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A Proposed Archaeological Survey of Tegea

by

Thomas Pfauth

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STATEMENT BY AUTHOR

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APPROVAL BY THESIS DIRECTOR
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May 15, 1997
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ABBREVIATIONS

Bibliographical:

AJA  American Journal of Archaeology

BCH  Bulletin de correspondance hellénique


BSA  Annual of the British School at Athens


Dodwell, Tour  Dodwell, E., A Classical and Topographical Tour through Greece, during the years 1801, 1805, and 1806 (London, 1819).


JFA  Journal of Field Archaeology


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**General:**

<table>
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ABSTRACT

This paper proposes a plan for an archaeological survey of the ancient Greek city of Tegea, in Arcadia. Excavations at the temple of Athena Alea in Tegea have uncovered evidence of cult practice that extends into the tenth century BC, and provide the basis for further archaeological investigation. An archaeological survey would connect known developments within the religious sphere to developments in the social and political spheres of the surrounding territory.

The survey will be an intensive, pedestrian, and all-period survey, will follow the methodology of the Cambridge/Bradford Boeotian Expedition, and will use computer databases and GIS. From the diachronic changes in settlement pattern discovered, we can infer the answers to questions regarding the social, political and economic structures in all periods from the Neolithic to modern times. The materials collected by the survey will provide opportunities for research beyond their immediate usefulness to the survey itself.
INTRODUCTION

In this paper I propose a plan for an archaeological survey to be carried out at the site of the ancient Greek city of Tegea, in Arcadia. Recent excavations conducted at the temple of Athena Alea in Tegea have uncovered evidence of cult practice that extends into the tenth century BC, and of cult buildings that are at least as early as the eighth century BC. This ancient sanctuary is the same one that later, in the fourth century BC, saw the construction of one of the finest marble temples in the Peloponnese. Literary evidence suggests that Tegea developed early into an important and powerful city, on a par with Sparta, Argos, and Corinth, and ahead of other Arcadian polities. Tegea’s location on a nexus of travel routes through the Peloponnese exposed the city to the common cultural developments of ancient Greece that comprised one of the greatest flowerings of thought and art in Western history. Tegea contributed materially to this flowering in the building of the magnificent fourth-century BC temple of Athena Alea. The city was likewise well positioned to mediate cultural developments to other parts of Arcadia. Her later history shows her as a leader in the foundation of the Arcadian League, which put her at the forefront of political development in ancient Greece.

An archaeological survey of Tegea would enable us to learn more about how Tegea developed into a great city, and how this development relates to the progress of events in Greece as a whole. In particular we would most like to understand the process by which small, scattered communities combined to form a central, dominant city-state, a process called synoecism. Recent scholarship has emphasized the importance of religion
in the process of synoecism,¹ and the evidence of early cult practice at the temple site reinforces this; we would like to know what were the other factors involved in synoecism. A clearer picture of Tegea will throw more light on other parts of Greece as well, particularly on Laconia with which Tegea was always closely connected.

Moreover, while an archaeological survey of the plain of Tegea will, in and of itself, contribute a great deal to the history and archaeology of the region, it will also provide a starting point for many other valuable research projects. One of the primary goals of archaeological surveys is to locate sites and to place them in proper chronological relation with each other. It follows that, once they are located, sites of interest can also be excavated. For Tegea such sites can range from features associated with agriculture, like small farms, to important civic and religious structures, like sanctuaries. The materials, particularly the ceramics, collected by the survey will also provide opportunities for research beyond their immediate usefulness to the survey itself. Occasions for new research especially benefit new students of archaeology, besides increasing our overall understanding of ancient culture and history.

There are also purely practical reasons for conducting a survey at this site and at this time. They are the following: 1) the recent excavation of the temple of Athena Alea, conducted under the auspices of the Norwegian School at Athens, can now provide a quantity of ceramic and other material from stratified contexts that can serve as a

foundation for identifying and dating the material on the surface of the surrounding plain;
2) The recent excavation can furnish a group of people who are familiar with this material, and with the region of Tegea, and who have established contacts with local Greek archaeologists; 3) The plain of Tegea will never be better suited for archaeological survey than it is now, since the greater part is under cultivation and has not yet succumbed to the urban encroachment of nearby Tripoli; 4) Methods and theory of archaeological survey are by now fairly well established for Greece; 5) There exists now a body of survey data from other regions of Greece with which a survey of Tegea can be usefully compared; 6) The Norwegian School at Athens, by whose agency the survey will proceed, has only one other field project underway at the present time; there are no competing applications and the survey is well within the means and resources of the School.

Other, more general, reasons for conducting an archaeological survey are at the same time pragmatic and theoretical. They include the need for archaeologists to recognize the limitations imposed by the economic development of Greece and the resources of the Greek government. The steadily increasing pace of urban and rural development, coupled with stricter legislation about antiquities, has imposed greater burdens on the Greek Archaeological Service. Not the least of these burdens is the demand for secure storage space for rising amounts of archaeological material. Surveys hold the possibility of producing a higher ratio of new knowledge to new objects, because, by their nature, surveys are more selective than excavations in the collection of

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2 See C/BBE, 124, for a succinct justification of archaeological surveys vis-à-vis excavations.
artifacts. Surveys also differ from excavations in that they produce data that can address a very different set of questions. Moreover, unlike excavation, survey is a non-destructive archaeological technique that can be repeated, and its results can be checked and refined.

The survey will largely follow the strategies and methodology that were worked out by the Nemea Valley Archaeological Project (NVAP), the associated urban survey of adjoining Phlius, and especially those of the Cambridge/Bradford Boeotian Expedition (C/BBE). In addition to the methods employed in these surveys, however, the Tegea survey will make use of a computer database and a Geographic Information System (GIS). GIS have been used in Mediterranean archaeological surveys before, but methods of data collection have seldom been tailored with their capabilities in mind. The Tegea survey will implement data collection techniques that complement GIS analyses. The GIS software that will be used in the Tegea survey, IDRISI, has already aided in an important method of record-keeping: the digitization of high-altitude aerial photographs. These photographs are digitally registered to Greek geodetic survey maps, producing what can be called “photo-maps.” Coordinates can be read directly from the computer screen for any feature on the photo-maps, theoretically allowing a very precise location of artifacts. In addition, digitized elevation contours can be overlaid upon the photo-maps. These have uses both in the field and in analysis.

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3 NVAP.
Applications to the Greek authorities will ask that the survey be conducted for three seasons beginning in the summer of 1998. Besides the author, the principal investigators would include Knut Ødegård of the University of Oslo, Knut Krzywinski, a paleobotanist, and Wojtek Nemec, a geologist. The survey will be conducted under the auspices of the Norwegian School at Athens, which has already committed itself to support this project.
I. PREVIOUS RESEARCH ON TEGEA

Research questions specific to the Tegea survey include those advanced by previous studies of the region, and some new ones advanced by recent trends in archaeological analysis. A short review of scholarship pertaining to Tegea will serve to introduce some long-standing problems that the survey will address. For one of these problems, i.e., the ancient course of the Alpheios River, a definitive solution is offered in this paper.

Early Investigations of Tegea

A visit to Tegea by Edward Dodwell, at beginning of the nineteenth century, serves to frame much of later research in the area. He was concerned largely with the location of the monuments of Tegea that were mentioned by the second-century AD writer Pausanias. Dodwell was the first to identify the visible remains of the temple of Athena Alea, and he noted the presence of ancient architectural fragments built into the churches at nearby Hagios Sostis and Palaio Episkopi. Hidden beneath the latter church were the foundations of the second-century BC marble theater, but although he searched for it, Dodwell missed this finely-made building. Dodwell supposed that the acropolis of Tegea lay either on the hill of Hagios Sostis or at the "eminence" of Palaio Episkopi, and he observed that the walls of the ancient city were nowhere to be seen.

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7 Dodwell, Tour.
8 Pausanias, Book VII.44.7 - VIII.54.7 deals with Tegea.
Later researchers at Tegea have, like Dodwell, pursued what Pausanias said was notable about Tegea. The theater and the temple of Athena Alea have both been excavated, as have small sections of the circuit wall, and the agora. The location of the acropolis has continued to be a problem, however, and although Tegea’s fortification walls have been dated to the fifth or the fourth-centuries BC, this has not settled questions about the date of Tegea’s synoecism. In connection with the walls, Dodwell wrote that they were perhaps concealed by soil that was “apparently much higher than its original level.”10 This early observation of alluvium is important for our understanding of the archaeology of Tegea, and it is also noteworthy that Dodwell thought that the greater part of the ruins of the temple of Athena Alea were also buried.

Shortly after Dodwell’s investigation, there came a French scientific mission to the Peloponnese.11 This expedition closely studied the geology and hydrology of the plain. It distinguished the alluvium from other soils on the plain by mineral content, and described the plain as having been filled up and brought to a common level by alluviation, whereas the surface must have been more irregular in the time of Pausanias. Such a description entails seeing the river wandering back and forth across the plain, depositing alluvium in different places at different times, building up the plain in one place to a height where it would then break its banks and flow to some place lower, eventually covering over a significant part of the plain, and many ancient monuments. Later excavation shows that

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10 Dodwell, Tour, 420.
the temple of Athena Alea was certainly covered by alluvium. Dodwell was, in general, correct about the city walls being concealed by alluvium, although there is reason to believe that the wall foundations were also hidden beneath the collapsed mass of their own mudbrick superstructure.

An important investigation in the area was conducted by Bérard, whose work included a close description of the landscape, excavations of portions of the city walls, a useful analysis of what Pausanias said about the population and its distribution into demes, and finally, a cogent argument about the absence of an acropolis in the city. From his detailed description of the landscape of Tegea as it was around 1900, we can draw some conclusions about past land use, especially as this relates to cultivation, upon which surface survey heavily relies. Bérard also excavated four short sections of the city walls, and from their positions he extrapolated the entire circuit. His analysis of the boundaries of the demes of Tegea, into which the population was grouped, was the first attempt to understand the settlement pattern of Tegea in any detail.

Bérard also made a significant contribution to the study of Tegea in his discussion of the location of Tegea’s citadel, or acropolis. His views are sensible and based on both archaeology and literature, and nothing discovered since contradicts them. Essentially he argues that Tegea had no acropolis in the sense of a fortified height within or attached to the city walls. The references in ancient literature to a “high place” refer to the hill of

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12 Pritchett, *SAGT*, n. 28, says that the presence of alluvium at an elevation higher than the temple’s shows that the entire temple was covered by at least 2 m of sediment. We may also recall Dodwell’s description of the temple as largely buried.

13 Bérard, *Tégée*. 
Hagios Sostis, which appears to have held several Tegean sanctuaries, but there is no
evidence of a fortress. The presence or absence of an acropolis possibly relates to the
form of Tegea's government, but without more definite archaeological correlates to
democracies, oligarchies, or monarchies, the survey can probably not determine which was
the form at Tegea.

Bérard's efforts to understand both the contemporary and the ancient topography
also led him to consider the course of the Sarandapotomos River, which presently flows
past Tegea to the east. He concluded that the river had changed its course since antiquity,
when it flowed to the west and was identified with the Alpheios River. His conjectures
about the ancient course of the river, while generally correct, should be followed with
cautions, however. His views have raised a debate in recent literature regarding the course
of the Sarandapotomos, its identity as the Alpheios River of antiquity, and the reliability of
Pausanias' *Description of Greece*. Some of Bérard's contemporaries contended that
rising ground between the present course of the river and areas to the west make a
westward-flowing river impossible. It is hoped that the issue will be laid to rest with this
paper or, if not, then with the geological investigations of the survey. The course of the
Sarandapotomos/Alpheios is crucial to the archaeology of Tegea since for millennia it has
laid down, and continues to lay down, the alluvium which essentially forms the plain of
Tegea.

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acropolis.

15 See Voyatzis, *ESAAT*, 18 ff. for a summary of the debate.
Excavations at the Temple of Athena Alea

Towards the end of the nineteenth century, excavations began at the temple of Athena Alea, first by the Germans then by the French, and have continued intermittently until the present. These have provided the most archaeological information about Tegea to date. They were summarized by Voyatzis in 1990, who, on the basis of more recent scholarship, was also able to reclassify much of the archaeological material found at Tegea up until that time. Although the earlier excavations of the temple, up to and including the extensive work by Charles Dugas in 1911-1913, were not rigorously scientific, Voyatzis was able to glean some stratigraphic information from them and to incorporate data from a later excavation by Steinhauer (1976-1977) that otherwise remains largely unpublished.

The recent Norwegian campaign at the sanctuary of Athena Alea, directed by Erik Østby, has investigated inside the cella of the fourth-century temple to test the hypothesis that two rows of dressed stone found there belonged to an earlier, Archaic temple. The excavation confirmed this hypothesis, and in addition yielded not one earlier temple but a succession of four possible temple structures, one beneath the other and aligned axially with one another. These older structures include the large Archaic temple, constructed around 600 BC, that Pausanias wrote was destroyed by fire in 395 BC, one seventh-century temple beneath this that survives in the form of a platform of rough stones, and

16 Voyatzis, ESAAT, 20 ff.
18 Østby, E., Excavations, 62 notes that none of the structures had hearths, and that the earlier ones were far too small to have been chieftain's houses or meeting places.
19 Pausanias, VIII.45.4: "When Diophantes was archon of Athens," i.e., 395 BC. See Develin, R., Athenian Officials 684-321 B.C. (Cambridge. 1989), 207.
two Geometric buildings in succession beneath this. In addition, a sounding in one corner of the earlier Geometric building revealed a surface that could possibly be yet another, earlier structure.

The picture that emerges suggests that the structures were expanded and improved several times, first in the later eighth century to replace an earlier Late Geometric structure, then a third, yet larger building, whose rough stone platform wrapped around the apse of its predecessor, and finally towards the end of the seventh century, the monumental Archaic temple was built. The finds dating to the seventh century BC are particularly rich and include many imports from Corinth, Sparta, and Argos. This is the first archaeological evidence that bolsters what had only been guessed at previously from literary sources, i.e., that the synoecism of Tegea occurred in the seventh century BC.

Significant material evidence exists to show that cult activity predates even the earliest architectural remains at the site. To judge from the objects found at the site, activity at the temple site may have begun as early as the twelfth and eleventh centuries, with a notable increase after 950 BC. There is a significant amount of Protogeometric

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20 See Mazarakis-Ainian, A.J., “Early Greek Temples: Their Origin and Function,” in Early Greek Cult Practice, eds. R. Hagg, N. Marinatos, and G. Nordquist (Stockholm, 1988) for the idea that early Geometric temples were the dwellings of chieftains who also had religious duties. In the eighth century these differentiated into temples per se.

21 This platform is so far the only architectural vestige of this building. Although it served no obvious function in either the late eighth-century temple or in the large, late seventh-century temple, the existence of a seventh-century incarnation between these two temples is still hypothetical. See Østby, et al., Tegea, 139.


23 Østby, Excavations, 62.

24 Callmer, C., Studien zur Geschichte Arkadiens (Lund, 1943), 70, concludes that the synoecism was not earlier than the later seventh century because Tegea is mentioned nowhere as playing a part in the Second Messenian War, c. 650 BC.

25 Voyatzis, ESAAT, 69.
pottery with Attic and Argive affinities, and from a bothros excavated within the cella of the fourth-century temple came a large amount of Protogeometric (PG) and Early Geometric (EG) pottery mixed together with "Laconian Dark Age," or Laconian PG, material in the lowest levels; above this was Middle Geometric (MG) and Late Geometric (LG) material. The bothros also contained animal bones, carbon, and small objects of terracotta, bronze, and gold. Both the quality and the quantity of this material point to cult activity at a very early date.

The greatest increase in material is from the eighth century on. Local styles predominate in certain classes of votives, particularly miniature vessels and bronze figurines. Voyatzis concluded from the number and variety of bronze objects that Tegea must have had a bronze workshop, and the recent excavations carried out at the temple have actually uncovered such a workshop immediately in front of the seventh-century temple.

In other classes of votives such as early pottery, the early excavations revealed evidence of influences from other regions of Greece, particularly from Argos, Laconia and Corinth. Moreover, these influences show themselves quite early: definite examples of Protogeometric pottery that are contemporary (c. 975-850 BC) with Attic and Argive PG

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26 See the forthcoming: Voyatzis, M.E., "Illuminating the Dark Age: An Examination of the Early Iron Age Pottery from Tegea," AJA (1997).
27 Voyatzis, ESAAT, 84.
28 Voyatzis, ESAAT, 126 and p. 260.
29 Voyatzis, ESAAT, 264.
30 Østby, et al., Tegea, 103 ff.
31 Voyatzis, ESAAT, 259. Argive influence was particularly strong in Late Geometric II, p. 82.
wares,\(^{32}\) and a PG iron pin.\(^{33}\) EG I and MG I pottery from the bothros show affinities with Argive wares, and there is a very large quantity of contemporary “Laconian Dark Age,” or Laconian PG, pottery. Argive influence predominates in MG II and LG pottery.\(^{34}\)

The materials recently uncovered at this site are similar to the types known from earlier excavations. The latest excavations, however, have yielded evidence of greater Laconian influence and imported articles, especially in the pottery, bone and ivory objects, and lead wreaths.\(^{35}\) In these media, many parallels can be seen in the material from the sanctuary of Artemis Orthia at Sparta. Otherwise the MG and LG pottery show close affinities to Argive production. For the late eighth and seventh-centuries there is also a fair quantity of Protocorinthian material.

The recent Norwegian campaign also excavated large sections of the area to the north of the temple, near a sacred fountain. The temple had a side door with a ramp leading northward into this area. This unusual feature is not found outside of Arcadia, and its significance is not altogether clear, but it appears that the doorway and ramp of the fourth-century temple at Tegea led out into a courtyard. Numerous artifacts were excavated in this area, but often the strata contained material of mixed dates.\(^{36}\) A significant amount of architectural tile was also found in stratified contexts, which will prove helpful since surveys find as many roof tiles as painted pottery fragments. So far

\(^{32}\) Voyatzis, *ESAAT*, 68 & Pl. 2: P3, P4; Pl. 3: P6, P7; Pl. 4: P10, P12.
\(^{33}\) Voyatzis, *ESAAT*, 204 & Pl. 147; B207.
\(^{34}\) Voyatzis, *ESAAT*, 69.
\(^{35}\) Østby, et al., *Tegea*, 133 f.
\(^{36}\) Østby, et al., *Tegea*, 32.
this material has not been examined closely, but preliminary analysis indicates that the
Archaic temple was roofed with Corinthian tiles,\textsuperscript{37} that tiles belonging to other buildings at
or near the site can be grouped into three or four broad fabric categories, and that the
earlier tiles were often painted (see section below, \textit{Archaeological Materials}).

The evidence from the temple of Athena Alea is in keeping with the developments
at Greek sanctuaries generally, where we can see an increase in activity from the middle of
the eighth century BC onward. The sanctuary is comparable to any other major
Peloponnesian sanctuary of the eighth-seventh centuries, and it reflects Tegea’s position as
a significant power in the same period.\textsuperscript{38}

The excavations at the temple of Athena Alea provide a detailed look at the nature
and history of the cult, as well as some idea of the range and strength of inter-regional
contacts, particularly among Tegea, Laconia, Argos and Corinth. The second-century BC
theater at Tegea has already been excavated\textsuperscript{39} (as far as possible since a large and
important church stands on the remains), and the agora has also been dug, but has not
been published yet.\textsuperscript{40} The possibilities of further excavation at Tegea are limited,
however, because of the difficulties in acquiring private property and in getting the
requisite permits, given the demands placed upon the Greek Archaeological Service
mentioned above.

\textsuperscript{37} Østby, E., personal communication.
\textsuperscript{38} Østby, et al., \textit{Tegea}, 94.
\textsuperscript{39} Vallois, R., \textit{op. cit.}, (n. 9).
\textsuperscript{40} Voyatzis, \textit{ESAAT}, 13 f., & n. 29.
Previous Regional Investigations

The Tegean plain was included in an earlier survey of eastern Arcadia by Howell.\(^{41}\) This survey focused mainly on Neolithic and Bronze Age remains. His methodology is not comparable to that of the Tegea survey. His was an extensive, non-systematic survey that combined a review of archaeological reports with personal observations of widely-scattered sites. His catalog of sites and his descriptions of prehistoric Arcadian pottery will be useful for the Tegea survey.

A much broader picture of the civic context in which the cult developed can be obtained by an archaeological survey of the city and territory around the temple. Bérard’s analysis of Pausanias’ account of the Tegean demes was based upon both literary and archaeological evidence. It has provided a very general picture of the population distribution that an archaeological survey will be able to refine. At present we can say that Tegea’s citizens inhabited an area very much larger than the city itself, and larger also than the plain of Tegea, extending well into the mountains on the south, and at least as far as the slopes of Parthenion on the east. There were towns, or villages of some size, in the Tegeatide, and probably the hierarchy of sites includes the entire range of habitations from single farmsteads, through small hamlets and villages, to the large walled city of Tegea. The development of these scattered places into a synoecized community is still an obscure process, however. We can be certain that the synoecism of Tegea did not involve the physical movement of the population of all these demes into a single location at the site of the city. The process is more likely to have resembled the synoecism of Athens, in which

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\(^{41}\) Howell, *Survey*. 
the communities of Attica remained fixed on the landscape while a regional civic authority consolidated itself in the city. The functions and importance of this civic authority must have been responsible in large part for the growth of Athens vis-à-vis other communities, however. If we assume a similar process at Tegea, then archaeological evidence of growth and development may signify a synoecism. An archaeological survey may be able to clarify this process by determining what were the changes in settlement patterns on the Tegean plain, and at what periods.

An archaeological survey of the entire ancient city could reveal the circumstances and the development of the synoecism of Tegea. Moreover, since such a survey would be a diachronic investigation of land use and settlement, it could also bring evidence to bear on other questions pertaining to the history of the site. The most significant of these questions are 1) What was the population density and distribution during the Bronze Age, and how were the land and natural resources used? 2) What was the population density and distribution during the succeeding early Iron Age, and does the distribution reflect any continuity from the Bronze Age? 3) What was the date and nature of the synoecism? 4) Did population numbers follow cycles from high to low and back again, and do these cycles correlate with any other known historical processes such as wars, trade and colonization, etc.? 5) Do we find a rise in large estates in the Roman period, and a corresponding fall in small farms? (Would this account for the relative dearth of finds from the sanctuary of Athena Alea during this period?) 6) What could we say about the
population of Tegea in later times, from the Byzantine period through the Frankish and Turkish occupations, up until modern times?

Such a diachronic investigation of land use and settlement depends heavily upon a knowledge of the present-day topography and geology of the area, and especially a knowledge of the sedimentary history. Reconstructing this history will be the task of a team of geologists who will make up an early and important part of a multi-disciplinary group. A paleobotanical study of the area will also comprise an element of the survey, with the objective of tying developments in settlement pattern and land use to changes in natural and cultivated vegetation regimes.
II. TOPOGRAPHY, GEOLOGY, AND HYDROLOGY

The primary aim of the Tegea Survey is to conduct a pedestrian survey of as much of the surface of the plain around the city as possible. However, some of the plain has been covered by alluvium since ancient times, making some archaeological data inaccessible to surface investigation. For this reason it is essential that the boundaries of the alluvium be ascertained through a geological investigation of the plain. Another aim of the geological division of the survey is to discover the ancient course of the Sarandapotomos River.

The Tegean plain lies in an enclosed basin in Arcadia, the mountainous central region of the Peloponnese. Bérard has a very useful description of the plain as it was around the turn of the century, but the description of the topography of Tegea that follows is primarily drawn from more recent sources, and from personal observations.

The mountains here, and the rock beneath the sediments of the basin floor, are largely limestone, contributing to the formation of a karstic landscape: the rivers and streams have no surface outlets, disappearing into swallow holes and subterranean passages. The western half of the basin is a closed depression, with a flat, alluviated bottom. This depression, or polje, contains a shallow seasonal lake, Lake Takka, in which there are at least two large swallow holes, or, to use the Greek term, katavothres. Tegea occupied a place roughly in the center of the basin, along the course of the Sarandapotomos (Fig. 2.1). This river is the principal drainage for the mountains to the

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42 Bérard, Tégée.
southeast of the city. It does not empty into Lake Takka, but flows through the plain to the northeast, into *katavothres* on this edge of the basin. The plain through which it runs is not flat, but undulates in rolling hills, some of which are erosional features composed of Neogene conglomerates.43

**Hydrology**

Average annual rainfall on the plain is around 1000 mm, with the highest surrounding peaks receiving in excess of 1200 mm. The plain lies at an elevation of 650 m to 700 m above sea level, and winter snow on the plain is not uncommon. Precipitation is greatest in the months of November through February, when average monthly precipitation can exceed 100 mm,44 at which time the *polje* becomes inundated and Lake Takka makes its appearance. The water table rises appreciably during this season, and floods into the surrounding farmland are not unheard of, especially if the *katavothres* become choked with debris.

The relatively cold climate in this highland basin means that, unlike all of the neighboring coastal regions, olive trees cannot thrive here. There are plenty of fruit orchards, and vines and grain are also grown in abundance. The surrounding mountains can still provide harvestable stands of timber but, on the plain and in the bordering foothills, there are few signs of the ancient forests for which Arcadia was so well known.45

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45 Comparing the landscape of today, however, with photographs taken as recently as 1936 suggests that the forests have made remarkable recoveries in some places.
Rackham, in his study of the ecology of Boeotia, concluded that major changes in the wild vegetation of Boeotia, including a vast reduction in deciduous trees, occurred in prehistoric times and were already completed by the Classical period.\(^{46}\) It is unclear how applicable his conclusions are to Arcadia, with its mountainous terrain, although his description of the uncultivated vegetation of the Boeotian plain, in particular the macchia, seems apt for the plain around Tegea. There are occasional stands of pine around Tegea, and there has apparently been at least one episode of forest extension at the expense of cultivation in late Classical times.\(^{47}\) A paleobotanical study of Tegea will be performed in close conjunction with the surface survey, which will address questions relating to changes in the environment and in the use of natural resources. Such an investigation would extract pollen samples from suitable sediments like, perhaps, those in Lake Takka, and determine the relative proportions of wild and domesticated varieties of plants. Other paleobotanical studies in Greece have been able to correlate high proportions of wild vegetation with periods of low population density, and vice versa.\(^{48}\) Paleobotanical data potentially provide an important check on conclusions drawn from archaeological materials.


The alluvium of the plain lies on Neogene conglomerate that has been eroded to form low rounded hills.\textsuperscript{49} Two major stream systems deposit alluvium: the Valtetsorrema, which enters the basin from the west and empties into Lake Takka, and the Sarandapotomos (Figure 2.1), which enters the plain from the south, runs north through an incised channel, and loses itself in \textit{katavothres} on the northeast edge of the basin. Both systems are seasonal; flowing water is generally present in winter and spring, while the beds are usually dry by August. The material transported by these streams has not been the subject of any detailed studies, but in the area of the temple of Athena Alea it has been characterized as "gravels ... composed of quartz, chloritoid schists, and various metamorphic rocks," and "mica-rich sandy loams."\textsuperscript{50}

Personal observations on Lake Takka indicate the following: The lacustrine deposits that form the bed of Lake Takka are primarily clays. These are laid down seasonally during the winter rainy period. The lake bed forms the base level for the surrounding drainages, the largest of which is the Valtetsorrema, which drains the region to the north and west. At times the area of the lake is quite extensive; the high-water line is visible on rocks on a steep shoreline at about 2 m. During the summer months when the water level of the lake is lowest, the lake bed is exposed and dry, and the surface is everywhere interrupted by deep shrinkage cracks. Grass covers the dry bed; it grows

\textsuperscript{49} Op. cit., n. 43 above.
\textsuperscript{50} Pritchett, \textit{SAGT}, 128, cites this personal communication with Burdon. In note 28, Pritchett cites another personal communication with C.G. Higgins, now with the Department of Geology, University of California, Davis. In this communication Higgins characterizes some of the sediments as mica-rich sandy loam, and concludes that when the river deposited this material it must have continued on a course to the west into Lake Takka.
The Tegean Plain with the Sarandapotomos River and Lake Takka.
Contour intervals at 20 m. North is up.
thinly where the water covers the land each year, but is quite thick and tall on mounds and prominences that can rise above the waters. Little agriculture takes place on the lake bed, although some tilled land can be found. The crops grown are unknown. Whatever water remains in the summer is captured in large reservoirs excavated in the lowest part of the basin. There are channels dug leading from these reservoirs to the *katavothres*.

Sections into the sediments of the lake are exposed in two places: a drainage ditch dug in the western arm of the lake to a depth of 1.5 m - 2.0 m, and the excavations for reservoirs in the center of the lake. The sediments exposed in the drainage ditch are clays, sand, and fine gravel. The sediments exposed in the reservoir walls are composed of reddish-brown clay, with some grading to yellow, almost no sand and nothing larger in grain size. This clay is used in local manufacture. The material removed from the excavated reservoirs stands in huge stockpiles in three places around the shore of the lake. A local factory uses this material for making building tile.

Deep shrinkage cracks can be observed all across the clay surface of the lake bed, that lead to thorough mixing of the sediments from any given range of years. This mixing, called argilliturbation, is a typical feature of clay soils that undergo cycles of inundation followed by desiccation. It destroys any potential for varves, which are discrete and sometimes datable strata in lake beds, and eliminates the chance that pollen exists in distinct, well-defined strata. Pedogenesis (soil formation) is interrupted almost every year by inundation and sedimentation, and there are no soil horizons evident in the exposed sections of the ditch or the reservoir.
The Sarandapotomos River

As explained below, there is a likelihood that much of the sediment in Lake Takka was transported there by the Sarandapotomos, even though the river's present course does not lead there. For this reason, and because some of the ancient city of Tegea lies buried under sediments of this river, a geological survey should investigate the disposition of the river's alluvium on the plain, and should search for buried channels.

The drainage basin of the Sarandapotomos lies to the south and east of the plain. The area of the basin before the river exits onto the plain is about 225 sq. km. The load deposited by the Sarandapotomos consists of everything from fine clays to large gravel. Deposits form an alluvial fan going well into the plain; indeed, the plain itself appears to have been built up from the deposits of this seasonal river. On topographic maps the boundaries of the alluvial fan are clearly delineated for some distance along a low-lying spur of the southern range of mountains (Figure 2.2). The existence of this spur (the finger-like hill pointing straight at the site of the ancient city) has led some to argue that the river could never have flowed in this direction toward Takka. There are, however, four arguments supporting the idea that the course of the river once flowed along the east side of the spur until the slope merged with that of the plain, then turned to the west, instead of continuing north. Three of these arguments also contend that the river has taken this westward course since ancient times, and has deposited alluvial soil over some portion of the archaeology.

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51 This can be estimated from the map supplied in Karkulias, op. cit. (n. 44) above.
52 A summary of the debate is in Voyatzis, ESAAT, 18-20.
Figure 2.2
Topographic map of a portion of the Tegean Plain.
The approximate circuit of the city walls as determined by Bérard is shown. Contour intervals vary from 1m to 4m. North is up.
One argument is the very existence of the alluvial fan in contact with the eastern side of the spur. 1:5000 scale topographic maps, obtained from the Greek Military Geographic Service, clearly show the down-slope curve of the contour lines that are characteristic of alluvial fans. These contours change direction abruptly at the spur, indicating that sediments were deposited by water flowing along the side of the spur.

Figure 2.2 represents a portion of the Geographic Service’s topographic coverage of Tegea, with only the contour lines digitized and other features such as roads, buildings, etc., omitted. The contour line interval on the plain, 1 m, indicates very gradual changes in slope here which are not always perceptible to one walking on the surface.

Nevertheless, the map shows how the site of Tegea sits on an alluvial fan spreading out mainly from the point where the Sarandapotomos exits the hills. This part of the plain can rightly be said to have been created by these deposits, laid down by water flowing around and on both sides of the ridge. The river must have flowed in many different directions to have created the contours seen here.

It is clear from the topographic maps that the Sarandapotomos has created an alluvial fan going some distance into the plain. The question of when these alluvial deposits were laid down still remains. Deep, virtually sterile layers of sediment were uncovered in the various excavations at the temple of Athena Alea. D.J. Burdon, who visited the site of the temple in 1962 while working for the Greek Institute for Geology and Subsurface Research, described some of the sediments exposed in the excavations as

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53 Bérard, Tégée, 532.
"water-borne gravels." The recent Norwegian excavations at the temple site uncovered not only what must have been these same alluvial strata, but others that indicate that there have been episodes of flooding at the site going back at least to early Byzantine times.

Historical testimony also exists for both the Sarandapotomos' westward course and for the suggestion that its diversion to the north and east was relatively recent. There is a story that local people told to Ross in the 1830's that the river did indeed once flow into Takka, but sometime about a hundred years earlier, was diverted to the north by a Turk who owned the village of Piali (modern Alea) in which the temple stood. In the same vein is the ancient tradition, recounted by Pausanias, that the river, after going underground in the plain of Tegea (he doesn't say where), rises again in the valley of the Alpheios River near Asea, which is to the southwest. In fact, the ancients believed that the two rivers were one and the same, and called them both Alpheios. Even if this connection of the two rivers is physically impossible, the belief is much more tenable if the Sarandapotomos/Alpheios actually flowed in this westerly direction and emptied down into the large katavothra that lies on the south side of Lake Takka, than if it flowed in the opposite direction toward Argos as it does today.

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54 See n. 50 above.
55 Østby, et al., Tegea, 109. On page 115 he notes that the temple stood on a perceptible "hill" in ancient times.
57 The ancient view that the waters of the two rivers were the same cannot have been correct, since the elevations of Lake Takka and the headwaters of the Alpheios near Asea are very close to one another, as can be measured on topographic maps, but there cannot have been a flow produced without a gradient. The katavothres into which the Sarandapotomos currently flows, at a place called Partheni, do connect with springs further down the mountainside toward Argos, as established by radioactive tracer experiments. See Burdon, D.J., et al. "The Use of Tritium in Tracing Karst Groundwater in Greece," Radioisotopes in Hydrology, International Atomic Energy Agency (Vienna, 1963).
A westward-flowing Sarandapotomos/Alpheos by necessity would have emptied into Lake Takka. A fourth indication that it did do so is the existence of what may be a Bronze Age dam in the eastern arm of the lake, identical in structure to another, longer one, in the western arm. This dam spans the gap between the hill of Vouno and Kukujeros hill that separates the western and eastern arms of the lake, and rises about 1.5 m from the lake bed. If excavation can confirm that this was a dam (its function as one seems obvious from its placement and its construction), then it must have held back the waters of the Sarandapotomos. Moreover, based on 1:5000 scale topographic maps, the most likely route for a westerly-flowing Sarandapotomos would be in the broad valley north of Vouno, in the direction of this structure at Lake Takka. On-the-ground work would be required to confirm this. In particular it is necessary to find any buried stream channels. Intensive agriculture in the plain may have obliterated any traces of channels on the surface. Active work to locate buried channels would consist of core transects laid out across the supposed route. Channels may be traceable to the Sarandapotomos through mineral analysis.

As the story of the Turk shows, the river is amenable to control. Developed and prosperous states like Classical Tegea could have directed its course with relative ease, even if we have no evidence that this was done. The city walls of Tegea could have had their strength bolstered by routing the river along their east and north side, as Bérard

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thought, and as was done with the fourth-century walls at nearby Mantinea.

Alternatively, the river could have passed through the city, or possibly between the city and the hill to the south.

**Recent Alluvium**

The most important objective of the geological survey, however, is that of locating the boundaries of the recent alluvium on the plain, in order to mark out those areas where the surface survey must try to take into account the burial of potential data. A preliminary investigation by the author together with Knut Ødegård has already shown that even in the areas that are thought to have been alluviated since ancient times, there exist ancient sherds on the surface. Evidently, these have been continually returned to the surface through various formation processes, such as plowing action. Some questions remained unresolved, however, such as the percentage of ancient materials that have been returned to the surface, and to what degree the action of flowing water dispersed this material before it was returned. The alluviated areas of the plain must be delimited as accurately as possible, and there are three methods by which to proceed.

The first method makes use of Howell’s extensive survey, carried out in the 1960’s. Howell’s focus was prehistoric ceramics, and the locations of his surface finds can be well enough mapped to determine at least some areas that have probably not been

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59 But see Xenophon’s caution against such a practice, *Hellenica*, V.2.7. King Agesipolis of Sparta circumvallated Mantinea and diverted the Ophis River against the mud-brick walls, threatening to breach them. The Mantineians capitulated, and the city was destroyed in 385 BC. It was reestablished in 370 BC, this time with the river channeled into a moat around the city.

60 Howell, *Survey*. 
buried by sediments since the Bronze Age. The second method is by mapping areas according to soil type. Some soils, for example, have developed on Neogene conglomerate, which is distinguishable by the presence of numerous small, rounded stones littering the surface.

The third approach offers some help in the difficult task of dating the separate deposits of alluvium. The date or range of dates of the alluvium at any given place can sometimes be dated by archaeological material, and different alluvial deposits can sometimes be chronologically related by soil horizons within core samples. If the land has been continuously cultivated since ancient times, there may have not been opportunity for soil horizons to form, however. On the other hand, there are suggestions that some of the alluvium has not been farmed intensively until only recently. Soil horizons may have had time to form in these places, and they may allow rough estimations of dates of deposition. These places are roughly correlated with modern day orchards, which seem to be a recent phenomenon in Tegea.

Orchards today make up the primary type of agriculture in the lower elevations of alluviated ground. Bérard described these lands as "marshy" at the end of the last century, even though the Sarandapotomos did not flow through them. Earlier in the nineteenth century, Dodwell described the landscape of Tegea as "perfectly open, without

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62 Bérard, Tégée, 534: “Aucun obstacle d’ailleurs n’encombre aujourd’hui la douve marécageuse qui marque encore le passage de l’ancien fleuve.” He distinguishes the ancient course of the river from the modern. See the discussion above.
trees or hedges,°° and a seventeenth-century description of the Tripoli area has the land in pasture, and lists the agricultural products of the Peloponnese without mentioning fruit, except for olives which cannot be grown in Arcadia.°° It appears as though the great number of fruit orchards today has only developed in the last century, concurrent with the general economic development of Greece. Evidently, they were largely uncultivated marshes prior to this century.

The implications of marshy bottomlands for the survey are that the continual plowing that returns artifacts to the surface may have been suspended here for long periods. This raises the possibility of soil horizons mentioned above. Without these, there is probably no better way to date the alluvium than by the artifacts found within it, keeping in mind the formation processes of such artifacts. These could include their movement by flowing water and redeposition at considerable distances from their point of origin.

°° Dodwell, Tour, 417.
III. PREHISTORY AND HISTORY OF TEGEA

The Tegean plain has always been a nexus of travel across the peninsula. The most important routes into and out of Tegea lead to Argos on the east, Sparta on the south, and Messenia on the southwest. To the southeast a road led to Thyrea (the plain of modern Astros), while to the north lay Mantinea and the passes leading to Achaia and the Corinthia. On the Tegean plain there were no physical barriers separating it from Mantinea, and there is some question where the boundary lay between the Mantineians and the Tegeans. Evidently there were always close relations of some sort between the two peoples, since the cult of Alea also existed in Mantinea, but these relations were antagonistic as often as not. Likewise the mountains to the south of Tegea posed no great barrier to Sparta, and here too there was a cult of Alea. The great quantity of Laconian style pottery found at the temple of Athena Alea, dating from the tenth century on, indicates very early connections with Laconia.

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66 Pritchett, W.K., op cit (n. 47), 43.
67 Pausanias, VIII.9.6. The introduction of the cult of Alea among the Mantineians could well predate the synoecism of the city. The cult existed also in the Arcadian polis of Alea, which claimed Aleos, son of Apheidas, as its founder, as did also Tegea. It is clear that Alea was only later syncretized with Athena, and that her cult is far older.
68 Two battles of Mantinea in 418 BC and 362 BC both saw Tegea and Mantinea on opposite sides. Pritchett sees the source of animosity in the control of a stream, the Zanovistas, that had the potential to flood the lands of both cities. See Pritchett, W.K., op. cit. (n. 47), 41 f.
69 Antigonus Doson, after capturing Tegea, was able to move his entire allied army into these mountains and to fight a set battle there at Sellasia with the Spartans under Cleomenes in 222 BC.
70 Xenophon, VI.5.27.
71 Also see Voyatzis, M., op. cit. (n. 26).
The location of Tegea within an upland basin encircled by mountains seems not to have isolated it politically or culturally from its neighbors. The excavations at the temple of Athena Alea revealed Corinthian, Argive, and Laconian pottery in substantial amounts; later historical accounts often show Tegea as a staging point or meeting place for armies, embassies, and the like. In Byzantine times it was the site of an important fortress, and during the subsequent Frankish occupation Tegea, then known as Nikli, was the site of a feudal barony complete with castle and knights.\textsuperscript{72} The Turks made nearby Tripoli their headquarters for the Peloponnese, and Arcadia figured prominently in the War of Independence from Turkey.

**Tegea in the Bronze Age**

Tegea and the Arcadians are included in Homer's catalog of ships, despite being landlocked territories. Agamemnon is said to have provided vessels for the Arcadian contingents to Troy,\textsuperscript{73} but the legend of the Tegean king Agapenor's foundation of Paphos in Cyprus cannot be substantiated by archaeology.\textsuperscript{74}

\textsuperscript{72} Rodd, R., *The Princes of Achaia and the Chronicles of the Morea* (London, 1907), 169.
\textsuperscript{73} Homer, *Iliad*, II.79-87.
\textsuperscript{74} For the legend see, Pausanias, VIII.5.2. The nature of the Mycenaean presence in Paphos is problematic, but an immigration may have occurred towards the end of the Bronze Age, in LH III C:1, and was by way of nearby Maa-Palaeokastro. See: Karageorghis, V., M. Demas, and B. Kling, "Excavations at Maa-Palaeokastro, 1979-1982: A Preliminary Report," *Report of the Department of Antiquities of Cyprus*, (1982): 86-108. The pottery associated with the second inhabitation of Maa-Palaeokastro is almost entirely LH IIIC:1 (p. 91), and shows very close similarities to the LH III C:1 pottery of the Evreti wells of Paphos. By far the most common shape is the skyphos or bell-shaped bowl, and the vast majority have antithetic spiral decoration (Kling, B., *ibid.* 105). For connections between Arcadia and Cyprus see: Voyatzis, M., "Arcadia and Cyprus: Aspects of their Interrelationship between the Twelfth and Eighth Centuries B.C.," *Report of the Department of Antiquities of Cyprus*, (1985): 155-163.
Howell's survey of eastern Arcadia in prehistoric times is the best archaeological
description to date of the Tegean plain in the Neolithic and Bronze Age. He lists eighteen
sites either on the plain itself or in the foothills close to the plain that had material ranging
in date from Early Neolithic to Roman. It is important to keep in mind, however, that
some sites are no more than the find spots of one or more pot sherds. Substantial
evidence of occupation, either in the form of architectural remains or a large number of
sherds, characterize ten of his sites: Ayioryitika, Tzivas-Gournaradhes, Thanas-Stoyia,
Stadhion-Ayios Konstandinos, Stringon-Ayios Ilias, Alea-Athena temple, Vounon, Garea-
Khairolimnes, Alea-Palaiokhori, and Pallantion. The Bronze Age is very well represented
in his catalog of sites: sixteen of the seventeen sites show some evidence of one or more
periods Early Helladic (EH), Middle Helladic (MH), or Late Helladic (LH), including
eight, possibly nine, of the ten occupation sites listed above. The fall-off in sites after the
Bronze Age is precipitous. Of the seven sites showing definite or abundant LH material,
only the temple of Athena Alea held evidence from the Protogeometric period.

It is noteworthy that Howell makes no report of finds from the hill of Hagios
Sostis. The surface of the hill today is markedly devoid of artifacts of any period, except

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75 Howell found a fair quantity of Early Neolithic sherds here, some obsidian fragments, a piece of white
flint, fragments of a stone cel l, a pestle, and a quern (p. 91) and some possible, but unspecified, Middle
Neolithic material. My own investigation of this site in 1996 occurred soon after plowing, at which
time I found a great quantity of sherds which I could not date with precision, a fair number of obsidian
flakes, as well as three stone ax heads, and part of a fourth, that I identified as Late or Final Neolithic
by comparison with those in the Tripoli museum and in the Benaki Museum in Athens. On a
subsequent trip to the site I was accompanied by members of the Norwegian excavation at Tegea, one
of whom, Jean-Marc Luce, discerned in the section at the edge of the field a light-colored stratum just
beneath the surface. Its extent was small, and it possibly was the remains of a feature, perhaps a floor.

76 Howell, Survey, 118.

77 Howell lists Palaiokhori as a possible PG site but Voyatzis has confirmed that the PG vessel thought to
have come from this site actually came from the temple of Athena Alea. See Voyatzis ESAAT, 66.
for some architectural fragments in the churchyard in Hagios Sostis, and the abundant terracotta figurines found at the site of the sanctuary of Demeter. Otherwise the density of artifacts on the hill is extremely low; but for this fact one might easily see in this hill a parallel with the hill of Gortsouli 1 km north of Mantinea, on which an early settlement called Ptolis was situated, before the synoecism of Mantinea on the plain.

Possible evidence for a large Late Bronze Age population at Tegea are the remains of a dam that traverses Lake Takka. A modern drainage ditch in the western arm of the lake cuts at right angles through a double line of large, unhewn stones, delineated as a road on topographic maps of the Hellenic Military Geographic Service, that crosses the western arm of the lake from shore to shore. The rows of stones are c. 2 m apart and they extend to a depth of at least 1.5 m, as revealed in the section along the drainage ditch. Today the stone rows are completely covered by sediments in many places, especially the eastern half, but as late as 1986 they were easily visible for their entire length. Knauss identified this structure as a Mycenaean dam by its similarities with those investigated at Lake Kopaïs in Boeotia, although his investigation did not involve excavation. If it

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78 Noted by Bérard and still to be seen today.
79 Excavations in 1862 dug up over 1800 terracotta figurines. Later excavation (1909-10) by Romaios uncovered more figurines and traces of peribolos walls and some architectural terracottas. Lenorment, F., "Terres-cuites de Tégée," Gazette archéologique IV (1878): 42-48 and Romaios, K., "Ετηνική Ευθείας πέρι τόν ἐν Τεγέα Ἀνασκαφών ἐν ἕτει 1910." Πρακτικά τῆς ἑν Ἀθηνῶν Ἀρχαιολογικῆς Ἐταιρείας, (1910): 274-6, cited in Voyatzis, ESAAT, 16. In 1996, members of the Norwegian team at Tegea were guided to the location of the temple by a local museum official and the farmer upon whose land the remains are situated. The farmer dug beneath a tree and pulled from among the roots handfuls of terracotta figurines. He indicated that there were many more remaining.
functioned in a way similar to other Mycenaean dams, the water would have been retained on the north side, creating a dry, probably arable polder from the lake bed. In this case, the archaeological surface would lay as deep under the sediment as the lower courses of the stones laid down for the dam. This can be as much as about 2 m, if the dam exists to near its original height, since this dimension, the same as the structure’s width, forms a stable configuration for such a dam.\(^2\) If the dam is Bronze Age, then presumably it went out of use with the general collapse of the Mycenaean civilization around 1200 BC, and perhaps was never put in service again even in Classical times.\(^3\)

Whether the dam was used to reclaim the lake bed for agriculture, or to control flooding into the surrounding plain, or for both, its existence presupposes a large population and an intense cultivation of the surrounding area. The Late Bronze Age remains that Howell catalogs are probably not a complete inventory of what once was the Mycenaean population here. Howell himself recognized that “it is possible that other

\(^2\) An excavation on the upstream side of this structure might reveal a sedimentary history of the lake, given the appearance of stratified sediments in the drainage ditch section. This excavation ought to be located somewhere near the middle of the span, in the deepest of the lake sediments. Any hiatus in sediment deposition on the downstream side, as compared with the upstream, might correspond to the period of time in which the dam was actively maintained, which in turn should roughly correspond to the life of the political organization which constructed it. Such excavations are beyond the scope of the Tegea survey, however.

\(^3\) There are no ancient texts that definitely refer to this structure. Pausanias, writing about AD 180, does mention a “χώμα” (VIII.44.1.3 ff.) which could well be this structure. (Cf. the two cases in Pausanias in which a χώμα definitely refers to a dike: the one at Arcadian Orchomenos (VIII.23.2.4), and the one at Thisbe in Boeotia (IX.32.3.3). Both these χώματα are similar to the dike in Lake Takka.) By comparison with other hydraulic works that are known to be Mycenaean, especially those surrounding the Kopais Basin in Boeotia, the identification of this structure as Late Bronze Age is fairly certain. The doubts of Loring and Frazer extend only to the identification of this structure with the χώμα of Pausanias, not to its date. See Loring, W., “Some Ancient Routes in the Peloponnese,” The Journal of Hellenic Studies XV (1895): 25-89, and J.G. Frazer's translation and commentary for Pausanias, op. cit. (n 56).
Mycenaean sites occur in flat areas, which would tend to make them very difficult to locate. An intensive survey of the surface is the only possible way to find them. Other traces of this Bronze Age population include three small tholos tombs, located on the Sarandapotomos just before it exits the hills onto the plain. One was excavated by Romaios, who found four LH III vessels in it.

Palaiochori is just off the southern edge of the map (Figure 2.2), where the Sarandapotomos cuts through a gorge just before entering the plain. Besides pottery sherds ranging from LH II to LH III B, this settlement has the only known LH structures in the region, the tholos tombs, with the possible exception of the dams. Lying as it does in confused, mountainous terrain, yet very near the edge of the Tegean plain, it is both defensible and in proximity to the agricultural wealth of the lowlands. The tholos tombs, albeit diminutive, are also evidence that this place may have been a leading site.

The excavations at the temple of Athena Alea have also recovered some LH sherds, but without further excavation it cannot be determined whether these represent an earlier Bronze Age settlement of the site (they do not necessarily indicate that this was a cult site in the Late Bronze Age), or the offering of relics at a later time. The latter possibility is likely perhaps, given the scarcity of evidence for the continuity of cult from

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84 Howell, Survey, 116.
other places on the Greek mainland, but the evidence of cult here in PG times should be recalled. The temple site is the only place in the area where the Dark Age is represented, by the PG sherds mentioned above.

For the Bronze Age we can surmise that the area was organized under a strong central authority. Howell's catalog of LH sites, plus the tholos tombs at Palaiochori and the LH III material from the excavations at the temple of Athena Alea, prove that Tegea shared in the common material culture of Bronze Age Greece. Moreover, the dams in Lake Takka were part of a hydraulic system that encompassed the entire Tegean basin, and we can possibly see a political structure at least as extensive as that system.

**Early Iron Age through the Classical Period.**

For a number of reasons, the Dark Age and the Archaic Period hold perhaps the most interest for an archaeologist. For one thing, no contemporary accounts of these periods exist, so that archaeology is the only way in which any light can be thrown on developments prior to the sixth century BC. Yet this time saw the development of that most distinctive Greek institution, the polis. Poleis developed at different times in different places in Greece. Tegea certainly became a polis at some point in its life, but just when is unclear.

The abrupt transition from the Bronze Age to the Iron Age is well indicated by Howell's catalog of sites. Howell's survey found that the temple of Athena Alea is the

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only site in all of Arcadia where definite evidence of the Protogeometric Period occurs. At least twenty three fragments of PG from the temple are mentioned in the 1994 publication of the Norwegian excavation; in addition, quite a lot more was unearthed from the bothros in the pronaos area.

Geometric pottery from Tegea has been found only in the ritual contexts of the earlier temples of Athena Alea, and at the nearby mountainside sanctuary of Artemis at Mavriki. Throughout the ninth and eighth centuries BC, there is evidence for the import of Laconian Dark Age pottery, and in the later eighth and early seventh centuries, of Argive LG, and Corinthian LG and PC pottery as well. The importance of the cult in the eighth and seventh centuries BC is indicated by the rich finds from the sanctuary of this period.

The wealth of seventh-century votives, combined with the construction of the monumental Archaic temple at the end of the century, suggest that this is may have been when Tegea became an important central place, i.e., a date for the synoecism. In one place, Snodgrass argues that the building of such a monumental temple, rather than fortification walls, is the clearest physical indication that the emergent polis has arrived, or is at hand. Elsewhere, however, Snodgrass seems to question whether Tegea was ever a fully developed polis, or was instead a "developed ethnos." He points out that the word

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89 Howell, Survey, 118.
90 Østby, et al., Tegea, 126.
91 Voyatzis, op. cit. (n. 26).
92 The definitive study of pottery from Tegea is in Voyatzis, ESAAT, Chapter 3.
93 Østby, et al., Tegea, see n. 23 above.
"polis" is used indiscriminately by most Greek writers, and that it took a purist like Aristotle to distinguish between a true polis and an ethnos "where the people live, not in scattered villages, but like the Arcadians," that is, a rustic, tribal society that engaged in collective actions only for certain purposes like war and the practice of shared cults. The Aitolians exemplify such a people, as Snodgrass points out, and it is also true that the building of their monumental temple of Apollo at Thermon was not accompanied by the synoecism of Aitolia. Nevertheless, Snodgrass discusses how an ethnos could develop into a polis, and this may be what he means when he says that Tegea was an ethnos of the "more developed type."

Certainly by the time of Aristotle the evidence suggests that Tegea was a polis. For example, her people, as Tegeans per se, had been inscribed upon the serpent-column at Delphi and had made a treaty with Sparta. Moreover, there were factions within the body politic, which persisted at least from the time of the above-mentioned treaty, the middle of the sixth century BC, to the battle of Leuctra in 371 BC. The city possessed fortification walls, a jail and a city hall. When we recognize the various forms that a Greek polis could take, Athens vis-à-vis Sparta for example, then it seems as though the definition of a polis can accommodate Tegea. Aristotle's reference to Arcadians may have

96 Ibid., 44 ff. He cites Aristotle, Politics, 1261a 27.
97 Plutarch, Questions Graecae 5, deals with the terms of a treaty between Tegea and Sparta that may be this one. Plutarch said that it required Tegea to cast out any Messenians from their territory, and to take no reprisals against the Laconizing party in Tegea. See Halliday, W.R., The Greek Questions of Plutarch (New York, 1975), 50 f.
98 Xenophon, VI.4.17, tells of a Laconizing party led by Stasippos that was strong at the time.
99 τό δεσμωτήριον and ἡ δημοσία οἰκία. Xenophon, VII.4.36.
served to indicate any people who lived a rustic, non-urban way of life, and may not have been pointed specifically at Tegea.

Synoecism should, therefore, have been a necessary step in Tegea's development into a polis. Synoecism may have occurred by the time of the earliest event that could be considered historical. This was Tegea's notable defeat of a Spartan invasion in the middle of the sixth century BC, although Herodotus and Pausanias recount a tradition from this period that already reveals the solidarity of a united people, i.e., that Tegea could not be defeated so long as it possessed the bones of Orestes. It is not absolutely clear if this unity was merely the loose grouping of a tribe, however, or if Strabo was correct in placing the synoecism in the early fifth century BC. An archaeological survey may be able to determine if and when changes in settlement pattern indicate synoecism.

The Tegeans were compelled to recognize the hegemony of Sparta in an unequal treaty, and became the first member together with Sparta in what became the Peloponnesian League. During the Peloponnesian War, Tegea afforded a base for King Agis of Sparta in his victory at Mantinea (418 BC), and Tegeans served in armies against the Athenians, but Tegea seems not to have suffered much in the war. In the decades that followed the war, only Tegea, of all the larger poleis of Greece had the wherewithal to

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100 The invasion was perhaps Sparta's response to Tegean assistance to Messenia in the Second Messenian War. See Cartledge, P., *Sparta and Lakonia: A Regional History 1300-362 BC* (London, 1979), 137.
103 See n. 97 above.
104 The fourth-century temples of Apollo at Delphi and Zeus at Nemea rivaled the temple of Athena in size and cost, but these were built in Panhellenic sanctuaries, not in poleis per se. See Cary, M., "The
finance a major architectural achievement: the marble temple of Athena Alea in its last incarnation was among the finest in the Peloponnese.\textsuperscript{105}

**City Walls**

Xenophon relates some factional strife that beset Tegea in the period after the Spartan defeat at Leuctra, during the brief heyday of the Arcadian League.\textsuperscript{106} In the course of this narrative he lets drop some clues about the archaeology of the city. He is the earliest writer to be explicit about the existence of the city walls at Tegea, and from his account we know that Tegea was a walled city in 370 BC. From B\textsuperscript{erard}'s\textsuperscript{107} description of them as being like the walls of Mantinea, which were rebuilt in 370 BC, we can say that the walls of Tegea are late fifth-century or early fourth.\textsuperscript{108}

No walls are visible today. As we know from B\textsuperscript{erard}'s description of them, the foundations of the walls were constructed of large, squared stone blocks, while the superstructure was made of mudbrick. Ready sources of material lay in the surrounding plain and in nearby Lake Takka, and mudbrick walls have certain structural advantages over stone. Mudbrick walls would have been vulnerable to water, however, and must

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\textsuperscript{105} Pausanias, VIII.45.5, but not, as he says, the largest in the Peloponnese. Several others were larger, like that of Zeus at Nemea.

\textsuperscript{106} Xenophon, VI.5.6-9.

\textsuperscript{107} B\textsuperscript{erard}, Tégée, 548.

\textsuperscript{108} There is also a possibility that the walls mentioned by Xenophon are not the walls excavated by B\textsuperscript{erard}. B\textsuperscript{erard}'s walls could have been built after the account in Xenophon - their style just as easily fits this period as the earlier - and the walls of Xenophon would be an earlier encore for which there is so far no archaeological evidence. I mention this because Winter, F.E., Greek Fortifications (Toronto, 1971), 30, n. 60, feels that there was a possibility that Tegea was walled in the early part of the sixth century BC. He believes that Tegean walls were responsible for Tegea's repulse of Sparta, although this contradicts the tradition that the Tegeans did beat them once in open battle, by the timely assistance of their women (Pausanias, VIII.48.4-5.)
have been capped by stone or burnt brick\textsuperscript{109} to shed rain and to prevent them from softening and melting. The disappearance of this capping, probably robbed for building material, may explain the disappearance of the extensive stone foundations: they could be buried beneath the collapsed mass of mudbrick,\textsuperscript{110} and could also have been covered by alluvium from the Sarandapotomos. The walls were still standing\textsuperscript{111} when Pausanias came through Tegea in the second century BC, but it is doubtful that they survived for much longer. It should be recalled that alluvial strata of the Byzantine period covered part of the temple site, which means that the walls were probably in an advanced state of decay by then.

The remains of the city walls may actually form a halo around the ancient city, in the shape of a stratum of dissolved mud-brick. This hypothesis can be tested by core sampling in those places where the circuit wall was thought to have been. This is one of the objectives of the geological division of the survey.

Xenophon also mentions two gates astride roads leading north to Mantineia and northwest to Pallantion. Pausanias mentions roads from Tegea to Laconia and to Thyrea.

\textsuperscript{109} Or they may have been roofed over. Bérand found a tile stamped: ΔΑΜΟΣ/\textsuperscript{t}, i.e., it covered some public structure. From this he seems to conclude that the walls were roofed for their whole circuit, but the location of this tile was the same as that of a tower, and it may have been only this which was roofed.

\textsuperscript{110} In his excavation of some sections of the wall, Bérand found a layer 1 to 2 m deep formed from dissolved mudbrick. Lawrence, A.W., \textit{Greek Aims in Fortification} (Oxford, 1979), 116\textsuperscript{f}. gives the example of Amphipolis, built on a plateau high above the river Strymon, whose mudbrick walls "eventually melted and spread so widely that no one can perceive the direction the wall took, once it has left the excavated strip."

\textsuperscript{111} They were standing at least in part. Pausanias, VIII.53.11 mentions some altars that are two stades from the walls (τοῦ τείχους), but VIII.54.4 suggests that the circuit of the walls had changed in some way. Here he says about the tomb of Orestes: καθ’ ἡμᾶς δὲ οὐκέτι πιλῶν ἐντὸς ἐγίνετο ὁ τάφος: "In our day the tomb is no longer inside the gates.”
one or both of which must have had its respective gate too.\textsuperscript{112} It is not known if the cemeteries were located by one or more of these gates. Bérard does note the presence of a cemetery on the north side of the hill of Hagios Sostis.\textsuperscript{113} Xenophon mentions a prison and a town hall\textsuperscript{114} that, at a guess, were located at or near the agora.

\textbf{Citadel}

Polybios, writing in the second century BC, offers little additional topographic information about the city. He does relate an episode in which the people flee to a high place (\textit{eis t\i n \kappa\varepsilon\rho\alpha\nu}) and survive an assault by Lycurgus of Sparta.\textsuperscript{115} Pausanias also mentions a lofty place (\textit{t\o \chi\varphi\iota\omicron\upsilon \t\o \upsilon\mu\iota\rho\lambda\omicron\upsilon})\textsuperscript{116} upon which there were several sanctuaries.\textsuperscript{117} The translation of these words as “acropolis” in the context of the topography of a city is understandable, but it is inexact and has led to some confusion.\textsuperscript{118} Probably Tegea had no acropolis in the sense of a fortified height within or connected to the city.\textsuperscript{119} This would not make it unusual among Greek cities, but it does raise the question of Tegea’s form of government, since according to Aristotle, acropoleis are more often established by tyrants or oligarchies than by democracies.\textsuperscript{120} We do know that

\begin{itemize}
    \item \textsuperscript{112} Pausanias, VIII.53.11 & VIII.54.4.
    \item \textsuperscript{113} Bérard, \textit{Tégée}, 542.
    \item \textsuperscript{114} See n. 99 above.
    \item \textsuperscript{115} Polybios, \textit{Historiae}, V.17.2.2
    \item \textsuperscript{116} Pausanias, VIII.53.9.
    \item \textsuperscript{117} Pausanias, VIII.53.7. That is, if the shrine of Demeter mentioned in Pausanias is to be identified with the remains on the hill of Hagios Sostis. Pausanias mentions the other sanctuaries near the sanctuary of Demeter and Kore as those of Paphian Aphrodite, two sanctuaries of Dionysos, an altar of Kore, and a temple of Apollo.
    \item \textsuperscript{118} The arguments are summarized by Voyatzis, \textit{ESAAAT}, 16 ff.
    \item \textsuperscript{119} Following Bérard, \textit{Tégée}, p. 546.
    \item \textsuperscript{120} Aristotle, \textit{Politics}, 1330b. See the discussion in Lawrence, A.W., op. cit. (n. 110), 132-3.
\end{itemize}
political factions existed, specifically a "Laconizing" party. At any rate, the best candidate for the location of the ἀκρα is the hill upon which the village of Hagios Sostis sits.

Other Monuments of Tegea

The information provided by Pausanias does not often allow the archaeologist to determine the location of the monuments that he describes, nor how they were disposed with relation to one another. Four things that he mentions have been located: the temple of Athena Alea, the sanctuary of Demeter, the agora, and the theater. Of those things still undiscovered the stadium was the largest. Since it was constructed of banked earth, which must have long since worn away, it is not likely to be found by a surface investigation. A marble starting block from the stadium has been found however, at the temple excavations. Østby believes that the stadium lies beneath modern houses just to the east of the temple of Athena Alea. Pausanias also mentions the sanctuary of Athena of the City. This goddess was supposed to preserve the city from attack, and was also called the Defense (Ἐπώω), suggesting that it might have been physically connected to the city wall somewhere.

Bérard found inscriptive evidence of a gymnasium, which he located near the theater. It seems more likely to have been located near the stadium, however, which on

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121 See nn. 97 & 98 above.
122 Østby, E., Excavations, 54.
present evidence was near the temple of Athena Alea. Gymnasia were also closely connected with palaestrae, which were enclosed spaces for wrestling and other sports. Palaestrae were often square in plan, and aerial photographs of Tegea show the outlines of what might be a square or rectangular structure (Figure 3.1) not far from where the stadium may have been. One side of this feature is c. 65 m long. The outline is only apparent in the photograph, and nothing at all is visible on the ground, although there are some ancient architectural fragments in the same field as the outline. It may mark out the line of walls beneath the surface, which can be investigated using electro-resistivity equipment.

Tegean Demes

The area enclosed by the walls of Tegea may be as much as 200 ha (~500 acres), as measured from Bérard’s map of the city walls. Although it certainly contained many public structures both civic and religious, and private houses as well, it is doubtful that the entire area was densely settled at any given time. Xenophon mentions that Epaminondas was able to encamp his army inside the walls, and Lawrence gives examples of city walls laid out not only to contain a large army, but also to encompass areas sufficient for pasturing flocks or growing grain, in the event of a long siege. The interior of Tegea’s enclavio likely contained much open space, including pastures and farms.

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125 Xenophon, VII.5.8.
126 Lawrence, op. cit. (n. 110) 117 ff. The examples include Syracuse and Phigaleia.
Figure 3.1
Possible archaeological feature revealed in aerial photograph.
The area shown is $0.5 \text{ km}^2$. Contour lines at 2 m intervals. North is up.
Many citizens lived outside the city, some at considerable distances. The boundaries of the Tegean territory, some of which we know from ancient texts and the others that can be guessed from the topography of the region, were so extensive that citizens with land along the periphery or even at middle distances from the city could not have resided there without making inordinately long journeys to and from their fields each day. We also know from Pausanias that a number of Tegean sanctuaries were located well outside the city walls.

Pausanias records the names of the nine communities (δήμοι) which synoecized to form Tegea, at least one of which, Manthyrea, was still in existence in Augustan times. Probably most or all of these communities still existed at that time, and were situated at some distance from the city. If we follow Bérard’s reconstruction of these communities and their locations, then the territory of Tegea was quite large, some 200-250 km². Figure 3.2, reproduced with the permission Mary E. Voyatzis, is a map reflecting what is generally agreed were the boundaries of Tegea’s demes. Much of this territory is mountainous and unsuitable for survey; the portion that is located on the plain of Tegea is substantially less than the total. We know from Pausanias that the Manthyreans inhabited the plain; following Bérard we can accept that other communities on the plain included the Korytheans, the Gareatai, and the Apheidantes. The last named may well have been the

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127 Pausanias, VIII.47.1. Pausanias says that when Augustus removed the sacred image of Athena from the temple of Athena Alea to Rome, the replacement image came from the Manthyreans.

128 18 km from Steno (in the ancient deme of Korythea) south to the east-west course of the Sarandapotomos (the boundary of Tegea with Laconia) and 13 km west from Steno to a north-south line drawn from the middle of Lake Takka (which takes in the deme of Manthyrea). 18 km X 13 km = 234 km² and this is very approximate.

129 Voyatzis, ESAAT, 10-11 & Fig. 2.
Figure 3.2. Tegean Demes and Modern Tegean Villages.
The location of the others are fairly certain; the Manthyreans lived to the west of Tegea, the Gareatai to the east, and the Korytheans to the north, centered on the sanctuary of Demeter near modern Steno. The survey will focus on the deme of the Apheidantes, i.e., the city itself, and take in as much as possible of Manthyrea, Gareatis, and Korythea.

The three-year plan for the Tegea survey will concentrate on the area of the ancient city, where preliminary investigation has revealed that artifact density ranges from low to very high. The survey will also include forays into what was the surrounding countryside of Tegea in the form of transects extending some distance into rural territory. It is hoped that the areas between transects can be surveyed in a continuation of the survey at a later date.

Research Questions and Diachronic Settlement Patterns

By their nature, archaeological survey projects are designed to disclose the occupation and/or use history of a region. From the density, location, and nature of archaeological remains, statements can often be inferred about a population’s economy and subsistence strategies, or its social structure. In Tegea’s case, the latter is of more interest than the former, since the economy of ancient Tegea, like almost all of ancient Greece, was certainly agricultural at its base.¹³¹ Arcadia was also known for its flocks,

¹³⁰ Bérard, Tégée, 539.
¹³¹ Some cities, notably Athens, could count the proceeds from mining as an important element in their economies. Tegea’s only known mineral resource was marble, which could not be exported far in significant quantities. Maritime cities like, again Athens, but also Corinth for example, drew wealth from trade, banking, and manufacturing. Athens, of course, also had the revenues from its empire, in the fifth century.
However, and to have been a major source of mercenary soldiers, at least in the Classical and post Classical periods.¹³²

The social and political structures of Tegea, on the other hand, remain relatively unknown in their details. The following principal research questions will be addressed by the Tegea survey:

1) What was the population density and distribution during the Bronze Age, and how were the land and natural resources used? Based on the evidence of the dams in Lake Takka, we can hypothesize that the Bronze Age population in the area was large, and may have been organized in a way similar to other Bronze Age peoples, e.g., the kingdom of Pylos. To test such a hypothesis, we would need to have an estimate of population density and an idea as to how people used natural resources. The existence of the dams suggests that the population may have approached the limits of the carrying capacity of the land. How were settlements organized to exploit natural resources? How were they distributed over the landscape? Their pattern ought to give some clues to their political structure(s).

2) What was the population density and distribution during the succeeding early Iron Age, and does the distribution reflect any continuity from the Bronze Age? Howell’s survey noted a precipitous decline in sites at the end of the Bronze Age, a situation that can also be seen elsewhere in Greece in this period. Howell’s observation may well be sustained by further investigation. Even so, we can ask what are the characteristics of the

population that emerges in the early Iron Age. Do settlements appear on the sites of older, Bronze Age antecedents, or do they arise in new places? Why or why not? How many sites are there at what times? How do settlement patterns change with population growth? What are the environmental concerns of the populations of different periods? Do they settle on the plain or on the hillsides? Can their subsistence be characterized as largely agricultural or largely pastoral? Do they farm the plain, or do they terrace the slopes? Are defensible sites settled in preference to exposed sites? Are religious activities dispersed in several places, or does the site of the later temple provide the sole focus for these?

3) What was the date and nature of the synoecism? Given that we can group materials into a site, the survey will look for associations among two or more contemporary sites that could determine the extents of, say, villages or hamlets. Presumably, proximity to one another is the criterion by which we should group sites into larger structures. It is probably in the analysis of these mid-scale structures that we will be able to investigate the process of synoecism. In this, we would look for the appearance of a new village, say, or a marked growth in an old one, at the site of the later city. In this process too, there may have been concomitant abandonments of other, nearby sites, but abandonments would only pertain to synoecism when they can be determined to have been contemporary, and when they involve the complete abandonment of villages or towns, not simply farms. 133

133 By itself, the survey would not determine whether violence accompanied abandonment. Given the later history of Arcadian attempts at federation, we might suspect that violence played some part in this
Farms, hamlets, and villages may be grouped again into yet larger structures, for example the demes that Pausanias mentioned. It may be that each deme possessed a core settlement, or a group of settlements situated within a peripheral zone of farm or pasture land. Zones in which villages or towns do not appear may represent the boundaries of the demes, or of some other large-scale political structures. The synoecism may have altered these boundaries, or it could have formed boundaries where none existed, in which case we may be able to judge the strength of the political union that formed Tegea. Such an estimate would go to the question of whether Tegea was a true polis.

4) Did population numbers follow cycles from high to low and back again, and do these cycles correlate with any other known historical processes such as wars, trade and colonization, etc.? For example, could we discern a peak in population density at Tegea, and would this peak coincide with an event like the construction of the fourth-century temple of Athena Alea? How do the large-scale, area-wide population features of Tegea relate to the broader currents of history?

5) Do we find a rise in large estates in the Roman period, and a corresponding fall in small farms? Would settlement patterns in the Roman period shed any light on the puzzling observation that little, if any, material from this period has been found at the temple site, even though in all likelihood the cult was still active at that time?

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135 Østby, E., *Excavations*, 47.
6) What could we say about the population of Tegea in later times, from the Byzantine period through the Frankish and Turkish occupations, up until modern times?

Diachronic settlement patterns derived from an all-period survey can be examined for the answers to these and other research questions. For any survey, the question remains how to discern such patterns. Two things directly relate to how well settlement patterns can be distinguished: 1) the state of the data and whether or not it embodies the required information, and 2) the methodology designed to retrieve the data.
IV. SURFACE SURVEY

The preceding review of the geography, history, and the scholarly research pertaining to Tegea serves to frame the survey's research questions listed above. To answer these questions, the archaeological survey's methodological aims are: 1) to map the distribution of artifacts on the surface of as large an area as possible, with as much precision as is practical; 2) to recover, catalog, and conserve diagnostic materials for close study; 3) to locate ancient structures, both rural installations, such as farms, and urban structures, such as the city walls; 4) to find out how alluviation determines the disposition of artifacts on the surface. In addition, the geological component of the survey will: 1) find the limits of the alluvial sediments deposited since ancient times, and; 2) find the course of the Sarandapotomos/Alpheios in antiquity. The paleobotanical component of the survey will extract pollen samples from suitable sediments, and determine the varieties and relative proportions of wild and domesticated species of plants.

Methodology

An intensive, pedestrian, all-period survey strategy addresses all of the archaeological research goals. The methods of such surveys have by now acquired some standard features, such as lines of field-walkers to count and locate artifacts, and the collection of artifacts according to a defined sampling regime. The Cambridge/Bradford Boeotian Expedition provides an excellent model for the Tegea survey.\(^{136}\) The agricultural landscape in which the C/BBE operated is closely comparable to that of Tegea, and Tegea

\(^{136}\) C/BBE.
conforms fairly well to the circumstances that Bintliff and Snodgrass have said are desirable for intensive survey: "A Mediterranean landscape that has a relatively well-documented history, a high density of surface artifacts but few standing monuments, and that is currently under fairly heavy farming." The strategy and methods employed by the C/BBE are for the most part clearly laid out for review, and the fact that these methods underwent frank re-evaluation and continual revision lends a great deal to confidence in the conclusions that the survey made.

The C/BBE was able to distinguish the full range of settlement types, from small farms, through hamlets and villages, to towns and cities. The survey also discovered even such tiny and rare structures as burials. Not only were discrete features located with good spatial precision, but the survey's site sampling method allowed the recovery of a high percentage of diagnostic artifacts that yielded fairly well refined chronological information. Clearly, a survey method that yields such results may be profitably repeated in similar conditions.

Tegea generally affords conditions of good visibility. Most of the land is either under grain or in orchards. Grain fields can be expected to be left fallow in at least one out of three years, so that a good proportion of the land should be in a plowed condition in any given year. Plowed fields are ideal for surface survey. There is experimental

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137 C/BBE, 127.
138 C/BBE, 139.
140 C/BBE, 140
141 Between 80% and 90%, C/BBE, 134.
142 Indeed, in one survey the surface was deliberately plowed to bring up a sufficient quantity of material for statistical analysis. See Jermann, J.V., "Surface Collection and Analysis of Spatial Pattern: an
evidence that shows that associations among artifacts are preserved to a significant degree in artifact scatters in plowed fields. Orchards are suitable for survey at any time of the year. The space between fruit trees is often carefully tended, with bare soil exposed everywhere beneath the trees. A small minority of the land is in pasture, essentially uncultivated and offering moderate-to-low visibility. The survey does not expect to encounter a lot of macchia, the wild vegetation which has bedeviled many other Mediterranean surveys. Only on a few rocky hill slopes can macchia be found; the plain of Tegea is evidently too rich an agricultural resource to go unused.

The core of the Tegea survey strategy is a flexible field-walking formation which can respond quickly to observed changes in artifact density. A denser concentration of artifacts necessarily requires more labor per unit area to count the artifacts, and a concentration of artifacts potentially represents a site worthy of closer examination. To efficiently discover the extent of concentrations, or sites, and to adequately enumerate the artifacts within them, the field walkers can be reformed in mid-field into a more closely


spaced order. Their field walking will then proceed as usual but with a greater intensity\(^{144}\) of examination.

It is clear, however, that intensity is but one dimension of a two-dimensional coordinate system. Field surveys can be conceived of as taking place on a Cartesian plane. Field walkers are spaced in a more-or-less straight line (one axis of the system) which proceeds straight across a given field (the other axis of the coordinate system). As the line moves along this axis, the motion covers a rectangular field equivalent to the Cartesian plane. Artifacts however, are not plotted as points on this plane, which is too costly in terms of time vs. information gained. Instead, artifacts are recorded as densities, i.e., artifacts per unit area. Rather than being represented by points on a coordinate plane, artifacts are amalgamated into fields of varying density. Some of their locational information is thus lost, in direct proportion as the size of the unit area increases. Thus we can say that the smaller the unit area chosen, the greater the resolution of the data. Higher resolution data is usually more useful than lower, but it comes at the price of coverage because there are limits of resources of time and money.

For example, the resolution of the field-walking data from the Nemea Valley Archaeological Project is typically no smaller than about 100 m.\(^{145}\) Field walkers were asked to tally the artifacts encountered in each pass every 100 m, so that even if crew

\(^{144}\) Intensity has been defined as the field-walking crew’s spacing. See: Plog, S., F. Plog, and W. Wait, “Decision Making in Modern Surveys,” in \textit{Advances in Archaeological Method and Theory}, vol. 1 M.B. Schiffer ed., New York, 1978, 390, and Schiffer, M.B., A.P. Sullivan, and T.C. Klinger, “The design of archaeological surveys,” \textit{World Archaeology} 10: 1 (1978): 13, where the advantages of defining intensity according to crew spacing over other measures of intensity, such as the number of person-days spent in the field, is explained.

\(^{145}\) NVAP, 162.
spacing (intensity) was substantially less than this figure, still no artifact could be placed into an area smaller than 100 m in dimension. Measurements of artifact density, averaged over paths 100 m long, were obtained in this way, although because of the c. 15 m crew spacing it is not likely that many large artifact concentrations were missed. Subsequent investigation of "anomalously dense concentrations of finds,"\textsuperscript{146} many of which could be called sites, often involved casting a grid of 5-, 10-, or 20 m over them for greater spatial resolution.

The Tegea survey will proceed in much the same way as just described, but artifact tallies will be made at 50 m intervals in the course of normal field-walking. At the end of each tally interval, the tallies of individual field walkers will be recorded. The actual resolution of field-walking data then will be: intensity (spacing) X tally interval.

Both intensity and tally interval will be variable. Spacing will be reduced to 7.5 m and tally intervals to 10 m when, in the judgment of the crew chief, the density of artifacts reaches "site level." When plotted on the map, points of equal numbers of artifacts will be connected with lines that represent the (irregular) boundaries of density fields. The resolution of the data will thus allow for some detailed analysis. For example, some sites may be resolved into dense, "core" concentrations surrounded by halos of less dense material, or again, some sites may contain more than one dense concentration, perhaps relating to different activity loci at the site. It is important to recall that these rather high-resolution data will be recorded in the course of field walking.

\textsuperscript{146} NVAP, 163.
In this way the Tegea survey will quickly and effectively survey both site- and off-site areas. The statistics for the first three years of the C/BBE demonstrate that this method was effective at discovering sites of all sizes, although very small sites, i.e., less than 0.1 ha, are not as well represented as might be expected. Most of the sites, thirty-four, were less than c. 0.5 ha in extent, eleven sites were between c. 0.5 and 2 ha, while five sites were greater than 2 ha in size. The overall density of sites/km² was 4.0, or over 10 sites/mi².

The C/BBE also worked out a useful sampling procedure for artifact collection. In the first two seasons, two different methods of probability sampling, random and systematic, were tried, but both were found to be deficient in recovering the full chronological range of materials at any given site. Moreover, the collections contained a large percentage of undiagnostic material, which even though it embodied no useful information beyond artifact count, still had to be bagged and housed, taking up time and valuable storage space. Concomitant with each of these probability sampling regimes, however, the C/BBE also conducted "grab samples" that covered the whole site. In these samples, each person was instructed to collect only materials with certain features, e.g., pottery sherds with rims, bases, handles, or painted decoration. By collecting all artifacts with such features, the survey was protected from chronological bias, and any bias toward fine, painted ware. Moreover, by collecting any sherd that displayed the above features,

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147 C/BBE, 136, Figure 11.
148 0.5 ha ≈ 1.1 acre. At least three of these were burials (p. 140), while about six sites were less than ¼ acre.
149 C/BBE, 133.
the decision as to whether a sherd was diagnostic did not have to be made in the field, by field walkers who probably varied considerably in the needed expertise. It was these grab samples that pointed out the deficiencies of the probabilistic sampling methods, and at the same time provided the basis for the survey's chronological analysis. After the second season, the C/BBE instituted the use of this selective sampling in conjunction with the intensive (7.5 m) site survey method described above, bagging samples according to each "mini-transect" (7.5 m X 10 m). Probability sampling methods were evidently discontinued. Collection and close study of the materials from the Tegea survey will allow their classification into chronological periods, ranging, probably, from Neolithic to Modern.

The effects of alluviation on the disposition of the archaeological data have not been dealt with yet, but in Tegea's case, these effects are almost totally unknown. Ancient ceramics (painted roof tiles) have been found on the surface in sediment identified as alluvial, but no general statement can be made that the alluvium has sufficient material on its surface with which to investigate the desired questions. It is possible to imagine that in some circumstances the alluvium has acted minimally to obliterate artifacts and their associations, in those cases where the alluvial cover is thin and has been turned by plowing. In other cases the action of flowing water and debris certainly must have destroyed associations, dispersed artifacts, or buried them too deep for plow action to ever return them. The existence of alluvium at Tegea raises this theoretical question: In

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150 C/BBE, 134.
151 This might be about 30 cm. See Rudolf, J., op. cit. (n. 139), p. 36 Table 4.
general, does the alluvium preserve observable associations among artifacts, or does it serve to obscure associations by covering up many of them and allowing the return of a few disassociated artifacts? One of the goals of the survey is to discover the ways in which alluviation affects the disposition and recovery of artifacts. Therefore, rather than seeking to discover the boundaries of the alluvium and then avoiding it altogether, the survey will examine the surface everywhere in the same way, i.e., the same collection and field-walking methods will be used. It is only in the analysis of the data that the alluvium will be treated as a different stratum.

Archaeological Materials

The survey expects to find materials comparable to those uncovered at the temple of Athena Alea. However, neither the architectural tiles nor the coarse ware from the excavations at the temple of Athena Alea have been published yet. These types of ceramic materials are going to be encountered more frequently in the survey than finely decorated ware. The latter, however, permits much finer chronological distinctions than either tiles or coarse ware, and will prove most useful when it is found.

In my preliminary examination of the roof tiles from the excavation of the temple, I distinguished one very large pan tile fragment and several smaller ones that are clearly Corinthian in fabric. Their size (c. 6 cm thick) suggests that they roofed the Archaic temple itself. All the other tile fragments are much smaller, c. 1 cm thick, and they are without exception flat pan tiles; no examples of curved or peaked cover tiles have come to

See n. 37 above.
light. They can be grouped into at least three fabrics: a soft, powdery, yellow or greenish clay, a light-brown-to-light-red clay, and red, brick-colored clay that often has fine white inclusions. Tiles of the first two fabrics are often painted solid black on their upper surface. The third fabric is never painted. My impression is that the first two types come from Archaic and Classical layers, the third from Classical and later layers. A closer analysis of the roof tiles will occupy me in the summer of 1997, when I hope to obtain better typological and chronological information.

A study of the coarse ware from the temple excavations would be an important resource for the survey. Very little coarse ware was found in the temple itself, but a large amount come from the area to the north, including a number of clay wool baskets. Besides being seen, evidently, as appropriate votives for a goddess, such baskets would presumably also be part of a typical domestic ceramic assemblage.

Other materials that the survey expects to encounter include stone tools, and obsidian flakes and cores. Architectural fragments, many of marble and finely sculpted, can also be seen in many places. Both these and coins are often closely datable.

GIS and Computer Databases

The Tegea survey will incorporate its data into a computer database such as Microsoft Excel. This will allow the data to be sorted easily by attribute, date, etc. This software also allows the importation of data into the GIS system that the survey has chosen, IDRISI. This GIS is an affordable, PC-based system that has become more

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153 See n.75 above.
useful as advances in computer technology have provided more powerful personal computers that can be used on-site, with memory and data-storage capacities that can accommodate the amount of data generated in surface surveys. Other software advances include affordable image-processing programs that can transform paper-backed aerial photographs into digital ones that can be scaled, cropped, rotated, and manipulated in other ways to produce a variety of hard-copy images useful for recording in the field. In addition, these same digital images can be used by the GIS.

A GIS can take a digital image such as an aerial photograph and correct the distortion that results from the wide-angle lens. It can scale the corrected image and register it with a digitized topographic map. The result is a digital aerial photograph, or photo-map, whose features can be located in the coordinates of the Greek geodetic survey system (Fig. 4.2). It follows that any archaeological datum whose location can be measured with reference to any feature on the image can also be recorded in the same coordinate system. The accuracy of such measurements can conceivably be within a few meters of the artifact’s actual position within the coordinate system.

A GIS can also incorporate the contents of a database, and append topographic attributes to each datum. Databases are anyway an excellent way of record keeping for archaeological projects, so that the use of one in the Tegea survey entails no special effort. The contents of the database will record the coordinates of an artifact, whether it is a sherd, tile, or other artifact, and its date if known. For pottery there will also be a place to note whether it is a rim, base, handle, or body fragment, the shape if it can be determined,
Figure 4.1
Photomap showing the village of Alea with the temple of Athena Alea at top. The area shown in $1\text{ km}^2$. Contour lines at 2 m intervals. North is up.
plus the fabric and date. Some may be decorated. For the tiles, the nature of their fabric and their date will be noted, and whether they are painted or unpainted. Some of them may also be stamped.

The database is a separate record from the GIS. It can be used independently, for example to sort and count pottery. Once it is imported into the GIS more kinds of analyses are possible. Importantly, these analyses are performed in a spatial mode, as if the artifacts lay upon the three-dimensional surface of the ground. The GIS can take artifacts sorted by date, for example, and analyze their positions on the surface with respect to one another. Large-scale patterns can be discerned and the strength of patterns measured. Boundaries among groups can be drawn by taking into account the topography of the land and the effort required to travel from the center of one group to the center of another. When all periods have been analyzed, a diachronic picture of large-scale population patterns emerges, in much the same way as other surveys have produced their results.

GIS analyses can also return numerical measures of any differences among the strata of the survey, between alluviated areas and non-alluviated, for example. These can render rather solid conclusions about how data is obtained from different contexts. Different measures of visibility can also be factored in. A numerical coefficient for visibility and other factors can even be created experimentally by sowing fields with a known number of “artifacts,” e.g., large washers, and counting the number returned. The

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154 Such an analysis produces a cost surface so that boundaries are more likely to fall along lines of equal cost, rather than equal distance.
GIS can relate artifact density and strength of artifact associations to soil, visibility, vegetation, or any spatial feature of the landscape. The functions of a GIS in the survey thus span every phase from beginning to end, from the creation of photo-maps, through the creation of a database of archaeological material, to the analysis of this material in relation with itself and with certain features of the landscape like soil type, relief, distance to water, etc.
V. CONCLUSION

An archaeological survey of Tegea can illuminate the developments at one of the most important cities of the ancient Peloponnese. The excavations at the temple of Athena Alea reveal that this site was an important religious center at an early date, and that a monumental temple was constructed here at the end of the seventh century BC. The votives found here show that Tegea shared in, and was abreast of, the common cultural developments of Greece in the preclassical periods. The literary evidence is not clear, but some sources suggest that Tegea was also abreast of political developments, and that it may have been synoecized before the fifth century BC. There is as yet no archaeological evidence for the synoecism, however. Much recent scholarship points to an intimate connection between religious and political developments in Archaic Greece, but on the other hand, much of the archaeological evidence to date has come from religious contexts. An archaeological survey of Tegea outside the precinct of the sanctuary of Athena Alea would provide a balanced view of developments in Archaic Greek society.

The survey will be able to build on the work of other research carried out at Tegea, especially that of Bérard and Howell, and it will also benefit from the experience gained from intensive archaeological surveys in Greece. Specifically, the Tegea survey will, to large extent, adopt the strategy and methods of the Cambridge/Bradford Boeotian Expedition, which showed remarkable success in defining changes in settlement pattern in
a landscape very similar to Tegea's. The Tegea survey will also be able to incorporate the latest advances in computer databases and in GIS, which the C/BBE was not in a position to do.

The excavations at the temple of Athena Alea provide a stratified body of materials with which the collections of the survey can be correlated. The survey offers the opportunity to study certain artifact classes more thoroughly, especially coarse ware pottery and roof tiles. Such studies would present useful comparative material to the archaeology of neighboring regions, such as Laconia, the Argolid, etc., and would provide an firmer basis from which to conduct future surveys at Tegea.

Archaeological surveys hold the best hope of discovering information about past social, political, and economic structures, in the absence of texts. The historical texts and the inscriptions relating to Tegea, which refer to events no earlier than the sixth century BC, are few enough. Even for the Classical period, the best documented time in terms of political developments, fundamental questions remain unanswered. The Tegea survey, by determining diachronic changes in the population density and the disposition of the population into settlements, aims to provide the information that can answer some of these questions. The most significant of these questions are 1) What was the population density and distribution during the Bronze Age, and how were the land and natural resources used? 2) What was the population density and distribution during the succeeding early Iron Age, and does the distribution reflect any continuity from the Bronze Age? 3) What was the date and nature of the synoecism? 4) Did population numbers follow cycles from
high to low and back again, and do these cycles correlate with any other known historical processes such as wars, trade and colonization, etc.? 5) Do we find a rise in large estates in the Roman period, and a corresponding fall in small farms? (Would this account for the relative dearth of finds from the sanctuary of Athena Alea during this period?) 6) What could we say about the population of Tegea in later times, from the Byzantine period through the Frankish and Turkish occupations, up until modern times?

In addition, the Tegea survey will contribute to the improvement of archaeological survey methods in the way that it will deal with alluvial deposits. The area of Tegea is suitable for archaeological survey because the alluvium, while it will undoubtedly affect the recovery of some ancient artifacts and their associations, covers only a portion of the area to be surveyed. Moreover, by conducting a surface survey on alluvial deposits, we may be able to determine some of the ways in which alluviation shapes the disposition of archaeological material. The survey will have an important geological component that will determine the boundaries of the alluvial sediments, and will determine once and for all the question of the ancient course of the Sarandapotomos/Alpheios River. There will also be a paleobotanical division that will relate past ecological variations with settlement patterns and land use.
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