὲν ἐς τροφήν, τῶν δὲ ἐς ὠδήν· συνηρεφῆς γὰρ καὶ κατάσκιος καὶ πηγαῖς τρισὶ κατάρρυτος· ἂν περιέλη τις τὴν αἰμασιῶν ἄλλος ὄραν οἴησεται. (2.3.5) Ἐνδόν ἦν τὰ καρποφόρα φυτὰ καθάπερ φρουρούμενα· ἔξωθεν περιειστῆκει τὰ ἄκαρπα καθάπερ θριγγός χειροποίητος, καὶ ταῦτα μέντοι λεπτῆς αἰμασιῶς περιέθει περίβολος. (4.2.4)

Δένδρα μὲν οὖν τέμνων ἔμελλεν ἀλώσεσθαι διὰ τὸν κτύπον, ἐπέιχε δὲ τοῖς ἄνθεσιν ὥστε διαφθεῖραι αὐτά. Νύκτα δὲ φυλάξας καὶ ὑπερβάς τὴν αἰμασιῶν τὰ μὲν ἀνώρυξε, τὰ δὲ κατέκλασε, τὰ δὲ κατεπάτησεν ὥσπερ οὖς. (4.7.3)

Into this garden flocks of birds come every morning, some to feed, some to sing. For it is thick, shady, and watered by three springs; and if you took away the haimasia, you would think you saw a grove (2.3.5). Within were kept, as in a prison, fruit-bearing trees. Without stood the trees that did not bear fruit, much like a barrier of human construction, and these were encircled by a narrow haimasia. (4.2.4)

To cut the trees, he did not dare, because of the noise, but instead he decided to destroy the flowers. Waiting for night, he climbed over the haimasia, and some of the flowers he pulled up by the roots, of some he ripped the stems, and the rest he trampled like a boar. (4.7.3)

Text 20. Procop. *Aed.* 4.10.5–6 (sixth century A.D.)

κατὰ τοῦτον οἱ πάλα ἄνθρωποι τὸν ἰσθμὸν παρέργως τε καὶ λίαν ἀπημελημένως ἐδείμαντο διατείχισμα κλίμακι ἀλωτόν. κήπον γὰρ πού τινα εἰκὴ κείμενον αἰμασιῶν περιβάλλειν οἴομενοι, ἰσχνόν τε αὐτὸ καὶ ὀλίγον τῆς γῆς ὑπερανεστηκός ἐξεργάσαντο.

At this very isthmus people of former times built a

cross-wall of a very casual and indifferent sort, which could be captured with the help of a ladder; because, I suppose, they thought they were building a haimasia around some casually placed garden plot, and so built it of meager dimensions and rising only slightly from the ground.

Text 21. Theophylactus Simocata, *Ep.* 59 (seventh century A.D.)

Συνέριθος ἔσο μοι μεσημβρίας ὥρα, Κορίαννε· αἰμασιῶν γὰρ τὸν ἀγρὸν περιφράζομαι. κακοὺς γὰρ τοὺς ὀδίτας κεκτήμεθα·

Corianna, be my workmate at midday. For I would like to fence around the field with a haimasia, as we have bad wayfarers.

Text 22. Pseudo-Zonaras, *Lexikon* (Tittman 1808, 80, alpha) (13th century A.D.)

<Αἰμασιά>. τὸ ἐκ χαλίκων ὠκοδομημένον τειχίον ἄνευ πηλοῦ. κυρίως δὲ ὁ ἠκανθωμένος φραγμός.

Haimasia: teikheion built out of small stones without earth, especially a thorny fence.

#### Enclosure Wall

Text 23. *IG* 12.5, 8.72.32, 8.72.65–67 (Tenos) (fourth/third century B.C.)

[ἐπρίατο τὰς οὖσας ἐν [Σ]απή[θ]ωι αἰμασιῶν τέτταρας αἶ εἰον ἐπάνω τῆς χ[ώ]ρας τῆς κάτω τῆς πρὸς τῷ κήπῳ, ὡς ὀρίζει ἡ ὁδὸς ἡ ἀν[ά]γουσα καὶ κάτω [ὁ ποτα]μός. (32) Καλλικράτης . . . παρὰ Θαρσαγόρου . . . καὶ Σιμ[. . .] . . . ἐπρίατο τὴν α[ί]μασιῶν τὴν ἐν Νευκλεί[ω]ι τὴν καλουμένην Λιμένειαν, ἣν ἐ[π]ρία[ν]το παρὰ Θρασυμήδους Ἡρα[κ]λείου Ἐλειθαιεύς?, ἡ γείτο]νες Σιμίας, Κτήτων, δραχμῶν ἀργυρίου τετρακοσίων. (65–67)

[He bought] the four haimasiai at Sapechos, which are above the land that is below the land near the garden, bounded by the road above and the river below. (32) Kallikrates bought from Tharsagoras . . . and Sim[. . .] . . . the haimasia at Neukleion, called Limenaia, which they bought from Thrasymedes son of Hera[kleios of Eleithaieus?], and whose] neighbors are Simias and Kteton, for 400 silver drachmai. (65–67)

Text 24. *Inschriften von Mylasa* 814.8–9 (Olymos) (Blümel 1987–1988, vol. 2) (second century B.C.)

ἐν τοῖς τόποις, εἷς τε τὴν αἰμασιῶν τὴν μακρὰν εἰς ὄλην ἣτις ἐστὶν παρὰ τῇ [. . .] . . . οὖν τοῖς ἐνοῦσι δ]ένδρεσιν πᾶσιν ἐλαῖνις τε καὶ συκίνις καὶ τῷ προσόντι καλμῶνι, καὶ εἰς τὸ ὀρεινὸν πᾶν τὸ ὑπὲρ . . . .

in those places, on the one side up to the long haimasia, which is entirely beside [. . . with all its] trees, olives, and figs and the adjacent reeds, and on the other side up to the whole mountainous area above . . . .

Text 25. Phot. *Lexikon* (Theodorides 1982, 67, alpha no. 590) (ninth century A.D.)

<Αίμασιά>· τὸ ἐκ χαλίκων ὠκοδομημένον τεῖχιον, ἦν τινες ἄρπεζον. καὶ οἱ Ἴωνες οὕτω χρῶνται. δηλοῖ δὲ Ἡρόδοτος ἐν τῇ πρώτῃ. φασὺς δὲ οἱ πολλοὶ τὸ χωρίον αὐτὸ τοῦτο τὸ δι' αἰμασιῶν περιεχόμενον αἰμασιᾶν καλοῦσιν.

Haimasia: teikhion built out of small stones, which some call a harpeza. The Ionians also have this usage, as Herodotus shows in Book 1 [text 3]. Colloquially, many people refer to a field surrounded by haimasiai as a haimasia.

Text 26. *Sudas* s.v. “alpha iota no. 189” (10th century A.D.)

Αἰμασιᾶ· τὸ ἐκ χαλίκων ὠκοδομημένον τεῖχιον ἄνευ πηλοῦ παρὰ Ἡροδότῳ· ἦν τινες ἄρπεζον. καὶ Ἴωνες οὕτω χρῶνται. δηλοῖ δὲ Ἡρόδοτος ἐν τῇ πρώτῃ. φασὺς δὲ οἱ πολλοὶ τὸ χωρίον τοῦτο αἰμασιῶν περιεχόμενον αἰμασιᾶν καλοῦσιν.

Haimasia: teikhion built out of small stones without earth, in Herodotus, which some call a harpeza. The Ionians also have this usage, as Herodotus shows in Book 1 [text 3]. Colloquially, many people refer to a field surrounded by haimasiai as a haimasia.

#### Terrace Wall

Text 27. Gaius, in *Dig.* 10.1.13 (Ruschenbusch 1966, F60a) (sixth century B.C.)

Gaius libro quarto ad legem duodecim tabularum. Sciendum est in actione finium regundorum illud observandum esse, quod ad exemplum quodammodo eius legis scriptum est, quam Athenis Solonem dicitur tulisse: nam illic ita est: ἐάν τις αἰμασιᾶν παρ' ἄλλοτρίῳ χωρίῳ <οἰκοδομηῆ ἢ> ὀφρύγην, τὸν ὄρον μὴ παραβαίνειν· ἐάν τεῖχιον, πόδα ἀπολείπειν· ἐάν δὲ οἴκημα, δύο πόδας· ἐάν δὲ τάφρον ἢ βόθυον ὀρύττη, ὅσον τὸ βάθος ἦ, τοσοῦτον ἀπολείπειν· ἐάν δὲ φρέαρ, ὄργυιάν. ἐλαίαν δὲ καὶ συκὴν ἐννέα πόδας ἀπὸ τοῦ ἄλλοτρίου φυτεύειν, τὰ δὲ ἄλλα δένδρα πέντε πόδας.<sup>67</sup>

Gaius in the fourth Book on the Law of the Twelve Tables. We must remember that in the action for regulating boundaries we should observe the rule that was formulated roughly on the model of the law. Solon is said to have passed at Athens; there it is stated: “If someone builds a haimasia or an embankment next to someone else’s land, he should not cross the boundary; if he builds a teikhion, he should leave a gap of one foot; if a building, two feet; if he digs a grave or a pit, he should leave a gap equal to the depth; if a well, a gap of one *orguia* [ca. 1.75 m]; he should plant an olive tree or a fig tree nine feet away from the other person’s land, other trees five feet away.”

<sup>67</sup> <οἰκοδομηῆ ἢ> ὀφρύγην is the emendation of the manuscript accepted by Ruschenbusch, on the basis of the adaptation of this law in the law code of Alexandria (*Papyrus Halensis* 1.84–87); the Alexandrian law omitted the reference to αἰμασιᾶ, no doubt because haimasiai were not built in Egypt.

Text 28. *IG* 2<sup>2</sup> 1322; Petrakos 1999, 2.167.16–19 (Rhamnous, Attica) (third century B.C.)

ἐπειδὴ καὶ οὗτος | ἀνατέθηκε τῷ θεῷ τὰς αἰμασιὰς ὅπου ὁ λάκκος ἐστὶν | καὶ δέδωκε τὴν πρόσοδον τοῖς Ἀμφιεραισταῖς τοῖς μετὰ | Διοκλέου Ἀμαξαντέως. . . .

Since he also dedicated to the god the haimasiai where the cistern is and apportioned the revenue to the Amphieraistai under Diocles son of Amaxas. . . .

Text 29. Ferguson 1938, 9, no. 2; *Agora* 19.L4b.11–13 (near Sunium, Attica) (third century B.C.)

τὸ δ' ἄλλο τέμενος ὠρίσθαι βορράθεμ μὲν ὡς ἡ αἰμασιᾶ ἢ πρώτη. . . .

The rest of the sanctuary is to be bounded, on the north by the first haimasia. . . .

Text 30. *IG* 12.3.248; Dittenberger 1982, no. 977.7–12 (second century B.C.)

ἀξίως αὐτῷ δοθῆ|μέν ἐν τῷ ἱερῷ τοῦ Ἀπόλλωνος τοῦ Ἀσγελάτα τό|πον, ὥσ[τε ναδ]ν Ἀφροδίτας οἰκοδομηῆσαι ὕλ[α]ι καὶ λί|θοις καὶ [χ]οῖ [χ]ρῶμενος ἐκ τοῦ ἱεροῦ ὧν κα χρεῖαν ἔχη| ἐν τῷ τόπῳ ἐν ταῖ αἰμασιᾶ ὅπεῖ ἄ ἐλαία ἄ ποτὶ τὸν|Εὐδῶρειον οἶκον καὶ τὸν Μειδίλειον.

We accordingly granted him a location in the sanctuary of Apollo Asgelatas so that he can buil[d] a temple of Aphrodite using timber, stones, and earth from the sanctuary whatever he needs in the place in the haimasia where there is the olive tree by the Eudorios building and Meidileios building.

Text 31. *SEG* 2.545; *Inschriften von Mylasa* 255.3–5 (Mylasa) (Blümel 1987–1988, vol. 1) (Hellenistic)

[ἀπὸ δὲ τοῦτου προελθόντες ἄλλον ἐθέμεθα ὄρον ἐπὶ τῆς ὀφ]ρύος τῆς αἰμα|[σιᾶς]. . . ἀπὸ δὲ τοῦτου προελθόντες καὶ ἄλλον ὄρο]ν ἐθέμεθα ἐπὶ τῆς ὀφρύ|[ος τῆς αὐτῆς αἰμασιᾶς ἐπὶ τὰ πρὸς μεσημβρίαν? μέ]ρη

[advancing from this we placed another boundary on the] brow of a [specified] haimasia . . . advancing from this we placed the next boundary on the brow [of the same haimasia to the south?]

Text 32. *Inschriften von Mylasa* 253.9 (Mylasa) (Blümel 1987–1988, vol. 1) (Hellenistic)

αἰμασιᾶ  
haimasia . . .

Text 33. Hesychius, *Lexikon* s.v. “omicron no. 1985” (fifth/sixth century A.D.)

ὄφρυα· τὰ ὑψηλὰ καὶ ὑπερκείμενα χωρία. τινὲς αἰμασιᾶς

Brows: lofty and overhanging fields. Some people for haimasiai.

### ΤΕΙΚΗΘΙΟΝ (τειχίον)

#### *Freestanding Wall*

Text 34. Pouilloux 1960, no. 35; Dittenberger 1982, no. 963; Rhodes and Osborne 2003, no. 59 (Arkesine, Amorgos), lines 17–20 (fourth century B.C.)

τειχία τὰ πίπτοντα ἀφ' αὐτοῦ ἀνορθώσ[ει].|εἰάν δὲ μὴ ἀνορθώσῃ, ὠφειλέτω ἐκάστης ὀρ[γυῖας]||δραχμῆν. φράξει τὰ ἐφ' ὁδοῦ τειχία ἅπαντα καὶ πεφρ[α]||γμ[έν]α [κα]ταλείψει ἁπῶν.

He shall build up again at his own expense all *teikhia* that are falling down; if he does not build them up, let him pay a fine of a drachma per *orguia* [ca 1.75 m]. He shall strengthen all the *teikhia* along the road, and shall leave them strengthened at the end of the lease.

Text 35. *IG* 12.5, 872.78–81 (Tenos) (fourth/third century B.C.)

[ἐπρίατο τὴν οἶ]||κίαν καὶ τὰ χωρία τὰ ἐμ Βαλανεῖω π[άν]τα καὶ τὰ ὕδατα ὅσα ἐστὶν τῶν χ[ω]ρ[ί]ων τούτων, οἷς γε[ί]των Καλλικράτης τὰ μ[έ]χρι τοῦ ποταμοῦ, ὡς ὀρίζει τὸ τειχίον ὃ ἐστὶν τέ[ρ]μα? τῶν|| χωρίων τῶν Καλλικράτους, ὃ ἀνάγει ἀ[ν]ω ἐς τὴν ὁδόν, καὶ ἀπὸ τῆς ὁδοῦ ὡς περιάγει π[ρὸ]ς τὴν κρήνην, ὡς ὀρίζει τὸ τειχίον τὸ Μελίσσωνος ὃ ἐστὶν ἐν τοῖς χωρίοις τοῖς Καλλικρά[του]||τοῦ Μελίσσωνος, ὡς περιάγει τὸ τειχίον κύκλωι καὶ ὡς ὁ χειμάρρου ἀ[ν]άγει ἄνω πρὸς τὰ ἐργάσιμα χωρία τὰ Καλλικράτους καὶ ὡς περιάγει τὸ τειχίον κύκλωι ἀ[χ]ρι πρὸς τ[ὸ] τειχίον? ὃ | ἐστὶν ὄρος τῆς ἐοχαιῆς τῆς ἡμισέας πρὸς τὸν χειμάρρου.

[He bought the] house and all the fields at Balaneion and all the water sources belonging to these fields, whose neighbor is Kallikrates, as far as the river, as bounded by the *teikhion*, which is the border of the lands of Kallikrates and which leads up to the road, and from the road as far as the spring, as bounded by the *teikhion* of Melisson, which is on the fields of Kallikrates son of Melisson, as far as the *teikhion* in a circle, as far as the torrent that runs up to the cultivated fields of Kallikrates, and as far as the *teikhion* in a circle up to the [teikhion?] which is the boundary of the rough land by the torrent.

Text 36. Herennius Philo, *De diversis verborum significationibus*, tau no. 173 (Palmieri 1988) (first/second century A.D.)

<τειχος> καὶ τειχίον διαφέρει. τεῖχος ἐπὶ πόλεων, τειχίον ἐπὶ ἐπαύλεων.

*teikhos* and *teikhion* are different: *teikhos* is urban, *teikhion* is rural.

Text 37. Achilles Tatius, *Leucippe et Clitophon* 1.15.1 (second century A.D.)

ὁ δὲ παράδεισος ἄλος ἦν, μέγα τι χρῆμα πρὸς ὀφθαλμῶν ἡδονῆν· καὶ περὶ τὸ ἄλος τειχίον ἦν

αὐταρκες εἰς ὕψος καὶ ἐκάστη πλευρὰ τειχίου (τέσσαρες δὲ ἦσαν πλευραὶ) κατάστεγος ὑπὸ χορφῶ κίωνων· ὑπὸ δὲ τοῖς κίοισιν ἔνδον ἦν ἡ τῶν δένδρων πανήγυρις.

This garden was really a grove, a real object of beauty to the eyes. Around it ran a *teikhion* of sufficient height, and each of the four sides of the *teikhion* formed a portico, resting on columns. Protected within the columns stood a populous assembly of trees.

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