HESPERIA 75 (2006)
Pages 453–523

THE EASTERN KORINTHIA ARCHAEOLOGICAL SURVEY

INTEGRATED METHODS FOR A DYNAMIC LANDSCAPE

ABSTRACT

From 1997 to 2003, the Eastern Korinthia Archaeological Survey (EKAS) investigated a 350-km² region east of the ancient city of Corinth, focusing primarily on the northern Corinthian plain. EKAS developed an interdisciplinary methodology that emphasizes novel applications of geological science, computer-based knowledge systems, and strategies for fieldwork and collaboration among experts. In this article, the research philosophies and methods are presented and their application illustrated with results from the survey. The historical development of one settlement, Kromna in the northern Corinthian plain, is examined in detail to demonstrate the interpretive potential of data collected by these methods.

INTRODUCTION

Corinth was one of the great cities of the ancient world, in large measure because of its location near strategic crossroads to the east.[1] The Isthmus of Corinth provided overland passage from southern to central Greece, and linked the Corinthian Gulf, leading to Italy and the west, with the Saronic Gulf, giving access to the Aegean Sea, Anatolia, and the Levant to the east (Fig. 1). The site of ancient Corinth has been excavated for more than 100 years by the American School of Classical Studies at Athens.[2] Much archaeological and topographic work has been undertaken in the city's eastern hinterland, including excavations at the Panhellenic Sanctuary

1. The Eastern Korinthia Archaeological Survey (EKAS) began with two seasons of environmental work in 1997 and 1998, directed by Jay Noller, under permits granted by the Hellenic Institute of Geology and Mineral Exploration (IGME). In 1999 EKAS was codirected by Timothy Gregory and Frederick Hemans; and in 2000–2003 by Gregory and Daniel Pullen. The project operated from 1999 to 2003 under a permit granted by the Hellenic Ministry of Culture to the American School of Classical Studies at Athens. All of the photographs reproduced here are from the project archives. Thomas Tartaron, with advice from his coauthors, generated the drawings based on the Geographic Information Systems (GIS) database. For the recognition of helpful suggestions and generous financial support from several sources, see below, Acknowledgments.

2. *Corinth* XX, with references.

© The American School of Classical Studies at Athens

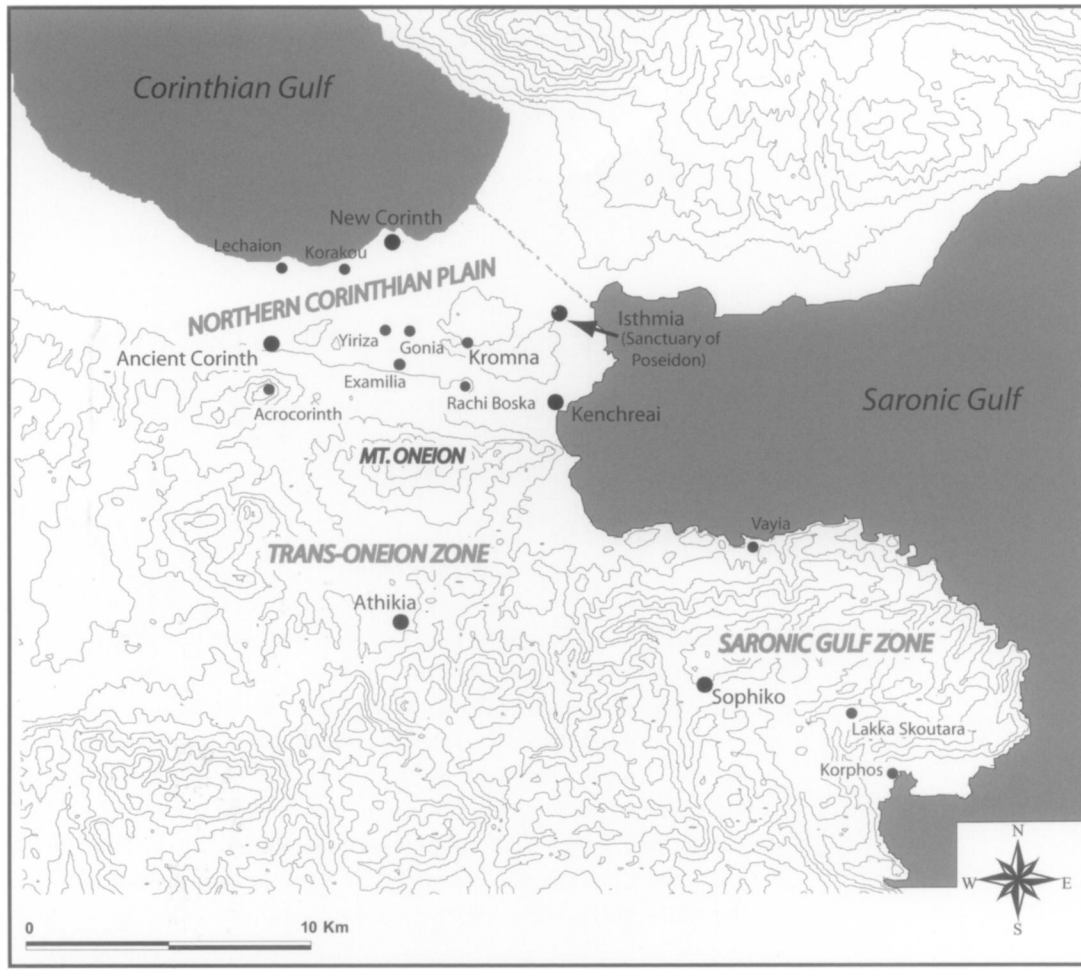


Figure 1. Map of the eastern Corinthia, showing sites mentioned in the text

of Poseidon at Isthmia,[3] the Saronic port at Kenchreai,[4] and the two major prehistoric sites of Korakou and Gonia,[5] as well as extensive studies of the built environment as it relates to historical sources.[6] A few unsystematic reconnaissance surveys were also undertaken, the most thorough being James Wiseman's walking survey of the entire Corinthia in the 1960s.[7]

Between 1997 and 2003, the Eastern Korinthia Archaeological Survey (EKAS) investigated a 350-km^2 region east of the ancient city of Corinth; the underlying methodology of the project and preliminary findings are detailed below. For two decades prior to the survey, Timothy Gregory and other EKAS archaeologists produced a large body of work on the Corinthia, focused particularly but not exclusively on the Roman, Byzantine, and Frankish periods.[8] With this extensive archaeological and historical

3. *Isthmia* II; Gebhard 1993; Gregory 1993b; Hemans 1994; *Isthmia* VIII.

4. *Kenchreai* I.

5. Blegen 1921, 1930; Rutter 1974. Renewed excavations at Gonia by the Greek Archaeological Service are currently under way.

6. Doukellis 1994; Romano 1993.

7. Wiseman 1963, 1978; Blegen 1920, 1921, 1930; Sakellariou and Faraklas 1971; Hope Simpson 1981, pp. 33–35. For similar kinds of topographic studies of the neighboring regions around Sikyon, Kleonai, and the southwestern Corinthia, see Lolos 1998 and forthcoming, Marchand 2002, and Bynum 1995, respectively.

8. Gregory 1985a, 1985b, 1990, 1993a, 1993b, 1994; *Isthmia* V; Kardulias, Gregory, and Sawmiller 1995; Kardulias, Gregory, and Dann 1997; Rife 1999; also Dann and Yerkes 1994.

TABLE 1. CHRONOLOGY FOR THE EASTERN CORINTHIA

Period	*Dates**
Early Neolithic	6500–5800 B.C.
Middle Neolithic	5800–5300
Late Neolithic	5300–4500
Final Neolithic	4500–3100
Early Bronze Age	3100–2000
Middle Bronze Age	2000–1680
Late Bronze Age (Mycenaean)	1680–1065
Submycenaean	1065–1000
Protogeometric	1000–800
Geometric	800–700
Archaic	700–480
Classical	480–323
Hellenistic	323–31
Early Roman	31 B.C.–A.D. 250
Late Roman	250–700
Early Medieval (Byzantine)	700–1200
Late Medieval (Byzantine)	1200–1537
Ottoman/Venetian	1537–1827
Modern	1827–present

*Dates are given in approximate calendar years.

sequence, we have been able to firmly affix our study to a chronological framework covering more than 8,000 years, from the establishment of Early Neolithic communities to the present (Table 1). Nevertheless, previous research has offered only limited understanding of the territory in which these sites were found, including the locations of habitation and nonhabitation sites, road networks, and patterns of resource distribution and exploitation.[9] EKAS has thus been both a natural outgrowth of ongoing research and a specific means to address these gaps in knowledge, using modern survey methods unavailable to previous investigators.

The eastern Corinthia, or the territory lying east of ancient Corinth, offers a unique opportunity to investigate the changing relationships among urban, "sub-urban," and rural entities from prehistory to the present. Prior to EKAS's work, a number of settlements, industrial and exploitative areas, and other sites were already known outside Corinth's urban zone in the eastern Corinthia. The area was heavily traveled in antiquity, providing Corinth life-sustaining access to land and sea connections at the heart of mainland Greece. The fertile coastal plain of the eastern Corinthia was a major source of agricultural commodities for Corinth and, just as important, for a time provided high-quality architectural building stone that was employed not just at Corinth and Isthmia, but was also exported for temple construction at the sanctuaries of Epidauros and Delphi.[10] The principal quarries can still be seen today at Examilia and Kenchreai, and smaller ones abound.[11]

The long-term human history of the eastern Corinthia reflects the interplay of local, regional, and supraregional interactions.[12] A principal

9. E.g., Rutter 2003.

10. Tod 1985, pp. 200–205; Wiseman 1978, p. 68; Burford 1969.

11. Hayward 1996, 2003.

12. E.g., Gregory 1993b; *Isthmia* VIII; Kardulias 1999; Rothaus 2000.

aim of EKAS has been to explore the way these relationships developed and changed at diverse spatial and temporal scales. In the prehistoric and protohistoric periods, the eastern Corinthia was not dominated by Corinth itself, and the questions surrounding the Corinthia tend to emphasize regional contrasts within the entire northeastern Peloponnese. Why were Korakou and Gonia seemingly not abandoned during the Middle Helladic period, in contrast to Tsoungiza and Zygouries? Why was there apparently no Mycenaean palace center in the Corinthia? It seemed likely that intensive survey might clarify these and other poorly documented patterns, such as an apparent change from nucleated to dispersed settlement at the end of the Mycenaean period.[13]

The sub-urban and rural eastern Corinthia becomes less distinct archaeologically once Corinth came to dominate the region, and our questions center more on agency in the hinterland. Was the trajectory of Corinth's eastern hinterland inextricably tied to that of the Corinthian state? Or were residents in the hinterland able to pursue independent relations within the region and with the outside world? Thus, a primary focus of EKAS has been the changing relationship between the urban center at Corinth and its hinterland in historical times. More broadly, we hoped that the survey data would contextualize known sites through the discovery and study of new sites and off-site material, reveal intraregional variability in human activity upon the diverse coastal, lowland, and upland landscapes of the eastern Corinthia over time, and illuminate the interactions of the people of the eastern Corinthia with other parts of the Aegean area and beyond.

RESEARCH COMPONENTS

Numerous research components were included under the EKAS umbrella (Table 2). They are described briefly here as an introduction to the detailed treatments of methods and results below. EKAS created a precise terminology to define specific methodological concepts, giving rise to a number of terms and associated acronyms (Table 3). These terms and acronyms are used throughout the discussion that follows.

TABLE 2. PRINCIPAL EKAS RESEARCH COMPONENTS

Component	*Years*
Geomorphological survey	1997–2001
Geographic Information System	1997–2002
Systematic archaeological survey	
Intensive (off-site) mode survey	1999–2002
Extensive mode survey	2000–2002
LOCA (on-site) mode survey	2000–2002
Experimental survey	1999, 2001
Modern survey	1999–2002
Coasts and harbors survey	1999–2001
Mortuary survey	2000–2002
Geophysical survey	2002

13. Rutter 2003, pp. 80–81.

TABLE 3. GLOSSARY OF EKAS ACRONYMS

Acronym	*Term*	*Meaning*
DU	Discovery Unit	Basic survey unit of intensive discovery mode survey
EDU	Extensive Discovery Unit	Basic survey unit of extensive discovery mode survey
GU	Geomorphic Unit	Individual piece of landscape formed under the influence of a specific geological or cultural process during a discrete period of time. Normally a subset of the MU, the GU explicitly concerns the formation of the archaeological record.
LOCA	Localized Cultural Anomaly	Term for "site" or anomalous scatter or feature
ML	Mortuary LOCA	Term for burial or funerary feature, a class of LOCA designated by the mortuary survey
MU	Morphostratigraphic Unit	Geomorphic entity of distinct surface form, shaped by tectonic, alluvial, colluvial, or littoral processes of variable magnitude and frequency
SIA	Special Interest Area	Term for concentrations of LOCAs that form interpretable foci of human activity

Geomorphological Survey

Geomorphology was fundamental to nearly every aspect of our work. At a basic level, we defined the archaeological survey universe as geomorphological space, emphasizing the notion that artifacts behave as sediments. Their movements and the condition in which they are found are strongly influenced by postdepositional processes (cultural and natural) that are best studied using geomorphological techniques. Well in advance of the archaeological survey, teams of geologists mapped soils, sediments, faults, and other features at scales ranging from coarse (drainage basins) to fine (localized geomorphic units). This information formed a basis for the long-term environmental context of the eastern Corinthia, and supplied many derived characteristics such as coastline change, availability of fresh water, distribution of arable soils, and stability/instability of archaeological landscapes. Geomorphologists were intimately involved in the daily survey effort: archaeological survey units were placed by teams of archaeologists and geomorphologists to respect geomorphic boundaries, and geomorphology interns accompanied survey teams to provide guidance and observations on fine-scale processes affecting the surface archaeological record.

Geographic Information System

Geographic Information Systems (GIS) are now a regular feature of archaeological projects,[14] but until recently GIS had been used in survey archaeology mainly to analyze retroactively data that had already been collected.[15] Before the survey commenced, we developed a multifunctional GIS that has been integrated into every phase of our research.[16] Topographic (contours, landforms), environmental (vegetation), geomorphological (geology, hydrology, tectonics), and cultural (sites, burials, roads, land use) data sets were created and continuously updated during the course of the project. Aerial photographs, satellite imagery, and topographic, geological, and geomorphological maps served as the principal data sets for locating and georeferencing the environmental and cultural data obtained through survey. Archaeological and geological teams navigated and mapped survey units using georeferenced aerial photographs and topographic maps

14. Wescott and Brandon 2000; Levy et al. 2001.

15. Gillings 2000, p. 109.

16. Our GIS is based on the ESRI software suite, including ArcVIEW, ArcINFO, and more recently, ArcGIS. The GIS database was designed and generated by Richard Rothaus and his students at St. Cloud State University.

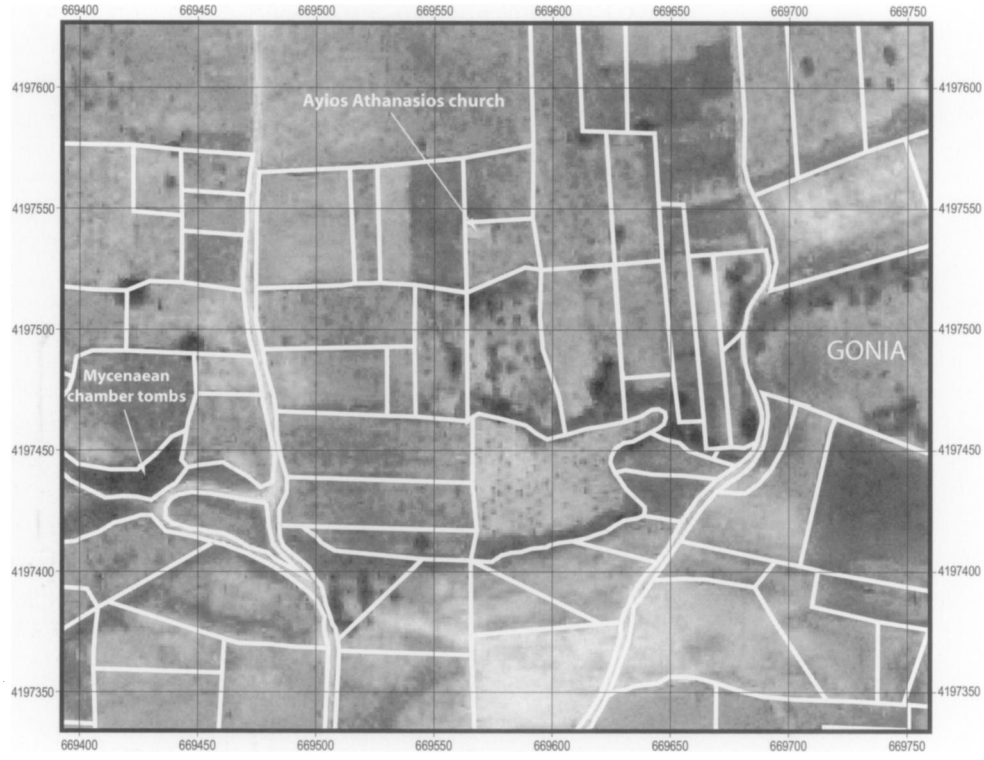


Figure 2. Discovery Units mapped before survey near the prehistoric site of Gonia and superimposed on an aerial photograph, with UTM coordinates and notable features indicated

generated by the GIS, on which locational and contextual information was printed (Fig. 2). Relational databases, using Access and FileMaker Pro, were developed for the environmental and archaeological data, and these were linked to paper field forms and to the GIS.

At the end of each field day, survey teams digitized their archaeological and geomorphic units into the GIS, and entered all data generated by survey, artifact processing, and geomorphic analysis in the appropriate database. These databases were linked in the GIS to the spatial information, making it possible to generate detailed reports and images on a daily basis. Once incorporated in the GIS, this information was used to analyze and interpret patterns of artifact distributions across the survey area.

GIS was also used to develop spatial probability models for settlement patterns in targeted periods of the past, notably for the coasts and harbors survey (see below).

Systematic Archaeological Survey

Systematic archaeological survey operated in three modes: intensive (off-site) mode, extensive mode, and LOCA (on-site) mode, reflecting different scales of investigation of a culturally and physically diverse landscape. The discovery phase of the survey was performed mainly in intensive survey tracts called Discovery Units (DUs). In these units, walkers at 10-m intervals inspected 2-m swaths of the surface, counting artifacts and picking up a representative sample according to the "chronotype" collection system (explained below). Artifact processing teams followed behind to perform in-field analysis of the finds. Extensive mode survey included nonsystematic advance scouting and systematic, nonintensive investigation of areas

falling outside the intensive survey transects. The small size of the extensive survey teams (typically two or three people) allowed them to range widely over the survey area. LOCA (on-site) mode survey involved intensive field investigation of anomalous concentrations encountered during the discovery phase of survey. Many were investigated by means of a grid of 10 × 10 m sampling squares, but we adopted a flexible approach to accommodate the diverse nature of the anomalies. The specific methods and activities of each of these survey modes are described in detail below, with several examples.

Experimental Survey

EKAS designed and carried out a series of experiments to reflexively evaluate procedures and to calibrate results against survey conditions. Methods were evaluated for their efficacy, with shortcomings exposed and sources of bias identified; the results could then be fed back into the process as adjustments to field procedures. In calibrating the results, we sought to identify the effects of variability in local field conditions, making it possible to adjust quantitative and qualitative results, and providing a meaningful basis for comparison among projects with disparate methods, aims, and local conditions.[17]

Modern Survey

EKAS aimed to extend equal treatment to the Modern period, defined as extending from the formation of the modern Greek state in 1827 until the present. Survey archaeologists have shown interest in modern Greece to the extent that it serves the purposes of ethnoarchaeology,[18] but the archaeological investigation of this chronological period is a relatively new phenomenon without a methodological tradition.[19] In order to augment the typical emphasis on "traditional" and recently abandoned settlements, seasonal structures,[20] and agricultural and industrial land use,[21] EKAS integrated the Modern period into standard data collection practices implemented in part by the regular survey teams.[22] Modern features were recorded on survey forms and modern artifacts were counted and gathered; this information was then incorporated into the project's GIS and databases. For these purposes, the Modern period was divided into two historically defined phases: Recent Modern (1827–1960) and Present Modern (1960–present), the latter reflecting the postwar transition from a largely agrarian society to an affluent, modern, urban one. A ceramic typology for Recent Modern was established on the basis of stratified samples from the Corinth Excavations,[23] and efforts are under way to provide a similar typology for Present Modern.

This archaeological approach has been complemented by an investigation of the relevant written records—both historical and archival—as well as oral information from local inhabitants. For example, the Greek State Archive in New Corinth is expected to yield important information about patterns of subsistence, land use, and modernization in the eastern Corinthia in the Modern period.[24] The modern survey also considered the human aspect of the present cultural landscape, including contemporary indigenous perceptions of heritage, history, and national identity, and the

17. The term "experimental survey" may also refer to the use of excavated material to evaluate the results of plow-zone experiments and surveys: Clark and Schofield 1991.

18. E.g., Chang 1984, 1992, 1997; Sutton 1988, 1994; Whitelaw 1991; Forbes 1997; Murray and Kardulias 2000.

19. Diacopoulos, Given, and Seretis 2003; Diacopoulos 2004.

20. Vroom 1993, 1996, 1998; Sutton 2000; Lee 2001.

21. Seretis and Diacopoulos 2003.

22. Diacopoulos 2004, pp. 186–190.

23. Courtesy of Guy Sanders, director of the Corinth Excavations, who kindly provided access to stratified modern pottery from the Panayia site in Ancient Corinth.

24. Courtesy of Adam Athousakis, director of the State Archive in New Corinth, and EKAS collaborator.

threat and impact of modern development on the cultural landscape.[25] These issues were explored with local residents, as well as with representatives of the Greek Archaeological Service and administrators in local and state government.

Fourteen modern sites (LOCAs), ranging from cemeteries to suburban settlements, have been fully investigated. The example of Lakka Skoutara, a recently abandoned agricultural settlement (Fig. 1), shows how investigations of the Modern period were integrated.[26] The archaeological exploration of the settlement and its surroundings aimed at clarifying the relationship between isolated rural establishments and their surrounding landscapes in the Modern period. Nestled in a polje among steep hills and ravines, Lakka Skoutara consists of a number of scattered domestic structures, a recently refurbished church, agricultural features including threshing floors and terraced fields, and resin-producing pine forests. The investigation by EKAS included geomorphological analysis, intensive pedestrian survey, an architectural survey of the standing buildings, the search for archival records, and the collection of oral information from present-day landowners.

On the basis of archaeological evidence alone, Lakka Skoutara conforms to the conceptually rigid and static interpretation of an isolated, nucleated agricultural hamlet or village. But information obtained from former residents challenges this interpretation, revealing instead a highly dynamic and flexible rural settlement and landscape. We conclude that Lakka Skoutara was neither a concentration of scattered seasonal farmhouses, nor an isolated village or hamlet. Rather, for most of the 19th and 20th centuries it was something in between, a semipermanent settlement characterized by lengthy periods of habitation intimately linked with the inland town of Sophiko, and connected to the outside world through extensive road networks and exchange networks facilitated through the harbor town of Korphos.[27] The study of Lakka Skoutara holds broad implications for conceptual and methodological approaches to Greek rural settlement in the past, reinforcing current views that emphasize dynamism over static categories that give a false impression of an eternal, unchanging Greek rural village.[28]

Coasts and Harbors Survey

The coasts and harbors survey was constituted as an independent research endeavor under the EKAS umbrella to address the difficulties of identifying prehistoric and early historical harbor sites in the Corinthia. A harbor location model, embedded in a broader probability model for the types of settings favored by prehistoric inhabitants, succeeded in guiding us to several potential harbors and in some cases associated settlements, including a fortified Early Bronze Age settlement and a Mycenaean harbor town. These results have been published in detail elsewhere.[29]

25. For the discussion of such issues, see, e.g., Fotiadis 1993; Hamilakis 1998.

26. Diacopoulos 2004, pp. 194–198.

27. Caraher and Diacopoulos 2004.

28. Sutton 1994, 2000.

29. Tartaron, Rothaus, and Pullen 2003; Rothaus et al. 2003; Tartaron, Pullen, and Noller 2006.

Mortuary Survey

The mortuary survey was constituted in recognition that proper documentation of the mortuary landscape required specialized skills and data collection beyond that carried out by survey teams. This study sought to document and interpret the physical remains of burial as indices of variability in settlement, land use, and sociocultural identity. The mortuary landscape may illuminate or reflect historical contingencies and processes, including the dynamic interaction between Corinth and its hinterland in ancient and medieval times and the evolution of settlement and the emergence of a Hellenic identity in modern times.

The systematic incorporation of the mortuary survey into the research strategy and field methods of EKAS is unprecedented in Mediterranean landscape archaeology. Working in conjunction with the extensive and intensive survey teams, the mortuary survey team examined both previously known and newly discovered sites and recorded the essential material components of mortuary behavior.[30] Each site was then dated by associated finds or formal typology, comparable evidence for Corinthian burial was evaluated, and locational data were entered into the EKAS GIS. The mortuary survey also served an important conservational purpose by documenting numerous sites of ancient or Byzantine date that were endangered by looting, vandalism, dumping, agriculture, or construction.

This study revealed that the eastern Corinthia has been an abundant and complex mortuary landscape throughout history.[31] Survey directed by Joseph Rife documented 47 discrete burial areas, representing well over 1,000 single burial events dating from the Geometric through the Middle or Late Byzantine periods. Most are situated near areas of dense settlement and coastal or inland routes of traffic on the Isthmus. The survey of modern cemeteries, directed by Lita Tzortzopoulou-Gregory as part of the broader modern survey (see above), recorded 10 sites containing 837 graves. These sites, which have been in use since the late 19th or early 20th century, are located throughout the survey region.

Geophysical Survey

In 2002, a geophysical survey using magnetic and soil resistance methods was conducted at several locations of interest identified during surface survey.[32] The results were mixed, but at one location, Perdikaria (see Fig. 16, below), strong magnetic and soil resistance anomalies outline the plans of several large buildings in two principal orientations indicating distinct chronological phases, including a complex measuring 30 × 15 m with a number of internal rooms (Fig. 3). These architectural features correspond well to a dense scatter of artifacts and architectural fragments of Roman–Late Medieval date.

At another location, Kesimia (Fig. 16, below), two anomalies near a concentration of Classical material may represent kilns. The geophysical survey allowed us simultaneously to evaluate the capabilities of a new generation of geophysical instruments for landscape-scale questions,[33] and to test the reliability of our surface patterns. At the Kesimia location,

30. Cf., e.g., O'Shea 1984, pp. 39–41, table 3.2; Carr 1995, pp. 129–132, table III; Parker Pearson 1999, pp. 5–17.

31. Dickey 1992; *Isthmia* IX, forthcoming.

32. Sarris 2003.

33. Kvamme 2003.

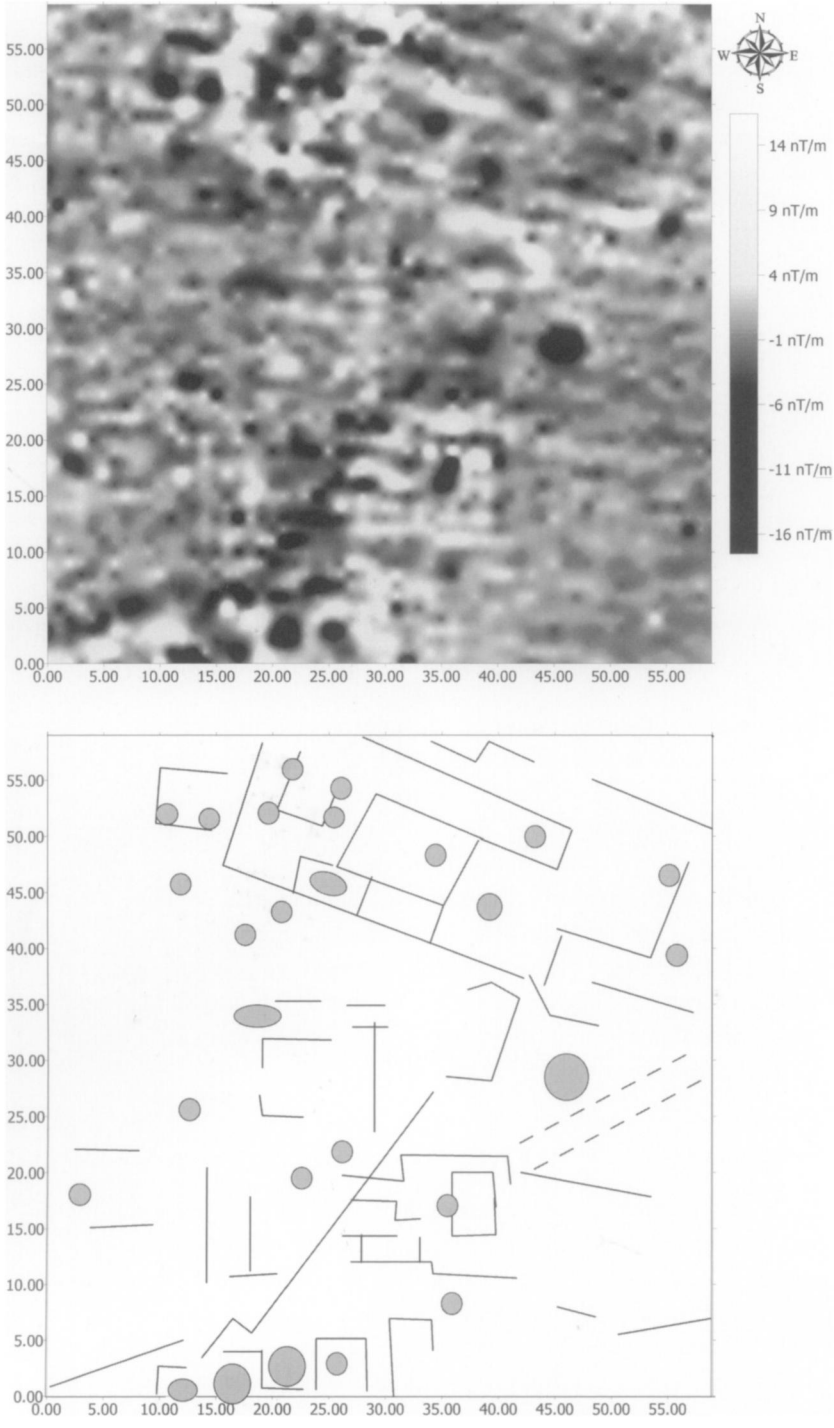


Figure 3. Processed image of geophysical results from Perdikaria *(above)*, with interpreted outlines of structures and other features *(below)*. Courtesy A. Sarris

we learned that a substantial surface concentration of architectural blocks and fragments has no corresponding subsurface foundations—at least not where we expected them to be. This result is a useful reminder of the complex transformational processes by which such material remains have been moved around the landscape.

RESEARCH PHILOSOPHY AND INTERDISCIPLINARY APPROACHES

A persistent concern in regional archaeology is the continuing inability of survey data to support increasingly sophisticated social questions. Because archaeological survey permits in Greece typically do not allow regional data sets to be strengthened through complementary excavation, coring, or long-term replication studies (see below), survey archaeologists have found that the most effective response is to improve the practices by which data are collected and incorporated into a project's "archaeological knowledge system."[34] EKAS focused on data collection first through a series of "quality control" practices, and second by emphasizing the free and timely flow of information among project members at every stage of the research. In this section we describe fundamental principles that guided our collection and treatment of data.

Research Integration

Modern survey projects tend to be regional in scope and heavily multidisciplinary, yet, as Tjeerd van Andel has noted, research agendas and interactions of experts from various disciplines are often poorly coordinated.[35] Although close coordination across disciplines would seem to constitute a common-sense approach that ought to be universal in multidisciplinary projects, experts such as natural scientists and pottery specialists continue to be marginalized in survey design and fieldwork.[36] These experts often serve as independent consultants excluded from guiding the fieldwork, and most detrimentally in our view, from the contexts of archaeological discovery. EKAS tackled this problem by emphasizing close collaboration of experts from all participating disciplines, beginning with the planning and organization of the project, and continuing through all preliminary studies, the archaeological survey, and subsequent data recording, analysis, and interpretation.

The fieldwork aspect of this philosophy entailed in-field collaboration in the acquisition of primary data. For example, archaeologists participated in geological and geomorphological mapping in seasons prior to the commencement of the surface survey, and geomorphology interns were attached to archaeological survey teams on a daily basis. The geoarchaeological program of EKAS exemplifies our commitment to true interdisciplinary research, an explicit response to van Andel's call for *daily* communication and "intensive exchange of information, ideas, and procedures from the planning stage through to final publication" between archaeologists and geological scientists.[37] In the field, specialists in artifacts of many periods formed processing teams, which followed the survey teams to examine the finds in their contexts of discovery. Survey team leaders were assisted in decision-making by in-field consultation with experts in geomorphology, archaeology, and other disciplines. The result was enhanced communication and deeper understanding of the data across disciplines. Other examples of this collaborative approach are described in relevant sections below.

34. McGlade 1997, where he uses the term more narrowly to describe an interactive computer environment in which archaeologists can define and explore problems through GIS and other technical tools. New theoretical approaches to landscape archaeology, including but not limited to those advocated in postmodern archaeologies (e.g., Ashmore and Knapp 1999), are rather poorly developed in Aegean survey archaeology. We expect that fuller integration of these perspectives in Aegean survey research design will be an important development in the future. For initial thoughts on these prospects, see Terrenato 2004.

35. van Andel 1994.

36. van Andel 1994, p. 28; Alcock 2000, p. 265.

37. van Andel 1994, p. 28; see also the "contextual approach" of Karl Butzer (1978, 1982).

This philosophy finds an interesting parallel in the "reflexive archaeology" practiced at the new excavations at Çatalhöyük.[38] Ian Hodder and his colleagues brought specialists to the trenches to observe the recovery of material "at the trowel's edge" to counteract the usual practice of removal by excavators and subsequent analysis by others with no experience of the primary context.[39] In a similar way, the participation of specialists (both archaeological and nonarchaeological) in EKAS field teams created a "rich interactive matrix"[40] between surveyors and specialists, who shared the experience of contexts of discovery and opportunities for mutually enlightening consultation.

Sampling, Survey Coverage, and Flexibility

EKAS is situated in the Mediterranean tradition of systematic, nonsite (or "siteless"), intensive survey,[41] in clear distinction to surveys that do not walk the survey universe in a systematic way, or which focus on the discovery and investigation of "sites," however defined, to the exclusion of other material in the landscape. The nonsite, intensive approach implies a commitment to landscape-based rather than site-based survey,[42] a distinction that underscores ontological problems with the concept of site.[43] EKAS employed a stratified sampling scheme in an attempt to extract data that would be as representative as possible of the characteristics of the entire study area. We first divided the survey universe into environmental strata, or zones. A first stratum consisted of six major drainage systems encompassing the 350-km^2 survey area (Fig. 4). Within each drainage, further stratification identified local environmental and ecological variability.

Set in this broader environmental background, EKAS sought to investigate selected parts of the area between the ancient city of Corinth and the Saronic Gulf, in part to explore how ecological diversity may have affected life over the past 8,000 years. Long transects, made up of small, contiguous survey units, were walked across a selection of the strata we defined (Fig. 4). These transects were intended to be representative of the environmental and cultural diversity of the survey area, but their locations also reflected the limitations imposed by our annual permits.

Each season, we were denied access to portions of the requested survey area, and we had no foreknowledge of which areas would be excised. The geographical extent of intensive survey was limited primarily to the northern Corinthian plain (the Examilia and Isthmia basins), with quite small areas approved for survey in other basins (Fig. 4). Total coverage in survey units amounted to 3.85 km^2, rather than a projected 12 km^2, in large part because bureaucratic delays in issuing permits reduced our total field time for archaeological survey over four seasons to nine of the planned 16 weeks (Table 4). This modest coverage was augmented by extensive

38. Hodder 1997, 2000b.

39. Hodder 2000a, pp. 5–6; Farid 2000; Berggren and Hodder 2003, pp. 426–428.

40. Doonan 2002, p. 787.

41. For early approaches, see Thomas 1975; Foley 1981; Dunnell and Dancey 1983. In the Aegean area, see, e.g., Bintliff and Snodgrass 1985, 1988; Wright et al. 1990; Cherry, Davis, and Mantzourani 1991; Wells and Runnels 1996; Davis et al. 1997; Cavanagh et al. 2002; Tartaron 2003.

42. Bintliff, Kuna, and Venclová 2000, p. 1.

43. As also discussed in, e.g., Gallant 1986; Cherry, Davis, and Mantzourani 1991, pp. 21–22; and Dunnell 1992.

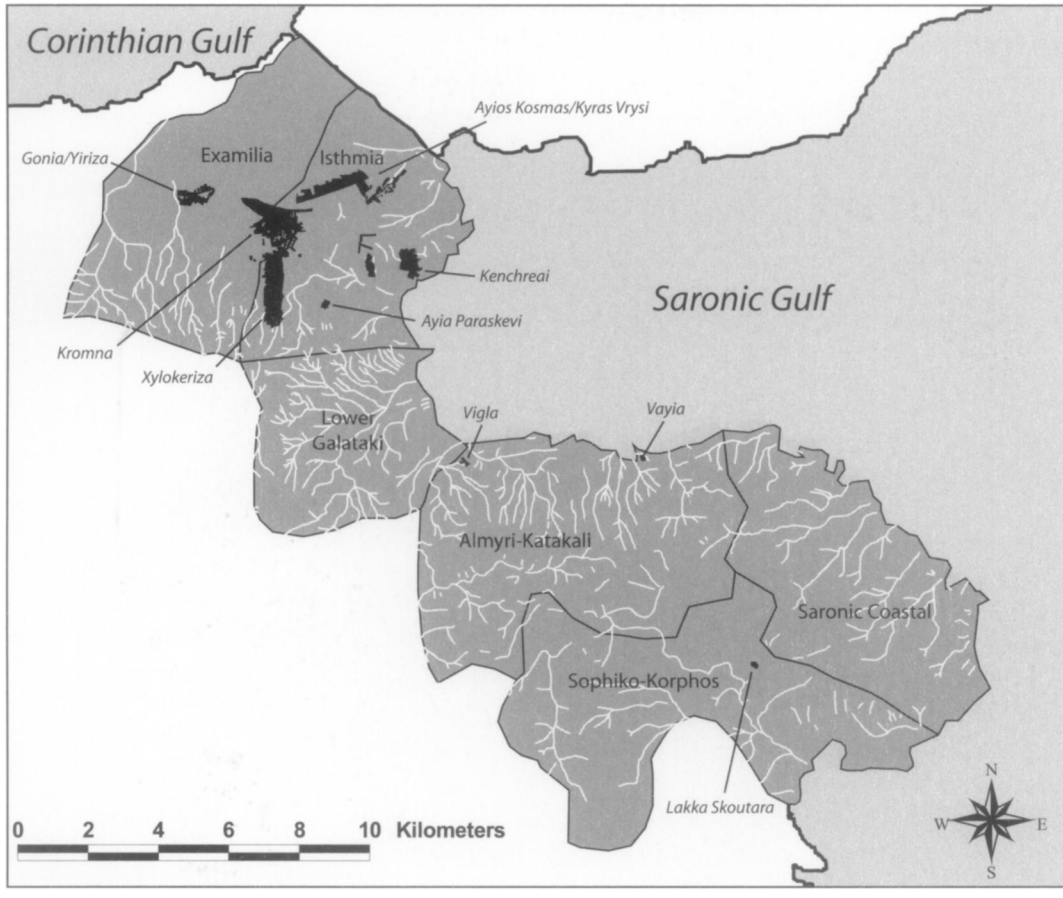


Figure 4. Eastern Corinthia, showing the six basins that define the area of archaeological and environmental interest, as well as the locations of archaeological survey transects

survey in nonsystematic (scouting) mode, which permitted us to examine a further 20 km^2 or more within the zones designated under our permits. Coverage in survey units was particularly restricted during the first season, when our permit was interpreted to mean that objects could not be moved, compelling us to use a cumbersome system of flagging artifacts for inspection. In subsequent seasons we were not permitted to remove artifacts from our survey units, although it was acceptable to collect artifacts from many "sites." Although we would have preferred to make targeted collections from off-site units, the material we retrieved under a liberal designation of sites is preserved for future examination by specialists.

While our sample did not much resemble the plan we drew up initially, the losses were to an extent offset by the project's other components (Table 2), several of which operated in a broader geographic framework without the same restrictions on field schedules, and which together formed an illuminating context for the natural and cultural history of the full study area. To cite two examples, the geomorphological component and the coasts and harbors survey operated throughout the study area under geological permits. Certain archaeological sites encountered outside the Examilia and Isthmia basins during this work were later approved for archaeological investigation.

An unexpectedly positive response to the restriction on nonsite collections was found in the creation of in-field artifact-processing teams

TABLE 4. SUMMARY OF SURVEY COVERAGE IN DISCOVERY UNITS

	1999	*2000*	*2001*	*2002*	*Total*
Discovery Units (DUs)	256	600	392	88	1336
Extensive Discovery Units (EDUs)	0	20	62	0	82
Coverage (km^2)	0.97	1.87	0.79	0.22	3.85

that examined the finds in their contexts of discovery. In-field processing became a fundamental component of our integrative philosophy, and serendipitously enforced our inclination to limit artifact collections for other reasons: the negative impact on the surface archaeological record and the crisis of storage space in Greek museums.[44]

The issues that engender conflict between the goals of survey archaeologists and those of the Greek archaeological establishment are complex,[45] and beyond the scope of this article. Certainly, we do not pretend that conditions were optimal for our survey, or that unencumbered by these restrictions we would have done everything the same way. Yet the important point about the EKAS research model is that the presence of experts from all relevant disciplines in the field afforded unusual flexibility, enabling us to undertake the necessary redesigns as unpredictable circumstances demanded. These adversities tested, and ultimately validated, the flexibility we built into research design, staffing, and logistical capability. In the currently uncertain climate of survey archaeology in Greece, adaptability is essential.

The Survey Universe as Geomorphological Space

The landscapes of the eastern Corinthia preserve pervasive evidence of natural (e.g., alluvial, colluvial, tectonic) and anthropogenic (e.g., plowing, bulldozing, removal of soils) processes that disturb soils and sediments, and consequently the ancient surfaces and deposits they may contain. Failure to recognize and control for this complex transformational history *before* performing survey may result in specious interpretations of the surface record. A central innovation of EKAS was the explicit geomorphological foundation for defining and analyzing survey space.

Prior to archaeological reconnaissance, a geomorphological survey provided maps of landforms and soils that influenced the selection of survey units, the way such units were treated in the field, and the interpretation of archaeological data. The survey universe was first divided into geomorphological spaces, at different scales; the most relevant of these are the Morphostratigraphic Unit (MU) and the Geomorphic Unit (GU). The MUs are defined as major landforms shaped by tectonic, alluvial, colluvial, or littoral processes, and identified by their distinct surface forms. MUs associated with alluvial processes might include terrace deposits, fans, flood channels, and floodplain insets. The boundaries between MUs commonly occur at breaks in slope, angle, or aspect. The GUs are individual pieces of

44. Gregory 2004. In-field recording and processing, driven by heritage issues rather than permit restrictions, is more common in other parts of the world, notably Australia: Holdaway et al. 1998, p. 4; Pardoe 2003.

45. See, e.g., Kardulias 1994a; Cullen 2001, p. 14; Cherry 2003, pp. 155–159.

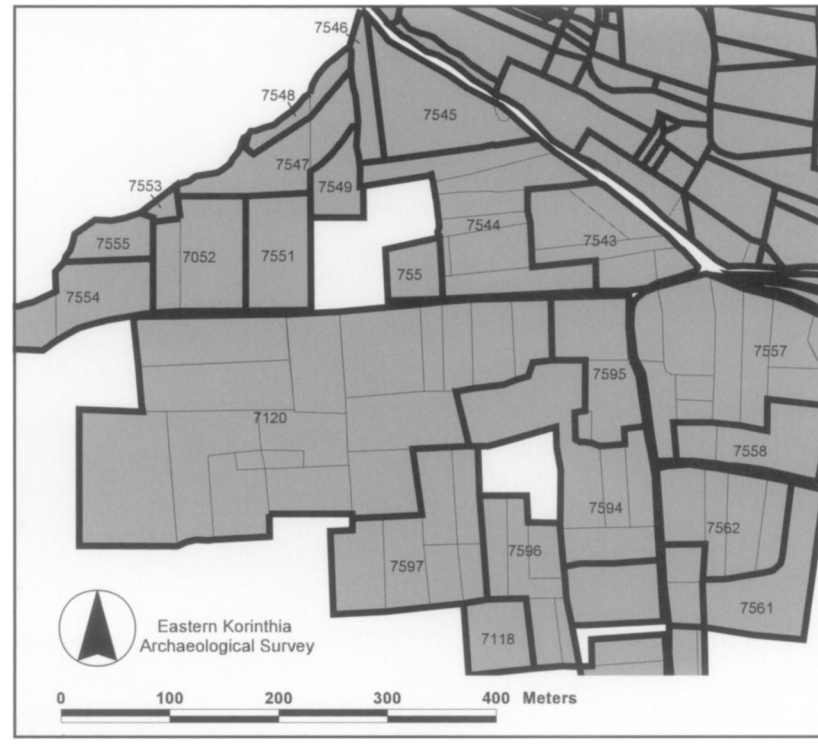


Figure 5. Geomorphological mapping: Discovery Units (light lines) within numbered Geomorphic Units (heavy lines)

landscape, however small or large, that have formed under the influence of a single geological (e.g., alluvial or colluvial) or cultural (e.g., bulldozing) process during a discrete period of time. The boundaries of the GUs take into account the effects of such processes on artifact movement and location. The GU is generally a smaller unit within the larger MU, although they can be coterminous.

Geomorphic Units formed the basis for the placement of our archaeological Discovery Units (DUs). The inviolable principle of our survey was that DUs must not cross GU boundaries. Within the GU, archaeologists were free to define as many DUs as they deemed necessary, primarily according to uniform conditions of discovery, such as visibility and ground cover (Fig. 5). For this reason, survey units were generally small, the mean size being ca. 0.3 ha and the median 0.21 ha. The DUs were placed in the field by teams of geomorphologists and archaeologists. The GU/DU system permitted us to recognize formation processes at a very fine scale, and to use that knowledge to better understand the integrity of the artifact distributions that we encountered. As a result, the inferences that we have drawn from the surface material have an explicit geomorphological foundation.

This approach differs from standard techniques of defining survey units.[46] One traditional method is the long transect (with or without subunits) superimposed on the landscape without regard for topography, terrain, or depositional history, designed to avoid judgmental placement and to provide a statistically valid sample. Another method defines "tracts" according to units of modern land use (e.g., an agricultural field or the land lying between two roads), ostensibly homogeneous in terms of topography or ground visibility. Yet survey spaces defined by these two methods ignore the fine-scale depositional history of sediments, and in our experience tend

46. Mattingly 2000, p. 7, table 2.1.

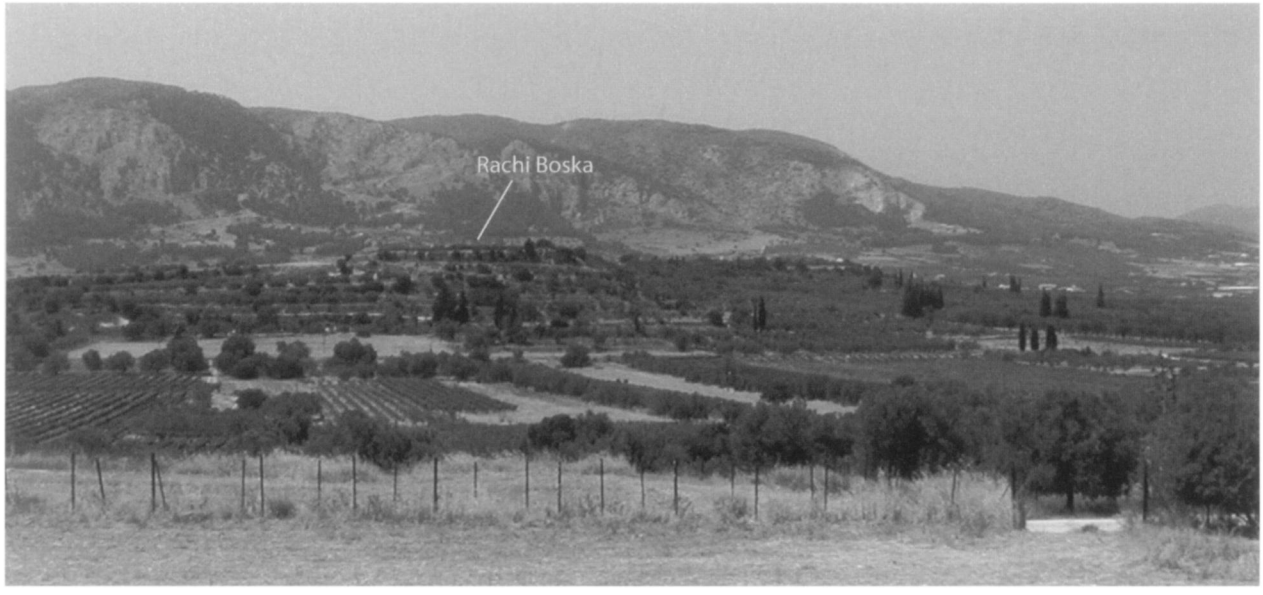


Figure 6. Rachi Boska, a flat-topped, relic marine terrace, with Mt. Oneion in the distance, looking south

to mix geomorphic deposits impacted by bulldozing, sediment transport, and other processes.

A second innovation was the attachment of a trained geomorphology intern to each survey team.[47] On a daily basis, the geomorphologist accompanied the team to perform fine-scale mapping and to consult with the team on geomorphological processes within the survey units. With the benefit of this collaboration, we avoided creating units comprising mixed contexts, preserving a meaningful basis for interpretation of the survey results. Archaeologists developed a better understanding of surface dynamics, and geologists became more sensitive to archaeological problems and cultural material.

The field geomorphologists' contributions were vital on many occasions, as two brief examples will show. During discovery-phase survey at Rachi Boska, an uplifted marine terrace overlooking the northern Corinthian plain (Fig. 6), we observed that recent deep plowing for a new vineyard had exposed copious remains of a multiperiod site, including segments of a Classical or Hellenistic fortification wall and a dense scatter of artifacts indicating repeated use from Neolithic to Roman times. To investigate the site, designated LOCA 9001, we superimposed a grid of 90 10 × 10 m collection squares over the vineyard (Fig. 7). Before the collection began, the geomorphology team identified a subtle disturbance that had escaped the archaeologists' notice: the deliberate movement of some of the plowed soil (along with the artifacts it contained) from the northern to the southern half of the vineyard, presumably to level an east–west-trending gully. This disturbance, detected on the basis of subtle properties of color and texture in the dumped sediments, was significant because it involved the removal of artifact-rich soil from one part of the vineyard to another with far lower artifact density. Without this intervention, it is virtually certain that our investigation would have produced a false impression of the extent of the scatter by grossly overestimating the amount of material in many southern grid squares. We excluded those squares from our grid collection, and later

47. This practice has now also been adopted by the Troodos Archaeological and Environmental Survey Project: Given 2004, p. 18.

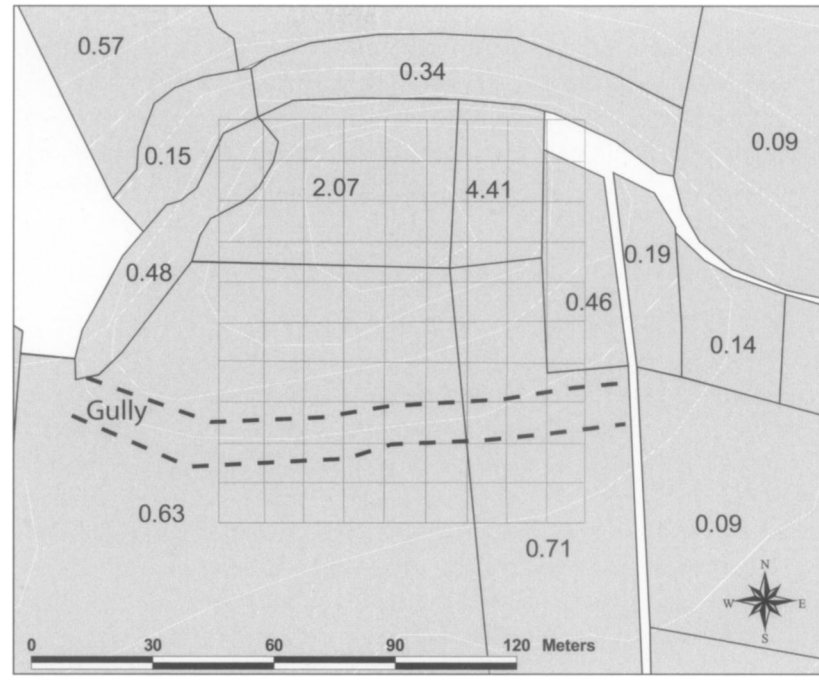


Figure 7. Plan of the gridded collection of LOCA 9001 at Rachi Boska, showing the location of the gully into which soil and artifacts were imported from the northern gridded area. Artifact density figures (sherds/m²) are indicated on each of the DUs.

Figure 8. View of a limestone cairn at Vayia with vertical rills formed by water erosion *(rillenkarren),* showing the long-term development of such erosional features in situ

found that low artifact densities in DUs surrounding the affected area justified the modification.

At another site, the Saronic coastal site of Vayia, geomorphological analysis provided pivotal evidence leading to a chronological framework for limestone cairns and other architecture.[48] In this case, geomorphologists examined karstic dissolution features, known as *karren,* as well as other formational features on the limestone (Fig. 8). They recognized differences in the progressive development of these features, suggesting a relative chronological framework with two broad phases in antiquity. Combining these observations with archaeological survey and site mapping, we were able to demonstrate a clear association between the older

48. Described in detail in Tartaron, Pullen, and Noller 2006.

phase architecture and Early Helladic (EH) II artifacts, the only material recovered from the interior of the cairns and sharing with the stone certain geomorphological features such as calcium carbonate accretions. As a result of this interdisciplinary effort, we recognized a fortified EH II coastal settlement overlooking a superb harbor, and developed a geoarchaeological method for studying architecture that may have broad applications in karstic regions worldwide.

THE ENVIRONMENTAL SETTING

The eastern Corinthia is environmentally diverse, and thus may be partitioned in a variety of ways for analysis. One approach is to suggest that three notional geographic zones make up the EKAS survey area: the northern Corinthian plain, a lowland corridor that links ancient Corinth with the Corinthian Gulf and the Isthmus; the Saronic Gulf zone south of the Isthmus; and the trans-Oneion zone, comprising the upland hills and mountains and the basins south of the Oneion ridge (Fig. 1). These zones reflect the experience of traversing a landscape of topographical diversity in which one ascends from the northern plain through or around the liminal Oneion range and continues in rugged terrain either inland toward the Argolid or coastward toward the Saronic Gulf. This approach is useful in that it presents a potentially humanized perception of the landscape, and also because restrictions placed on our permit limited most of our work to the northern Corinthian plain, readily definable from this phenomenonological point of view. Yet the basis of our initial definition of a 350-km^2 survey zone was the geomorphological perspective that sediments, including artifacts, are transported by a series of drainages that crosscut and are crosscut by the geographic zones (Fig. 4). In spite of the geographical limitations placed on the pedestrian survey, we were able to perform paleoenvironmental work throughout the 350-km^2 area.

The eastern Corinthia has been shaped mainly by regional uplift of the northern Peloponnese and by sea-level fluctuations caused by Tertiary glacial and interglacial sequences.[49] Because Greece is positioned at the southern edge of the Eurasian tectonic plate, with the African plate being subducted below, the country is seismically active and the historical record of frequent and often devastating earthquakes reaches back almost three millennia and continues to the present.[50] Three main structural fault domains affect the eastern Corinthia: W–WNW-trending normal faults bounding the Corinthian Gulf; NNW-trending normal faults of the eastern Peloponnese; and NW- and NE-trending structures of the western terminus of the Hellenic Volcanic Arc. Tectonic activity along these faults is one of the most rapid and significant agents of landscape change in the Corinthia. The regional record of uplift and subsidence is complex and variable, and local sequences may be the most significant factors in topography and coastline configuration. The faults also play a key role in determining the supply of fresh water through the distribution of groundwater sources accessible through wells and issuing at the surface as springs (Fig. 9).

49. Freyberg 1973; Hayward 1999, 2003.

50. Ambraseys and Jackson 1990; Stiros 2001.

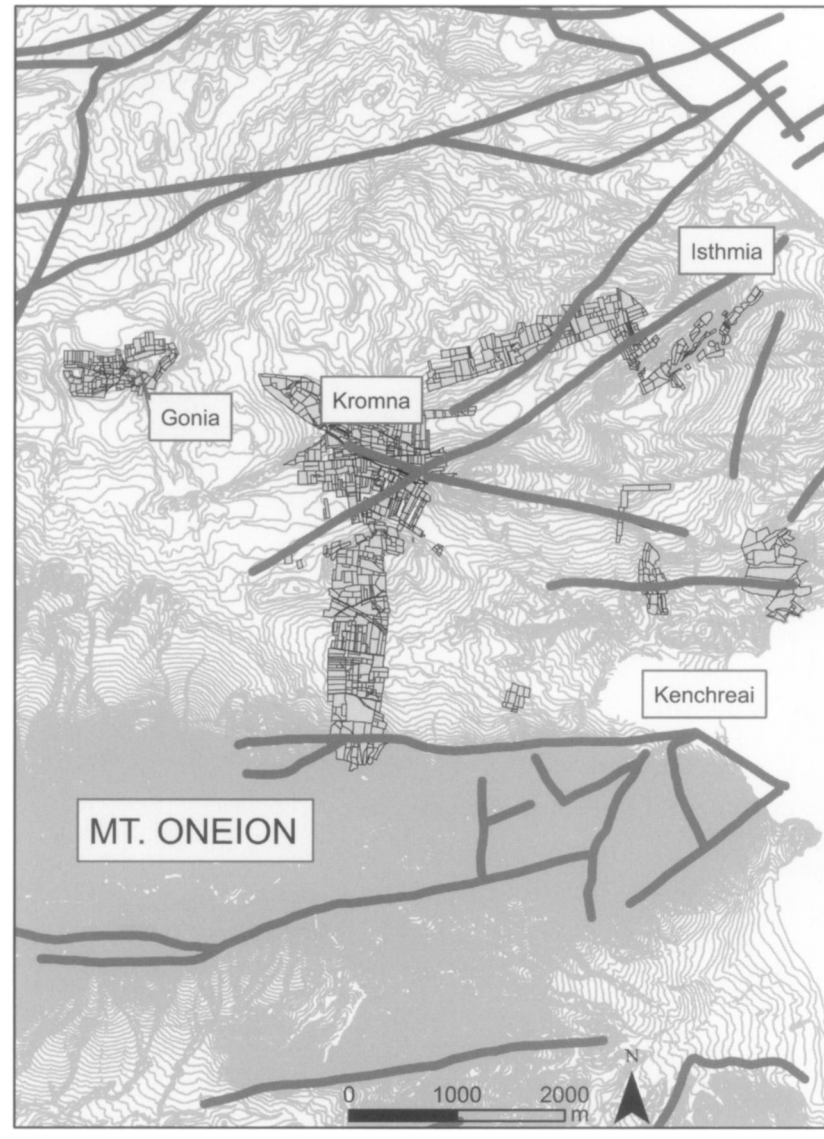


Figure 9. Major faults traversing the Isthmia and Examilia basins. Note the convergence of two major fault lines at Kromna.

The surface geology of the eastern Corinthia is dominated by carbonate rock, generally white to grayish Pliocene–Pleistocene marine marls, capped by Pleistocene conglomerates, sandstones, and limestones that are interbedded with marls and other clay units (Fig. 10).[51] The properties of the limestones, including stratification, solubility, and mineralogy, produce springs and strongly influence the formation of soils, particularly the red (iron-oxide stained) terra rossa,[52] but because of regional topography and relief, colluvial and alluvial processes are also major contributors.[53] In addition, the complex depositional history of these sediments, particularly as affected by tectonic activity, has resulted in highly variable occurrences of red, white, and greenish-white clays suitable for potting.[54]

Today, the eastern Corinthia is characterized as a fragmented Mediterranean forest with a xeric moisture regime.[55] On the basis of numerous paleoenvironmental studies, a consensus has emerged that the climate of Greece—that is, temperature, rainfall, and seasonality—has remained

51. Institute of Geology and Mineral Exploration 1972, 1975.

52. Yassoglou, Kosmas, and Moustakas 1997; Atalay 1997.

53. Yaalon 1997; van Andel 1998; Bruno 2003.

54. Farnsworth, Perlman, and Asaro 1977; Whitbread 2003.

55. Yaalon 1997, pp. 159–162; Adams and Faure 1998, p. 636.

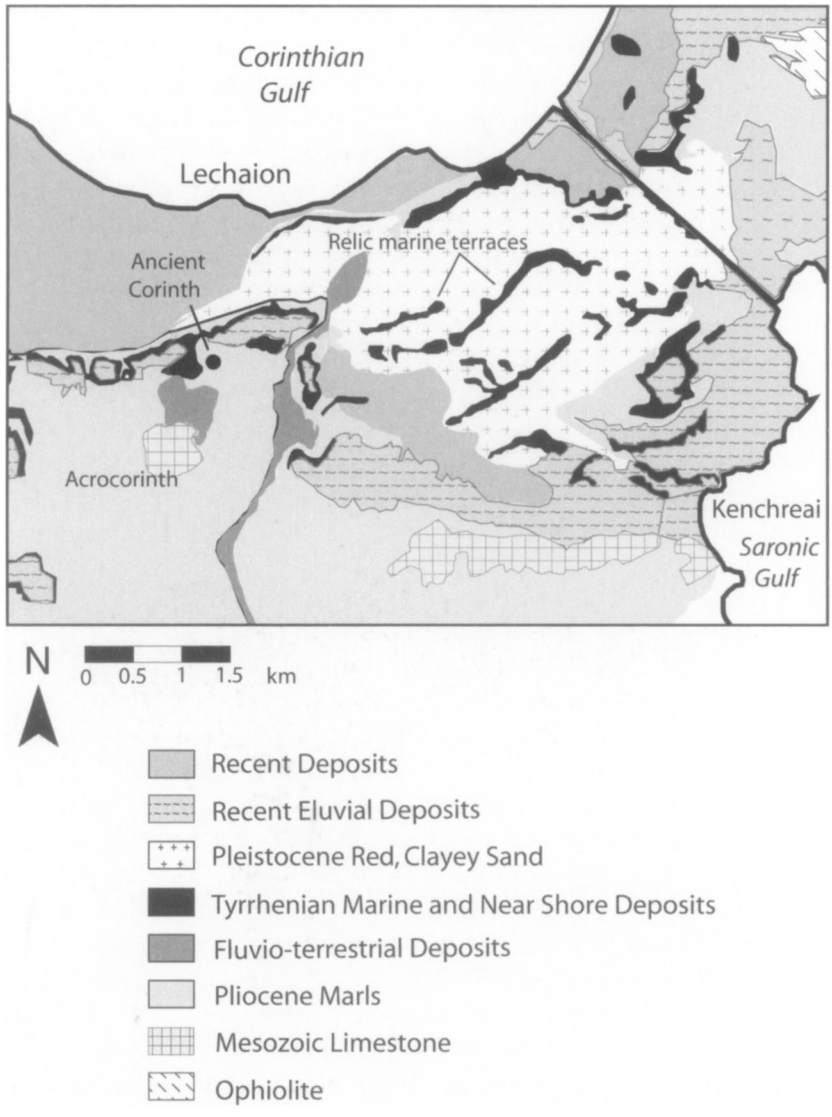


Figure 10. Geological features of the northern Corinthian plain.
T. F. Tartaron, after Hayward 2003, p. 17, fig. 2.1

relatively constant for the last 5,000 years. By that time, the Mediterranean climatic regime of hot, dry summers and cool, wet winters was established. Similarly, recent glacio- and hydro-isostatically corrected sea-level curves suggest that modern sea level was attained some 6,000 years ago, and has on average increased a few meters at most since that time.[56] Yet it is also recognized that variability at smaller geographical and temporal scales frequently becomes significant in cultural processes. Frequent co-seismic uplift and subsidence events in the Corinthia have altered the relationship between shore and sea, drowning coasts or thrusting them upward in ways that greatly exceed the modest changes accommodated by general eustatic or isostatic sea-level models.[57] The same may be said of climatic variability: annual or decadal anomalies in climate may induce drought, flooding, and other perturbations with devastating effects on humans and significant consequences for archaeological patterning.[58]

Although the Corinthia has been of considerable interest to geologists for its tectonic history and long-term structural development,[59] much less is

56. Lambeck 1995, 1996.

57. Noller et al. 1997; Wells 2001, pp. 173–176.

58. See, e.g., Bawden and Reycraft 2000; Chew 2001.

59. Freyberg 1973; Vita-Finzi and King 1985; Keraudren and Sorel 1987.

known about local geomorphology in areas that would be most relevant to human activity: soils, local faults, hydrology and groundwater sources, and karst topography. EKAS studied the environmental history of the eastern Corinthia in a number of ways. Each of the six natural drainage systems, comprising major streams, subsidiary streams, and the surrounding landforms that provide sediment load and transport cultural material, was considered as the coarsest-grained entity in a nested hierarchy of geomorphological units. Within each basin, finer-grained units were mapped to document the history of Holocene landscape evolution, including investigations of soil erosion, tectonics, coastline change, vegetational succession, mineralogy, raw materials sourcing, and dating of deposits and landforms.

The geomorphic mapping was based on analysis of satellite imagery and aerial photography, with extensive field checking by teams of geologists and archaeologists. Surface deposits and landforms were mapped onto 1:5,000 topographic sheets and incorporated into digital elevation models for the use of field teams. Field verification consisted of numerous north–south transects in each drainage system, in which geomorphologists described the physical landscape, examined geomorphic surfaces and surficial deposits exposed in natural outcrops such as stream banks and coastal bluffs, and completed soil profiles of exposures in wells, landfill pits, and new house excavations. These soil-sediment-slope-landscape profiles, or *catenas,*[60] involve geomorphic mapping and classification, sediment and soil stratigraphy, measurement of modern and long-term rates of soil erosion, and geochronological control for these processes.

Localized sequences of tectonic uplift and subsidence were investigated by extensive field examination. With the aid of Landsat imagery and topographic maps, active and potentially active major fault domains were identified and mapped throughout the survey area.

These studies show that the eastern Corinthia possesses unusually diverse and dynamic landscapes, shaped continuously by natural forces of tectonism, erosion, and sedimentation during the Holocene—the period of time in which we can demonstrate a human presence in the Corinthia. But the long history of intensive human activity has also transformed eastern Corinthian landscapes. In addition to varied modifications of the landscape wrought by permanent settlements and agro-pastoral land use, intensive exploitation and the dense population left behind a thick residue of durable material, particularly ceramics, in surface and subsurface deposits. In many locations, overlapping surface scatters form multiperiod palimpsests and often the "continuous carpets" of material from many periods that have been noted also in Boeotia.[61]

Much of our methodological attention was directed to finding effective means of sorting out these transformational processes and their respective contributions to variability in the surface record. A close integration of geomorphology and archaeology allowed us to evaluate landscape stability and assess the integrity of surface artifact scatters by mapping processes, including the movement of artifacts, at a very fine scale. Archaeological survey units were plotted using this information, and the survey effort focused on ways to record as faithfully as possible the content and variability of the surface remains.

60. Birkeland 1984, pp. 238–254.

61. Bintliff and Snodgrass 1988, p. 506.

METHODS OF PRIMARY DATA COLLECTION

The main archaeological activity of EKAS was to systematically investigate a sample of landscapes within the survey universe. As noted above, the survey operated in three modes: intensive discovery mode, extensive discovery mode, and site investigation mode.

Discovery Units

The Discovery Unit (DU) was the methodological unit of the discovery phase of the survey. In the discovery phase, our main objectives were (1) to detect broad patterns of the presence and absence of human activity; (2) to evaluate the varying density of material remains and advance preliminary hypotheses concerning its significance; (3) to characterize where possible the chronology and functional characteristics of the material remains; (4) to collect environmental information as a contextual framework for the archaeological material; and (5) to identify anomalous concentrations of material that may warrant further consideration. It was not the purpose of discovery-phase investigation to analyze at a very fine scale the remains within the DU, but rather to collect basic data over a broad swath of the landscape. When "anomalous" concentrations of material remains were perceived, a second phase of more detailed and precise analysis was often initiated.

The investigation of the DU relied in part on relatively standard procedures for intensive survey in the Mediterranean. Crew members were arrayed at a uniform 10-m spacing and equipped with two tally counters ("clickers"; normally one each for pottery and tile/brick),[62] a compass, and plastic resealable bags. Each walker observed the ground surface in a 2-m swath only, a meter to the right and a meter to the left, resulting in an effective 20% sample of each survey unit. All observed artifacts larger than a thumbnail were counted. Artifact counts were generated and recorded by individual fieldwalkers, so we were able to obtain sub-DU data about the quantities of broad artifact types. In addition to counting artifacts, walkers collected certain objects. Potsherds, by far the most abundant surface artifact type, were picked up in accordance with the chronotype system, in which objects that are "unique" to an individual fieldwalker in each DU are gathered (see below). Other ceramic materials, mainly rooftiles and bricks, were collected according to chronotype principles, but lithics and other nonceramic objects were collected in their entirety. At the conclusion of walking the unit, all collected objects were placed together in labeled artifact bags according to material type. Finally, the team filled out a three-page DU form detailing field conditions and the results of the investigation.[63]

Extensive Discovery Units (EDU) provided some degree of coverage for areas that could not be examined using intensive methods, and targeted certain interesting or problematic locations that otherwise would not be examined. Such areas might fall outside the transects earmarked for DU sampling, often because they were particularly difficult of access for a large and fully laden team. Some EDUs were walked systematically in a way similar to DUs, using forms to record most or all of the same information

62. In rare cases when pottery and tile were not the dominant artifact types, clickers were used to count other materials. Artifacts not being counted with clickers were counted by hand.

63. The EKAS forms are available from the first author by request.

as in DUs, but covering ground at much greater walker intervals. Other extensive investigations were unsystematic, taking the form of thin "probes" sent into unknown territory to gather information in advance of the intensive survey effort. Yet all extensive units were defined in geomorphological terms, and artifacts encountered were processed using the chronotype system. Extensive survey teams were small, typically composed of a team leader, an assistant, and a geomorphologist. The small size allowed the team to maximize its most crucial asset, mobility.

The Chronotype System

The chronotype system performs two related but distinct roles, serving both as a framework for classification of artifacts and as a standard for field collection. It is designed to simplify and improve the quality of the identification of pottery in the field, while facilitating our ability to analyze these data. In this dual role, the chronotype system has now been used successfully in five regional surveys: the Sydney Cyprus Survey Project (SCSP), the Australian Paliochora-Kythera Archaeological Survey (APKAS), EKAS, the Troodos Archaeological and Environmental Survey Project (TAESP), and the Pyla-Koutsopetria Archaeological Project (PKAP).[64]

Chronotype as a System for Classification

The chronotype system provides a flexible, hierarchical structure for classifying artifacts based on the ability of any analyst to assign a form or date, however precise or imprecise, to a given object.[65] The hierarchical nature of the chronotype system is expressed in a structure consisting of seven basic classes—pottery, stone/lithics, metal, glass, terracotta (nonpottery), shell/bone, and other—that are then divided into subclasses. Pottery, for example, is divided into seven subclasses: coarse ware, medium coarse ware, fine ware, semifine ware, kitchen/cooking ware, lamp, and pithos. These subdivisions are further divided, potentially ad infinitum. Each chronotype consists of a unique set of the following characteristics: period (chronology); place in the hierarchy of class and subclasses (e.g., a given chronotype cannot be both coarse ware and fine ware); and presumed function. If the characteristics of a given artifact do not fit all the characteristics of an existing chronotype, a new chronotype must be created.

The place of a particular object in the hierarchy at any given moment is determined by the ability to assign it a date or form. The date may be very specific (within a decade or less) or very broad (e.g., "ancient," "Early Modern"). Each level of the hierarchy represents a specific chronological or formal resolution, so that all artifacts residing at a given level possess the resolution inherent to that level. The structure of the chronotype system

64. The chronotype system was designed and used first by the Sydney Cyprus Survey Project: Given et al. 1999, pp. 24–25; Meyer 2003; Meyer and Gregory 2003. For APKAS and EKAS: Gregory 2004; TAESP: Given et al. 2002; Boutin et al. 2004; PKAP: Caraher et al. 2005; Caraher, Nakassis, and Pettegrew 2006, pp. 11–13. For SCSP and TAESP, the term "chronotype" is reserved for the system of classification, while the collection strategy is known as "representative collection" (M. Given, pers. comm.).

65. Given et al. 1999, p. 24; Meyer 2003; Gregory 2004.

is infinitely expandable, however, so that an expert may move an object to a higher level of resolution in the hierarchy, or for that matter create new chronotypes to accommodate the expert's knowledge. New chronotypes were often created by the processing teams in the field.

Further, the chronotype is based, whenever possible, on standard definitions of artifacts used by ceramicists in different period specializations. The system is thus flexible and not based on definitions of "wares" that may be appropriate for one period but not for others. In some cases an individual chronotype may be what most scholars call a "ware," but in others it may be defined by decoration (e.g., types of transfer prints on the same "ware," types of combing on Late Roman amphoras) or some other characteristic that has chronological significance. The system easily accommodates multiple identifications, so that a scholar should be able to search the pottery using different definitions—thus, it does not matter for analysis if an amphora is identified by Dressel type, Bernice type, Williams and Peacock number, or any other system; the database recognizes these identities. Finally, because the system encourages the creation of chronotypes that accommodate ambiguous or currently undatable material (e.g., "ancient historical," "prehistoric," and "ceramic age" are EKAS chronotypes), the pressure on ceramic analysts to shoehorn objects into dubious chronological, functional, or fabric categories is reduced, and problematic material can be differentiated on broad, hierarchical scales of probability rather than wrongly classified or simply consigned to oblivion.[66]

The chronotype for a kind of Roman red-slipped pottery is illustrated in Figure 11. In this well-developed chronotype, the hierarchy includes class (pottery); subclass (fine ware); subdivision (Roman fine ware); type (Roman red slip); subtype (African Red Slip); form (Form 50); and subform (Form 50B).

Chronotype as a Method for Field Collection

As a method for collecting artifacts in the field, the chronotype addresses the problem of obtaining a systematic sample of artifacts by generating information about both the *quantity* and *variety* of the artifacts encountered in a given physical space (DU, EDU, or portion of LOCA). The "clicker" count provides a very rough indication of raw and relative densities of various classes of artifacts, but does not allow chronological or functional differentiation beyond gross categories such as pottery, tile, lithics, and so on. The chronotype system offers a compromise between the impossible goal of recording all artifacts and the unacceptable option of gaining only an impressionistic view of the material residing in a given space. The essence of this compromise is the principle that fieldwalkers pick up all artifacts they encounter, with the important exceptions of those that duplicate ones already collected. By "duplicate" we mean that the artifact is the same in terms of (1) material (color, thickness, coarseness, etc.); (2) shape or body part; and (3) decoration (slip, glaze, etc.). For instance, each fieldwalker picks up only one example of identical coarse, red body sherds, but if different parts (formal elements) of the same fabric or vessel type are encountered, one of each is picked up as well. Thus, since by convention

66. Hayes 2000, pp. 105–106.

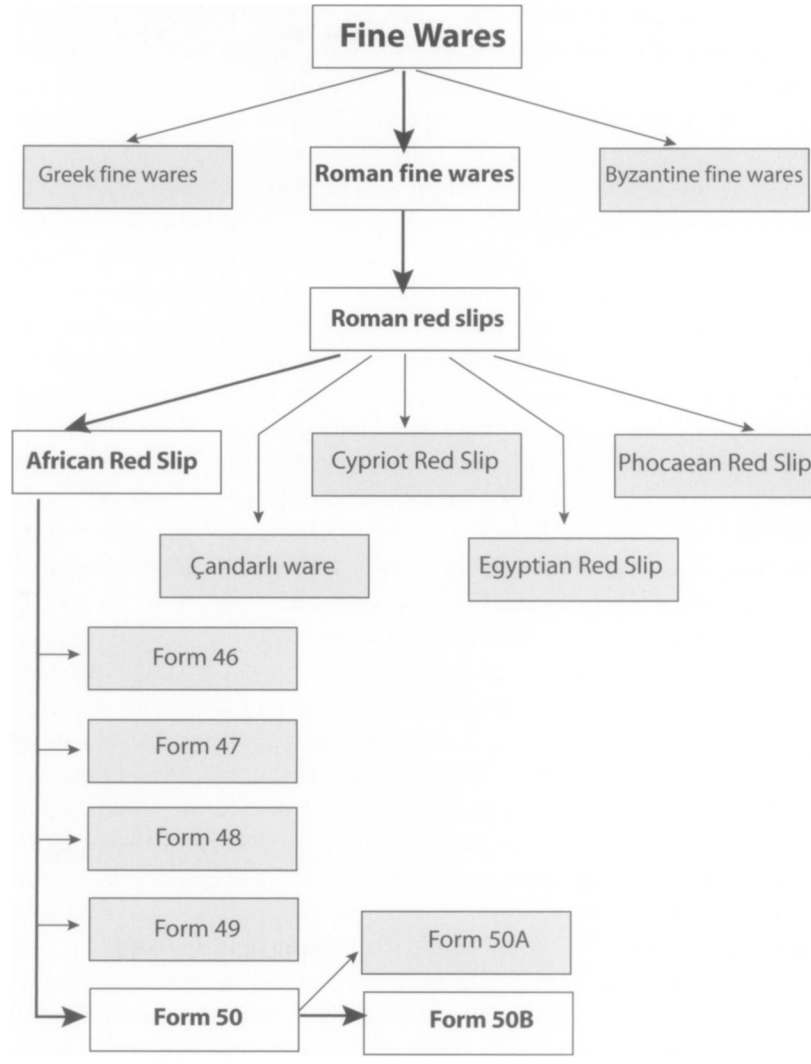


Figure 11. Example of a well-developed chronotype for a variety of Roman red-slipped fine ware.
T. F. Tartaron, after Gregory 2004, p. 22, fig. 2.4

we identify five different vessel components (rim, handle, neck/shoulder, body, base), a single fieldwalker may theoretically collect up to five pieces from the same kind of vessel (or even the same vessel). This measurement is not, of course, precise, but it does provide systematic evidence that allows comparison across the survey area.

The notion of the chronotype may be compared with two widely used alternative methods—diagnostic collection and total collection—for effectiveness in generating information about quantity and variety. Diagnostic collection involves the pickup of "diagnostic" artifacts, a category that in ceramics typically includes all rims, bases, handles, and necks or shoulders, as well as all painted or decorated sherds—the principle being that the original form or classificatory type of the whole vessel can be reconstructed from the diagnostic features of these sherds. Yet such collections are ineffective measures of variety since entire classes of artifacts, i.e., coarse or undecorated body sherds (which may have no corresponding diagnostic parts preserved), are considered nondiagnostic and as a consequence are not collected. Further, since diagnostic collections are biased—producing

unlimited numbers of specific kinds of highly recognizable types at the expense of others—they are notably poor at measuring relative quantities of ceramic types.

"Total" collection, in which surveyors pick up all artifacts they observe in their survey swaths, naturally yields the most accurate measures of quantity and variety,[67] but often at an unacceptable cost in terms of time and burden on processing and storage systems. Under conditions of low artifact density, total collection may be viable or even essential, but in the generally artifact-rich eastern Corinthia, it is not a feasible option.

Chronotype collections present an appealing compromise because they generate an accurate and reliable measure of variety in a given unit, while offering a coarse yet systematic estimation of relative quantities of artifact types. Because the chronotype system promotes the collection of all ceramic forms and fabrics, the variety it captures should be as comprehensive as that of a total collection, without the massive amount of largely redundant material. The system generates ratios of artifact quantity by type (i.e., chronotype) that are far coarser than those obtained by total collection, yet while not as precise they should nevertheless be accurate,[68] and they are entirely consistent with our requirement for assembling basic data over a broad swath of the landscape.

Of course, chronotype collections do not solve all problems associated with in-field sampling of artifacts. The downside to any artifact sampling strategy is that the burden of recognizing artifacts sometimes devolves upon inexpert surveyors, who, it might be argued, lack the experience to recognize the fine physical attributes distinguishing one type of artifact from another. The chronotype system is designed so that even inexperienced fieldwalkers can effectively select representative samples, and the pottery specialists working with teams in the field report that it is rare that two distinct pottery types are so similar in all characteristics that they cannot be distinguished by fieldwalkers with minimal chronotype experience. Nonetheless, EKAS adopted a cautious policy in implementing the chronotype system: fieldwalkers were instructed to pick up an artifact whenever there was doubt as to whether that artifact was a duplicate sample of a chronotype already collected in their swath. In practice, the EKAS finds database confirms that fieldwalkers overcollected rather than undercollected data, producing some redundant chronotypes for their swaths and "outcollecting" the resolution of our ceramic analysts in assigning sherds to any specific chronological period.

Over the course of three seasons, fieldwalkers counted 146,599 artifacts in DUs.[69] Most of the artifacts counted were pottery (74.5%) and

67. Even total collection is not a perfect tool, since geomorphological and human factors always place limits on the fullness of the archaeological record detected at a single moment in time, and total collection is not synonymous with total coverage of a given survey space.

68. Meyer and Gregory 2003.

69. This total includes only artifacts from the survey of standard discovery units, and does not include experimental, extensive, LOCA, and other units sampled in nonstandard ways, thus accounting for the quantitative difference between this analysis and the numbers reported for all units in the section on artifact processing below.

TABLE 5. FIVE PERIODS REPRESENTED MOST FREQUENTLY IN DU SURVEY FINDS

Period	*Dates*	*Time Span (Years)*	*Number of Artifacts*	*Percentage Analyzed*
Ceramic age	6700 B.C.–A.D. 2000	8,700	5,695	14.9
Ancient	6700 B.C.–A.D. 700	7,400	7,748	20.2
Post-prehistoric	1050 B.C.–A.D. 2000	3,050	1,923	5.0
Ancient historic	1050 B.C.–A.D. 700	1,750	9,563	24.9
Late Roman	A.D. 250–A.D. 700	450	1,707	4.5
Total			26,636	69.5

tile (24.4%) fragments, with lithics (0.4%) and other types of artifacts (e.g., marble revetment, glass, metal) together comprising less than 1%. Of the counted artifacts, 38,337 (26.2% of the artifacts seen) were collected using the chronotype system and subsequently analyzed by the processing team.[70] What does this body of data suggest about the implementation of the chronotype system as a whole?

On the one hand, our data support the observation made time and again that the vast majority of pottery encountered by Mediterranean survey projects is not especially diagnostic to chronological period.[71] The five periods represented most frequently (Table 5) include 69.5% of all analyzed artifacts, and only one of these periods—Late Roman—can be considered narrow or precise. Moreover, the 15 chronotypes listed in Table 6 are a tiny minority of the nearly 600 chronotypes noted in three years of survey, and yet constitute a remarkable proportion of the overall pottery counted and processed in the field (23,480 of the total number of artifacts recorded; 61.2% of all chronotyped artifacts). These figures suggest that our fieldwalkers did not miss the significant quantities of poorly diagnostic medium coarse wares, kitchen wares, and tile fragments that littered the surface of their survey units.

A more specific piece of evidence, moreover, indicates that fieldwalkers generally overcollected artifacts on the basis of perceived differences in the physical attributes of the artifacts. In principle, the maximum number of specimens of a single chronotype that any walker should collect in a swath is five, representing the five different parts of the vessel (see discussion above). In practice, the average ratio of chronotype sherds to each walker swath should be much lower, since rim, base, and neck/shoulder fragments are not found as frequently as body fragments.[72] Given that body fragments frequently constitute the great majority (often 70%–99%) of the most abundant chronotypes, we should expect a chronotype:walker

70. The figure of 38,337 is based on standard chronotype collection procedures and excludes other rare types of collection, such as grab samples.

71. E.g., Haggis and Mook 1993, pp. 265–267; Annis, van Dommelen, and van de Velde 1995, pp. 143–148; Millett 2000, pp. 53–57.

72. The average ratio of chronotype to walker is calculated on the basis of units where that chronotype was discovered. Hence, units that did not yield examples of the chronotype do not factor into the average ratio for that chronotype. As one example, in DU 1785, one piece of "Medium coarse ware, ancient" was produced from two walker swaths, giving a ratio of 0.50. The average ratio for a chronotype is simply the average of the ratio of chronotype:walkers in all units where that chronotype was found.

TABLE 6. FIFTEEN CHRONOTYPES REPRESENTED MOST FREQUENTLY IN DU SURVEY FINDS

Chronotype	*Period*	*Count*	*Chronotyped Artifacts (%)*
Medium coarse ware, ancient	ancient	5,360	14.0
Medium coarse ware	ceramic age	4,909	12.8
Medium coarse ware, ancient historic	ancient historic	3,785	9.9
Tile, ancient historic	ancient historic	1,830	4.8
Amphora, ancient historic	ancient historic	1,236	3.2
Kitchen ware, ancient	ancient	1,149	3.0
Tile, Lakonian, ancient historic	ancient historic	830	2.1
Tile	post-prehistoric	829	2.1
Kitchen ware, ancient historic	ancient historic	719	1.9
Spirally Grooved ware	Late Roman	702	1.8
Wheel-Ridged ware	Roman	568	1.5
Kitchen ware	ceramic age	406	1.1
Pithos, orange and blue core	Archaic–Classical	401	1.0
Tile, Lakonian	post-prehistoric	385	1.0
Combed ware	Late Roman	371	1.0
Total		23,480	61.2

ratio to be, on average, below 1, where each fieldwalker on average collects no more than one specimen (usually a body sherd) of a chronotype per swath. In reality, what we find is that the average ratio exceeds a value of 1 in eight of the 15 most abundant chronotypes found in DUs (Table 7). This result indicates that fieldwalkers collected sherds on the basis of physical attributes that did not prove to be typologically significant during ceramic analysis. By contrast, the three lowest ratios in Table 7 belong to the Roman/Late Roman chronotypes (Combed ware, Spirally Grooved ware, and Wheel-Ridged ware), the most diagnostic of these 15 chronotypes, readily defined by their characteristic surface treatments. The average ratio of chronotype sherds to walker in units where these chronotypes are found is much lower (0.44 to 0.47), suggesting in part that fieldwalkers felt more confident in *not picking up* additional specimens of the same chronotype after they had already collected examples. This would seem to indicate that in the implementation of the chronotype system, the inherent fieldwalker bias favors overcollecting coarse, poorly diagnostic body sherds (e.g., the medium coarse wares) rather than more obviously diagnostic artifacts (e.g., Combed ware).

While it is impossible to quantify the absolute effectiveness of implementing the chronotype system in the field, these data suggest that we can be confident that our fieldwalkers collected *more* artifact data than was necessary for the resolution of our analysis. And while a certain amount of redundant data were collected, the implementation of the chronotype

TABLE 7. CHRONOTYPES REPRESENTED BY EXTANT VESSEL PORTION

Chronotype	*Vessel Portion*					*Total*	*Ratio of CT to Walker**
	Body	*Base*	*Handle*	*Neck / Shoulder*	*Rim*		
Medium coarse ware, ancient	4,594 (85.7%)	81 (1.5%)	430 (8.0%)	16 (0.3%)	239 (4.5%)	5,360	2.88
Medium coarse ware	4,248 (86.5%)	89 (1.8%)	316 (6.4%)	24 (0.5%)	232 (4.7%)	4,909	2.90
Medium coarse ware ancient historic	2,988 (78.9%)	73 (1.9%)	446 (11.8%)	11 (0.3%)	267 (7.1%)	3,785	2.61
Tile, ancient historic	1,821 (99.5%)	—	—	—	9 (0.5%)	1,830	1.42
Amphora, ancient historic	688 (55.7%)	50 (4.0%)	418 (33.8%)	32 (2.6%)	48 (3.9%)	1,236	1.05
Kitchen ware, ancient	738 (64.2%)	12 (1.0%)	173 (15.1%)	3 (0.3%)	223 (19.4%)	1,149	1.35
Tile, Lakonian, ancient historic	717 (86.4%)	—	—	—	113 (13.6%)	830	1.11
Tile	825 (99.5%)	—	—	—	4 (0.5%)	829	1.06
Kitchen ware, ancient historic	483 (67.2%)	19 (2.6%)	86 (12.0%)	3 (0.4%)	128 (17.8%)	719	0.93
Spirally Grooved ware	700 (99.7%)	—	1 (0.1%)	1 (0.1%)	—	702	0.44
Wheel-Ridged ware	560 (98.6%)	1 (0.2%)	2 (0.4%)	2 (0.4%)	3 (0.5%)	568	0.47
Kitchen ware	280 (69.0%)	4 (1.0%)	58 (14.3%)	13 (3.2%)	51 (12.6%)	406	0.64
Pithos, orange and blue core	347 (86.5%)	9 (2.2%)	2 (0.5%)	6 (1.5%)	37 (9.2%)	401	0.71
Tile, Lakonian	374 (97.1%)	—	—	—	11 (2.9%)	385	0.87
Combed ware	371 (100%)	—	—	—	—	371	0.44

*Figure represents the average ratio of chronotype count to walker count per DU.

system also seriously reduced the amount of artifact processing in the field, since little more than a quarter (26.2%) of all artifacts counted for these units were analyzed. The system thus permitted us to minimize the corpus of artifacts to record while simultaneously enabling us to systematically and representatively map a complex artifactual landscape.

Systematizing Periods from Chronotype Data: The Case of the Late Roman "Explosion"

EKAS also generated evidence that the chronotype system can reveal meaningful patterns of relative ubiquity among artifact types. We may explore this by examining the apparent expansion of activity across Mediterranean landscapes in Late Roman times.[73]

Landscape archaeologists have frequently interpreted the abundance of Late Roman pottery across Greek landscapes as an indication of a final

73. For a fuller discussion, see Pettegrew, forthcoming.

phase of economic prosperity for the province of Achaia, perhaps corresponding to population growth, intensification of agriculture, or even imperial policy.[74] Although there has been recent discussion about the relative representation of particular periods in survey data,[75] there has been little effort to analyze the degree to which the differential visibility and identification of Late Roman pottery might exaggerate this period on the ground and, by consequence, lead to a misimpression of settlement "explosion" in the countryside.

The EKAS data for the Late Roman period support the general pattern of a very busy Late Roman countryside (Fig. 12) but also provide insight into the material ingredients that create the Late Roman "spike" in the eastern Corinthia. On the one hand, material that can be securely tied to the Late Roman period is ubiquitous: Late Roman ceramic fragments are found in nearly half of all survey units (43.2%, compared, for example, to 14.5% for the Early Roman period). Furthermore, Late Roman pottery constitutes almost 4.5% of all pottery analyzed, making Late Roman the best-represented period in EKAS. By stark contrast, the material from periods immediately preceding and following the Late Roman period forms less than a percent of the total number of analyzed artifacts.

As indicated in Table 6, two of the 15 most abundant chronotypes in the eastern Corinthia—Spirally Grooved ware and Combed ware—belong to the Late Roman period, and form a substantial part (2.8%) of the overall number of artifacts analyzed from intensive survey units. These two chronotypes also constitute the majority (62.8%) of the 1,707 total pieces of Late Roman pottery, even though some 30 other chronotypes dating to the Late Roman period were recorded.

The great majority (83.0%) of Late Roman wares analyzed by EKAS represent coarse wares and amphora fragments, with fine wares (9.7%) and kitchen wares (5.6%) following meagerly behind. To offer one immediate contrast, the Early Roman period is more evenly divided between medium coarse wares and amphoras (36.2%), fine wares (38.0%), and kitchen wares (24.9%). In the eastern Corinthia, utilitarian vessel fragments are much more important signatures of the Late Roman period than are fine-ware fragments. The point is even more significant when we consider that the great majority (83.5%) of cases of Late Roman medium coarse and amphora chronotypes are body fragments. The obvious source of this enormous corpus of Late Roman body sherds are those two predominant chronotypes—Spirally Grooved and Combed wares—that are easily identified as Late Roman by their characteristic surface treatment. Again, by contrast, the Early Roman period, usually recognized through fine-ware rims (found far less frequently than coarse-ware body sherds), may be a more typical ceramic period in terms of its visibility in archaeological survey. Taking into account these factors, the Late Roman settlement "explosion" in the eastern Corinthia is more aptly described as an "upturn," and even this designation need not indicate increased habitation.[76]

Our results show that highly visible and identifiable artifact types occur frequently using the chronotype system just as they do using more tradi-

74. Bintliff and Snodgrass 1988; Bintliff 1991, pp. 126–127; van Andel and Runnels 1987, pp. 113–117. For recent reviews and discussion, see Rautman 2000; Shipley 2002, pp. 329–331; Kosso 2003; Caraher, Nakassis, and Pettegrew 2006, pp. 21–26; Pettegrew, forthcoming. The term "Late Roman" is often defined as the period between the 3rd/4th and early 7th centuries A.D.; for EKAS, "Late Roman" corresponds to the dates A.D. 250–700.

75. Bintliff, Howard, and Snodgrass 1999, with several responses and a rejoinder in *JMA* 13 (2000), and continued discussion in Bintliff et al. 2002. For further critique, see Davis 2004.

76. Pettegrew, forthcoming; Caraher, Nakassis, and Pettegrew 2006, pp. 21–26.

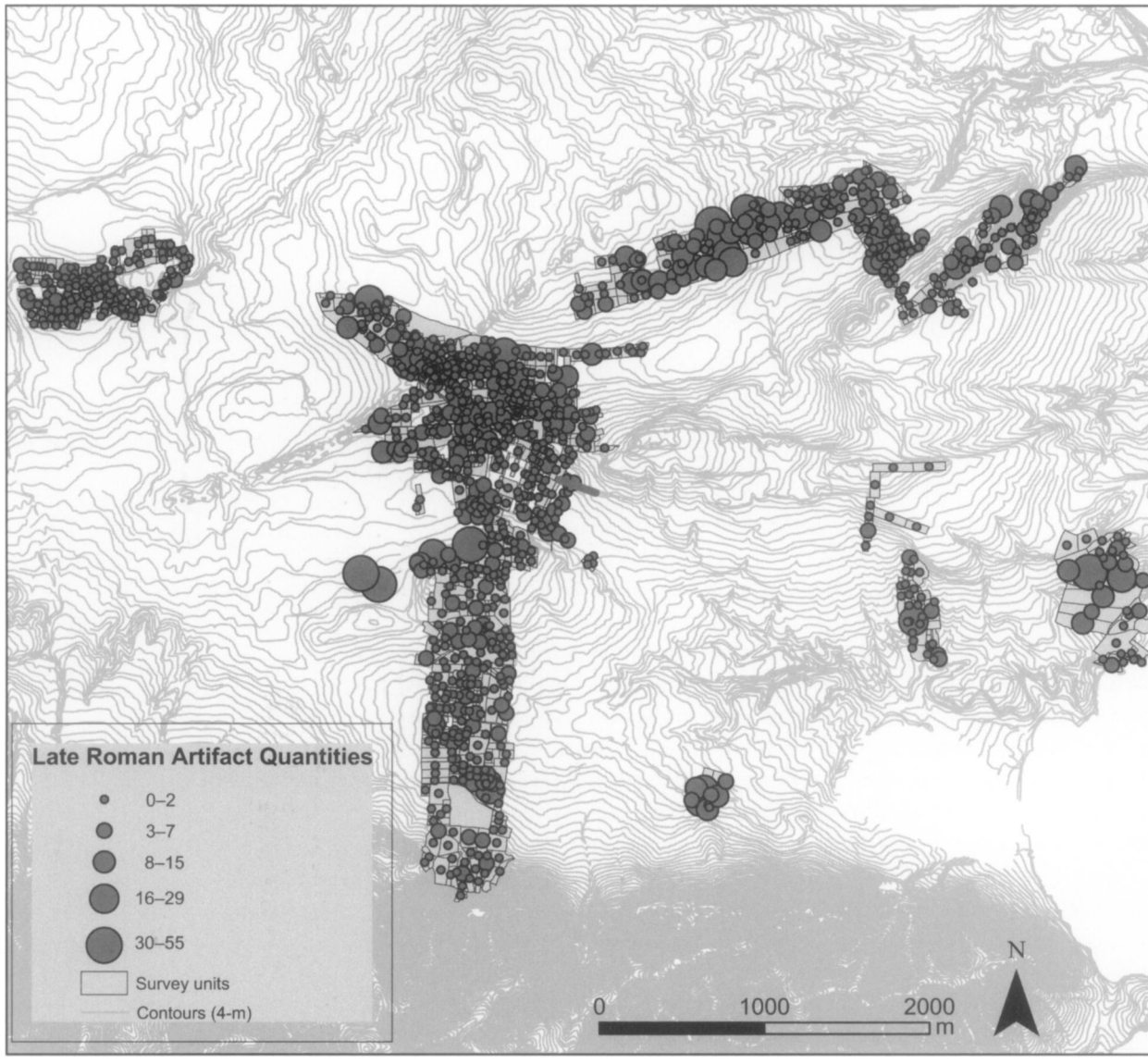


Figure 12. Late Roman artifact quantities in DUs in the northern Corinthian plain

tional collection methods. The limit of five pieces per type per walker per survey unit had little effect, given the rarity of attaining maximum collections of any chronotype. But the example of Late Roman pottery also points to a fundamental problem in Mediterranean survey that the chronotype does not solve: our general inability to date coarse-fabric sherds. Until we are better able to identify coarse wares of other periods, comparisons and inferences based on the coarse-ware-dominated Late Roman assemblage are likely to be problematic. Without targeted studies of all fabric types correlated with data from stratigraphic excavations,[77] there is little hope that differential visibility and invisibility of archaeological periods can be adequately addressed. It is worth noting that the emphasis of the chronotype system on capturing the full variety of forms and fabrics will facilitate this endeavor in a way that diagnostic and grab collections cannot.

77. See Haggis and Mook 1993 for an excellent application of this strategy to prehistoric coarse fabrics on Crete.

Figure 13. Examples of artifacts recorded in the field

In-Field Processing

In an effort to minimize the volume of material removed from the landscape, EKAS pursued a low-impact collection strategy. This strategy was prompted by our concerns about the repercussions of collecting large samples, but also by permit restrictions about removing off-site material. The processing team, staffed by artifact experts and illustrators, was the methodological extension of the low-impact collection strategy, charged with the responsibility for identifying, recording, photographing, and drawing objects picked up by survey teams. Processing data in the field avoided time-consuming and poorly rationalized collections, eliminated the need for extensive storage facilities, and provided a unique opportunity for dialogue between artifact experts and those responsible for identifying and collecting appropriate material.

The processing teams operated in close concert with field teams engaged in discovery-phase survey. Following behind the survey team, the processing team entered a survey unit once it was finished. Bagged artifacts were described, and selected artifacts were measured, drawn, and photographed using a digital or standard camera (Fig. 13). In many cases the processing teams simply recorded as much basic information as could be discerned about an artifact, in accordance with the chronotype classification system. Toothbrushes and dental picks were often used to clean artifacts, and selected objects were also washed as deemed necessary. Along with records kept by the survey teams, the processing team's work forms the basis for inferences about chronology and function.

Although artifacts could not be retained from the DUs for permanent collections, the processing system generated a thoroughly documented archive of information consisting of drawings, photographs, and detailed descriptions, which is augmented by substantial artifact collections that we were permitted to make from LOCAs (see below). The processing teams

recorded 48,558 of the 158,802 objects counted in the field by all methods (30.6%); of the objects recorded, 1,919 (4.0%) were retained for permanent storage.[78] This material will be available for inspection by experts, who will also have access to the finds database for analytical purposes. Furthermore, because most of the artifacts were left in the field, selected DUs may be revisited to evaluate and expand information about the archaeological assemblages found in them.

Localized Cultural Anomalies (LOCAs)

In the course of walking DUs, survey teams frequently encountered surface scatters of archaeological material or recognizable architectural features that were insufficiently documented by discovery-mode survey alone. As noted earlier, the traditional concept of the "site" has become increasingly problematic in theoretical and methodological terms. The concept has been forcefully critiqued,[79] discrediting the equation of site with habitation and questioning the status of artifact scatters as behavioral entities that can be "discovered" and interpreted in archaeologically meaningful ways. Surface phenomena do not universally resist interpretation, for standing architectural remains, caves, and graves are potentially well-bounded, functionally interpretable loci that are often detected during surveys. But surface artifact scatters must be seen as modern phenomena affected by complex, long-term postdepositional processes that have obscured or obliterated behavioral patterning in possibly unknowable ways.

The challenge for survey archaeologists is to untangle the complex interactions of geological and cultural structuring that result in these scatters,[80] and to interpret them in the context of the overall landscape rather than from a strictly site-based perspective. Several innovative approaches have recently been developed, including long-term replication studies,[81] geophysical remote sensing,[82] phosphate analysis,[83] and controlled collections followed by limited, targeted excavations.[84] A recent approach in Lakonia combined gridded surface collection, limited coring to a depth of 20 cm, geophysical survey (resistivity and magnetometry), and chemical analysis for mineral magnetic properties and levels of key elements at 20 small, dense rural scatters.[85]

Because our permit prohibited all manner of subsurface testing, EKAS focused on careful investigation of the geomorphological processes acting upon localized parcels of land on which anomalous artifact densities were found. Using this information, field teams were better able to identify scatters with sufficient integrity to warrant further investigation. Geophysical prospection was applied to a small selection of LOCAs to test for subsurface architecture and other features.[86]

78. The discrepancy between these figures and those reported above (see pp. 478–479) arises because the former include materials recovered in LOCAs and in nonsystematic survey.

79. See esp. Dunnell 1992.

80. Schiffer 1972, 1987; Taylor 2000.

81. Ammerman 1985, 1995.

82. Weymouth and Huggins 1985; Kvamme 2003; Sarris and Jones 2000.

83. Cavanagh, Jones, and Sarris 1996.

84. Shott 1995; Dunnell and Simek 1995.

85. Cavanagh, Jones, and Sarris 1996; Mee and James 2000.

86. Sarris 2003.

Archaeologists have generally retreated from terminology that makes transparent associations between artifact scatters and traditional functional classes of sites, giving rise to such concepts as the "place of special interest" (POSI).[87] Areas with concentrations of POSIs, forming interpretable landscapes of human activity, have often been termed "special interest areas" (SIAs).[88]

We have preferred the term "localized cultural anomaly" (LOCA). The elements of this term explain the concept: (1) localized, thus having some spatial integrity, or clustering, by which a scatter or feature may be distinguished from the material or the landscape around it; (2) cultural, thus a product of human manufacture or modification, and not (as far as we can tell through geomorphological study) the result of natural causes; and (3) anomaly, thus standing out qualitatively or quantitatively from the surrounding material or landscape. Typically, the designation of a LOCA relied first on the detection of a higher density of one or more classes of artifacts (e.g., Classical black-slipped pottery, obsidian bladelets) or of chronologically associated objects, relative to densities of the same materials in adjacent units on the landscape; and second, on the identification of definable edges to the artifact scatter. The designation of a LOCA was viewed as an invitation to further study in the hope of extracting useful behavioral information from it.

LOCAs were designated by team leaders in consultation with fieldwalkers, geomorphologists, processing team members, and other experts. In-field consultation played a crucial role in these decisions, as did our use of GIS, which allowed for the display of large amounts of data, such as artifact densities, in a clear and understandable format. Many LOCAs, though not nearly all, were subjected to further, more intensive methods of field investigation. We adopted a flexible approach to investigating them, in recognition of their diversity in material, size, complexity, and terrain conditions. In many cases, a grid composed of 10 × 10 m squares was superimposed over the entire LOCA. These squares became sampling units within the LOCA, allowing us to gain fine spatial control over the locations of artifacts and features. For some LOCAs, samples were recorded and collected from all squares, while in others only a selection of the sample squares was investigated. Within the squares, artifact collections ranged from total collection to chronotype collections of the entire square or of a 5-m^2 sampling circle therein. The field processing team followed the LOCA team to carry out a chronotype analysis of the artifacts. Each investigation was supplemented by photography and geomorphological description, and with topographic mapping or geophysical prospection as needed. We received permission to collect artifacts from many LOCAs for curation and study in the laboratory.

87. Davis et al. 1997, p. 401, n. 27; Given et al. 1999, p. 24; Given and Meyer 2003, pp. 34–35. Noncultural phenomena have also been designated POSIs, e.g., geomorphological or botanical POSIs (M. Given, pers. comm.). Note that in spite of such new formulations, archaeologists remain reluctant to part with the site concept (Caraher, Nakassis, and Pettegrew 2006, pp. 7–9, 14).

88. Given and Meyer 2003, pp. 35–36.

Chronotype Artifact Collections from LOCAs: An Experiment

LOCA 9002, a large, dense artifact scatter, was encountered in 1999 on the gently sloping south side of Rachi Boska (Fig. 6). In 2000 a sample collection was made there from a grid of 40 10 × 10 m squares superimposed over an area 80 m (N–S) × 200 m (E–W). Because this was one of the first LOCAs we designated, we employed four different sampling techniques in 10 "experimental" squares in an effort to establish an optimal sampling strategy for similar dense scatters. In each experimental square, we collected the following samples: (1) chronotypes from a 5-m^2 circle within the grid square (a 5% sample); (2) the remaining artifacts from the circle; (3) chronotypes from the rest of the square; and (4) the remaining artifacts from the square. With these samples, we could form four distinct collections: (1) the chronotype collection of the circle (sample 1); (2) the complete collection of the circle (samples 1 and 2 combined); (3) the chronotype collection of the square (samples 1 and 3); and (4) the complete collection of the square (samples 1–4).

We sought to clarify two parameters of LOCA sampling: first, by comparing samples from circles with samples from entire squares, we would see if the smaller sample provided by a 5-m^2 circle would be sufficiently representative of the artifact types on the surface. Second, by comparing the total artifact collection with the chronotype collection, we could measure the effectiveness of the chronotype system in delivering a representative sample of the artifacts in the LOCA. The results of the experiment are quite informative. Collection 1 (the chronotypes from the circles) consisted of 77 chronotypes, or 34% of a total 229 chronotypes from the squares. Collection 2, the entire circle, contained 111 chronotypes (48%), and Collection 3, the chronotype collection of the square, 208 chronotypes (91%). By any reasonable standard, the sampling circles failed uniformly to capture an acceptable proportion of total chronotypes within the 10 × 10 m squares, whether subjected to total or chronotype collection. On the other hand, in chronotype collections of entire squares, 91% of all chronotypes were recovered.

In view of the substantial amount of time saved, the chronotype collection from squares appears to be a reasonable compromise between time spent and information obtained. These data also indicate that loss of information stemmed not from using the chronotype system rather than total collection, but instead from examining a small areal sample of the dense surface concentration. Thus, we are confident that chronotype collections produced accurate and precise accountings of the range of materials present at the artifact concentrations we designated as LOCAs.

Multiple Landscape Perspectives on LOCAs

In recognition of the inescapable element of subjectivity attached to designating LOCAs in the field, EKAS developed alternative means of analyzing and interpreting artifact density data, complementing in-field LOCAs with cultural anomalies revealed only through the application of GIS analysis. We may illustrate this approach using a simple example drawn

from intensive survey in and around the large Classical site of Kromna in the northern Corinthian plain (analyzed in detail below).

The designation of LOCAs in the field by team leaders was a relatively conservative and intuitive process (Fig. 14:a). Mapped against a background of raw artifact densities, we see that most, but not all, areas of high or relatively high artifact density were declared LOCAs, but so also were some areas of relatively low density. In-field decisions were apparently driven more by anomalous occurrences of architecture or particular types of artifacts than by density alone—in other words, attributes such as chronology and function that are variables independent of density were deemed to be of great importance. This perspective must have been influenced also by a sense of uncertainty about extracting coherent, meaningful cultural entities from relatively continuous carpets of material, characterized by palimpsests of residue from many periods of the past.

Although exceptionally high artifact densities were normally recognized in the field, particular densities take on archaeological significance only in the context of the survey universe as a whole, something rarely perceived by archaeologists whose daily frame of reference is limited to a relatively small percentage of the total survey area. Consequently, the anomalous and even cultural nature of many localized concentrations of artifacts emerged only once the densities—that is, the number of artifacts per area walked, or per total unit area—were analyzed and compared against a wide range of environmental, cultural, and archaeological variables and constants. For example, the GIS-generated maps of "density LOCAs," defined as units where artifact density exceeded a certain threshold established either arbitrarily (e.g., the top 15% or 20% of units) or statistically by a Jenks (K-means) equation that grouped units according to "natural breaks" in the data. Raw density figures produce both *more* and *different* LOCA units than the in-field set when a threshold of the top 20% (quintile) of all units in raw artifact density is applied (Fig. 14:b).

Moreover, the GIS and our survey databases allowed us to analyze the environmental data (such as ground visibility, ground cover, and surface clast composition) collected from each unit, against which we could better evaluate artifact densities. For example, we were able to identify units with exceptional artifact densities per surface visibility. In many instances where visibility was poor, team leaders did not recognize anomalous concentrations of cultural material. When the density data were adjusted for ground visibility, however, certain units with low visibility but relatively high density met the threshold requirements (Fig. 14:c). Many of these lie on the periphery of raw density "hot spots," suggesting more continuous high-density scatters, where intervening areas of low artifact density are the product of discovery conditions and not the actual intensity of human activity. Similar analyses that compared artifact density to ground cover, modern land use, and background disturbance brought to our attention numerous units whose moderate or even low densities may have been produced by the limitations of surface survey methods rather than the quantities of material actually on the surface. Furthermore, by identifying high-density LOCAs among units with comparable environmental conditions, we avoided simplistic "corrections" for visibility and other environmental conditions, which tend

to assume a more fixed relationship between variations in artifact density and environmental factors.

The chronotype system allowed us to identify units with anomalously diverse artifact assemblages with respect to chronology, function, and specific artifact types. Since we could observe, for example, that the higher a unit's artifact density, the more chronologically diverse the artifact assemblage tended to be, we could suppose that exceptionally diverse units with lower-than-average densities might reflect anomalous, but essentially "invisible," concentrations of artifacts. In this way, we might identify units in which adverse environmental conditions mask culturally significant artifact concentrations.

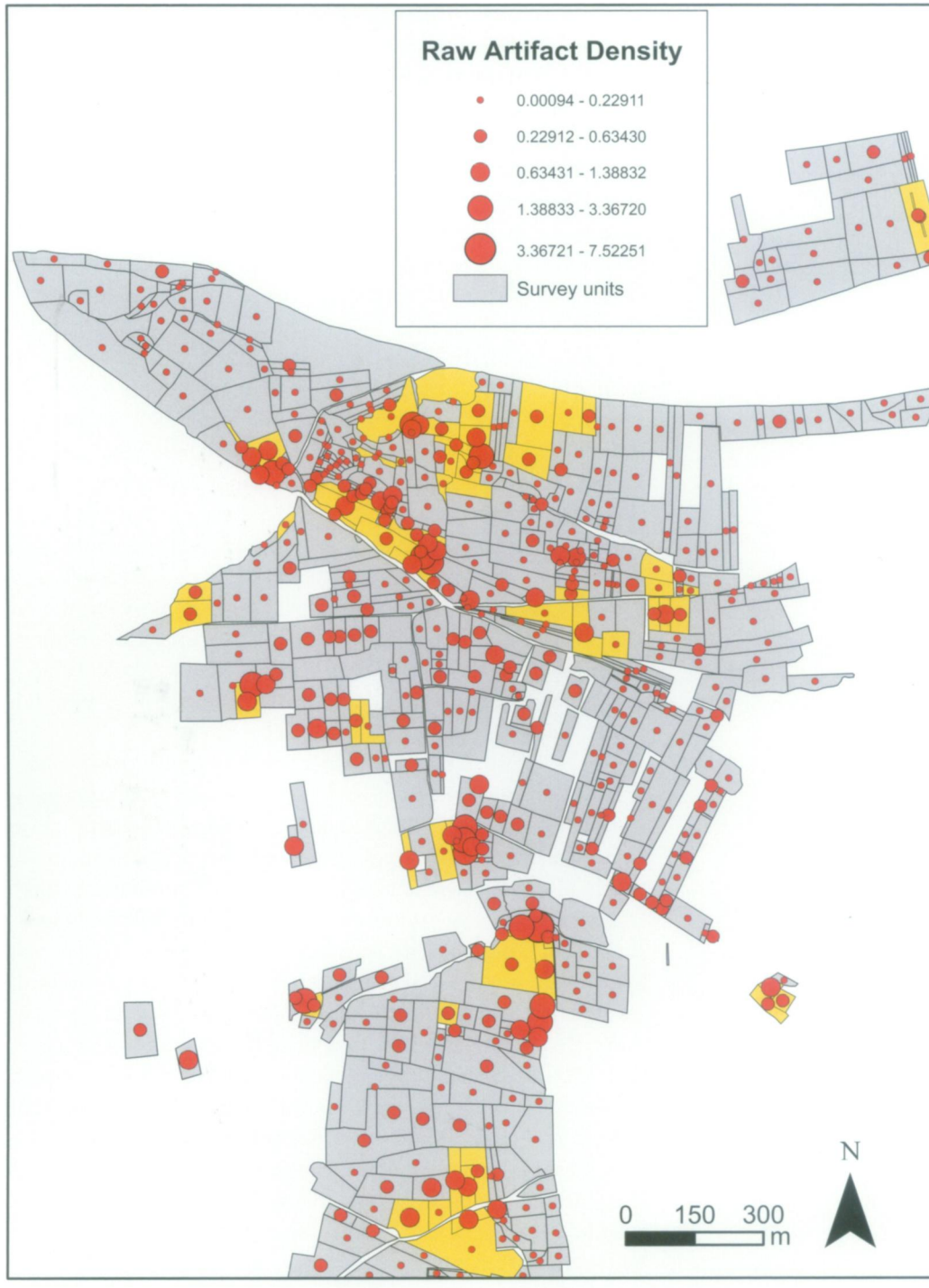
We also used GIS to analyze surface trends in artifact density patterning across the survey universe. This procedure involved comparing the artifact density of a particular unit with the densities present in its immediate vicinity, with the effect of placing seemingly isolated LOCAs in their local context, and often allowing us to group units together as potential "density SIAs." We revealed these phenomena by transforming our unit-based density data, essentially a series of complex polygons with density-per-meter values, to a raster grid where each cell of a particular standard dimension (e.g., 5×5 m) was assigned as a value the mean artifact density of the unit into which it fell. Then, a neighborhood analysis was performed: the density value for each cell was recalculated by comparing its value to those for all cells within a circle of 20-m radius around it (Fig. 14:d, e).

The effect of this analysis is first to smooth small spikes or dips in artifact densities created by such factors as very localized areas of poor visibility or small units that exist at the margins of statistical error inherent in our collection and mapping methods. Second, this method establishes fixed, quantifiable areas based on the distribution and nature of cultural material rather than arbitrarily defined modern features or local toponyms that may have little to do with patterns of the past. This is not to say that local features, geological characteristics, or modern land-use patterns could not be established as factors influencing the distribution of artifacts, but rather that we can use GIS to integrate these aspects with the archaeological data to create a landscape that blends expected cultural and environmental influences with the recorded distribution of cultural material upon the landscape. The use of fluctuating densities across broader zones defined by geomorphology, topographic entities, or blind "cells" of equal size[89] permits the patterning of cultural material to be discussed with reference not to specific spots on the landscape ("sites"), but rather to particular kinds of landscapes or resources.[90]

Such manipulations of density data, combined with EKAS's methods of defining and collecting data from survey space, suggest ways to overcome some of the obstacles, such as variable visibility, to characterizing surfaces in archaeologically meaningful ways. Although density-derived LOCAs may be viewed as more objective than those designated in the field, they rely on similarly imperfect human measurements and carry the same burden of demonstrating significance with respect to the past. Intuitively, it appears that humans are sometimes more effective at judging the cultural

89. Thomas 1975; Foley 1981; Ebert 1992.

90. Binford 1982; Schlanger 1992.



a

Figure 14 *(above and opposite)*. Alternative approaches to the designation of LOCAs in the Kromna area: *(a)* in-field LOCAs (in yellow) designated by team leaders during survey, plotted against artifact density; *(b)* LOCAs (in red) derived from top 20% of DUs in artifact density; *(c)* LOCAs (in red) derived from top 20% in artifact density adjusted for visibility; *(d)* grayscale plot showing projected trends in artifact density over the surface, using K-means equation to derive natural breaks in data and not adjusted for visibility; *(e)* grayscale plot as in *(d)*, with superimposed survey units designated as LOCAs by all other methods combined

b

c

d

e

significance of artifact scatters, while often the obstacles to detection of artifacts, and the ambiguity of fragmentary material upon recovery, combine to limit human judgment and necessitate the kinds of subsequent analyses described above. A likely outcome of our ongoing analysis is that each technique reveals different but useful information; therefore, knowledge about the past is maximized by the application of multiple perspectives. Certainly, however, the use of GIS for evaluating surface scatters in terms of density is effective in highlighting locations where revisits and reassessments should be profitable.

EXPERIMENTS TO EVALUATE AND CALIBRATE RESULTS

All regional-scale surface surveys would benefit by having an experimental component operating in tandem with the main archaeological reconnaissance. EKAS conducted a series of experiments in 1999 and 2001 with two specific aims: (1) to measure the effects of field conditions upon archaeological procedures for purposes of calibration, standardization of practice, and development; and (2) to reflexively test the efficacy of our methods. With regard to field performance, one might ask: How well do we recognize cultural material when half the surface is covered with vegetation, or when the color of red-fabric potsherds and terra rossa–stained limestone gravel is essentially the same? How does the pace of fieldwalking affect identification? Will a pace twice as fast decrease recognition by half? These questions are important ones as they influence the archaeological document that a survey produces.

EKAS assembled a team to address these and other questions. The most extensive experiments (Table 8) investigated the effects of field conditions upon artifact recovery through a series of seeding experiments in which a team of researchers planted potsherds, which had been previously photographed and described, along a 50-m tract and plotted their positions.[91] Two kinds of potential survey conditions were tested. In the first experiment, equivalent sets of artifacts were placed in a tract with optimal visibility (100%, i.e., with the ground surface not obscured), in another with poor visibility (20%), and in two others with average visibility (50%–70%). This experiment focused on the extent to which ground cover such as weeds and grain stubble hinders artifact recovery. In a second experiment, a tract with high background disturbance[92] was tested against a tract in which there were few visual distractions, in order to measure differences in artifact recognition under these two conditions. The analysis took into account vegetation cover, artifact type and appearance, and background confusion as they affected the rate of artifact recovery. The determination of recovery rates over a broad range of conditions was expected to provide a better sense of the total range and quantity of material, not only in the inspected portions of survey units, but also in the uninspected portions.

By feeding the results of the seeding experiments back into everyday practice, we contributed to the acquisition of more robust data for analysis

91. A full presentation and analysis of the experiments in the 1999 season may be found in Schon 2002.

92. Background disturbance differs from visibility in that it refers not to vegetation and other matter preventing the surface from being visible, but to clastic material in the soil itself, such as rock, or to conditions of the soil (compact, loose), which confuse the viewer or distract attention away from artifacts. A good example is that mentioned above: the confusion caused by red-stained limestone gravel that has a color similar to the red fabric of sherds.

TABLE 8. MAIN SURVEY EXPERIMENTS

Experiment	*Purpose*
Visibility and artifact recovery (seeding experiments)	Measure the effects of various field conditions upon the recovery of artifacts
Efficacy of Geomorphic Unit	Test the use of GUs to define survey units against benchmarks of person-hours and artifact patterning
Efficacy of processing artifacts in the field	Compare the chronotype classification results between washed and unwashed artifacts
Field identifications	Measure long-term effects of low-impact collection strategy vs. large artifact collections in terms of the identification and representation of artifact types and the preservation of cultural heritage
Efficacy of using the chronotype as a collection strategy	Test whether artifact collection according to chronotype principles generates representative samples of artifact types
Assessment of artifact densities (for chronotype and aggregate counts)	Develop methods and algorithms for calculating adjusted artifact densities, extrapolated from samples collected over a wide range of field conditions

TABLE 9. ARTIFACT RECOVERY PROFILE FOR SURVEYOR 1 IN SEEDED FIELDS

Field	1	1	1	2	2	2	3	3	3	4	4	4
Pass	1	2	3	1	2	3	1	2	3	1	2	3
Visibility (%)	60	50	50	10	10	10	100	100	100	70	70	70
Time of day	15:23	15:40	15:58	16:16	16:23	16:39	15:29	15:45	15:58	15:22	15:38	15:47
Sherds recovered	50	16	33	52	6	12	90	25	42	75	21	39
Sherd recovery rate (%)	50.0	53.3	61.1	52.0	20.0	22.2	90.0	83.3	77.8	75.0	70.0	72.2
Seconds	910	880	810	819	330	566	875	630	710	809	396	467
Sherds/minute	3.30	1.09	2.44	3.81	1.09	1.27	6.17	2.38	3.55	5.56	3.18	5.01

and to a more refined interpretation of artifact patterning in our standard survey units. In 1999 and 2001, the experimental team used the seeding results to create a standard for surface visibility rankings with the aid of detailed written descriptions, photographic images, and in-field collaboration with team leaders and fieldwalkers. Team leaders were charged with rating effective visibility as a percentage of potential visibility (in increments of 10 from 0% to 100%, where 0% represents total impediment to surface visibility, and 100% represents no surface or ambient impediments to visibility). The continuity of key personnel in the team leader positions ensured consistency in these observations. To serve as a further, independent check, two "visibility" photographs were taken for each DU: one overview of the unit, and one detail of a representative surface. These photographs may be used retroactively to assess the visibility rankings, which are crucial since the relationship between surface visibility and artifact recovery forms one basis for GIS analyses (described above) and ultimately for our interpretations of the survey data.

The seeding experiments generated a large dataset of records of artifact recovery by individual walkers in a variety of field conditions (Table 9). The full dataset shows that artifact recovery and relative visibility have a linear relationship, although not an equivalent one (Fig. 15). In other words, while recovery increases consistently as visibility improves from 40% to 80%, that

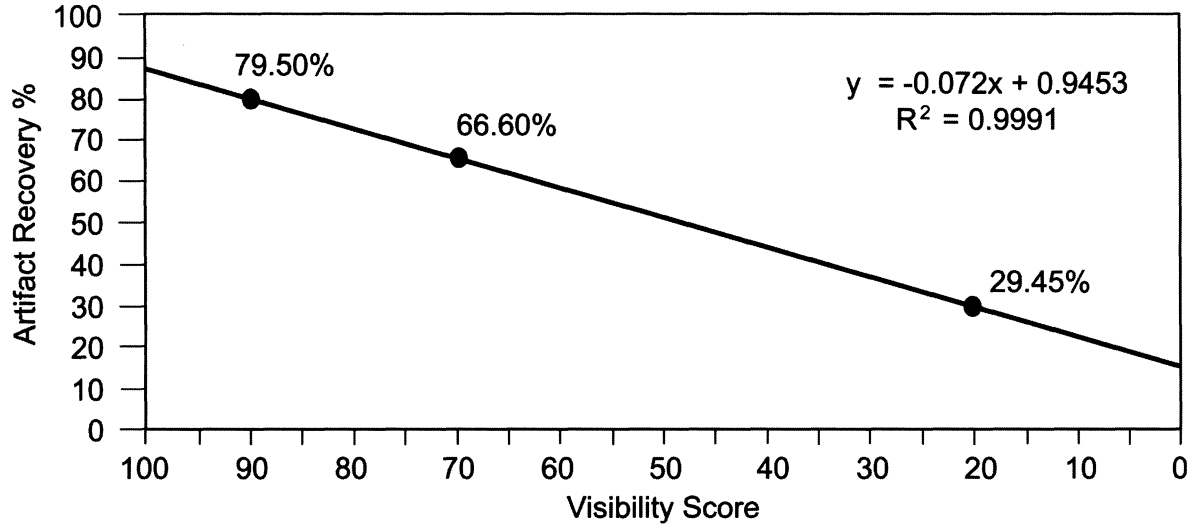


Figure 15. Graph showing the relationship between ground visibility and rates of artifact recovery, projected from artifact recovery experiments

increase is not twofold.[93] A series of recovery curves, correlated with specific discovery conditions, might be used to apply quantitative corrections to normalize visibility for all units. When visibility and artifact collection data are combined, formulas to extrapolate to adjusted artifact counts, and derived statistics such as total artifact densities, are within reach.[94]

Without such experimental data, there is no basis for explaining or attempting to control for the sources of variability in artifact recovery, although we acknowledge that myriad other factors must be taken into consideration as well,[95] some of which were also addressed by the experimental teams and are currently undergoing analysis (Table 8). Although these experimental data may be informative principally for the eastern Corinthia, they offer an excellent comparative dataset for surveys in the Mediterranean and beyond.[96] Similar experiments, adapted to local field conditions and methodological interests, would be relatively simple to devise and implement.

PUTTING IT ALL TOGETHER: THE CLASSICAL LANDSCAPES OF KROMNA

The densest and most diverse concentration of cultural material in the survey area occurred in the northern Corinthian plain in an area previously identified by Wiseman as the Classical town of Kromna. A place by this name in the Corinthia is mentioned by Callimachus in a passage that was later discussed by Middle Byzantine commentators (Callim. *Sos.* 12 [frag. 384 Pfeiffer]; Tz. *ad Lyc.* 576). In 1960, Wiseman discovered a fragment of a stone funerary monument of the late 4th or early 3rd century B.C., inscribed "Agathon of Kromna" and reused in a 3rd-century B.C. fortification tower (*SEG* XXII 219).[97] The findspot was at the north edge of a dense artifact scatter east of the modern village of Examilia. Wiseman posited a connection between the Kromna mentioned in literature and the inscription, and the extensive artifact scatter, suggesting that this site was probably "the largest inland Classical settlement on the Isthmus."[98] Although there

93. Schon 2002, pp. 149–157, chart 5.5; Meyer and Schon 2003.

94. Meyer and Gregory 2003.

95. Wandsnider and Camilli 1992; Given 2004.

96. See Schon 2002 for complete data.

97. Wiseman 1963, p. 257, fig. 4.

98. Wiseman 1978, p. 66.

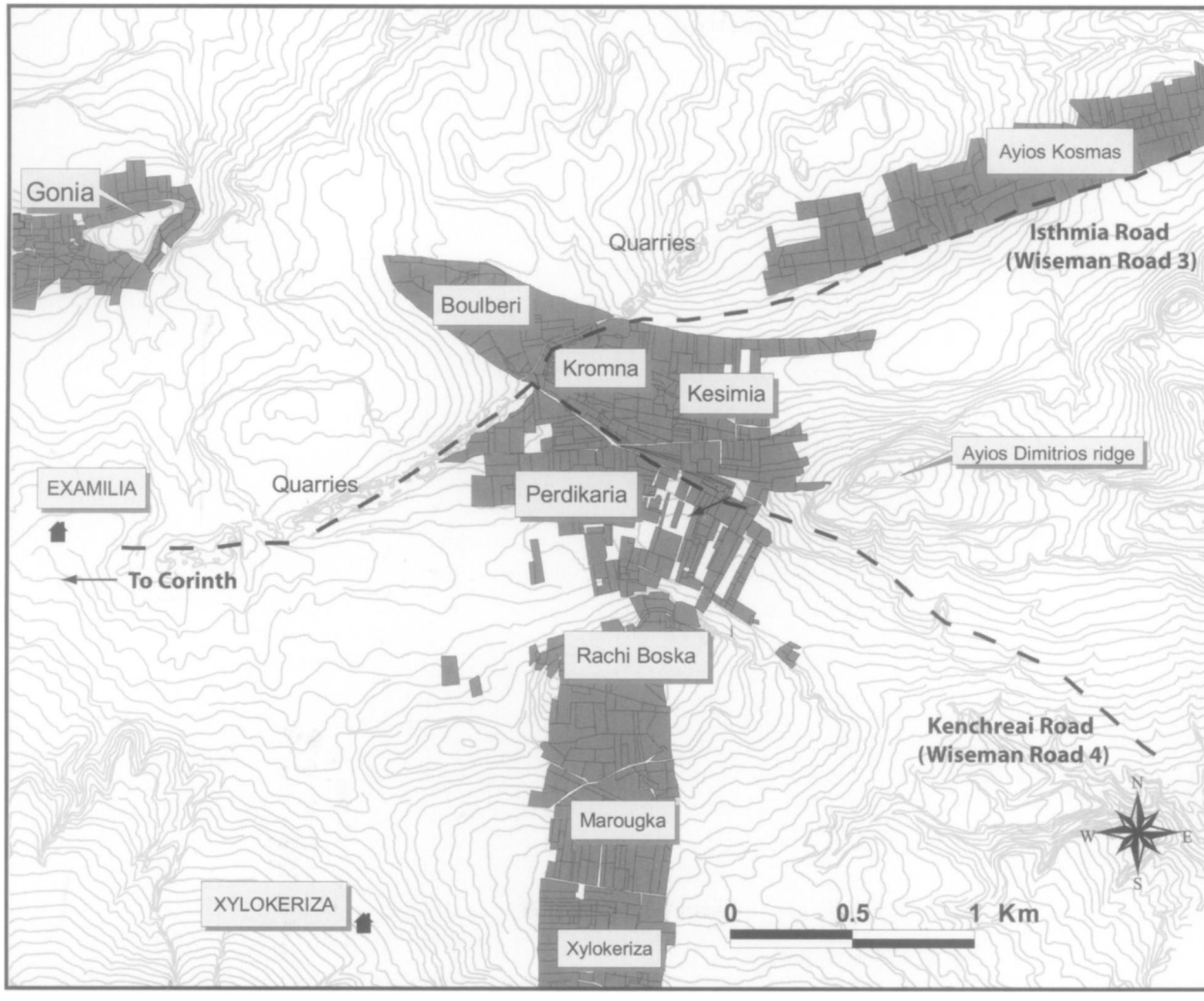


Figure 16. The environs of Kromna in the northern Corinthian plain

are now alternative readings of the literary testimony,[99] this area of the crossroads was clearly an important node of habitation and land use east of Corinth.

EKAS investigated Kromna and its environs in four survey zones with the local names Kromna, Kesimia, Boulberi, and Perdikaria (Fig. 16). The integrative approach adopted by EKAS found its most effective expression at Kromna, because so many major components of the project—intensive survey and processing, LOCA analysis, geomorphology, mortuary and modern survey, and GIS—were important for understanding the complex history behind the cultural patterns. The survey produced a variety of new kinds of information about the area, and also documented, in broader terms, the growth and cyclical development of this principal site at the Isthmian crossroads. Alongside our varied explorations, interviews with local informants conducted by the modern survey team led us to notable features and shed particular light on how the archaeological record has been transformed in recent years. The discussion that follows highlights different ways of understanding the long-term history of Kromna from a landscape perspective.

99. See *SEG* L 339; and Shipley 2000, pp. 371–372, where the author identifies the Agathon inscription as referring to a man from the polis of Kromna in Arcadia. See also Caraher, Nakassis, and Pettegrew 2006, pp. 14, 36, n. 2; and Pettegrew 2006, pp. 250–262, for a rereading of the literary testimony for a Corinthian "Kromna," which argues that the Kromna mentioned by Callimachus refers not to a Corinthian town per se, but to a place on the Isthmus sacred to or mythologically associated with Poseidon, perhaps Kenchreai.

Kromna's Physical Setting

Kromna is situated on the lowland corridor known as the northern Corinthian plain, comprising the coastal front on the Corinthian Gulf and the fertile plain behind it. The plain has been shaped mainly by geologically recent deposits (see Fig. 10, above). Behind the beach sands and gravels on the shores of the Corinthian Gulf, the plain is formed by recent sediments brought by swift-flowing rivers such as the Xerias and Solomos (or Xeropotamos, the ancient Leukon), which flow perpendicular to the coast in narrow channels cut in response to regional uplift.[100] Behind the alluvial deposits are eluvial loam and sandy loam derived from the weathering of Pliocene or Tyrrhenian sandy marls, and fossiliferous red clayey sand representing near-shore deposits. A prominent feature on the northern Corinthian plain is a series of fossil marine terraces arrayed in several arcs approximately parallel to the shore of the Corinthian Gulf. These terraces represent old beach fronts that have been subsequently uplifted and then subjected to faulting and erosion.[101] Through tectonic activity they have been tilted backward, so that the forward (roughly north-facing) edges rise prominently as cliff faces, while the trailing edges slope gently to the plain behind. The terraces have not survived intact in the Holocene; rather, erosion and the cutting of streams and gullies have left remnants of the arcs as isolated eminences rising above the plain (Fig. 10).

This unique geological configuration is important for several reasons. Because these relic terraces afford expansive views and defensive possibilities, they have been favored locations for human settlement from the earliest occupation of the eastern Corinthia. One such prominent terrace at Rachi Boska (LOCA 9001; Fig. 6), occupied repeatedly over many millennia, overlooks Kromna from the south. Long-term settlement at Kromna was supported by a branch of the Corinth fault that runs east to west directly through the ancient site (Fig. 9); along the fault numerous wells and at least one large spring hint at the permanent supply of water necessary to sustain a settlement of some size. Moreover, the terraces run longitudinally east to west, structuring and delimiting the routes of communication and transport through this area. Wiseman deduced from the known sites and the territory's geological structure that at least eight major roads must have crossed the central Isthmus. In antiquity, as today, two roads converge, one from Kenchreai and one from Isthmia, at or very near the area identified as Kromna.[102]

Finally, the northern Corinthian plain is today almost entirely cultivated, the mix of crops varying as a function of market forces and other factors affecting local farmers' decisions.[103] Olive trees are particularly common in the survey area, present in more than half of all survey units, followed by grain, vineyards, citrus, and almonds; apricots and vegetables occur in lesser amounts. As might be expected, this entire area was used for agricultural purposes in antiquity, as indicated by scattered fragments of artifactual material such as groundstones, millstones, and agricultural equipment. Thus, modern and ancient evidence attests to the fertility of Kromna's territory.

100. Hayward 2003, pp. 16–17.

101. Pirazolli et al. 1994; Dia et al. 1997.

102. Wiseman 1978, p. 64.

103. Shutes 1997.

Tracking Kromna through Time: The View from Siteless Survey

Although the survey data are in an early stage of analysis, the broad outlines of a settlement history of the Greek and Roman community at Kromna are discernible. The artifacts and features we encountered permit the reconstruction of land use and cyclical patterns of growth and decline from ca. 700 B.C. to A.D. 700. At present, given the fragmentary condition of surface materials, the chronological resolution of these patterns is somewhat coarse, but they appear to mirror the changing fortunes of Corinth itself, and probably reflect an intimate relationship between city and hinterland.

By the late 8th century B.C., Corinth was already a major founder of colonies to the west along the shores of the Corinthian Gulf, on the northwestern Greek coast facing Italy, and on Sicily. These colonies facilitated Corinth's commercial interests, providing raw materials as well as markets for finished goods, notably oil, wine, and the fine painted pottery that dominated the western markets for more than a century (ca. 725–575 B.C.). Architectural terracottas, bronze work, and stone were other major Corinthian exports. Under the tyrants Kypselos and Periander (ca. 655–586 B.C.), Corinth reached a zenith in prosperity and power. In addition to sending out colonies, these rulers built temples and other monumental works, and oversaw a major development of Corinth's primary harbors. Shortly thereafter, ca. 582 B.C., the Panhellenic Isthmian athletic games were organized at the Sanctuary of Poseidon on the Isthmus.

At Kromna, the Archaic period (ca. 700–480 B.C.) was seemingly a time of growth, at first gradual and then probably rapid (Fig. 17:a, b). The number of artifacts that can be classified with certainty as Archaic is small, with only seven DUs producing more than three such objects (Fig. 17:a). Although Archaic pottery has been found in limited amounts near the crossroads at Kromna, the principal scatter of Archaic material lies immediately south of the Classical site in an area extending almost a kilometer northwest to southeast. This dispersed, low-density spread demonstrates the utility of a siteless approach, since the density of Archaic material is well below what might be expected of a former settlement, and surely would not be recognized as such by any site-based method. The recording of artifact density distributions, the use of the chronotype system, and subsequent analysis using GIS and database queries together revealed a consistent, low-density pattern that suggests to us a nascent settlement ancestral to the later Classical town.[104]

A sharp increase in DUs producing significant numbers of artifacts that can be assigned with less precision to "Archaic–Classical" (ca. 700–323 B.C.) probably reflects the rapid physical and economic expansion of Corinth in the Late Archaic and Classical periods (Fig. 17:b). It is likely that an agricultural (and perhaps industrial) community of some size and significance first emerged at Kromna in the Late Archaic or Early Classical period. The DU data suggest this, in coarse terms: not only does the number of DUs producing more than three objects increase sharply, but there is a

104. Caraher, Nakassis, and Pettegrew 2006, pp. 14–21.

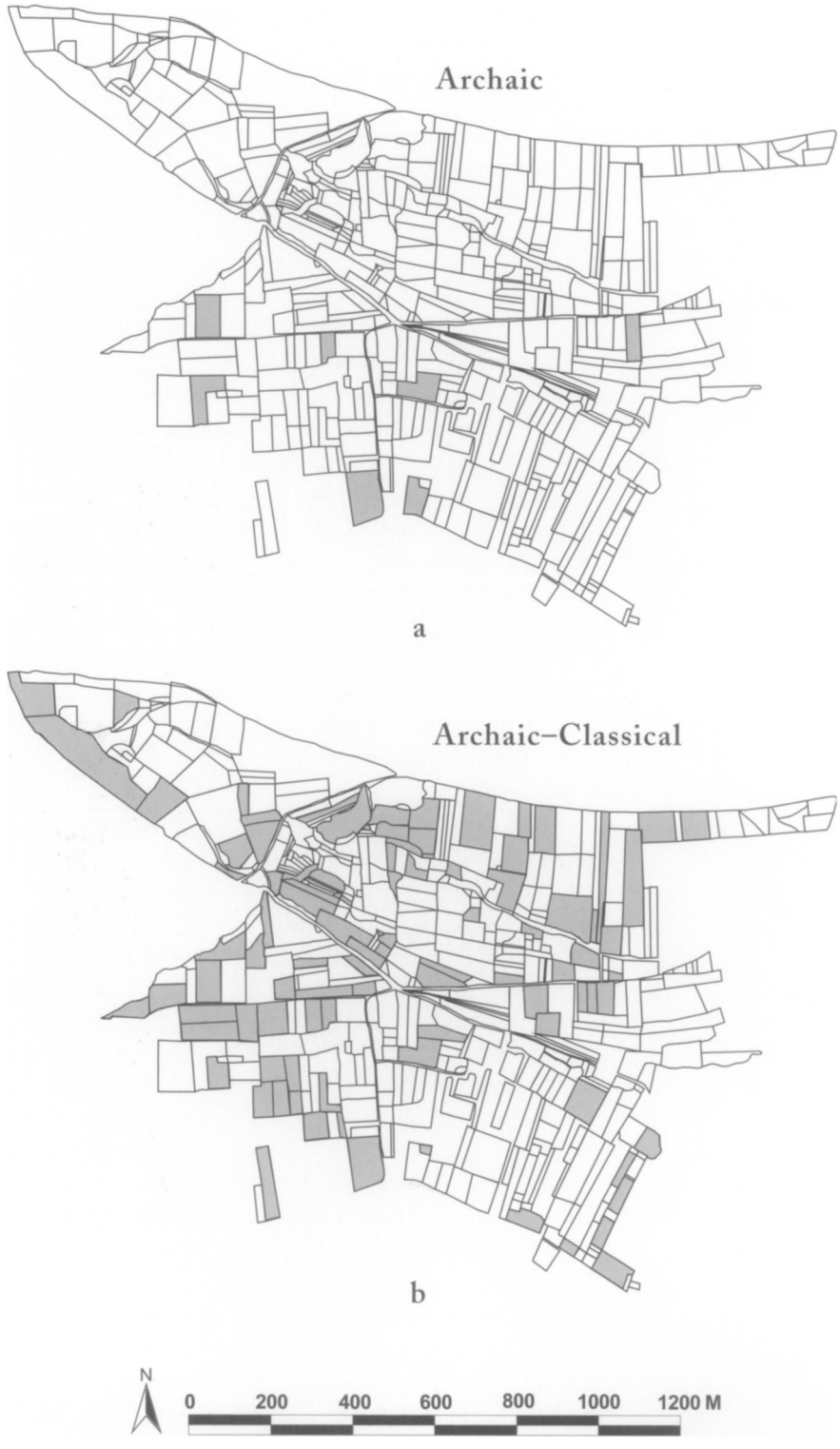
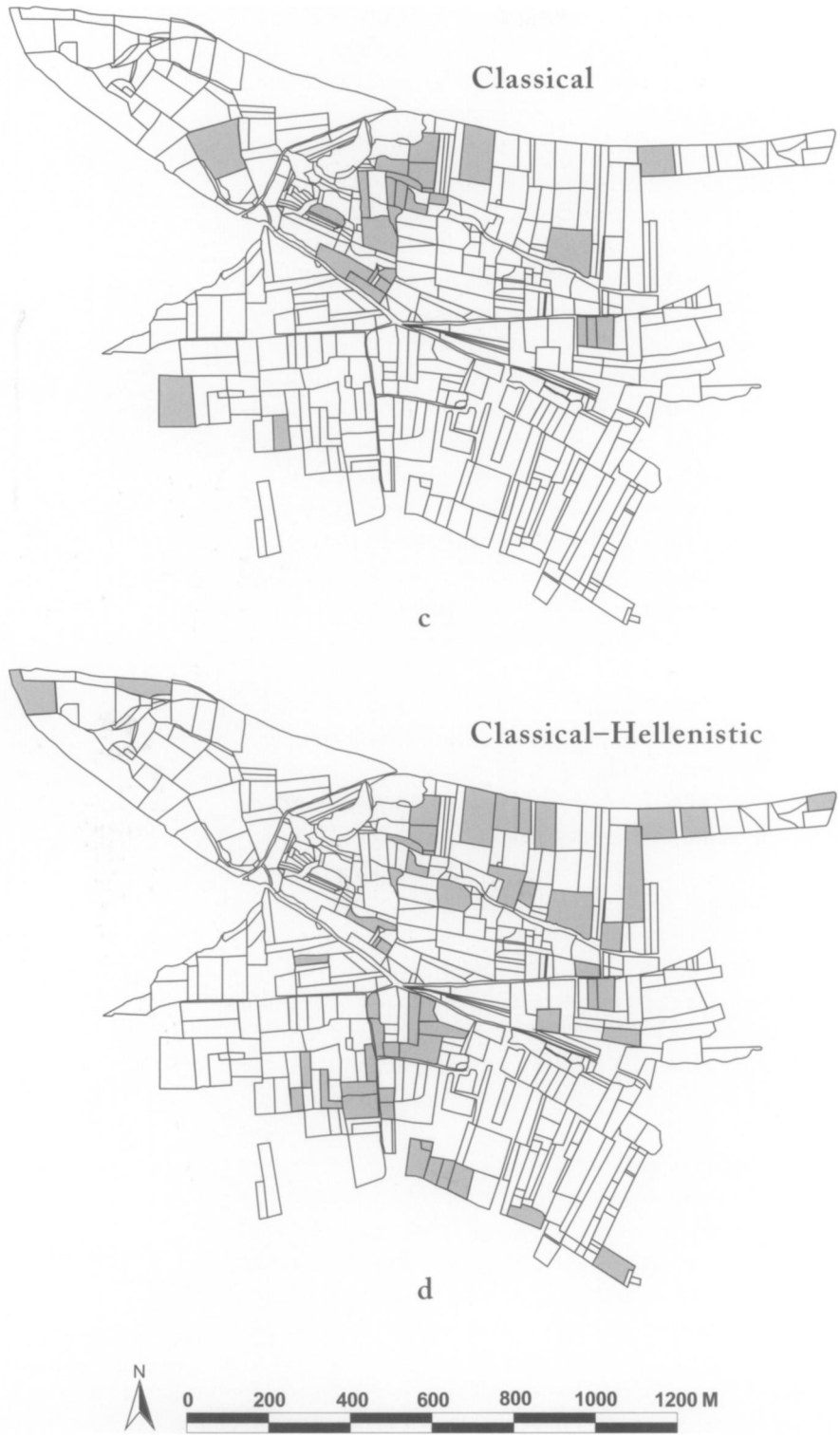


Figure 17 *(above and opposite)*. Chronological development of Kromna. DUs with more than three objects of certain attribution to a period are shaded.


Classical
c
Classical–Hellenistic
d
N
0
200
400
600
800
1000
1200 M

geographical shift to the crossroads area where roads from Kenchreai and Isthmia met at the limestone quarries (Fig. 16), indicative perhaps of a developing residential "core" of the growing community. Piecemeal discoveries from extensive cemeteries in the quarry area at the western edge of the site include graves containing 7th- and 6th-century pottery, indicating that this coalescence was under way already in the later Archaic period.[105]

Corinth's prosperity continued through the first half of the Classical period. J. B. Salmon argues that even the Peloponnesian War (431–404 B.C.) affected the inhabitants of the Corinthia only marginally, mainly indirectly by closing off the harbors and other means of commerce that furnished so much wealth.[106] This relative security evaporated in the first quarter of the 4th century B.C., as the Corinthia became the theater for near-constant warfare among the Greek city-states. For more than a decade surrounding the Corinthian War (395–387 B.C.), the Spartans and their allies laid waste regularly to the Corinthian countryside, burning crops, stealing livestock, and driving residents from their homes. Kromna can hardly have escaped the devastation, and may have been abandoned for years at a time as the inhabitants sought safety behind the walls of Corinth. Rachi Boska, overlooking Kromna from the south, was fortified at around this time and may have housed a small garrison monitoring movements into and around the plain.

There was relief after Thebes ended Spartan hegemony with a resounding victory at Leuktra in 371 B.C.; and later, in the Hellenistic period when the Macedonian kings Philip, Alexander, and their successors united Greece under a single rule, Corinth was able to recover some of its former prosperity. In the early 3rd century B.C., a major trans-Isthmian wall was constructed through the area that must have transformed the local topography and landscape. It is telling that the wall appears to have protected the town of Kromna and we might wonder how that would have impressed a visitor traversing the plain from Isthmia.[107] Inscriptions concerning a substantial export business in Corinthian architectural stone date to this period of the 4th and 3rd centuries; plausibly, some of this stone was acquired from the quarries at Kromna, and we can therefore infer a continued relationship between the settlement and the quarries.

Later Hellenistic occupation at Corinth was interrupted in 146 B.C., when the Romans under Mummius destroyed the city. At that time, the Corinthia suffered a general depopulation, and Kromna may have persisted as little more than a tiny rural settlement, if at all. Yet there is growing evidence that Corinth was never entirely abandoned,[108] and the results of EKAS portray a similar picture for smaller satellite communities such as the one at Kromna.

The DU data furnish echoes of this turbulent history: the Classical–Hellenistic period is represented in fewer DUs than the Archaic–Classical, and none of these DUs had more than three artifacts datable with certainty to the Hellenistic period (Fig. 17:c, d). We may assume that Kromna survived into the Early Hellenistic period, given the gravestone of Agathon of that date, as well as circumstantial evidence of substantial activity in

105. Morgan 1939, pp. 265–266; Lawrence 1964, pp. 94–101; Wiseman 1978, p. 66. The EKAS archaeological and mortuary surveys discovered other graves and cemeteries around Kromna, some of which are discussed below.

106. Salmon 1984, pp. 175–177.

107. Wiseman 1963; 1978, pp. 62–63.

108. See Gebhard and Dickie 2003, with references to other arguments for and against an interim community.

Figure 18. Olive press of Hellenistic or Roman date (LOCA 9132) on the surface at Kromna

the quarries and on the trans-Isthmian wall. The weak material signature of the Late Hellenistic period at Kromna may reflect a period of abandonment, although this need not entail an entirely bleak picture. It is possible that the installation of an olive press (Fig. 18), capable of pressing olives from ca. 10 ha of groves per year, may date to that period,[109] suggesting continued agricultural use of the plain despite the destruction of the city nearby.

We may say much the same about the Early Roman era. Corinth was refounded as a Roman colony in 44 B.C., and gradually rose to renewed prominence as the first city of the Roman province of Achaia. The sparse representation in DUs of definitively Early Roman ceramic material (Fig. 19:a) contrasts sharply with the expansive spread of Late Roman times (Fig. 19:c), appearing to confirm the picture of Roman Greece so often reported by regional surveys: an abandoned Early Roman settlement that came back to life in the later Roman period.[110] But there is ample reason to be skeptical of this simplistic notion. Recent work by David Romano has revealed evidence for Caesarian and Flavian centuriation of the northern Corinthian plain, enveloping Kromna.[111] In addition, as argued above, this contrast is exaggerated by the greater diagnosticity of ceramics of the latter period.[112] Here again, a siteless survey method that records the distribution of artifacts systematically can reveal the biases responsible for perceived differences in settlement patterns. Even taking these biases into account, however, there appear to be real changes in the locations of activities in the Roman period. Evidence for Early Imperial activity is focused on the area southwest of the Classical Greek town, while occurring in only slight amounts in the immediate vicinity of the quarries. Only in the later Roman period did activity shift once again to the north into the quarry area of Kromna proper, accompanied by a survey-wide pattern of extensive, dispersed use of the landscape after ca. A.D. 400.

109. James 2005.

110. Alcock 1993; Kosso 2003.

111. Romano 2005, 2006.

112. See the discussion above, pp. 481–483, of the chronotype collection of Late Roman pottery fabrics.

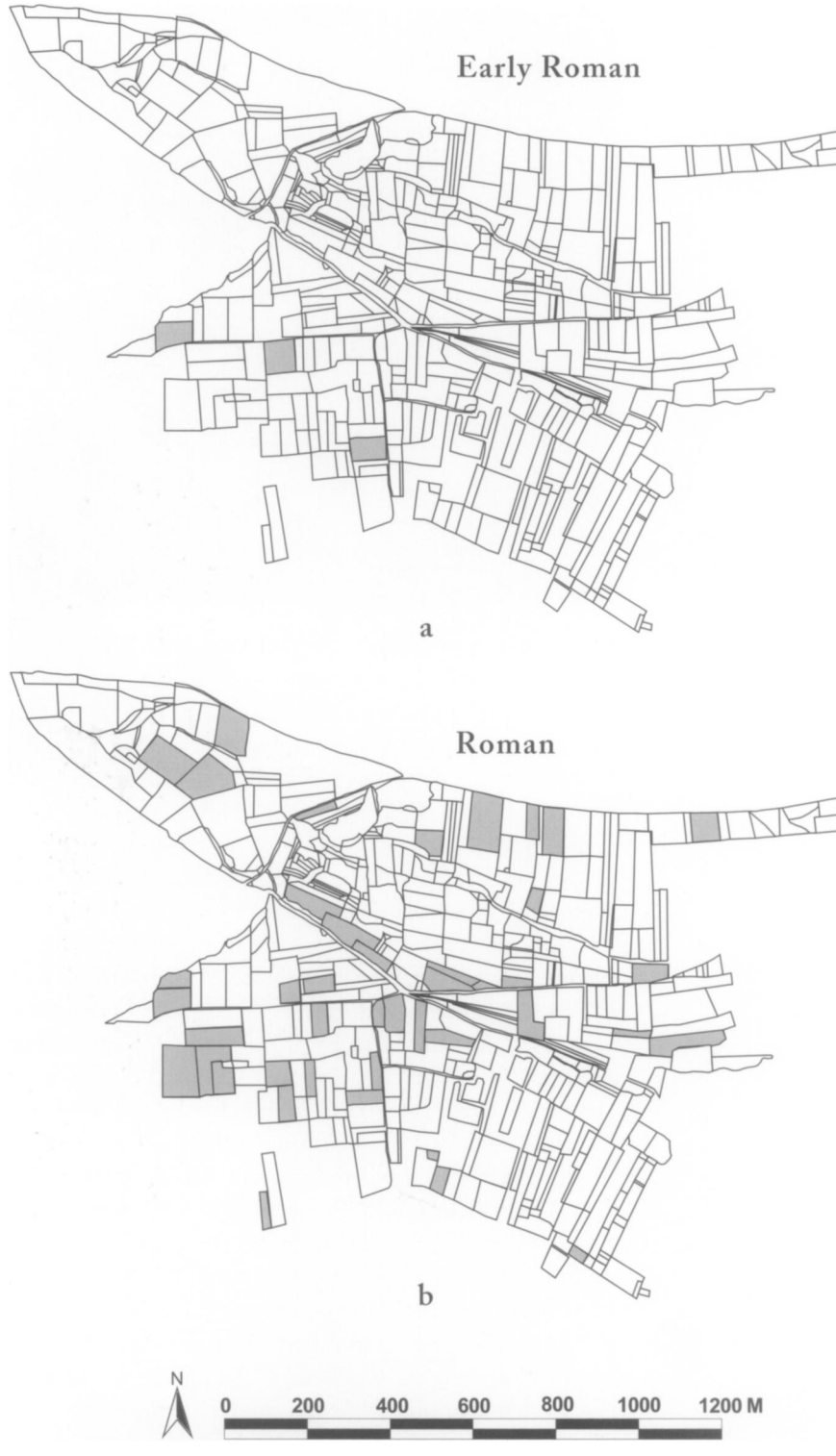
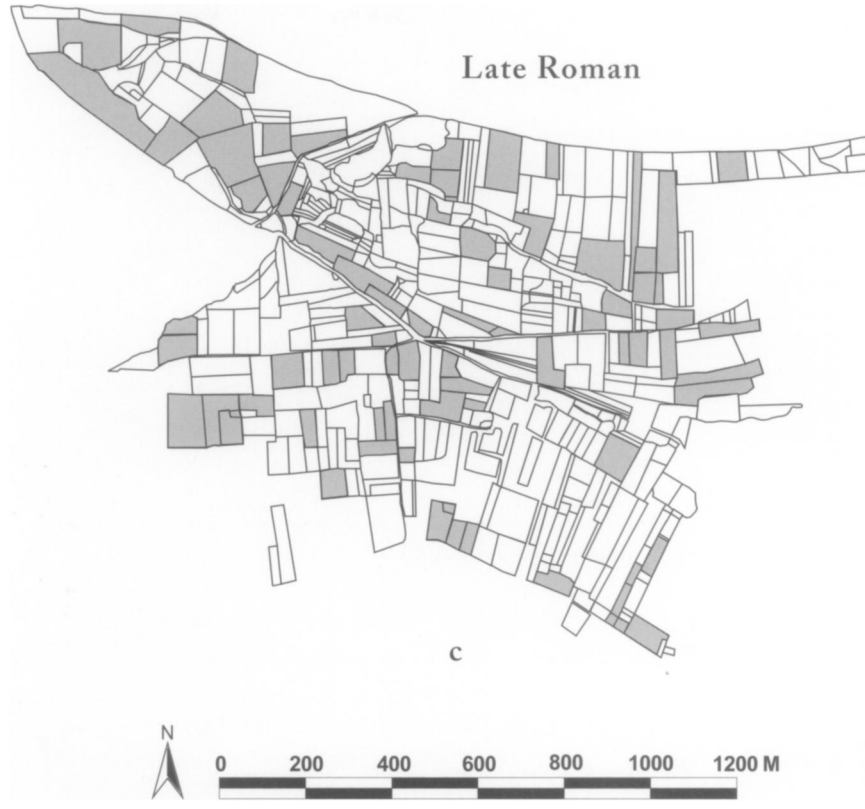


Figure 19 *(above and opposite)*. Chronological development of Kromna from the Early Roman through the Late Roman era. DUs with more than three objects of certain attribution to a period are shaded.



Another View: LOCA Analysis and Locating Kromna

A complementary approach to reading broader patterns from the siteless data is to focus on LOCAs in the area, which represent places of exceptionally high artifact density or features on the land. Several of these LOCAs (9001, 9003, 9005, 9006, and 9007) were surveyed more intensively through gridded collections; as such they offer greater chronological and functional resolution than is possible to obtain from the DU data (Table 10; Fig. 20).[113] The resulting outlines of the settlement history of Kromna appear similar to those described above, but in greater detail and with more clarity; there are also some real differences that confirm the place of LOCA analysis in complementing the picture of land use inferred from the siteless data.

The Geometric period (800–700 B.C.) emerges as it did not in the DU data, raising the possibility of "hidden landscapes" that might only be discovered by careful, high-resolution search.[114] A nearly complete Geometric teacup was found in an otherwise empty grave at Mortuary LOCA (ML) 10, and artifacts in LOCAs 9005 and 9007 provide evidence for a small settlement between the Geometric and Archaic periods. While LOCA 9003 has little of the earliest material, it is there that we may see the geographical expansion of settlement in later Archaic times, a trend that continues through the Classical period.

What is perhaps most striking about the data from these LOCAs is that there is virtually nothing that can be characterized definitively as Hellenistic or Early Roman. It would be tempting to interpret this pattern

113. Tables 10 and 11 contain only artifacts that could be dated with some confidence. Other artifacts could only be assigned a chronology too coarse to be useful for this analysis (e.g., "ancient historical").

114. See Meyer and Gregory 2003. We have collected data with which to address the hidden-landscape hypothesis, and will do so at a later time.

TABLE 10. ARTIFACT COUNTS BY PERIOD FROM LOCAS IN THE VICINITY OF KROMNA

		LOCA			
Period	*Approximate Dates*	*9003*	*9005**	*9006*	*9007*
Geometric	800–700 B.C.	0	8	0	15
Geometric–Archaic	800–480	1	9	0	13
Archaic	700–480	7	4	0	24
Archaic–Classical	700–323	16	88	1	54
Archaic–Hellenistic	700–31	13	62	1	10
Classical	480–323	11	22	4	40
Classical–Hellenistic	480–31	16	17	2	21
Hellenistic	323–31	0	0	1	0
Early Roman	31 B.C.–A.D. 250	0	0	0	0
Roman	31 B.C.–A.D. 700	8	24	0	27
Late Roman	250–700	9	8	5	23

*LOCA 9005 consists of two areas, 9005a and 9005b.

as an abandonment in Late Hellenistic times and a gradual repopulation of the countryside after Corinth's reestablishment, which, as noted above, would conform to a remarkably consistent decrease in rural site numbers in the Late Hellenistic and Early Roman epochs reported by surveys in Greece and the Aegean islands.[115] But because the intensive, siteless survey detected low to moderate levels of activity, in the form of modest artifact counts, agricultural installations, and graves, we see clearly the limits of a site-based approach and perceive instead the shifting focus of a small agricultural community away from the center of the former Classical town during the time of Corinth's nadir.

Functional information extracted from the gridded collections illuminates the range of activities and the spatial patterns of land use at Kromna and its vicinity. Considering the period between ca. 650 and 146 B.C., it is possible to use the ceramic finds (by far the most ubiquitous and most easily dated) to gain a first impression of the spatial arrangement and character of Kromna during prosperous times (Table 11). LOCAs 9003, 9005, and 9007 yielded high percentages of fine and semifine painted table ware, pointing to a generally high level of prosperity among the inhabitants of those locations. Further, the eight sherds from vessels likely to have had a votive function at LOCA 9007 span the Archaic and Classical periods, suggesting the existence nearby of an enduring sanctuary or shrine. In 1960, Wiseman discovered miniature votive bowls, a terracotta female figurine (probably a Kore), and a terracotta altar, suggesting to him the proximity of a sanctuary, possibly close to LOCA 9003.[116] Yet the finds from these LOCAs also imply a working community engaged in agriculture, industry, and trade. Ceramics of a domestic or commercial/industrial function are common at LOCAs 9005 and 9007, and many other sherds of these categories that cannot be closely dated must belong also to the Archaic–Hellenistic settlement. An interesting contrast in the two assemblages may be significant: cooking pottery is well represented at 9007, while at 9005 there is a particular abundance of storage and transport vessels. LOCA 9005, facing the Kenchreai road reaching Kromna from the southeast, may have

115. Alcock 1989a; 1989b; 1994, pp. 177–179.

116. Wiseman 1963, p. 272, pl. 70; 1978, p. 66.

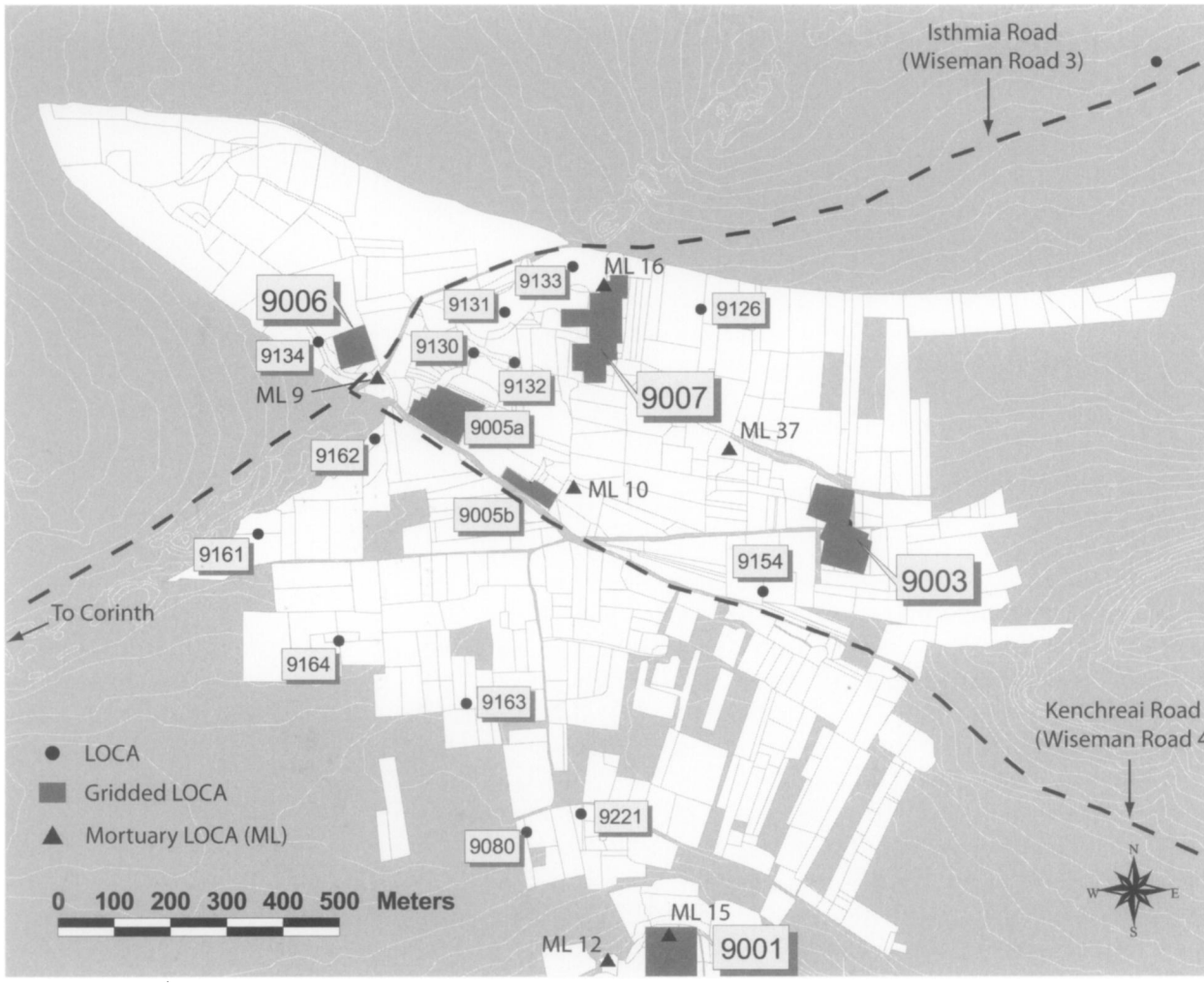


Figure 20. LOCAs, MLs, and other features at Kromna

been a focus of warehousing or transshipping products such as wine or oil. The assemblage at LOCA 9007, by contrast, looks more domestic.

Other feature and artifact-scatter LOCAs, at which no gridded collections were made, fill out the general picture, so that it is possible to begin to map out land-use patterns and functional areas at Kromna and its surroundings (Fig. 20). LOCA 9126, just east of LOCA 9007, is similar in artifact composition, but the sample is more consistent with a domestic function while lacking a votive content. It is likely that LOCA 9126 should be attached to the central residential core that includes LOCAs 9005 and 9007. The quarries abut the western and northwestern edges of the dense Archaic–Hellenistic scatter, and the lack of a strong signature from that era at Boulberi, across the quarries to the northwest, suggests that the quarries formed one boundary to the town. Within the residential center, the olive press mentioned above (LOCA 9132) reinforces the impression of a working agricultural community, although this feature may be as late as Early Roman.[117]

Some part of the quarry area adjacent to the settlement was utilized for ritual activity, evident in two dining areas that for convenience we call the "upper" and "lower" dining rooms (LOCAs 9130 and 9131, respectively).

117. James 2005.

TABLE 11. CERAMIC FUNCTIONAL ATTRIBUTES, CA. 650–146 B.C.

	LOCA			
Functional Category	*9003*	*9005*	*9006*	*9007*
Table ware: fine, semifine	42	91	5	82
Votive vessel: fine, miniature	0	0	0	8
Figurine: terracotta	0	0	1	0
Ritual basin (perirrhanterion)	1	0	0	0
Storage: pithos	3	14	0	6
Utilitarian: coarse, medium coarse	5	31	0	34
Transport: amphora	2	25	0	2
Cooking/kitchen	0	2	0	15
Loomweight	1	1	0	1
Lamp	2	0	0	0
Rooftile, painted	0	9	1	1
Rooftile, slipped	7	14	0	4

In the Greek world, these dining areas served commonly as arenas for communal meals attached to certain kinds of ritual. It is possible that these dining rooms had ritual connections with a nearby sanctuary, similar to those associated with ritual dining at the Sanctuary of Demeter and Kore at Corinth in the 6th–5th centuries B.C.[118] Although far from complete, these dining rooms are comparable in size and apparently similar in plan to those at the Sanctuary of Demeter and Kore.[119] Two fragments of ceramic perirrhanteria—ritual washing basins—found on the surface within the perimeter of the upper dining room reinforce the impression of ritual, rather than domestic, activity. The concentration of votive material from LOCA 9007 is less than 200 m from the dining rooms, and although there is a broad chronological fit, we can only guess at this point that the two may be related.

Archaic–Classical cemeteries and other mortuary features may help to further fix the town's boundaries. Wiseman listed three cemeteries that he believed delimited the boundaries of the settlement, which must roughly correspond to the locations of ML 9, 16, and 37 (Fig. 20).[120] A number of other cemeteries and surface finds of fragmentary stone burial sarcophagi are known in the vicinity of Kromna,[121] but it has proven difficult to reconstruct their exact locations and this effort is ongoing. It is clear, however, that large cemeteries were associated spatially with the roads and quarries in the Archaic and Classical periods. ML 10, a cemetery of broadly Classical date, overlooks the probable line of the Kenchreai road at the southeastern limit of LOCA 9005. ML 16 is an unfinished sarcophagus probably of Late Archaic–Late Classical date resting at its manufacturing location in a quarry adjacent to the Isthmia road, at the northern limit of LOCA 9007. The convergence of quarries, roads, and mortuary contexts suggests that together these features defined the physical and symbolic limits of the residential core on the northern, southern, and western sides. The eastern boundary is more problematic, lacking definitive features or obvious breaks in density, but ML 37, an area 200 m east of LOCA 9007 where numerous Archaic–Late Classical sarcophagi were reported by a local resident, hints at a possible boundary. More likely, the eastern boundary

118. Bookidis 1993; 2003, pp. 255–256.

119. Bookidis 1993, pp. 46–48, figs. 3.1–3.3, table 3.1.

120. Wiseman 1963, p. 271.

121. Morgan 1939, pp. 265–266; Lawrence 1964, pp. 94–101; Wiseman 1978, p. 66, nn. 117–119.

was always more fluid, the natural direction for growth but susceptible to expansion or contraction in response to the political and economic fortunes of the eastern Corinthia.

Outside the main residential zone lie several concentrated artifact scatters that have a domestic character and may be hypothetically assigned to the functional category of "farmstead."[122] LOCAs 9154 and 9163 in particular have strong signatures in the Archaic–Hellenistic periods. LOCA 9163 typifies their artifact assemblages: 18 fragments of fine to semifine table ware, 11 rooftiles, 7 pithoi, 1 transport amphora, 2 loomweights, 2 millstones, and 1 lamp. Such farmsteads surrounding the main settlement were presumably placed to take advantage of the well-watered arable soil. Other potentially similar sites, LOCAs 9161, 9164, and 9221, produced too few objects of certain Archaic–Hellenistic date for functional attributes to be inferred.

We may, therefore, propose several functional areas at Kromna: a residential core ("town"), an adjacent industrial area at the quarries, a focus of ritual activity at the transition between residential and industrial zones, a series of mortuary locations that may have demarcated the transition between residential and nonresidential space, two major carriage roads connecting Corinth with the eastern coast of the Corinthia, a fortified position (garrison?) overlooking Kromna from the south, and several farmsteads in the fertile agricultural land on the plain. LOCA 9003, several hundred meters to the east of the settlement, remains something of a puzzle. There, large quantities of cut architectural stone, an unusual number of sherds from fine vessels, many of which are characteristic of Archaic–Classical sanctuaries, and the discovery of two fragments of perirrhanteria all point toward the presence of a sanctuary. This function appears to be corroborated by Wiseman's discovery, somewhere nearby, of a terracotta altar and a partial Kore figurine. Yet a geophysical survey covering this area in 2002 turned up no indication of monumental foundations.[123] This LOCA may be a sanctuary and settlement that grew up along the road outside the confines of the main settlement at a time of expansion and prosperity in the eastern Corinthia, but we remain ignorant of its form and extent.

These various features were certainly not all in existence or use at any given time, but we believe that they give a good impression of activity areas and land use during several centuries of prosperity, when Kromna's fortunes seemingly coincided with those of Corinth itself. The preliminary patterns invite many questions that will only be fully addressed by continued analysis of the data, which will refine, if not substantially revise, the reconstruction offered here.

Interpreting the Functional Landscapes of Kromna

The archaeological and environmental evidence suggests that Kromna held a distinctive position in the Corinthia because of a unique convergence of landscapes, where an auspicious location was augmented by the intensive exploitation of abundant agricultural and lithic resources, and by the creation and manipulation of social landscapes by which power and identity were asserted.

122. But see Pettegrew 2001 on this problematic category.

123. Sarris 2003.

Kromna as Crossroads

The location of Kromna best explains its existence and its apparent prosperity. As noted above, the town sat on well-watered, fertile soil at the crossroads of the major land routes through the eastern Corinthia (Fig. 16).[124] One of these roads connected Corinth, via Kromna, with the Isthmus, giving access to the wealth generated by the Diolkos and the rich Sanctuary of Poseidon, where Panhellenic games were held every two years. Another road began at the Saronic port of Kenchreai and ran northwest to meet the road from Isthmia at Kromna, before heading west to Corinth. Wiseman suggested that another route ran north from Kromna toward Lechaion and the Corinthian Gulf. Kromna must have been a busy place, with a constant movement of goods and people between Corinth—a popular destination famous for commerce and pleasurable diversions—and the coasts. Kromna, as an important node in a connective landscape, was central to Corinth's efforts to maintain firm control over its eastern territory.

The Agricultural Landscape

A variety of evidence discussed above indicates that agriculture was a fundamental activity of the inhabitants of Kromna. The soils in the adjacent plain are deep and fertile, supplied with water from streams, springs, and wells, and with sediment from local streams and hills (Rachi Boska, Ayios Dimitrios). Fine-scale mapping by the geomorphology team shows that sediments transported into the plain by alluvial and colluvial processes have been transformed by the formation of deep soils, of which a thick B_t horizon is visible in plowed fields and miscellaneous cuttings today. The impressive thickness of the B_t horizon, variable but exposed to tens of meters in one deep cutting for a municipal landfill, indicates the considerable time depth of formation and the essential stability of the landscape over that interval.

The water supply too was ample: faults running through the plain offer access to groundwater, and springs issue at exposed interfaces between soft, porous limestones and conglomerates and the underlying impermeable marls and clays.[125] At the very heart of Kromna, a huge fig tree growing from a chasm beneath a small rise at the southern edge of LOCA 9007 marks the location of just such a spring. In 1960, Wiseman saw 11 wells, two cisterns, and a basin of poros slabs.[126] Fewer wells are visible today, but local farmers have described vividly the water resources encountered in the course of digging. EKAS further discovered several features related to agriculture, described above: an olive press (LOCA 9132), millstone (LOCA 9134), and two or more artifact scatters that are provisionally interpreted as farmsteads (LOCAs 9154, 9163). The northern Corinthian plain, of which Kromna was a part, was a rich agricultural land for the urban polis, as it still is today.

The Industrial Landscape

The settlement of Kromna was adjacent to one of the largest of Corinth's famed limestone quarries, which extended along a low ridge for almost 3 km from the modern village of Examilia to Kromna and beyond. Cuttings along this ridge show the tremendous volume of material removed from

124. Wiseman 1978, p. 64.

125. For the natural water supply at Corinth, see Landon 2003.

126. Wiseman 1978, p. 66.

the quarries over time. Ancient cut blocks were identified in 66 of the 470 DUs (14%) in the Kromna, Kesimia, Boulberi, and Perdikaria zones; the figure for Kromna/Kesimia is just over 21%. In addition to cut blocks, an unfinished sarcophagus and columns can still be seen in the quarries, attesting to the range of products that were manufactured on site. Wiseman saw far more unfinished objects in the quarries as recently as the 1960s, most of which have since disappeared.[127] Contemporary inscriptions confirm that Corinthian limestone was used extensively in the 4th and 3rd centuries B.C. for construction at the sanctuaries of Asklepios at Epidauros and Apollo at Delphi,[128] and closer at hand we may infer a substantial demand for stone at Corinth, at the Sanctuary of Poseidon at Isthmia, and elsewhere. It is not known whether the quarries at Kromna provided some or all of the Corinthian stone for these major projects, but an ongoing geochemical and petrographic study by Chris Hayward offers the hope that it will be possible to match the architectural stone to the quarry of origin.[129]

The quarries must also have supplied stone for buildings, monuments, and sanctuaries at Kromna and its vicinity. One of the greatest uses of stone locally was for the construction of a trans-Isthmian fortification wall in response to the threat of the Persian invasion in 480 B.C.[130] This wall was later rebuilt, probably in 279 B.C., to forestall an anticipated Gallic invasion.[131] The value of Kromna's agricultural and industrial resources is illustrated by the fact that they were protected behind these walls, while the Sanctuary of Poseidon at Isthmia was not. Today, the line of the Classical–Hellenistic wall can still be followed as it passes to the north of Kromna, providing a useful measure of the limit of Kromnian territory in turbulent times.[132] A pair of wheel ruts (LOCA 9133) worn into bedrock possibly shows that the quarries were connected with Wiseman's Road 3 as it passed Kromna's northern edge (Fig. 20). Logically we may associate these ruts with an access road for moving quarry stone to a main road for shipment, but it is not possible to date them, except to note that their depth (6–15 cm) and gauge (1.27–1.33 m) fall within known ranges for Roman vehicles.[133]

It is likely that work in the quarries was mainly a seasonal occupation undertaken by the inhabitants of Kromna, who were at other times engaged in agro-pastoralism. Journeymen may have been employed at times of great demand for stone, and soldiers drafted for the hasty work of throwing up defensive walls. By the Roman period, slaves may have comprised a substantial component of the workforce.[134]

At Kesimia, the detection by geophysical survey of two probable kilns among a concentration of Classical surface pottery hints at other workshop or industrial-scale activities, although their date cannot be confirmed without excavation.

127. Wiseman 1963, pp. 271–272; 1978, p. 66.
128. Burford 1966, 1969; Wiseman 1978, p. 68.
129. Hayward 2003, pp. 33–40.
130. Hdt. 8.71.
131. Paus. 7.6.4; see also Wiseman 1963, pp. 267–269.
132. Wiseman 1963, pp. 256–258, pl. 68:a.
133. Pritchett 1980, pp. 167–181.
134. Hayward 2003, p. 39.

The Mortuary and Memorial Landscape

In classical antiquity, it was common to bury the dead and set up funerary monuments along roads outside the confines of cities. As proposed above, these cemeteries may help to fix the approximate boundaries of Kromna's residential core through time. Pausanias, traveling through the Corinthia in the 2nd century A.D., noted the existence of memorial monuments along the road between Kenchreai and Corinth, but regrettably he did not describe them.[135] Until recently, many such monuments survived around Kromna as ruins, and extensive cemeteries and freestanding tombs of Archaic through Roman times existed on the margins of the town, as revealed by excavations of the last century and surface discoveries made by Wiseman, members of EKAS, and others.

Monumental funerary structures served multiple purposes. A constant stream of merchants, pilgrims, soldiers and sailors, athletes and spectators, journeymen, slaves, and local residents provided an audience for the social messages encoded in these highly visible monuments. For elite families, the monuments served to proclaim their status and to facilitate social reproduction in Corinthian society. The Corinthian state undoubtedly used monuments of various types to advance explicit historical claims to the territory and resources between the city and the coast, echoing the territorial role played by tombs and funerary monuments around the world.[136] Such monuments held considerable propaganda value, celebrating the glorious exploits and persons of the Corinthian past.

The Sacred Landscape

Although there is no explicit mention in the ancient sources of sanctuaries or temples at Kromna, the surface remains at certain locations are suggestive of sacred contexts. The votive pottery at LOCA 9007, along with Wiseman's discovery of comparable ceramics and an altar and a figurine of terracotta farther east, leaves little doubt that during Archaic–Classical times shrines or sanctuaries existed in the residential core of the settlement and beyond. The two, roughly contemporary, dining areas (LOCAs 9130 and 9131) were associated with ritual and possibly a neighboring sanctuary: the architectural evidence and the presence of perirrhanteria—particularly common components of ritual at Corinthian sanctuaries—are strong indications of sacred contexts. Fragments of perirrhanteria were also found at LOCA 9003, where, in addition to one of the highest concentrations of cut-stone blocks in the survey area, the finds include abundant sherds from fine-ware vessels that are characteristic of, though not exclusive to, sanctuary offerings of the Archaic and Classical periods.[137] Wiseman's discoveries may indicate that a cult of Demeter and Kore existed there. Such a cult would not be surprising as shrines dedicated to the pair have been identified across the Isthmus, from Acrocorinth in the west to the Rachi settlement and the Isthmian sanctuary in the east.[138]

The development of a sacred landscape, first detectable in the Archaic period, probably reflects the physical and symbolic consolidation of surrounding territories, including the Sanctuary of Poseidon at Isthmia, by the expanding city of Corinth.[139] There is no evidence for earlier shrines at

135. Paus. 2.2.4.

136. E.g., Saxe 1970; Goldstein 1980; Wise 1995; Buikstra and Charles 1999.

137. M. K. Risser (pers. comm.).

138. Anderson-Stojanović 2002.

139. Gebhard 1993.

Kromna, although these would have been small, open-air shrines lacking durable architecture and thus not easily recognized from surface remains. More likely, the inhabitants of Geometric Kromna joined a regional community of cult at the Early Iron Age shrine at Isthmia, prior to the establishment of the first known sanctuary at Corinth in the early 7th century B.C. The archaeological evidence indicates that for centuries, the Isthmian roadside sanctuary served as a meeting place for widely dispersed groups from the Isthmus and beyond, fostering what Catherine Morgan has called a "regional framework of community identity."[140]

Reintegrating Kromna

Although we may place the materials we discover and the activities we infer at Kromna in convenient categories, such as "industrial" or "sacred," or attempt to locate physical boundaries or liminal places, such dichotomies may reflect our own intellectual preconceptions more than the reality in which ancient Kromnians existed. The data we have gathered can be read alternatively to show that neat boundaries in space and in daily life did not exist, and in fact the integrative approach of EKAS leads us to alternative points of view by breaking down such divisions. An example is the interpenetration of the "sacred" with industrial, memorial, and connective landscapes. At Kromna, ritual was practiced at sanctuaries and dining rooms situated in residential areas and among the quarries. Dedicatory inscriptions are known from quarries in the classical Greek world, such as the dedication to Dionysos inscribed on a face of cut limestone bedrock in the quarries just northwest of Kenchreai.[141] The sacred and memorial landscapes were closely linked—indeed, there is a wide functional overlap in the artifacts from sacred and funerary contexts in early times, as is known from the 6th–4th-century deposits at the Sanctuary of Poseidon and the West Cemetery at Isthmia (though this is distinctly not the case later in Roman or Byzantine times, when the functional overlap is between domestic and funerary assemblages).[142] These shared forms indicate a conflation of some aspects of the acts of worship and commemoration.

Similarly, aspects of a connective landscape held importance for Greek religion—a typical example being the status of crossroads as both magical, associated with protection and healing, and dangerous, the haunt of witches and the restless dead. The Greek gods Hermes and Hecate were particularly associated with crossroads, where their images were often set up. The clear evidence for ritual dining rooms and shrines very near the crossing of the Isthmia and Kenchreai roads may reflect a strong emotional association with supernatural forces at such places.

Furthermore, the present analysis raises many questions about agency in the relationship of this important site with the urban center at Corinth. What were the relationships linking Kromna, quarrying activity, and Corinth? Is it possible that Kromna developed independent strategies for economic prosperity, security, and ritual activity?[143] Might Kromna at certain times have pursued separate relations with other entities in the eastern Corinthia and beyond? It is perhaps significant that Agathon was memorialized not as a Corinthian, but as a Kromnian.[144] Yet we cannot

140. Morgan 1994, p. 115.

141. *SEG* XI 50; Mitsos 1936, p. 146.

142. Clement and Thorne 1974; Dickey 1992; Gebhard and Hemans 1992, passim; 1998, passim; M. K. Risser (pers. comm.).

143. For ideas of agency and theories of practice and "structuration," see Bourdieu 1977; Giddens 1979, 1981; Dobres 2000.

144. This point becomes irrelevant, however, if Shipley (2000, pp. 371–372) is correct that Agathon was a foreigner from Arcadian Kromna who was buried in the Corinthia.

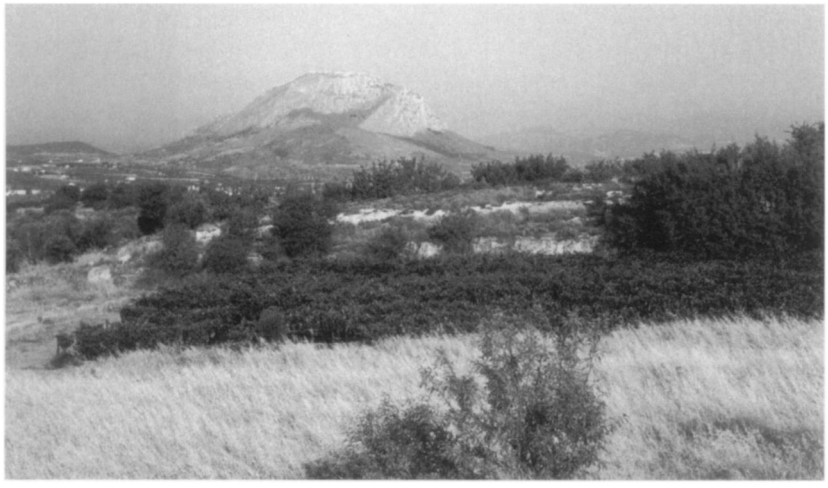


Figure 21. View from Kromna to Acrocorinth, looking west–southwest: Kromna figuratively and almost literally in the shadow of Corinth

say that the land and quarry owners at Kromna were not in fact wealthy urban dwellers from Corinth.[145] If they were, it will be difficult to separate the interests of *astu* and *chora.* On an even more fundamental level, a close examination of the literary, epigraphic, and archaeological evidence has led Pettegrew to suggest that Kromna was not really a well-bounded "town" at all—rather, it functioned as a crossroads emporium as part of an ex-urban zone of spatially continuous exploitation in Corinth's eastern territory.[146] Ongoing analysis of survey contexts and artifact collections from the broader survey area may enable us to better place Kromna in its Corinthian context (Fig. 21).

We are also left with questions regarding the nature of change and chronological development of the area. For instance, should the northward geographical shift in the Classical period be understood in terms of the development of the residential "core" of a growing community associated directly with quarrying activity? Or does the shift indicate the formation of a town at the crossroads befitting the material developments at Isthmia and the harbor at Kenchreai? Or is it the cultic and mortuary significance of the area in the midst of an ancient quarry that is the greatest factor affecting the migration of settlement? How are we to read the paucity of Early Roman material and the apparent shift in settlement to the southwest? And what is the reason for the rehabitation of the quarry area in late antiquity?

It is in the margins of uncertainty, at this early analytical stage, that such questions arise and alternative interpretations take shape. It is clear, however, that Kromna was significant because so many aspects of the Corinthian ethos found expression in this single place. It was central to Corinthian life, both geographically and in the practical and symbolic construction of Corinth as a prosperous and historically situated polis. An integrative methodology enabled us to extract remarkably detailed information on Kromna's setting and its human history, offering interpretive potential well beyond that of Wiseman's impressive but nonsystematic investigation, or the piecemeal information supplied by chance finds.

In an article assessing a century of investigations into the Bronze Age of the Corinthia, tellingly subtitled "Old Approaches, New Problems,"

145. Osborne 1987, pp. 13–26; 1991.

146. Pettegrew 2006, pp. 248–327.

Jeremy Rutter advocates an infusion of new field research in the form of problem-oriented surveys and excavations, to avoid a scholarship made stagnant by continued reliance on the reanalysis of old excavation material.[147] This need for new archaeological approaches to address more finely focused questions extends to all periods of the Corinthian past.[148] The preliminary examination of Kromna by EKAS, one of many such historical inquiries and merely the beginning of a process of reconstituting past landscapes in the eastern Corinthia, suggests some of the fruits of the application of new methods and perspectives.

CONCLUSIONS

Dense human occupation of the eastern Corinthia for more than 8,000 years, combined with an active tectonic, sedimentary, and erosional landscape, presents serious challenges to eliciting meaningful data from the surface record. The density of material across the landscape is variable, in some areas characterized by an "unbroken carpet" of overlapping, superimposed palimpsests of material from multiple periods of the past, and elsewhere typified by sparse material or discrete, single-period scatters. A further complication is the frenetic pace of modernization in the countryside, characterized by extensive bulldozing and the proliferation of new settlements. The coastal Corinthia is especially at risk, with villas and hotels appearing everywhere to attract tourists and Athenian weekenders. The situation will only worsen with the recent completion of a high-speed rail line connecting Athens and Corinth; this could effectively make much of the Isthmus a bedroom community for Athens, about 45 minutes away by train. The urgency of preserving the cultural heritage of the eastern Corinthia provides justification for the survey, even under less than ideal conditions.

While we do not advocate a specific set of "best practices," such as those formulated for the European POPULUS Project's Manual of Best Practice,[149] we believe that many of the principles and practices guiding EKAS are widely relevant. Our integrative approach provides a unifying philosophy of interdisciplinary collaboration focused on the critical moment of primary data collection, and enhances the effectiveness of the discovery process by attaching to it experts in geomorphology, archaeology, GIS, and other disciplines. This flexible model allowed us to accomplish an effective survey in spite of unanticipated limitations over which we had little control.

A fundamental emphasis on fine-scale geomorphological analysis guided our research design, sampling schemes, field procedures, analysis, and interpretation. It is our view that this level of involvement of geomorphology should be standard among archaeological surveys. Without recourse to complementary programs such as long-term replication studies or test excavations to calibrate survey results, our geomorphological work played an even greater role in the success of the survey, and it is clear that geomorphological analysis of survey space on the EKAS model is practicable on a regional scale.

147. Rutter 2003.

148. For example, the application of survey data to issues affecting the Bronze Age of the northeastern Peloponnese is explored in Cherry and Davis 2001; Rutter 2003; Wright 2004.

149. Barker and Mattingly 2000.

The combination of geomorphology, the chronotype system, and our DU procedure allowed us to answer the question recently posed by Elizabeth Fentress: What are we counting for?[150] She suggests that it may be of little value to count or weigh off-site material, because gross numbers or weights are uninformative if we have no information about relative ubiquity of specific artifact classes, or if we cannot decipher the site-formation processes that create off-site distributions. By carefully defining geomorphological space in which to survey, and by using the chronotype approach to acquire a representative sample of artifacts, both qualitatively and quantitatively, EKAS is able to make more confident use of off-site data to assess the potential for reconstructing past cultural patterns. The experiments EKAS conducted on the parameters of artifact recovery further refine the quantitative and qualitative information acquired from off-site locations.

More broadly, our methods and results demonstrate the continued value and relevance of intensive, siteless survey, in the face of considerable and, to an extent, justified criticism.[151] Taking only the example of Kromna, careful analysis of the intensive survey data revealed activity during the Geometric, Late Hellenistic, and Early Roman periods that surely would have been invisible using a site-based or nonintensive method. We were able to detect spatially continuous patterns of low-density material that modify in fundamental ways our understanding of Kromna's long-term history at such times as the interim between Corinth's destruction and refoundation.

We believe that the low-impact collection policy of EKAS anticipates future directions in survey archaeology, as budgets tighten, host countries seek to establish closer controls on territorially extensive fieldwork, and archaeologists ponder the utility of large collections of redundant, fragmentary material. These developments focus attention on the responsibility of survey archaeologists to help preserve cultural heritage, particularly in countries that suffer from rampant modernization and looting. The case studies presented above indicate that chronotype collections yield samples that are representative of ubiquity, type, and date, while dramatically reducing the number of artifacts retained.

Specific EKAS methods, such as the geomorphological approach to survey space and the chronotype as a collection or classification strategy, may be attractive in a form modified to suit local conditions and research objectives. These methods can be augmented where fieldwork permissions are more liberal. But the broader goal of producing data that are usefully comparable across regions and areas of the world is crucial, and in the absence of a standard practice, it is essential that methods of data collection be presented in explicit detail.[152] A central aim of this article has been to explain clearly our methods so that the inferences that are generated from them may be evaluated by others.

As an archaeological tool set, the EKAS methodology was designed, above all, to harmonize geographic, environmental, and archaeological information at all stages of the research endeavor, and to enable firmly grounded interpretations of the archaeological record to be drawn. The data generated by EKAS will complement the vast archive of information from prior excavations, surveys, and chance discoveries, contributing to a fuller and more nuanced understanding of the Corinthian past.

150. Fentress 2000.

151. Blanton 2001; Osborne 1996; Alcock and Cherry 2004a.

152. Tartaron 2003, p. 26; Alcock and Cherry 2004b. The Internet provides a promising vehicle for communicating even the most voluminous and detailed accounts and datasets: Gates, Alcock, and Cherry 2004.

ACKNOWLEDGMENTS

We acknowledge gratefully the cooperation of the 37th Ephoreia of Prehistoric and Classical Antiquities (represented by Panayiota Kasimi) and the 25th Ephoreia of Byzantine and Post-Byzantine Antiquities (represented by Konstantina Skarmoutsou). EKAS was supported by grants from the following organizations, to which we extend our sincerest appreciation: the Institute for Aegean Prehistory, the National Geographic Society, the Foundation for Exploration and Research on Cultural Origins, and the Ohio State University Excavations at Isthmia.

In addition, individual members received support from university and other external funds. Tartaron was supported by grants from Yale University, including the A. Whitney Griswold Faculty Research Grant, the Yale Center for International and Area Studies Grant, and the Stavros S. Niarchos Faculty Research Grant; funding for students was provided by the Council on Archaeological Studies summer grant program. Pullen received support from Florida State University through the Committee on Faculty Research Support and the Arts and Humanities Program Enhancement Grant. Noller was funded in part by an Oregon State University General Research Fund grant, and also by a National Science Foundation grant awarded to Noller and Lisa Wells. Rothaus received funds from St. Cloud State University for equipment, supplies, and GIS development. Rife received funding from the Classics Department of Cornell University. Tzortzopoulou-Gregory received an Alexander S. Onassis Public Benefit Foundation Fellowship and a School of Archaeology Research Grant from LaTrobe University. Schon's work was supported in part by the Christopher Fund at Bryn Mawr College and by a grant from the Whiting Foundation. Caraher received funding from a United States Department of Education Fund for the Improvement of Secondary Education Research Grant, as well as the following Ohio State University sources: a Department of History Summer Research Fellowship, an Office of International Affairs Summer Dissertation Research Grant, a Graduate School–Alumni Research Award, and a Department of History Isthmia Fellowship. Pettegrew was supported by several Ohio State University sources: the Ruth Higgins Award for Summer Research in the Department of History; the College of Humanities G. Michael Riley International Academic Fund; and by an Office of International Education Dissertation Research Grant. Nakassis received travel support from the Classics Department and from the Program in Aegean Scripts and Prehistory at the University of Texas at Austin. We also thank enthusiastically all of the crew members and other participants, who will be listed individually elsewhere.

Finally, we are grateful to Michael Given, P. Nick Kardulias, and Apostolos Sarris, as well as Tracey Cullen, Carol Stein, and three anonymous *Hesperia* reviewers, for their insightful critiques and suggestions during the editorial process.

REFERENCES

Adams, J., and H. Faure. 1998. "Preliminary Vegetation Maps of the World since the Last Glacial Maximum: An Aid to Archaeological Understanding," *JAS* 24, pp. 623–647.

Alcock, S. E. 1989a. "Archaeology and Imperialism: Roman Expansion and the Greek City," *JMA* 2, pp. 87–135.

———. 1989b. "Roman Imperialism in the Greek Landscape," *JRA* 2, pp. 5–34.

———. 1993. *Graecia Capta: The Landscapes of Roman Greece,* Cambridge.

———. 1994. "Breaking up the Hellenistic World: Survey and Society," in *Classical Greece: Ancient Histories and Modern Archaeologies,* ed. I. Morris, Cambridge, pp. 171–190.

———. 2000. "Extracting Meaning from Ploughsoil Assemblages: Concluding Remarks," in Francovich and Patterson 2000, pp. 265–266.

Alcock, S. E., and J. F. Cherry. 2004a. "Introduction," in Alcock and Cherry 2004b, pp. 1–9.

———, eds. 2004b. *Side-by-Side Survey: Comparative Regional Surveys in the Mediterranean World,* Oxford.

Ambraseys, N. N., and J. A. Jackson. 1990. "Seismicity and Associated Strain of Central Greece between 1890 and 1988," *Geophysical Journal International* 101, pp. 663–708.

Ammerman, A. J. 1985. "Plow-Zone Experiments in Calabria, Italy," *JFA* 12, pp. 33–40.

———. 1995. "The Dynamics of Modern Land Use and the Acconia Survey," *JMA* 8, pp. 77–92.

Anderson-Stojanović, V. 2002. "The Cult of Demeter and Kore at the Isthmus of Corinth," in *Peloponnesian Sanctuaries and Cults. Proceedings of the Ninth International Symposium at the Swedish Institute at Athens, 11–13 June 1994,* (*SkrAth* 4°, 48), ed. R. Hägg, Stockholm, pp. 75–83.

Annis, M., P. van Dommelen, and P. van de Velde. 1995. "Rural Settlement and Socio-political Organization: The Riu Mannu Survey Project in Sardinia," *BABesch* 70, pp. 133–152.

Ashmore, W., and A. B. Knapp, eds. 1999. *Archaeologies of Landscape: Contemporary Perspectives,* Malden, Mass.

Atalay, I. 1997. "Red Mediterranean Soils in Some Karstic Regions of Taurus Mountains, Turkey," *Catena* 28, pp. 247–260.

Barker, G., and D. Mattingly. 2000. "General Editors' Introduction," in Francovich and Patterson 2000, pp. iii–ix.

Bawden, G., and R. M. Reycraft. 2000. *Environmental Disaster and the Archaeology of Human Response* (Maxwell Museum of Anthropology Anthropological Papers 7), Albuquerque.

Berggren, Å., and I. Hodder. 2003. "Social Practice, Method, and Some Problems of Field Archaeology," *AmerAnt* 68, pp. 421–434.

Binford, L. R. 1982. "The Archaeology of Place," *JAnthArch* 1, pp. 5–31.

Bintliff, J. 1991. "The Roman Countryside in Central Greece: Observations and Theories from the Boeotia Survey (1978–1987)," in *Roman Landscapes: Archaeological Survey in the Mediterranean Region,* ed. G. Barker and J. Lloyd, London, pp. 122–132.

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. Snodgrass. 1999. "The Hidden Landscape of Prehistoric Greece," *JMA* 12, pp. 139–168.

Bintliff, J., M. Kuna, and N. Venclová. 2000. "Editorial Overview," in *The Future of Surface Artefact Survey in Europe,* ed. J. Bintliff, M. Kuna, and N. Venclová, Sheffield, pp. 1–2.

Bintliff, J., and A. Snodgrass. 1985. "The Cambridge/Bradford Boeotian Expedition: The First Four Years," *JFA* 12, pp. 123–191.

———. 1988. "Off-Site Pottery Distributions: A Regional and Interregional Perspective," *CurrAnthr* 29, pp. 506–513.

Birkeland, P. W. 1984. *Soils and Geomorphology,* Oxford.

Blanton, R. E. 2001. "Mediterranean Myopia," *Antiquity* 75, pp. 627–629.
Blegen, C. W. 1920. "Corinth in Prehistoric Times," *AJA* 24, pp. 1–13.
———. 1921. *Korakou, a Prehistoric Settlement near Corinth,* Boston.
———. 1930. "Gonia," *MMS* 3, pp. 55–86.
Bookidis, N. 1993. "Ritual Dining at Corinth," in *Greek Sanctuaries: New Approaches,* ed. N. Marinatos and R. Hägg, London, pp. 45–61.
———. 2003. "The Sanctuaries of Corinth," in *Corinth* XX, pp. 247–259.
Bourdieu, P. 1977. *Outline of a Theory of Practice,* Cambridge.
Boutin, A., A. B. Knapp, I. Banks, M. Given, and M. Horowitz. 2004. "Settlement and Cemetery in and around Katydhata Village: From Prehistory to the Roman Era," *RDAC* 2004, pp. 335–351.
Bruno, C. 2003. "Isotopic Record of Paleoclimatic Change in Soils of the Eastern Korinthia, Greece" (M.S. thesis, Oregon State Univ.).
Buikstra, J. E., and D. K. Charles. 1999. "Centering the Ancestors: Cemeteries, Mounds, and Sacred Landscapes of the Ancient North American Midcontinent," in Ashmore and Knapp 1999, pp. 201–228.
Burford, A. 1966. "Notes on the Epidaurian Building Inscriptions," *BSA* 61, pp. 254–339.
———. 1969. *The Greek Temple Builders at Epidauros: A Social and Economic Study of Building in the Asklepian Sanctuary during the Fourth and Early Third Centuries* B.C., Liverpool.
Butzer, K. 1978. "Toward an Integrated, Contextual Approach in Archaeology: A Personal View," *JAS* 5, pp. 191–193.
———. 1982. *Archaeology as Human Ecology,* Cambridge.
Bynum, M. R. 1995. "Studies in the Topography of the Southern Corinthia" (diss. Univ. of California, Berkeley).
Caraher, W. R., and L. Diacopoulos. 2004. "Less than a Village: Patterns of Rural Settlement in the Landscape of the Southeastern Korinthia" (paper, San Francisco 2004).
Caraher, W. R., R. S. Moore, J. S. Noller, and D. K. Pettegrew. 2005. "The Pyla-Koutsopetria Archaeological Project: First Preliminary Report (2003–2004 Seasons)," *RDAC* 2005, pp. 245–268.
Caraher, W. R., D. Nakassis, and D. K. Pettegrew. 2006. "Siteless Survey and Intensive Data Collection in an Artifact-Rich Environment: Case Studies from the Eastern Corinthia, Greece," *JMA* 19, pp. 7–43.
Carr, C. 1995. "Mortuary Practices: Their Social, Philosophical-Religious, Circumstantial, and Physical Determinants," *Journal of Anthropological Method and Theory* 2, pp. 105–200.
Cavanagh, W., J. Crouwel, R. W. V. Catling, and G. Shipley. 2002. *The Laconia Survey* 1: *Continuity and Change in a Greek Rural Landscape. Methodology and Interpretation* (*BSA* Suppl. 26), London.
Cavanagh, W., R. Jones, and A. Sarris. 1996. "The Phosphate and Geophysical Surveys," in *The Laconia Survey* 2: *Continuity and Change in a Greek Rural Landscape. Archaeological Data* (*BSA* Suppl. 27), ed. W. Cavanagh, J. Crouwel, R. W. V. Catling, and G. Shipley, London, pp. 235–261.
Chang, C. 1984. "The Archaeology of Herding Sites in Greece," *MASCAJ* 3:2, pp. 44–48.
———. 1992. "Archaeological Landscapes: The Ethnoarchaeology of Pastoral Land Use in the Grevena Region of Northern Greece," in *Space, Time, and Archaeological Landscapes,* ed. J. Rossignol and L. Wandsnider, New York, pp. 65–90.
———. 1997. "Greek Sheep, Albanian Shepherds: Hidden Economies in the European Community," in Kardulias and Shutes 1997, pp. 123–141.
Cherry, J. F. 2003. "Archaeology beyond the Site: Regional Survey 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., and J. L. Davis. 2001. "'Under the Sceptre of Agamemnon': The View from the Hinterlands of Mycenae," in *Urbanism in the Aegean Bronze Age* (Sheffield Studies in Aegean Archaeology 4), ed. K. Branigan, Sheffield, pp. 141–159.
Cherry, J. F., J. L. Davis, and E. Mantzourani, eds. 1991. *Landscape Archaeology as Long-Term History: Northern Keos in the Cycladic Islands* (Monumenta archaeologica 16), Los Angeles.
Chew, S. C. 2001. *World Ecological Degradation: Accumulation, Urbanization, and Deforestation, 3000* B.C.–A.D. *2000,* Walnut Creek.
Clark, R. H., and A. J. Schofield. 1991. "By Experiment and Calibration: An Integrated Approach to Archaeology of the Ploughsoil," in *Interpreting Artefact Scatters: Contributions to Ploughsoil Archaeology,* ed. A. J. Schofield, Oxford, pp. 93–105.
Clement, P. A., and M. M. Thorne. 1974. "From the West Cemetery at Isthmia," *Hesperia* 43, pp. 401–411.
Corinth XX = C. K. Williams II and N. Bookidis, eds. *Corinth, the Centenary: 1896–1996* (*Corinth* XX), Princeton 2003.
Cullen, T. 2001. "Introduction: Voices and Visions of Aegean Prehistory," in *Aegean Prehistory: A Review* (*AJA* Suppl. 1), ed. T. Cullen, Boston, pp. 1–18.
Dann, M. A., and R. W. Yerkes. 1994. "Use of Geographic Information Systems for the Spatial Analysis of Frankish Settlements in the Korinthia, Greece," in Kardulias 1994b, pp. 289–311.
Davis, J. L. 2004. "Are the Landscapes of Greek Prehistory Hidden? A Comparative Approach," in Alcock and Cherry 2004b, pp. 22–35.
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.
Dia, A., A. Cohen, R. O'Nions, and J. Jackson. 1997. "Rates of Uplift Investigated through ^{230}Th Dating in the Gulf of Corinth (Greece)," *Chemical Geology* 138, pp. 171–184.

Diacopoulos, L. 2004. "The Archaeology of Modern Greece," in *Mediterranean Archaeological Landscapes: Current Issues,* ed. E. Athanassopoulos and L. Wandsnider, Philadelphia, pp. 183–198.

Diacopoulos, L., M. Given, and K. Seretis. 2003. "Historical Archaeology, Oral History, and Field Survey," in Given and Knapp 2003, pp. 23–24.

Dickey, K. 1992. "Corinthian Burial Customs, ca. 1100–550 B.C." (diss. Bryn Mawr College).

Dobres, M.-A. 2000. *Technology and Social Agency: Outlining a Practice Framework for Archaeology,* Oxford.

Doonan, O. 2002. Rev. of Hodder 2000b, in *AmerAnt* 67, pp. 787–788.

Doukellis, P. N. 1994. "Le territoire de la colonie romaine de Corinthe," in *Structures rurales et sociétés antiques. Actes du colloque de Corfou, 14–16 mai 1992,* ed. P. N. Doukellis and L. G. Mendoni, Paris, pp. 359–390.

Dunnell, R. C. 1992. "The Notion Site," in *Space, Time, and Archaeological Landscapes,* ed. J. Rossignol and L. Wandsnider, New York, pp. 21–41.

Dunnell, R. C., and W. S. Dancey. 1983. "The Siteless Survey: A Regional Scale Data Collection Strategy," in *Advances in Archaeological Method and Theory* 6, ed. M. B. Schiffer, New York, pp. 267–287.

Dunnell, R. C., and J. F. Simek. 1995. "Artifact Size and Plowzone Processes," *JFA* 22, pp. 305–319.

Ebert, J. I. 1992. *Distributional Archaeology,* Albuquerque.

Farid, S. 2000. "The Excavation Process at Çatalhöyük," in Hodder 2000b, pp. 19–35.

Farnsworth, M., I. Perlman, and F. Asaro. 1977. "Corinth and Corfu: A Neutron Activation Study of Their Pottery," *AJA* 81, pp. 455–468.

Fentress, E. 2000. "What Are We Counting For?" in Francovich and Patterson 2000, pp. 44–52.

Foley, R. 1981. "Off-Site Archaeology: An Alternative Approach for the Short-Sited," in *Pattern of the Past: Studies in Honour of David Clarke,* ed. I. Hodder, G. Isaac, and N. Hammond, Cambridge, pp. 157–183.

Forbes, H. 1997. "A 'Waste' of Resources: Aspects of Landscape Exploitation in Lowland Greek Agriculture," in Kardulias and Shutes 1997, pp. 187–215.

Fotiadis, M. 1993. "Regions of the Imagination: Archaeologists, Local People, and the Archaeological Record in Fieldwork, Greece," *Journal of European Archaeology* 1:2, pp. 151–168.

Francovich, R., and H. Patterson, eds. 2000. *Extracting Meaning from Ploughsoil Assemblages* (The Archaeology of Mediterranean Landscapes 5), Oxford.

Freyberg, B. von. 1973. *Geologie des Isthmus von Korinth* (Erlanger geologische Abhandlungen 95), Erlanger.

Gallant, T. W. 1986. "Background Noise and Site Definition: A Contribution to Survey Methodology," *JFA* 13, pp. 403–418.

Gates, J. E., S. E. Alcock, and J. F. Cherry. 2004. "Internet Resources for Mediterranean Regional Survey Projects: A Preliminary Listing," in Alcock and Cherry 2004b, pp. 243–251.

Gebhard, E. R. 1993. "The Evolution of a Pan-Hellenic Sanctuary: From Archaeology towards History at Isthmia," in *Greek Sanctuaries: New Approaches,* ed. N. Marinatos and R. Hägg, London, pp. 154–177.

Gebhard, E. R., and M. W. Dickie. 2003. "The View from the Isthmus, ca. 200 to 44 B.C.," in *Corinth* XX, pp. 261–278.

Gebhard, E. R., and F. P. Hemans. 1992. "University of Chicago Excavations at Isthmia, 1989: I," *Hesperia* 61, pp. 1–77.

———. 1998. "University of Chicago Excavations at Isthmia, 1989: II," *Hesperia* 67, pp. 1–63.

Giddens, A. 1979. *Central Problems in Social Theory,* London.

———. 1981. *A Contemporary Critique of Historical Materialism,* London.

Gillings, M. 2000. "The Utility of the GIS Approach in the Collection, Management, Storage, and Analysis of Surface Survey Data," in *The Future of Surface Artefact Survey in Europe,* ed. J. Bintliff, M. Kuna, and N. Venclová, Sheffield, pp. 105–120.

Given, M. 2004. "Mapping and Manuring: Can We Compare Sherd Density Figures?" in Alcock and Cherry 2004b, pp. 13–21.

Given, M., V. Kassianidou, A. B. Knapp, and J. Noller. 2002. "Troodos Archaeological and Environmental Survey Project, Cyprus: Report on the 2001 Season," *Levant* 34, pp. 25–38.

Given, M., and A. B. Knapp, eds. 2003. *The Sydney Cyprus Survey Project: Social Approaches to Regional Archaeological Survey* (Monumenta archaeologica 21), Los Angeles.

Given, M., A. B. Knapp, N. Meyer, T. E. Gregory, V. Kassianidou, J. Noller, L. Wells, N. Urwin, and H. Wright. 1999. "The Sydney Cyprus Survey Project: An Interdisciplinary Investigation of Long-Term Change in the North Central Troodos, Cyprus," *JFA* 26, pp. 20–39.

Given, M., and N. Meyer. 2003. "Mapping and Fieldwalking Procedures," in Given and Knapp 2003, pp. 30–36.

Goldstein, L. G. 1980. *Mississippian Mortuary Practices: A Case Study of Two Cemeteries in the Lower Illinois Valley,* Evanston.

Gregory, T. E. 1985a. "An Early Byzantine Complex at Akra Sophia near Corinth," *Hesperia* 54, pp. 411–428.

———. 1985b. "Cities and Social Evolution in Roman and Byzantine South East Europe," in *European Social Evolution: Archaeological Perspectives,* ed. J. Bintliff, Bradford, pp. 267–276.

———. 1990. "Intensive Archaeological Survey and Its Place in Byzantine Studies," *Byzantine Studies* 13:2, pp. 155–175.

———. 1993a. "The Byzantine Dark Age Occupation in the Roman Bath at Isthmia," in Gregory 1993b, pp. 149–160.

———, ed. 1993b. *The Corinthia in the Roman Period* (*JRA* Suppl. 8), Ann Arbor.

———. 1994. "From Kleonai to Agios Vasilios: Journey through an Ancient Landscape," in *Structures rurales et sociétés antiques. Actes du colloque de Corfou, 14–16 mai 1992,* ed. P. N. Doukellis and L. G. Mendoni, Paris, pp. 351–358.

———. 2004. "Less is Better: The Quality of Ceramic Evidence from Archaeological Survey and Practical Proposals for Low-Impact Survey in a Mediterranean Context," in *Mediterranean Archaeological Landscapes: Current Issues,* ed. E. Athanassopoulos and L. Wandsnider, Philadelphia, pp. 15–36.

Haggis, D. C., and M. S. Mook. 1993. "The Kavousi Coarse Wares: A Bronze Age Chronology for Survey in the Mirabello Area, East Crete," *AJA* 97, pp. 265–293.

Hamilakis, Y. 1998. "Comments and Responses to M. Given, 'Inventing the Eteocypriots: Imperialist Archaeology and the Manipulation of Ethnic Identity' (*JMA* 11.1, June 1998): Archaeology and the Politics of Identity in Cyprus," *JMA* 11, pp. 107–111.

Hayes, J. W. 2000. "The Current State of Roman Ceramic Studies in Mediterranean Studies, or Handling Pottery from Surveys," in Francovich and Patterson 2000, pp. 105–109.

Hayward, C. L. 1996. "High-Resolution Provenience Determination of Construction Stone: A Preliminary Study of Corinthian Oolitic Limestone Quarries at Examilia," *Geoarchaeology* 11, pp. 215–234.

———. 1999. "Geological Evidence for the Pre-8th-Century Topography of the Central Plateau," in *Isthmia* VIII, pp. 3–14.

———. 2003. "Geology of Corinth: The Study of a Basic Resource," in *Corinth* XX, pp. 15–42.

Hemans, F. P. 1994. "Greek Architectural Terracottas from the Sanctuary of Poseidon at Isthmia," in *Proceedings of the International Conference on Greek Architectural Terracottas of the Classical and Hellenistic Periods, December 12–15, 1991* (*Hesperia* Suppl. 27), ed. N. A. Winter, Princeton, pp. 61–83.

Hodder, I. 1997. "'Always Momentary, Fluid, and Flexible': Towards a Reflexive Excavation Methodology," *Antiquity* 71, pp. 691–700.

———. 2000a. "Developing a Reflexive Method in Archaeology," in Hodder 2000b, pp. 3–18.

———, ed. 2000b. *Towards Reflexive Method in Archaeology: The Example at Çatalhöyük* (British Institute of Archaeology at Ankara, Monograph 28), Cambridge.

Holdaway, S., D. Witter, P. Fanning, R. Musgrave, G. Cochrane, T. Doelman, S. Greenwood, D. Pigdon, and J. Reeves. 1998. "New Approaches to Open Site Spatial Archaeology in Sturt National Park, New South Wales, Australia," *Archaeology in Oceania* 33, pp. 1–19.

Hope Simpson, R. 1981. *Mycenaean Greece,* Park Ridge.

Institute of Geology and Mineral Exploration (IGME). 1972. *Korinthos Sheet,* Athens.

———. 1975. *Sofikon Sheet,* Athens.

Isthmia = *Isthmia: Excavations by the University of Chicago under the Auspices of the American School of Classical Studies at Athens,* Princeton

II = O. Broneer, *Topography and Architecture,* 1973.

V = T. E. Gregory, *The Hexamilion and the Fortress,* 1993.

VIII = C. Morgan, *The Late Bronze Age Settlement and Early Iron Age Sanctuary,* 1999.

IX = J. L. Rife, *The Roman and Byzantine Graves and Human Remains,* forthcoming.

James, S. 2005. "An Olive Press Installation from the Eastern Korinthia" (poster, Boston 2005).

Kardulias, P. N. 1994a. "Archaeology in Modern Greece: Bureaucracy, Politics, and Science," in Kardulias 1994b, pp. 373–387.

———, ed. 1994b. *Beyond the Site: Regional Studies in the Aegean Area,* Lanham.

———. 1999. "Multiple Levels in the Aegean Bronze Age World-System," in *World-Systems Theory in Practice: Leadership, Production, and Exchange,* ed. P. N. Kardulias, Lanham, pp. 179–201.

Kardulias, P. N., T. E. Gregory, and M. A. Dann. 1997. "Re-creating a Frankish Town," *Archaeology* 50:3, pp. 54–58.

Kardulias, P. N., T. E. Gregory, and J. Sawmiller. 1995. "Bronze Age and Late Antique Exploitation of an Islet in the Saronic Gulf, Greece," *JFA* 22, pp. 3–21.

Kardulias, P. N., and M. T. Shutes, eds. 1997. *Aegean Strategies: Studies of Culture and Environment on the European Fringe,* Lanham.

Kenchreai I = R. L. Scranton, J. W. Shaw, and W. Ibrahim, *Kenchreai,*

Eastern Port of Corinth: Results of Investigations by the University of Chicago and Indiana University I: *Topography and Architecture,* Leiden 1976.

Keraudren, B., and D. Sorel. 1987. "The Terraces of Corinth (Greece): A Detailed Record of Eustatic Sea-Level Variations during the Last 500,000 Years," *Marine Geology* 77, pp. 99–107.

Kosso, C. 2003. *The Archaeology of Public Policy in Late Roman Greece* (*BAR-IS* 1126), Oxford.

Kvamme, K. L. 2003. "Geophysical Surveys as Landscape Archaeology," *AmerAnt* 68, pp. 435–457.

Lambeck, K. 1995. "Late Pleistocene and Holocene Sea-Level Change in Greece and Southern Turkey: A Separation of Eustatic, Isostatic, and Tectonic Contributions," *Geophysical Journal International* 122, pp. 1022–1044.

———. 1996. "Sea-Level Change and Shore-Line Evolution: A General Framework of Modelling and Its Application to Aegean Greece since Upper Palaeolithic Time," *Antiquity* 70, pp. 588–611.

Landon, M. E. 2003. "Beyond Peirene: Toward a Broader View of Corinthian Water Supply," in *Corinth* XX, pp. 43–62.

Lawrence, P. 1964. "Five Grave Groups from the Corinthia," *Hesperia* 33, pp. 89–107.

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.

Levy, T. E., J. D. Anderson, M. Waggoner, N. Smith, A. Muniz, and R. B. Adams. 2001. "Digital Archaeology 2001: GIS-Based Excavation Recording in Jordan," *The SAA Archaeological Record* 1:3, pp. 23–29.

Lolos, G. J. 1998. "Studies in the Topography of Sikyonia (Greece)" (diss. Univ. of California, Berkeley).

———. Forthcoming. *Land of Sikyon: The Archaeology and History of a Greek City-State* (*Hesperia* Suppl. 39), Princeton.

Marchand, J. 2002. "Well-built Kleonai: A History of the Peloponnesian City Based on a Survey of the Visible Remains and a Study of the Literary and Epigraphic Sources" (diss. Univ. of California, Berkeley).

Mattingly, D. 2000. "Methods of Collection, Recording, and Quantification," in Francovich and Patterson 2000, pp. 5–15.

McGlade, J. 1997. "GIS and Integrated Archaeological Knowledge Systems," in *Archaeological Applications of GIS. Proceedings of Colloquium II, UISPP XIIIth Congress, Forli, Italy, September 1996* (Sydney University Archaeological Methods Series 5, CD-ROM), ed. I. Johnson and M. North, Sydney.

Mee, C., and P. James. 2000. "Soils and Site Function: The Laconia Rural Sites Project," in *Landscape and Land Use in Postglacial Greece* (Sheffield Studies in Aegean Archaeology 3), ed. P. Halstead and C. Frederick, Sheffield, pp. 162–175.

Meyer, N. 2003. "Pottery Strategy and Chronotypes," in Given and Knapp 2003, pp. 14–16.

Meyer, N., and T. E. Gregory. 2003. "Pottery Collection, Pottery Analysis, and GIS Mapping," in Given and Knapp 2003, pp. 48–52.

Meyer, N., and R. Schon. 2003. "Experimental Data," in Given and Knapp 2003, pp. 52–56.

Millett, M. 2000. "Dating, Quantifying, and Utilizing Pottery Assemblages from Surface Survey," in Francovich and Patterson 2000, pp. 53–59.

Mitsos, M. 1936. "Επιγραφές εξ Αρκαδίας, Επιδαύρου, και Κορινθίας," *ArchEph* 1936, pp. 136–146.

Morgan, C. 1994. "The Evolution of a Sacral 'Landscape': Isthmia, Perachora, and the Early Corinthian State," in *Placing the Gods: Sanctuaries and Sacred Space in Ancient Greece,* ed. S. E. Alcock and R. Osborne, Oxford, pp. 105–142.

Morgan, C. H., II. 1939. "Excavations at Corinth, 1938," *AJA* 43, pp. 255–267.

Murray, P., and P. N. Kardulias. 2000. "The Present as Past: An Ethnoarchaeological Study of Modern Sites in the Pikrodhafni Valley," in Sutton 2000, pp. 141–168.

Noller, J., L. Wells, E. Reinhardt, and R. Rothaus. 1997. "Subsidence of the Harbor at Kenchreai, Saronic Gulf, Greece, during the Earth-

quakes of A.D. 400 and A.D. 1928," *Eos* 78, p. 636.

Osborne, R. 1987. *Classical Landscape with Figures: The Ancient Greek City and Its Countryside,* London.

———. 1991. "Pride and Prejudice, Sense and Subsistence: Exchange and Society in the Greek City," in *City and Country in the Ancient World,* ed. J. Rich and A. Wallace-Hadrill, London, pp. 119–145.

———. 1996. "Survey and Greek Society," *AJA* 100, pp. 165–169.

O'Shea, J. 1984. *Mortuary Variability: An Archaeological Investigation,* New York.

Pardoe, C. 2003. "The Menindee Lakes: A Regional Archaeology," *Australian Archaeology* 57, pp. 42–53.

Parker Pearson, M. 1999. *The Archaeology of Death and Burial,* College Station.

Pettegrew, D. K. 2001. "Chasing the Classical Farmstead: Assessing the Formation and Signature of Rural Settlement in Greek Landscape Archaeology," *JMA* 14, pp. 189–209.

———. 2006. "Corinth on the Isthmus: Studies of the End of an Ancient Landscape" (diss. Ohio State Univ.).

———. Forthcoming. "The Busy Countryside of Late Roman Corinth: Ceramic Data, Source Analysis, and Regional Settlement Patterns," *Hesperia.*

Pirazolli, P. A., S. C. Stiros, M. Arnold, J. Laborel, F. Laborel-Deguen, and S. Papageorgiou. 1994. "Episodic Uplift Deduced from Holocene Shorelines in the Perachora Peninsula, Corinth Area, Greece," *Tectonophysics* 229, pp. 201–209.

Pritchett, W. K. 1980. *Studies in Ancient Greek Topography,* Part III: *Roads* (University of California Publications in Classical Studies 22), Berkeley.

Rautman, M. 2000. "The Busy Countryside of Late Roman Cyprus," *RDAC* 2000, pp. 317–331.

Rife, J. L. 1999. "Death, Ritual, and Memory in Greek Society during the Early and Middle Roman Empire" (diss. Univ. of Michigan).

Romano, D. G. 1993. "Post-146 B.C. Land Use in Corinth, and Planning of the Roman Colony of 44 B.C.," in Gregory 1993b, pp. 9–30.

———. 2005. "Urban and Rural Planning in Roman Corinth," in *Urban Religion in Roman Corinth: Interdisciplinary Approaches* (Harvard Theological Studies 53), ed. D. N. Schowalter and S. J. Friesen, Cambridge, Mass., pp. 25–59.

———. 2006. "Roman Surveyors in Corinth," *PAPS* 150, pp. 62–85.

Rothaus, R. M. 2000. *Corinth, the First City of Greece: An Urban History of Late Antique Cult and Religion* (Religions in the Graeco-Roman World 139), Leiden.

Rothaus, R. M., E. Reinhardt, T. Tartaron, and J. Noller. 2003. "A Geoarchaeological Approach for Understanding Prehistoric Usage of the Coastline of the Eastern Korinthia," in *METRON: Measuring the Aegean Bronze Age* (*Aegaeum* 24), ed. K. Foster and R. Laffineur, Liège, pp. 37–47.

Rutter, J. B. 1974. "The Late Helladic IIIB and IIIC Periods at Korakou and Gonia in the Corinthia" (diss. Univ. of Pennsylvania).

———. 2003. "Corinth and the Corinthia in the Second Millennium B.C.: Old Approaches, New Problems," in *Corinth* XX, pp. 75–83.

Sakellariou, M. V., and N. Faraklas. 1971. *Corinth–Cleonai* (Ancient Greek Cities 3), Athens.

Salmon, J. B. 1984. *Wealthy Corinth: A History of the City to 338 B.C.,* Oxford.

Sarris, A. 2003. *Technical Report: Geophysical Prospection Survey at Kromna-Kesimia and Perdikaria as Part of the Eastern Korinthia Archaeological Survey (EKAS-2002),* Rethymnon.

Sarris, A., and R. E. Jones. 2000. "Geophysical and Related Techniques Applied to Archaeological Survey in the Mediterranean: A Review," *JMA* 13, pp. 3–75.

Saxe, A. A. 1970. "Social Dimensions of Mortuary Practices" (diss. Univ. of Michigan).

Schiffer, M. B. 1972. "Archaeological Context and Systemic Context," *AmerAnt* 37, pp. 156–165.

———. 1987. *Formation Processes of the Archaeological Record,* Albuquerque.

Schlanger, S. H. 1992. "Recognizing Persistent Places in Anasazi Settlement Systems," in *Space, Time, and Archaeological Landscapes,* ed. J. Rossignol and L. Wandsnider, New York, pp. 91–112.

Schon, R. 2002. "Seeding the Landscape: Experimental Contributions to Regional Survey Methodology" (diss. Bryn Mawr College).

Seretis, K., and L. Diacopoulos. 2003. "SIA 5: Mitsero Village," in Given and Knapp 2003, pp. 109–118.

Shipley, G. 2000. "The Extent of Spartan Territory in the Late Classical and Hellenistic Periods," *BSA* 95, pp. 337–390.

———. 2002. "The Survey Area in the Hellenistic and Roman Periods," in Cavanagh et al. 2002, pp. 257–337.

Shott, M. J. 1995. "Reliability of Archaeological Records on Cultivated Surfaces: A Michigan Case Study," *JFA* 22, pp. 475–490.

Shutes, M. T. 1997. "Working Things Out: On Examining the Relationships between Agricultural Practice and Social Rules in Ancient Korinthos, Greece," in Kardulias and Shutes 1997, pp. 237–257.

Stiros, S. C. 2001. "The A.D. 365 Crete Earthquake and Possible Seismic Clustering during the Fourth to Sixth Centuries A.D. in the Eastern Mediterranean: A Review of Historical and Archaeological Data," *Journal of Structural Geology* 23, pp. 545–562.

Sutton, S. B. 1988. "What Is a Village in a Nation of Migrants?" *Journal of Modern Greek Studies* 6, pp. 187–215.

———. 1994. "Settlement Patterns, Settlement Perceptions: Rethinking the Greek Village," in Kardulias 1994b, pp. 313–335.

———, ed. 2000. *Contingent Countryside: Settlement, Economy, and Land Use in the Southern Argolid since 1700,* Stanford.

Tartaron, T. F. 2003. "The Archaeological Survey: Sampling Strategies and Field Methods," in *Landscape Archaeology in Southern Epirus, Greece* 1 (*Hesperia* Suppl. 32), ed. J. Wiseman and K. Zachos, Princeton, pp. 23–45.

Tartaron, T. F., D. J. Pullen, and J. S. Noller. 2006. "*Rillenkarren* at Vayia: Geomorphology and a New Class of Early Bronze Age Fortified Settlement in Southern Greece," *Antiquity* 80, pp. 145–160.

Tartaron, T. F., R. M. Rothaus, and D. J. Pullen. 2003. "Searching for Prehistoric Aegean Harbors with GIS, Geomorphology, and Archaeology," *Athena Review* 3:4, pp. 27–36.

Taylor, J. 2000. "Cultural Depositional Processes and Post-depositional Problems," in Francovich and Patterson 2000, pp. 16–26.

Terrenato, N. 2004. "Sample Size Matters! The Paradox of Global Trends and Local Surveys," in Alcock and Cherry 2004b, pp. 36–48.

Thomas, D. H. 1975. "Non-Site Sampling in Archaeology: Up the Creek without a Site?" in *Sampling in Archaeology,* ed. J. W. Mueller, Tucson, pp. 61–81.

Tod, M. N. 1985. *Greek Historical Inscriptions* (originally published as two volumes, *Greek Historical Inscriptions* I [1946] and II [1948]), Chicago.

van Andel, T. 1994. "Geo-archaeology and Archaeological Science—A Personal View," in Kardulias 1994b, pp. 25–44.

———. 1998. "Paleosols, Red Sediments, and the Old Stone Age in Greece," *Geoarchaeology* 13, pp. 361–390.

van Andel, T., and C. Runnels. 1987. *Beyond the Acropolis: A Rural Greek Past,* Stanford.

Vita-Finzi, C., and G. C. P. King. 1985. "The Seismicity, Geomorphology, and Structural Evolution of the Corinth Area of Greece," *Philosophical Transactions of the Royal Society of London* 314, pp. 379–407.

Vroom, J. 1993. "The Kastro of Veloukovio (Kallion): A Note on Surface Finds," *Pharos* 1, pp. 113–138.

———. 1996. "Coffee and Archaeology: A Note on a Kütahya Ware Find in Boeotia, Greece," *Pharos* 4, pp. 6–19.

———. 1998. "Early Modern Archaeology in Central Greece: The Contrast of Artefact-Rich and Sherdless Sites," *JMA* 11, pp. 131–164.

Wandsnider, L., and E. L. Camilli. 1992. "The Character of Surface Archaeological Deposits and Its Influence on Survey Accuracy," *JFA* 19, pp. 169–188.

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

Wells, L. E. 2001. "Archaeological Sediments in Coastal Environments," in *Sediments in Archaeological Context,* ed. J. K. Stein and W. R. Farrand, Salt Lake City, pp. 149–182.

Wescott, B., and R. J. Brandon, eds. 2000. *Practical Applications of GIS for Archaeologists,* London.

Weymouth, J. W., and R. Huggins. 1985. "Geophysical Surveying and Archaeological Sites," in *Archaeological Geology,* ed. G. Rapp Jr. and J. A. Gifford, New Haven, pp. 191–235.

Whitbread, I. K. 2003. "Clays of Corinth: The Study of a Basic Resource for Ceramic Production," in *Corinth* XX, pp. 1–13.

Whitelaw, T. 1991. "The Ethnoarchaeology of Recent Rural Settlement and Land Use in Northern Keos," in Cherry, Davis, and Mantzourani 1991, pp. 403–454.

Wise, K. 1995. "La ocupación Chinchorro en Villa del Mar, Ilo, Peru," *Gaceta Arqueologica Andina* 24, pp. 135–149.

Wiseman, J. R. 1963. "A Trans-Isthmian Fortification Wall: Notes on Hellenistic Military Operations in the Corinthia," *Hesperia* 32, pp. 248–275.

———. 1978. *The Land of the Ancient Corinthians* (*SIMA* 50), Göteborg.

Wright, J. C. 2004. "Comparative Settlement Patterns during the Bronze Age in the Northeastern Peloponnesos," in Alcock and Cherry 2004b, pp. 114–131.

Wright, J. C., J. F. Cherry, J. L. Davis, E. Mantzourani, S. B. Sutton, and R. F. Sutton Jr. 1990. "The Nemea Valley Archaeological Project: A Preliminary Report," *Hesperia* 59, pp. 579–659.

Yaalon, D. 1997. "Soils in the Mediterranean Region: What Makes Them Different?" *Catena* 28, pp. 157–169.

Yassoglou, N., C. Kosmas, and N. Moustakas. 1997. "The Red Soils, Their Origin, Properties, Use, and Management in Greece," *Catena* 28, pp. 261–278.

Thomas F. Tartaron

UNIVERSITY OF PENNSYLVANIA
DEPARTMENT OF CLASSICAL STUDIES
LOGAN HALL 201
PHILADELPHIA, PENNSYLVANIA 06520

tartaron@sas.upenn.edu

Timothy E. Gregory

OHIO STATE UNIVERSITY
DEPARTMENT OF HISTORY
106 DULLES HALL
230 WEST 17TH AVENUE
COLUMBUS, OHIO 43210

gregory.4@osu.edu

Daniel J. Pullen

FLORIDA STATE UNIVERSITY
DEPARTMENT OF CLASSICS
TALLAHASSEE, FLORIDA 32306

dpullen@mailer.fsu.edu

Jay S. Noller

OREGON STATE UNIVERSITY
DEPARTMENT OF CROP AND SOIL SCIENCE
3017 AGRICULTURAL AND
LIFE SCIENCES BUILDING
CORVALLIS, OREGON 97331

jay.noller@oregonstate.edu

Richard M. Rothaus

St. Cloud State University
office of sponsored programs,
research, and faculty development
720 4th avenue south
st. cloud, minnesota 56301

rrothaus@stcloudstate.edu

Joseph L. Rife

Macalester College
classics department
1600 grand avenue
st. paul, minnesota 55105

rife@macalester.edu

Lita Tzortzopoulou-Gregory

La Trobe University
department of archaeology
kingsbury drive
bundoora,melbourne
victoria 3086
australia

l.gregory@usyd.edu.au

Robert Schon

Wellesley College
department of classical studies
founders hall
106 central street
wellesley, massachusetts 02481

rschon@wellesley.edu

William R. Caraher

University of North Dakota
department of history
merrifield hall, room 209b
grand forks, north dakota 58202

william.caraher@und.nodak.edu

David K. Pettegrew

Messiah College
department of history
p.o. box 3051
one college avenue
grantham, pennsylvania 17027

dpettegrew@messiah.edu

Dimitri Nakassis

Trinity University
department of classical studies
one trinity place
san antonio, texas 78212

dimitri.nakassis@trinity.edu