SANDY PYLOS

An ARCHAEOLOGICAL HISTORY *from* NESTOR *to* NAVARINO

EDITED BY JACK L. DAVIS

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CHAPTER 1

The ENVIRONMENTAL SETTING

Messenia is the name both of a region and of an administrative district in the far southwest corner of Greece—an area segregated from the central Greek mainland by several mountain divides, bordered on three sides by the sea and on the fourth by the Taygetus Mountains, which rise to a height of 2,400 meters. Because of its remoteness, much of Messenia is only sparsely inhabited, and the entire province has a single regional center of traffic and commerce, its capital, Kalamata.

Although Kalamata possesses a port with ferry connections to Crete and a small airport with scheduled flights to and from Athens, most who visit Messenia will drive by car over winding roads through the center of the Peloponnese before arriving in one of the most beautiful parts of Greece. A mere 150,000 people in an area of 3,000 square kilometers share the best soil and most favorable climate in the entire Peloponnese. Most live in the city of Kalamata and in the towns of Pylos, Hora, Gargaliani, and Cyparissia; thus the spectacular coastal scenery of western Messenia, including the Bay of Navarino, remains almost unspoiled by modern buildings.

The great Bay of Navarino, the extensive swampy lagoon known as Osmanaga, and the beach barrier dividing these two are among the most prominent geographical features of western Messenia. West of the lagoon is a shallow sea inlet, ringed by tall sand dunes at a place called Voidokoilia ("ox-belly") because of its distinctive shape. Voidokoilia, crowned by the so-called Cave of Nestor on the nearby Navarino Ridge, certainly ranks as one of the most enchanting landscapes in Greece (Fig. 11).

To understand how this landscape evolved, it is necessary for us to widen our perspectives beyond those normally considered by historians and archaeologists, and to consider geological scales of time and space. The main geological and physiographic characteristics of Messenia are the result of a collision between two units of the earth's crust that are called the African and the European plates. These plates have been moving toward each other

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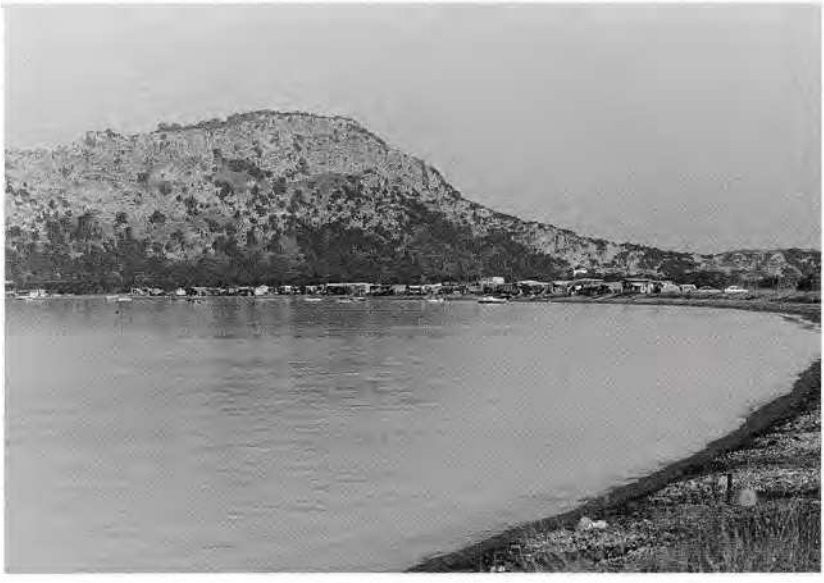

FIGURE 11

The north end of the Bay of Navarino, the castle of Palaionavarino, and the sand bar separating the bay from Osmanaga Lagoon. PRAP Archive. R. Dupuis-Devlin and E. Dallagher.

at a rate of approximately 1 centimeter per year, and during the past two million years, it seems that probably as much as 20 kilometers of the earth's crust has subsided between them.

These horizontal plate movements are accompanied by vertical displacements of the earth: mountain ridges are uplifted along tectonic faults, while coastal plains temporarily sink below sea level, where they accumulate large amounts of sediment. Subsequently, they may rise above sea level again, thus exposing their marine deposits.

Messenia's landscape was shaped by a combination of these processes. Precipitous slopes occur along tectonic faults: the island of Sphacteria and the Aigaleon range of mountains in western Messenia are good examples of such landforms. Extensive terraces of uplifted marine sediments now cover areas between ridges. In places, deposits that formed at the beginning of the Pleistocene, two million years ago, are now located as high as 400 meters above sea level. Streams that drain the mountain basins cut their beds deeply into these young, soft deposits and, in so doing, fashion the soft powdery marl bedrock into spurs (Fig. 12).

Since natural resources such as arable land, abundant fresh water, pro-

tected harbors, and mineral resources have all, to a greater or lesser degree, influenced the fate and fortune of both ancient and modern cultures, any attempt to reconstruct Messenia's history requires an understanding of the habitat in which Messenians, past and present, have lived. What is more, the success of royal palaces, trading cities, and even entire states has often reflected their geographic position either in their immediate landscape or in a larger geopolitical world-system.

Interrelations between the natural environment and the history of its human habitation are complex, and require that archaeological field projects like the Pylos Regional Archaeological Project engage physical scientists, including geologists, geomorphologists, geophysicists, botanists, and soil scientists. Their job is to investigate the evolution of the landscape around the archaeological sites that are of interest to the archaeologists. Specifically, the scientists aim to find out how the landscape has changed since it was first settled, how the environment has influenced the choice of places to live or land to farm, and how the natural habitat, in turn, has been affected and changed by people.

These were the goals of the physical scientists who participated in PRAP and who formed a significant percentage of its staff. And after several years of fieldwork and laboratory analysis, we are now in a position to sketch the

FIGURE 12
The Englianos Ridge (distant center) and the uplands around Hora from the top of the Aigaleon Ridge. PRAP Archive.

FIGURE 13
The area of the Mycenaean port basin (open area right of the large house in center) and the mouth of the Selas River from the town of Tragana. PRAP Archive. R. Dupuis-Devlin and E. Dallagher.

following history of the landscape of western Messenia, in the areas around the Palace of Nestor that formed the focus of detailed research by PRAP.

Ten thousand years ago, sea level was lower than at present, and the Bay of Navarino would have extended several kilometers farther north than it does today, reaching the foot of the ridge on which the modern village of Tragana is located. Osmanaga Lagoon, the beach barrier that separates it from the Bay of Navarino, and the dune fields at Voidokoilia did not exist at that time, although there *were* extensive stabile dunes north of Romanou. The two biggest rivers in the Pylos region today are those which run immediately north and south of the Englianos Ridge, then unite at its southwestern end to form the Selas River; several thousand years ago, this combined river would have exited into the Bay of Navarino (Fig. 13).

There is no doubt that these streams then flowed perennially. Rain would have been caught and preserved by a thick vegetation cover and by mature soils, which would have released their water slowly but steadily. Botanical investigations by our project allow such a reconstruction since they indicate that warmer and wetter conditions that followed the Ice Age supported open oak forests that, at low elevations, contained beech, holly,

hornbeam, pistachio, and almonds with pine forests and evergreen shrubs at high elevations and on poor sandy soil.

At the end of the last Ice Age, it appears that Greece was largely deserted. The first farmers seem to have traveled from the Near East to northern Greece during the seventh millennium B.C., and to have chosen to settle in the most fertile plains facing the Aegean Sea, across which they would have traveled from Turkey. They brought with them the knowledge required for both agriculture and animal husbandry, including the ability to produce all tools needed for woodcutting and farming. Messenia, being far from the Aegean Sea, was settled later in the Neolithic. Pollen remains from this period are not exceptionally well preserved but are adequate to show that the first settlement by farmers was not accompanied by major land clearance. In a natural replacement, the extensive pine forests gradually gave way to deciduous oaks.

Until the third millennium B.C., agriculture was limited to the most fertile floodplains, where the soft soil could be manipulated with primitive tools. With the introduction of the plow around 3000 B.C., even fields of marginal quality became arable on a relatively large scale. As a result, hill slopes surrounding the fertile floodplains were cleared of forests to make space for new fields and pastures. The population expanded rapidly, and more deforestation and land clearance ensued.

These major changes in agricultural practice occurred first in Thessaly, then in the Argive Plain, and finally, after a delay of about a millennium, in remote areas such as the southern Argolid and western Messenia. By the time that the southern Argolid was cleared for large-scale agriculture (around 2000 B.C.), the agricultural potential of Messenia seems to have been exploited, too. Since then, the Messenian landscape has undergone rapid and long-lasting changes on four occasions.

Our pollen cores from Osmanaga Lagoon show that by 2000 B.C., pine forests had been reduced to a fraction of their former size. The sedimentation rate accelerated sharply, and the amount of organic matter in the sediments increased. We also found a 15-centimeter-thick sediment layer containing much charcoal, possibly stemming from forest fires, which may have been set intentionally to clear the pine woods. It appears that this first phase of deforestation brought about landscape instability and triggered a phase of increased fragility that has lasted until the present day.

The second period of significant environmental change coincides with the formative stages of Mycenaean civilization. Although the landscape seems to have regained stability between 1800 and 1600 B.C.—when even the pine forests were able partly to recover—shortly thereafter, between

1600 and 1400 B.C., the pines were suddenly and completely wiped out. Dramatic environmental destruction seems to have accompanied early Mycenaean agriculture. In addition to the total disappearance of pines, the number of oak trees dropped by half, making space for plants that are indicative of steppe and macchia communities. This radical change in the vegetation cover is best explained as the result of human-induced deforestation combined with subsequent overgrazing, which suppressed the recovery of trees.

Around 1400 B.C., however, the environmental situation took another turn. The steppe communities declined, and olive trees replaced them. New species of plants appeared, including rye, walnut, plane tree, and Judas tree. At the same time, sediments from Osmanaga Lagoon record a time of relative landscape stability between 1400 and 1200 B.C. Considering how prone to erosion the Pylos area is, it is more than likely that the steep slopes of Englianos were protected by terrace walls to prevent them from slumping. But whatever system the Mycenaean Greeks used to obtain landscape stability, it could not be maintained after the collapse of the kingdom, when archaeological evidence suggests that population density dropped precipitously.

During such phases of social and political readjustment in Greece, natural resources tend to be abused. In this instance, however, it did not take too long before the landscape became stabile once more, as its surface was protected by vegetation that grew almost without restriction. Indeed, deciduous oaks spread to such an extent that they may have covered over half of the total surface of the Pylos area. Although deciduous oaks are much less resistant to grazing than are evergreen oaks, with a deemphasis on husbandry, deciduous oaks have the competitive advantage of faster growth. At the same time, the number of olive and pistachio trees decreased, presumably because there was nobody resident on the land who would cultivate and maintain them.

The physiography of the Pylos area has not experienced any major changes since the end of the second millennium, except that the sand barrier at the northern end of the Bay of Navarino closed between 800 and 500 B.C., isolating Osmanaga Lagoon from the remainder of the gulf. What *has* changed significantly during the past three millennia is the plant cover.

The third phase of major environmental change coincides with the Classical to early Roman periods and marks one such alteration in plant communities. The study of the vegetation argues for a dense population and a high level of agricultural production between 500 and 100 B.C. After the

end of the Spartan control of Messenia in the middle of the fourth century B.C. (see Chapters 6–7), the olive reaches an all-time peak (between 350 and 100 B.C.), when a quarter of the entire surface of the Pylos area may have been covered with olive trees. Many of the plants that are likely to have been cultivated at that time, including cereals and grapes, are hard to discern in fossil assemblages. This intense land use was accompanied by a significant drop in deciduous oaks and above-average erosional rates, as reflected in the physical parameters of sediments from our cores in Osmanaga Lagoon.

Land use diminished during the time of barbarian raids and Slavonic invasions in the later first millennium A.D. Fewer olives were cultivated and deciduous oaks recovered, each trend indicating decreased human activity. The sedimentation rate—an indicator of landscape instability—slowed down to a third of its previous value. During the Middle Byzantine period, the environmental data points to more intensive agriculture, while archaeological evidence suggests settlement was also more widespread (see Chapter 8). But no major changes in the environment occurred before the modern period, the fourth and last phase for which there is abundant evidence of human interference with the landscape.

Core samples from sediments just beneath the floor of the lagoon confirm what can be observed by eye in the present landscape. Agriculture has had such an impact on the vegetation that almost no examples of undisturbed natural plant communities can be found anywhere in the landscape. A mixture of cultivated land and pasture covers southwestern Messenia. Natural forests have completely disappeared, and macchia, a seminatural shrub vegetation, has spread over steep and inaccessible slopes. In many places, where grazing is most intense, the macchia has been degraded even further into another kind of plant community, called phrygana (or garrigue), a light, open, shrub plant community of 0.5–1 meter in height that covers many dry, sunburnt, eroded slopes with thin soil. Phrygana tends to look patchy, because many of its plants are cushionlike, and some parts of the community are dominated by only a single species of plant.

A flight to the cities and economic oscillations have forced most landowners to emphasize low-labor monocultures, mainly olives. The invention of deep plows, bulldozers, rototillers, and herbicides in this century was accompanied by a massive destruction of soils and shrubs. Today, in many areas, no low vegetation exists between the olive trees. Almost everywhere on the soft marl bedrock, soils have already been destroyed to the point that it is hard to find remains of them. Most farmers are simply plowing bedrock! For them, however, this is no cause for alarm, since the

silty marl has very good physical properties for agriculture, and what it may lack in terms of minerals and organic compounds can be added with modern chemical fertilizers.

Widespread erosion has far more serious consequences for archaeologists, however, because artifacts contained in the soil are washed away, too. Hence, the loss of soil has, in many instances, destroyed archaeological strata. How much of the surface has been destroyed in recent years can often be measured at the bottoms of olive trees, where it is clear that in some instances the roots have been exposed to a depth of 1 meter.

Although calculating the total amount of natural and human-induced erosion that has occurred since prehistoric times is difficult, there are a number of ways to derive estimates. As a general rule, geologists hold that 1 meter of uplift in one thousand years should be equivalent to 1 meter of erosion in one thousand years—for internal mountain-building and external destructive processes on earth are roughly in balance. For western Messenia, we can be more specific if we examine the state of preservation of rock-cut chamber tombs, one of the most typical forms of burial employed by the Mycenaeans at the time of the Palace of Nestor.

Although the size and shape of these tombs vary considerably, in the Pylos area they tend to consist of a chamber that is 2.5–4.5 meters deep, with a doorway (or *stomion*) and an entrance passageway (*dromos*) that are together 4–9 meters long. Of those examined by PRAP in detail, only the rear wall and less than 1 meter of the chamber of several such tombs located on the Englianos Ridge itself were still preserved. In other words, it is obvious that since the later second millennium B.C., a few vertical meters of soil and bedrock have been removed from the surface of the slopes of the ridge in these locations (Fig. 14).

More evidence for very recent environmental destruction exists in the form of conspicuous, well-defined knolls, consisting of undisturbed marl bedrock, usually 3 to 5 meters high and several meters wide. Their surfaces are level and overgrown by grass and bushes, whereas their sides are usually vertical. Some of the mounds bear trigonometric markers, some ancient graves, some both. Apparently these mounds represent leftover bedrock prominences that have been spared from plowing and bulldozing. Their tops are remnants of the former surface, which used to extend laterally before the surrounding area was lowered by excessive plowing. The date of the destruction most likely falls between the erection of the trigonometric stations and the planting of the olive trees on the lowered surface around them—in most cases, in the last thirty years. In two instances, these "leftovers" suffered even more destruction shortly after we had investigated them (see Chapter 10).

FIGURE 14
Destroyed chamber tombs on the Englianos Ridge. PRAP Archive. J. Bennet.

At the end of this journey through the last few thousand years of environmental evolution in southwestern Messenia, we return to our starting point: the present landscape around the Palace of Nestor. Those factors which characterize today's landscape—high rates of tectonic movement, erosion compensating for uplift, and intensive human land use—have also determined the landscape in prehistoric and historic times. Messenia was always blessed with fertile soil and relatively abundant fresh water. Geopolitically speaking, however, it has almost always lain far away from the pacemaking centers of culture. We shall explore the effects of this isolation in subsequent chapters.