The Rural Basis of the Ancient Greek City

by

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Introduction

Traditionally, the study of ancient Greek society has focused on activities in the urban centers. There is a wealth of scholarship on art, literature, and diplomacy in ancient Greek cities, but we seldom hear about the average farmer’s struggle for subsistence. Part of the reason for the lack of scholarly interest in the countryside is that the ancient writers themselves downplayed its importance. Since the rise of the environmental movement in the second half of the twentieth century, however, people have started to ask questions about how the Greeks managed and exploited their landscape. In order to find answers, researchers have had to develop new methods for studying the ancient world. Increasingly, Classicists have started to borrow from other disciplines such as geology and biology. The more people learn about the Greek countryside, the more they realize how essential it was to all aspects of life in the polis.

Until the middle of the twentieth century, studies of the ancient Mediterranean were usually limited to politics, art, and literature. While reading Classics textbooks from before the 1970s, it is easy for a person to forget that the majority of the population in any polis was directly involved in agriculture.¹ The political emphasis was particularly strong in the 1940s, 50s, and 60s, when democratic countries across the globe were fighting to blot out fascism and communism.² Textbooks from the mid-century describe the Greek cities as if they were completely disconnected from the surrounding countryside. Even archaeologists focused on the urban centers and

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¹ Osborne 1987, 197.
² Shipley and Salmon 1996, 4.
ignored country farmsteads. For the most part, the questions that scholars asked about ancient society were the ones that the Greeks themselves had asked, but as direction of popular culture began to shift, people started thinking about the ancient world in new ways.

The environmental movement has changed the way people study ancient Greece. Modern environmentalism has its roots in the Industrial Revolution. As new factories multiplied in western cities, people began to observe the effects that pollution had on humans as well as on plants and animals. In England, biologists noticed that selective pressures caused peppered moths to became darker to match the soot-covered trees near large cities. Environmentalism did not become a popular movement, however, until Rachel Carson published *Silent Spring* in 1962. The book dealt with the effects of DDT and other insecticides on ecosystems in the United States. While birds and other small animals were the first to suffer the effects of agricultural chemicals, Carson suggested that humans would ultimately suffer as well. Public interest in the natural environment and the ways that humans might be affecting it has grown steadily since the sixties. In 1992, thirty years after Carson published her book, leaders from around the world met in Rio de Janeiro for the United Nations Conference on Environment and Development. Although the delegates did not cover as much ground as many would have liked, the event showed that environmental conservation had become a global concern.

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3 Shipley and Salmon 1996, 6-7.
4 Osborne 1987, 9.
7 Lincoln 2006, 45-46; “Two Successful Week at Rio” 523.
It was not long before Classical historians began to ask questions about how the Greeks and Romans interacted with their natural surroundings. In 1972, for example, R. A. Tomlinson of the University of Birmingham began his book on the Argolid with a description of the natural geography of the region. His assumption was that the natural factors of a state have a profound affect on the course of political and military history.\textsuperscript{8} While some researchers were content to reanalyze the literary sources, others searched for new techniques to learn about the ancient Mediterranean world.

Survey archaeology has become important to Classical studies in the past thirty years.\textsuperscript{9} The first experiments in archaeological surveying in the Mediterranean occurred in the sixties, and by the late seventies they had become commonplace. Unlike traditional archaeological projects, which focus on the intensive excavation of a single site, survey archaeology attempts to gain a general impression of the history of land use at a site. On a typical day, researchers will set up a grid on a field and walk across it in formation, searching for artifacts and other signs of human presence. As data are collected, their coordinates are recorded for later analysis. In recent years, advances in technology have made the mapping process significantly easier. On Princeton’s current expedition at Akvat in Turkey, for example, the researchers use satellite maps to plot out their grids and GPS technology to confirm the coordinates of their finds.\textsuperscript{10}

\textsuperscript{8} Tomlinson 1973, 7-14.
\textsuperscript{9} Alcock and Osborne 2007, 20-25.
\textsuperscript{10} Tomlinson 2008, 21-27.
Since surveys do not require large work crews or heavy machinery, they can be carried out on a small budget. Nevertheless, the projects can result in important finds. Over the summers from 1979 to 1983, Stanford launched a large-scale survey in the southern Argolid to study patterns of soil deposition since the introduction of agriculture. After four years of work, the team found that soils had remained essentially stable except during two short events in the historical period: one at the end of the Classical period, and another during the late Roman period.\textsuperscript{11} Perhaps because of its proximity to Mycenae and Nauplion, the Argolid has been a particularly popular location for archaeological surveys in Greece.

Historians have approached the topic of ancient Mediterranean landscapes in radically different ways. Some have set out with the goal of proving that the Greeks and Romans inflicted permanent damage on their ecosystems. J. Donald Hughes of the University of Denver, for example, began his book \textit{Pan’s Travail} by saying, “The landscapes of Greece and Italy, and of the other countries once occupied by Greek colonists and the Roman Empire, have suffered greatly from human occupation since ancient times.”\textsuperscript{12} Studies like Hughes’ should be read with caution; he rarely supplements his literary sources with other types of evidence, and he tends not to question ancient authors as long as they support his arguments. In his chapter on logging, for example, Hughes mentions that an Athenian named Phainippos made twelve drachmas a day by carting wood from his property to the marketplace. What

\textsuperscript{11} van Andel 1997, 33-56.
\textsuperscript{12} Hughes 1994, 1.
Hughes does not tell his readers, however, is that the detail comes from a speech in which Demosthenes attempts to prove that Phainippos is a wealthy man.\textsuperscript{13}

Other researchers have devoted themselves to field work. Oliver Rackham of Cambridge University has been studying the geology, vegetation, and climate of Mediterranean countries for more than thirty years.\textsuperscript{14} Rackham’s most extensive work on ancient landscapes so far has been \textit{The Nature of Mediterranean Europe}, which he published with A. T. Grove in 2001. In the book, he uses a combination of biological and comparative evidence to make inferences about the ancient countrysides of Greece and other countries.\textsuperscript{15} Rackham’s arguments are based on solid evidence, but he tends to disregard the value of literature and epigraphy. When he does mention ancient texts, it is usually to point out how inadequate they are.\textsuperscript{16} Although written sources can be problematic, they offer valuable information to historians with the patience to separate insight from rhetoric.

The most convincing studies of the ancient landscape are those that combine as many different sources of information as possible. In his book \textit{Classical Landscape with Figures}, Robin Osborne of Cambridge University draws on information from literature, epigraphy, archaeology, geology, and biology to argue that the countryside was of fundamental importance to life in every Greek polis.\textsuperscript{17} Osborne is tough on ancient authors when he needs to be, but literary sources are nevertheless an important part of his narrative. Osborne quotes Demosthenes’ speech

\begin{thebibliography}{9}
\bibitem{13} Hughes 1994, 74.
\bibitem{14} Grove and Rackham 2001, 370.
\bibitem{15} Grove and Rackham 2001.
\bibitem{16} Rackham 1996, 16-38.
\bibitem{17} Osborne 1987.
\end{thebibliography}
Against Phainippos on two separate occasions, but unlike Hughes he does not take everything that the speaker says at face value.\textsuperscript{18} Classical Landscape with Figures was published in 1987, but it continues to be an important resource for historians studying the ancient countryside.\textsuperscript{19}

For a historian interested in the Greek landscape, working with literary sources can be frustrating. The Greeks chose to play down their dependence on the countryside, especially in the Classical period when authors were most prolific.\textsuperscript{20} Many of the references that authors make to the fields and the mountains are little better than rhetorical devices.\textsuperscript{21} Only a handful of authors explored the landscape in detail. Hesiod’s Works and Days offers advice for Greek farmers, but it falls far short of a comprehensive description of the agricultural process. While he does discuss some of the aspects of cereal cultivation, he barely mentions vines and livestock, and he leaves out olives altogether.\textsuperscript{22} Xenophon dedicated two short works to agriculture and hunting, but he is interested in these activities only to the extent that they provide good exercise and training for aristocratic landholders.\textsuperscript{23} Aristotle and his successor Theophrastos wrote commentaries on plants, animals, minerals, and weather patterns, but they omitted important information about how their topics related to human

\textsuperscript{18} Osborne 1987, 37-38, 40.
\textsuperscript{19} Classical Landscape with Figures is cited by almost half of the contributors to Human Landscapes in Classical Antiquity (Shipley and Salmon 1996).
\textsuperscript{20} Osborne 1987, 16-21.
\textsuperscript{21} Rackham 1996, 24.
\textsuperscript{22} Works and Days 381-617.
\textsuperscript{23} Oikonomikos, Kynegetikos.
activities. While each author records valuable information about the Greek countryside, all of them except for Hesiod present an outsider’s perspective on the rural lifestyle.

A number of other authors were clearly interested in the countryside, even if they did not write about it in detail. Homer’s epics provide scraps of information about rural occupations such as farming, hunting, and herding, but interpreting these references can be a tricky process. The everyday activities described in the *Iliad* and the *Odyssey* are a hybrid of Mycenaean and seventh-century practices, but in some cases we can be confident that Homer is speaking from first-hand observation. Laertes’ farm on Ithaca, with its mountainous topography, diverse crops, and fiercely independent owner, bears the signs of subsistence agriculture in the early polis period. Aristophanes’ *Acharnians* contains a variety of ordinary people who have been dispossessed by the war between Athens and Sparta. The protagonist is a subsistence farmer named Dikaiopolis, and over the course of the play he meets with a swineherd from Megara, a trapper from Thebes, and a mob of charcoal-burners from the deme of Acharnai. Similarly, many of Menander’s plays were centered around peasants from rural Attica. The author’s best-preserved play, the *Disagreeable Man*, takes place on two small farmsteads near the shrine of Pan at

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25 Osborne suggests that urban Greeks saw the agricultural landscape as foreign at Osborne 1987, 18-20.

26 Hanson 1995, 47-89.

27 The chorus of Acharnians appears at *Acharnians* 208. A Megarian visits Dikaiopolis in lines 729-835, followed by a Theban in lines 860-958 and finally a poor farmer named Dercetes in lines 1016-1036.
Although the countryside was marginalized in antiquity, it was not entirely absent from Greek literature.

Archaeological finds are also an important source of information about Greek landscapes. Epigraphical documents in the form of leases, decrees, and dedications all offer information about how the countryside was managed. Everyday scenes of farming and hunting were not popular on Greek pottery, but they can be found by anyone with the patience to sift through the archives and databases. Before the Classical period, a large percentage of the votive offerings deposited at shrines were figurines of livestock and wild animals. While the objects are too simple to add much to our knowledge of agricultural practices, they do say something about how the Greeks saw the relationships between humans, animals, and gods. Occasionally, the discovery of farmsteads and other agricultural buildings in the countryside contributes important information to our understanding of agricultural practices in ancient times. As described above, survey archaeology provides information about large-scale patterns of land use.

Techniques borrowed from other fields are becoming increasingly important to studies of ancient landscapes. Thanks to the hard work of generations of botanists, modern researchers can identify and date fossilized pollen grains that have been preserved in damp soils for thousands of years. Geologists have provided useful information about the distribution of minerals across Greece as well as the geological

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28 Disagreeable Man 1-10.
29 Osborne 1987, 18-20.
30 Osborne 1987, 186-187.
31 Forbes 1996, 93.
32 Zohary and Hopf 1993; Grove and Rackham 2001, 151-166.
processes at work in the landscape. Like literary sources, the new methods do have some limitations. Pollen cores, for example, can only be collected from soils that have remained moist through the centuries. The study of Classics is becoming a more interdisciplinary field with every passing year.

This thesis explores some of the ways that the Greeks exploited their landscape during the polis period (c. 800-300 BC). Since it would be impractical to present a complete picture of the natural resources that were used in ancient times in a paper of this length, I have decided to concentrate on the domesticated and wild species that were essential to the Greek way of life. Although stones and metals were important to the economies of some cities, they are outside the scope of this project. As much as possible, I try to draw on the diverse sources of information that have been uncovered over the past thirty years. Recent studies in the Classics have been influenced by modern movements that have little to do with ancient Greece, but looking at the past from a different perspective has led to new discoveries about how ancient cities operated.

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33 Higgins and Higgins 1996.
Chapter 1: The Natural Backdrop to Greek Society

When landscapes became important to European art during the Renaissance, artists from western and northern Europe started to paint scenes from Greek history and mythology into a countryside they were familiar with. In the 1890s, J. W. Waterhouse set his painting *Hylas and the Nymphs* in a shaded pond crowded with lily pads. While the painting is well-executed, it resembles England more than the coast of Turkey, where the kidnapping of Hylas took place.\(^1\) Influenced by the art they saw at home, travelers from northern Europe and America were disappointed by the appearance of modern Greece. After visiting the Mediterranean in the nineteenth century, George Perkins Marsh wrote, “The decay of these once flourishing countries is partly due, no doubt, to that class of geological causes, whose action we can neither resist nor guide, and partly also to the direct violence of hostile human forces.”\(^2\) Without any actual evidence, the assumption that Greece’s countryside had been degraded over the centuries developed into a respected hypothesis. In his book *Pan’s Travail*, J. Donald Hughes searches for proof of permanent environmental degradation in ancient Greece without ever questioning the idea that degradation did occur.\(^3\) In reality, the Greek landscape is covered with a patchwork of different plant communities that alternate over very short distances.\(^4\) Although tourists usually visit the most arid and rugged parts of the region, there are also grassy meadows and dense

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\(^3\) Hughes 1994.

\(^4\) Grove and Rackham 2001, 45-71.
forests. The current distribution of plant species is the result of complex geological and climatic processes. All of the field work that has been done in Greece indicates that the countryside has changed very little since ancient times.\(^5\)

**Geological History of Greece**

Geologists can track the origins of the Greek peninsula back to the beginning of the Jurassic (200 million years ago), when Europe and Africa were still attached to the eastern coast of North America. Between the European and African branches of the supercontinent was a wedge-shaped sea called the Tethys. Two huge bodies of rock, called the Rhodope and Serbo-Macedonian massifs, formed the southern margin of the Eurasian plate where Greece would form later on. The massifs are composed mostly of metamorphic rock that was formed by pressure at heat beneath the earth's surface and then pushed upward by geological forces. Today, the Rhodope and Serbo-Macedonian massifs are still exposed from the north of Greece up into Serbia and Bulgaria.\(^6\)

Africa started to tear itself off from North America in the Middle Jurassic (165 million years ago). The fissure started in the south and worked its way to the north like a zipper. As a result, the African plate rotated toward Europe, closing up the Tethys in the process. As the sea basin was pushed to the north and east, some parts of it were forced under the Eurasian plate while others were piled up against the plate. Any islands that happened to be situated in the Tethys were also caught up in the compressions. The Pelagonian zone, which encompasses modern Pieria, Volos, Euboia, and most of Attica, was once a micro-continent in the middle of the Tethys.

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\(^5\) Grove and Rackham 2001, 141.  
\(^6\) Higgins and Higgins 1996, 19.
As the various bodies of rock welded themselves onto the Rhodope and Serbo-Macedonian massifs, they formed the Greek peninsula, the islands, and the Aegean basin (see Figure 1).  

The African plate finally collided with the Eurasian plate sometime around the extinction of the dinosaurs (65 million years ago). As the continents pressed against each other, the crust on both sides of the impact buckled to form mountains. Thus began the Alpine compressions that have produced most of the mountain ranges that encircle the Mediterranean basin. The most imposing of the mountains are the Alps, but the Greek mountain ranges also date to this period. In fact, the Pindos mountains are considered to be an eastern branch of the Alps. The Alpine compressions were at their most active in the Early Miocene (20 million years ago), but they are still going on today at a slower rate.\(^8\) Thanks to the ancient collision of Africa and Europe, 80 percent of Greece is mountainous today.\(^9\) Greece’s rugged landscape plays an important role in creating the diverse microclimates in the region (see Figure 3).

The Early Miocene was also the point at which the African plate began to force its way under the Eurasian plate. The process of one plate cramming itself under another, which is called subduction by geologists,\(^{10}\) has had important consequences for the landscape of Greece. At one time, the arc stretching from Epirus through the western Peloponnese, Crete, Rhodes, and southern Turkey was arranged in a straight line. As Greece was forced upwards over the African plate, however, it fanned out into its present curve. The uplifting of the Greek plate also

\(^7\) Higgins and Higgins 1996, 23.  
\(^8\) Higgins and Higgins 1996, 17.  
\(^9\) Moores 1997, 302.  
\(^{10}\) Higgins and Higgins 3-4.
caused the massive bodies of rock that made up the floor of the Aegean to fracture into smaller pieces. As a result, there are no simple plate boundaries in Greece today. Instead, there is an intricate system of smaller continental fragments that interact with each other in complex ways. Unlike in northern Europe, Greece’s peninsulas and islands can move independently of the continents.\textsuperscript{11}

As the African plate continued to sink beneath the Aegean, it eventually came into contact with the mantle. The edge of the plate began to melt, and the resulting magma escaped through fissures in the crust to form the volcanic islands of the southern Aegean. The most famous of these volcanoes is Santorini, which was the site of a major explosion about 3,000 years ago.\textsuperscript{12} All the islands are now dormant except for Santorini and Nisyros.\textsuperscript{13} Subduction of the African plate is also the cause of the intense seismic activity in the Aegean region today. Subduction is famous for causing deep-seated earthquakes that can be felt hundreds of kilometers from its epicenter. Countless earthquakes of various magnitudes have been recorded in Greece in the historic period.\textsuperscript{14} In the Aegean region, at least, seismic activity is much more important than volcanism.

The Mediterranean Sea finally started to take its present shape toward the end of the Paleocene (55 million years ago). First, the Arabian peninsula rammed into southwestern Asia. The collision created the mountains of Turkey and split the Tethys in half. While the eastern part of the sea developed into the Black, Caspian, and Aral seas, the western part became the Mediterranean. At the beginning of the

\textsuperscript{11} Higgins and Higgins 1996, 22-23.  
\textsuperscript{12} Blondel and Aronson 1999, 9.  
\textsuperscript{13} Grove and Rackham 2001, 41; Higgins and Higgins 1996, 210-211.  
\textsuperscript{14} Blondel and Aronson 1999, 9.  

Miocene (20 million years ago), the gap between Africa and the Arab peninsula closed up, which separated the Mediterranean from the Indian Ocean. The western side of the Mediterranean, however, did not shut until the end of the Miocene (6 million years ago). Since then, the Strait of Gibraltar, between modern Spain and Morocco, has been the only link between the Mediterranean and the world’s oceans.\textsuperscript{15}

\textbf{Ice Age Greece}

The most recent glacial period, which started 2.8 million years ago, has also played a role in shaping the Greek landscape. While high rates of erosion ate away at rocky mountain faces, the warmer parts of Greece acted as refuges for frost-sensitive plants and animals until temperatures warmed up again. The cooling and heating of the climate had important consequences for Greece, as it did for other regions across the globe.

During the last glacial maximum (20,000 years ago) Greece looked very different than it does today. The sea level was 120-150 m lower than present levels, which meant that some of the Aegean islands were connected either to each other or to the mainland. Most of the islands remained isolated, however, and continued to house groups of endemic species.\textsuperscript{16} Because the sea was lower, rivers and streams dug out deep valleys below the present water line. When the seas filled back in, an intricate coastline dominated by narrow inlets and jutting promontories formed that has lasted until modern times.\textsuperscript{17}

Unlike northern Europe, Greece was not covered in a thick sheet of ice. Glaciers were restricted to the highest mountains, such as Olympus in Pieria. As a

\textsuperscript{15} Blondel and Aronson 1999, 5.
\textsuperscript{16} Thompson 2005, 16.
\textsuperscript{17} Higgins and Higgins 1996, 23-25.
result, Greece was spared from the massive erosive force of glaciers. Still, other types of erosion were highly active during this period. Frosts, for example, chipped away at exposed mountain faces. The temperature gradient between Europe and Africa was much greater then than it is today, which resulted in fierce winds that whipped through the Mediterranean basin and wore away at any exposed rock in their path. Working together, the different forces of erosion whittled away at the mountain ranges and deposited fresh soils in the valleys and plains below. Rivers rapidly filled inlets with alluvial sediment, resulting in coastal plains of varying sizes.

Although alluvial deposits simplified the coastline to a certain extent, Greece’s coastline still measures roughly 15,000 km, which is a disproportionately large figure for a country of its size.

Throughout most of the Mediterranean basin, temperatures were generally 6-8 °C cooler than today. Conditions might have been milder in southern Greece, however, as indicated by the fact that some frost-sensitive species that died out elsewhere have survived on Crete and some of the other islands. Olive trees are especially vulnerable to frosts, but they are hardy enough to sprout from their roots even after a storm has killed the rest of the tree. The Cretan palm (*Phoenix theophrasti*), is a relic of the Mesozoic era when the Mediterranean climate was similar to that of the Bahamas today.

**The Sea**

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18 Grove and Rackham 2001, 41
22 Grove and Rackham 2001, 41.
Interactions between land and sea are important to both the ecology and the history of Greece. Nowhere in Greece is more than 110 km from the coast. The sea moderates the climate of coastal lowlands, and provides food and trade routes for the people who live along it. Learning about the Mediterranean Sea is therefore important to any study of Greece.

The Mediterranean is the world’s largest inland sea. It measures 3,800 km from east to west and up to 720 km from north to south. The average depth is 1,496 m, but there are numerous ridges and troughs in the basin, such as the Hellenic trough off the western coast of the Peloponnese. Most of the seabed is made up of thin oceanic crust, but the Aegean basin is floored with thick continental crust. The average depth of the Aegean is therefore only 350 m.

As noted earlier, the Strait of Gibraltar is the Mediterranean’s only link to the oceans. The strait is only 14 km across and 365 m deep, but it is essential to the maintenance of the sea. The Mediterranean loses over a meter of surface water to evaporation every year, and only 61 percent of that water is replaced by rivers and rainfall. The remaining 39 percent must therefore flow in from the Atlantic. When the Straight of Gibraltar closes up, which has happened several times in the sea’s history, the sea loses more than 3,000,000 km$^3$ of water per year.

The Mediterranean's isolation is also the reason for its weak tides. Mediterranean tides are much smaller than the ones that occur in the oceans because

\[ \text{\textsuperscript{23}} \] Blondel and Aronson 1999, 9.
\[ \text{\textsuperscript{24}} \] Blolubasi 2004, 460.
\[ \text{\textsuperscript{25}} \] Hughes and Stoll 2005, 2.
\[ \text{\textsuperscript{26}} \] Blondel and Aronson 1999, 9.
\[ \text{\textsuperscript{27}} \] Hughes and Stoll 2005, 2.
the moon’s gravitational force is pulling on a smaller body of water. The effect is exaggerated by the jagged coastline of the northern Mediterranean, which divides the sea into numerous smaller bodies of water. Along most of the coastline, the difference between high and low tide is only a few inches.²⁸

**Karst Landscapes**

The term *karst* is used to describe lime or marble-rich areas that share a unique set of geological properties (see Figure 2). Karst landscapes are possible because of the special properties of calcium carbonate, which is the main ingredient in limestone and marble. When carbon dioxide comes into contact with water, it forms a weak acid that can break down calcium carbonate into simpler molecules. If the concentration of carbon dioxide in the water is high, then limestone will dissolve into the water. If the concentration of carbon dioxide is low, however, calcium carbonate can re-crystallize from the water. Since rainwater accumulates carbon dioxide from the atmosphere and from plant matter on the ground, it eats away at limestone and marble to form the pitted features that are characteristic of karst landscapes in Greece. Greece has thick deposits of limestone, which crystallized in the shallow waters of the Tethys Sea. Marble, which consists of limestone that has been transformed by heat and pressure, is also widespread in the Aegean area.²⁹

Karst landscapes are dotted with basins of different sizes. The water that collects in the basins drain into cave systems that form along fissures in the rock, and

²⁸ Hughes and Stoll 2005, 3.
it eventually emerges at lower altitudes as springs. Lake Stymphalos in Arkadia empties 50 km away in the plain of Argos.\textsuperscript{30}

Networks of karstic basins, caves, and springs are capable of absorbing over half of the annual rainfall, with the result that karstic regions have relatively few streams and rivers. A river may flow into a karst landscape only to be swallowed up by sinkholes. The surface of a karst landscape may be desolate even when there is a rich supply of water stored in the rock below.\textsuperscript{31} Lakes and rivers appear on karst landscapes only when water flows over the limestone faster than it can be absorbed into the underlying caves.\textsuperscript{32} Karst landscapes can be found in mainland Greece, the Cyclades, Chios, Karpathos, and Crete.\textsuperscript{33}

**Climate**

Like the landscape, the climate of Greece has changed since the closing up of the Tethys. There are a number of methods that can be used to assess ancient climatic conditions. First, we can examine ancient pollen grains that have been preserved in moist soils. If researchers know what plant species lived in a certain place at a certain time, then they can make some general statements about what the climate was like. Similarly, fossilized plant remains can provide information about ancient plant populations. Finally, some ancient plant species have been able to survive in isolated regions despite widespread climate change. One such relict species is the Cretan palm (*Phoenix theophrasti*), which is found only in western Crete. Plants like the

\textsuperscript{30} Grove and Rackham 2001, 323-324.
\textsuperscript{31} Grove and Rackham 2001, 323.
\textsuperscript{32} Osborne 1987, 28.
\textsuperscript{33} Grove and Rackham 323.
Cretan palm are essentially living fossils from an earlier period in Greece’s history.\textsuperscript{34} Despite the usefulness of plant remains and relict species as evidence, they can be misleading at times. Because thirsty plants tend to grow around the lakes and swamps where pollen is preserved, pollen analysis generally gives an impression that the overall climate was wetter than it actually was.\textsuperscript{35} Still, plant remains provide us with our best clues about ancient climates.

While the Tethys sea was closing up to form the Mediterranean, both sides of the basin supported subtropical foliage. Greece and the rest of the European coastline were dominated by trees such as arbutus, olive, oak, and pine. Because of the geographical separation between Europe and Africa, each continent supported its own species of plants and animals. Still, the plant life on both sides of the basin was suited to a climate that was warmer and wetter than that of the modern-day Mediterranean. Temperatures varied little from month to month, and rain fell in the summer as well as the winter.\textsuperscript{36}

The climate underwent a major transformation in the Middle Miocene (15 million years ago). Tropical plants relying on warm and humid conditions dropped rapidly out of the pollen record. The few tropical species that managed to survive were confined to the warmest and wettest parts of the basin. Meanwhile, species that were more resistant to frost and drought spread across the landscape. Many such

\textsuperscript{34} Grove and Rackham 2001, 151-155.
\textsuperscript{35} Thompson 2005, 19.
\textsuperscript{36} Thompson 2005, 21.
plants, including olive, pistachio, and oleander, are still common in the Greece today.\(^{37}\)

All the evidence suggests that a seasonal pattern was starting to develop in Greece. Two important events accompanied the development of seasons in the Mediterranean. First, the gap between Africa and the Arab peninsula closed up, permanently isolating the Mediterranean from the weather patterns of the Indian Ocean. At the same time, the planet as a whole was starting to cool down in preparation for a glacial period. Massive ice sheets were already beginning to form in Antarctica.\(^{38}\) Each of the development played a role the climatic alterations that followed.

In the Pliocene (3 million years ago), the extensive temperate forests that used to cover the lowlands started to thin out. The areas deserted by forests were colonized by more drought-resistant species. The result was a complex assortment of forests, shrubs, and grasses that resembled the vegetation in southern Europe today. The changes in plant life suggest that the Mediterranean seasons had more or less reached their current state. The basin may have been slightly warmer and wetter than today, but the characteristic alternation between cool, wet winters and hot, dry summers was already in place.\(^{39}\)

As described above, the Pleistocene (1.8 million years ago - 15,000 years ago) was kinder to the Mediterranean region than to the rest of Europe. Though the seasonal alternation between wet winters and dry summers remained intact, yearly

\(^{38}\) Thompson 2005, 21-22.
\(^{39}\) Thompson 2005, 22-25.
precipitation was probably somewhat heavier than in the periods immediately before or after. Many of the mountain ranges were snowcapped in winter and so delivered a steady source of water to lowlands throughout the summer.\textsuperscript{40} The home ranges of plant species expanded and contracted as the climate fluctuated over time, but many of them were able to survive when in the Mediterranean after they were obliterated from other parts of Europe.\textsuperscript{41} As a result, the vegetation in the Mediterranean basin is much more diverse than in northern Europe today. Modern Greece has twice as many species of flowering plants as does Great Britain.\textsuperscript{42}

The climate finally started to warm up again about 15,000 years ago, and temperatures began to reach modern values between 10,000 and 8,000 years ago. Annual precipitation decreased, but probably remained slightly higher than modern levels. Plant species that had weathered out the ice age in isolated refuges spread across the landscape. Since the end of the last ice age, human pressures have become an important factor shaping plant communities in Greece.\textsuperscript{43}

\textit{Modern Climatic Conditions}

The Mediterranean stands between the temperate climate of Europe and the arid climate of Saharan Africa. As a result, it shares some features with both of its neighboring climate zones. The Mediterranean is characterized by an alternation between two main seasons hot, dry summers and cool, wet winters. While winter comes on abruptly, summer conditions tend to develop gradually. Since fall and spring are milder than either the winter or the summer, they are the main growing

\textsuperscript{40} Thompson 2005, 23-24.
\textsuperscript{41} Grove and Rackham 2001, 41-42.
\textsuperscript{42} Blondel and Aronson 21-25.
\textsuperscript{43} Thompson 2005, 26.
seasons for both wild and cultivated plants. Fall can be a dangerous time for vegetation, however, because frosts can occur unexpectedly. Generally speaking, areas to the north and west are cooler and wetter than those to the south and east. Boiotia, for example, receives more rain in a typical year than does Attica (see Figure 4).

Most of the yearly precipitation is concentrated in a few violent winter storms, which tend to occur earlier in the western half of the basin than in the eastern half. In the French Riviera, for example, precipitation usually peaks in September or October. In most of Greece, however, December and January are the wettest months. The concentration of precipitation in a few short deluges means that much of the rain that does fall either descends into underground reservoirs or is swept away by rivers. Although springs and snowmelt provide some freshwater during the summer, the period from July to September is a difficult time for Mediterranean plant life.

Individual mountains can also play a part in determining how much rainfall a particular area receives. When water-bearing clouds collide with a mountain, they are forced upward along its slopes. As the clouds approach higher elevations, condense and expel their moisture as rain. As a result, the clouds let out most of their water on the windward side of the mountain, leaving the sheltered side relatively dry. Most

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45 Osborne 1987, 29-34.
47 Grove and Rackham 2001, 30-36, 326.
48 Thompson explains how the Greek seasons have affected plant life at Thompson 2005, 36-37. See Grove and Rackham 2001, 24 for climate charts of Mediterranean cities.
mountains in Greece have wet northern and western slopes and rain shadows on their southern and eastern slopes.\textsuperscript{49}

While average precipitation values provide useful information about the climates of different Greek cities, it is important to remember that the actual amount of rain that falls can vary widely from one year to the next. In 1955, Eleusis received a whopping 740 mm of rain, but in the following year it only received 374 mm. In the 1960s, the annual rainfall in Kavala (a city in northern Greece) averaged out to 549 mm, but the extremes were 252 mm (in 1964) and 897 mm (in 1969). There can also be extraordinary differences in precipitation over very short distances. In 1956, for example, Athens only received 281 mm of rain while Eleusis (only 20 km away) received 374 mm.\textsuperscript{50} The fickle nature of the Greek climate presents significant challenges for both wild and cultivated plants.

In the \textit{Archarnians}, Aristophanes demonstrates how important natural forces were in the lives of ancient Athenians. Trying to persuade judges to steer clear of corruption, his chorus of clouds speaks as follows: “If you wish to plough up your fields in spring, we will rain for you first… And then we will protect the fruits, and the vines, so that neither drought [shall] afflict them, not excessive wet weather. But if any mortal [should] dishonor us who are goddesses, let him consider what evils he will suffer at our hands, obtaining neither wine nor anything else from his farm.”\textsuperscript{51} Even in the Classical period, when Athens was more urban than it had even been

\textsuperscript{49} Grove and Rackham 2001, 25.
\textsuperscript{50} Osborne 1987, 34.
\textsuperscript{51} Clouds 1115-1125. Translation by Hickie.
before, the productivity of the landscape was a primary concern of most of its citizens.
Chapter 2: Crops and Cultivation

Agriculture was the primary industry in every Greek state. The vast majority of the citizen body were small farmers, but even urban aristocrats relied on produce from their country farms to pay for daily expenses. Although authors tended not to dwell on agricultural topics, the surviving literature is peppered with evidence that most free citizens were highly invested in the country.

The Attic stelai provide valuable information about the finances of young Athenian aristocrats. The tablets provide a list of items that were confiscated from Alkibiades and the other suspected participants in the religious scandal that occurred on the eve of the Sicilian expedition (415 BC). The lists indicate that, aside from furniture, clothes, and imported drapes, the men had few valuable possessions. Instead, they kept massive quantities of agricultural produce in their homes and farmhouses. While hording entire silos of grain may sound strange to us today, it was a regular practice in ancient Greece among farmers who were wealthy enough to possess large storage facilities. After storing their surpluses, rich Athenians could sell it off piecemeal for much higher prices than if they had decided to auction it off all at once.\(^1\) According to Plutarch, Pericles angered his relatives by selling his crops directly after the harvest.\(^2\) While selling all of the produce at once was a deliberate choice for wealthy statesmen like Pericles, it was a necessity for poor farmers who had nowhere to store their crops securely.\(^3\)

\(^1\) Osborne 1987, 21-23. See also Princhett 1953 and 1956.
\(^2\) Plutarch, *Life of Pericles* 16.
\(^3\) Sallares 1991, 29.
Lysias hints at the agricultural preoccupations of wealthy Athenians in his speech *On the Murder of Eratosthenes*. More than once during the speech, the speaker suggests that rich farmers made regular visits to their country estates. At one point, the speaker surprises his wife by returning unexpectedly from the country.  

About ten lines later, he explains how he met with a friend who had just returned from the country. The two passages demonstrate that it was normal for wealthy landowners to spend some of their time on their country estates, at least during the peak agricultural seasons.

Ordinary farmers also show up in the literature from time to time. Dikaiopolis, the protagonist of Aristophanes' *Acharnians*, is a subsistence farmer who is forced to settle in the town of Athens during the Peloponnesian War (431-404 BC). During his prologue, Dikaiopolis tells the audience how much he despises having to buy produce and other everyday commodities. “I miss my country home,” he says, “which never told me to buy charcoal, vinegar, or oil. The word ‘buy’ was not known, but instead I produced everything myself.” Farmers like Dikaiopolis were highly invested in agriculture, and had little need for the market except during food shortages.

**The Mediterranean Triad**

The three most important crops on a Greek farm were cereals, grapes, and olives. In addition to forming the core of the Greek diet, these three plants were handy because they could be stored and transported with relative ease. It is with good

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4 *On the Murder of Eratosthenes* 11.
5 *On the Murder of Eratosthenes* 22.
6 *Acharnians* 33-36.
reason that modern historians call cereal, grapes, and olives the 'Mediterranean triad,' but it is important at the same time to remember that there were many other domestic species available in antiquity. In fact, most farmers grew a mix of cereals, fruits, and vegetables. Growing a variety of crops meant that farmers could survive almost entirely on produce that they produced on their own land.

**Cereals**

The Greek diet relied heavily on cereals. According to Homer, growing grain is what distinguishes civilized men from savages. The two main cereals grown in Greece were wheat and barley, but both of these plants had several distinct varieties that were grown at different times for different reasons. Emmer wheat, for example, was a major crop during the Bronze Age, but it had been almost completely supplanted by free-threshing wheat by Homer's lifetime (c. 700 BC). Archaeological evidence proves that millet was also grown in ancient times, but it never reached the economic importance of the other cereals.

Wheat and barley were suited for different conditions. Wheat was the preferred crop in Greece because it tastes better and has a higher calorific value, but it was not as hardy as barley. Wheat needs 300mm of rain per year to produce a successful harvest without irrigation, but barley only needs 200mm. In the drier parts of Greece, such as Attica and the Cyclades, barley must have been the only viable option most years (see Figure 4). During Demosthenes' description of Phainippos’

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7 *Odyssey* 9.105-110.
8 Isager and Skydsgaard 1996, 21.
9 Osborne 1987, 33.
estate in Mesogeia Plain, barley is the only cereal that he mentions. Barley matures a full month earlier than wheat, and it also grows on a wider variety of soils. Even though wheat is the more nutritious crop, barley has significantly higher yields than wheat. The result is that a field of barley can feed slightly more people than a similarly sized field of wheat.

Cereal cultivation followed a yearly cycle of plowing, sowing, harvesting, and processing. Plowing prepared field for sowing by eliminating weeds and making the soil lighter and more absorbent. The main implement used in plowing was a simple implement called an ard that cut the soil but did not turn it over (see Figure 5). Most of the ard was made of wood, but the pointed tip that dug into the ground was fashioned of stone or metal. Hesiod expects a farmer to construct ards for himself.

The ard was operated by a single man and drawn by a pair of oxen. Mules and asses could also do the job, but oxen were the preferred drought animals for plowing. One or more workers would follow behind the ard a mattock to turn over the soil and break up clods of earth. The mattock was a multipurpose tool with one head shaped like a hoe and another shaped like a pick. However useful the mattock was, it was also heavy and unwieldy. When one of the characters in Menander's *Disagreeable Man* uses a mattock for the first time, he cries out, "It crucifies my loins, my back, my neck— in short, my whole body!"

Plowing began in the spring, when the soil was neither too muddy nor too parched to be workable. Theophrastos and Xenophon

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10 Demosthenes 42. See Osborne 1987, 38.
11 Osborne 1987, 33-34.
12 *Works and Days* 425-435.
13 *Disagreeable Man* 524-525.
14 *Oikonomikos* 16.11-12.
recommend plowing as often as possible in the summer to prevent the soil from becoming completely desiccated by the sun. In reality, however, three plowings appears to have been the norm. Both Homer and Hesiod used the epithet *tripolos*, or ‘thrice-plowed,’ to describe well-tended fields.\(^{15}\) In Book 5 of the *Odyssey*, Homer says, “When lovely braided Demeter surrendered her heart to Iasion, making love on that farmland plowed three times, Zeus knew it before long and hurled a glaring thunderbolt, killing him outright.”\(^{16}\)

Sowing took place when the first rains fell in autumn.\(^{17}\) The process began with one last plowing of the field. Once the ard and the mattocks had created a furrow, one of the workers would scatter the seeds from a basket. Afterwards, the mattocks were used to cover the seeds with soil and thereby protect them from birds and other opportunists.\(^{18}\) Depending on local weather conditions and the type of soil being cultivated, a farmer may choose to spread the seed lightly or heavily. As Socrates says in Xenophon's *Oikonomikos*, "The weaker the soil, the less seed should be put into it".\(^{19}\) The completion of sowing did not mean that work on the field was finished until the harvest. Frequent weeding needed to be done to prevent unwanted plants from competing with the crop.\(^{20}\)

The grain finally ripened in midsummer.\(^{21}\) Farmers harvested the grain with scythes, orienting their backs to the wind to prevent the stalks from flying into their

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\(^{16}\) *Odyssey* 5.127. Cited at Isager and Skydsgaard 1992, 22.

\(^{17}\) *Oikonomikos* 17.4.

\(^{18}\) *Works and Days* 470.

\(^{19}\) *Oikonomikos* 17.8-11.

\(^{20}\) *Oikonomikos* 17.15.

\(^{21}\) Osborne 1987, 15.
eyes. Afterward, the stalks were bound up into bushels and transported to the threshing floor. Here, farm animals trampled the grain to separate the seeds from the stalks. In order to separate the grain from the chaff, workers collected the trampled mixture into large baskets and tossed the contents up into the air. While the grain fell back into the basket, the lighter chaff blew down to the opposite end of the threshing floor. The process of isolating the grain is called winnowing. Afterwards, the chaff and battered stalks could be swept up and used as fodder.

**Grapes**

Unlike cereals, which grow naturally in arid conditions, grapes are poorly adapted to the Greek climate. The vine sheds its leaves in the winter, requires irrigation in the summer, and is vulnerable to copious amounts of sunlight. It is most likely that the crop originated from the northern boundary of the Mediterranean climate zone, where conditions are cooler and wetter than in Greek territory. Grapes can only survive Greece's long summer droughts with constant human attention.

Grapes were a labor-intensive crop that required digging, pruning, training, weeding, and irrigation. Since they are perennial plants, grapes do not have to be replanted every year. Theophrastos recommends that vines should not even be pruned until their third year. Vines can multiply in a number of ways, but it appears that the Greeks only used one of them on a regular basis. When a farmer wanted to plant a new vine, he would trim a scion from an adult vine and plant it in a hole

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22 Oikonomikos 18.1.
23 Oikonomikos 18.3-7.
floored with well-tilled earth. According to Xenophon, the holes should be 1.5-2.5 feet in diameter and 1-2 feet deep. In dry soils, the hole should be deep to ensure that sufficient water is absorbed, and in wet soils the hole should be shallow to avoid hitting ground water. The scions should be planted at an angle so that roots can form along the length of the trimming.²⁵ Theophrastos suggests that planting should take place either in autumn or spring in order to avoid both the winter cold and the summer drought.²⁶

In order to grow to their full potential, vines require some sort of support system. None of the ancient authors describe these support systems in detail, but they do occasionally provide us with hints as to what they may have looked like. Xenophon and Theophrastos both mention that vines are perfectly content to grow up the trunks of olive trees.²⁷ There are also a number of literary references to the practice of binding vines to wooden stakes. In Menander's Disagreeable Man, the grumpy old farmer Knemon uses one of these stakes to flog an intruder on his farm.²⁸

Farmers took a number of steps to maximize the size and sugar content of their grapes. Pruning encouraged the plant to concentrate on producing fruit instead of growing. Hesiod does not tell us much about viticulture, but he does mention that pruning should be carried out in the winter.²⁹ Theophrastos adds that removing some of the leaves and grape clusters during the summer can force the plant to focus its resources on developing the clusters that remain. In autumn, a farmer could delay the

²⁵ Oikonomikos 19.3-10.
²⁸ Disagreeable Man 112.
²⁹ Works and Days 564.
ripening of the fruit by raking up the earth around the vines, which covered the clusters with a fine layer of dust. By putting off the harvest for a few weeks, the farmer ensured that the fruit would be as sweet as possible.\footnote{Causes of Plants 3.11. See Isager and Skydsgaard 1992, 32.}

Since vines are thirsty plants, they required irrigation during the summer drought. In some cases, farmers could divert natural watercourses to feed their vineyards. Alternatively, they could carry water from wells and springs to their plants either by hand or by pack animals. On steep ground, building agricultural terraces could prevent runoff and help the ground to conserve water (see below). The holes in which vines were planted collected water and shielded the roots from the sun’s harmful rays. Another common practice was to dig out the plant’s surface roots, which encouraged the plants to develop deeper root systems. According to Theophrastos, digging should be done at the beginning of spring to allow the plants to expand their root systems before the onset of the drought.\footnote{Causes of Plants 3.11. See Isager and Skydsgaard 1992, 32.} Deep roots were more likely to find moisture during Greece’s dry summers.

Grapes were harvested in September. The \textit{Shield of Achilles} provides an idyllic scene of young men and women collecting grapes in baskets to the music of a lyre.\footnote{Iliad 18.561-572.} Afterward the harvest, the fruit could be eaten fresh or processed to make wine and raisins. For Hesiod, making wine was a simple process; he advises his audience to lay the grapes in the sun for ten days, cover them for five, and then press
them into juice and seal them in jars. Multiple Attic vases show scenes of satyrs collecting and pressing grapes.\textsuperscript{33}

\textbf{Olives}

Although olives are native to Greece, most of the cultivated varieties were introduced from the eastern edges of the Mediterranean climate zone.\textsuperscript{34} Since olives are vulnerable to frost, they cannot be grown at high altitudes or in inland basins that become frost hollows in the winter months. In other ways, olives are an amazingly hardy crop. For example, they are able to regenerate even after they have been chopped down to their roots (see Figure 9).\textsuperscript{35} Unlike grapes, olive trees have extensive root systems that collect adequate moisture from the ground even during the summer drought. Like grapes, however, olives can be cultivated on a wide variety of soils. In fact, olives do best on calcareous substrates such as limestone, which makes them perfectly suited for Greece's mountain slopes.\textsuperscript{36} Olive trees can survive for many centuries, especially when they are cared for by humans.\textsuperscript{37}

Domesticated olives can reproduce naturally, but seedlings usually revert to their wild state. As is the case today, the edges of ancient fields supported communities of scrubby feral olives. In order to maintain high fruit quality, however, farmers had to propagate their trees artificially. Literary sources indicate that the most common means of propagation was grafting, which involves attaching a domesticated branch, or \textit{scion}, onto a wild stump. Theophrastos suggests that olives

\textsuperscript{33} Isager and Skydsgaard 1992, 58-59.
\textsuperscript{34} Thompson 2005, 216-220.
\textsuperscript{35} \textit{Causes of Plants} 4.4; Grove and Rackham 2001, 67; Isager and Skydsgaard 1992, 39.
\textsuperscript{36} Isager and Skydsgaard 33-40.
\textsuperscript{37} Grove and Rackham 2001, 113.
should be grafted either in autumn or spring, which are the times of year when the tree is growing most rapidly. Since rain and sunlight can kill the scions, he recommends bandaging the scion or plastering it with mud to protect it from the elements.\textsuperscript{38} Once the scion sprouted new shoots, the farmer could either transplant the tree into an orchard or leave it where it was. Like vines, olives could also develop from trimmings planted in the soil, but grafting was preferred because it gave the plant a head start on growth. Olive trees grow at an incredibly slow pace, and it can take years for them to start producing valuable crops. With grafting, trees start showing returns several years sooner than if they have to develop from shoots.\textsuperscript{39}

Although olives can survive without human help, they require several kinds of care in order to produce optimal crops. Many of the techniques used in growing olives are either similar or identical to the ones used in viticulture. Pruning, for example, is carried out to encourage trees to produce higher quantities of fruit. Xenophon recommends placing olives in ditches, but he says that they should be deeper than the ones used for vines.\textsuperscript{40} Watering is important during grafting and planting when the tree is most vulnerable to the elements. While irrigation is not essential to the survival of mature trees, it can significantly improve a tree’s yields. Digging around the base of the tree can force it to grow deeper root systems that are better at collecting moisture during the arid summers. Turning up the soil also aerates it and makes it more absorbent. When Odysseus finds his father in book 24 of the

\textsuperscript{38} \textit{Causes of Plants} 6.1-6.10.
\textsuperscript{39} Hanson 1995, 81.
\textsuperscript{40} \textit{Oikonomikos} 19.13.
The old man is digging around the base of a tree. Olive trees do not wear out soils as quickly as cereal crops, but occasional manuring can be beneficial to the plants.

The olive harvest was a long process that stretched from December to February. The fruits reached maturity at different times in different parts of an orchard, but they could also ripen at different times on different parts of a single tree. As a result, every tree had to be harvested multiple times every year. A few Attic pots show farmers harvesting olives by shaking the branches or tapping the fruit with sticks. The falling fruit could either be caught in nets or collected from the ground by hand. Instead of producing consistent yields from year to year, there is a regular alternation with olives between heavy and light crops. An orchard can produce more than twice as much fruit is a good year as in a bad year. The same pattern can be observed to a lesser extent in other fruits, such as grapes, pears, and apples.

Once the olives were collected, they could be eaten ripe, pickled, or pressed into oil. Olive oil was an especially important commodity in antiquity because it had a wide range of household uses. Then as now, olive oil was used in cooking on a daily basis. Oil was also used to clean the skin. In his *Works and Days*, Hesiod describes a girl who is in the process of anointing herself with oil. In the days before propane and light bulbs, oil was a common fuel for lamps. Olive cakes, which were made from the leftovers collected from the press, were a highly flammable

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41 *Odyssey* 24.242.  
42 Isager and Skydsgaard 1992, 40.  
43 Osborne 1987, 45; Hanson 1995, 74.  
44 *Works and Days* 522.
substance that could be used as a starter fuel.\textsuperscript{45} Like wine and grain, oil could be transported easily and stored for long periods of time.

\textbf{The Agricultural Calendar}

Since most of the population was involved in agricultural work, it was imperative that the civic calendar revolve around annual patterns of planting, harvesting, and pruning. Important festivals and athletic competitions were slotted into the agricultural down-times when farmers could afford to abandon their fields for a few days at a time. Scholars believe that the Pythian games were held in Mounichion (April/May), which was situated conveniently between the harvesting of grain and the pruning of vines (see Figure 7).\textsuperscript{46} Since building projects required large amounts of labor, both from humans and from pack animals, they had to be carried out during the agricultural slack periods. Figure 7 shows the agricultural calendar paired with public spending on construction at the sanctuary of Demeter in Eleusis. The information about the building project comes from a set of stone tablets dating from the year 329/8 BC. The tablets are not fully preserved, but enough information survives to show that the Athenians spent the most money on the temple complex during the times of year when there was the least amount of work to do on the farms.\textsuperscript{47} Even traditional hoplite warfare had to submit to the demands of cultivated plants.\textsuperscript{48} In Thucydides’ \textit{History of the Peloponnesian War}, the campaigning season is synonymous with summer. Clearly, the agricultural calendar had a profound affect

\textsuperscript{45} Isager and Skydsgaard 1992, 33-40. 
\textsuperscript{46} Anthon 1886, 826. 
\textsuperscript{47} Osborne 1987, 14-16. 
\textsuperscript{48} Osborne 1987, 138-145.
on the lives of everyone in a Greek state, whether or not they were personally invested in farming.

**Survival Strategies**

The Greek climate posed significant challenges for agriculture. The summer sun and winter frosts could be equally fatal to crop plants. Rainfall varied wildly from year to year and from place to place. When precipitation did occur, it came in big storms that could flood fields and erode hillsides. Most of the available land consisted of rocky mountain slopes that did not support cereals and required substantial human effort to produce fruit crops. Perhaps we should not be surprised that Hesiod describes his hometown of Askra in Boiotia as "bad in winter, unbearable in summer, and pleasant at no time of the year" (see Figure 6).\(^{49}\) Nevertheless, Greek farmers took pride in being able to support themselves entirely off of their own produce. Xenophon thinks that farming is a simple occupation that is easy to learn, but he is writing from the perspective of a foreman, not an actual farmer.\(^{50}\) In truth, Greek agricultural techniques were the product of hundreds of years of experimentation. Thanks to the successes and failures of earlier generations of agriculturalists, Greek farmers were armed with strategies that helped them live sustainably on their land.

**Diversification of Crops**

There is some evidence for crop specialization in ancient Greece. Solon's laws stated that Athenians could only export olives, which suggests that the sale of

\(^{49}\) *Works and Days* 640.

\(^{50}\) *Oikonomikos* 20.13.
olive oil was important the Athenian economy.\textsuperscript{51} Similarly, the fact that laws on the island of Thasos placed restrictions on viticulture suggest that wine was an important commodity on the island.\textsuperscript{52} While specialization may have been possible on the state level, individual farmers were primarily concerned with providing for their immediate needs.

The most fundamental way that a farmer could protect himself from Greece's unpredictable climate was to grow more than one crop. Different plants are vulnerable to different types of weather, so growing multiple crops ensured that at least some of the plants would show returns in any given year. Wheat needs 300mm of rainfall per year in order to survive, but olives are well-adjusted to the summer drought and can survive on even less water.\textsuperscript{53} If an especially dry summer destroys a farmer's grain, then at least he will still have his olives. Similarly, wheat can survive the winter frosts that severely damage olive trees. Diversification can also provide protection against pests and diseases. When insects damage a farmers cereals, there is a good chance that the fruits and vegetables will remain untouched. It is particularly important for a farmer to diversify his crops if he has a large olive orchard. As mentioned above, the biennial nature of olive crops guarantees that the orchards will produce meager crops at least half of the time. During the off years, it is important for the farmer to have other crops to fill the void.

There is ample literary evidence for crop diversification on Greek farms. Demosthenes' speech \textit{Against Euergos and Mnesiboulos} contains a valuable

\textsuperscript{51} Plutarch, \textit{Life of Solon} 24.
\textsuperscript{52} Osborne 1987, 36.
\textsuperscript{53} Osborne 1987, 33.
description of the division of land on a farm. At one point in the speech, the speaker explains how his opponents in the trial once pillaged his farm. The perpetrators started at the edge of the speaker’s land and made their way toward the center. The first thing they came upon is the a flock of sheep. "Instead of going to the bank and collecting the fine," says the speaker, "[they] took fifty of my soft-wooled sheep as well as the shepherd and all of the gear involved in shepherding."

The attention given to the sheep's wool may indicate that they were being kept for their fleece instead of their meat. Although the livestock and the shepherd are the speaker's personal property, the rest of the passage suggests that he does not have exclusive rights to the pasture: "Not content with these, they trespassed onto my land - I have a farm near the racetrack, and I have lived there since I was a boy - and first attacked by household slaves..."

The speaker does not mention which crops are being grown, but we can see that he has legal rights to both the land and the laborers on it.

"Coming up to the house and knocking down the garden gate," he continues, "they barged in on my wife and children and took away all of the equipment and furniture that I had left." At the actual house, there is a garden that was probably devoted to fruits and vegetables that were intended to be eaten and not sold. The speaker has various types of plants and animals on his farm. Some of them were kept primarily for sale, and others were intended to be used directly by the household.

A number of surviving land leases emphasize the importance of diversification in the ancient countryside. A lease of sacred land Arkesine on

54 Demosthenes 47.52. Translation by Osborne. Cited by Osborne 1987, 53.
56 Demosthenes 47.53. Translation by Osborne. Cited by Osborne 1987, 53.
Amorgos actually required the lessee to cultivate a number of different crops. One particularly relevant passage states, "The lessee is to plough half the land each year, and not all of the land in a single year. He is to dig round the vines twice, first in Anthesterion [February] and again before Taureon [April], and round the figs once." The lessors are clearly concerned with preserving the perennial crops on the plot, but they also expect the lessee to grow annuals such as wheat and barley. The fact that even rented land was managed like a subsistence farm demonstrates that the practice of crop diversification was deeply ingrained in Greek society.

Laertes' farm on Ithaka also produced a wide range of crops. As Odysseus approaches the old man's land, he can see that there are both a vineyard and an orchard. When he finally finds his father, Odysseus says, "Old man, you lack no skill at tending gardens. Everything is well-kept, and there is not a single plant, fig, vine, olive, pear, or garden that lacks your careful attention." In his effort to cut himself off from palace life, Laertes has had to produce everything that he needs to sustain himself and his servants. Homer's epics contain numerous references to the country estates of wealthy men, but Laertes' farm stands out from the rest. The old man's farm is a small operation, and he works alongside his servants in the fields. Laertes himself is a character from the mythic past, but his farmstead lifestyle is very likely reflects the situation of ordinary farmers in Homer's lifetime (c. 700 BC).

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58 Odyssey 24.220-225.
59 Odyssey 24.244-247. Translation by McCorie.
60 Hanson 1995, 49.
While subsistence living was a choice for Laertes, it was a necessity for ordinary Greek farmers during the polis period.

Evidence of diversification even crops up in plays from time to time. Dikaiopolis, the protagonist of Aristophanes' *Akharnians*, is a Attic farmer who has been forced to settle in the city during the Peloponnesian War (431-404 BC). During his prologue, Dikaiopolis explains how jarring it is for him to have to pay for everyday commodities. "I miss by country home," he says, "which never told me to buy charcoal, vinegar, or oil. The word 'buy' was not known there, but instead I produced everything myself." Because they grew many different crops on their land, subsistence farmers like Dikaiopolis had little need for the market except during food shortages.

Large farming operations in America today tend to focus on a single cash crop. The result is that farmers can exploit their land more efficiently and make higher profits than if they had decided to grow a variety of crops. Classical Greek farmers, however, were limited by their unpredictable climate and basic technology. Cash cropping would have resulted in booming harvest some of the time, but catastrophic crop failures would also have occurred on a regular basis. It made more sense for farmers in ancient Greece to sacrifice the possibility of high profits in favor of long-term stability. As Xenophon says, "It is better to get enough food at all times than too much at one time and not enough at another." The preference for security over profitability is a basic principle of Greek agriculture.

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62 *Oikonomikos* 17.6. Translation from *Xenophon in Seven Volumes*. 
Fragmentation of Holdings

The Greek landscape is made up of a complex patchwork of microclimates (See Figure 3). Typically, conditions change over shorter distances on rugged landscapes than on flat ones because mountains expose some slopes to the elements while sheltering others (see Chapter 1). Also, higher altitudes experience more precipitation and larger oscillations in temperature than lower altitudes. As a result, there could be different weather patterns at opposite ends of a hilly plot. In ancient Greece, the best way to cope with the challenges of a high relief landscape was to fragment a farm into smaller plots that could be scattered about the countryside.

Like the choice to diversify crops, fragmentation of holdings involved a trade-off between security and profitability. Under favorable climactic conditions, spreading plots around the landscape is inefficient because it forces the farmer to waste time traveling from one field to another, lugging his supplies along with him. Nevertheless, Greek farmers put up the inconvenience of commuting between their various plots. In Menander’s *Disagreeable Man*, the reclusive farmer Knemon has an orchard behind his house, but he has to walk to a nearby valley in order to cultivate his cereal crops. When the young aristocrat Sostratos decides to win the old man’s respect by working in the fields, he as to carry a heavy mattock from Knemon's farmstead down to the valley before he can even start working. “This mattock weighs for talents!” he says. “Still, I won’t soften up once I’ve gotten down to work.” The farm is located in the rugged hills near Phyle in Attica, where microclimates alternate quickly over short distances. In such conditions, fragmentation of holdings was a

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kind of insurance policy. Even if one plot failed from lack of water, it was likely that other plots would be spared.64

The Attic stelai provide solid evidence that Athenian aristocrats spread their holdings across the landscape. One man named Axiokhos owned three separate properties in the countryside around his hometown in Skambonidai.65 Unlike subsistence farmers, who had to travel to their plots on a daily basis, wealthy citizens could afford to space out their holdings as much as they liked. Euphiletos, for example, had estates in four separate demes. Having money also meant it was possible to have plots in different types of ecosystems. Two of Euphiletos' plots were on the coast, and two were further inland. Some of the young men even owned land in different states. The tablets record plots that were confiscated in Euboia, Thasos, and Abydos.66 Like Isomakhos in Xenophon's Oikonomikos, the men mentioned on the stelai may have overseen some of the work on their farms in Attica, but they must have had servants or hired foremen to operate their foreign holdings.67 The prices and areas that survive for the farms indicate that most of them were relatively small. The evidence from the stelai shows that it was possible for wealthy farmers to be heavily invested in agriculture without possessing large estates.68

The fact that wealthy Athenians opted to split up their holdings shows that it was desirable to have plots in a variety of locations, but it was surely more difficult for a subsistence farmer to scatter his plots around the countryside. Because small-

64 Osborne 1987, 37-39.
65 Osborne 1987, 22.
67 Osborne 1987, 38.
68 Princhett 1956, 275.
time farmers worked their land themselves, they were limited to the lands that they could easily commute to on foot. In Menander’s *Disagreeable Man*, Knemon has an orchard on the hill behind his house and an arable field in a nearby valley. Poor farmers had a limited ability to fragment their holdings, but they did so as much as they could.

Some Greek customs may have helped ordinary farmers to spread their holdings around the countryside. When a farmer died, for example, it was common for him to divide his holdings between his surviving sons. The custom has confused historians for generations, because one would expect that after a few generations the farms would shrink into absurdly small sizes. If farmers were committed to fragmenting their holdings as much as possible, however, then eventually dividing up the inheritance must have become a matter of distributing small plots between heirs instead of breaking up a single plot into tiny pieces. As a result, inheritors would end up with several small but workable plots that were already well spaced out from one another. In order to earn a living, however, a farmer would have to find ways to acquire additional plots.

When it came time for a poor farmer to marry off his daughter, he had a limited number of resources to offer the groom as a dowry. Instead of making a monetary gift, he might have decided to give up part of his land. There is some evidence farmland was a common component of rural dowries. When Knemon decides to make Gorgias his daughter’s guardian, his first thought is to offer up part

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69 Knemon tends the pears in his orchard at *Disagreeable Man* 100-102, and the valley is mentioned at 351.
of his land for the girl’s dowry. “Measure out half of my land as her dowry,” he says, “and use the other half to look after me and your mother.” At the time that Knemon makes this statement, he does not know that a young aristocrat from the city is planning to marry his daughter. Instead, he is hoping that a poor but hardworking farmer like himself will want to take her into his home.

The cheapest way for a farmer to expand his fields was to carve out a piece of uncultivated land for himself. Since all of the workable land in the plains had been claimed early on, ‘uncultivated land’ usually meant steep mountain slopes at the edge of the agricultural area of the polis. Steep hillsides were better-suited for perennial crops such as trees and vines than for annuals like wheat and barley. A new plot could take years to start showing returns, but when the plants matured they could last for well over a lifetime. Laertes made his farm in the country from scratch, and had to put in a good deal of work to do it. In book 24, Homer describes the plot as a “well-tended farm that the old king himself had wrested from the wilds, years ago, laboring long and hard.” If a farmer already possessed enough arable land to provide his family with bread throughout the year, starting an orchard or a vineyard on a nearby hillside could allow him to provide oil and wine for his family and participate in the market economy at the same time.

Of course, it was also possible for a farmer to gain access to land without buying it outright. To begin with, he could lease land either from the state or from wealthy farmers who did not bother to keep all of their land under cultivation. The lessee would have to part with a portion of the crops that he produced on the rented

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71 *Disagreeable Man* 737-739.
72 *Odyssey* 24.205-207. Translation by Fagles.
land, but if he managed the plot well he would hopefully have enough left over to make his effort worthwhile. Thanks to the Greek obsession with recording legal transactions on stone, there are a number of leases from Athens and the other states that have survived to the present day. A lease of sacred land at Arkesine (see above) required the renter to practice biennial fallow on the arable land, which suggests that renters were motivated to exploit the land as intensively as possible.\(^7\)

Fragmentation of holdings is a familiar strategy for anyone who has spent time in the eastern Columbia River Gorge. Oregon cherry growers space their orchards miles apart from each other, but they do it for a different reason than Greek farmers did. Thanks to modern technology, cherry farmers can irrigate all of their trees cheaply and efficiently. Summer rains, however, can seriously damage a crop. Ripe cherries readily absorbs water, but since the skin cannot expand, it bursts open and exposes the fruit to infection. If rain occurs in the early stages of the fruit’s development, it can still be edible, but the cherries will be covered with unsightly cracks that greatly reduce their marketability. By spreading their orchards around the mountainous landscape, however, farmers can be confident that some of their fruit will survive even heavy downpours. Fragmentation of holdings was an important part of the ancient Greek agricultural strategy, and it has remained a common practice in the Mediterranean as well as in other parts of the world with unpredictable climates.

**Cultivation Terraces**

Terraces are a common feature of the modern Greek landscape. The hills of Methana in the eastern Peloponnese are etched with terraces that have been in place

\(^7\) IG xii.vii.62. See Rhodes and Osborne 2003, 285-286.
for generations (see Figure 8). Terraces are constructed by digging stones out of a hillside, piling them up into a wall, and then filling in the uphill side with the displaced soil. The result is a series of level platforms supported by retaining walls. Once they have been built, terraces provide a means of cultivating trees, vines, and sometimes even cereals on sloped ground. There is solid evidence for terracing in antiquity, but we do not know how prevalent the technique was on ancient hillsides.

There are a number of different reasons to build terraces on hilly plots. Most obviously, they provide level ground that is easy to cultivate. Flat ground is particularly important for cereal cultivation, since ards are unwieldy on uneven terrain (see above). The flat surfaces created by terracing also help soils to conserve moisture, since less water is lost as runoff. The digging that occurs during the construction of terraces lightens soils and breaks up rocks, which allows for better root penetration. Most importantly, terracing slows down the rate of erosion on uneven plots. Disturbed soils, which would ordinarily be swept downhill during winter storms, are held in place on the flat platforms of a terraced hillside. Aside from making agriculture easier on sloped land, terraces also make it more sustainable.

Searching for written evidence of ancient terraces can be a frustrating process. Most of the possible references to terraces are ambiguous because the Greeks used the same words, teikhos and haimasia, for all the different types of walls on their farms. In Menander’s Disagreeable Man, one of the servants says, “Meanwhile I will

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74 Foxhall et al. 2007, 99.
75 Foxhall 1996, 53.
76 Foxhall 1996, 52; Grove and Rackham 2001, 110.
build up the wall since that needs to be done, too.” The word that Menander uses in the passage, *haimasia*, could refer to a terrace wall, a boundary wall, or even an enclosure wall.

On some special occasions, however, the context makes it clear that the author is talking about terraces. In the *Odyssey*, Eurymachus offers to employ Odysseus on one of his plots in the country. “My guest,” he says, “would you like to work? If I were to hire you on far-off land, your pay would surely be steady. You’d plant tall trees and gather the wall stones.” The suitor uses the word *haimasia* for the walls, which is not helpful, but the passage contains other important information about the farm. Eurymachus describes the plot as an *eskhatie*, which the translator renders as “far-off land.” The translation is literally correct, but in an agricultural context the word usually refers to marginal land. The presence of trees is also important, since fruit trees and vines grow better on the thin and rocky soils of Greek hillsides than cereal crops. It is clear that Eurymakhos is describing a hilly plot in the remote countryside. In such a context, it is hard to imagine that the walls could be anything but retaining walls for terraces.

The lease of sacred land from Arkesine (see above) also contains a probable reference to terracing. One of the lessee’s responsibilities is described as follows: “He will dig ditches in the month Eiraphion, in the places marked out by the temple administrators, 4-foot ones and 3-foot ones, and will put in the plants in the presence of the temple administrators, planting twenty vines at the spacing ordered by the

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78 *Odyssey* 18.357-359. Translation by McCorie.
79 Hanson 1995, 40.
temple administrators, and ten fig trees, and he will build an additional wall above the land.\textsuperscript{80} There are other references to wall maintenance in the lease, but this one is associated with the planting of new trees and vines. Predictably, the wall is called a \textit{teikhion}, but it is modified by the words \textit{huper ges}. The expression is unusual, but it seems to indicate that the wall was at the top of the plot.\textsuperscript{81} Apparently, the magistrates in charge of the sanctuary were attempting to expand the orchards and vineyards on a hilly section of the farm. While none of the evidence is conclusive, the circumstances under which the lessee is ordered to construct the wall strongly suggest that it is a terrace wall.

The archaeological evidence for terraces is similarly problematic. Since soils are dug up and then filled in again during the construction process, the stratigraphy of the soil cannot be used to determine the age of a terrace. The fact that the retaining walls have to be regularly repaired means that even very old terraces often consist of rocks that were put in place at different points in history. Nor do terraces decompose at a predictable rate. Depending on geological and climatic conditions at a specific site, an abandoned terrace can either disappear completely in less than a century or remain intact for many hundreds of years.\textsuperscript{82} Still, rough dating is possible in a few special situations. Excavation on Delos has turned up a set of terrace walls that were probably built in the sixth century BC. Ancient paths lead from the terraces to farmhouses that are easier to date. Since the terraces were covered with more recent sediment, they were not affected by later settlement. In southwestern Crete, there is

\textsuperscript{80} Rhodes and Osborne 2003, 282-283.  
\textsuperscript{81} Foxhall 1996, 51.  
\textsuperscript{82} Grove and Rackham 2001, 112.
an ancient olive tree growing on a pre-existing terrace wall. Based on tree rings, the age of the olive has been estimated at about 2,300 years. It is likely that the terrace walls surrounding the tree have been rebuilt over time, but the section of wall that it rests on must be at least as old as the tree itself. Terracing was clearly practiced in different parts of Greece, but we do not know if terraces were as ubiquitous in the ancient landscape as they are today.

Either way, terracing was not the only strategy for farming on steep slopes in antiquity. Literary sources suggest that trenching was the preferred technique among wealthy farmers. Trenching involved planting trees in large ditches that funneled water to the roots. Xenophon recommends digging deeper ditches for olives than for other trees. According to Theophrastos, connecting the ditches with small canals could help to drain off extra water during the winter. Both authors recommend regular digging throughout the year. Digging aerated the soils, which minimized evaporation and created a barrier between the roots and the harmful summer sun. Theophrastos suggests digging around each tree three times a year. Because of the amount of digging that was required, terracing must have been a labor-intensive process. Unlike terraces, trenches had to be renovated every year. While trenches maximized the output of trees and vines, they were useless for cereal crops. For subsistence farmers, who coped with a small work force and had limited access to good arable fields, trenching must not have been an option except in

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84 Foxhall et al. 2007, 99.
85 Oikonomikos 19.13.
88 Foxhall et al. 2007, 99.
unusual circumstances. While ancient authors gave some information about the ways in which wealthy landowners cultivated steep slopes, they ignored the strategies used by ordinary farmers.

Terracing and trenching allowed the Greeks to grow crops sustainably on land that was otherwise marginal for agriculture. Since the Greek landscape is dominated by mountains, such techniques greatly increased the percentage of the landscape that could be farmed profitably. Xenophon implies that marginal land could be purchased relatively cheaply even during the Classical period. Hesiod’s father started out as a poor rower on a ship, but even he was able to obtain a farm on the slopes of Mt. Helikon. Not only could cultivating marginal land bring extra cash to elite households, but it could also provide a better standard of living for poor Greeks.

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89 *Oikonomikos* 20.22-23.
90 *Works and Days* 633.
Chapter 3: The Wild Landscape

Even after the switch to an agricultural economy, people continued to collect wild plants on a large scale. Thanks to the multiplicity of plant communities present in the landscape (see Figure 3), the Greeks had access to more plant species than people living in central Europe. The mosaic of woodlands, scrublands, and grasslands provided a wide range of useful goods and services for everyday consumption. Gatherers could either eat the products that they collected or sell them in the market for profit. Archaeological evidence for wild plant products is highly fragmentary because herbs and vegetables do not preserve well when they are burned. The surviving literature makes only scattered comments about wild plants, but there are enough to demonstrate that wild plants were used on a broad scale in ancient Greece. The mountains may have appeared to be wild, but in reality they were actively managed to ensure that they continued to produce vegetation that was useful to humans.

Gathering Wild Plants

As discussed in Chapter 2, ancient arboriculture depended on the practice of grafting. In turn, grafting depended on the availability of wild fruit trees in the uncultivated landscape. Today, the Greek hillsides are covered with wild breeds of olives, pears, apples, and a variety of nuts. The wild trees are perfectly capable of reproducing amongst themselves, but they can also be fertilized by cultivated trees, which results in populations of feral trees that are neither useful for agriculture nor fully wild (see Chapter 2). After grafting high performing scions onto wild or feral stumps, a farmer could uproot the tree and replant it in his orchard. Alternatively, he
might choose to clear all of the other vegetation from between the grafted trees and establish a new orchard on the spot.¹ In modern Greece, farmers often graft domesticated branches onto a large number of wild trees and then leave them to develop naturally on the hillside.² The strategy produces significantly less fruit per tree than a carefully tended orchard, but it allows farmers to increase their crop yields with very little extra effort on their part. It is probable that all three techniques of exploiting wild trees were used at least occasionally in antiquity.

Wild fruits, nuts, and vegetables could be every bit as edible as their domesticated counterparts. At one point in his *Causes of Plants*, Theophrastos mentions that wild pears and apples start to ripen after they are removed from the tree.³ In another passage, he lists the wild versions of ordinary garden vegetables that can be found in Greece. Cabbage, rhubarb, turnip, celery, and lettuce may look different than their domesticated counterparts, but they were all useful in some way. Wild lettuce, which grew as a weed in wheat and barley fields, was used to cure a number of eye conditions.⁴ While some wild plants can be eaten raw, Theophrastos reminds his readers that other plants need special preparation before they can be consumed.⁵ Wild almonds are mildly toxic, for example, but cooking the nuts makes them fit for consumption.⁶

The Greeks also made use of a wide range of plants that had no associations with agriculture. Theophrastos names a vast number of plants that were collected in

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¹ Hanson 1995, 81.
² Forbes 1996, 77-78.
³ *Causes of Plants* 2.8.2.
⁴ *History of Plants* 7.6.1.
⁵ *History of Plants* 7.7.2.
⁶ Zohary and Hopf 1993, 174-175.
antiquity, but most of his descriptions are frustrating for anyone trying to study how plants were exploited. Many of his identifications are useless to modern readers, and he frequently omits important information about how the plants were gathered, processed, and consumed. In his short work *On Odors*, for example, he mentions that some kinds of cedar were used to flavor water, but he fails to give any more information on the topic.\(^7\)

A number of foreign species were introduced into Greek habitats in ancient times. Carob trees are common in Greece today, but they were probably introduced from the eastern Mediterranean sometime before the Classical period; some Greeks called the plant the 'Egyptian fig.'\(^8\) The carob is well-adjusted to hot and dry conditions, and it thrives in Greek savannas.\(^9\) The trees produce sugar-rich seed pods that make good fodder for pigs. Theophrastos says that the plant has a sweet taste, but he does not discuss how it was cultivated.\(^10\)

There were a number of plants that could provide extra food for humans when crops failed. Traditionally, Mediterranean farmers have collected acorns from oak trees to use as fodder for livestock. Different kinds of oaks produce acorns with different sizes and flavors, but they are usually too bitter for human taste buds. During food shortages, however, acorns can be a convenient source of nourishment because they are ubiquitous and easy to open.\(^11\) Hesiod lists acorns among the most

\(^7\) *Concerning Odors* 5.
\(^8\) *Concerning Odors* 5
\(^9\) Grove and Rackham 2001, 69.
\(^10\) *History of Plants* 4.2.4. Cited by Baumann 1993, 146.
\(^11\) Zohary and Hopf 1993, 196.
important products supplied by the mountains.\textsuperscript{12} The bulbs of the tassel hyacinth were also eaten in ancient times. Theophrastos mentions the plant while he is counting off the different types of edible roots.\textsuperscript{13} The bulbs remain a popular snack in rural Greece today.\textsuperscript{14} The umbrella pines that are so characteristic of Mediterranean landscapes produce edible nuts that are sold by street vendors in modern cities.

Theophrastos describes the tree in his \textit{History of Plants}, though he does not mention the nuts.\textsuperscript{15} Athenaius, writing in the second century AD, said that wild lupines could be consumed when crops failed.\textsuperscript{16} Like other legumes, lupines rejuvenate soils by fixing nitrogen atoms to organic molecules. Since Theophrastos tells us that there were domesticated lupines on ancient farms, it is likely that people started collecting the plants long before the Classical period. Although wild plants could provide extra food in emergencies, they could also improve the taste or ordinary meals.

Greece abounds in aromatic plants that make for excellent seasonings. The fourth-century playwright Antiphanes included thyme, cumin, and marjoram in his list of indispensable seasonings.\textsuperscript{17} Mycenaean tablets also attest to the use of coriander, cumin, mint, and fennel, all of which grow wild on the Greek hillsides.\textsuperscript{18} While the farmer in Menander's \textit{Disagreeable Man} has to struggle to keep his crops

\textsuperscript{12} \textit{Works and Days} 233.
\textsuperscript{13} \textit{History of Plants} 7.12.1. Cited by Baumann 1993, 133-134.
\textsuperscript{14} Baumann 1993, 133-134.
\textsuperscript{15} \textit{History of Plants} 3.9.1.
\textsuperscript{16} Cited by Baumann 1993, 146.
\textsuperscript{17} Cited by Baumann 1993, 132.
\textsuperscript{18} Cited by Baumann 1993, 134.
alive, the author sees savory and sage as natural components of Attica's rocky hillsides.\textsuperscript{19}

In addition to seasonings, wild plants provided a number of flavorings that were used extensively in ancient times. Resins tapped from various trees were added to wine both as a preservative and a flavoring. The result was a beverage similar to modern \textit{retsina}. Writing in the first century AD, Dioscorides claimed that the practice of adding resin to wine was widespread in the ancient world.\textsuperscript{20}

Some plants had a wide range of uses. The Cornelian cherry is a particularly useful plant that grows wildly in Greece. The tree produces large, sweet fruits that were frequently used as a fodder for animals. In Homer's \textit{Odyssey}, the comrades of Odysseus feed on Cornelian cherries after Circe transforms them into pigs.\textsuperscript{21} Homer, Herodotus, and Theophrastos all agree that the tree's hard wood makes for excellent weapons.\textsuperscript{22} In modern Greece, the fruits of the Cornelian cherry are used to make jellies and alcoholic beverages.\textsuperscript{23} Other wild plants were used to dye clothing, tan hides, and treat illnesses.

There is a good amount of evidence that wild produce was sold in Greek markets on a regular basis. The Boiotian trapper in Aristophanes' \textit{Acharnians} sells a variety of plant products. When Dikaiopolis asks the man what wares he is carrying with him, the Theban responds, "Simply everything that is good among the Boiotians:

\textsuperscript{19} \textit{Disagreeable Man} 604-606.
\textsuperscript{20} Cited by Baumann 1993, 151.
\textsuperscript{21} \textit{Odyssey} 10.242.
\textsuperscript{22} Cited by Baumann 1993, 37.
\textsuperscript{23} Zohary and Hopf 1993, 201.
marjoram, pennyroyal, rush-mats, plantains..."24 Marjoram and pennyroyal are aromatic undershrubs, and plantains are herbaceous plants that were used to make wicks for lamps.25 It appears that collecting and trapping are full-time occupations for the Boiotian trapper, but some Greek farmers sold wild produce on the side.

Selling wild produce was seen as a sign of poverty in ancient times. Euripides was teased about the fact that his mother used to sell herbs at the market in Athens. In Aristophanes' *Acharnians*, for example, Dikaiopolis jokingly says that he wishes he could have as much luck as the playwright's mother. Several lines later, he begs Euripides for some of his mother's chervil.26 Enraged, Euripides orders his slave to shut the door in Dikaiopolis' face.27 The poor reputation of herb vendors lasted into the 20th century. At Methana in the eastern Peloponnese, old women were frowned upon if they sold herbs and other produce in the towns, but the women could use the money they earned to support their children's education.28

In her article “Gathering Herbs in the Marketplace,” Mari Clark provides an example of modern gathering can help us to imagine what plant-collecting might have been like in ancient times.29 Every July, the inhabitants of the Methana collect vast quantities of oregano. The plant is closely related to the marjoram that the Theban trapper sold to Dikaiopolis in the *Acharnians* (see above). Oregano is a member of the mint family, and it is well-adapted to Greece's summer drought. The plant can regenerate quickly, which means that it copes well with burning and grazing. In fact,

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26 Chervil is a wild herb that is closely related to parsley.
27 *Acharnians* 455-480.
29 Clark 1997.
burning the plant can make it grow faster. Since oregano is a low-growing plant, it does best in scrubland or on the edges of fields where there are no taller plants to shade it out. Oregano is commonly used in Greece to treat the common cold and to promote general health. The plant can be added to dishes as a seasoning or steeped in hot water to produce a tasty herbal tea.

Oregano is collected in a few different ways. In the fields, farmers gather the herb in the summer while they are binding their vines to stakes. Luckily, oregano ripens in the slack season between the grain and grape harvests, when farmers have time to devote to non-agricultural activities. Shepherds also collect the plant while they are tending their animals in the mountains. Some townspeople walk out into the fields and hillsides with the sole purpose of collecting oregano. After collecting oregano, the residents of Methana prepare the plants for use by laying them out in the sun to dry. Whatever the collectors do not keep for themselves is either taken to local markets or sold to highway-men who transport the plants to Athens for sale.30

Collecting wild plants could only have been more prevalent in pre-industrial times before automobiles and refrigeration were available to ease the very real problems of transportation and storage. The surviving archaeological and literary evidence suggests that gathering wild produce was a common pursuit during the agricultural down-times of the year, and some poor Greeks may have relied on the sale of herbs to supplement their meager crop yields.

**Honey**

Honey was an important component of the wild and cultivated landscapes in ancient Greece. Hesiod includes honey in his list of the most important products gathered from the mountains.\textsuperscript{31} Plato was impressed by the capacity of bees to find food for themselves even on the most desolate mountain landscapes.\textsuperscript{32} Like their modern counterparts, ancient Greek farmers probably moved their hives around the countryside to take advantage of plants that flowered on different parts of the mountain slopes.\textsuperscript{33} Since the flowers that the bees feed on affects the taste of the honey they produce, different landscapes produced different varieties of honey. Mt. Hymettos, with its communities of savory, sage, and thyme, produced an especially tasty type of honey that was in demand all over the ancient Mediterranean.\textsuperscript{34} According to Pausanias, Hymettos was the best land for beekeeping in all of Greece.\textsuperscript{35}

There is also substantial evidence that bees were kept on agricultural land. Most of the data related to beekeeping comes from Attica. At Laurion, fragments of earthenware beehives have been found nearby agricultural buildings and threshing floors.\textsuperscript{36} One of Solon's laws stated that beehives on neighboring plots of land had to be spaced out from each other, indicating that honey production was a common activity on Athenian farms.\textsuperscript{37} Excavations at the modern town of Vari in Attica have

\begin{itemize}
\item \textsuperscript{31} \textit{Works and Days} 232-234.
\item \textsuperscript{32} Plato, \textit{Critias} 111.
\item \textsuperscript{33} Forbes 1996, 93.
\item \textsuperscript{34} Osborne 1987, 108.
\item \textsuperscript{35} Pausanias 1.32.1.
\item \textsuperscript{36} Osborne 1987, 78.
\item \textsuperscript{37} Pausanias, \textit{Life of Solon} 23.6.
\end{itemize}
uncovered a Classical farmstead along with a large number of beehives, which attests to the importance of honey to the Attic economy.\(^{38}\)

Honey was one of the most important sweeteners in ancient Greece.\(^{39}\) It was an important ingredient in cakes and other dishes, and could even be added to wine to enhance its flavor.\(^{40}\) What made honey especially appealing compared to other sweeteners was the fact that the hives demanded very little maintenance by the farmer. Bees derived their own food from both wild and cultivated vegetation and converted it into honey without any watering, fertilizing, pruning, or terracing. In addition, bees provided the added service of pollinating fruit trees and other flowering plants. Like their modern counterparts, ancient farmers may have brought beehives into their orchards when the trees were in bloom.

**Woodcutting**

When people think about woodcutting today, they imagine men with chainsaws clear-cutting vast tracts of pristine forest. Such an image does not always reflect modern forestry techniques, and it certainly does not bear any resemblance to ancient practices. The truth is that not all woodcutting kills trees, and not all wood comes from the uncultivated countryside. Cutting down entire trees was necessary for major construction projects, but the wood that was required on a daily basis for fuel and other purposes could be obtained through coppicing and pruning. Wood for household uses could be collected in a sustainable way, and larger logging projects occurred only periodically in ancient Greece.

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\(^{38}\) Forbes 1996, 93.

\(^{39}\) Forbes 1996, 92.

\(^{40}\) Baumann 1993, 150.
Ancient farmers made use of local wood supplies on a regular basis. Hesiod expects that farmers will make plows and wagons for themselves from trees growing on the hillsides. Some other common equipment made primarily of wood included olive presses, levers, handles for tools, and basins for pressing grapes. Thorny branches were piled on top of low stone walls to discourage animals from jumping over them. When Odysseus approaches the home of this loyal swineherd Eumaios, he observes that the pens are made of large stones topped with thorny branches.

Hesiod thought that woodcutting was an important annual activity for any small-time farmer. The poet recommends cutting wood in the fall, because that is when worms are least likely to ruin the farmer's hard work. Hesiod clearly knows a good deal about the trees growing on the mountain slopes near his farm, because he recommends different types of wood for different purposes. He advises farmers to use holm-oak for their plows because of its strength and laurel or elm for poles because they are resistant to worms. A few of the items that Hesiod describes would require large quantities of wood to build. "There are a hundred timbers to a wagon," he says. "Take care to lay these up beforehand at home." At the same time, he expects that a farmer will be able to find all the wood he needs within walking distance of his farm. While some of the implements he describes would have required the trunk of a tree to build, others could be made from branches.

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41 Works and Days 414-436.
42 Forbes 1996, 80.
43 Odyssey 14.10.
44 Works and Days 414-436.
45 Works and Days 448.
There were a variety of ways that wood could be harvested without killing the tree that produced it. Pollarding involves cutting a tree down to the height of a few meters above the ground. After the tree starts to regenerate, the farmer can return periodically to harvest the new growth. Coppicing is similar to pollarding, except that the tree is cut down to ground-level. The resulting stump is called a coppice stool (see Figure 9). Coppicing works particularly well for herders, because livestock are be able to feed off of the new growth without any assistance. Pollarding is better suited for fuel collection, because the new branches can grow without being nibbled on by passing livestock. Some trees, such as the prickly-oak, are capable of surviving in both states, while other trees put up with little or no trimming.\footnote{Grove and Rackham 2001, 48-49.}

There is evidence that woodlands were harvested sustainably during at least some parts of the historical period. Once again, the Attic stelai have proven to be an importance source of information (see Chapter 2). The rural holdings of the young Athenian aristocrats mentioned on the tablets include a number of oak and pine coppices, which are referred to as *druinon* and *pituinon* in the Greek.\footnote{Princhett 1956, 264.} It appears that each plot specialized in a single kind of tree. When they were managed well, coppices such as these would have been profitable to their owners while at the same time decreasing the community's need to disturb wild woodlands.

Demosthenes' speech *Against Phainippos* contains another example of how wealthy Athenians managed the woodlands on their properties. According to the speaker, Phainippos owns a large forested plot from which he harvests wood to be sold in the marketplace. "In addition to the rest of his property," the speaker says,
"Phainippos also has this very considerable source of revenue: six asses carry off wood the whole year through, and he receives more than twelve drachmæ a day." 48 If the speaker is telling the truth and the plot was a reliable source of income throughout the year, then Phainippos must have been able to exploit it in a sustainable way, either by coppicing or selective felling. The speaker, however, had every reason to stretch the truth in his speech (see Introduction).

Collecting firewood was one of the most time consuming activities on a Greek farm. Unlike pruning, sowing, or harvesting, firewood had to be collected throughout the year. In Menander’s *Disagreeable Man*, collecting firewood is one of the main duties of Knemon’s only slave. During the prologue, Pan says, "The old man lives alone with his daughter and an old slave woman who is always at work gathering wood and digging." 49 Firewood could be collected from a variety of sources. Pruning an orchard, for example, can generate a considerable amount of wood every year. Still, an ordinary farmer could not expect to harvest all of the firewood he needed from his orchard alone, and forays into the uncultivated landscape would have been necessary. Of course, it was not necessary to chop down a tree to collect wood from it. Fallen branches, for example, provided a ready source of fuel. Chopping branches off of a tree was preferable to chopping down the entire tree for a number of reasons. First, a tree can regenerate its branches faster than it takes a new tree to grow from scratch. Secondly, grazing animals were a constant presence in both in the farmed and unfarmed landscapes; while a goat can easily nibble down a seedling tree, it cannot reach the new branches of a tree that has been pollarded or shredded.

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48 Demosthenes 42.7. Translated by Murray.
49 *Disagreeable Man* 30-32. My translation.
Logging

Although wood for everyday uses could be obtained without removing many trees, large-scale building projects did require extensive logging. Massive amounts of timber and pitch were needed to build and maintain the Greek naval fleets. During the Classical period, naval warfare became increasingly important, and numerous cities rushed to build fleets for themselves. The large public buildings of the fifth century also required large quantities of wood, for although Classical temples were constructed primarily of stone, timbers were needed to support their pitched roofs.

Natural supplies of timber were spread unevenly across Greece, and cities in the drier parts of the region had to import most of their timber from abroad. Since ships and monumental structures do not need to be built every day, the exploitation of forests for timber was an episodic process. Whenever the need for timber disappeared, forests had a chance to recuperate.

While some cities had more timber than they could use themselves, others needed to import timber for large-scale building projects. Within Greece, Corinth, Rhodes, and the cities of Arkadia all had respectable reserves of timber. Farther afield, Macedon, Thrace, the Black Sea, Italy, and Sicily were all major sources of timber for Greek cities.\(^{50}\) The hottest and driest parts of Greece had the smallest forests. The tiny size of most Greek cities also limited the amount of timber that could be harvested without causing serious harm to other aspects of the rural economy. Athens and the islands of the Cyclades were especially dependent on

\(^{50}\) Osborne 1987, 36.
foreign timber. During the Classical period, the search for good timber had a major impact on political and military history.\textsuperscript{51}

Attica’s landscape did not support large forests. Sitting in the rain shadows of Parnes and Cithaeron, Athens and its territories received significantly less rainfall than their neighbors to the north and west (see Figure 4). For the most part, woodlands were restricted to the mountains, where there was more rain and the trees did not have to compete with farms. In Euripides’ \textit{Bacchae}, Pentheus has to pass through pine and fir forests in order to find the worshippers of Dionysus on the upper slopes of Cithaeron. Even in the mountains, however, Attic timber was inferior to wood from Macedon and Pontus.\textsuperscript{52} Before the Athenians could build their Persian-crushing fleet or the monumental temples on the Acropolis, they first had to secure outside sources of timber.

Macedon was Athens’ main source of timber starting at least as early as the fifth century BC. Between 440 and 413, Athens allied with King Perdikkas of Macedon. Fragments of the treaties survive, and they make it clear that the Athenian’s main objective was to secure high-quality timber. In the 430s, the Athenians could afford to distance themselves from Perdikkas because they had established the colony of Amphipolis in Thrace to provide for their timber needs. In fact, the Athenians even supported Perdikkas’ brother when he tried to seize power. In 424, however, the Spartans took over Amphipolis, and the Athenians once again

\textsuperscript{51} Meiggs 1982, 154-187.
\textsuperscript{52} Meiggs 1982, 188-190.
had to look for a partner with access to extensive forests. Luckily, they were able to renew their alliance with Perdikkas soon afterward.\textsuperscript{53}

The Athenians, however, did not have a monopoly on Macedonian timber. In the early fourth century, a group of cities from Chalcidice made a treaty with Amyntas, who was the king of Macedon at the time. Part of the original tablet survives, and the inscription on the back side of it makes the motives of the Chalcidians clear. "There shall be export of pitch and of all building timbers," the tablet states, "and of all shipbuilding timbers except firs."\textsuperscript{54} Macedonian timber was clearly in high demand in cities both near and far from Macedon. The treaty also gives a good summary of the uses of timber trees. While some trees are preferred for architectural purposes, others are used in shipbuilding. Macedonian firs were considered the best material for the latter. Pitch was also important because it provided weatherproofing for timbers. According to Theophrastos, pitch could be harvested either by boring a hole into the trunk or by burning the timbers very slowly.\textsuperscript{55} Trees, then, were valuable for more than just the wood that they produced.

\textsuperscript{53} Meiggs 1982, 126-127.
\textsuperscript{54} SIG\textsuperscript{3}135. Cited by Rhodes and Osborne 2001, 55-57.
\textsuperscript{55} History of Plants 9.2.6-9.3.3.
Chapter 4: Hunting

Hunting meant different things to different people in ancient Greece. To the upper classes, hunting was thought of as recreation, military training, and an important status marker. For poorer people, wild game provided a supplementary source of meat as well as an opportunity to make a profit. It is difficult to judge how abundant animals were in the ancient landscape, but there is evidence, both literary and artistic, that hunting was practiced on a regular basis.

Professional Hunters

Professional hunters brought a wide variety of animals to Greek markets. The Theban in Aristophanes' *Acharnians* makes his living by hunting birds, hares, and other small animals. When Dikaiopolis asks him what he is selling, the man replies, "...ducks, jackdaws, francolins, coots, wrens, grebes... geese, hares, foxes, moles, hedgehogs, cats, badgers, martens, otters, Copaic eels."¹ It is hard to believe that the trapper and his servant could carry so many animals over Mt. Cithaeron by themselves. Instead, Aristophanes is probably listing some of the species that Boiotian trappers brought to the Athenian market for sale.

The war between Athens and Sparta (431-404 BC) put serious limitations on Greek commerce. During the hostilities, Athens was unable to trade with the neighboring states of Megara and Thebes. The embargo strained both the consumers in Athens and foreigners who relied on the Athenian market. The Theban trapper is so desperate to make a profit that he is willing to sell off all of his wares at once.²

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¹ *Acharnians* 873-880. Translation by Henderson.
² *Acharnians* 898.
Plutarch's *Life of Perikles* demonstrates, selling goods off bit by bit to different buyers inevitably led to larger profit margins (see Chapter 2). Dikaiopolis decides to purchase everything that the Theban has to offer, but he is especially excited about the eels from Lake Copais in Boiotia, which were a famous delicacy. When the trapper hands him an eel, Dikaiopolis turns to his children and says, "Children, look at the excellent eel we've been pining for, just arrived after six years. Say hello to her, kids, and in honor of this lady guest I'll provide you with coals."\(^3\) The passage demonstrates that trading animals across state borders was a common practice in ancient Greece. When the exchange was interrupted, everyone suffered in one way or another.

The Theban's job requires him to be a shrewd salesman as well as a skilled hunter. When Dikaiopolis asks how he should pay, the trapper responds that he would rather barter than receive hard cash. "[Give me] something that's found in Athens," he says, "but not among the Boiotians."\(^4\) Because of the embargo on Athenian products, the Theban judges that he will be able to make a handsome profit by reselling Attic goods back home. He refuses to take a cash payment because he reckons that a rich Theban will be able to pay more for his wares than will a poor farmer like Dikaiopolis. Even allowing for comic exaggeration, the fact that the Theban is able to offer so many different wares attests not only to his detailed knowledge of the Greek countryside, but also to his experience with different hunting techniques.

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\(^3\) *Acharnians* 889-892. Translation by Henderson.

\(^4\) *Acharnians* 900.
In his *Laws*, Plato describes three main styles of hunting. The first involves catching animals with nets, traps, and snares. One of the characters in the dialogue, who is simply called the Athenian stranger, disapproves of the technique because it makes the process too easy for the hunter. "O friends," he says, "may you never be seized by a desire for... those basket-traps that perform the toil of a lazy hunt, whether the hunters are awake or asleep!" For the same reasons, the Athenian looks down upon men whom he calls 'night-hunters.' "But no one," he says, "is to allow the night-hunter, who trusts in nets and traps, to hunt anywhere." Plato does not fully explain the technique used by night-hunters, but it appears that they came up on animals while they were sleeping. The poor hunter in Dio Chrysostom's *Euboikos*, which was written about four centuries later, prefers to hunt hares and gazelles "in their beds." Like trappers, night-hunters used nets and other equipment that helped them to find and incapacitate their quarry. The only form of hunting that the Athenian in Plato’s dialogue approves of is the kind that involves a chase in broad daylight. "What alone remains and is best for everyone," he says, "is the hunting of four-footed prey that employs horses, dogs, and the bodies of the hunters themselves." The type of hunting that the Athenian prefers may have been appropriate for young sportsmen, but it would have been an inefficient technique for professional hunters. Unlike nets and snares, which a hunter can make for himself, thoroughbred hounds and horses were expensive commodities. The Theban in Aristophanes' *Acharnians*, who traveled to Athens on foot, would not have been able to afford such luxuries. For a

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5 Dio Chrysostom 7.19.
6 *Laws* 823e-824a. Translation by Pangle.
man who sold his catches in the marketplace, trapping and night-hunting would have been the most efficient methods.

Traps, nets, and snares could be used to capture a variety of different animals. Plato’s Athenian stranger dislikes fishing because it requires lines, tackle, and basket-traps. Unsurprisingly, he also disapproves of hunting birds. "May the seductive, erotic love of bird-hunting," he says, "never come over any of the young!" The Athenian does not describe the details of bird-hunting, but it is likely that he thought of it as an activity that required traps. One fourth century pot from southern Italy shows Eros holding a bird snare. Like trappers today, ancient hunters surely used a variety of nets, traps, and snares to bring down four-legged animals. Although Plato dislikes all trappers, he ultimately admits that some trapping is necessary in a Greek city. At the end of Chapter 3 of the *Laws*, the Athenian says, "The bird-hunter is not to be hindered on land that is not in use or in the mountains... The water-hunter is not to be hindered, except in harbors, sacred streams, ponds, and reservoirs." No matter how lazy he thought trappers were, the Athenian could not deny that birds and fish were important supplements to the Greek diet.

Once in a while, epigraphy provides evidence about the types of traps used by ancient hunters. Sometime in the 1st or 2nd century, a trapper from Orkhomenos left the following dedication at a shrine to Pan:

This old scrap of mist net, and this triple twisted footsnare; these springs of stretched sinew, these broken bird cages and running neck

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7 *Laws* 823e. Translation by Pangle.
8 Anderson 1985, 21.
9 *Laws* 824a. Translation by Pangle.
nooses; these sharpened stakes hardened by fire; the sticky ooze of the oak and the reed limed with mistletoe that catches the birds; the triple cord that pulls shut the hidden purse net, and the net that catches by the neck the clanging cranes; all these, Pan of the lookout places, are dedicated to you by old Craugis the hunter, son of Neolaidas, an Arcadian from Orchomenos."^{10}

Constructing traps required a range of natural products. The sinews described in the passage, for example, would have been extracted from game animals. Stakes could have been cut from brushwood. Craugis also exploits the natural properties of reeds and pitch to capture his prey. For a professional hunter to be successful, he needed an encyclopedic knowledge of the habits of wild animals as well as the properties of the natural plants. Like the Theban in Aristophanes' *Acharnians* (see above), prudent hunters would also collect wild plants to sell in the market.

It is unclear whether the Theban in the *Acharnians* is a full time trapper or a farmer who hunts in his spare time to make extra cash. Either way, he is a man of simple means. When they arrive at Dikaiopolis' house, the Theban and his slave are carrying their freight on their backs. "Heracles bear witness," he says, "my shoulder's damned weary. Put the pennyroyal down easy, Ismenias."^{11} Although he does not have a pack animal, the hunter does have a slave, which suggests that he was not completely destitute. Whether or not the exact details of the character are true to life, Aristophanes makes it clear that he thinks of trappers as average people struggling to make a living.

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^{11} *Acharnians* 860-861. Translation by Henderson.
There is little surviving evidence to suggest that farmers hunted on a regular basis to supplement their diet, but that does not mean that subsistence farmers never went after wild animals. Part of the reason for the scarcity of evidence is that wilderness scenes were not popular in Greek art. Occasionally, however, the material record provides hints that farmers did find time to go hunting. An Attic cup from the late 6th century pairs agricultural tasks with hunting (see Figure 11). The main scene shows farmers plowing and sowing in their grain fields. Meanwhile, in the outer ring of the cup, young men hunt deer with spears. In the center of all the action, a man kneels and holds a club above his head. In Xenophon's hunting manual, hunters use clubs to kill hares after the animals are cornered in nets. Although the cup was found at Vulci in Italy, the artist has been identified as an Athenian named Nikosthenes. Since natural scenes did not sell well in Greece, Nikosthenes probably made the cup with his Italian consumers in mind. The artist may not have been experienced in country living, but he still tried to produce an accurate representation of rural activities.

**Sport Hunters**

Wealthy Greeks were interested in hunting for different reasons than trappers. Aristocrats went hunting for recreation and as a way of enacting their elite status. Some people also saw hunting as good military training. Because their intentions were different, the techniques they used tended to differ from those used by

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12 Osborne 1987, 18-20.
13 *Kynegetikos* 6.
14 Osborne 1987, 18-20.
professional hunters. While hunting was a common activity for young men, older aristocrats were less likely to accompany hunting parties into the wild landscape.

Aristocrats were quick to point out the differences between sport hunting and professional hunting. As noted above, Plato’s Athenian stranger dismisses trapping as a lazy and cowardly alternative to sport hunting. While he considers fishing and birding to be necessary evils, the Athenian argues that mammals should never be trapped because young aristocrats can do the same job in a much nobler way. According to the Athenian, sport hunting relies on the physical exertion of horses, dogs, and the hunters themselves. He argues that the chase is honorable because it requires courage, exercise, and endurance. Unlike trapping, the author says that sport hunting depends on "the victory of the soul and likes struggle." Xenophon by contrast thinks of nets, snares, and traps as necessary components of the chase, but he points out other differences between sport hunting and trapping.

According to Xenophon, sport hunting takes place at different times than trapping. At one point in his hunting manual, Xenophon fondly imagines a time in the distant past when wealthy hunters had free-reign over the countryside. "They also prohibited night-hunting," he says, "within a radius of many stades of the city, so that those who possessed this skill would not deprive young men of their game." The passage suggests that professional hunters were most active at night. In other parts of the manual, the author makes it clear that sport hunting is carried out during daylight hours. The chase begins when the first dog is unleashed: "She should be the most skilful tracker of the pack," he says, "and should be released at sunrise in winter,

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15 *Laws* 824a. Translation by Pangle.
16 *Kynegikos* 12.7.
before daybreak in summer and sometime in between in spring and autumn."\(^{17}\) As soon as evening arrives, it is time to wrap up the hunt. At the end of Chapter 6, Xenophon says, "When the hounds are tired from their pursuit and it is getting late in the day, the hunter must go in search of the hare, which by now will be suffering from exhaustion."\(^{18}\) The duration of a hunt is limited by the endurance of both the dogs and the hunter who must follow them on the chase. The need for the hunter to run alongside his dogs also means that he cannot hunt in the dark. Since it was not necessary for trappers to use hounds or to chase their prey, they had considerable freedom concerning when and where they hunted.

The different classes also went after different sorts of animals. The Theban in Aristophanes' play sells a wide range of small animals ranging from birds to mammals and fish. While it is hard to believe that a man could carry all sixteen different kinds of animals over a mountain on his back, the list does give a good impression of the variety of species caught by trappers in ancient Greece. Similarly, the trappers in Plato's *Laws* go after animals in the air, on the ground, and in the water. The Theban's sacks contain no animal that is much larger than a hare, but that does not mean that trappers never pursued larger animals. The country farmer in Dio Chrysostom's *Euboikos* hunts deer, gazelles, and boars.\(^{19}\) Wealthy hunters concentrated on land mammals. Xenophon assumes that his readers will focus mainly on hunting hares. While there are short sections on boars and deer in the dialogue, Xenophon makes references to hares throughout the *Kynegetikos*. Hares are

\(^{17}\) *Kynegetikos* 6.13. Translation by Cartledge.  
\(^{18}\) *Kynegetikos* 6.25. Translation by Cartledge.  
\(^{19}\) Dio Chrysostom 7.16-19.
the perfect prey species for Greek landscapes because they can survive on less food than larger herbivores. In addition, hares can reproduce at an impressive rate. Hares are also the most common animal that appears in hunts on Greek pottery. Xenophon also mentions large predators such as lions, bears, leopards, lynxes, and panthers, but he considers them exotic animals that are not hunted on a large scale in Greece. While hares were common in Greece, larger mammals were scarce in the hottest and driest parts of the region. Robin Osborne reckons that hunting could not have been an important occupation in Attica. Maybe that is why the trapper in Aristophanes' play comes from Boiotia.

Because of the physical rigors involved with sport hunting, ancient authors considered it an excellent form of education for young aristocrats. In Plato's *Laws*, the topic of hunting comes up at the end of a chapter on education. "The lawgiver," he says, "ought to praise and blame what pertains to hunting with a view to the exercises and practices of young men." In Plato's mind, techniques that emphasize exercise, endurance, and courage are better than those that are aimed at making a profit. Speaking of sport hunting, he says, "In this type the hunters use running, blows, and missiles thrown by their own hands to prevail over all their prey, and this is the type that should be practiced by whoever cultivates the courage that is divine."

According to Xenophon, sport hunting leads to personal gain, but it is not the sort of gain that trappers are looking for. At the beginning of the twelfth chapter of

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21 Osborne 1987, 18.  
22 *Laws* 823c. Translation by Pangle.  
23 *Laws* 824c. Translation by Pangle.
his manual, the author says, "A strong desire to hunt can lead to a great deal of profit. It makes for physical fitness, improves sight and hearing, slows down the process of growing old, and above all it is good training for warfare." The usefulness of hunting as military training is one of the main themes of Xenophon's text. He goes on to argue that hunting prepares young men to deal with rough conditions, makes them obedient, sharpens their will, and increases their fitness.24

The connection between hunting and warfare is supported by Greek pottery. Starting in the 8th century, scenes showing battles were often paired with scenes of hunting.25 The Chigi Vase, which has been dated to 640-630 BC, shows a hoplite battle, a procession on horseback, and two separate hunting scenes (see Figure 10). The lion hunt occupies the upper register on the opposite side of the vase from the procession scene. Four men are busy attacking the animal, but that does not prevent it from mauling one of their comrades. In the lower register, a hare hunt runs around the complete circumference of the pot. One of the hunters is crouching behind a bush and restraining his dog by the collar, while another follows his dogs after a sprinting hare. Such hunts are a common element of Greek pots, even when they are not the main scene.26 All the men on the Chigi vase are clean-shaven, which suggests that they are young men who have not reached full adulthood. If the artist intended to depict the hunters as adolescents, then the scenes fit into the wider theme of hunting as a sport for young men.

24 Kynegetikos 1-5. Translation by Cartledge.
The boar hunt in Homer's Odyssey reinforces the idea that hunting is an activity for youths. In book 10, Odysseus remembers visiting his grandfather's home at Mt. Parnesos when he was a young man. On the morning after his arrival, his uncles took him on a boar hunt: "When newborn Dawn came on with her rose-fingered daylight, they all went out for a chase: Autolykos' own sons, the dogs as well as godlike Odysseus joined them".27 Even though Autolykos is Odysseus' host, he does not accompany him on the hunt. The hero's uncles are probably older than Odysseus, but they are not yet past their prime. It appears that young aristocrats were encouraged to hunt, but older men were expected to stay behind.

A similar situation occurs at Croesus' court in Herodotus' Histories. Even though the King would prefer to keep his son Atys safe at home, the youth demands to go on a boar hunt. "Father," he says, "it used to be so good and honorable for me to go to battles and hunts!"28 Later on, Croesus tries to convince his guest Adrastus to attend the hunt by pointing out that it is an appropriate pursuit for a man his age and class. "It is fitting that you should go on these missions and win fame for yourself," he says, "because it suits your noble upbringing and besides you have enough strength for it."29 The characters in the episode are Lydian and Phrygian, but the storyteller is an Ionian from Halicarnassus. For Herodotus, aside from being a marker of elite status, hunting is also an important way for a young aristocrat to win distinction among his peers.

27 Odyssey 429-430. Translation by Henderson.
29 Herodotus 1.41.2-3. My translation.
Pest Control

Both rich and poor Greeks thought of hunting as pest control. When lions appear in Homer's similes, for example, they are almost always being hunted by farmers and shepherds who are protecting their animals. In the *Iliad*, Homer calls Diomedes "Claw-mad as a lion some shepherd tending woolly flocks in the field has just grazed, the lion leaping into the fold." Xenophon mentions in his hunting manual that lions, bears, and other large predators are hunted for sport at the margins of the Greek world, but he does not consider them important quarries for Greek hunters. Nevertheless, some large predators clearly did live in Greece in Classical times. In his *Description of Greece*, Pausanias says that there were bears on Mt. Parnes. The author also seems to think that populations of lions survived into Classical times in parts of Thessaly: "The mountainous part of Thrace, on this side of the river Nestus, which runs though the land of Abdera, breeds among other wild beasts lions, which once attacked the army of Xerxes, and mauled the camels carrying his supplies." Some of the stories that Pausanias tells about ancient times sound farfetched, but he has a reputation for being meticulously accurate about the current state of Greece. Whether or not Pausanias’ sources are correct, large predators were not important to sport hunting in Classical Greece.

Large herbivores could also disturb agricultural land. In Herodotus' *Histories*, an enormous boar invades the fields of Mysia during the reign of Croesus and

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*Anderson 1985, 15.*
*Iliad* 5.136-138. Translation by Fagles.
*Kynegetikos* 11.
*Pausanias* 1.32.1.
*Pausanias* 6.5.4.
proceeds to ruin the crops. At first, the local farmers try to chase down the animal themselves, but after multiple failures they finally decide to ask their king for help. When their messengers arrive at Croesus' capital they say, "O King, a great thing of a boar has appeared in our land, and it is destroying our fields. We want to rid ourselves of it, but we are not able to do it by ourselves. So now we have come to ask you to send your son as well as chosen youths and hounds to us so that we can expel the beast from the land." Eventually, Croesus does decide to send a hunting party. The passage shows that, although sport hunting was mainly a recreational activity, it could occasionally be put to practical use.

35 Herodotus 1.36.2. My translation.
Chapter 5: Pastoralism

Livestock was an important component of the Greek countryside in ancient times. The Greeks themselves assumed that their ancestors had been nomadic herders. Sheep, pigs, cattle, and especially goats were ubiquitous in both the cultivated and uncultivated landscapes. In some regions, such as Arkadia and Thessaly, livestock formed an important part of the local economy. Domesticated animals produced milk, meat, hides, and wool, which in turn were used to make a wide variety of everyday products from cheese to sandals. Some animals, such as oxen, donkeys, and mules, performed important labor on ancient farms. Like forests and fields, however, good pasture land was not spread evenly across Greece. In Attica, for example, herding was not an important occupation. Even in states where livestock played an insignificant role in the local economy, domesticated animals and their herders helped to shape the plant communities that grew in the country.

Livestock could be cared for in a number of ways. To begin with, it was possible to keep animals on the agricultural land throughout the year. Fallow land must have provided important pasture for farm animals when it was not being used to grow fallow crops such as lentils or broad-beans.\(^1\) Animals also had opportunities to graze on actively cultivated fields. It was common knowledge that if animals were permitted to nibble down the first shoots of grain, then the stalks would end up producing more ears than if they were allowed to grow normally.\(^2\) After the harvest, animals could be led into the fields again to graze on the stubble. The by-products of

\(^1\) See Blondel and Aronson 1999, 230 for the practice of grazing animals on fallow land. Osborne discusses fallow cropping at Osborne 1987, 41.
\(^2\) Osborne 1987, 47.
the harvesting process also provided food for livestock. After threshing and winnowing, for example, the chaff could be swept up and used as fodder. Some crops, such as Emmer wheat, were kept under cultivation as fodder long after they had lost their value as human food (see Chapter 2). In addition, animals could be fed surplus produce from the fields. Despite the variety of food sources on a farm, it could only support a limited amount of livestock. Priority was given to the animals that were needed for agricultural labor. Donkeys, mules, and oxen were essential for plowing and transportation. Animals that were valuable for their wool, milk, or meat were likely to spend some of their time on the uncultivated landscape.

A second technique for keeping livestock was to move along with herds from pasture to pasture. When the animals had depleted the resources in one area, the community would pull up stakes and search for another suitable camp. Agriculture was not impossible under such circumstances, but it was limited to annual crops that could be sown and harvested in a single season. Nomadic herding was impracticable in Classical Greece because the landscape was divided into a patchwork of independent states that were small and intensely territorial, but the lifestyle was not completely unknown to the Greeks. Plato and other respected writers believed that their ancestors had been wandering herdsmen.\(^3\) The Scythians, who lived in the northeastern corner of the Greek world, were also nomads. As late as the second century AD, Lucian the satirist compared a gluttonous banqueter to a Scythian wandering from one pasture to the next.\(^4\)

Transhumance was a compromise between the other two methods of caring

\(^3\) Laws 3.679a.
\(^4\) Lucian, Symposium 13.
for livestock. In the summertime, the herds were driven up to pastures in the mountains where conditions were cooler and moister than in the sun-scorched plains. When the temperatures dipped in the fall, herders would lead their livestock back down to the fields. During the winter, temperatures in the plains and valleys remained mild, while rainstorms provided sufficient vegetation for grazing. At least during the summer, the system required full-time herders to look after the livestock. Although shepherds could have found some food to eat in the mountains (see Chapter 3), they probably had to return to the farm periodically to stock up on provisions. Transhumance successfully removed animals from the agricultural land when it was hardest to feed them, but at the same time it did not require the fluidity of borders that was necessary for a truly nomadic lifestyle.

Transhumance changed the appearance of Greek mountains. Grazing generally promotes grassland, scrubland, and savanna at the expense of contiguous forest. Both the animals and their herders have roles to play in expanding and maintaining good pasture land. Deer, boars, and other wild herbivores have always grazed on wild vegetation, but domesticated animals put unprecedented pressures on wild plant communities. The exception to the rule may have been the Greek islands, where there were no natural predators. Because livestock and their herders were ubiquitous in the countryside, the Greek wilderness was only wild compared to the fields.

Different plants had different tolerance levels for grazing. Prickly-oak, for example, was perfectly adapted for heavy browsing. The tree can survive both as a shrub or a full-grown tree. Its leaves are mildly palatable, but grazing does not kill
the tree. Prickly-oaks cannot reproduce as a shrub, but they can survive for many years until browsing rates ease up enough for the plant to develop into a mature tree. Lentisk, wild olive, and carob are some other plants that can survive in both tree and shrub form. Such plants are a major component of the Mediterranean scrubland.⁵

Other types of plants are vulnerable to browsing. *Ebenus cretica* is an undershrub that grows only on Crete. The plant can cope with burning, but it cannot survive heavy grazing. Thanks to the rugged geography of the island, however, *Ebenus* has never been completely eradicated. When browsing levels are high, the plant is simply confined to inaccessible cliff faces.⁶ Because they were off-limits even to grazing animals, the Greeks considered the highest peaks and the steepest cliffs to be the wildest parts of their landscape. In the Homeric Hymn to Pan, the god of the wilderness roams around on snowcapped mountains and precipitous cliffs. The poet describes Pan as “the god of the pastures with the splendor of rough hair, who has been assigned every snowy hill, the mountain peaks, and the rocky tracks.”⁷ Whenever grazing levels decrease, *Ebenus* can reclaim the landscape.

Taste can also determine how a plant is affected by domesticated animals. Holm-oak, elm, willow, and olive care all highly palatable to livestock, and therefore they are browsed more intensely than other vegetation. Other plants are so unpalatable that animals avoid them whenever there are tastier plants present in the pasture. For example, goats prefer the sharp leaves of the prickly-oak to the soft but pungent leaves of the cypress tree. As a result, cypresses can grow relatively

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⁵ Grove and Rackham 2001, 47-55.
⁷ Homeric Hymn to Pan 4-7.
unimpeded by the presence of domesticated animals.\(^8\)

Herders also played an active role in promoting plant communities that were suitable for pasture. According to Virgil, shepherds would often practice controlled burning. "When the long anticipated summer winds blow," he says, "the shepherd will often set fire to the forest, and the flames will consume the densely-packed trees."\(^9\) Controlled burning thinned out forests to make room for grasses, shrubs, and herbaceous plants, which were the best foods for grazing animals. Some trees, such as prickly oak, have the capacity to sprout from their roots even after being burned to the ground. Such trees eventually grew into bushes that could then be grazed by livestock. As long as grazing was practiced intensively on the land, the animals would trim down the shrubs and prevent them from growing into full-fledged trees. When low-growing plants were scarce, shepherds could also lop branches off trees for their animals to feed on. Once the branches had been cleared of all of their leaves and edible twigs, they could be used as firewood at the shepherd's camp. A shepherd could also make use of branches to construct folds for his livestock. Certain types of trees, such as oak, arbutus, olive, and chestnut, respond well to coppicing (see Chapter 2).\(^10\)

Pastoralism certainly changed the composition of the Greek mosaic of vegetation, but the negative effects of browsing have been exaggerated by some modern scholars trying to prove that livestock permanently damaged the Greek

\(^8\) Grove and Rackham 2001, 52-53.
\(^9\) *Aeneid* 10.405-410.
\(^10\) Grove and Rackham 2001, 48-52.
landscape (see Introduction). The fact that vulnerable species like Ebenus have survived to the present day indicates that grazing was never equally intensive on all parts of the landscape. At times when browsing rates were low, wild plants could reclaim the landscape. Shrubs could develop into trees, and Ebenus could descend from its cliff-side refuges. The fact that shepherds practiced controlled burning in ancient times suggests that the natural vegetation was re-growing faster than livestock could consume in at least some parts of the countryside. In the second century BC, Eratosthenes noticed that forests were expanding on Cyprus despite various kind of human exploitation. The original words of Eratosthenes do not survive, but Strabo quotes him in his Geography: “Eratosthenes says that in ancient times the plains were thickly overgrown with forests, and therefore were covered with woods and not cultivated… [The Cyprians] permitted anyone who wished, or was able, to cut out the timber and to keep the land thus cleared as his own property and exempt from taxes.”

Considering how small Greek states were in Classical times, it must have been tempting for shepherds to graze their animals on foreign territory. Crossing borders, however, could have serious political consequences. At the beginning of the second century, the neighboring cities of Myania and Hypnia in Lokris made an agreement concerning a piece of disputed land. The treaty states that shepherds who have washed their sheep on the land in the past may continue to do so as long as they leave afterwards. All other shepherds are permitted to graze their animals on the land for as

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13 Strabo, Geography 14.6.5. Translation by Jones.
long as ten days at a time. The passage shows that even the movement of livestock in the periphery of a state could be the basis of serious negotiations. It appears that the independence of a city depended on its ability to defend all of its territory, even its remote pastures, against foreign intrusions.

The agreement between Myania and Hypnia also suggests that transhumance routes tended to become fixed over time. The governments of the two cities assume that if a shepherd has washed his animals in a certain pool in the past, then he will want to return to the pool in the future. In the culminating scene of Sophocles’ *Oedipus Rex*, the Corinthian messenger says, “I am sure he [the Theban shepherd] knows well of the time we dwelled in the region of Cithaeron for six month periods, from spring to Arcturus, he with two flocks, and I, his comrade, with one. And then for the winter I used to drive my flock to my own fold, and he took his to the fold of Laius.” The passage suggests that the shepherds sought out the same mountain pastures year after year. Sophocles may not have been an expert herder, but he probably made an effort to make the scenario seem realistic to his audience. If ancient shepherds did in fact follow the same routes year in and year out, then little has changed over the millennia. Modern shepherds still drive their animals along trails that have been in use for generations. Pasturage may have been plentiful in the mountains, but the same could not be said for the plains and valleys.

Competition over winter pastures in the lowlands could be intense. The situation in Thessaly, where there was enough flat ground for everyone to share, was

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15 *Oedipus the King* 1132-1140. Translation by Jebb.
highly unusual. In most states, arable fields were in short supply, and open pastures were even harder to come by. The practice of biennial fallow, in which only half of the land was cultivated each year, did help to free up some of the land, but even so farmers struggled to keep their animals fed. The surviving evidence suggests that shepherds grazed their livestock wherever they could whenever they could. The lease of holy land from Arkesine (see Chapter 2), which dates to the fourth century BC, attempts to control the flow of livestock in and out of the farm: "No one shall be allowed to bring flocks into the sanctuary; if anyone does bring them in, the flocks are to be sacred to Zeus Temenites." It is possible that the temple magistrates were trying to protect the land from the pollution that animals brought with them, but it also appears that any available pasturage on the plot was needed to sustain the sacred flocks.

Similarly, a set of fourth-century regulations from Tegea reveal how closely grazing was monitored on public lands. "For the last three days of the three major festivals all restrictions on pasturing are to be suspended, as long as there is not pasturing on the concourse. A pasturing fine is to be exacted from anyone pasturing there. No foreigner or citizen is to pasture in Alea unless he has come for the feast. Strangers who have come for the feast may pasture one yoke beast for a day and a night." If it was challenging for a local farmer to find pasturage near the city, then the process must have been especially difficult for foreigners traveling with pack animals. Greek farmers and herdsmen alike must have been relieved that the animals

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18 Lease of sacred land from Arkesine, Amorgos, mid-fourth century. IG xii.7 62. See Rhodes and Osborne 2003, 282. Translation by Rhodes and Osborne.
20 IG v 2.3.1-21. See Osborne 1987, 49. Translation by Osborne.
only had to stay in the lowlands for half of the year.

The beauty of transhumance is that it is perfectly synchronized with the Greek seasons. By driving their animals up to summer pastures in the mountains, the herders lightened the burden on the agricultural land in the months when it was least productive. Because of their high elevation, the summer pastures escaped the ravages of the summer drought. During the winter, animals had to share the land with farmers, but winter was also a time of rapid plant growth in the Greek lowlands.

Livestock was more important in some parts of Greece than others. Thessaly was and is situated on one of Greece's largest plains, with ample room for herding in the lowlands in addition to farming. Thessaly received significantly more annual precipitation than Attica or the Cyclades, which meant that the land could support more different kinds of vegetation. The region's geography and climate made it an ideal place for raising livestock. Unlike Athens, the Thessalian countryside could support large herds of cattle in addition to pigs, sheep, and goats. Jason of Pherai, a fourth-century tyrant from Thessaly, was able to sacrifice more than 10,000 animals at Delphi before the start of the Pythian Games in 370BC. The magnitude of the display makes it clear that animal husbandry was an important occupation in the region.

Arkadia was also famous for its flocks. Unlike Thessaly with its rolling hills, Arkadia was located in the highlands of the central Peloponnese. Higher altitudes meant more precipitation, but it also meant lower temperatures. Olives did not grow well in Arkadia because frosts were common in the winters, but animals could deal

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21 Osborne 1987, 32.
22 Howe 2008, 1-5.
with cold conditions better than most crops. Livestock require far more water than olive trees, so the extra precipitation was also important. Arkadia's reputation as good pasture land goes back at least as far as Homeric times, and probably much further. In the Homeric Hymns, most of the epithets used to describe Arkadia are related to animal husbandry in one way or another. In the Hymn to Hermes, the region is called "rich in sheep."\textsuperscript{23} Similarly, the Hymn to Pan describes Arkadia as both a "mother of sheep" and "rich in springs."\textsuperscript{24} The association between Arkadia and shepherding is also apparent in documents that survive from the Classical period. The city of Orkhomenos, for example, decided that one of the best ways to honor men from neighboring cities was to allow them to graze their animals on the state’s territory.\textsuperscript{25}

Other parts of Greece were marginal for livestock. Most of the surviving epigraphical evidence suggests that Attica was poor pasture land. Athenians did not grant foreigners the right to graze their flocks in Attica because it would not have been much of a compliment.\textsuperscript{26} When the Athenians undertook a major building project, they had to rent oxen from Boiotia in order to transport heavy chunks of stone from quarries in the mountains.\textsuperscript{27} Large public sacrifices may also have required the purchase of animals from foreign cities. The Athenians appointed special officials to buy animals for sacrifice. The budget set aside for sacrificial victims must have been considerable. In 334, the officials made 6,000 drachmas for the state just from selling

\textsuperscript{23} Homeric Hymn to Hermes 2
\textsuperscript{24} Homeric Hymn to Pan 30.
\textsuperscript{25} Osborne 1987, 119-120.
\textsuperscript{26} Osborne 1987, 49.
\textsuperscript{27} Osborne 1987, 16; Princhett 1956, 255.
off the hides of sacrificed cattle. If the Athenians had to import teams of oxen to build a temple, then a large portion of the animals sacrificed in a year must also have come from foreign pastures.

Animal husbandry was an important part of a farmer's overall agricultural strategy. Pack animals such as donkeys, mules, and oxen were needed for agricultural work, but farmers also kept goats, sheep, pigs, and cattle for the useful products that they produced. Milk, cheese, meat, wool, and hides were just some of the items that livestock offered. Subsistence farmers did not have much time to devote to herding, but they were probably still able to graze their animals on local hillsides. Since wealthy farmers could afford to send slaves out into the mountains with the flocks, they could practice animal husbandry on a much larger scale. For both rich and poor farmers, owning livestock offered farmers a means of participating in the market economy.

Public sacrifices required large numbers of animals every year. A useful document from 363/2 BC records some of the religious duties of the clan of the Salaminoi at Athens. One of the clan's responsibilities was to purchase animals for the public sacrifices that it administered. The list of victims required in Mounychion (March/April) reads as follows: "At Porthmus, to Kourotophos a goat, 10 dr.; to Maia a sheep, 12 dr.; to Heracles an ox, 70 dr.; to the hero at the saltpan a sheep, 15 dr.; to the hero at Antisara a piglet, 3.5 dr.; to the hero Epipyrigidius a piglet, 3.5 dr.; to Ion to sacrifice a sheep every other year. Wood for the sacrifices including those for which the city gives money according to the kybaires, 10 dr. On the eighteenth of

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28 Osborne 1987, 182.
Eurysaces a sow, 40 dr. Wood for the sacrifices and other purposes, 3 dr."29 Luckily for the Salaminoi, the state paid most of the expenses associated with the sacrifices. Since the Salaminoi were only one of many clans that had religious duties, the state's yearly budget for sacrifices must have been considerable. At least in Athens, but probably in other cities as well, the government must have been a major customer for herders both large and small.

There is a good amount of evidence that ordinary farmers kept livestock. Hesiod does not give a full description of herding, but he does drop clues that there is livestock on his farm. The poets discussion of the summer contains several references to animal products. "But then give me a shady rock and wine made from reeds," he says, "and also barley bread made with milk, milk from dried-out goats, the meat of a cow that has never given birth, and young goats."30 Ancient authors regarded cheese as one of the main necessities of life.31 Laertes’ farm in the Odyssey is a small operation, but Odysseus still expects that there will be livestock there. Addressing his son and a pair of slaves, he says, "You men go down to the well-built house and get ready for dinner soon. Kill the best of the swine there."32 For self-sufficient farmers like Laertes, keeping animals factored into their broader strategy of diversification.

Epigraphical sources also indicate that average farmers possessed animals. A will from Dodona in Epiros that survives from the fourth century includes a meadow

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29 SEG xxi.527. Rhodes and Osborne 2003, 189.
31 Princhett 1956, 183.
in addition to a field, a vineyard, and a house.\textsuperscript{33} A fourth-century law from Tegea (see above) even allows priests to graze livestock on the temple precincts. The most relevant passage reads as follows: "The priest may pasture twenty-five sheep, a yoke of cattle, and a goat. If he breaks the law there is a pasturing fine."\textsuperscript{34} When it came to animal husbandry, subsistence farmers were limited by their need to work on the farm on a daily basis. In all likelihood, an average farmer in the Classical period possessed only a small number of animals that he kept within a short distance of the agricultural land. Still, farmers did not have to feed their livestock exclusively on agricultural products. Some farmers, like the farmer at Dodona (see above), were lucky enough to own a meadow. Any farmer, however, could send a son or a slave out for the day to pasture the animals on uncultivated hillsides. Since animals can be moved around easily, they offered farmers the same economic opportunities as the Mediterranean triad. Any animals that the farmer did not need himself could be sold in the market.

Wealthy farmers had the resources to practice animal husbandry on a large scale. Unlike subsistence farmers, aristocrats could afford to keep servants whose sole task was to tend the flocks throughout the year. While the owners of the flocks were rich, the shepherds who actually cared for the animals were poor. The relationship between a wealthy lord and a poor shepherd is a familiar one in Greek literature. When Odysseus returns to Ithaca after twenty years of fighting and

\begin{footnotesize}
\begin{enumerate}
\item Will from Dodona, Epiros, fourth century. IJ XXIII C. See Osborne 1987, 40.
\item Laws of Tegea, fourth century. IG v 2.3.2-21. See Osborne 1987, 49. Translation by Osborne.
\end{enumerate}
\end{footnotesize}
wandering, the first person to receive him is his faithful swineherd Eumaios. In Sophocles' play *Oedipus the King*, the shepherd who carried Oedipus up to Mt. Cithaeron when he was a baby was a household slave of King Laius (see above). It is also just possible that farmers sent their sons out into the mountains to help with the herding. In the Homeric Hymn to Aphrodite, the goddess happens upon Ankhises in a shepherd's hut on Mt. Ida. Ankhises belongs to the Trojan royal family, but the hymn makes it clear that he played an active role in tending the herds. Livestock added to the wealth and prestige of rich men, but the actual work of watching the herds fell upon boys and slaves.

Epigrammatic sources confirm that the upper classes were highly invested in livestock. In Demosthenes' speech *Against Euergos and Mnêsiboulos* (see Chapter 2), the speaker owns a flock of sheep that are being pastured on land at the outskirts of his farm. "[They] went and took fifty fine soft-wooled sheep of mine and their shepherd and all of the hardware involved in shepherding." Not only does the farmer own an impressive number of sheep, but he also possesses a skilled laborer to take care of them. The attention paid to the sheep's wool suggests that the animals were kept for shearing rather than slaughtering. The Attic stelai also contain useful references to pastoralism. The sixth panel is badly damaged, but it is possible to make out that one man named Panaitios owned at least eight oxen, eighty-four sheep, and sixty-seven goats, not counting newborn animals. Instead of being kept together

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35 Odyssey 10.  
36 *Oedipus the King* 1123.  
37 *Homeric Hymn to Aphrodite* 53-55.  
38 Demosthenes 47.52. Cited by Osborne 1987, 53. Translation by Osborne.  
39 Osborne 1987, 53.
in one place, the animals were spread over several different properties.\textsuperscript{40}

Another man named Pherekles owned a section of mountain woodland (\textit{orgas} in Greek) that he may have exploited as pasture for livestock.\textsuperscript{41} Each of the men owned numerous slaves, some of whom would have been set the task of watching the herds.

In ancient Greece, both lords and laborers were needed to make large-scale animal husbandry work.

Like the Mediterranean triad, livestock provided ordinary farmers with valuable economic opportunities. Milk, cheese, wool, and hides could be sold in the market, and the animals themselves could be sold to farmers, butchers, or even state officials. The evidence from Athens and Thessaly confirms that magistrates in Greek cities had large budgets for purchasing animals for public sacrifices. Because the climate was so unpredictable, any extra funds raised from livestock would have been a useful guard against hunger during crop failures. Pasture did not simply form a buffer between farms and the wilderness. Instead, domesticated animals were an integral part of the uncultivated landscape except in the most inaccessible peaks and cliffs. It was no coincidence that Pan, the god of the wilderness, was half goat.

\textsuperscript{40} Princhett 1953, 272.
\textsuperscript{41} Princhett 1953, 272.
Epilogue

Recent studies of the Greek landscape have revealed that the ancients exploited their natural surroundings in a variety of ways. Unsurprisingly, agriculture was the primary activity in the Greek countryside. Farmers grew a wide range of cereals, fruits, and vegetables, which kept them busy throughout the year. Cattle, sheep, goats, and other animals were raised for their labor, hides, wool, milk, and meat. While subsistence farmers kept their animals close to the fields, wealthy landowners had the luxury of grazing their livestock in mountain pastures during the summer months. In their spare time, the Greeks gathered wild plants for cooking, medicine, and the manufacture of ropes, baskets, and other everyday items. Wood was collected on a regular basis, but most of it was shrubs and branches for use as fuel. Timber was cut only on a small scale unless a navy or a large temple was being constructed. Hunting was practiced for profit and for sport, but it could not have had any real economic importance in Greek cities.

It is not always easy to determine what effects human activities had on the environment. Soil analysis indicates that the ground has remained stable except during a few short episodes of erosion. Some human practices, such as terracing, actually slow down the pace of erosion. Hunting, gathering, logging, and grazing have doubtless put pressure on wild species at certain times during the historical period, but nevertheless the landscape of Greece has continued to support an impressive variety of plants and animals. Today, scientists consider Greece to be a part of one of the world’s twenty-five biodiversity hotspots. The tiny territories of the Greek cities set limits on the ecological destruction that farmers, loggers, and trappers
could get away with without directly suffering from their mismanagement. Not only was the landscape dominated by mountains, but it was also divided into a large number of small and fiercely independent political units. As a result, land for farming, grazing, and other rural activities was in short supply in most cities. If a farmer exhausted his soils, for example, he would have trouble finding new land to cultivate. In order to make a profit, farmers and other rural Greeks had to manage the land as sustainably as possible.

Patterns of land use varied from city to city. Arkadia’s mountainous landscape did not support large-scale agriculture, but it was ideal for herding livestock. Although the thin and dry soils of Attica were unsuited for growing wheat, the fragrant herbs that grew naturally on the hillsides produced exceptional honey. Most of the territory of Thasos was too rugged for cereal crops, but the island’s high levels of precipitation made it perfect for vineyards. Still, there was some continuity between the rural activities of different cities. Every state, from Thasos to Sparta, depended on an agricultural economy dominated by cereals, grapes, and olives. Each city had its own specialties, but they all kept livestock, gathered plants, cut wood, and hunted to some extent. Most cities strove for self-sufficiency in the main staple crops, although the unpredictable climate guaranteed that every city would have to import produce from time to time.

In the Classical period, authors and artists tried to play down their reliance on the landscape. Most of the time, the countryside was mentioned solely for rhetorical purposes. Dramatist, poets, and prose writers used farmers as moral examples for people in the towns, but farmers also appear as stock characters who are grumpy and
unsociable. Classical artists avoided natural scenes, except when the intended audience was non-Greek. When the countryside did crop up, the authors and artists almost always presented an outsider’s view of the rural lifestyle.

Nevertheless, the work that was done in the fields and the mountains had important implications for life in the towns. The civic calendar revolved around annual cycles of planting and harvesting. Even religious festivals and building projects had to be slotted into the agricultural off-seasons. Because the fields and pastures were the source of a city’s economic independence, trespassers were seen as a direct threat to its autonomy. As a result, even the movements of shepherds in remote pastures could be the source of serious political conflicts. Hoplite warfare, while inappropriate for mountainous terrain, was perfectly designed for citizen soldiers trying to expel raiders from their fields. In the Classical period, urban aristocrats increasingly tried to distance themselves from the work in the fields. Nevertheless, documents such as the Attic stelai demonstrate that wealthy men were highly invested in agriculture, even during the Golden Age at Athens.

Even if they were inspired by the modern environmental movement, Classical historians and other researchers have uncovered a large amount of valuable information about the ancient Greek countryside over the past thirty years. Recent studies have shown that the polis was not simply a town and its territory; it was an actively managed landscape with different areas set aside for different purposes. At first, the towns were established to offer the public buildings, defenses, and trading centers that country villages could not provide for themselves. During the Classical period, some of the towns became centers of high culture, but they never lost their
agricultural base. Modern textbooks on ancient Greece are starting to include chapters on the natural landscape.¹ Increasingly, Classical historians are realizing that it is impossible to understand the political, military, and religious history of Greece without a detailed knowledge of its countryside.

¹ Osborne 1996, 53-69.
Figure 1 The Greek landscape consists of a jumble of different geological zones that were pressed together during the Alpine compression.
Figure 2 The karst landscape of modern Chios. Soil washes down from the mountains and collects in the inland plains.

Figure 3 A view of the Amari district in southern Crete. Notice how forest alternates with savanna, which in turn alternates with rocky mountain slopes.
Figure 4 This map shows the average annual rainfall in different parts of Greece (in mm). Notice that the northern and western regions are wetter than the southern and eastern regions.
Figure 5 This Attic black-figure vase, which dates to the mid-sixth century BC, displays a variety of familiar agricultural tasks. On this side of the vase, one man is driving a plow while another follows behind with a mattock. On the opposite side of the pot (not shown here), a farmer transports two large amphorae on a cart pulled by a pair of donkeys or mules.

Figure 6 Farms on the slopes of Mt. Helikon, where Hesiod lived.
Figure 7 This table shows the Greek agricultural calendar paired with Athenian spending on a building project at the sanctuary of Demeter at Eleusis. The price values come from a set of inscriptions from 329 BC.
Figure 8 Modern terraces on the hillsides of Methana in the eastern Peloponnese.

Figure 9 Olive coppice stools on Crete. Cutting down an olive tree can re-energize it and make the harvesting process much easier.
Figure 10 This image shows three of the scenes on the Chigi vase. The upper registers contain a hoplite battle and a procession of young men on horseback. In the bottom register, two men are hunting hares with the help of their hounds. The opposite side of the vase (not shown here) shows a lion hunt.
Figure 11 This sixth-century Attic cup found at Vulci in Italy contains scenes of plowing, sowing, and hunting. Since combining hunting and farming imagery was not a common feature of Greek pottery, it is likely that the artist was catering to the tastes of Italian consumers.
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