HESPERIA 79 (2010)
Pages 1–51

PYLOS REGIONAL ARCHAEOLOGICAL PROJECT, PART VIII

LITHICS AND LANDSCAPES: A MESSENIAN PERSPECTIVE

ABSTRACT

The authors document and discuss the chipped stone assemblage collected by the Pylos Regional Archaeological Project in Messenia, Greece, during three seasons of surface investigations conducted between 1992 and 1994. The article begins with a brief description of the basic characteristics of the PRAP chipped stone assemblage. This section is followed by a discussion of the diachronic social processes that can be inferred from the patterns in the assemblage, from the Middle Palaeolithic through historical periods. The article concludes with a comparative analysis of how the distribution of chipped stone in the Messenian landscape relates to comparable evidence from survey projects elsewhere in the Aegean.

INTRODUCTION

Artifacts made of chipped or flaked lithic materials comprise one of the most common classes of artifacts everywhere in the world.[1] In many early prehistoric contexts, chipped stone artifacts and animal bones together make up virtually the entirety of material remains from which the archaeologist can make observations about the past. In much later periods, chipped stone artifacts continued to be used alongside metals and glasses, supplementing

1. We are very grateful to Jack Davis and the other codirectors of the Pylos Regional Archaeological Project (PRAP) for the invitation to study the chipped stone materials from the project. Acknowledgment is due to all those fieldwalkers who were, of course, responsible for collecting this material in the first place. We appreciate the efforts of Xeni Arapoyianni (Directorate of Prehistoric and Classical Antiquities in Olympia [now in Kalamata]) in facilitating the project and subsequent study of its material. Major funding for PRAP was provided by the National Endowment for the Humanities, the National Geographic Society, the Institute for Aegean Prehistory, and many other organizations and individuals; for details, see Davis et al. 1997, p. 488.

We thank Curtis Runnels for his guidance in the search for Pleistocene sites within the PRAP study area, as well as for his expert opinion in evaluating the materials found. He also provided us with helpful comments on the manuscript, as did P. Nick Kardulias and two anonymous *Hesperia* reviewers. Suzanne Hofstra kindly provided us with information about the distribution of chipped stone artifacts at the Palace of Nestor. We thank all of them, and Tracey Cullen for her helpful editorial comments. The maps in this article are the product of invaluable input from Sebastian Heath and Rosemary Robertson. Jill Seagard is responsible for the final inked versions of pencil drawings of the artifacts by John Cherry.

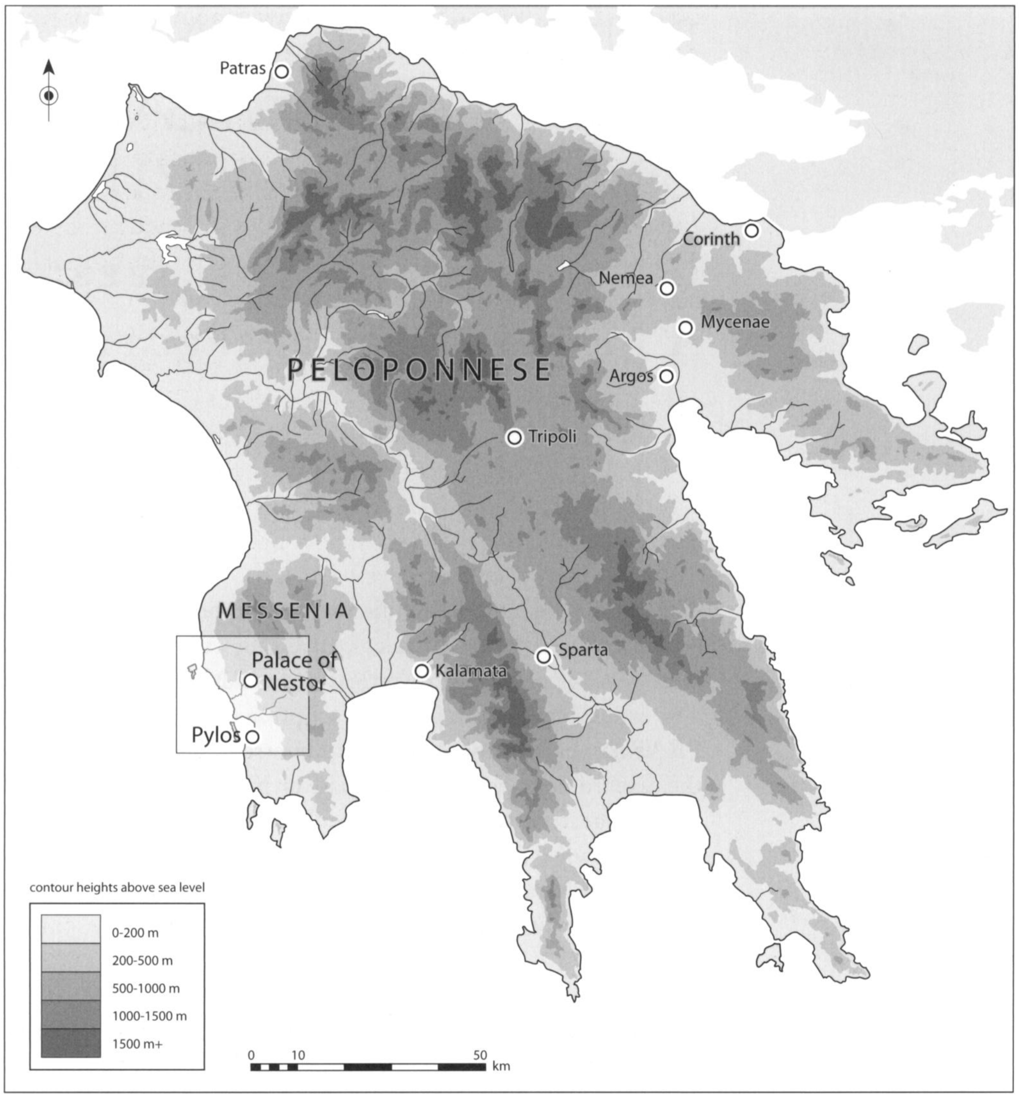


Figure 1. Map of the Peloponnese showing the location of the area studied by the Pylos Regional Archaeological Project. R. J. Robertson

those technologies with qualities of durability and strength that only stone can provide.[2] Despite the obvious potential for such artifacts to shed light on the economic, political, and even ideological processes of the societies that left them behind, in the Aegean they have not until relatively recently been accorded the attention they deserve.

Fortunately, lithic artifacts are now routinely collected on projects aimed at understanding prehistoric periods in the Aegean. More importantly, a number of the surface survey projects carried out in this region over the last 30 years have instituted systematic recovery techniques designed specifically to deal with lithics. As we have attempted to demonstrate elsewhere,[3] the analysis of lithic artifacts from surface surveys provides us with a valuable tool for exploring past cultural landscapes and human land use. In addition, since many of these surface surveys in Greece have adopted relatively similar, although certainly not identical, collection methodologies (several, in fact, were carried out by the same individuals), it gradually is becoming possible to compare the patterns exhibited in different regions using data collected by different survey

2. Runnels 1982.
3. Cherry and Parkinson 2003; see also Clarkson 2008.

projects. Such comparative, regional information allows us to assess models of the past that have been based primarily upon information collected from excavations.

In this article we present and discuss the chipped stone artifacts collected during the course of surface investigations undertaken by the Pylos Regional Archaeological Project (PRAP) in Messenia in the southwestern Peloponnese during three seasons of fieldwork conducted between 1992 and 1994 (Fig. 1).[4] Since several articles and reports that describe the objectives, research design, and field methodology of the project have been published previously in the pages of this journal[5] and elsewhere,[6] the discussion here focuses specifically upon the information that can be gleaned from the analysis of the chipped stone artifacts from PRAP, in the context of the results from other survey projects in Greece.

In the following section, we discuss the formal characteristics of the PRAP chipped stone assemblage. We then consider diachronic patterns in the assemblage as they relate to regional-scale chipped stone assemblages collected from elsewhere in the Aegean.

THE CHIPPED STONE ASSEMBLAGE

All lithics encountered during the course of PRAP survey fieldwork were collected. This includes any definite or possible chipped stone artifacts that were discovered during intensive fieldwalking, surface collection at sites, and more extensive field reconnaissance.[7] The artifacts then were segregated from any unmodified natural stones and were cleaned, catalogued, and inspected using a 15× hand lens. All artifacts were examined at least once by each author and a number of them were also studied by Curtis Runnels. Finally, typological attributes of the artifacts were entered into a database designed specifically for the PRAP assemblage; we employed a modified version of the European Palaeolithic typology that is consistent with that employed on many survey projects and excavations elsewhere in the Aegean.[8]

Raw Materials

A total of 1,104 chipped stone artifacts was collected during the three years of intensive survey fieldwork.[9] Of that number, 192 (17%) are of obsidian, two of quartz or quartzite (<1%), and the remaining 910 (82%) of chert or other crypto- or microcrystalline materials that are mostly available locally

4. Davis et al. 1997.

5. Zangger et al. 1997; Bennet, Davis, and Zarinebaf-Shahr 2000; Lee 2001; Stocker 2003; Davies 2004; Alcock et al. 2005.

6. See, e.g., Bennet 1995, 2007; Bennet and Shelmerdine 2001; Alcock 2002; Davis 2004, 2008. For a more comprehensive list of PRAP publications, see http://classics.uc.edu/prap/publications.html.

7. For an extensive description of fieldwalking techniques and site collection strategies employed by PRAP, see Davis et al. 1997, pp. 396–407.

8. See Movius et al. 1968; Brézillon 1971; Crabtree 1972; Perlès 1987; Kardulias and Runnels 1995.

9. This number is slightly higher than the 1,099 artifacts we reported in a preliminary account of this material (in Davis et al. 1997, p. 414). The discrepancy is due to the identification of five artifacts that were mislabeled during their initial cataloguing. PRAP ran from 1991 to 1995, with a scouting season in 1991 and a study season in 1995; fieldwork seasons resulting in the collection of artifacts took place in 1992–1994.

TABLE 1. RAW MATERIALS AND CONTEXTS OF RECOVERY

Recovery Context	*Obsidian*	*Chert**	*Total*
Site collection	86 (16%)	462 (84%)	548 (50%)
Survey tract directly associated with a site	46 (47%)	52 (53%)	98 (9%)
Survey tract adjacent to a site	10 (15%)	58 (85%)	68 (6%)
Survey tract not associated with or adjacent to a site	50 (13%)	340 (87%)	390 (35%)
Total	192 (17%)	912 (83%)	1,104 (100%)

* Two pieces of quartz or quartzite are included in the chert category.

in the limestone conglomerate that underlies the survey region (Table 1, Fig. 2).[10]

All of the obsidian in the lithic assemblage is gray-black, often with gray banding and sometimes translucent; it appears from macroscopic analysis to derive from the well-known sources on the island of Melos.[11] Only one piece (SF 580, from site I4) is homogeneously black and might derive from a non-Melian obsidian source. Although recent research has demonstrated that there may be diachronic variation in the use of the different obsidian outcrops on Melos,[12] we did not employ any analytical techniques that permit us to discuss this issue with regard to the PRAP assemblage.

The vast majority of the chert artifacts are made from small, highly tectonized nodules of relatively poor quality, variously colored cherts that are available in nearly every streambed in the region. These chert nodules appear to have eroded out of the conglomerate limestone massif that rises above the coastal plain and culminates in the steep Aigaleon ridge. This ridge has been described as follows: "It consists primarily of Mesozoic limestones and cherts. One of its main geological units is a thinly bedded black, red, and white chert of a Jurassic to Cenomanian radiolarite series containing limestone lenses and limestone interstratification."[13] Thirteen of the chert artifacts are made of a very high-quality, reddish brown or chocolate-colored material that may have been imported into the region; it has also been noted as present among the lithic materials found by survey in the northeast Peloponnese undertaken by the Nemea Valley Archaeological Project (NVAP).[14]

Three artifacts are made from a high-quality, translucent, honey-colored material with circular white impurities (termed "vugs") that also occurs in significant quantities elsewhere in the Aegean and which may derive from a source located somewhere in the central Balkans.[15] Bulgarian scholars refer to this material as "Balkan flint" and other scholars in central

10. For the bedrock geology, tectonics, and geomorphology of the region, see Zangger et al. 1997, pp. 554–559.

11. Torrence 1986.

12. See discussion in Carter 2008, p. 225. In addition to the well-known sources at Adamas and Demenagaki, Arias et al. (2006) have recently reported the existence of a third Melian source at Ayios Ioannes, ca. 2.5 km northwest of Dhemenagaki, consisting of obsidian blocks inside a volcanoclastic deposit.

13. Zangger et al. 1997, pp. 555–556.

14. The lithics from NVAP have been studied and will be published by one of the present authors (Cherry).

15. Manolakakis 1996.

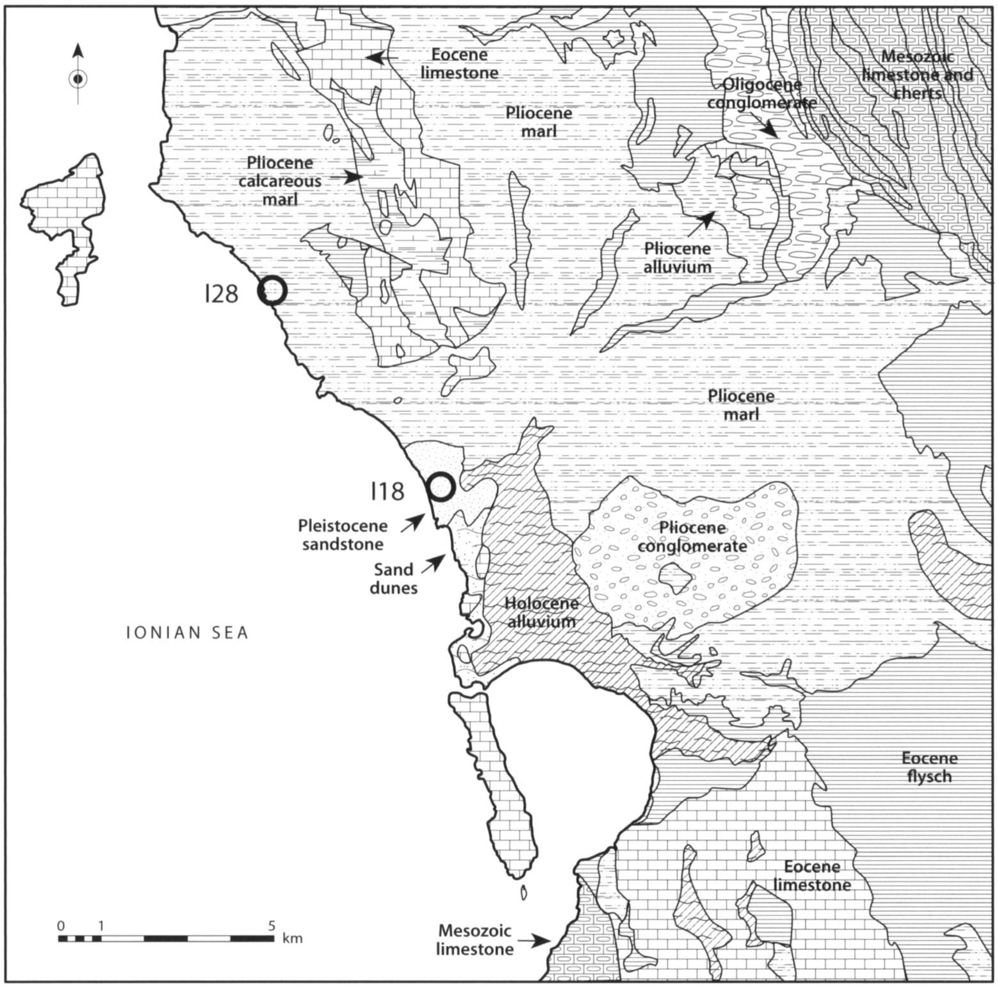


Figure 2. The geology of the PRAP study area, showing the geomorphological context of sites I18 (Romanou *Rikia*) and I28 (Vromoneri *Vergina Rema*). After Zangger et al. 1997, p. 555, fig. 4. R. J. Robertson

and eastern Europe refer to it as "honey flint" or "yellow-spotted flint."[16] Perlès has suggested this material may derive from a source in Epirus or southern Albania,[17] while Bulgarian archaeologists and geologists have successfully sourced one variant of the material to north-central Bulgaria.[18] Wherever its origins may prove to be, this material was in use in the Aegean from the earliest stages of the Neolithic through the Bronze Age.[19]

Recovery Contexts

Of the 1,104 chipped stone artifacts recovered by PRAP, 390 (35%) are from off-site contexts, 548 (50%) were picked up during the surface collection of sites, 98 (9%) were collected from fieldwalking tracts that comprised parts of areas subsequently defined as sites (or "places of special interest"[20]), while 68 (6%) were collected from fieldwalking tracts that were immediately adjacent to such sites,[21] giving a total of 714 (65%) artifacts from "on-site"

16. See Bonsall 2008, p. 271.
17. Perlès 1992, p. 124.
18. Maria Gurova (pers. comm.).
19. Perlès 1990, pp. 9–10.
20. For the rationale behind the use of the term "place of special interest" (POSI) in PRAP's methodology, see Davis et al. 1997, p. 401, n. 27.
21. Lithics discovered in tracts adjacent to sites are included here as part of the assemblages from these sites.

contexts (Table 1). The relative percentages of chert and obsidian in these different recovery contexts mirror that of the assemblage as a whole (obsidian 17%; chert 83%), with only a slightly higher frequency (16%) of obsidian occurring in contexts from site pick-ups than from fieldwalking (13%). In tracts directly associated with sites, however, the relative frequencies of obsidian and chert are nearly equal (obsidian 47%; chert 53%). This unusual pattern may be due to a bias toward the identification (and collection) of obsidian rather than chert during survey when fieldwalkers realize they are in a locale where relatively high quantities of lithics may be expected.

Assemblage Characteristics

In the analysis of the PRAP lithic assemblage, an important objective was to identify which elements of the reduction sequence are exhibited at different sites within the region. As a result, we classified each artifact according to those formal characteristics that can suggest the stage of the reduction sequence at which the basic type (or "blank") would have been removed from its parent material. Several blank types can be recognized: flakes, blades, cores, spalls, and natural blanks.

The vast majority of artifacts in the assemblage are flakes with varying amounts of cortex (a weathered rind). In our blank typology, we differentiated three different flake types: primary, secondary, and tertiary (Table 2). The dorsal surface of primary flakes is completely covered in a cortex, indicating that they were struck from the exterior portion of the natural nodule of raw material. Secondary flakes exhibit at least some cortex on their dorsal surface, together with some flake scars, suggesting that they too were removed from near the surface of the nodule. Tertiary flakes, on the other hand, bear no evidence of any cortex or weathered rind on their dorsal surface, which is completely covered in flake scars, indicating that such flakes were removed from the interior of the nodule.

Leaving aside the numerous category of spalls (which lack the formal characteristics of blank types), blades comprise the next most common type of blank in the assemblage. Although a blade is frequently described as a flake that is twice as long as it is wide and with roughly parallel sides, it is useful to differentiate blades in this wider sense (here classified as "bladelike flakes") from blades manufactured specifically from prismatic blade cores, which are very common in Neolithic and Bronze Age lithic assemblages throughout the Aegean. It also is possible to distinguish different types of blades on the basis of whether their cross-sections are triangular or trapezoidal (Table 3). This is a distinction that permits us to identify roughly the stage at which the blade was removed during the reduction of the core, since in general trapezoidal blades derive from deeper within the blade core. Several other blade types were also recorded, such as "crested blades" *(lames à crête)*, which mark the initiation of the blade removal sequence. The majority of blades are made of obsidian (n = 66; 73%), which is not surprising since most of the artifacts in the PRAP assemblage appear to have been produced during the Neolithic and Bronze Age (only two sites have been assigned to the Palaeolithic period).

We identified in the assemblage a total of 109 cores from which blades or flakes had been struck (Table 4). Sixty-five are flake cores of varying

TABLE 2. BLANK TYPES BY RAW MATERIAL

Blank Type	*Obsidian*	*Chert**	*Total*
Natural blank	3 (23%)	10 (77%)	13 (1%)
Primary flake	7 (17%)	33 (83%)	40 (4%)
Secondary flake	29 (12%)	217 (88%)	246 (22%)
Tertiary flake	53 (12%)	395 (88%)	448 (41%)
Spall	25 (16%)	135 (84%)	160 (14%)
Blade	64 (74%)	22 (26%)	86 (8%)
Crested blade	3 (75%)	1 (25%)	4 (0.3%)
Blade core	5 (45%)	6 (55%)	11 (1%)
Flake core	3 (3%)	85 (97%)	88 (8%)
Core/chopper	0 (0%)	8 (100%)	8 (0.7%)
Total	192 (17%)	912 (83%)	1,104 (100%)

* Two pieces of quartz or quartzite are included in the chert category.

TABLE 3. VARIABILITY IN BLADE TYPES

Blade Type	*Obsidian*	*Chert**	*Total*
Triangular	17	7	24
Trapezoidal	44	14	58
Crested	3	1	4
Irregular	2	0	2
Plunging	0	1	1
Secondary	0	1	1
Total	66	24	90

* Two pieces of quartz or quartzite are included in the chert category.

forms (discoidal, globular, irregular, tabular), mostly made of chert. There are strikingly few (11) blade cores in the assemblage, given the number of blades. Parkinson has previously noted that all five obsidian blade cores in the PRAP assemblage derive from the large (ca. 38 ha), multicomponent site of Romanou (I4), located near the coast at the base of the Englianos Ridge (Fig. 3).[22] That site, furthermore, is the only one that exhibits *all* stages of the reduction sequence for producing obsidian blades, strongly suggesting (as discussed below) that it was a production center for such artifacts.

We also identified many artifacts that are clearly anthropogenic, but which bear no identifiable formal characteristics that allow them to be allocated to any of the types described above. These artifacts most likely were debris or "débitage" generated during the flaking process, and they are referred to generically in our typology as "spalls." The final category we identified consists of natural blanks (i.e., natural pieces of raw material) that have been modified—or "retouched."

A total of 328 artifacts in the assemblage bear signs of retouch, and several of these have been classified into formal tool types (e.g., bec, end-scraper; see Table 5). Only 21 of the artifacts in the assemblage bear clear evidence of use-wear, whether in the form of "sickle-sheen," macroscopically identifiable use-polish, or incidental retouch resulting from use rather than from intentional modification of the shape of the edge.

22. Parkinson 2007, p. 91.

TABLE 4. VARIABILITY IN CORE TYPES

Core Type	*Obsidian*	*Chert*	*Total*
Biface	0	2	2
Blade core	2	3	5
Blade core: irregular	0	1	1
Blade core: pencil	3	1	4
Blade core: pyramidal	0	1	1
Core/chopper	0	8	8
Flake core: discoidal	0	7	7
Flake core: globular	1	12	13
Flake core: irregular	1	43	44
Flake core: tabular	0	1	1
Flake/core	1	19	20
Levallois core	0	1	1
Levallois flake/core	0	2	2
Total	8	101	109

TABLE 5. RETOUCHED TOOL TYPES

Tool Type	*Obsidian*	*Chert*	*Total*
Retouched flake	17	116	133
Notch	8	28	36
Bec	3	23	26
Endscraper	1	24	25
Retouched blade	19	3	22
Sidescraper	0	11	11
Borer	0	7	7
Burin	1	6	7
Point	1	5	6
Denticulate	0	6	6
Sickle element	0	6	6
Convergent scraper	0	5	5
Multiple tool	1	4	5
Crested blade	3	1	4
Triangular flake	0	4	4
Levallois flake	0	3	3
Pièces esquillées	1	1	2
Biface	0	2	2
Mousterian point	0	2	2
Perçoir	0	2	2
Threshing sledge?	0	2	2
Transverse sidescraper	0	2	2
Retouched blade-flake	0	1	1
Core/chopper	0	1	1
Double sidescraper	0	2	2
Gun flint?	0	1	1
Lunate?	0	1	1
Scraper	0	1	1
Slug?	0	1	1
Transverse endscraper	0	1	1
Trapeze	0	1	1
Total	55	273	328

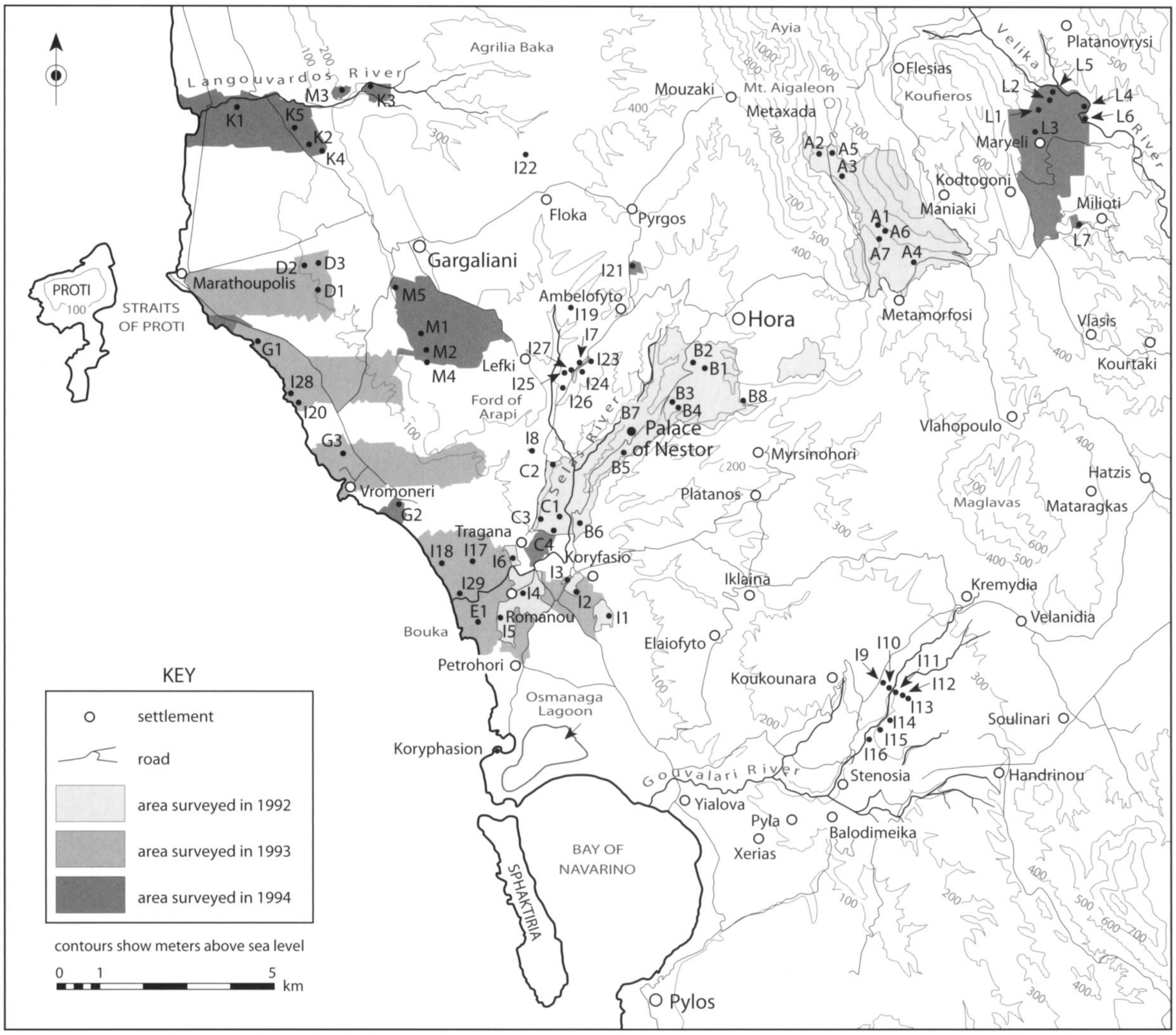


Figure 3. Region investigated by PRAP, showing major topographic features, areas intensively surveyed, and sites defined. After Davis et al. 1997, p. 393, fig. 2. R. J. Robertson

DIACHRONIC PATTERNING IN THE ASSEMBLAGE

The vast majority of lithic artifacts in the PRAP assemblage, as with many other recent surveys in the Aegean, were clearly created and deposited during the Neolithic or the Bronze Age. As we have noted elsewhere,[23] this is doubtless a reflection both of the intensity of prehistoric land use, as well as of the research emphasis for most survey archaeologists on the later periods of Greek prehistory. There are a few notable exceptions where surveys have been directed explicitly to search for evidence of habitation during the Pleistocene and very early Holocene,[24] but most Aegean surveys have focused primarily upon cultural periods of the later part of the Holocene, and especially the Bronze Age.

Yet despite their temporal research focus on these later periods, surface surveys are inherently diachronic in nature and tend to generate information about all periods of human occupation of a region. As a result, the analysis of chipped stone assemblages from all time periods across a region can reveal patterns of exploitation and land use that then can be used to augment patterns derived from excavated contexts. By combining information from

23. Cherry and Parkinson 2003, p. 46.

24. E.g., Runnels 1988, 1994, 2009; Runnels and van Andel 1993; Runnels et al. 2004; Strasser et al. 2009; forthcoming.

TABLE 6. CHIPPED STONE ASSEMBLAGES BY SITE

Site	Toponym	Area (ha)	Collection Strategy	Obsidian (n)	Chert (n)	Total Lithics	Periods Represented
A2	Metaxada *Kalopsana* (1)	6.90	S (M)	0	5	5	MH, LH I–II, (LH IIIA), (G?), (Mod)
A4	Metamorfosi *Skarminga*	39.80	S (M, VC)	1	21	22	(A?), (C), HL, ER–MR, LR, Byz, Ott, EMod, Mod
A5	Metaxada *Kalopsana* (2)	0.40	S (M, VC)	0	3	3	EMod, Mod
B7	Hora *Palace of Nestor, Lower Town*	18.00	T (G 20 m)	1	29	30	(N?), (EH III?), MH, LH I–II, LH IIIA–B, (LH IIIC?), DA, G, C–HL, (Byz), (Ott), EMod, Mod
C1	Tragana *Alafinorema*	0.37	T (G 10 m)	0	1	1	MH–LH, (A–C), (C), C–HL, (R), R–Byz, Byz, Byz–Ott, Ott–EMod, EMod, Mod
D1	Gargaliani *Kanalos*	0.45	T (G 10 m)	2	11	13	(N), (EH), MH, LH I–II, LH IIIA–B, PG, G–A, (A–CL), HL, R, Byz, EMod, Mod
D2	Gargaliani *Megas Kambos* (1)	2.16	T (G 20 m)	4	13	17	(N), (EH–MH), MH III–LH II, LH I–II, LH IIIA–B, (G), (G–A), (A–HL), (HL–R), R, (Byz), EMod, Mod
D3	Gargaliani *Megas Kambos* (2)	27.00	S (G 10 m)	4	8	12	MH–LH, LH IIIB, C–HL, HL, HL–R, ER, MR?, LR, Ott–EMod, EMod
E1	Romanou *Glyfadaki*	0.39	T (G 10 m)	0	3	3	G?, A, (C), HL, Late HL, (EMod)
G1	Marathopolis *Dialiskari*	34.90	S (M, VS)	2	21	23	HL, ER, MR, LR, (Byz?), (Ott?), EMod, Mod
G2	Vromoneri *Ayia Sotira*	6.50	S (M, VC)	1	9	10	HL, R, EMod, Mod
G3	Vromoneri *Pigadia*	7.20	S (M, VC)	4	18	22	MH III–LH II, MH–LH, LH IIIA–B, (HL), HL–R, (ER–MR), MR–LR, LR, (Byz), (Byz–Ott), (EMod), Mod
I1	Koryfasio *Beylerbey*	12.0	T (G 20 m)	8	28	36	(N), MH, LH I–II, LH IIIA–B, (G), (A), (C), HL, R, Byz, (Ott), EMod, Mod
I2	Koryfasio *Haratsari*	n/a	Tract only	0	1	1	EH, MH–LH I, (LH I/II), (Late C–HL)
I3	Koryfasio *Portes*	11.06	S (M, VC)	1	4	5	MH–LH, LH I–II, LH IIIA–B, (LH IIIC?), (R), EMod, Mod
I4	Romanou *Romanou*	38.07	S (M, VS)	77	37	114	(EH), (MH?), LH IIIB, A, C–HL, R, Byz, Ott–EMod, EMod, Mod
I18	Romanou *Rikia*	0.065	T (G 5 m)	0	59	59	Palaeolithic
I20	Vromoneri *Nozaina*	0.025	T (G 2 m)	9	19	28	EH II, LH IIIB?
I28	Vromoneri *Vergina Rema*	0.48	T (P)	5	119	124	Palaeolithic, EH II
I29	Romanou *Kokevis Estate*	7.60	Tract only	0	3	3	Area associated with prehistoric "port"; see Zangger et al. 1997, pp. 613–623.
K1	Gargaliani *Ordines*	4.64	T (G 20 m)	12	70	82	N?, (EH), MH, LH I–II, LH IIIA–B, DA, (G), (A?), C–HL, HL, ER, E–MR, LR, (Byz), (EMod), Mod
K2	Gargaliani *Ayia Sotira*	0.06	S (M)	1	2	3	(N), MH, LH IIIA–B, (Byz–EMod), (Ven–Ott), (Mod)
K3	Valta *Kastraki*	2.13	M (VC)	1	4	5	MH, LH I–II, LH IIIA–B, (Mod)
K4	Gargaliani *Koutsouveri*	0.10	T (G 10 m)	0	2	2	Ott–EMod, (Mod)
K5	Gargaliani *Krystallopiyi*	3.23	S (M, VC)	0	4	4	HL–R, R, R–Byz, Byz, EMod
M1	Gargaliani *Kalantina* (1)	0.52	S (L)	3	53	56	EH II
M2	Gargaliani *Kalantina* (2)	0.75	T (G 20 m)	6	21	27	(MH), (MH III–LH II), G–A, C, HL–R, (EMod), (Mod)
M4	Gargaliani *Ayios Konstantinos*	n/a	S (M, VC)	0	4	4	Late C–Early HL, HL, (R–Byz), (Byz), (Ott–EMod), (Mod)

Source: online PRAP site gazetteer, http://docs.classics.uc.edu/fmi/xsl/prap/sites_list.xsl (accessed April 2010). Only sites that yielded chipped stone assemblages are included.

Abbreviations: Collection strategies: S = sample collection; T = total collection; M = microtract collection; G = gridded collection; L = collection loci; P = piece plotted collection; VC = vacuum circle collection; VS = vacuum strip collection. For additional information, see Davis et al. 1997.

Periods: N = Neolithic; EH = Early Helladic; MH = Middle Helladic; LH = Late Helladic; DA = Dark Age; PG = Protogeometric; G = Geometric; A = Archaic; C = Classical; HL = Hellenistic; ER = Early Roman; MR = Middle Roman; LR = Late Roman; Byz = Byzantine; Ven = Venetian; Ott = Ottoman; EMod = Early Modern; Mod = Modern. Periods given in parentheses indicate small amounts of datable material.

both types of datasets, it is possible to generate archaeological models that will allow us to understand more precisely how humans engaged with the landscape in the past, in a variety of ways.[25]

Owing to the nature of chipped stone artifact types, which generally tend not to be unequivocally assignable to specific chronological periods, accurate dating of lithic materials from surface contexts is problematic. Chronological classification of chipped stone recovered from surface contexts thus relies heavily upon the formal properties of the assemblage itself (e.g., artifact types, raw material types, blank types, techniques of production), its co-occurrence with datable ceramic artifacts, and its stratigraphic situation in the landscape.[26]

The diachronic patterning in the Messenian assemblage derives from two principal recovery contexts—on-site and off-site. The former include artifacts identified and recovered during site collection, or during the course of regular fieldwalking in tracts that were subsequently classified as directly associated with sites. In the discussion of on-site contexts, we have chosen also to include artifacts derived from the fieldwalking of tracts immediately contiguous with those that later came to be associated with sites.

Of the 62 sites investigated by PRAP (Fig. 3), 28 (45%) produced chipped stone artifacts. The number of chipped stone artifacts from those sites ranges from one to 124, with an average of 26 (see Table 6). Only two sites were identified primarily by lithic scatters—I18 and I28; all the others were identified by both lithic and ceramic scatters.

Pleistocene Patterns

Two locations produced groups of chipped stone materials that date to the Pleistocene, while intensive and extensive tract-walking produced a further handful of lithic stray finds (i.e., individual off-site artifacts) that fit comfortably within the Palaeolithic period, based on their typological characteristics and geological contexts.[27]

As is becoming commonplace on surface survey projects in the Aegean,[28] we attempted to identify those geological settings most likely to yield Pleistocene deposits and to supplement regular intensive tract-walking with extensive survey directed explicitly at these target areas. Given the geological setting of the PRAP study area,[29] it seemed most productive to focus attention on two main areas: a series of preserved fossil dunes along the present-day coastline, and a number of karstic rock shelters along the Gargaliani escarpment (Figs. 2, 3).

We succeeded in identifying only two Palaeolithic sites: I18 (Romanou *Rikia*) and I28 (Vromoneri *Vergina Rema*), both located on the modern coastline (Fig. 2).[30] Despite exhaustive searching in the karstic areas around

25. As usefully spelled out in Clarkson 2008, p. 498.

26. For an excellent discussion, see Kardulias and Runnels 1995, pp. 85–86.

27. This section augments our earlier discussion of PRAP lithic studies and Pleistocene sites in Davis et al. 1997, pp. 414–417, pls. 88:b, c.

28. E.g., Runnels 1988; Jameson, Runnels, and van Andel 1994.

29. See Zangger et al. 1997, pp. 554–559.

30. Korres (1981, p. 456) mentions several possible locations of Palaeolithic finds in Messenia (including the hill of Profitis Ilias, northwest of the Bay of Navarino and the Bay of Voïdokilia), but none of them have been confirmed by subsequent autopsy.

the Gargaliani escarpment, no lithic scatters or stray finds were identified that might suggest exploitation of that area during the Palaeolithic. Not coincidentally, the few stray finds that, based on their typological characteristics, appear to belong to the Palaeolithic were also collected on the coastal plain south of Marathoupolis (see below). It seems probable, therefore, that this pattern is not solely the result of sampling bias, since *all* observed lithic items were collected during routine tract-walking; lithic stray finds do indeed occur in other parts of the survey area, but none are of typical Middle or Upper Palaeolithic types.

Middle Palaeolithic Sites

I18 (Romanou *Rikia*) was identified during extensive prospecting along the fossilized Pleistocene dune deposits just northwest of the modern town of Romanou. The site is located approximately 70 m from the present coastline. A small scatter comprised of 59 flakes[31] was found eroding out of a Pleistocene soil matrix that had formed on top of a fossilized dune deposit. While most artifacts derived from directly within or below the eroding deposit, several had been washed as far as 15 m down the collapsed sand-dune talus. The site was collected using both grab sampling and a 5 m grid.

All of the artifacts are made on highly tectonized chert derived from the intermittent streambeds that carry small nodules of chert from the limestone conglomerate formation in the center of the study region. Several pieces are covered in a milky white patina and/or are stained red from the iron oxides in the deposits from which they eroded. All of the artifacts are very small (<5 cm in length), and only five pieces are retouched.

The assemblage contains 39 flakes (including four lamellar, i.e., blade-like, flakes), eight flake cores, and 12 spalls or other debris (Table 7). The flakes exhibit all stages of a typical flake-reduction sequence, with two primary flakes, 19 secondary flakes, and 18 tertiary flakes. The small cores (<5 cm in length) include two unifacial core/choppers (SF 405 and 406), a "bladelet core" (SF 688), and a discoidal flake core (SF 399) (Fig. 4).[32] All of the blanks appear to have been produced by direct percussion applied to very small stream-rolled pebbles, probably collected from the nearby Selas River itself. The retouched flakes in the assemblage include pieces with irregular, intermittent, lateral retouch, a single oblique perçoir or bec (SF 401), and two very irregularly backed flakes.

Other than the complete lack of obsidian in the assemblage, the small amount of material at this site, combined with its overall lack of diagnostic artifact types, makes it especially difficult to assign the assemblage to a specific (or even general) chronological period. The assemblage bears no obvious technological or typological resemblance to the nearby Levallois Mousterian site (I28), located farther north along the coast and in a very similar geological context.

In an attempt to acquire an absolute date for the lithic-bearing deposits, samples of the parent matrix were collected and submitted for optically stimulated luminescence (OSL) dating on sand grains, to provide an estimate of the last time the grains were exposed to ultraviolet radiation. This

31. In an earlier discussion of this site (in Davis et al. 1997, p. 416), we reported 58 artifacts. One artifact had been incorrectly entered into the database and mislabeled.

32. Not all artifacts explicitly mentioned by their SF (small find) numbers are illustrated in this article; their SF numbers have been included here to facilitate study by other scholars.

TABLE 7. LITHIC ASSEMBLAGES FROM SITES I18 AND I28

	Site I18		*Site I28*	
Blank Type	*Obsidian*	*Chert*	*Obsidian*	*Chert*
Primary flakes	0	2	0	2
Secondary flakes	0	19	0	28
Tertiary flakes	0	18	0	45
Flake cores	0	8	0	13
Blades	0	0	5	3
Spalls	0	12	0	28
Total blanks	0	59	5	119
Total retouched pieces	0	4	2	44

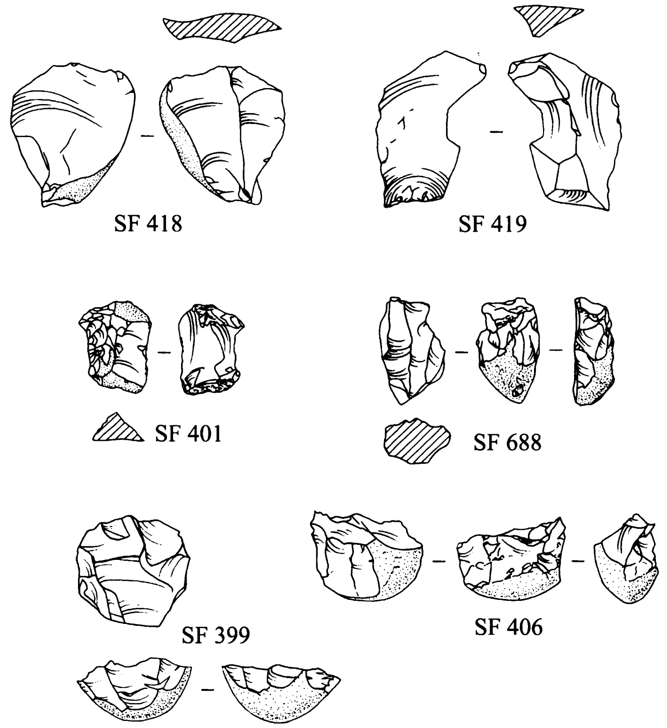


Figure 4. Chipped stone artifacts from I18 (Romanou *Rikia*). SF 418: secondary flake, brown chert; SF 419: tertiary flake with notch, brown chert; SF 401: oblique perçoir or bec on a secondary flake, reddish brown chert; SF 688: bipolar bladelet core, yellow chert pebble; SF 399: discoidal flake (pseudo-Levallois), light brown chert pebble; SF 406: unifacial core/chopper, brown chert pebble. Scale 1:2. J. F. Cherry and J. Seagard

process produced dates of 89,800 ± 15,600 B.P. and 110,000 ± 56,000 B.P.[33] Assuming the artifacts associated with the sand grains were incorporated into the matrix—and were buried—simultaneously, this may suggest an earlier Middle Palaeolithic date for the assemblage (i.e., 60,000–100,000 years ago). If that is indeed the case, then it would mean that I18 may be earlier than I28, which exhibits typological and technological attributes more typical of the later Mousterian in Greece (see below). If, on the other hand, the artifacts were incorporated into the sandy matrix after it had already formed, then the dates provide only a terminus post quem for the assemblage. In this case, site I18 may be contemporary with—or even later than—site I28, but it may be a different site type, perhaps

33. OSL analyses were conducted by Yannis Bassiakos (National Center for Scientific Research "Demokritos," Athens) and Günther Wagner (Max Planck Institute, Heidelberg).

associated with specific tasks (e.g., raw material exploitation, hunting, butchering).

Although lacking the Levallois technique, the assemblage from I18 bears a resemblance to some of the assemblages collected in Elis by French teams.[34] The small bifaces and pebble cores from I18 are similar to artifacts from several of the sites in the region of Amalias, most likely owing to similar origins of the raw materials, which in both cases eroded from limestone conglomerate in the form of small river-rolled chert pebbles.

Recent investigations in the prefecture of Preveza in Epirus have produced a few sites with similar assemblages that also date to the Middle Palaeolithic. In their recent summary of research in that region, Runnels and van Andel discussed the Middle Palaeolithic site of Rodaki at the mouth of the Paliourias River.[35] There they recorded a lithic assemblage, generally lacking in typical Middle Palaeolithic types, eroding out of a paleosol capped by a layer of dune or coastal sand. As at I18, the artifacts from Rodaki are small and are made on river-rolled pebbles of local chert. Types represented include small core/choppers, transverse convex scrapers, lamellar flakes, and rare endscrapers and notched pieces. Runnels and van Andel related this material to similar assemblages from Vassiliko on the island of Zakynthos.[36] Following Mellars,[37] they suggested that relatively undiagnostic assemblages of this nature, which also tend to be made on small pebbles, may be a variant of the Mousterian associated with coastal exploitation. Similar assemblages may occur all along the eastern Adriatic coastline and in Italy as well.[38]

The expedient nature of the Rikia assemblage, its small size, and the relative frequency of cores (which make up nearly 15% of the assemblage) all suggest that the site was probably a single-use activity area, possibly associated with the exploitation of raw materials in the form of redeposited chert pebbles available near the mouth of the Selas River. Such small lithic scatters have also been associated with other specialized activities, including animal "kills," hunting camps, and butchering sites; but the lack of formal tool types or faunal materials and the overall expedient nature of the assemblage at I18 preclude further speculation on these activities.

The largest assemblage of lithics collected by PRAP came from I28 (Vromoneri *Vergina Rema*), a site that was also discovered during extensive investigations along the fossilized dunes on the present-day coast south of Dialiskari.[39] The site, an extensive (ca. 120 × 40 m) scatter of 124 chipped stone artifacts, is located 4.5 km north of I18, along a dirt farm road that runs atop a low cliff of Pliocene beach sandstone adjacent to the Vergina streambed (Fig. 5). Lithics were found eroding from a thin deflated layer of dark red soil, less than 15 cm thick. The red deposit formed from erosion of a Pleistocene beach fascia that was partially protected from wave erosion by its situation atop the Pliocene sandstone cliff. Some artifacts were also recovered from secondary contexts in colluvial deposits (talus) adjacent to the cliff.

During site collection, all of the artifacts and several of the landscape features were piece-plotted using a total station. We had hoped that, despite the deflation of the artifact-bearing deposits, the distribution of artifact types across the surface of the site might yield some spatial patterning

34. Chavaillon, Chavaillon, and Hours 1967, 1969.
35. Runnels and van Andel 2003, pp. 108–113.
36. Sordinas 1968.
37. Mellars 1996, pp. 356–365.
38. Kuhn 1995, pp. 46–72.
39. See also the discussion of this site by the present authors in Davis et al. 1997, pp. 416–417, pls. 88:b, c; Cherry and Parkinson 2003, pp. 40–41.

Figure 5. The setting of site I28 (Vromoneri *Vergina Rema*), looking north. PRAP Archive

indicative of differential activity areas; researchers working in other parts of Greece have had some success in analyzing activity areas on Palaeolithic sites from surface distributions.[40] Unfortunately, our analyses revealed no identifiable patterns in the distribution of materials at the site, suggesting either that no such patterns existed, or that any patterns have been obscured by postdepositional processes of erosion and deflation.

With the exception of five obsidian blade fragments, which are likely to relate to the Early Helladic occupation at Nozaina (site I20) just to the south, all of the artifacts are made on local chert, probably collected from the cobbles redeposited from the limestone conglomerate in the Vergina streambed. Compared to the assemblage from I18, the blanks and cores from I28 are generally larger and appear to have been made from somewhat bigger chert nodules, but even so no artifact exceeds 7 cm in length. Although there is a wide range of variability exhibited in the quality and color of the raw materials in the assemblage, many of the artifacts were produced on gray and pale brown chert. Like those from I18, many of the artifacts are covered in a thick, milky-white patina and several are stained with iron oxide from the parent soil matrix—both good indicators of their considerable antiquity.

Despite the presence of the aforementioned obsidian blades in the assemblage, which most likely date to the Bronze Age, we are comfortable in assigning the site to the Middle Palaeolithic Levallois-Mousterian tradition, based upon several typological and technological characteristics, including the presence of several Levallois cores and flakes, a single Levallois point, several denticulates and sidescrapers, and a few bifacial core/choppers (see Figs. 6–9). As at I18, we attempted to obtain absolute dates for the artifact-bearing deposits at I28 using OSL dating. Unfortunately,

40. See, e.g., Runnels, Karimali, and Cullen 2003.

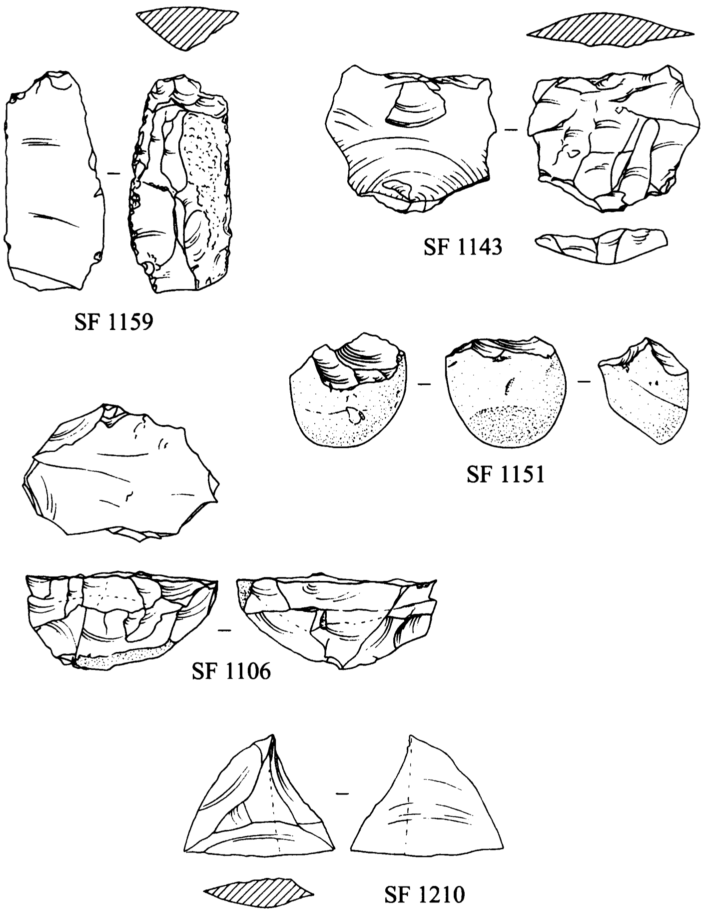


Figure 6. Chipped stone artifacts from I28 (Vromoneri *Vergina Rema*). SF 1159: sidescraper on secondary blade, gray chert; SF 1143: Levallois flake, faceted platform, gray chert; SF 1151: core/chopper on pebble, gray chert; SF 1106: Levallois core, white chert; SF 1210: Levallois flake, brown chert. Scale 1:2. J. F. Cherry and J. Seagard

the only sample that successfully produced an estimate was collected from what proved to be a redeposited colluvial debris flow over the edge of the Pliocene sandstone cliff; as such, it only provided a terminus ante quem for the artifact scatter itself (12,200 ± 1,100 B.P.).

The 119 chert artifacts in the assemblage all fit comfortably in the Middle Palaeolithic and exhibit no typological or technological characteristics typical of later periods. Of course, this does not wholly preclude the possibility that some of the chert artifacts, like the obsidian blades, may instead belong to later periods.

The assemblage yielded 75 flakes that derive from all stages of the reduction sequence (two primary, 28 secondary, and 45 tertiary flakes); these include five lamellar flakes, and at least three Levallois flakes (SF 1143, Fig. 6; SF 1210, Fig. 6; SF 1229). The assemblage also contains three chert blades, two of which are sidescrapers (SF 1159, Fig. 6; SF 1212, Fig. 7), and 13 flake cores (e.g., SF 1106, Fig. 6; SF 1173, Fig. 9; SF 1395, Fig. 9). Twenty-eight artifacts are made on natural blanks or on unidentifiable flaking débitage (spalls). The flake cores include a Levallois core (SF 1106, Fig. 6), several core/choppers (SF 1151, Fig. 6; SF 1116, Fig. 7; SF 1395, Fig. 9; SF 1110), and one small biface (SF 1195, Fig. 8). The other flake cores are irregular or discoidal in form.

Forty-six artifacts in the collection are retouched (including two of the later obsidian blade fragments). In addition to the biface and the

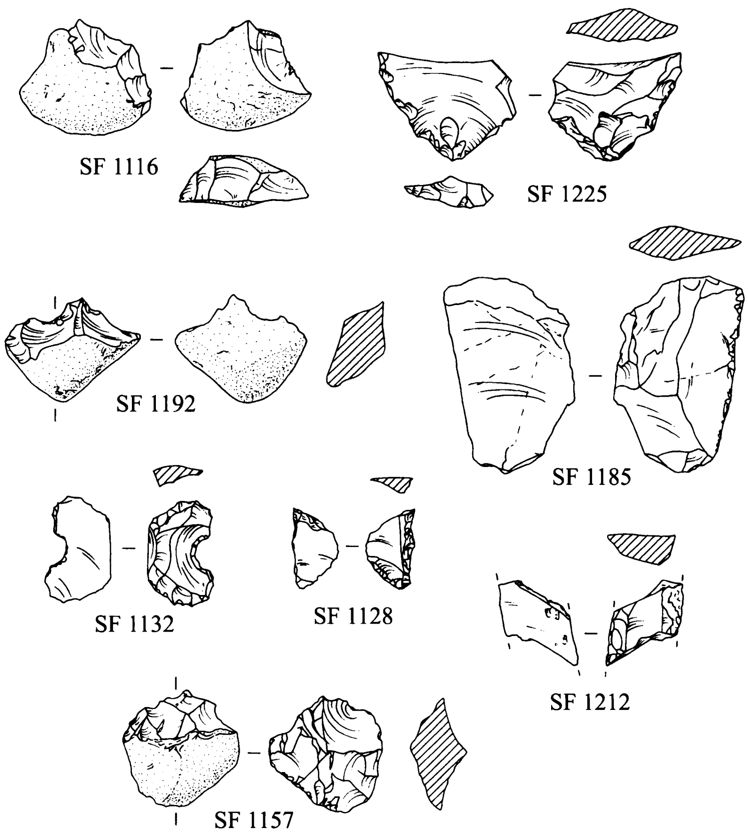


Figure 7. Chipped stone artifacts from I28 (Vromoneri *Vergina Rema*). SF 1116: unifacial chopper, gray chert pebble; SF 1225: bec on tertiary flake, brown chert; SF 1192: notch on natural blank, gray and white chert pebble; SF 1185: sidescraper on bladelike flake, brown chert; SF 1132: backed notch on tertiary flake, gray chert; SF 1128: partially backed bec on tertiary flake, brown chert; SF 1212: sidescraper on trapezoidal blade fragment, gray chert; SF 1157: flake core, gray and white chert. Scale 1:2. J. F. Cherry and J. Seagard

core/choppers, formal tool types in the assemblage include a pseudo-Levallois point (SF 1210, Fig. 6), three becs (SF 1128, Fig. 7; SF 1225, Fig. 7; SF 1190), a denticulate (SF 1208), four endscrapers on flakes (SF 1105, Fig. 9; SF 1154, Fig. 9; SF 1153; SF 1171), a double sidescraper on a lamellar flake (SF 1172, Fig. 8), three notches (SF 1132, Fig. 7; SF 1202, Fig. 9; SF 1192), three sidescrapers on blades (e.g., SF 1159, Fig. 6; SF 1212, Fig. 7), two sidescrapers on flakes (e.g., SF 1185, Fig. 7; SF 1200, Fig. 8), and one on a spall (SF 1175). Other retouched tools include a point (SF 1164) on a flake, and 10 pieces with irregular retouch to one or both lateral edges. There are only three pieces that have been retouched distally.

The differences between the assemblages from I28 and I18 cannot be overemphasized, especially given their strikingly similar landscape settings. The material from I18 is difficult to classify chronologically owing to its small size and its general lack of distinctive technological and typological attributes, but the assemblage from I28 contains several features frequently associated with the Mousterian in other parts of Greece. These features include Levallois flakes and cores, sidescrapers, lamellar flakes, a biface, and core/choppers. These all suggest a Levallois-Mousterian association for the assemblage. Although formal types commonly associated with earlier or later Upper Palaeolithic assemblages (e.g., carinated endscrapers on blades, or backed blades) are lacking at I28, the few thick chert blades in the assemblage may also indicate an ephemeral Upper Palaeolithic phase at the site. Since most of the material eroded from a deflated soil layer, it is certainly possible that the site was used more than once during the

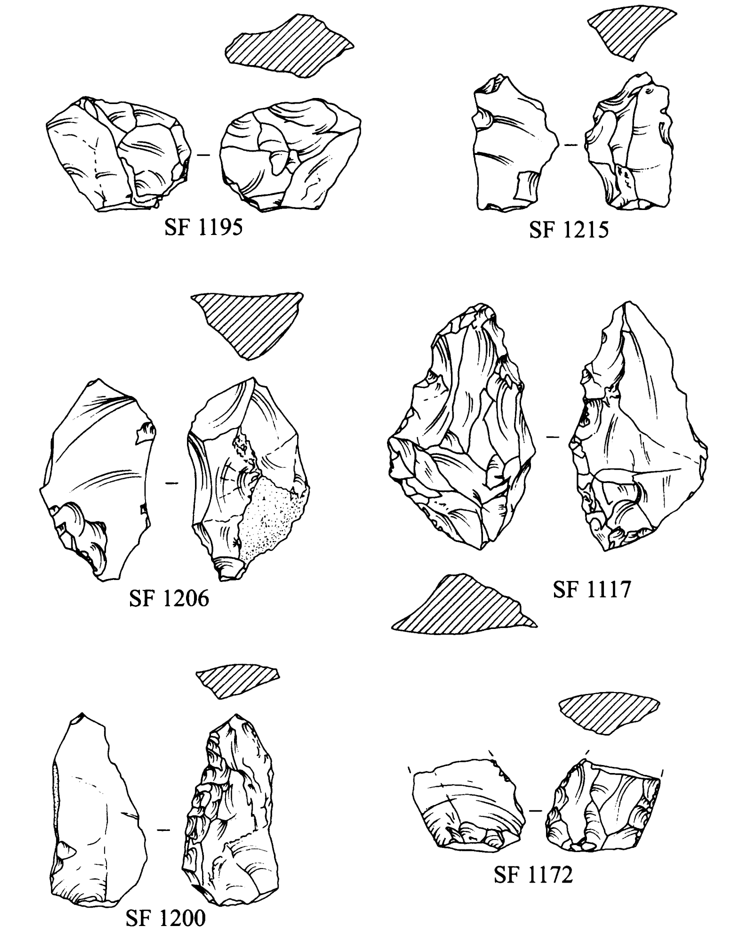


Figure 8. Chipped stone artifacts from I28 (Vromoneri *Vergina Rema*). SF 1195: bifacial core, brown chert; SF 1215: tertiary flake, brown chert; SF 1206: secondary flake, brown chert; SF 1117: biface, brown chert; SF 1200: sidescraper on secondary flake, gray chert; SF 1172: double sidescraper on bladelike flake, brown chert. Scale 1:2. J. F. Cherry and J. Seagard

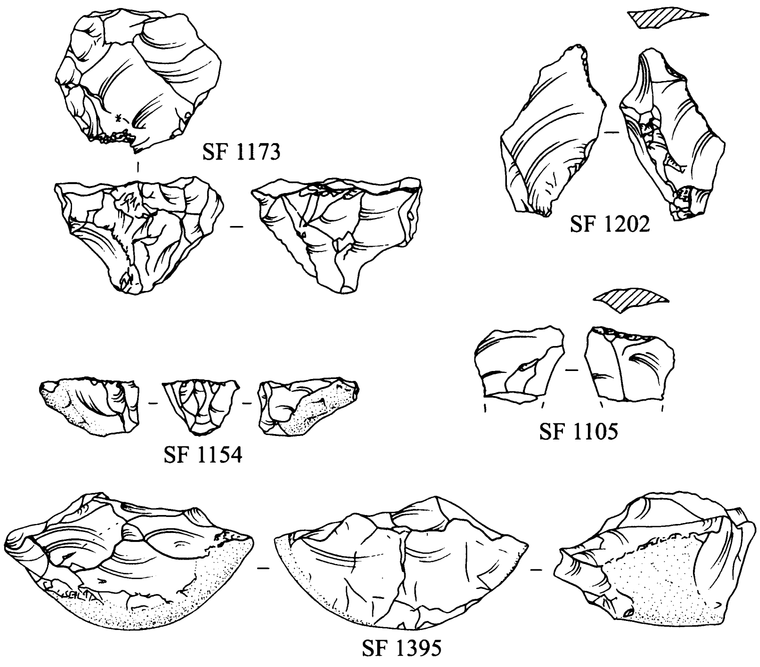


Figure 9. Chipped stone artifacts from I28 (Vromoneri *Vergina Rema*). SF 1173: flake core, dark purple chert; SF 1202: shallow notch on tertiary flake, gray chert; SF 1154: endscraper on spall, gray chert; SF 1105: endscraper on secondary flake, brown chert; SF 1395: core/chopper, white chert. Scale 1:2. J. F. Cherry and J. Seagard

later Pleistocene. I28 also lacks the bifacial, leaf-shaped points that have been identified on terminal Mousterian sites in northern Greece and in the Argolid,[41] suggesting that the site dates to a different, probably earlier, phase of the Mousterian.

Absolute dating of Mousterian assemblages in Epirus has defined two relatively distinct facies corresponding to the earlier and later Mousterian.[42] The earlier facies is characterized by relatively larger artifacts and frequent use of the Levallois technique, lamellar flakes, Levallois points, and convex sidescrapers. At Asprochaliko (basal layers 16 and 18) this facies is dated to ca. 98.5 kyr bp; it belongs to oxygen isotope stage (OIS) 5 (ca. 115–74 kyr bp), and may continue into OIS 4 and 3 (ca. 74–59 kyr bp). The later facies of the Mousterian is very similar to the earlier one, but exhibits the Levallois technique in much lower frequency and generally is associated with relatively smaller artifacts (termed the "micromousterian"). Although the size difference between the two has been overemphasized in the past, the later facies is characterized by Mousterian points and a wide range of sidescrapers. At Asprochaliko, the later facies, which is associated with layer 14, is poorly dated by radiocarbon to ca. 40–30 kyr bp. Later Mousterian assemblages in the southern Argolid and Thessaly have been dated by radiocarbon and U/Th series to ca. 55,000–30,000 years ago.[43]

Other stratified Middle Palaeolithic Mousterian assemblages are known from Mavri Myti, Kalamakia, Theopetra, Klissoura, Lakonis, Maara, Kephalari, and Franchthi.[44] The small size of the Franchthi assemblage[45] makes comparison to that site difficult, and the assemblage from I28 does not contain the retouched Mousterian points common at Theopetra and Klissoura (Cave 1), but this lack may be merely a function of the small size of the sample from I28.

The artifacts in the I28 assemblage are generally not very large (all <7 cm in length). The Levallois technique of core preparation is present, but certainly not dominant, with at least as many discoidal and irregular cores. In addition, the most common formal tool type in the assemblage is the sidescraper, followed by the endscraper on a flake. These features would suggest a later Mousterian association for the assemblage. But, as already noted, the assemblage does not contain the bifacial "laurel-leaf" points associated with the terminal Mousterian in the southern Balkans,[46] roughly associated with the Szeletian in Hungary and the Chatelperronian in western Europe, which is dated to approximately 30,000–45,000 years ago. Hence, the assemblage from I28 appears to correspond best with the phase of the later Mousterian documented in excavated contexts in layer 14 at Asprochaliko, although it lacks retouched Mousterian points.[47]

Given the site's situation alongside the Vergina streambed and the fact that all stages of the reduction sequence are represented in the assemblage, it may be suggested that the site could have served as a location for raw material procurement. In contrast to I18, however, which appears to have been a single-use activity area, there are rather more artifacts at I28, and they include a number of different formal tool types, suggesting either more frequent site use by different groups carrying out different tasks, or—less likely—the single use by a larger group carrying out more diverse tasks.

41. Gamble 1986, pp. 160–179; Runnels 1988, p. 285.

42. Bailey, Papaconstantinou, and Sturdy 1992; Huxtable et al. 1992; Runnels and van Andel 2003, p. 106.

43. Pope, Runnels, and Ku 1984; Runnels 1988; Runnels and van Andel 1993; 2003, p. 106.

44. Darlas (2007) provides an excellent recent review; see also Darlas 1995 (Mavri Myti); 1999 (Kalamakia); Darlas and de Lumley 2004 (Kalamakia); Panagopoulou 2000 (Theopetra); Koumouzelis et al. 2001 (Klissoura); Panagopoulou et al. 2002–2004 (Lakonis).

45. Perlès 1987, pp. 85–88.

46. Runnels 1988, p. 285; Runnels and van Andel 1993.

47. Bailey, Papaconstantinou, and Sturdy 1992; Huxtable et al. 1992.

Middle Palaeolithic: Off-Site Artifacts

In addition to the Middle Palaeolithic artifacts collected at sites I18 and I28, both of which were identified in the course of targeted searches for Pleistocene sites, routine intensive survey resulted in finds of a few artifacts that typologically and/or technologically can also be assigned to the Middle Palaeolithic. The findspots of these artifacts are also restricted to the coastal plain west of the Gargaliani escarpment—that is, in the same general area as I18 and I28.

The Middle Palaeolithic stray finds include three Levallois flakes (SF 290, Fig. 10; SF 393; SF 584, Fig. 10), the last of which approaches a Levallois point in form. A possible retouched Mousterian point (SF 614) was identified among the lithics collected from site I20, a predominantly Early Helladic site located about 300 m south of I28 (see Fig. 3). All of these lithics are heavily patinated and chemically altered, and some are stained red with iron oxide. Although some other artifacts in the assemblage (e.g., SF 230, SF 260) are also heavily patinated, chemically altered, and stained red, and may likewise date to the Pleistocene, these lack formal attributes that allow them to be assigned to specific traditions within the Palaeolithic.

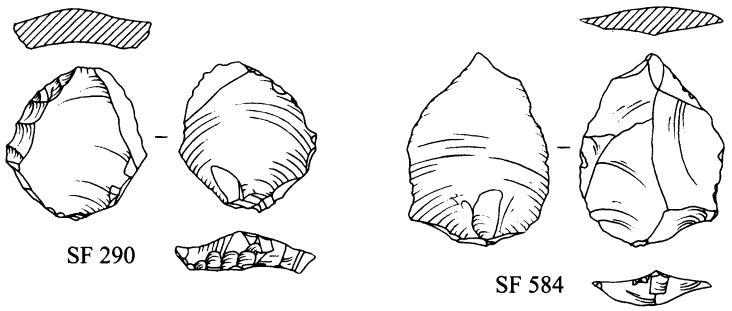


Figure 10. Middle Palaeolithic stray finds. SF 290: Levallois flake/core, gray chert; SF 584: Levallois flake, white limestone. Scale 1:2. J. F. Cherry, R. J. Robertson, and J. Seagard

These few off-site stray finds generally support the pattern indicated by sites I18 and I28—namely, that the Middle Palaeolithic exploitation of Messenia was very ephemeral, probably occurred rather late (perhaps after ca. 60,000 years ago), and seems to have been restricted to open-air sites near the coast.

The Middle Palaeolithic Exploitation of Messenia

The timing and tempo of the Palaeolithic occupation of the Greek peninsula has been the subject of much debate. The data indicate only a very sparse human presence in the region during the Lower Palaeolithic,[48] but there exists considerable evidence for much more substantial habitation during the Middle Palaeolithic.[49] Runnels has argued that Thessaly and the Peloponnese were only occupied late in the Middle Palaeolithic, during the later Mousterian (after ca. 50,000 B.P.).[50] He attributes this to a southward "push" of early Upper Palaeolithic (i.e., Aurignacian) populations into the southern Balkans, a process that would have displaced Middle Palaeolithic (i.e., Mousterian) groups. Climatic amelioration also may have reduced the

48. Runnels (1995) offers a thorough discussion of earlier research on this topic; see also Kokkoros and Kanellis 1960; Higgs 1964; Runnels 1988; Runnels et al. 1999; Runnels and van Andel 2003.
49. Summarized in Cherry and Parkinson 2003, pp. 39–40.
50. Runnels 1995, p. 714.

size of the coastal plains in northwestern Greece, thus forcing Mousterian (i.e., Neanderthal) populations further south.

The admittedly limited data from the PRAP survey, presented above, generally support this late model for a substantial exploitation of the Peloponnese: no Lower Palaeolithic artifacts were identified in the study area, and the earliest substantial evidence for exploitation in the region comes from sites I18 and I28. This matches a general pattern throughout the Peloponnese, where already in the 1960s Michael Jameson and various French teams had documented significant Middle Palaeolithic habitation in the Argolid, at Kephalari Cave (near Argos), and in the region of Elis.[51] As noted above, stratified Peloponnesian Middle Palaeolithic Mousterian assemblages are known from caves at Klissoura, Kephalari, Franchthi, Lakonis, and Kalamakia.[52] Despite our inability to assign the assemblage from I18 to a specific phase, both absolute chronometric techniques and weak technological and typological parallels with assemblages elsewhere suggest that it dates generally to the Middle Palaeolithic and that it most likely is a coastal variant of the Mousterian. I28 exhibits several elements typical of the later Mousterian and bears strong formal parallels with later Mousterian open-air sites both in northern Greece and in the Argolid.[53]

Open-air Mousterian sites are not uncommon in the southern Balkan Mousterian. In fact, recent comparisons of patterns derived from surveys and excavations suggest that open-air sites tend to be much more common than rock-shelter or cave sites in Greece.[54] Mousterian sites occur in relatively high frequencies compared to sites of other (both earlier and later) periods of the Palaeolithic in the Aegean. In general, they tend to occur in larger numbers in northern Greece (Thessaly and Epirus) and in Albania than they do in southern Greece.[55]

For example, in addition to the very small Mousterian assemblage in the basal layers at Franchthi Cave,[56] the Argolid Exploration Project (AEP) identified only three other sites in the area that date to the Middle Palaeolithic; all of them are in open-air settings and one (B85) is located on a coastal plain, like PRAP sites I28 and I18.[57] Kardulias and Runnels noted that all of the Middle Palaeolithic assemblages in the Argolid are very similar, despite their quite varied landscape settings. Interestingly, the homogeneity in size of the Middle Palaeolithic artifacts in the Argolid assemblages extends to those from PRAP: despite considerable differences in their findspots, raw material availability, and sample size, the length and width of flakes from I18 and I28 are closely comparable to those in the material from the Argolid.

Recent research in Epirus has expanded our understanding of the formal variability associated with Mousterian sites. There, based largely upon data collected during the course of surface survey,[58] Runnels and van Andel

51. Servais 1961; Bialor and Jameson 1962; Leroi-Gourhan, Chavaillon, and Chavaillon 1963; Leroi-Gourhan 1964; Reisch 1980, 1982.
52. For references, see n. 44, above.
53. Kardulias and Runnels 1995, pp. 86–87.
54. Runnels 1995, p. 710; Cherry and Parkinson 2003, p. 43; Runnels and van Andel 2003, p. 106.
55. Runnels 1988, 1995; Kardulias and Runnels 1995; Runnels et al. 1999; Papagianni 2000; Cherry and Parkinson 2003, pp. 39–43; Runnels and van Andel 2003; Runnels et al. 2004, 2009.
56. Perlès 1987, pp. 85–88.
57. Kardulias and Runnels 1995, pp. 86–87.
58. Papagianni 2000; Runnels, Karimali, and Cullen 2003; Runnels and van Andel 2003.

have argued that the wide range of variability exhibited by Mousterian sites suggests a model of "modified logistical land use."[59] In their view, different locales in Epirus offered variable types of resources that drew hominids at different times of year. As a result, they adopted a system of residential mobility that incorporated the use of some special-purpose sites (e.g., kill-sites, hunting camps, sites for the exploitation of raw material), along with longer-term "base camps."

The sites in southern Greece do not exhibit the wide range of variability in site size, artifact numbers, types represented, site location, and temporal duration that is documented in northwestern Greece, but recent excavations at stratified Middle Palaeolithic cave sites such as Kalamakia, Lakonis, Klissoura, and Kephalari are helping to flesh out the picture of Middle Palaeolithic settlement variability in the Peloponnese. Although we cannot be certain of the extent to which our sample has been biased owing to eustatic sea-level rise,[60] at least three different types of Mousterian sites in southern Greece can now be identified: 1) large stratified sites in caves; 2) open-air sites producing 100–500 artifacts; and 3) open-air sites with fewer than 100 artifacts. The stratified cave sites and the larger open-air sites (including PRAP site I28 and AEP sites B27 and F25) tend to have more "typical" Mousterian tool types represented, while the smaller sites (including PRAP I18 and AEP B85) tend to be more variable in their typological characteristics. For example, PRAP site I18 contains very few typological or technological indicators, while AEP site B85 contains two bifacial foliates similar to those well documented further north.[61] This variability at smaller sites may be due to temporal differences, since the sites with bifacial leafpoints seem to date to the terminal Mousterian, or it may be due to variability in activities carried out by different groups at the sites.

Upper Palaeolithic and Mesolithic

There is little that can be said about the Upper Palaeolithic or Mesolithic periods in the PRAP study area. Our research produced only two relevant stray finds: two heavily patinated, thick chert blades (Fig. 11), one with steep endscraper retouch typical of the early Upper Palaeolithic (SF 329), and the other, snapped distally, with retouch to both lateral edges forming a double sidescraper (SF 335). Both of these artifacts were found near the coast. No other artifacts in the assemblage as a whole are identifiable as having typological or technological attributes characteristic of Upper Palaeolithic or Mesolithic; obvious type fossils such as backed blades, bladelets, or geometric microliths are absent.

Throughout Greece, there seems to be a tendency for Upper Palaeolithic and Mesolithic sites to be clustered into relatively discrete areas of the landscape.[62] It may be that those relatively small areas of Messenia intensively investigated by PRAP simply did not witness occupation during these periods, even though human activity may have been taking place elsewhere quite close by. On the other hand, for the Mesolithic in particular, "directed surveys" aimed at environments to which Mesolithic people would have been drawn, and which also provide settings suitable for the visible

59. Runnels and van Andel 2003, p. 108.

60. See van Andel and Shackleton 1982; van Andel 1989.

61. Runnels 1988; Kardulias and Runnels 1995, p. 87, fig. 71:1.

62. The evidence is summarized in Cherry and Parkinson 2003, pp. 43–45.

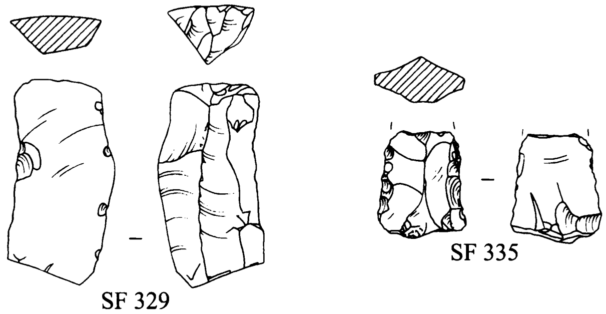


Figure 11. Upper Palaeolithic stray finds. SF 329: endscraper on blade, gray chert; SF 335: double side-scraper on proximal blade fragment, white chert. Scale 1:2. J. F. Cherry, R. J. Robertson, and J. Seagard

preservation of artifacts, have over the past decade been notably successful in locating sites of this period in areas as widely scattered as coastal Albania, Epirus, the northern Sporades, the Argolid at Kandia, and the south coast of Crete at Plakias.[63] Runnels has also recently demonstrated, from a restudy of undated artifact assemblages from the 1979–1983 AEP survey, that some Mesolithic sites had been overlooked because the characteristic features of their lithic industries were not yet properly understood at the time of the original survey.[64] It is thus quite possible that future directed surveys in Messenia may bring to light additional information about occupation in the latest Pleistocene and earliest Holocene.

The Neolithic Period

There is little evidence for Holocene exploitation of the region until the Bronze Age. Prior to PRAP fieldwork in Messenia, evidence of Neolithic activity within its survey area came from excavations at Petrohori *Cave of Nestor*,[65] Petrohori *Voidokoilia*,[66] and within the town of Hora (Hora *Katavothra*).[67] PRAP produced scanty ceramic material at several sites that may probably or possibly be assigned to the Neolithic period (e.g., at Gargaliani *Kanalos* [D1], Koryfasio *Beylerbey* [I1], Gargaliani *Ordines* [K1], and at Gargaliani *Ayia Sotira* [K2]); all of these sites have substantial later prehistoric occupations, however, and this uncertain material—a distinct class of coarse ware—quite possibly belongs to those later periods.[68]

No lithics in the assemblage can be assigned with absolute certainty to the Neolithic. Although the assemblage does contain a handful of sickle elements and several dozen of the obsidian prismatic blades that are so common in the Neolithic and Bronze Age in the Aegean, in most cases these too derive from contexts that are associated with substantial amounts of Bronze Age material. This fact, combined with the overall scarcity of evidence for Neolithic settlement throughout the study region, leads us to suspect that most of these blades also date to the Bronze Age.

63. For Albania, see Runnels et al. 2004, 2009; Epirus: Runnels and van Andel 2003; Sporades: Sampson et al. 2002; Argolid: Runnels et al. 2005; Crete: Strasser et al. 2009; Strasser et al., forthcoming.

64. Runnels 2009.

65. Sampson 1980; Davis 2008, pp. 60–61.

66. Korres 1990, pp. 1–2; Davis 2008, p. 62.

67. Lolos 1994, p. 45; Davis 2008, p. 59.

68. This material is discussed in detail, with comparanda, in Davis et al. 1997, pp. 417, 430, 438–439.

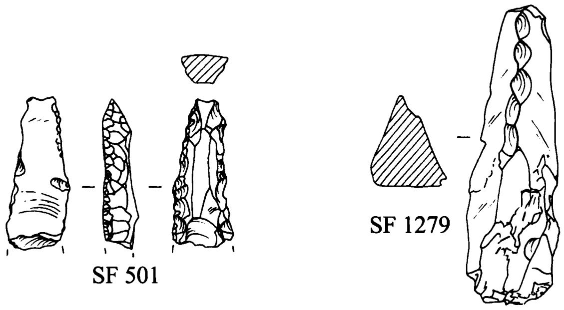


Figure 12. Stray finds of possible Neolithic or Early Helladic date. SF 501: "slug"-like steeply retouched flake, brown chert; SF 1279: denticulate on natural blank, beige chert. Scale 1:2. J. F. Cherry and J. Seagard

The only possible candidate for an artifact datable to the Neolithic is a thick, retouched blade made on an exhausted blade core (SF 501, Fig. 12) collected in tract D-305. The blank is made on very homogeneous reddish brown chert that has steep retouch on both lateral edges, creating a tool reminiscent of (but not typologically identical to) the "slugs" common in the Neolithic throughout the region.[69] One bifacially flaked point fragment from site I4 (SF 712, Fig. 15, below) evokes a Middle Neolithic transverse arrowhead, but the diagnostic base is broken off, preventing reliable assignation to that period.

Remnant layers of Final Neolithic settlements have been identified under Helladic occupations elsewhere in the Peloponnese, and it is possible that a similar pattern may have obscured the evidence for Final Neolithic settlement in the PRAP study area. But even if there were small Final Neolithic settlements in the region, the overall lack of evidence for the habitation of Messenia throughout the Neolithic period is somewhat anomalous for the Peloponnese as a whole,[70] and may relate to a continuation of the trend established during the Upper Palaeolithic and Mesolithic—namely, one of clustered settlements in specific areas with diverse resources.

Other surveys in the Peloponnese—for example, in the southern Argolid, the Nemea valley, and the Asea valley, as well as on Methana—have documented plentiful Neolithic sites and off-site finds.[71] In general, those areas in Greece that have produced Neolithic sites in abundance tend also to be the same areas that contain some (albeit not many) Upper Palaeolithic and Mesolithic sites, for example in the Argolid.[72] This pattern may not be perfectly consistent over time, and it does not seem to hold in northern Greece where there is a marked inverse correlation between the frequency of Neolithic and Mesolithic sites.[73] Nevertheless, it is a pattern that may help to shed light on the processes associated with the "Neolithization" of a given region—processes that are becomingly increasingly complex and dynamic as our detailed understanding of them increases.

Just as the process of Neolithization is now understood to have occurred through a combination of demic migration and in situ acculturation across the European continent, it is equally likely that both processes occurred

69. Cherry and Torrence 1982, pp. 27–31, fig. 3.3:i–k; 1984, p. 14. The term "slugs" was first introduced by Evans and Renfrew (1968, pp. 50–52, figs. 16:E, 67:9, 67:11), who defined them as "long narrow tools with longitudinal symmetry, and end-to-end symmetry, but asymmetrical in section. The bulbar surface is flat while the upper surface is strongly convex and heavily worked" (p. 52). At Saliagos, these tools date to the Middle to Late Neolithic transitional period.

70. Cavanagh 2004.

71. Cherry et al. 1988; Kardulias and Runnels 1995; Mee and Forbes 1997, pp. 46–50; Carter 2003.

72. Kardulias and Runnels 1995, pp. 85–92.

73. Perlès 2001, pp. 59–60.

within the Greek peninsula itself. While there is significant evidence for demic migration in the northern part of the peninsula, the hunting and gathering Mesolithic groups in the south seem to have acquired different elements associated with the Neolithic only gradually, and probably through processes of acculturation. While early agriculturalists quickly moved into those areas that were ideal for raising domesticated crops and animals (e.g., the Thessalian plain), broad expanses of the southern Greek landscape, such as Messenia, seem to have remained largely unoccupied throughout the period. This may be because they were as unattractive to early horticulturalists as they were to their hunting-and-gathering predecessors; on the other hand, Messenia's water sources, rich in comparison with much of the remainder of the Peloponnese, might be expected to have encouraged early settlement, despite the current scarcity of evidence for it.

The Early Helladic Period

The evidence for occupation and exploitation of this part of the Messenian landscape increases steadily throughout the Bronze Age: a handful of sites in the Early Helladic (EH) period, a few more in Middle Helladic (MH), and substantial growth in the Late Helladic (LH) period. Rather few EH sites were known in Messenia prior to PRAP. These include the burial tumulus at Petrohori *Voidokoilia*,[74] Lepreon *Ayios Dimitrios*,[75] Kalamata *Akovitika*,[76] and Filiatra *Stomio*.[77] To this number, PRAP has added at least one new site at Vromoneri *Nozaina* (I20), and possibly another at Gargaliani *Kalantina* (1) (M1).

In addition to these sites that are predominantly Early Helladic in date, sparse ceramic materials associated with this horizon were collected at several sites whose main occupation seems to have been in other periods. Among these finds is a handful of EH pottery at I28 whose fabric is similar to that at Vromoneri *Nozaina* (see below) and a small amount of diagnostic EH II pottery at Romanou *Romanou* (I4), a site that is mainly LH IIIB and later.[78] Possible EH II material was also collected at Gargaliani *Kanalos* (D1) and Gargaliani *Ordines* (K1), both sites predominantly occupied in the MH, LH, and later periods. The site surrounding the Palace of Nestor (B7), surveyed very intensively by PRAP, has produced minimal signs of settlement prior to 2000 B.C., the end of the EH phase.[79]

Davis and his colleagues note that most of the EH materials in the region derive from sites near the coast of western Messenia.[80] This paucity of EH sites is not typical of the Peloponnese as a whole. For example, in the southern Argolid, Kardulias and Runnels noted that "the largest single

74. Hope Simpson and Dickinson 1979, site D8; Korres 1990, pp. 2–5; 1993, p. 234, no. 3.
75. Hope Simpson and Dickinson 1979, site D245; Zachos 2008.
76. Hope Simpson and Dickinson 1979, site D151.
77. Hope Simpson and Dickinson 1979, site D65; Hatzi 1991.
78. Extensive Early Bronze Age remains have recently come to light in the vicinity as a result of rescue excavations (conducted by Jörg Rambach) necessitated by construction work for the massive Costa Navarino resort complex on the coast near Romanou. The settlement, dating to EH II, lies on the south side of the Selas River and consists of a number of houses oriented along streets arranged in a rather regular plan. Preliminary reports refer to "large quantities of obsidian" in the east part of the settlement (Morgan 2008, p. 41).
79. Bennet 2007, p. 32. Stocker (2003, p. 402) discusses the distribution of EH III–MH I finds in the lower town of the Palace of Nestor and elsewhere on the Englianos Ridge.
80. Davis et al. 1997, pp. 418–419.

TABLE 8. BLANK TYPES BY SITE

Site	Obsidian								Chert								Total Retouched	Total (n)	Density (per ha)
	P Fl	S Fl	T Fl	Bl	F Core	B Core	Spall	Total	P Fl	S Fl	T Fl	Bl	F Core	B Core	Spall	Total			
A2								0	1	1	2			1		5	3	5	0.72
A4		1						1	1	4	11		3		2	21	8	22	0.55
A5								0			2				1	3	1	3	7.50
B7			1					1	1	5	14	1	3		5	29	10	30	1.67
C1								0			1					1	1	1	2.70
D1			1		1			2		1	7		1		2	11	4	13	28.89
D2			3	1				4		4	6	1			2	13	4	17	7.87
D3		1		3				4		1	7					8	4	12	0.44
E1								0		1	1				1	3	0	3	7.69
G1		1		1				2	1	5	8		4		3	21	9	23	0.66
G2			1					1		5	3		1			9	1	10	1.54
G3		1	2	1				4	1	5	7		1		4	18	12	22	3.06
I1			2	5			1	8	1	9	14		1		3	28	17	36	3.00
I2								0			1					1	1	1	n/a
I3		1						1		1	2				1	4	2	5	0.45
I4	7	18	20	14	2	5	11	77	3	7	14		5	1	7	37	37	114	2.99
I18								0	2	19	18		8		12	59	5	59	907.69
I20			2	7				9		4	7				8	19	3	28	1,120.00
I28				5				5	2	29	45	2	14		27	119	46	124	620.00
I29								0			3					3	1	3	0.39
K1		1	2	7			2	12	1	11	31	2	15	3	7	70	21	82	17.67
K2				1				1		1					1	2	0	3	50.00
K3				1				1		1	1	1			1	4	2	5	2.35
K4								0			1	1				2	1	2	20.00
K5								0		2	1	1				4	0	4	1.24
M1	1			1			1	3	3	13	27		2		8	53	13	56	107.69
M2	1		2	2			1	6		4	6	2	2		7	21	5	27	36.00
M4								0			3		1			4	0	4	n/a
Total	9	24	36	49	3	5	16	142	17	133	243	11	61	5	102	572	211	714	

Only sites with chipped stone assemblages are included.
Abbreviations: P Fl = primary flake; S Fl = secondary flake; T Fl = tertiary flake; Bl = blade; F Core = flake core; B Core = blade core.

category of sites in the [AEP] survey belongs to the Early Bronze Age,"[81] and they identified 33 sites with lithics dating to the EH period. Such variability in the distribution of sites and population throughout the Peloponnese, however, is now well established and may simply reflect a continuation of trends established much earlier. Since the PRAP EH dataset is so small, it can contribute relatively little to our understanding of lithic technology in the Early Bronze Age of southern Greece, fortunately already well documented at a number of excavated sites elsewhere in the Peloponnese (e.g., at Lerna).[82] We limit the discussion here to the chipped stone assemblages associated with sites I20 and M1.

Vromoneri *Nozaina* (I20) is situated about 300 m south of I28 on a conglomerate cap that overlies eroding clay deposits. Ceramic material was found densely concentrated in a very small area (0.01 ha) and consisting of coarse to semifine pottery that belongs exclusively to the EH period, with a few diagnostic shapes that suggest an EH II date.[83] The small lithic assemblage associated with the site contains nine obsidian and 19 chert artifacts. The former include two tertiary flakes and seven blade fragments; one blade is triangular and six are trapezoidal in cross-section; only one blade is retouched. The chert assemblage contains 11 flakes and eight spalls on local chert, most of which is gray; two artifacts are retouched (Table 8).[84]

M1 (Gargaliani *Kalantina* [1]) is an inland site located on dark red soils south of the modern town of Gargaliani. The site lies on the slope of a steep valley that connects the flat coastal plain west of the Gargaliani escarpment with the uplands at the foot of Mount Aigaleon. Ceramic material similar in fabric to that found at I20 was collected here, along with a few pieces diagnostic of EH II.[85]

The assemblage from M1 is associated with a dense cluster of off-site material that occurs throughout the vicinity. The 56 artifacts directly associated and contiguous with M1 include only three pieces of obsidian (a primary flake, an unretouched trapezoidal blade fragment, and a spall) and 53 pieces of chert (43 flakes, two flake cores, and eight spalls, mostly on light brown chert similar to that abundant in the surrounding area). In the immediate vicinity, however, another 142 lithics were collected, of which 27 were associated with site M2 (Gargaliani *Kalantina* [2]), a site mainly occupied after the end of the Bronze Age. The site is located in an area rich with chert nodules redeposited from the conglomerate eroding out of the uplands, and all stages in the reduction sequence are represented at the site, suggesting that it was used, at least in part, to exploit these chert resources. The 13 retouched tools in the M1 assemblage include two becs

81. Kardulias and Runnels 1995, p. 93.

82. Runnels 1985; Hartenberger and Runnels 2001.

83. As already noted (p. 25), a few potsherds with a similar fabric were collected at (otherwise Palaeolithic) site I28, where they are associated with five obsidian blade fragments that are probably also of Early Bronze Age date.

84. The retouched pieces include a flake on heavily patinated, red-stained material that has a faceted platform as well as partial retouch on both lateral margins that forms a point distally (SF 614). Although the piece is quite small and broken on the left proximal edge, its formal characteristics suggest that it may be a Mousterian point associated with nearby site I28. Clearly, there has been some spatial blurring between the materials from sites I20 and I28 (see n. 83, above).

85. Davis et al. 1997, p. 418.

(SF 1322, SF 1356), two endscrapers (SF 982, SF 1353), a convergent scraper (SF 1354), a borer (SF 1380), and a notch (SF 1372). The two flake cores are small and irregular.

A significant amount of material derived from the tracts in and around M1 may also date to the EH period. The density of chipped stone artifacts in the 42 ha area around M1 (area IV) is the highest of all the analytical units in the region (areas I–IX; Figs. 13, 14). It is twice as high as any other region in the PRAP study area (2.7 per hectare) and includes 143 pieces of chipped stone, 27 of which are associated with site M2, and four are associated with M4 (Table 8).

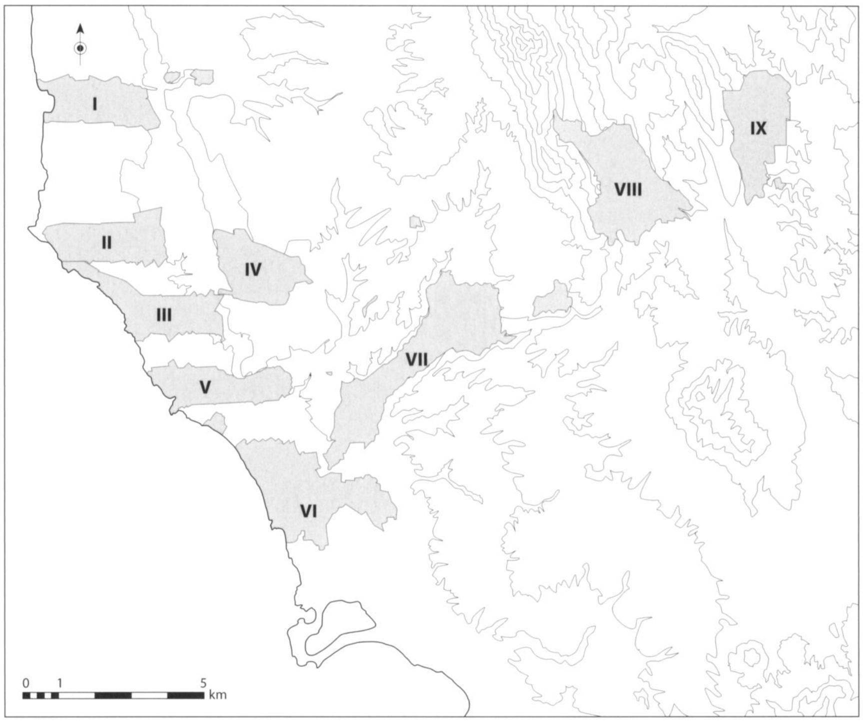
The primary occupation at M2 seems to be post–Bronze Age, although a handful of sherds dating to the MH and LH periods were found at the site. M4 has no prehistoric component. All but one of the lithics associated with M2 were found either in tracts contiguous to the site itself or in survey tracts that were later directly associated with (i.e., on top of) the site. The small assemblage includes six pieces of obsidian and 21 of chert; there are two obsidian blade fragments. The chert assemblage also contains two small blade fragments, a tabular flake core, a bifacial flake core, and a single notch. Although it is possible that the dispersed assemblage at M2 is, in fact, associated with the post–Bronze Age occupation at the site, its situation in an area with a relatively high lithic density suggests that the association of the lithics with the site may be purely coincidental. This uncertainty, of course, is an inevitable consequence of dealing with surface assemblages of chipped stone, much of which may not in itself be chronologically diagnostic.

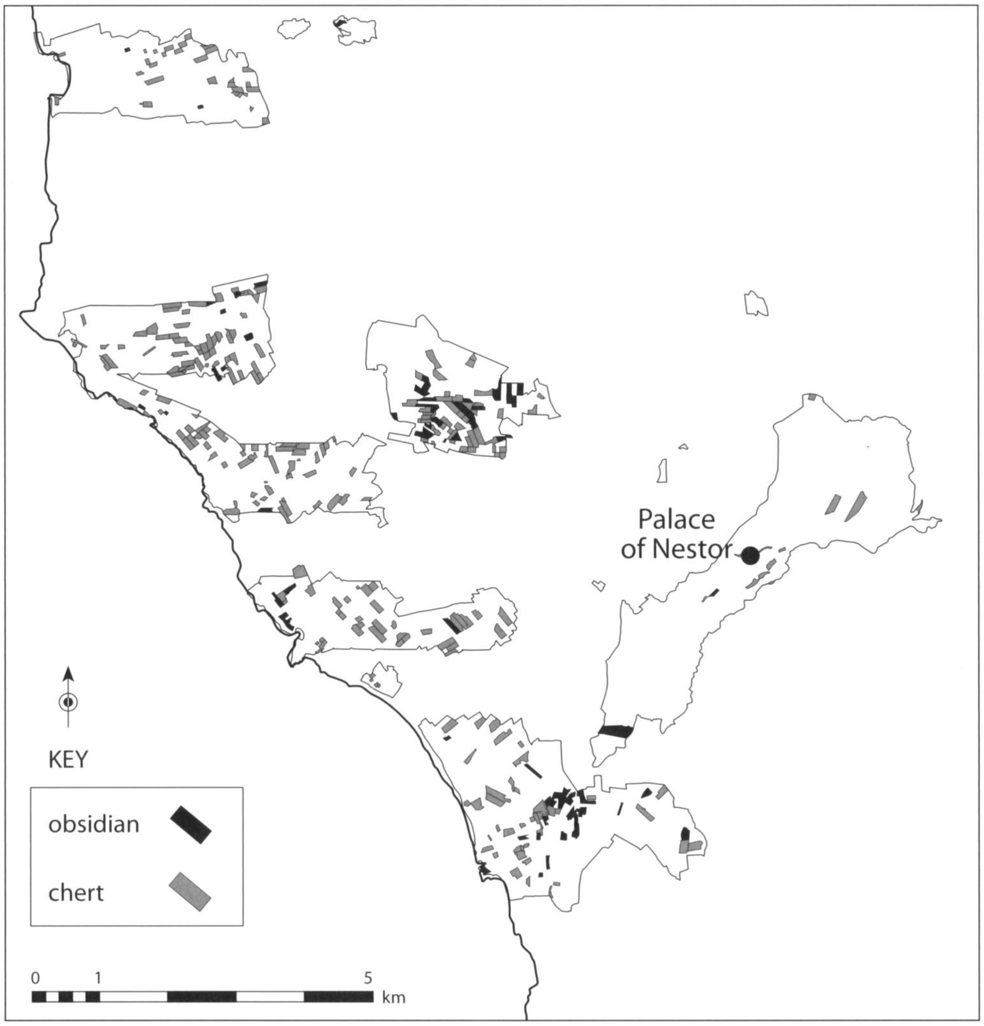
The tract finds from area IV that are not associated (or contiguous) with sites number 113, including 29 pieces of obsidian, 83 pieces of chert, and one piece of quartz. The off-site obsidian associated with area IV includes five blade fragments, 11 flakes, and 13 spalls or natural blanks. The six retouched obsidian tools include three retouched blade fragments and a notch (SF 1086). The chert assemblage contains 60 flakes, two blades, six flake cores, and 15 spalls or pieces of débitage. The retouched chert tools include two becs (SF 1002, SF 963), a borer (SF 1023), two denticulates (SF 991; SF 1279, Fig. 12, above), two endscrapers (SF 997, SF 1001), a sidescraper (SF 1294), a possible lunate (SF 1066), a notch, and several pieces with intermittent retouch. Most of the raw material is brown, and some of it is patinated and stained from the iron oxides in the soil, giving it an appearance similar to some of the Palaeolithic artifacts recovered from site I28.

The relative percentage of obsidian in off-site finds (26%) is higher in area IV than it is in any of the other areas. Area VI has the next highest percentage of obsidian in the off-site assemblage, but that figure (23%) is almost certainly skewed by the obsidian-rich site of Romanou (I4, see below). This high percentage of obsidian in area IV is especially surprising, given the ubiquity of relatively good-quality chert throughout this part of the survey area. While some of the chipped stone artifacts in the area IV collection may date to earlier (possibly even Palaeolithic) contexts, and some may have been deposited in post–Bronze Age contexts, the majority of the lithic material in the collection seems to relate to a relatively high-density off-site lithic scatter associated with the EH (probably EH II) settlement at M1.

Figure 13 *(opposite, top)*. Location of the nine areas intensively surveyed by PRAP. Alcock et al. 2005, p. 165, fig. 6. R. J. Robertson

Figure 14 *(opposite, bottom)*. Distribution of tracts with obsidian or chert artifacts in the western part of the PRAP study area. Areas VIII and IX, in which very few tracts produced lithic finds, have been omitted. S. Heath and R. J. Robertson


I
II
III
IV
V
VI
VII
VIII
IX
0 1 5 km


Palace
of Nestor
KEY
obsidian
chert
0 1 5 km

Middle and Late Helladic: On-Site Distributions

The number of sites in the region increased significantly during the MH period,[86] including more substantial evidence of settlement at B7 (Palace of Nestor), D1 (Gargaliani *Kanalos*), I1 (Koryfasio *Beylerbey*), and K1 (Gargaliani *Ordines*), and at two sites beyond the ridge of Mt. Aigaleon: A2 (Metaxada *Kalopsana*) and L1 (Maryeli *Koutsouveri*). MH ceramics also were collected at several smaller sites, including C3 (Tragana *Voroulia*), K2 (Gargaliani *Ayia Sotira*), and K3 (Valta *Kastraki*). All of the sites that were occupied during MH continued to be occupied well into the LH period. New sites established either very late in MH or during the LH period include D2 (Gargaliani *Megas Kambos* [1]), G3 (Vromoneri *Pigadia*), I3 (Koryfasio *Portes*), and I21 (Ambelofyto *Lagou*). I4 (Romanou *Romanou*), a site that produced some material dated to EH but no clearly datable MH finds, grew substantially during the LH period.

PRAP explored 22 sites that date to MH and/or LH; of these, 15 sites (A2, B7, C1, D1, D2, D3, G3, I1, I2, I3, I4, K1, K2, K3, and M2) yielded lithic finds (Tables 6, 8). They include both small sites with modest assemblages comprising only a handful of flaked-stone artifacts (e.g., A2, K2), and larger settlements with over 100 artifacts (e.g., I4). M2 has only evanescent traces of MH and LH, and is primarily a historical site.

The 373 lithic items associated with these 15 MH and LH sites include 121 (32%) pieces of obsidian and 252 (68%) pieces of chert—a considerably higher percentage of obsidian when compared both to the total percentage in the PRAP lithic assemblage overall (17%), and to the percentage of obsidian collected from the two EH sites discussed above (14%). This could signal a general increase of obsidian in circulation in western Messenia during the MH and LH periods; more likely, however, it is a reflection of the high frequency of obsidian at a single site (Romanou *Romanou* [I4]), which alone accounts for almost two-thirds of all the obsidian associated with the MH and LH sites in the region, and makes up 40% of all the obsidian in the PRAP assemblage (see Table 8).

The quantity of chipped stone artifacts on each of these sites is very variable (from one to 114), but most sites with chipped stone assemblages are restricted to the coastal plain in the westernmost portion of the study area. Several of the sites with only a few chipped stone artifacts actually exhibit a lower density of chipped stone artifacts than the "background" density of lithics throughout the region, suggesting that the association of chipped stone artifacts with these sites is coincidental rather than a reflection of meaningful cultural patterns. Over the ca. 630 ha intensively surveyed by PRAP, the average density of flaked stone material is about 0.6 per hectare. This provides a rough estimate of the "background" frequency of chipped stone artifacts across the landscape that can be used as a baseline for comparing the relative densities of chipped stone artifacts on sites. As Table 8 reveals, the density at different sites throughout the region varies from 0.44 per hectare (e.g., at D3) to 620 and 908 lithics per hectare at the two Palaeolithic sites discussed above. It is important to remember that these are general numbers generated from a variety of

86. Davis et al. 1997, p. 419.

different sampling methods, including total "vacuum" pick-up of some sites, and various sampling methodologies at others (as indicated in Table 6). As such, these numbers provide only the roughest of measures for gauging relative densities at different sites in the study area.

The sites that predate MH and LH generally have high densities of lithics. Both Palaeolithic sites exhibit densities that exceed 600 lithics per hectare, while the two Early Bronze Age sites vary from 1,120 per hectare at I20, to 107 per hectare at M1 (Table 8). This high density of chipped stone materials decreases markedly during the later Bronze Age.

Sites with MH and LH materials have densities of chipped stone that vary from 0.44 per hectare (at D3) to 50 per hectare (at K2). Not surprisingly, most of those sites that exhibit the denser concentrations were collected using total pick-up methods, or are themselves very small, with correspondingly small lithic assemblages. But even when only those sites that were completely collected and that have more than 15 pieces of chipped stone are considered, the chipped stone densities are extremely variable. Some sites have as few as 1.67 items per hectare (B7) while others have more than 10 times as much (K1). Interestingly, the Lower Town around the Palace of Nestor (B7), a site that was totally "vacuum" collected, exhibits one of the lower densities, whereas other, presumably secondary centers in the region (e.g., K1),[87] have significantly higher densities. Similarly, Romanou *Romanou* (I4)—which produced more obsidian than any other PRAP site—was only sampled (rather than "vacuum" collected), and it covers a huge area (38 ha) largely associated with a post–Bronze Age occupation;[88] lithic density there is nevertheless nearly twice as high as it is in the tracts around the palace.

The scarcity of flaked stone from survey units around the Palace of Nestor—just 30 pieces—is itself striking, given both the intensity with which the collection there was conducted, and the relative abundance of lithics at other sites that presumably served as secondary centers or tertiary settlements as the Mycenaean state began to extend its authority throughout the region.[89] The site of Romanou *Romanou* (I4) stands out from all the others since it has produced nearly four times as much lithic material (n = 114), 68% of which is obsidian. Even other sites with more modest assemblages (such as at K1, n = 82) have much higher lithic densities than the area around the palace. A further intriguing observation is the differential distribution of obsidian and chert at various MH and LH sites throughout the region. For example, the area around the Palace of Nestor (B7) produced only one piece of obsidian (3%) and 29 pieces of chert (97%); at I4, near the coast, the ratio is 68% obsidian and 32% chert; whereas at K1, located farther to the north along the coastal plain, it is 15% obsidian and 85% chert.

87. For the site of Gargaliani *Ordines* as a second-order place within the Pylos polity, see Davis 2008, p. 135. It is about one-sixth the size of the palace settlement (Bennet 2007, p. 37, fig. 3:7).

88. Bennet 2007, p. 38, figs. 3:8, 3:9.

89. Total collection of B7 took place within 20 × 20 m grid squares over an area of 18 ha; see Davis et al. 1997, p. 429, fig. 12; Bennet 2007, p. 32, fig. 3:3. For further discussion of the process of expansion of the Pylian state, see Bennet 2007; Davis 2008, pp. 134–138.

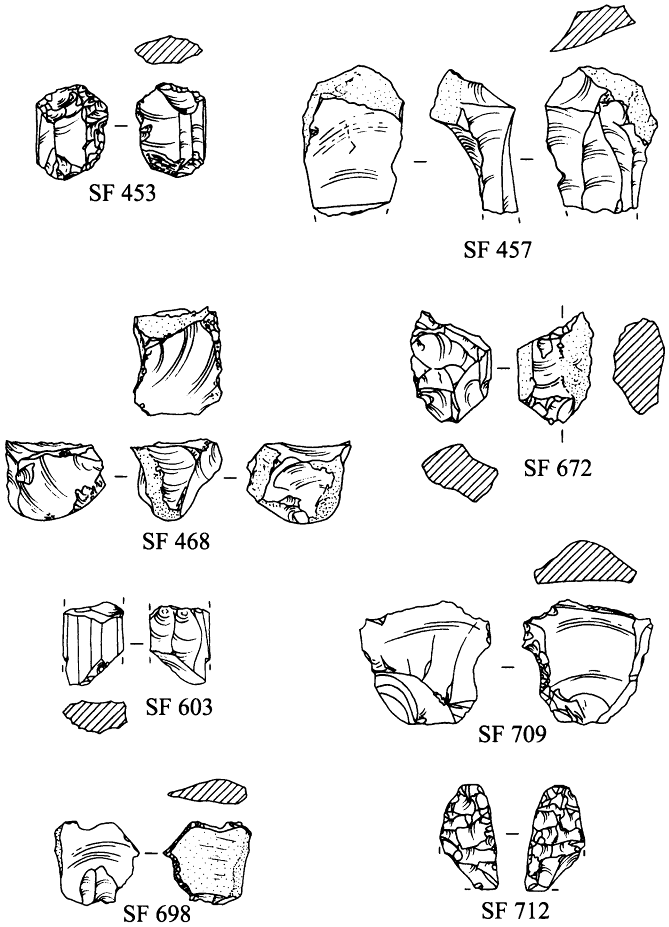


Figure 15. Chipped stone artifacts from I4 (Romanou *Romanou*). SF 453: bipolar reduced bladelet core, obsidian; SF 457: plunging blade fragment, yellow chert; SF 468: globular core, obsidian; SF 672: irregular flake core, black chert; SF 603: bladelet core fragment, obsidian; SF 709: retouched notch on flake, obsidian; SF 698: multiple retouched tool, primary flake, obsidian; SF 712: bifacially retouched point, obsidian. Scale 1:2. J. F. Cherry and J. Seagard

Parkinson has argued, based on the reduction stages represented at various sites throughout the study area, that almost all the evidence for obsidian blade production in the PRAP assemblage comes from Romanou *Romanou* (I4), the single site where *every* stage of the obsidian-blade reduction sequence is represented (Fig. 15).[90] The only obsidian blade cores (a total of five) collected by the survey are from Romanou, as are two crested blades *(lames à crête),* indicating that blades were indeed produced on-site. This number, while certainly not at all indicative of an "industrial" level of production, is particularly striking with reference to the distribution of blade cores at excavated sites in the region (see below). The occurrence of primary, secondary, and tertiary flakes in the Romanou assemblage indicates that obsidian core preparation also occurred at the site and suggests that the raw material probably arrived there from the island of Melos in the form of roughed-out nodules.

In contrast, obsidian blades regularly comprise between 20% and 100% of the entire obsidian assemblage at other MH–LH sites in the study area, but none of those sites exhibit any elements commonly associated with blade production, suggesting that blades were produced elsewhere, possibly at Romanou or sites like it, and were circulated as finished products. Other sites, such as K1, do provide evidence for the on-site production of

90. Parkinson 2007, pp. 90–96.

chert flakes and blades, but the production of *obsidian blades* seems to have occurred only at specific sites (see Table 8).

This pattern holds up even when the PRAP survey distribution is compared to data from three relevant excavated contexts in the region.[91] At Nichoria, ca. 20 km east of the Palace of Nestor, the modest sample of 202 obsidian artifacts can generally be dated to the MH and LH periods.[92] The assemblage includes 93 blades (46% of the total recovered obsidian) and a single exhausted blade core, found in a mixed deposit[93] of MH, LH I–II, and Dark Age II pottery; the core, along with a single crested blade, constitutes the only evidence at this site for blade production. A similar pattern obtains at Malthi, some 25 km northeast of the Palace of Nestor.[94] The site produced an assemblage of 161 chipped stone artifacts (59 obsidian, 102 chert) from contexts dated to the MH and LH periods; the 38 blades make up 64% of the total obsidian sample and, as at Nichoria, a single obsidian blade core was found. The relative percentage of blades in the assemblages at both of these sites is quite similar to that represented at MH and LH sites in the PRAP study area, and the general dearth of evidence for blade production strongly suggests that these sites too were receiving blades from elsewhere.

The most important excavated Bronze Age site in the region is, of course, the Palace of Nestor itself. Although the chipped stone collected during Blegen's excavations has been studied, this material has never been fully published.[95] The following summary of the lithics from the palace is thus based upon two primary sources: first, the room-by-room summaries provided by Blegen and Rawson in their 1966 publication of the artifacts discovered during the initial excavation of the palace and its immediate vicinity; and, second, Suzanne Hofstra's catalogue, compiled for her dissertation research,[96] of the excavated small finds from Blegen's excavations, now stored in the Chora Museum (Table 9).

By Hofstra's count, the lithic materials recovered from the palace and its immediate vicinity comprise 495 chipped stone artifacts, including 158 pieces of obsidian (32%) and 337 of chert (68%); these percentages are likely to be only approximate, since distinguishing the local black chert from obsidian can present difficulties for the untrained eye. The obsidian assemblage includes 39 blade fragments (25% of the total obsidian) and seven cores, but—frustratingly—it is unclear whether any of these cores are actually blade cores; the five examples illustrated in Blegen and Rawson's plates are all small flake cores, the two remaining unillustrated cores being of unknown type.[97] The most common retouched artifact types are arrowheads and "dentates" (probably what are more commonly referred to as "sickle elements").[98]

91. Parkinson 2007, pp. 93–96.
92. This information is derived from Blitzer's (1992) preliminary analysis of the chipped stone from the site, currently the only published information available; see also Parkinson 2007, pp. 93–94, fig. 9:5.
93. L23, Wc, level 4, lot 4038/3.
94. Blitzer 1991.
95. Blegen and Rawson 1966; Blitzer 1991, p. 39.
96. Hofstra 2000.
97. Blegen and Rawson 1966, fig. 282, no. 6 (room 49); fig. 283, no. 11 (room 27); fig. 306, no. 14 (room 92); fig. 308, no. 6 (room 97); and fig. 319, no. 1 (room 100). The two unillustrated obsidian cores are from room 50 and hall 65.
98. "Dentate" is the term used in Blegen and Rawson 1966 and Hofstra 2000.

TABLE 9. CHIPPED STONE ARTIFACTS FROM THE PALACE OF NESTOR

		Published by Blegen and Rawson														*Located in the Chora Museum by Hofstra*						
		Obsidian							*Chert*							*Obsidian*			*Chert*			
No.	*Context*	*Total*	*C*	*Pt*	*Bl*	*Dt*	*Ch/Fl*	*Fl*	*Total*	*C*	*Pt*	*Bl*	*Dt*	*Ch/Fl*	*Fl*	*Total*	*Pt*	*Bl*	*Total*	*Pt*	*Bl*	*Dt*
1	Propylon exterior	0							1		1					0			9	6		1
2	Propylon interior	0							1		1											
3	Court of Megaron	3		2				1	0							4	2	1	0			
4	Portico of Megaron	0							0													
5	Vestibule of Megaron	0							0							0			0			
6	Megaron Throne Room	0							1				1			1			0			
7	Archive Room	0							0							0			1			
8	Archive Room and Chasm	3					×		3		1	1		×		2		2	2	1	1	
9	Pantry	0							0							0			0			
10	Waiting Room	1		1					0							1			0			
11	Lobby	1						1	0							1			0			
12	Room	×					×		0							0			0			
13	Corridor	1						1	0							0			0			
14–15	Southwest Stairway	1						1	1				1			0			1			
16	Corridor	0							0							0			0			
17	Room	0							0							0			0			
18	Corridor/Pantry	0							0							0			0			
19	Kylix Pantry	0							0							0			0			
20	Pantry	3				1		2	0							1		1	0			
21	Cup Pantry	0							0							0			0			
22	Corridor/Pantry	0							0							0			1	1		
23	Oil Magazine	10							26							3		3	0			
24	Oil Magazine	6							21							1		1	1			1
25	Northeast Corridor	0							×					×		2		2	0			
26	Corridor	×							×							11		2	20			
27	North Magazine	3	1				1	1	3					3								
28	Northeast Corridor	5					1	4	1			1				3			0			
29	Lobby	0							0							0			0			

30	Room	×					×		×					×		5			2			
31	Room of the Ivories	6			1			5	×			1		×		8	1	1	9			
32	Room of the Pithoi	3					3		13						13	3			16			
33	Room	5			1		4		8							8	2		10			
34	Closet under stairs	0							4					3	1	0			3			
35	Northeast Corridor	4							4							4			1			
36	Northeast Stairway	0							0							0			0			
37	Corridor	0							0							0			2			
38	Room	0							1						1	0			1			
39	Room	4			2		2		1			1				3	1	2	5			
40	Room	3							1		1					3			2	1		
41	Northeast Gateway	1						1	2							1			3			
42	Open Court	2						2	2							7		2	9			1
43	Bathroom	0							3						3	0			3			1
44	Northeast Stoa	3			1			2	×					×		4		2	9		3	
45	Southeast Corridor	0							0							1			0			
46	Queen's Hall	3			1			2	1		1					2		1	6		1	
47	Open Court	×					×		×					×		1			6			
48	Corridor	0							1			1				0			1		1	
49	Corridor	1	1						0							0			2			
50	Room	4	1				3		1							1			2			
51	Southeast Corridor	0							0							0			0			
52	Southeast Corridor	1		1					1			1				1	1		1		1	
53	Room	0							0							0			0			
54	Southeast Stairway	0							0							0			0			
55	Room	0							0							0			0			
56	Room	0							0							0			0			
57	Room	0							0							2			1			
58	Palace Forecourt	×							×							2			6		1	
59	Ramp to Southwest Building	1							2							1			2			
60	Pantry	0							2							0			0			
61	Corridor	0							0							0			0			
62	Guardroom?	0							0							0			0			

Continued on next page

TABLE 9—*Continued*

		Published by Blegen and Rawson														*Located in the Chora Museum by Hofstra*						
		Obsidian							*Chert*							*Obsidian*			*Chert*			
No.	*Context*	*Total*	*C*	*Pt*	*Bl*	*Dt*	*Ch/Fl*	*Fl*	*Total*	*C*	*Pt*	*Bl*	*Dt*	*Ch/Fl*	*Fl*	*Total*	*Pt*	*Bl*	*Total*	*Pt*	*Bl*	*Dt*
63	Court	3			3			×	0							5		4	0			
64	Entrance hall of Southwest Megaron	2			1		1		0							0			1	1		
65	Hall of Southwest Megaron	1	1					×	3		1				2	1			0			
66	Lobby	0							0							0			0			
67	Pantry	0							0							0			0			
68	Pantry	1							1					1		1			0			
69	Stairway	0							0							0			0			
70	Corridor	0							0							0			0			
71	Room	1							1	1						2						
72	Room	0							0													
73	Room	1						1	2						2	0			2			
74	Room	0							0													
75	Lobby	0							0							0			0			
76	Lightwell	0							×							2			0			
77	Room	0							0							0			0			
78	Bathroom?	0							0							0			0			
79	Lobby	0							0							0			0			
80/81	Rooms	0							0							0			0			
82	Northwest Building room	×							×							0			0			
83–87	Northwest Building rooms	0							0							0			0			
88	Court	0							1			1				0			2	1	1	
89	Late room	0							0							0			1		1	
90	Late room	0							0							0			0			
91	Ramp of Northeast Building	5					5		6						6	3			5			
92	Court	1	1				×		×					×		6		3	47		2	
93	Shrine	×						×	×						×	2			6	5		

94	Colonnade	2		1				1	5					5		0			7			
95	Corridor	×						×	×						×	4			16			
96	Room	×						×	×						×	1			3			
97	Room	2	1		1		×		2		1		1			7			0			
98	Room	1		1			×		×					×		12	1		52			1
99	Room	1			1				2		1	1		×		9		2	40	1		2
100	Room	1	1					×	2		1		1			0			1			
101	Area	3		3			×		2		1		1	×		5	2	3	9	4	4	1
102	Reservoir or cistern	1		1												7		3	2	1		
103	Area	0							0							1		1	1			
103a	Room	0							0													
103b	Room	0							0													
103c	Room	0							×													
104	Wine Magazine	0							0							0			0			
105	Wine Magazine	3			3		×		3		2	1		×		3		3	5	2		3
Total		107	7	10	15	1	20	25	135	1	12	9	5	12	27	158	10	39	337	24	16	11

Sources: Blegen and Rawson 1966; Hofstra 2000, pp. 268–271, table 5.3.
Abbreviations: C = core; Pt = point; Bl = blade; Dt = dentate; Ch/Fl = chip or flake; Fl = flake; × = mentioned as present by Blegen and Rawson, but quantity unspecified.

Thus, while it is possible, if not likely, that flake production and some of the final steps associated with arrowhead production occurred at the Palace of Nestor and at sites such as Malthi and Nichoria, there is little evidence that blades were produced at any of these locations in significant quantity. Even if the two obsidian cores of unknown type from the palace were in fact blade cores, they would still represent only a very small number considering the total amount of earth excavated there, thus making the seven cores (five blade cores and two flake cores) recovered from purely surface contexts at Romanou all the more impressive. As noted above, evidence for the production of obsidian blades within the study area is restricted largely to that one site, suggesting that it, and probably others like it, were responsible for obsidian blade production during MH and LH times. So while the production of obsidian was, to some extent, "centralized" within the region, it is important to recognize that it was *not* centralized at the primary center in the region—namely, the Palace of Nestor.

The centralized production of obsidian blades is evidently a pattern common throughout the Bronze Age in the Aegean.[99] Access to the obsidian sources on Melos appears to have been relatively unrestricted throughout the later Neolithic and Bronze Age,[100] but several different surface surveys have identified similar patterns of centralized blade production in various parts of the Peloponnese—from the Argolid to Laconia.[101] The pattern of a single site generating most, if not all, of the evidence for blade production in a region seems to have begun sometime near the end of the Neolithic,[102] and may be a distinctive central and southern Greek craft activity.[103]

It has recently been suggested that obsidian blade production, like the production of coarseware pottery, probably occurred beyond the scope of palatial control.[104] Both activities occurred in an organized fashion (i.e., at specific sites) and are not documented in either the excavated finds from the palace itself or in the Linear B tablets. Considering the tendency of the palatial administrators to relocate specialist industries to the palace proper, and given the apparent complete absence of mention of obsidian in the Linear B tablets themselves, it appears the local elite either did not wish, or did not need, to exercise control over the production of obsidian blades. Galaty has made a similar argument for the production of ceramic coarsewares.[105] While there is evidence for the palatial elite attempting to oversee the production of some ceramic types (such as kylikes) related to specifically palatial activities, the evidence for palatial management of more traditional craft activities that developed from domestic contexts in the Neolithic is generally lacking.

The absence of evidence for palatial control over these types of craft activities has led Galaty and Parkinson[106] to question the predominant model of the Mycenaean economic system, which posits a high degree of redistribution and control over most aspects of local production and

99. See Karabatsoli 1997; Carter 2008.

100. Torrence 1979, 1986; Kardulias and Runnels 1995; Kardulias 2007.

101. Kardulias and Runnels 1995, pp. 106–108; Carter and Ydo 1996; Carter 2003.

102. Cherry and Parkinson 2003, p. 51.

103. Kardulias and Runnels 1995; Hartenberger and Runnels 2001, pp. 274–278.

104. Parkinson 2007.

105. Galaty 2007.

106. See Galaty and Parkinson 2007b.

distribution.[107] They suggest that a model based on wealth finance (as opposed to staple finance) better describes the operation of the Mycenaean economic system, which seemed to emphasize the production and distribution of prestige goods to entice participation through alliance-building.[108] Killen has criticized this argument, correctly pointing out that several industries (e.g., textile production) documented in the Linear B tablets include processing steps that do not occur at the palace proper.[109] But precisely the fact that such industries are documented—in considerable detail—in the tablets indicates significant interest on the part of the elite in organizing and wielding control over them. What distinguishes traditional craft activities such as obsidian blade production and the production of coarse pottery is that not only did they not take place at the palace proper, but they also have no record in the Linear B tablets. Such autonomous traditional craft activities have a long history in the region and most likely were fully operational long before the establishment of centralized economic control during the later Bronze Age.[110]

The Middle and Late Helladic Periods: Off-Site Distributions

The distribution of off-site lithic finds in the study area seems to have been influenced primarily by the expansion and establishment of settlements during the Middle and Late Helladic periods. As noted earlier, PRAP recorded 714 lithic artifacts from on-site contexts. By our best estimate, roughly half (n = 346) of these are associated with sites occupied primarily in MH and LH. We have suggested that the majority of finds in area IV are probably to be connected to an EH occupation near site M1, and that a handful of the finds elsewhere may be attributable to the Palaeolithic; but the vast majority of lithics from off-site contexts seem to be associated with the MH and LH periods and thus can be used to augment the site-based patterns discussed above.

The off-site lithic material parallels the coastal bias seen in the distribution of sites along the coast, with a clear falloff in density and number farther inland. If the material in area IV is, as suggested, predominantly EH and earlier, then this pattern would be even more exaggerated during MH and LH: discounting the 113 stray finds from area IV, 93% (258 of 276) of the remaining material is derived from the survey areas that lie directly along the coast (I, II, III, V, and VI; see Figs. 13, 14, above). It is in those same areas that the only appreciable spatial clustering of lithics is also seen.

Others have noted a comparable coastal bias in regional lithic assemblages, which seems to be associated not only with the distribution of settlements in a region, but also with the processes of obsidian acquisition and distribution. For example, of the 1,247 fragments of chipped stone (1,122 pieces of obsidian, 125 pieces of chert) recovered by the Methana survey, 95.5% came from the limited lowland zone.[111] Like PRAP, the Argolid Exploration Project identified a single site near the coast (F32, the "Fournoi Focus") that produced 49% of all the obsidian in the lithic assemblage.[112] The Central Laconia Survey also identified one site (E48/80), albeit not

107. *Contra* Bendall 2003, 2007. Halstead (2007) provides an excellent discussion of Mycenaean economies; see also various contributions to Galaty and Parkinson 2007a.

108. The terminology is that of D'Altroy and Earle 1985.

109. Killen 2007; see also Bendall 2007.

110. For more detailed discussions, see Parkinson 2007; forthcoming.

111. Mee and Forbes 1997, p. 47.

112. Kardulias and Runnels 1995, pp. 106–108, fig. 93; Cherry and Parkinson 2003, p. 50.

on the coast, that produced a large proportion (33%) of the 1,575 pieces of obsidian in the survey assemblage overall.[113] As with PRAP site I4 in Messenia, the sites in these other regions also seem to contain most of the evidence for blade production in the survey area.

Unpublished data from inland surveys such as the Nemea Valley Archaeological Project (NVAP) suggest that a similar pattern also holds for the distribution of obsidian from the coast into the interior of the Peloponnese. For example, NVAP reported only 45% obsidian, and the Berbati-Limnes Survey, for the Neolithic and Bronze Age findspots, found that only two-thirds of the lithics were obsidian—a significant falloff from those surveys in coastal regions, which often boast upward of 90% obsidian in their assemblages.[114] In the Asea Valley Survey, set in the mountainous interior of Arcadia, as little as 33% (n = 334) of all chipped stone collected was obsidian; it was, furthermore, concentrated among only a few sites, and 60% of the total came from a single site (S 60, Asea Palaiokastro). Carter has suggested that, in this instance, obsidian may have reached the Asea valley from intermediaries such as Lerna or Franchthi Cave on the Argive coast, and that there occurred a secondary stage of redistribution from regional centers (such as S 60) to sites in their hinterlands.[115]

Assuming unrestricted access to the obsidian quarries themselves, we have suggested elsewhere that these patterns may be explained in terms of a direct (or, sometimes, indirect) geographic falloff with distance from the sources on Melos, or by temporal differences between the various assemblages, or by both.[116] The situation here is reminiscent of that documented by Albert Ammerman in Neolithic Calabria (southern Italy), where obsidian from the Lipari source appears to have been distributed through "emporia" or "break of bulk" sites on the west coast; lithic assemblages there are composed almost entirely of obsidian, whereas those from sites further inland have considerably more chert.[117]

This uniformity in the reduction and distribution of obsidian in different parts of the Peloponnese is replicated in a technological similarity in the assemblages themselves. Kardulias and Runnels have assessed the degree of uniformity within obsidian blade assemblages in the Aegean by analyzing the degree of variability exhibited in formal characteristics of blades (width and thickness),[118] and we include the PRAP data here for comparison (Table 10). In their discussion of the Argolid assemblage, they attribute the widespread uniformity in obsidian blade assemblages in the Aegean to common production techniques and to pragmatic considerations regarding efficiency of raw material use.[119] The relatively small PRAP sample of 66 obsidian blades exhibits slightly less variation in width than

113. Carter and Ydo 1996, pp. 141–142, ill. 18:1. Site E48/80 produced 520 chipped stone artifacts, of which 514 were obsidian; only 63 (3.8%) of the 1,638 lithics from the Laconia Survey are not obsidian.

114. Wells and Runnels 1996, pp. 42, 71, fig. 44. The overall percentage of obsidian from the Berbati-Limnes Survey is much lower, perhaps around 17%, since over 1,000 Mesolithic and an unspecified number of Middle and Upper Palaeolithic flint artifacts were recorded (Wells and Runnels 1996, pp. 23–35). Quantities of obsidian found in various interior and coastal surveys in the southern Greek mainland are usefully tabulated by Carter (2003, p. 130, fig. 99).

115. Carter 2003, pp. 131, 152.

116. Cherry and Parkinson 2003, p. 51.

117. Ammerman 1979.

118. Kardulias and Runnels 1995, p. 98, table 5.15.

119. Kardulias and Runnels 1995, p. 97.

TABLE 10. DESCRIPTIVE STATISTICS FOR BLADES IN AEGEAN ASSEMBLAGES

		Width			*Thickness*		
Assemblage	*N*	$\bar{x}$	*SD*	*CV*	$\bar{x}$	*SD*	*CV*
PRAP (total sample)	66	98.7	24.9	25.22	30.7	10.8	35.01
Southern Argolid (Neolithic)	35	104	29	27.9	28	8	28.6
Southern Argolid (Bronze Age)	308	86	24	27.9	26	8	30.8
Ayios Stefanos	120	93	29	31.2	26	9	34.6
Lerna III	318	96	24	25	26	7	26.9
Lerna IV	462	98	29	29.6	27	8	29.6
Lerna V	189	99	28	28.3	29	9	31
Kephala	128	144	37	29.8	39	16	41
Phylakopi (total sample)	1,542	104	31	29.8	31	13	41.9
Phylakopi (obsidian deposit)	409	93	31	33.3	30	17	56.7
Ayia Irini	960	96	25	26	29	9	31

Source: Kardulias and Runnels 1995, p. 98, table 5.15. All measurements in mm.
Abbreviations: $\bar{x}$ = mean; SD = standard deviation; CV = coefficient of variation.

most of the other assemblages, but slightly more variation in thickness. These data indicate a general positive correlation between distance from the source and standardization in blade morphology, with only the excavated materials from the EH II levels of Lerna III indicating more standardization in blade width. This distribution most likely can be attributed to increased standardization (and thus increased efficiency) as the raw material becomes rarer and more valuable farther from the source.[120]

Lithics After the Bronze Age

Although it is now well established that the production and use of stone tools did not wholly cease at the end of the Bronze Age,[121] many functions that previously had been carried out with chipped stone artifacts were now performed instead with the use of metal tools. In Messenia, this technological replacement also coincided with a considerable decrease in the number of sites in the region.

Nearly 14% (98) of the on-site lithic assemblage derives from nine sites—A4, A5, E1, G1, G2, K4, K5, M2, and M4—that have primary occupations *only* after the end of the Bronze Age (Table 6). However, two of these sites (A4, G1), both very large, exhibit lithic densities that fall below the background average for the region as a whole, suggesting that the chipped stone artifacts associated with them are at least partly coincidental. The remaining seven sites include M2, discussed above (p. 28), which is part of a larger off-site concentration of lithics associated with EH occupation around site M1. This leaves a total of 12 lithic items from just four other post–Bronze Age sites. Thus, while acknowledging that the situation is different in other parts of the Aegean, and allowing that careful stratified excavations in historical levels at sites in Messenia may yet yield more secure evidence than these survey data can provide, we suggest that on present evidence the use of chipped stone was not a significant part of the technology and material culture of Messenia after the end of the Bronze Age.

120. For discussion of this general argument in relation to Aegean obsidian assemblages, see Torrence 1979, 1986.
121. Runnels 1982.

MESSENIAN LITHICS AND LANDSCAPES IN COMPARATIVE PERSPECTIVE

A flurry of publications has appeared in recent years that discuss how best to interpret patterns of prehistoric materials, including lithics, collected in the course of intensive regional surveys.[122] There is also growing attention to the problems involved in the comparative utilization of disparate data from surveys conducted using different field methodologies and with different aims in mind.[123] Nonetheless, the variability within the PRAP lithic assemblage, and the differences between PRAP and other survey projects, are in our view unequivocally related to variations in patterns of human behavior. Although the archaeological signatures of those patterns have of course been modified by natural and cultural processes that necessarily affect their interpretation, the Messenian case study elucidates several patterns that recur in different regions throughout the Greek mainland, and it also demonstrates various ways in which this particular landscape and its prehistoric utilization differ from other parts of Greece. We contend that it is more fruitful—and much more interesting—to concentrate on the interpretation of these patterns, rather than to argue about whether they are "hidden" or meaningful at all. To that end, we focus discussion in this concluding section on the general trends indicated by the PRAP assemblage and attempt to place the Messenian patterns into a comparative regional framework.

The PRAP chipped stone differs significantly from assemblages collected by other regional survey projects, with respect both to the size of the sample and the relative frequencies of Melian obsidian and local cherts represented.[124] For purposes of comparison, Table 11 lists summary statistics of lithic assemblages from seven other regional survey projects in the Aegean. The size of these different groups of material varies widely, from 526 (NVAP) to 6,553 (AEP). This variation correlates with variations in densities per square kilometer intensively surveyed, suggesting that the disparities in the size of the assemblages is a "real" pattern that cannot be attributed to sampling error, but which must be explained in terms of patterned human behavior. We propose three factors that may account for the majority of this variation: 1) the intensity of prehistoric habitation in a given region during different time periods; 2) the distance from Melos; and 3) the distance from the coast. These factors are not mutually exclusive, but are interrelated.

For example, the largest lithic survey assemblage comes from the southern Argolid (AEP survey), an area of the Greek mainland that was intensively occupied from the Middle Palaeolithic through the Bronze Age and later. This is indicated not only by the higher number of prehistoric sites in the region, but also by the size of the lithic assemblages associated with

122. Bintliff and Snodgrass 1985; Bintliff 1999, 2000; Bintliff, Howard, and Snodgrass 1999, 2000; Bintliff et al. 2002; Cherry and Parkinson 2003; Davis 2004; Clarkson 2008.

123. Alcock and Cherry 2004.

124. Cherry and Parkinson 2003.

TABLE 11. LITHIC ASSEMBLAGES FROM REGIONAL SURVEYS IN THE AEGEAN

Survey	*Chert (n)*	*Obsidian (n)*	*Total Lithics*	*Chert (%)*	*Obsidian (%)*	*Density (n/km²)*	*Area Intensively Surveyed (km²)*	*Distance to Melos (km)*
Melos	n/a	n/a	n/a	1.00	99.00	n/a	151	0
Kea	6	1,005	1,011	0.59	99.41	56.17	18	105
Southern Argolid	2,294	4,259	6,553	35.01	64.99	148.93	44	120
Methana	125	1,122	1,247	10.02	89.98	24.94	50	130
Laconia	63	1,575	1,638	3.85	96.15	n/a	n/a	160
Berbati	755	1,510	2,265	33.33	66.67	90.60	25	175
Nemea	288	238	526	54.75	45.25	10.52	50	195
PRAP	912	192	1,104	82.61	17.39	27.60	40	240
Total/Avg	Total 4,443	Total 9,901	Total 14,344	Avg 27.65	Avg 72.36	Avg 59.79		

Sources: *Melos:* Cherry and Torrence 1982; *Kea:* Cherry et al. 1991; *Southern Argolid:* Kardulias and Runnels 1995; *Methana:* Mee and Forbes 1997; *Laconia:* Carter and Ydo 1996; *Berbati:* Wells and Runnels 1996; *Nemea:* unpublished analysis by J. F. Cherry.

them (Table 12). Such a pattern suggests that the southern Argolid was more intensively inhabited than Messenia, in every prehistoric period.

While intensity of occupation can help explain the number of sites and the size of the lithic assemblages represented at them, it does not account for the significant variation exhibited in the relative amounts of obsidian and chert in these different survey lithic datasets. The percentage of obsidian in the Messenian assemblage overall is less than 18%, whereas in all the other assemblages it varies from 45% to 99%. Although the obsidian sources on the island of Melos were exploited as early as the Mesolithic period,[125] most obsidian in survey assemblages is associated with sites occupied predominantly during the Neolithic and Bronze Age. As a result, the abundance of obsidian and chert in the lithic assemblages from surveys is heavily influenced by the relative intensity of occupation during those periods.

Conversely, because the obsidian sources on Melos were not used extensively until the Holocene, regions that were more intensively exploited during the Pleistocene exhibit significantly higher frequencies of chert than those regions that experienced more intensive occupation during the Holocene. This is a sampling bias that results from having a few large Palaeolithic sites without obsidian in a region, which inflates the relative amounts of chert, compared to obsidian. For example, obsidian comprises 65% of the chipped stone assemblage collected in the AEP, but when the chert-rich Pleistocene sites are excluded and only sites that date to the Neolithic and Bronze Age are included, the frequency of obsidian rises to 86%.

In addition to the diachronic intensity of occupation, the distance from Melos also makes a powerful difference in the composition of lithic assemblages. On Melos itself, unsurprisingly, obsidian constitutes virtually 100% of the lithic raw material on sites of all periods. Survey regions located within ca. 150 km of Melos also have yielded very high relative proportions of obsidian (85%–100%).[126] (One exception is the AEP survey lithic assemblage, which, as just noted, has lower relative amounts of obsidian, due to its Palaeolithic sites.) The Berbati-Limnes and NVAP survey regions

125. Perlès 1979.

126. This corresponds to what Renfrew (1972, pp. 465–471, fig. 20.9) and Torrence (1986, pp. 13–15) referred to as the "contact zone" or the "supply zone," the area within which the percentage of obsidian in the total chipped stone industry decreases only very gradually.

TABLE 12. LITHIC ASSEMBLAGES FROM THE SOUTHERN ARGOLID AND PRAP SURVEYS

	Southern Argolid			*PRAP*		
Period	*Chert*	*Obsidian*	*Sites (n)*	*Chert*	*Obsidian*	*Sites (n)*
Palaeolithic/Mesolithic	892	67	5	178	5	2
Neolithic/Bronze Age	569	3,361	40	666	182	17
Post–Bronze Age	379	290	36	68	5	9
Total	1,840	3,718	81	912	192	28

Source for Southern Argolid data: Kardulias and Runnels 1995. The Southern Argolid assemblage also included 995 lithic artifacts not attributable to any specific period.

are located 150–200 km from Melos, and have 45%–67% obsidian. In the Asea valley in Arcadia, more remote still, the percentage of obsidian drops to 33%.[127] Messenia, more than 200 km from Melos, has only 17% obsidian in its chipped stone assemblage.[128]

We suggest that this falloff is a result of the pattern of access to the Melian sources, as well as the organization of local systems of obsidian production and distribution throughout the Aegean during the Neolithic and Bronze Age.[129] Although access to the obsidian sources on Melos seems not to have been restricted at the source itself,[130] the relative lack of obsidian in Messenia represents an interesting pattern that might readily—perhaps too readily—be attributed to its distant location in the southwestern Peloponnese. But, via Kythera (and notwithstanding the perils of rounding Cape Malea), this part of the Peloponnese is readily connected to the Cycladic island group, and thus to Melos. The structure of the PRAP lithic assemblage suggests that, perhaps for cultural reasons, the inhabitants of Messenia did not interact with the islands of the Cyclades in the same manner as those located in certain other parts of the Aegean. A similar pattern is apparent in the low frequency of "exotic" items created outside the Aegean in Late Bronze Age Messenia, implying that during both the Neolithic and the Bronze Age, Messenia was not fully integrated into the same trade networks as the Argolid, which throughout these periods maintained very strong trade contacts with the Cyclades and beyond.

Despite this variation in the relative amounts of obsidian in different survey assemblages, which we attribute to differential participation in trade networks, the way obsidian was worked, once it was transported from Melos, is remarkably similar in different regions. In those survey regions located near the coast, a single site in several cases accounts for the majority of the obsidian in the survey assemblage. This is certainly so in Laconia, the Argolid, and Messenia. Although the Laconian site in question (E48/80) is not on the coast, those in the Argolid (F32, the "Fournoi Focus") and Messenia (I4) are within 1 or 2 km of the present coastline. In each case,

127. Carter 2003, p. 130, fig. 99.

128. In Cherry and Parkinson 2003, p. 49, the percentage of obsidian in the PRAP assemblage is erroneously given as 29%.

129. The falloff is graphed in Cherry and Parkinson 2003, p. 49, fig. 4:7. See Karimali 2001 for an excellent discussion of the problems of falloff models that do not incorporate information about acquisition, production, and distribution.

130. As argued in great detail throughout Torrence 1986; see Barber 1987, pp. 117–119, for a contrary view.

the obsidian from these individual sites accounts for 31% (Laconia), 49% (Argolid), and 40% (Messenia) of all the obsidian in the survey assemblages. In the cases of Messenia and the Argolid, these sites seem to have been the primary (if not in fact the only) site involved in obsidian blade production in the entire region; it is less clear whether this is also the case for site E48/80 in Laconia. We attribute this pattern to the establishment of production centers that functioned as "suppliers" of obsidian blades, and perhaps also roughed-out cores for flake tools, at the end of the Neolithic and throughout the Bronze Age.

Despite the similarity exhibited in the organization of obsidian blade production in these different parts of the Peloponnese, the individual regional systems of obsidian production and exchange emerged at different points in time. The Laconian site (E48/80) dates to the Final Neolithic; the Fournoi sites in the Argolid date primarily to the Early Bronze Age; and the Messenian site (Romanou *Romanou*) dates primarily to the Late Bronze Age. In some areas, such as Messenia, this system of organization persisted throughout the later Bronze Age, even as politically and economically complex Mycenaean palatial systems developed around them. The production of pressure-flaked obsidian blades requires specific skills that probably were carried out by part-time specialists,[131] but the palatial authorities had little interest in bringing them under centralized control. This pattern is likely to have occurred with other skilled and semispecialized crafts and activities too, such as the production of certain types of pottery, and it provides an important insight into the development and organization of the Mycenaean palatial system.[132]

It is unclear whether similar patterns of obsidian blade production occurred on Crete. A central question is whether the production of obsidian blades was organized similarly to other crafts on Crete, such as the production of specialized ceramic wares, which Day and Wilson have argued was decentralized from an early date.[133] Carter argued that obsidian blades were used during funerary ceremonies in the Early Cycladic period, and that their production was incorporated into the performances associated with such rituals.[134] It follows, therefore, that we can expect the pattern of obsidian blade production and exchange in the islands and on Crete to differ from the mainland pattern. Torrence reported obsidian production areas at Knossos and Mallia, suggesting that palatial centers may have been the locus of specialized production,[135] but the published excavation and survey data from Crete lack critical information about reduction sequences, which are necessary for such an assessment. Kardulias noted that a centralized pattern of blade production might occur in northeastern Crete, where cores and blades were identified at Mochlos, but only blades were identified at Debla and Myrtos.[136] In northwestern Crete, Moody noted a general falloff in the number of obsidian finds with distance from the coast,[137] but she did not provide a description of the reduction sequences.

131. Based on the level of standardization, as argued by Torrence (1986) and Runnels (1995).

132. See Galaty and Parkinson 2007b; Parkinson and Galaty 2007; and Parkinson, forthcoming, for detailed discussions.

133. Day and Wilson 1998.

134. Carter 2007.

135. Torrence 1979, pp. 77–79.

136. Kardulias 2007, p. 107.

137. Moody 1987, p. 202.

CONCLUSION

This article represents the eighth contribution to *Hesperia* by members of the Pylos Regional Archaeological Project reporting on different aspects of the survey and its results. Chipped stone may not be the most glamorous of archaeological materials, and the quantities encountered by the PRAP survey are far from overwhelming. Nonetheless, in presenting a detailed analysis of the lithic assemblage from this survey, we have attempted to demonstrate some of the types of information that can be gleaned from the intensive, systematic study of this important class of material. It is the chipped stone evidence that has, for example, made it possible to extend the history of human activity in Messenia much further back into the Pleistocene than was previously known, and to shed useful light on the structure of the obsidian-knapping industry in the context of a Mycenaean palatial economy.

More generally, well over a hundred regional survey projects of very different sorts have been conducted in the Aegean over the past three decades,[138] yet relatively few of them have yet published detailed information about their lithic assemblages. This is why we also have attempted to delineate patterns and provide information from the PRAP survey that can be built upon by other scholars interested in the comparative analysis of long-term patterns of landscape use, as seen through the lens of chipped stone industries.

138. Cherry 2003, pp. 138–143; Alcock and Cherry 2004, pp. 1–4. The statistics in both of these papers are already significantly out of date, a fact that is itself testimony to the vigorous state of survey archaeology in the Aegean.

REFERENCES

Alcock, S. E. 2002. "A Simple Case of Exploitation," in *Money, Labour, and Land: Approaches to the Economies of Ancient Greece,* ed. P. Cartledge, E. E. Cohen, and L. Foxhall, London, pp. 185–199.

Alcock, S. E., A. M. Berlin, A. B. Harrison, S. Heath, N. Spencer, and D. L. Stone. 2005. "Pylos Regional Archaeological Project, Part VII: Historical Messenia, Geometric through Late Roman," *Hesperia* 74, pp. 147–209.

Alcock, S. E., and J. F. Cherry, eds. 2004. *Side-by-Side Survey: Comparative Regional Studies in the Mediterranean World,* Oxford.

Ammerman, A. 1979. "A Study of Obsidian Exchange Networks in Calabria," *WorldArch* 11, pp. 95–110.

Arias, A., M. Oddone, G. Bigazzi, A. Di Muro, C. Principe, and P. Norelli. 2006. "New Data for the Characterization of Milos Obsidians," *Journal of Radioanalytical and Nuclear Chemistry* 268, pp. 371–386.

Bailey, G., V. Papaconstantinou, and D. Sturdy. 1992. "Asprochaliko and Kokkinopilos: TL Dating and Reinterpretation of Middle Palaeolithic Sites in Epirus, Northwest Greece," *CAJ* 2, pp. 136–144.

Barber, R. L. N. 1987. *The Cyclades in the Bronze Age,* London.

Bendall, L. M. 2003. "A Reconsideration of the Northeastern Building at Pylos: Evidence for a Mycenaean Redistributive Center," *AJA* 107, pp. 181–231.

———. 2007. *Economics of Religion in the Mycenaean World: Resources Dedicated to Religion in the Mycenaean Palace Economy* (Oxford University School of Archaeology Monograph 67), Oxford.

Bennet, J. 1995. "Space through Time: Diachronic Perspectives on the Spatial Organization of the Pylian State," in *POLITEIA: Society and State in the Aegean Bronze Age. Proceedings of the 5th International Aegean Conference, University of Heidelberg, Archäologisches Institut, 10–13 April 1994* (*Aegaeum* 12), ed. R. Laffineur and W.-D. Niemeier, Liège, pp. 587–602.

———. 2007. "Pylos: The Expansion of a Mycenaean Palatial Center," in Galaty and Parkinson 2007a, pp. 29–39.

Bennet, J., J. L Davis, and F. Zarinebaf-Shahr. 2000. "Pylos Regional Archaeological Project, Part III: Sir William Gell's Itinerary in the Pylia and Regional Landscapes in the Morea in the Second Ottoman Period," *Hesperia* 69, pp. 343–380.

Bennet, J., and C. Shelmerdine. 2001. "Not the Palace of Nestor: The Development of the 'Lower Town' and Other Non-Palatial Settlements in LBA Messenia," in *Urbanism in the Aegean Bronze Age* (Sheffield

Studies in Aegean Archaeology 4), ed. K. Branigan, London, pp. 135–140.

Bialor, P., and M. H. Jameson. 1962. "Palaeolithic in the Argolid," *AJA* 66, pp. 181–182.

Bintliff, J. 1999. "Pattern and Process in the City Landscapes of Boeotia from Geometric to Late Roman Times," in *Territoires des cités grecques. Actes de la table ronde internationale organisée par l'École française d'Athènes, 31 octobre–3 novembre 1991* (*BCH* Suppl. 34), ed. M. Brunet, Paris, pp. 15–33.

———. 2000. "Beyond Dots on the Map: Future Directions for Surface Artefact Survey in Greece," in *The Future of Surface Artefact Survey in Europe* (Sheffield Archaeological Monographs 13), ed. J. Bintliff, M. Kuna, and N. Venclová, Sheffield, pp. 3–20.

Bintliff, J., E. Farinetti, P. Howard, K. Sarri, and K. Sbonias. 2002. "Classical Farms, Hidden Prehistoric Landscapes, and Greek Rural Survey: A Response and an Update," *JMA* 15, pp. 259–265.

Bintliff, J., P. Howard, and A. M. Snodgrass. 1999. "The Hidden Landscape of Prehistoric Greece," *JMA* 12, pp. 139–168.

———. 2000. "Rejoinder," *JMA* 13, pp. 116–120.

Bintliff, J., and A. M. Snodgrass. 1985. "The Boiotia Survey: A Preliminary Report. The First Four Years," *JFA* 12, pp. 123–161.

Blegen, C. W., and M. Rawson. 1966. *The Palace of Nestor in Western Messenia* I: *The Buildings and Their Contents,* Princeton.

Blitzer, H. 1991. "Middle to Late Helladic Chipped Stone Implements of the Southwest Peloponnese, Greece, Part I: The Evidence from Malthi," *Hydra* 9, pp. 1–73.

———. 1992. "The Chipped Stone, Ground Stone, and Worked Bone Industries," in *Excavations at Nichoria in Southwest Greece* II: *The Bronze Age Occupation,* ed. W. A. McDonald and N. C. Wilkie, Minneapolis, pp. 712–756.

Bonsall, C. 2008. "The Mesolithic of the Iron Gates," in *Mesolithic Europe,* ed. G. Bailey and P. Spikins, Cambridge, pp. 238–279.

Brézillon, M. N. 1971. *La dénomination des objets de pierre taillée: Matériaux pour un vocabulaire des préhistoriens de langue française* (*GalliaPrHist* Suppl. 4), Paris.

Carter, T. 2003. "The Chipped and Ground Stone," in *The Asea Valley Survey: An Arcadian Mountain Valley from the Palaeolithic Period until Modern Times* (*SkrAth* 4°, 51), ed. J. Forsén and B. Forsén, Stockholm, pp. 129–157.

———. 2007. "The Theatrics of Technology: Consuming Obsidian in the Early Cycladic Burial Arena," in *Rethinking Craft Specialization in Complex Societies: Archeological Analyses of the Social Meaning of Production* (Archeological Papers of the American Anthropological Association 17), ed. Z. X. Hruby and R. K. Flad, Arlington, pp. 88–107.

———. 2008. "The Consumption of Obsidian in the Early Bronze Age Cyclades," in *Horizon: A Colloquium on the Prehistory of the Cyclades* (McDonald Institute Monographs), ed. N. Brodie, J. Doole, G. Gavalas, and C. Renfrew, Cambridge, pp. 225–235.

Carter, T., and M. Ydo. 1996. "The Chipped and Ground Stone," in *The Laconia Survey: Continuity and Change in a Greek Rural Landscape* II: *Archaeological Data* (*BSA* Suppl. 27), ed. W. G. Cavanagh, J. Crouwel, R. W. V. Catling, and G. Shipley, London, pp. 141–182.

Cavanagh, W. 2004. "WYSIWYG: Settlement and Territoriality in Southern Greece during the Early and Middle Neolithic Periods," *JMA* 17, pp. 165–189.

Chavaillon, J., N. Chavaillon, and F. Hours. 1967. "Industries paléolithiques d'Élide, I: Région d'Amalias," *BCH* 91, pp. 151–201.

———. 1969. "Industries paléolithiques d'Élide, II: Région de Kastron," *BCH* 93, pp. 97–151.

Cherry, J. F. 2003. "Archaeology beyond the Site: Regional Archaeology and Its Future," in *Theory and Practice in Mediterranean Archaeology: Old World and New World Perspectives* (Cotsen Advanced Seminars 1), ed. J. K. Papadopoulos and R. M. Leventhal, Los Angeles, pp. 137–159.

Cherry, J. F., J. L. Davis, A. Demitrack, E. Mantzourani, T. F. Strasser, and L. E. Talalay. 1988. "Archaeological Survey in an Artifact-Rich Landscape: A Middle Neolithic Example from Nemea, Greece," *AJA* 92, pp. 159–176.

Cherry, J. F., J. L. Davis, and E. Mantzourani. 1991. *Landscape Archaeology as Long-Term History: Northern Keos in the Cycladic Islands, from Earliest Settlement until Modern Times* (Monumenta Archaeologica 16), Los Angeles.

Cherry, J. F., and W. A. Parkinson. 2003. "Lithic Artifacts from Surveys: A Comparative Evaluation of Recent Evidence from the Southern Aegean," in *Written in Stone: The Multiple Dimensions of Lithic Analysis,* ed. P. N. Kardulias and R. W. Yerkes, Lanham, Md., pp. 35–57.

Cherry, J. F., and R. Torrence. 1982. "The Earliest Prehistory of Melos," in *An Island Polity: The Archaeology of Exploitation in Melos,* ed. C. Renfrew and M. Wagstaff, Cambridge, pp. 24–34.

———. 1984. "The Typology and Chronology of Chipped Stone Assemblages in the Prehistoric Cyclades," in *The Prehistoric Cyclades: Contributions to a Workshop on Cycladic Chronology,* ed. J. A. MacGillivray and R. L. N. Barber, Edinburgh, pp. 12–25.

Clarkson, C. 2008. "Lithics and Landscape Archaeology," in *Handbook of Landscape Archaeology* (World Archaeological Congress, Research Handbooks in Archaeology 1), ed. B. David and J. Thomas, Walnut Creek, pp. 490–501.

Crabtree, D. E. 1972. *An Introduction to Flintworking* (Occasional Papers of the Idaho State University Museum 28), Pocatello.

D'Altroy, T., and T. K. Earle. 1985. "Staple Finance, Wealth Finance, and Storage in the Inka Political Economy," *CurrAnthr* 26, pp. 187–206.

Darlas, A. 1995. "L'industrie du Paléolithique Moyen de Mavri Myti (Lakkopetra, Grèce)," *BSPF* 92, pp. 390–398.

———. 1999. *Η παλαιολιθική Μάνη: Η ανασκαφή στα Καλαμάκια,* Athens.

———. 2007. "Le Moustérien de Grèce à la lumière des récentes recherches," *L'Anthropologie* 111, pp. 346–366.

Darlas, A., and H. de Lumley. 2004. "La Grotte de Kalamakia (Areopolis, Grèce): Sa contribution à la connaissance du Paléolithique Moyen de Grèce," in *XIV[e] Congrès UISPP, Liège, 2–8 septembre 2001. Actes de la 5[e] Section: Le Paléolithique Moyen* (*BAR-IS* 1239), Oxford, pp. 225–233.

Davies, S. 2004. "Pylos Regional Archaeological Project, Part VI: Administration and Settlement in Venetian Navarino," *Hesperia* 73, pp. 59–120.

Davis, J. L. 2004. "Are the Landscapes of Greek Prehistory Hidden? A Comparative Approach," in Alcock and Cherry 2004, pp. 22–35.

———, ed. 2008. *Sandy Pylos: An Archaeological History from Nestor to Navarino,* 2nd ed., Princeton.

Davis, J. L., S. E. Alcock, J. Bennet, Y. G. Lolos, and C. W. Shelmerdine. 1997. "The Pylos Regional Archaeological Project, Part I: Overview and the Archaeological Survey," *Hesperia* 66, pp. 391–494.

Day, P., and D. E. Wilson. 1998. "Consuming Power: Kamares Ware in Protopalatial Knossos," *Antiquity* 72, pp. 350–358.

Evans, J. D., and C. Renfrew. 1968. *Excavations at Saliagos near Antiparos* (*BSA* Suppl. 5), London.

Galaty, M. L. 2007. "Wealth Ceramics, Staple Ceramics: Pots and the Mycenaean Palaces," in Galaty and Parkinson 2007a, pp. 74–86.

Galaty, M. L., and W. A. Parkinson, eds. 2007a. *Rethinking Mycenaean Palaces* II: *Revised and Expanded Second Edition* (Cotsen Institute of Archaeology, University of California, Los Angeles, Monograph 60), Los Angeles.

Galaty, M. L., and W. A. Parkinson. 2007b. "Introduction: Mycenaean Palaces Rethought," in Galaty and Parkinson 2007a, pp. 1–17.

Gamble, C. 1986. *The Palaeolithic Settlement of Europe* (Cambridge World Archaeology), Cambridge.

Halstead, P. 2007. "Toward a Model of Mycenaean Palatial Mobilization," in Galaty and Parkinson 2007a, pp. 66–73.

Hartenberger, B., and C. N. Runnels. 2001. "The Organization of Flaked Stone Production at Bronze Age Lerna," *Hesperia* 70, pp. 255–283.

Hatzi, G. 1991. "Δοκιμαστική ανασκαφή στο Στόμιον Φιλιατρών," in *Πρακτικά Γ΄ Τοπικού Συνεδρίου Μεσσηνιακών Σπουδών, 24–26 Νοεμβρίου 1989,* Athens, pp. 81–87.

Higgs, E. 1964. "A Hand Axe from Greece," *Antiquity* 38, pp. 54–55.

Hofstra, S. 2000. "Small Things Considered: The Finds from LH IIIB Pylos in Context" (diss. Univ. of Texas at Austin).

Hope Simpson, R., and O. T. P. K. Dickinson. 1979. *A Gazetteer of Aegean Civilisation in the Bronze Age* 1: *The Mainland and Islands* (*SIMA* 52), Göteborg.

Huxtable, J. A., J. Gowlett, G. N. Bailey, P. L. Carter, and V. Papaconstantinou. 1992. "Thermoluminescence Dates and a New Analysis of the Early Mousterian from Asprochaliko," *CurrAnthr* 33, pp. 109–114.

Jameson, M. H., C. N. Runnels, and T. H. van Andel. 1994. *A Greek Countryside: The Southern Argolid from Prehistory to the Present Day,* Stanford.

Karabatsoli, A. 1997. "La production de l'industrie lithique taillée en Grèce centrale pendant le Bronze Ancien (Litharès, Manika, Nemée, Pefkakia)" (diss. Univ. de Paris X).

Kardulias, P. N. 2007. "Flaked Stone and the Role of the Palaces in the Mycenaean World System," in Galaty and Parkinson 2007a, pp. 102–113.

Kardulias, P. N., and C. Runnels. 1995. "The Lithic Artifacts," in *Artifact and Assemblage: The Finds from a*

Regional Survey of the Southern Argolid, Greece 1: *The Prehistoric and Early Iron Age Pottery and the Lithic Artifacts*, ed. C. N. Runnels, D. J. Pullen, and S. Langdon, Stanford, pp. 74–139.
Karimali, E. 2001. "Redefining the Variables of Material Abundance and Distance in the Fall-Off Models: The Case of Neolithic Thessaly," in *Αρχαιομετρικές μελέτες για την ελληνική προϊστορία και αρχαιότητα*, ed. Y. Bassiakos, E. Aloupi, and Y. Facorellis, Athens, pp. 753–761.
Killen, J. T. 2007. "Critique: A View from the Tablets," in Galaty and Parkinson 2007a, pp. 114–117.
Kokkoros, P., and A. Kanellis. 1960. "Découverte d'un crâne d'homme paléolithique dans la péninsule chalcidique," *L'Anthropologie* 64, pp. 438–446.
Korres, G. S. 1981. "Μεσσηνία," in *Μεγάλη Σοβιετική Εγκυκλοπαίδεια* 21, pp. 453–456.
———. 1990. "Excavations in the Region of Pylos," in *Eumousia: Ceramic and Iconographic Studies in Honour of Alexander Cambitoglou* (*MeditArch* Suppl. 1), ed. J.-P. Descoeudres, Sydney, pp. 1–11.
———. 1993. "Messenia and Its Commercial Connections in the Bronze Age," in *Proceedings of the International Conference, Wace and Blegen: Pottery as Evidence for Trade in the Aegean Bronze Age, 1939–1989, Held at the American School of Classical Studies at Athens, Athens, December 2–3, 1989,* ed. C. W. Zerner, P. C. Zerner, and J. Winder, Amsterdam, pp. 231–248.
Koumouzelis, M., K. J. Kozlowski, M. Nowak, K. Sobczyk, M. Kaczanowska, M. Pawlikowski, and A. Pazdur. 2001. "La fin du Paléolithique Moyen et le début du Paléolithique Supérieur en Grèce: La séquence de la Grotte 1 de Klissoura," *L'Anthropologie* 105, pp. 469–504.
Kuhn, S. L. 1995. *Mousterian Lithic Technology: An Ecological Perspective,* Princeton.
Lee, W. E. 2001. "Pylos Regional Archaeological Project, Part IV: Change and the Human Landscape in a Modern Greek Village in Messenia," *Hesperia* 70, pp. 49–98.
Leroi-Gourhan, A. 1964. "Découvertes paléolithiques en Élide," *BCH* 88, pp. 1–8.
Leroi-Gourhan, A., J. Chavaillon, and N. Chavaillon. 1963. "Paléolithique du Péloponnèse," *BSPF* 60, pp. 249–265.
Lolos, Y. 1994. *Η πρωτεύουσα του Νέστορος και η γύρω περιοχή: Πύλος ημαθόεις*, Athens.
Manolakakis, L. 1996. "Production lithique et émergence de la hiérarchie sociale: L'industrie lithique de l'Énéolithique en Bulgarie (première moitié du IV^{e} millénaire)," *BSPF* 93, pp. 119–123.
Mee, C. B., and H. Forbes, eds. 1997. *A Rough and Rocky Place: The Landscape and Settlement History of the Methana Peninsula, Greece: Results of the Methana Survey Project, Sponsored by the British School at Athens and the University of Liverpool* (Liverpool Monographs in Archaeology and Oriental Studies), Liverpool.
Mellars, P. 1996. *The Neanderthal Legacy: An Archaeological Perspective from Western Europe,* Princeton.
Moody, J. A., 1987. "The Environmental and Cultural Prehistory of the Khania Region of West Crete: Neolithic through Late Minoan III" (diss. Univ. of Minnesota).
Morgan, C. 2008. "Archaeology in Greece, 2007–2008," *AR* 54, pp. 1–113.
Movius, H. L., N. David, H. Bricker, and R. B. Clay. 1968. *The Analysis of Certain Major Classes of Upper Palaeolithic Tools* (Peabody Museum Bulletin 26), Cambridge, Mass.
Panagopoulou, E. 2000. "The Middle Palaeolithic Assemblages of Theopetra Cave: Technological Evolution in the Upper Pleistocene," in *Theopetra Cave: Twelve Years of Excavation and Research, 1987–1998. Proceedings of the International Conference, Trikala, 6–7 November 1998,* ed. N. Kyparissi-Apostolika, Athens, pp. 139–161.
Panagopoulou, E., P. Karkanas, G. Tsartsidou, E. Kotjabopoulou, K. Harvati, and M. Ntinou. 2002–2004. "Late Pleistocene Archaeological and Fossil Human Evidence from Laconis Cave, Southern Greece," *JFA* 29, pp. 323–349.
Papagianni, D. 2000. *Middle Palaeolithic Occupation and Technology in Northwestern Greece: The Evidence from Open-Air Sites* (*BAR-IS* 882), Oxford.
Parkinson, W. A. 2007. "Chipping Away at a Mycenaean Economy: Obsidian Exchange, Linear B, and 'Palatial Control' in Late Bronze Age Messenia," in Galaty and Parkinson 2007a, pp. 87–101.
———. Forthcoming. "Beyond the Peer: Social Interaction and Political Evolution in the Bronze Age Aegean," in *Political Economies of the Aegean Bronze Age. Papers from the Langford Conference, Florida State University, Tallahassee, 22–24 February 2007,* ed. D. J. Pullen, Oxford.
Parkinson, W. A., and M. L. Galaty. 2007. "Secondary States in Perspective: An Integrated Approach to State Formation in the Prehistoric Aegean," *American Anthropologist* 109, pp. 113–129.
Perlès, C. 1979. "Des navigateurs méditerranéens il y a 10,000 ans," *La Recherche* 10:96 (January), pp. 82–83.
———. 1987. *Les industries lithiques taillées de Franchthi (Argolide, Grèce)* 1: *Présentation générale et industries paléolithiques* (*Franchthi* 3), Bloomington.
———. 1990. "L'outillage de pierre taillée néolithique en Grèce: Approvisionnement et exploitation des matières premières," *BCH* 114, pp. 1–42.
———. 1992. "Systems of Exchange and Organization of Production in Neolithic Greece," *JMA* 5, pp. 115–164.
———. 2001. *The Early Neolithic in Greece: The First Farming Communities in Europe* (Cambridge World Archaeology), Cambridge.
Pope, K. O., C. Runnels, and T. L. Ku. 1984. "Dating Middle Palaeolithic Red Beds in Southern Greece," *Nature* 312, pp. 264–266.

Reisch, L. 1980. "Pleistozän und Urgeschichte der Peloponnes" (diss. Friedrich-Alexander Univ.).
———. 1982. "The Transition to Middle Palaeolithic in Greece and the Southern Balkans," in *The Transition from Lower to Middle Palaeolithic and the Origins of Modern Man. International Symposium to Commemorate the 50th Anniversary of Excavations in the Mount Carmel Caves by D. A. E. Garrod, University of Haifa, 6–14 October 1980* (*BAR-IS* 151), ed. A. Ronen, Oxford, pp. 223–231.
Renfrew, C. 1972. *The Emergence of Civilisation: The Cyclades and the Aegean in the Third Millennium B.C.*, London.
Runnels, C. N. 1982. "Flaked-Stone Artifacts in Greece during the Historical Period," *JFA* 9, pp. 363–373.
———. 1985. "The Bronze Age Flaked-Stone Industries from Lerna: A Preliminary Report," *Hesperia* 54, pp. 357–391.
———. 1988. "A Prehistoric Survey of Thessaly: New Light on the Greek Middle Paleolithic," *JFA* 15, pp. 277–290.
———. 1994. "Pleistocene and Early Holocene Archaeological Sites in Southern Epirus, Greece," *AJA* 98, pp. 315–316 (abstract).
———. 1995. "Review of Aegean Prehistory IV: The Stone Age of Greece from the Palaeolithic to the Advent of the Neolithic," *AJA* 99, pp. 699–728.
———. 2009. "Mesolithic Sites and Surveys in Greece: A Case Study from the Southern Argolid," *JMA* 22, pp. 57–73.
Runnels, C. N., E. Karimali, and B. Cullen. 2003. "Early Upper Palaeolithic Spilaion: An Artifact-Rich Surface Site," in *Landscape Archaeology in Southern Epirus, Greece* I (*Hesperia* Suppl. 32), ed. J. Wiseman and K. Zachos, Princeton, pp. 135–156.
Runnels, C. N., M. Korkuti, M. L. Galaty, M. E. Timpson, S. R. Stocker, J. L. Davis, L. Bejko, and S. Muçaj. 2009. "Early Prehistoric Landscape and Landuse in the Fier Region of Albania, *JMA* 22, pp. 151–182.
Runnels, C. N., M. Korkuti, M. L. Galaty, M. E. Timpson, J. C. Whittaker, S. R. Stocker, J. L. Davis, L. Bejko, and S. Muçaj. 2004. "The Palaeolithic and Mesolithic of Albania: Survey and Excavation at the Site of Kryegjata B (Fier District)," *JMA* 17, pp. 3–29.
Runnels, C. N., E. Panagopoulou, P. Murray, G. Tsartsidou, S. Allen, K. Mullen, and E. Tourloukis. 2005. "A Mesolithic Landscape in Greece: Testing a Site-Location Model in the Argolid at Kandia," *JMA* 18, pp. 259–285.
Runnels, C. N., and T. H. van Andel. 1993. "The Lower and Middle Palaeolithic of Thessaly, Greece," *JFA* 20, pp. 299–317.
———. 2003. "The Early Stone Age of the Nomos of Preveza: Landscape and Settlement," in *Landscape Archaeology in Southern Epirus, Greece* I (*Hesperia* Suppl. 32), ed. J. Wiseman and K. Zachos, Princeton, pp. 47–134.
Runnels, C. N., T. H. van Andel, K. Zachos, and P. Paschos. 1999. "Human Settlement and Landscape in the Preveza Region (Epirus) in the Pleistocene and Early Holocene," in *The Palaeolithic Archaeology of Greece and Adjacent Areas. Proceedings of the ICOPAG Conference, Ioannina, September 1994* (British School at Athens Studies 3), ed. G. Bailey, E. Adam, E. Panagopoulou, C. Perlès, and K. Zachos, London, pp. 120–129.
Sampson, A. 1980. "Σπήλαιο του Νέστορος," *Prakt* 1980, pp. 175–187.
Sampson, A., J. Koslowski, M. Kaczanowska, and B. Giannouli. 2002. "The Mesolithic Settlement at Maroulas, Kythnos," *Mediterranean Archaeology and Archaeometry* 2, pp. 45–67.
Servais, J. 1961. "Outils paléolithiques d'Elide," *BCH* 85, pp. 1–9.
Sordinas, A. 1968. "The Prehistory of the Ionian Islands: The Flints and Pottery" (diss. Harvard Univ.).
Stocker, S. R. 2003. "Pylos Regional Archaeological Project, Part V: Deriziotis Aloni: A Small Bronze

Age Site in Messenia," *Hesperia* 72, pp. 341–404.

Strasser, T. F., P. Murray, E. Panagopoulou, C. Runnels, and N. Thompson. 2009. "The Results of the Plakias Mesolithic Survey on Crete, 2008," *Archaeological Institute of America, 110th Annual Meeting, January 8–11, 2009, Philadelphia: Abstracts* 32, p. 40.

Strasser, T. F., E. Panagopoulou, C. N. Runnels, P. Murray, N. Thompson, P. Karkanas, F. W. McCoy, and K. W. Wegmann. Forthcoming. "Stone Age Seafaring in the Mediterranean: Evidence from the Plakias Region for Lower Palaeolithic and Mesolithic Habitation of Crete," *Hesperia* 79.

Torrence, R. 1979. "A Technological Approach to Cycladic Blade Industries," in *Papers in Cycladic Prehistory* (*UCLAMon* 14), ed. J. L. Davis and J. F. Cherry, Los Angeles, pp. 66–86.

———. 1986. *Production and Exchange of Stone Tools: Prehistoric Obsidian in the Aegean* (New Studies in Archaeology), Cambridge.

van Andel, T. H. 1989. "Late Quaternary Sea Level Changes and Archaeology," *Antiquity* 63, pp. 733–745.

van Andel, T. H., and J. Shackleton. 1982. "Late Palaeolithic and Mesolithic Coastlines of Greece and the Aegean," *JFA* 9, pp. 445–454.

Wells, B., and C. Runnels, eds. 1996. *The Berbati-Limnes Archaeological Survey, 1988–1990* (*SkrAth* 4°, 44), Jonsered.

Zachos, K. 2008. *Ayios Dhimitrios, a Prehistoric Settlement in the Southwestern Peloponnese: The Neolithic and Early Helladic Periods* (*BAR-IS* 1770), Oxford.

Zangger, E., M. E. Timpson, S. B. Yazvenko, F. Kuhnke, and J. Knauss. 1997. "The Pylos Regional Archaeological Project, Part II: Landscape Evolution and Site Preservation," *Hesperia* 66, pp. 549–641.

William A. Parkinson

The Field Museum of Natural History
DEPARTMENT OF ANTHROPOLOGY
1400 SOUTH LAKE SHORE DRIVE
CHICAGO, ILLINOIS 60605

wparkinson@fieldmuseum.org

John F. Cherry

Brown University
JOUKOWSKY INSTITUTE FOR ARCHAEOLOGY
AND THE ANCIENT WORLD
BOX 1837
60 GEORGE STREET
PROVIDENCE, RHODE ISLAND 02912

john_cherry@brown.edu