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## The growth of Greek cities in the first millennium BC

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Abstract: In this paper I trace the growth of the largest Greek cities from perhaps 1,000-2,000 people at the beginning of the first millennium BC to 400,000-500,000 at the millennium's end. I examine two frameworks for understanding this growth: Roland Fletcher's discussion of the interaction and communication limits to growth and Max Weber's ideal types of cities' economic functions. I argue that while political power was never the only engine of urban growth in classical antiquity, it was always the most important motor. The size of the largest Greek cities was a function of the population they controlled, mechanisms of tax and rent, and transportation technology.

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## 1. Introduction

Greece in 1000 BC was a world of villages. Most people lived in communities of just a few dozen souls; even the largest settlement, Athens (Figure 1), was probably just 3,000 to 4,000 strong. But at the millennium's end, the Greek east Mediterranean boasted some of the largest cities in pre-industrial history. Alexandria, Antioch, and Seleucia-on-the-Tigris probably each had 250,000-500,000 inhabitants.

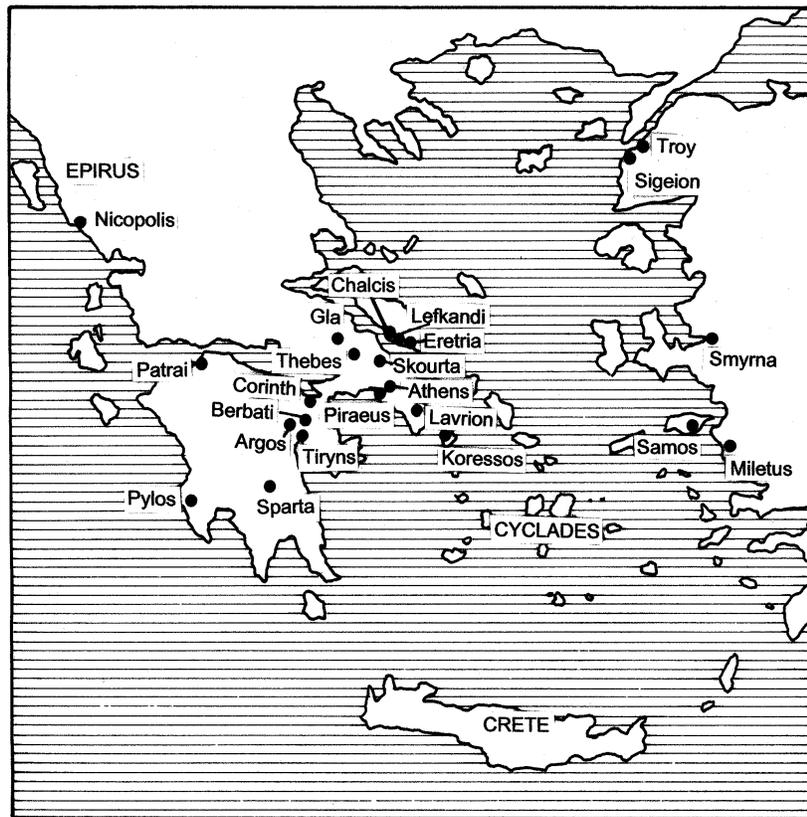


Figure 1. Sites in the Aegean mentioned in this chapter

In this chapter I discuss the size of Greek cities and the implications of their growth. I identify three major transitions:

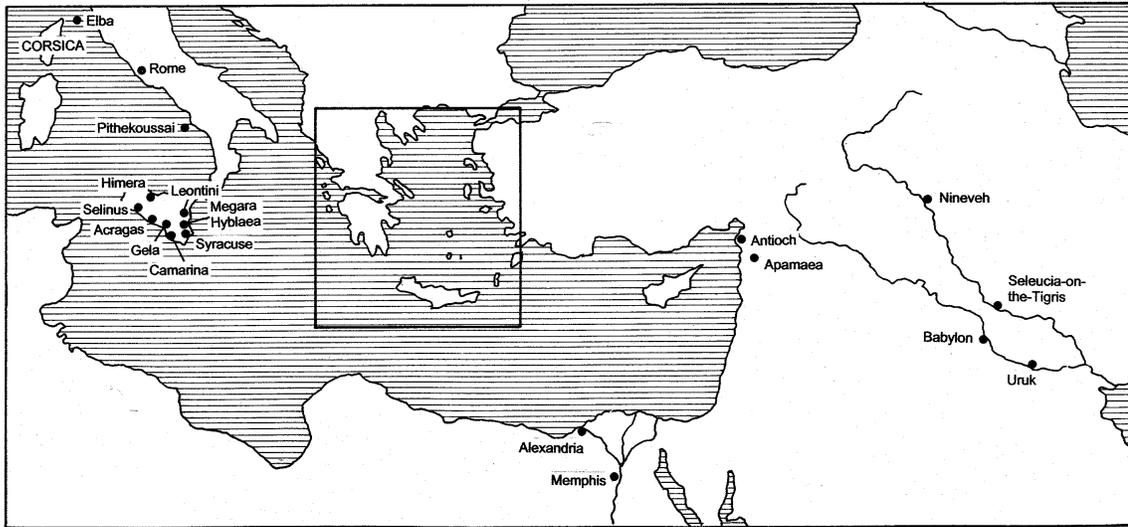


Figure 2. Sites outside the Aegean mentioned in this chapter. The box represents the area shown in Figure 1

### 1. Archaic Greece

The first transition, in the eighth century BC, was a response to Mediterranean-wide population growth. Greeks developed institutions that allowed larger groups to live together than previously. By 700 BC, the largest towns probably had 10,000 people. Although Greeks elaborated their forms of urban life over the next millennium, the main outlines emerged in the archaic period.

### 2. Classical Greece

Cities crossed a second threshold soon after 500 BC, with the rise of imperial administrative centers. The control of empires provided enough wealth for Athens and Syracuse to grow beyond the carrying capacity of their hinterlands. By 431 BC Athens probably had 40,000 residents, and its harbor town Piraeus another 25,000. Fifth-century Syracuse was roughly the same size as Athens, and a century later had between 50,000 and 100,000 inhabitants.

### 3. Hellenistic Greece

The third breakthrough began at the end of the fourth century, with the Macedonian conquest of the Persian Empire. The administrative centers this created controlled vastly greater revenues than classical Athens or Syracuse. The growth of these cities paralleled Rome's emergence as an imperial center, and in the first two centuries AD these super-cities dominated the Mediterranean.

Understanding these transitions takes this chapter into larger theoretical issues. I suggest that two specific debates are particularly relevant. These models help organize the Greek data, but the Greek case also raises questions about the organizing frameworks.

### 1. The interaction-communication transition

In a theoretical *tour-de-force*, Roland Fletcher (1995) has identified two independent variables in the history of settlement sizes. He calls the first *interaction limits* (I-limits), by which he means the maximum population densities people could tolerate. Members of tiny, mobile groups can live in very close proximity, but sedentary communities of more than 50-100 rarely tolerate densities above 300 people per hectare (p/ha). Fletcher suggests that I-limits are hard-wired into humans by their “finite sensory capacity, [which] will produce universally constant parameter conditions” (1995: 81).

Fletcher’s second variable is the *communication limit*, or C-limit. Technology and culture limit the distance messages can be effectively transmitted, and therefore the size of community that can hold together within a particular technological system. A settlement may increase in density until it approaches the I-limit, when it begins expanding in space; or it may spread until it reaches its effective C-limit, when it begins increasing in density. Eventually it presses against both I- and C-limits, and serious urban stresses develop. A settlement might then (a) fission into several smaller communities; (b) stagnate; (c) “bypass” the problem, by dropping down to such low densities (fewer than 10 p/ha) that extension is almost indefinitely possible; or (d) create what Fletcher calls “a new I-C assemblage [of cultural methods for dealing with interaction and communication] ... enabling a transition” (1995: 106).

Fletcher identifies three great I-C transitions in world history: (1) from tiny bands to sedentary villages of 1-2 hectares; (2) from villages to agrarian cities of more than 100 hectares, with populations in the range 10,000-20,000; and (3) from agrarian cities to industrial super-cities of more than 100 km<sup>2</sup>, with populations from one to ten million. Each transition involved a revolution in material behavior.

Greek cities in the eighth century BC are in many ways excellent illustrations of Fletcher’s second transition, to agrarian cities of 100+ hectares. He argues that I-C assemblages enabling such growth typically involve “blocking” architecture restricting lines of sight; shifts from curvilinear to rectilinear buildings; creation of rectilinear monuments at least 30 meters long; and the invention of writing and other information-storage technologies. These are all prominent features of the eighth-century archaeological record (Snodgrass 1980: 15-84; Morris 2000: 257-86), and Fletcher’s model underwrites the importance of the eighth century in Greek history, as a cultural revolution that created the frameworks of classical civilization.

However, some features of the Greek case might challenge Fletcher’s larger claims. First, settlement at Athens apparently covered some 200 hectares for a full three centuries before the creation of the kind of I-C assemblage that Fletcher sees as necessary for a 100-hectare city. Fletcher faces apparent exceptions to his generalizations (1995: 198-203), and notes that his 1-2 and 100-hectare limits “are only conventions”; we can document I-C transitions in settlements ranging from 70 to 150 hectares (1995: 90, 237 n. 11). Early Athens may have been an extreme case of a precocious sprawling town, suffering various forms of stress. However, given the weakness of our evidence, it may equally well be that Athens was in fact closer to 100 hectares than 200, or that population fell below the critical 10 p/ha threshold.

Fletcher suggests that breakthroughs from one I-C assemblage to another are best explained through Darwinian evolution: people constantly and randomly innovate within the limits imposed on them by social structures. When urban growth presses against the I-C limits, certain cultural traits among turn out to be adaptively advantageous and are

reproduced more effectively. Other things being equal, the more culturally diverse a society is, the better chance it has of solving I-C pressures; and, usually, the traits which prove advantageous will have emerged before the transition. Fletcher concludes that “Each of the features takes some time to develop and the likelihood of their occurring together, very rapidly, after a community reaches the zone adjacent to both an I-limit and a C-limit is very small” (1995: 159).

Here, too, eighth-century Greece raises questions. Some elements of the eighth-century cultural revolution can be traced back through the Iron Age, and others developed gradually across the archaic period (Morris 1998a; 2000: 195-256). But we are nevertheless dealing with traumatic, and transformative cultural changes across just two generations: what Snodgrass (1980) called a “structural revolution.” Population growth pushed up the size of the largest communities, creating revolutionary ferment and turning old ways of life upside down; and the new I-C assemblage then made possible further urban growth. I suggest that Fletcher downplays the importance of particular, local economic and sociological changes to emphasize universal generalizations about material behavior.

## 2. *The consumer city*

Fletcher sees the transition through the 70-150 hectare threshold as the most important stage in urban history before the industrial revolution. He suggests that while cities must have resources to grow, economics matter less than I-C assemblages (1995: 151-53). But the Greek evidence suggests that in decoupling economic from “material/behavioral factors” Fletcher (1995: 209-10) obscures other important phenomena. To understand the classical and Hellenistic transitions that I describe below, we must return to an older sociological framework, initially developed by Max Weber.

Weber was less interested in settlement size than in the economic functions of cities. In his classic essay *The City* (1921 = 1968: 1212-1372), Weber set up a three-part typology of urban economies (summary at 1968: 1215-17):

- (1) Consumer cities: a *rentier* class of landowners or an administrative elite of office-holders sucked wealth into the city, either as rents or taxes. The elite then spent its wealth on retainers, artisans, etc., in the city, creating an urban market for food, and deriving further wealth from supplying it.
- (2) Producer cities: urban entrepreneurs set up factories, buying raw materials from the countryside and then selling finished products back to it, using profits from the value added by the workers’ labor to buy food from the farmers.
- (3) Merchant cities: trading elites grew rich from selling local goods in distant markets and/or selling exotic imported goods at home.

Weber identified examples of each type in every period of European history, but suggested that consumer cities were typical of the ancient Mediterranean, while producer cities dominated medieval Europe. Early-modern merchant cities developed out of producer cities. The importance of this typology, he argued, was that merchant cities and incipient capitalism could not develop directly out of ancient consumer cities, which explains why Rome never experienced a capitalist take-off. Weber saw different

sociological forces behind the industrial revolution and its breakthrough to super-cities than does Fletcher.

I argue that the second and third transitions in Greek city-size, to classical settlements of 40,000+ and Hellenistic ones of 500,000+, require a Weberian explanation, in terms of politics, economics, and power. Only with the creation of centralized empires could a rentier/administrative elite draw enough wealth into cities to support large populations. Urban growth was inseparable from administration and imperialism.

Through most of the twentieth century, professional ancient historians ignored Weber's frameworks, producing what Moses Finley called "a spate of pseudo-histories of ancient cities and regions in which every statement or calculation to be found in an ancient text, every artefact finds a place, creating a morass of unintelligible, meaningless, unrelated 'facts'" (Finley 1985: 61). The explanation is clear: few classicists were interested in grand, comparative history. Cities were important to classicists as physical containers for high culture, but urbanism as a process—and Weber's sweeping comparisons—were not. Finley revived Weber's ideas in a classic article (Finley 1977), and following Leveau and Goudineau's response (1983), Finley's use of Weber's categories became the starting point for most discussions of urbanism.

Most ancient historians continue to ask very particularistic questions, and conclude that consumer-, producer-, and merchant-cities are not sufficiently sharp analytical tools to answer them (e.g., Engels 1990; Wallace-Hadrill 1991; Cornell and Lomas 1995; Morley 1996; Parkins 1997; Parkins and Smith 1998). Others seem to misunderstand the issues, as when Mogens Hansen (2004: 33) concludes that "the concept of the consumption city does not fit the great majority of Classical Greek *poleis*." Hansen began from philology not sociology: noting that most of the settlements that Greeks called *poleis* had small populations, he concluded that Greek cities were self-sufficient. But the issue for urban history is not how Greeks used terminology (clearly, very loosely); it is the economic relationships that made possible the emergence of increasingly large cities, and Weber's categories are crucial for explaining these.

I make three arguments: (1) the most important ancient Greek cities were always consumer cities; (2) the size of Greek cities was a function of imperial power; and (3) until late in the first millennium BC, Greek cities were politically and militarily weak, and consequently remained small. Only when the Greeks entered the framework of the Persian Empire did super-cities become possible.

I begin with a brief review of the environmental parameters of Greek urbanism, and then survey settlement growth across the first millennium BC.

## **1. The parameters of Greek urban growth**

### *(a) Natural environment*

Ecologists define Mediterranean climates as having (a) sufficient rain for dry-farming in most years, but not enough for dense forests; (b) mild winters; and (c) at least two-thirds of precipitation falling in the winter, with a hot, dry summer (Milliman et al. 1992). In ancient times as in modern, much of Greece met this definition, though the climate in the northwest is more Balkan, with cooler weather and higher, more evenly distributed precipitation. Generally speaking, the lower the precipitation, the higher its variability from year to year. Between 1930 and 1961, rainfall around Athens varied so much that

barley failed one year in twenty, wheat one in four, and legumes three in four. Pollen samples, tree rings, and literary sources suggest that these figures are roughly applicable to antiquity (Garnsey 1988: 8-16). According to a third-century BC proverb, “the year makes the crop, not the soil” (Theophrastus, *History of Plants* 8.7.6).

In southern Greece ranges of hills and mountains divide up small plains, while farther north the plains are larger, and the northwest is mountainous and forested, with some fertile upland valleys. The geography, like the climate, is typically Mediterranean: traveling from the sea across agricultural plains and through semi-arid foothills into rugged mountains often requires just a few miles, and fertile farmland can be an easy day’s walk from high pastures. Between 750 and 500 BC tens of thousands of Greeks settled around the Mediterranean (Scheidel 2003), and by 400 probably one-third of all Greeks lived outside the Aegean. They favored zones like Sicily and southern Italy, ecologically similar to their homeland (cf. Braudel 1972: 25-85; Horden and Purcell 2000), but with larger plains and more reliable rainfall (De Angelis 2000). But their massive emigration to Egypt and the Middle East between 330 and 250 BC took them into very different zones.

#### (b) *Agricultural methods*

Dry-grain farming was the rule. There was some irrigation (Hanson 1995: 60-63), but it was not the norm. Manuring was intense, especially in classical times: intensive surveys have revealed “haloes” of low-density sherd scatters around higher-density “sites” (Snodgrass 1991; 1994; Bintliff 2002).

Literary sources and archaeological remains suggest that by 750 BC (and probably before) the staple food was barley bread, with some wheat. People generally preferred wheat, but barley’s resistance to fluctuations in rainfall made it the norm. Our evidence is poor, but the best guesses suggest that in good years the seed-yield to seed-sown ratio was around 4.8:1 for wheat and 6:1 for barley (Garnsey 1992: 148). The amount of seed sown per unit of land varied. Garnsey estimates yields of 625 kg/ha for wheat and 770 kg/ha for barley as possible averages for good years, and Sallares (1991: 79) suggests 400-600 kg/ha for wheat. Gallant (1991: 77) provides figures for 1911-1950 showing that average fields varied from area to area, ranging from 470 (Arcadia) to 903 kg/ha (Kavala) for wheat and from 529 (Corfu) to 1097 (Thessaly) for barley.

A farmer’s ability to produce beyond subsistence depended on skill, luck, and access to land and labor. In simulations, Gallant (1991: 60-112) suggests that typical family farms in classical Attica, working five or six hectares with little extra-familial labor, produced only small surpluses to sell in the city. He argues that sensible farmers stored as much grain as possible against the inevitable bad years.

There are too many unspecifiable variables for precise estimates of the costs of concentrating population. As a rough guide, though, farmers growing grain probably averaged production beyond subsistence, storage, and seed of around 10 percent. Some residents of ancient cities walked out to the fields and grew much of their own food; but to support 20,000 non-farmers, urban markets needed to draw in surpluses from 200,000 country folk. The costs depended on transport technology, rural population density, forms of urban control over rural production, and farmers’ assessments of the incentives for bringing grain to market. Laurence (1998: 134) suggests that in the Roman Empire, the cost of wheat would increase by 40 percent for every 100 miles it was moved by road, as

against 1.3 percent per 100 miles for sea transport. The scarcity of good roads within the Aegean (particularly earlier in the first millennium) and the often difficult terrain might have meant still higher costs for land transport.

Written sources suggest that classical and Hellenistic Greeks had a strong preference for urban living. In well populated countrysides, the costs of moving to a small city of fewer than 20,000 people were probably low. But as a city rose above that size, it needed to generate great wealth to pay prices high enough to attract food to its markets, or use political and/or legal means to extract food from the countryside.

### **3. City sizes**

#### **1. *The Dark Age (c. 1000-750 BC)***

(i) *Evidence.* The evidence is mainly archaeological. Writing disappeared after the destruction of the Bronze Age palaces around 1200 BC, only returning around 750 BC. Homer's *Iliad* and *Odyssey* probably date c. 750-700, but purport to describe a heroic age, probably based on the pre-1200 Bronze Age. Homer imagined small towns, but we do not know how they related to real Dark Age settlements.

Dark Age houses flimsy, and on long-lived urban sites survive poorly. Estimating populations depends on the distribution of settlement-type pottery, wells, and graves. This creates wide margins of error.

(ii) *General demography.* There were population movements and demographic decline after destructions around 1200 and again around 1100. Barely one-tenth as many sites are known from the eleventh century as from the thirteenth. Many systematic surveys reveal no Dark Age sites. Visibility problems may exaggerate the decline, though there is also evidence that surveys also under-represent earlier Bronze Age sites (Bintliff et al. 1999). But the general pattern is clear: occupation contracted on a few centers, leaving much of Greece lightly settled or even abandoned (Morris 2000: 195-207). Pollen data from Messenia even suggest that "During the Early Iron Age the landscape experienced the least intensive human impact of the last 4,000 years" (Zangger et al. 1997: 593).

(iii) *Urban demography.* Bronze Age towns were quite small: just eight hectares at Tiryns, twenty to thirty at Pylos, Thebes, and Troy, and a little more at Gla (Davis et al. 1997: 428-30; Jablonka 1996; Dickinson 1994: 78). None of these sites necessarily had a population above 10,000. The largest town, Knossos on Crete, had perhaps 15,000 residents (Whitelaw 2001).

After these towns declined in the twelfth century, most people lived in hamlets of a few dozen inhabitants, often lasting only a few generations (Whitley 1991). The Dark Age was a time of "a tiny population, based in small, widely separated settlements, with broad tracts of country having no permanent population" (Snodgrass 1993: 37). There may have been a shift toward mobile pastoralism after 1200 (Snodgrass 1987: 189-99), but interregional variations outweigh diachronic in the limited first-millennium evidence (Legouilloux 2000).

But there were also larger sites. Finds cover 50 hectares at Argos. 100 at Knossos, and 200 at Athens. As noted above, Athens and perhaps Knossos push the limits of Fletcher's model, but our evidence—scatters of find spots—may be misleading. Knossos may have been compact, but Athens and Argos probably consisted of clusters of villages

separated by open spaces. On the mainland the few excavated houses are chiefly oval and apsidal, with open areas around them, although on Crete rectilinear houses were more tightly packed (Mazarakis Ainian 1997). City-wide densities were perhaps as low as 12.5-25 p/ha, perhaps even falling below Fletcher's 10 p/ha cut-off; but population probably never fell below 600-1,200 people at Argos, 1,250-2,500 at Knossos, and 2,500-5,000 at Athens (Morris 1991: 29-34). Lefkandi may have been the biggest site in the tenth and ninth centuries, but we cannot yet even guess its population.

(iv) *Political structures/markets*. Snodgrass (1971; 1977) interpreted Dark Age burials as evidence for an egalitarian society, but I have argued that hidden selectivity masked a rank distinction between better-off peasants and a dependent lower class (Morris 1987). The likely size of Athens, Argos, and Knossos and the scale of the Toumba building and mound at Lefkandi (Popham et al. 1993) also imply hierarchies. The distribution of Dark Age burial customs and pottery styles sometimes corresponds to later political boundaries, and similar (but weaker) political units possibly existed before 750 (Coldstream 1983; cf. Morgan and Whitelaw 1991). But there are no indications that Dark Age leaders wielded state-level political or military powers. Historians often interpret Homer's epics as evidence that by 800 Greece was dominated by loose social groups headed by chiefs, who might muster warriors for raids and vendettas, and monopolized some legal functions, but little more (e.g., Donlan 1989; Raaflaub 1997).

In most years, even Athens could support itself from its hinterland, but variations in rainfall would mean that local supplies sometimes failed. The same would be true for smaller villages. But farmers in other communities might have had bumper crops in the same year, and regional exchange systems must have developed. Already by c. 700 BC the poet Hesiod described seaborne trade (*Works and Days* 630-44), though he saw this more as a response to debt than a sound way to earn a living. His advice "admire a small ship, but put your cargo in a large one" (643) implies an important role for the rich. Chiefs may have coordinated long-distance movement of goods, through networks created by gift-giving (Tandy 1997: 93-111).

## 2. *Archaic Greece (c. 750-480 BC)*

(i) *Evidence*. Around 750 BC, writing reappeared in Greece. Thousands of inscribed lines survive, usually on potsherds (Jeffrey 1990), plus about 28,000 lines of Homer's *Iliad* and *Odyssey*, probably written down between 750 and 700; 2,000 lines of Hesiod, recorded a little later; and another 25,000 lines of other poets across the seventh and sixth centuries. Van Wees (1992: 269-71) estimates that Homer imagined Odysseus' Ithaca having about 600 inhabitants, while large cities (Troy, Pylos, Phaeacia) as having more like 4,000. But other than this guess, the texts are little help. Classical writers tell suggestive stories about the archaic period, but it is hard to evaluate such anecdotes (Thomas 1989).

Archaic houses were more robust than Dark Age, and villages have been excavated in the Cyclades. But apart from their monumental architecture, the major archaic centers, buried or destroyed by later activity, are poorly known. However, everything suggests that by 500 BC the major Greek cities were much larger than in 750.

(ii) *General demography*. There was rapid population growth in the late eighth century, particularly around the Aegean. Snodgrass (1977; 1980: 23-24) argued that in Attica, the 2,400km<sup>2</sup> territory around Athens, population increased seven-fold in two generations—i.e., at a rate of 4 percent per annum, as fast as human populations have ever been known to grow. He suggested an almost equal rate for Argos. Since significant immigration is unlikely (population grew all round Greece; there are no signs of movements into Greece; and there was major emigration to new Greek cities in the west Mediterranean), this would require spectacular birthrates. Osborne (1996a: 65) notes that if, as seems likely, life expectancy at birth ( $e_0$ ) was between 25 and 30 years, even a stable population required 4-5 live births per woman. Only by raising  $e_0$  to 37 years and hypothesizing 7 live births per woman can we reach 4 percent per annum growth.

Alternatively, death rates (especially infant mortality) may have fallen. But the burials do not support this. Between 900 and 725 only one burial in ten belongs to children, but after 725, the adult: child ratio is roughly even. Fifty percent child mortality rates are normal in pre-industrial societies, and there is no parallel for a rate of just 5-10 percent lasting nearly two centuries. The only plausible explanation is that before 725 the subadult burials had low archaeological visibility (Morris 1987; 1992: 78-80; 1998b). The increase in child burials around 725 tells us more about beliefs than about demography. Concluding that the Dark Age record under-represents the young roughly halves the rate of increase hypothesized by Snodgrass.

I have argued that class, as well as age, limited access to formal cemeteries in Dark Age Athens, and that only the wealthier 25-33 percent of the adult population is represented before 750, while after that date, all residents had access to the same cemeteries, causing the number of archaeologically visible burials to rise dramatically (Morris 1987). This undermines using burial numbers as demographic data, although it opens up new ways to interpret social structure.

(iii) *Urban demography*. But even without the burials, there is clear evidence for larger settlements in Aegean Greece. Eretria went from a scattering of huts around 850 to interlinked villages covering 100 hectares by 700 (Mazarakis Ainian 1987), with a population of perhaps 5,000. We cannot document density at other major centers, but I would guess that Athens reached 10,000 people by 700 BC. Corinth, Knossos, and Argos were surely at least as big as Eretria by 700 and there were probably dozens of communities like Smyrna, Thebes, and Miletus with populations over 1,000.

Later texts speak of *synoikismos*, population movements from villages to larger towns, but intensive surveys show that the number of minor sites also increased (e.g., Cherry et al. 1991: 327-47; Jameson et al. 1994: 372-81, 547-59; Ekroth 1996). Further, digs in Cycladic villages show them blossoming from a dozen or two houses around 800 into communities of hundreds by 700/650 (particularly Cambitoglou et al. 1988). Growth did not reach 4 percent per annum, but population probably doubled in the eighth century (Scheidel 2003; Morris, forthcoming), and affected all levels of the settlement hierarchy.

Large numbers of Greeks—particularly from Eretria, Chalcis, and Corinth—emigrated to new homes in Sicily and southern Italy. The first western *apoikia* (“home away from home”), Pithekoussai, probably had 4,000-5,000 residents in the late eighth century (Morris 1996: 57). These may not all have been Greeks, and other settlements were smaller. De Angelis (2003: 40-71) suggests that Megara Hyblaea,

founded in 728, began with just 240-320 settlers, growing to about 2,000 by 625 BC. But if we assume that the 23 or 24 *apoikiai* founded by c. 700 BC (Graham 1982: 160-62) averaged just 500 colonists each, that would still mean that more than 10,000 Greeks emigrated in roughly fifty years.

In the eighth century the Greek world changed from one of villages to one of towns. But the seventh-century evidence is confusing. In some areas, numbers of graves decline, and Camp (1979) argued from this and closures of wells in Athens that a drought wiped out much of the population, driving others to emigrate. Eretria seems almost abandoned between 700 and 550, despite having strong fortifications and a flourishing sanctuary. Still more baffling is the disappearance of most evidence from Crete around 600, even though sixth-century inscriptions are abundant (Morris 1998a: 66-68). Meanwhile, Smyrna, Corinth, and other towns flourished (Akurgal 1983; Salmon 1984). The peculiar regional patterns and the prominence of certain kinds of evidence suggest that we are again dealing with problems of social change, archaeological dating, and new forms of deposits, rather than with direct evidence for demography (Snodgrass 1983; Morris 1987: 156-67; 1998a: 77; Erickson, forthcoming). These problems need closer study.

After the rapid late eighth-century growth and the confusion of the seventh-century evidence, there are signs of another major change in the later sixth century. Snodgrass rightly observes that “whatever factors made possible the achievement of Archaic Greece, an advanced urban culture was not one of them” (1980: 157-58), but by 550 more urban amenities were appearing, and signs of clearer political and religious distinctions between town and country. Most late sixth-century cities had a formal *agora* for political, commercial, and religious activity, bordered by temples and public buildings. At Athens, the Pisistratid tyrants (546-510) built fountain houses and clay pipes to carry water across the city (Shapiro 1989; Thompson and Wycherley 1972). Athens probably had 20,000 residents by 500, and Corinth was probably roughly the same size.

It seems that Greeks in towns like Corinth, Argos, Athens, and Eretria rapidly created a new I-C assemblage between 750 and 700 BC. I have argued elsewhere that this was a time of intense anxiety, competition, and experiment, and that in some parts of central Greece (notably Athens) the shift toward a new cultural order was actually reversed in the seventh century (Morris 1987; 1998a; 2000: 287-305). The cultural traits which proved adaptively advantageous in the eighth century—the alphabet, new artistic and symbolic systems, rectilinear houses, monumental temples, and a culture of egalitarian male citizenship—continued to evolve across the archaic period, but the structural revolution of 750-700 nonetheless challenges Fletcher’s Darwinian model of transitions to new levels of integration (Snodgrass 1980; Morris 1998a; 2000: 155-91, 257-86).

(iv) *Political structures/markets*. Political organization changed massively between 800 and 500. Controlling dependent labor in a largely empty landscape must have been a major issue for Dark Age elites, but by 700 Greece was getting crowded, and institutions forged in the tenth and ninth centuries were becoming unsuitable. Snodgrass (1980: 15-84) suggests that the population pressure drove warfare, political centralization, greater hierarchy, and cultural innovations to justify the new order. There is some evidence that

people started identifying more strongly with specific territories and frontiers (de Polignac 1995). Archaic Greek states generally lacked coercive power (Snodgrass 1980: 85-122; Morris 1991: 43-49), but by the late sixth century a powerful tyrant like Polycrates of Samos could mobilize resources for substantial public works and a state navy (Herodotus 2.148; 3.39-40, 60).

The spending power of successful governments made their cities attractive places to settle, and trade networks to supply cities with food improved. Around 525 Athenian painted pots for the first time show pictures of round, sail-driven merchant ships, as distinct from warships, which seem to have doubled as trading ships until this period (Casson 1971; cf. Herodotus 1.163). Plutarch (*Pericles* 26), writing around AD 100, adds that the Samians invented merchantmen (thereafter known as *samaina*) in the sixth century.

Around 525-500, even major centers like Athens and Corinth could still feed themselves from their hinterlands in good years. Garnsey (1988: 104) suggests that Attica could feed 120,000-150,000 people, and Sallares (1991: 79) estimates 84,000-124,000. If their figures are roughly right, then by 500 Athens was reaching the point that food imports would be required in most years.

Plutarch (*Solon* 24) describes an Athenian law was passed in 594 prohibiting all agricultural products except olive oil, which some historians take as evidence of early problems with food supply. However, as Garnsey (1988: 111) notes, this law—assuming it is genuine—makes most sense as protection against exporting grain in agricultural bad years.

Other anecdotes may indicate increasing difficulty feeding Athens during the sixth century. A story in Aristotle's *Constitution of Athens* (16.6) mentions the tyrant Pisistratus meeting a farmer working particularly infertile soil, which some see as evidence for extension of cultivation into marginal land; and Herodotus (5.94-95) says that Pisistratus established a military base at Sigeion, not far from the route Black Sea grain ships would take regularly in classical times. However, there are three problems with interpreting this as evidence for state interest in the food supply by 550: (a) Herodotus was confused about chronology; (b) Sigeion is not directly on the trade route; and (c) there is no evidence for Black Sea connections with Athens so early (Tsatskhladze 1998). The story that Xerxes of Persia saw grain ships from the Black Sea bound for Greece in 480 (Herodotus 7.147) may be more relevant, but again there are three problems: (a) this may have been part of preparations to meet the Persian invasion; (b) it may have been part of a response to a poor agricultural year; and (c) Herodotus says the ships were bound for Aegina and the Peloponnese, not Athens.

These snippets are suggestive, but no more. *If* by 500 Athens had a population of about 20,000, and *if* the total population of Attica was approximately 150,000, and *if* Attica's carrying capacity was 120,000-150,000—all statements open to challenge—then late sixth-century Athens was starting to depend on grain imports every year. At this period, Athens' ability to attract imports probably combined elements of Weber's producer and merchant cities. Athens was a center for certain manufactures, particularly ceramic tablewares. The number of artisans involved was small (Cook 1959) and prices low (Vickers and Gill 1994), but there are indications that the trade was profitable and market-oriented (Osborne 1996b). Athenian olive oil was also widely traded. More importantly, silver mining intensified after 550. By 483, the mines were highly

productive. There was a huge windfall that year, which the Athenians used to finance a state navy (Herodotus 7.144; Aristotle, *Constitution of Athens* 22.7). If, as in classical times, *rentiers* living in Athens controlled most mines, this combination of income flows probably already made Athens Greece's richest city.

If Athens needed regular food imports by 500, selling value-added goods paid for them. Whether the city could have expanded further on this base, we simply do not know, because the Persian War of 480-479 transformed it into an imperial power.

(v) *Sparta*. The one archaic community that could exploit a large agricultural hinterland through taxes and rents was Sparta. The Spartans conquered Laconia in the ninth century and neighboring Messenia in the eighth and seventh, reducing their populations to serfdom. These dependents (helots) worked the land as sharecroppers (Hodkinson 2000: 113-51). Spartans fought wars of annexation until their military power reached its limits in the 560s (Herodotus 1.65-66), then changed strategy. By the 530s they had "subjugated most of the Peloponnese" (Herodotus 1.68), more through diplomacy and bullying than direct warfare.

Sparta had an enormous supply zone, operating through coercion, not markets. Spartan ideology held that no full male citizen (Spartiate) engaged in manual labor. According to legend, there were originally 9,000 Spartiates (Plutarch, *Lycurgus* 8). The sources describe ritual systems that would require the Spartiates to live close together, and anecdotes imply that they and their families lived in the town of Sparta (e.g., Plutarch, *Cimon* 16). Sparta would then have had some 20,000-35,000 free residents around 500 BC, plus numerous helots and *perioikoi* ("dwellers around"). At 40,000+ it would have been by far the largest Greek city.

This is possible; we know almost nothing of the archaic city's layout. Herodotus (1.56) says that Sparta and Athens were the major Greek states in the 540s, but no more than that. But Thucydides' famous comment (1.10) around 400 BC that if "the city of Sparta were to become deserted and only the temples and foundations of buildings remained, I think that future generations would, as time passed, find it very difficult to believe that the place had really been as powerful as it was represented to be," does not sound like a major population center. Possibly the Spartiates and their families did not all live in Sparta. Transporting food for 40,000+ people to Sparta would have been difficult: the social cost of dispersed settlement, closer to the sources of food, may have been lower than the physical cost of having helots move bulk commodities overland (particularly if the Spartiates still lived close enough to Sparta to participate in communal rituals).

### 3. *Classical Greece (480-323 BC)*

(i) *Evidence*. The classical written sources are fuller than the archaic. Much information comes from military figures, requiring untestable extrapolations to reach total populations, but do establish approximate scales. Beloch (1886) and Gomme (1933) scrupulously assessed these data. The archaeological record is also richer, including city walls, which sometimes give a rough sense of the settled area (Muggia 1997; Hansen 2004: 33-40), and numerous excavated houses. The most important evidence comes from highly intensive surveys, using sophisticated methods to deal with high-density urban sites (Bintliff and Snodgrass 1988; Alcock 1991).

(ii) *General demography*. As in archaic times, population growth was uneven (Bintliff 1997). The Aegean grew fastest in the fifth century, though in the fourth century the north and west caught up. Growth was also concentrated on a few major centers. Ruschenbusch (1983; 1984; 1985) has argued that the typical city-state had fewer than 6,000 citizens in a territory of just a few hundred square kilometers. Some of his calculations are questionable (Nixon and Price 1990: 158-62), but the general picture seems plausible. The “urban” centers of most city-states probably numbered just a thousand or two. These were large villages, not cities, feeding themselves in most years.

Surveys have revealed strong growth in rural settlement (Alcock [1993: 33-49] summarizes the data; add Jameson et al. 1994; Lohmann 1995; Wells 1996; Davis et al. 1997). In the southern Argolid, the ratio of third-order (probably farmstead) to second-order (village) sites rose from three to one in archaic times to six to one in classical (c. 500-350 BC), and ten to one in late classical/early Hellenistic (c. 350-250 BC; Jameson et al. 1994: 383).

Everything about this development is disputed. Some scholars argue that few third-order sites were actual farms (e.g., Osborne 1992), but in southern Attica, where walls can be seen on the surface, many were definitely residential/production units (Lohmann 1993). There are also differences over chronology, which may reflect regional variations or dating problems. In southern Attica, dispersed settlement began around 500, lasting till 300; while in the southern Argolid, Berbati/Limnes in the northern Argolid, and on the Skourta plain, it begins around 350, lasting till 250 or 200 (Lohmann 1993; Jameson et al. 1994: 383-94; Penttinen 1996: 271-73, 278-81; Munn and Zimmermann-Munn 1989: 100-110, 122-23).

The shifts were partial. At Koressos, Cherry et al. (1991: 337) estimate that at the height of dispersion, three-quarters of the population still lived in the main town (population 900-1,200). But even a shift of residence by 10-15 percent of the population could have serious consequences. A “new model” of classical agriculture envisages farmers working contiguous fields, pasturing animals on them, and using manure to reduce fallow (e.g., Hodkinson 1988). Some historians argue that these agricultural changes shifted political power toward the middling citizens, fueling the rise of democratic institutions (Hodkinson 1992; Morris 1994a: 363-66; Hanson 1995: 41-89).

The larger rural populations of the fourth and perhaps fifth centuries could support larger urban populations. At Sparta, the number of full citizens shrank during classical times, largely because inheritance laws made it easy to concentrate property, and Spartiates whose estates could not support their mess contributions lost their citizen status (Hodkinson 2000). 5,000 Spartiates fought at Plataea in 479 BC (Herodotus 9.10), but by the battle of Leuctra in 371 there were only 1,200 Spartiates, 400 of whom died on the field (Xenophon, *Hellenica* 6.4.15). This decline may mean that the town of Sparta also shrank, though given the uncertainties discussed above, there is currently no way to know.

(iii) *Urban demography*. At Athens, by contrast, population increased sharply in the fifth century, definitely outgrowing local agricultural resources. Several texts provide military strengths (especially Thucydides 2.13, for 431 BC), and historians have extrapolated to total numbers of citizens, citizen families, resident aliens, and slaves. Estimates vary. For

the likely highpoint, in 431, Gomme (1933: 26) suggested 315,500 people in Attica, while Hansen (1986) counted 350,000. The plague of 430-428 and heavy losses among poor rowers during the Peloponnesian War (431-404; Strauss 1986: 70-86) reduced Athenian population. For 323 BC, at the death of Alexander, Gomme estimated 258,000. Garnsey (1988: 90) suggested much lower figures, of just 160,000 to 172,000 in 431, and 84,000-120,000 in the fourth century, but did not argue the case in detail. There is a wide margin of error in these guesses, but all agree that Attica was densely populated. Following Beloch (1886: 56-57) in calculating the area of Attica at 2,527 km<sup>2</sup>, Garnsey's figures give a density of 104 persons/km<sup>2</sup>, Gomme's give 125, and Hansen's 139. Jardé (1925: 142-43) estimated Attica's carrying capacity as 33 persons/km<sup>2</sup>, and Garnsey 42/km<sup>2</sup>. Sallares (1991: 72) agrees on 35-42/km<sup>2</sup>. Even in the best years during the 430s, Attica imported two-thirds to three-quarters of its food.

Gomme estimated the combined urban population of Athens and Piraeus at 155,000 in 430 BC, and 168,000 in 330. However, his only arguments were that "We may assume, I think, rather over a third of the citizen population ... to have been living in the town-area by 430, [and] nearly a half, say 50,000[,] a hundred years later" (1933: 47). However, the walls of Athens only enclose 215 hectares, of which 120 were used for domestic settlement. Travlos (1960: 71-72) estimated 36,000 people, or 170 p/ha. This is toward the high end of comparable figures (Fletcher 1995: 73-81), but plausible. There is little evidence for houses outside the walls, and I estimate the population at Athens around 430 BC at 35,000-40,000 (Morris 1987: 100). Piraeus was a distinct area, and probably had at least another 25,000 people (Garland [1987: 58] says "above the 30,000 mark," but without arguments).

These figures suggest that 10-25 percent of the Attic population lived at Athens, not the one-third Gomme suggested. The ancient texts are consistent with the lower figures. Thucydides (2.16) said that "most" Athenians lived in the countryside in 431, and in the fourth century Xenophon (*Hellenica* 2.4.8-9; 2.26) and Demosthenes (57.10) used similar expressions. Xenophon even says there were 10,000 households, presumably about 40,000 people, in early fourth-century Athens (*Memorabilia* 3.6.14), though this may be a purely conventional figure. Further, fourth-century quotas for the representation of different regions on the civic council suggest that one citizen in nine came from the city of Athens.

Athens, then, probably peaked at around 40,000 inhabitants in the 430s. The Spartan siege in 404 caused severe famine, and the city probably had a smaller (though not dramatically smaller) fourth-century population. Throughout classical times Athens depended not only on attracting grain from the Attic countryside but also on substantial imports from overseas, most famously from the Black Sea area.

In comparative terms, Athens was still small. So far as we know, the city never had the same health problems as Rome (Sallares 1991: 257; but cf. Laurence 1997). Athens did employ *koprologoi* to dispose of human waste (Aristotle, *Constitution of Athens* 50.2), and suffered a devastating epidemic in 430-427 BC (Thucydides 2.47-55; Sallares 1991: 244-65). Thucydides comments that overcrowding exacerbated the epidemic, but this was unusual: beginning in 431, the city received an influx of refugees from Spartan invasions of the countryside. Emphasizing the peculiarity of the epidemic, Thucydides (2.53) observed that law and order broke down, and everyone acted as if each day were their last. But after 427 these urban ills are never mentioned again, even during

the period 413-404 when the Spartans occupied Decelea and refugees settled in Athens year-round.

Athens' growth to 40,000 people was not a transformation from a large archaic town into a sink-hole of mortality like Rome, but it nonetheless involved crossing a threshold. No archaic city had played such an economic role, or integrated the surpluses of such a large area. Even after 404 Athens' population probably never fell below 25,000, and it remained the major market.

The other example of major classical urban growth is Syracuse on Sicily. Beginning in 485 BC, its tyrant Gelon forcibly moved the population of Camarina to Syracuse, and then the richer citizens of Megara Hyblaea and Euboea, selling the poor into slavery (Herodotus 7.156). Around 475, Pindar (*Pythian* 2.1) already spoke of Syracuse's great size, and Diodorus of Sicily (11.72) commented that by 463 the population had grown greatly through imports of slaves. Thucydides (6.17) had Alcibiades refer to the swollen populations of Sicilian cities in a speech set in 415 BC, and speaking in his own voice observed that in 413 Syracuse was no smaller than Athens (7.28). Beloch (1886: 281) estimated the population of Syracusan territory at 250,000 in 415, a density of 53-75/km<sup>2</sup>. The fifth-century walls encircled 120 hectares, but by the 470s settlement had spread beyond them (Finley 1979: 52). If the urban density was like that Athens', the population of the city itself was also about 40,000.

Syracuse withstood an Athenian siege in 415-413, which must have reduced its population, and in 405 the citizens of Camarina and Gela who had been moved to Syracuse escaped to Leontini (Diodorus 13.113). But the new tyrant Dionysius I (405-367) took Syracuse from strength to strength. Plato could even say that he "united all Sicily into a single city" (*Letters* 7.332c). He incorporated freed slaves into the population and made new relocations (Diodorus 14.7, 14-15, 106-111). He substantially extended the city walls to protect his new community. We cannot make a precise estimate for Dionysius' city, but it was clearly larger than that of 415. It was probably the first Greek settlement to exceed 50,000 people, and may indeed have reached Beloch's estimate (1886: 281) of 100,000.

Most Sicilian cities had 10,000-20,000 residents (Muggia 197: 116-48). At least five had walls enclosing 100+ hectares, although normally only about half was used for housing (Muggia 1997). Diodorus (13.57) says that when Carthage sacked Selinus in 409, there were 21,000 people within its walls. Many were probably rural refugees, and De Angelis (2003: 146-49) estimates the normal urban population as 6,664-10,000.

The texts suggest that the fourth-century wars that swelled Syracuse's population brought ruin to the rest of Greek Sicily (Diodorus 14.66). Plutarch (*Timoleon* 1, 23) even calls Sicily *apolis*, "cityless," by 350. The causes, scale, and even historicity of this urban crisis are open to debate; and in any case, it was apparently short-lived. According to Plutarch (*Timoleon* 23) and Diodorus (16.82), drawing on the contemporary writer Athanis, by 337 BC Timoleon of Corinth had brought 60,000 colonists from Greece to Sicily and resettled the cities. Archaeological evidence shows flourishing cities in the late fourth century (Talbert 1974: 146-60). Beloch (1886: 281) suggested that Syracuse held 200,000 people by 300 BC.

(iv) *Political structures/markets*. Athens and Syracuse stand out from other classical Greek cities: both were imperial administrative centers. In 478, Athens took over the

league that had been formed in 481 to resist Persia. By 441 BC, it included 205 communities, nearly all paying tribute, which funded a league fleet. Most contributions were small, but the total, 407 talents of silver, was enough to feed 7,000-10,000 people at subsistence level for a year, and supported the greatest navy in the Mediterranean. Most ships were Athenian, and most of the revenues flowed into the pockets of Athenians who rowed them (Gabrielsen 1994). Athens taxed movements of goods within the empire, and diverted other economic benefits to the center (Morris 2001). According to Aristotle (*Constitution of Athens* 24.3; cf. Aristophanes, *Wasps* 656-63, 707-11), this produced enough wealth to support 20,000 people. Ancient figures are problematic, but the empire did inject major resources into Athens. More people than ever before earned or supplemented their income through industrial activity or state pay (Raaflaub 1998: 22-26).

Athens drew in food because it could pay. It was a classic consumer city in the fifth century, extracting wealth from administering the empire and using it to buy agricultural goods. Thucydides (2.38) had Pericles say in a speech set in 430 that “The greatness of our city brings it about that all the good things from all over the world flow in to us, so that to us it seems just as natural to enjoy foreign goods as our own local products.” The money in Athenian hands drew traders from all over the Mediterranean, and the city’s large population made grain was one of the most profitable commodities. At least in the fourth century, the Athenian Assembly discussed the state of the grain supply every month (Aristotle, *Constitution of Athens* 43.4; cf. Xenophon, *Memorabilia* 3.6.13; Aristotle, *Rhetoric* 1.4.7, 11). Further, Athenian law required any trader using Athenian shipping or finance to unload his entire grain shipment at Piraeus (Gauthier 1981); and while the Athenians did not directly use the fleet to bring grain to Athens, they regularly intervened against threats to the grain supply (Garnsey 1988: 120-23). The Old Oligarch (2.11-12), probably writing in the 430s, recognized the fleet’s role in guaranteeing that all the world’s goods flowed through Athens. When Sparta captured the Athenian fleet in 405 and cut the Black Sea supply line, Athens rapidly succumbed.

The loss of empire in 404 interrupted but did not destroy Athens’ trading relationships, and by 380 Isocrates (4.42) could once again celebrate Piraeus as “the market place in the middle of Greece.” But shorn of its empire, Athens began to look less like Weber’s model of a consumer city and more like his producer city. The Athenians increased silver production (particularly in the 350s) and organized state revenues more efficiently (particularly in the 330s). But these steps never fully compensate for the loss of imperial revenues. Population never returned to pre-431 levels, and state finances were in constant crisis. Most important of all, the loss of naval supremacy meant that supplies were constantly threatened (Garnsey 1988: 134-64).

Syracuse’s food supply has received less attention, although the city not only fed itself but was also a food exporter. Herodotus (7.158) says that in 480 Gelon offered grain for the entire Greek army fighting Persia, and according to Thucydides (3.27), one reason for Athenian intervention in Sicily in 427 was to cut off grain exports to the Peloponnese. In the late fourth century there is abundant evidence for Sicilian grain coming to Athens (Garnsey 1988: 151-52; Habicht 1997: 26-27, 69).

Like Athens, Syracuse drew wealth from its empire, paying much of it to poorer citizens working as wage-laborers on vast building projects (e.g., Diodorus 15.13), although Syracuse never instituted pay for public office. Also like Athens, Syracuse was

a major naval power. Asheri (1992: 151) speaks of the Tyrrhenian Sea “becoming a Syracusan lake” in the 470s. In 453, Syracusan fleets ravaged Elba and Corsica, and in 439 Syracuse built 100 triremes (Diodorus 11.88; 12.30). This fleet defeated Athens in 413 (Thucydides 7.31-41, 59-71), and Dionysius I built a further 200 ships in 385 (Diodorus 15.13).

But despite these similarities to Athens, Syracuse was probably supplied largely by land, despite the higher transport costs. Its territory covered 4,685 km<sup>2</sup>, more than twice the area of Attica, and Diodorus (11.72) commented on Syracusan farms’ wealth in 463. Plutarch (*Moralia* 551F) preserves a tradition that the tyrant Hiero (478-467) promoted husbandry, and all the Syracusan tyrants redistributed land. Some of Syracuse’s territory was worked by non-Greek serfs called Killyrioi (Herodotus 7.155), recalling Sparta’s helots. Di Vita (1956) suggested that these serfs farmed the territories of cities whose populations were relocated to Syracuse, sending part of the produce to the main city. The tyrants founded new cities, such as Aetna in 476, for which Hieron confiscated native lands and divided them up into 10,000 properties (Diodorus 11.49). These new cities probably also supplied Syracuse. The tyrants placed Syracusan officials or puppet kings in other conquered cities, and Syracusan coins attest trade with the Sicels of the interior (Jenkins 1975; Ampolo 1984).

Like fifth-century Athens, Syracuse was very much a consumer city. The wealth of empire flowed to a famously rich urban administrative elite (e.g., Plutarch, *Dion* 6, 15). They spent lavishly on retainers and public buildings, making money available to poorer citizens to buy food brought in from other parts of Sicily. Only Athens and Syracuse, the administrative centers of revenue-generating empires, broke through the carrying capacity of their immediate hinterlands to become cities of 40,000+. Other militarily strong cities, like Sparta in the sixth and early-fourth century or Thebes in the 360s, did not make this breakthrough, because they did not administer other cities so as to channel wealth back to the metropolis and into the pockets of urban consumers. The fifth-century wall at Thebes incorporates 328 hectares, but Symeonoglou (1985: 119) notes that only a quarter was settled. He estimates the population at 20,000 by 431 and nearly 25,000 in 362 (1985: 203-6). He assumed densities of 300 p/ha, which seems high, and 15,000-20,000, comfortably supportable by Thebes’ hinterland in good years, may be more realistic.

#### 4. *Hellenistic Greece (323-31 BC)*

(i) *Evidence.* Polybius and Diodorus provide narratives of parts of this period, and there are many inscriptions. As in classical times, however, the sources rarely give population figures; and when writers like Strabo and Pliny the Elder do so, they are rarely believable. Archaeology continues to be crucial, although Hellenistic levels typically receive less attention from excavators than earlier phases (particularly in Egypt and the Middle East).

(ii) *General demography.* A massive emigration of Greeks and Macedonians followed Alexander’s conquest of the Persian Empire between 335 and 323, only slowing after 250 (Billows 1995: 146-82). Demographic trends in the Seleucid Empire varied from region

to region (Alcock 1994), but on the whole there was population growth, urbanization, and more intensive agriculture (Aperghis 2001).

Survey data reveal a crowded and thriving countryside of small towns, villages, and farmsteads in the Aegean in the fourth and early-third centuries; but by the later third century decline had set in, and many sites were abandoned (Alcock 1993: 33-49; 1994: 177-80). Alcock (1993: 49-55) rightly warns against simply equating site numbers with population size, but the survey findings are consistent with textual accounts of decline. Around 150 BC, Polybius wrote that

In our time the whole of Greece has been subject to a low birth rate and a general decrease of the population, owing to which cities have become deserted and the land has ceased to yield fruit, although there have neither been continuous wars nor epidemics ... as men had fallen into such a state of pretentiousness, avarice, and indolence that they did not wish to marry, or if they married to rear the children born to them, or at most as a rule but one or two of them, so as to leave these in affluence and bring them up to waste their substance, the evil rapidly and insensibly grew. For in cases where of one or two children the one was carried off by war and the other by sickness, it is evident that the houses must have been left unoccupied, and as in the case of swarms of bees, so by small degrees cities became resourceless and feeble. (Polybius 36.17)

Small sites were particularly affected: in the southern Argolid, over half of the probable farmsteads used between 350 and 250 BC were abandoned by 200 (Jameson et al. 1994: 394). This picture of an emptying countryside is consistent with texts like Dio Chrysostom's *Euboean Discourse*, in which an imaginary local notable said

... almost two thirds of our land is a wilderness because of neglect and lack of population. I too own many acres, as I imagine some others do, not only in the mountains but also in the plains, and if anybody would till them, I should not only give him the chance for nothing but gladly pay money besides. (Dio Chrysostom, *Oration* 7.34-35)

Despite Polybius' denial, internal wars and major conflicts with Rome in the second century BC probably did accelerate decline. One Roman raid in 167 carried off 150,000 people from Epirus (Livy 45.33-34), and in 146 Rome massacred or sold into slavery the entire population of Corinth (Pausanias 7.16.7-10). Roman absentee landlordism prevailed (e.g., Strabo 10.2.13; Nepos, *Atticus* 14.2; Alcock 1993: 72-92), and Sulla's Greek wars in the 80s BC, including a sack of Athens in 86, exacerbated problems (Appian, *Roman History* 12.9.61-63).

Sicily suffered similarly. The First Punic War (264-246 BC) was fought mainly in western Sicily. Akragas and Selinous never recovered from their sacks, and there was a general population decline (Gallo 1994). Rome left many institutions untouched after Sicily became a province in 227, but much land was divided into vast slave-worked *latifundia*, supplying Rome's urban markets (Serrati 2000). The biggest slave revolts in history erupted on these estates in 133 and 104 BC (Diodorus 34). Syracuse had joined Rome in 263, and was rewarded, but defected to Hannibal in 216 and was brutally sacked

in 212 (Polybius 7.14b; 8.3a, 37; 9.10; Livy 24.21-39; 25.23-31; 26.21; Plutarch, *Marcellus* 13-21). In the second and first century many coastal cities flourished while the older hill cities declined, but we know little about the countryside (Wilson 1990: 17-32; 2000).

(iii) *Urban demography*. The Aegean cities declined. Some time after 294, Heraclides of Crete visited Athens, commenting that “The city itself is all dry and does not have a good water supply; the streets are narrow and winding, as they were built long ago. Most of the houses are cheaply built, and only a few reach a higher standard; a stranger would find it hard to believe at first sight that this was the famous city of Athens.” He added that “The produce of the land is all priceless and delicious to taste, though in rather short supply” (Heraclides 1.1-2 = Austin 1981: no. 83). Throughout the third and much of the second century, Athens faced regular food shortages (Garnsey 1988: 163-64) and often depended on gifts from Hellenistic kings. After Sulla’s sack in 86, its dependence on Roman largesse was near-total (Habicht 1997: 328-37). By 150 BC, Athens probably had fewer than 10,000 residents, and there is no reason to think that other cities were any larger. Symeonoglou (1985: 207) suggests that Hellenistic Thebes never surpassed 5,000 people.

Roman interventions transformed the urban system in the later first century BC. Julius Caesar founded a colony at Corinth in 44, and Augustus set up new cities at Nicopolis (soon after 31) and Patrai (by 14). Strabo described all three as populous (8.6.23; 7.7.5-6; 8.7.5). Engels (1990: 84) estimates the settled area of Corinth as 525 hectares by AD 150 and extrapolates to a population of 80,000. Both figures can be questioned, but even if only half that size, Roman Corinth was one of the largest cities in mainland Greece’s history.

Alexander established at least twenty new cities in the former Persian Empire (the number is disputed: see Fraser 1996), and settled them with his own soldiers and populations drawn from the local region. Most failed, but a few flourished, drawing immigrants from the old Graeco-Macedonian world. The most important were Alexandria in Egypt, founded in 331, and Seleucus’ foundations Seleucia-on-the-Tigris (305; modern Tell Ubar) and Antioch (300).

We have little literary or archaeological evidence for Alexandria’s earliest history (Fraser 1972.I: 3-7; Hoepfner 1990; Grimm 1996), although the situation is improving (Empereur 1998). Strabo (17.1.8) and Diodorus (17.52) both say Alexandria replaced Memphis as Egypt’s capital in 331, and commercial prospects drove Alexander’s choice of site (Plutarch, *Alexander* 26; Arrian, *Anabasis* 3.1-2). Curtius (*History of Alexander* 4.8.5) says Alexander “provided the city with a large population” by forcibly emptying local cities. Public building boomed during the third century (Fraser 1972.I: 12, 20, 21, 28, 36), and the city drew many Greek immigrants (Fraser 1972.I: 63). Scheidel (forthcoming) makes a strong case that population grew to 300,000 by 250 BC, then increased more slowly, to perhaps 400,000.

Ancient historians are normally skeptical about numbers reported in texts, but some believe that the Egyptian censuses were surprisingly accurate (Bagnall and Frier 1994), although others identify problems (Scheidel 2001: 118-62). For what the reports are worth, Diodorus visited Alexandria in 60 BC, and said that census returns put the free population at 300,000 (17.52). Strabo visited between 24 and 20 BC, and estimated total population at 500,000 (16.2.5). Both men called Alexandria the biggest city in the world,

which would mean that its population surpassed Rome's. The *Gerousia Acts* papyrus speaks of 180,000 citizens at Alexandria voting in AD 37, which would mean a population close to a million (Rostovtzeff 1941: 1138-39), but few experts accept this figure.

Unlike earlier Greek cities, Alexandria was famous for urban problems, particularly street violence. Polybius (15.33) described especially gory murders around 200 BC, and Diodorus (1.83) mentioned a Roman being lynched for killing a sacred cat. Nearly a millennium after the city's foundation, Socrates (*History of the Church* 7.13) commented that Alexandria had always been more violent and anarchic than any other city (Barry 1993).

In western Asia the Macedonians took over the oldest and densest urban system in the ancient world. As early as 2800 BC, the walls of Uruk had enclosed 494 hectares, and those of the seventh-century Assyrian capital Nineveh encircled 750 hectares. According to Jonah (3.3) the city was "three days' walk across," with a population of 120,000 (4.11). Modern estimates vary from 75,000 to 350,000 (van de Mieroop 1997: 97 n. 19). Nineveh was destroyed in 612 BC, but fifth-century Babylon was even larger. Its outer wall enclosed 890 hectares (Wiseman 1985; George 1993). Herodotus (1.178, 191) was astonished by Babylon's size, and according to Aristotle (*Politics* 1276a30) when Cyrus of Persia captured Babylon in 539 BC it took three days for the news to reach some of its neighborhoods. The problems of estimating population are particularly acute in Mesopotamia (Postgate 1994; van de Mieroop 1997: 97), but probably at least 100,000 people lived in Babylon on the eve of Alexander's conquest.

The Hellenistic cities created on this foundation were on a similar scale to Alexandria. Strabo (16.2.5) thought that Antioch, Seleucia, and Alexandria were roughly the same size, though Antioch was slightly smaller, and around AD 70, Pliny said that Seleucia had a population of 600,000 (*Natural History* 6.122). Seleucia's remains cover an enormous area, but little has so far been excavated (Hopkins 1972).

Pliny added that Seleucus created Seleucia in order to empty Babylon, just forty miles away. Alexander certainly moved part of Babylon's population to Seleucia (Pausanias 1.16.3), and Antiochus I moved more in 273 (Austin 1981: no. 141). But Babylon (along with other nearby cities, including Uruk) remained a major center until the Parthian sack of 126 BC (van der Spek 1987; Sherwin-White and Kuhrt 1993: 149-61). Most likely Seleucus created Seleucia to support assumption of the title *basileus* or "king" (Sherwin-White 1987: 18-20).

The original Antioch probably covered less than 90 hectares (Will 2000), and its serious growth only began in the 230s, as wars with Ptolemy III undermined other Syrian cities. In the 180s Antiochus III settled mainland Greek refugees there (Libanius, *Oration* 11.205-7). Around 170 Antiochus IV expanded the city and built a new aqueduct, making Antioch for the first time a serious rival to Alexandria (Grainger 1990: 124-26; Will 1990). By then it had eclipsed the other cities Seleucus founded in Syria, although a census in AD 6/7 nevertheless recorded 117,000 people at Apamea (Dessau 1892-1916: no. 2683).

(iv) *Political structures/markets*. The major Hellenistic phenomenon was the creation of larger Greek empires than ever before. The Macedonians and Greeks who took over Achaemenid Persia controlled far greater flows of wealth and resources than the Aegean

had ever seen, and took over established systems for supplying great cities with food. Van de Mieroop (1997: 166-67) suggests that food was brought to Babylon along a network of canals extending 200 km. North and South of the city, and documents describe merchants involved in this trade. According to Herodotus (1.192) fifth-century Babylonia fed not only its great city but also one-third of the Persian court and army, suggesting very high yields and efficient mobilization of surpluses. Over the next four centuries, the Greek-ruled metropolises in the former Persian Empire outstripped their Achaemenid predecessors.

The Greek world's political center-of-gravity drifted irresistibly toward west Asia and Egypt. Alexandria, Seleucia, and Antioch were administrative centers controlling vast regional networks, with access to navigable rivers and the sea. Athens, Thebes, and other old Greek cities were increasingly marginal after the 330s. Cut off from the wealth flowing through imperial cities, they went into decline, accelerated by rural problems and ruinous wars with Rome. Only at the end of the first century BC did cities revive in Aegean Greece, and then under direct Roman sponsorship. Diodorus (46.22-24) could celebrate Roman Corinth as the market to the world.

At Alexandria, we have some evidence on food supply (Rostovtzeff 1941: 909, 1273). At least in bad years, all grain exported from Egyptian estates had to come to the city, although as in classical Athens, this operation was left in private hands (Rostovtzeff 1941: 1551 n. 188). The Nile valley was densely settled. Diodorus (1.31) refers to 18,000 communities, with a population of 7,000,000; while in the late first century AD Josephus (*Jewish War* 2.385) said that the population outside Alexandria was 7,500,000. Scheidel (2001: 181-250) defends these figures, though other historians (e.g., Rathbone 1990; Bagnall and Frier 1994: 56, 103) lower the total to 4-5 million. In good years, this thriving agricultural zone not only fed Alexandria, but also exported grain.

There were significant improvements in transportation between the third and first centuries BC, particularly in Roman-controlled areas (Hopkins 1980; Parker 1992; Laurence 1998). Bigger ships sailed more often and more safely, and better roads reached further inland. In combination with the jump in the wealth Greek cities could commandeer, these developments shattered the classical barriers to demographic growth. The first Greek super-cities took shape after 300 BC.

## **5. Conclusion**

I draw seven conclusions from this review of the growth of Greek cities in the first millennium BC:

1. There were three major periods of transition in the growth of Greek cities, in the eighth, fifth, and late fourth/third centuries.
2. The eighth-century transition created the cultural framework (Fletcher's I-C assemblage) that sustained Greek urban life for the next thousand years.
3. The fifth-century transition allowed a few cities to capture imperial revenues, allowing them to grow well beyond the carrying capacity of their immediate hinterlands.
4. The late fourth-/third-century transition allowed a few Greek cities in west Asia and Egypt to become large-scale administrative centers, capturing resources from large areas, and supporting populations in the hundreds of thousands.

5. Once the cultural framework for urban life was in place, the growth of the largest Greek cities depended on imperial expansion and administration. While there were always exceptions, Weber's consumer-city model remains the key to Greek urbanism.
6. Nothing in the history of Greek cities in the first millennium suggests they would have developed into producer or merchant cities. Stripped of its empire, fourth-century Athens resembled the producer-city model more than the consumer-city; but its population never returned to its fifth-century level.
7. Equally, nothing suggests that further significant population growth was possible in the Greek cities after the first century BC, when Alexandria, Antioch, and Seleucia probably had 300,000-500,000 inhabitants. Absent a social, economic, and cultural transformation of the kind that happened in western Europe between AD 500 and 1500, the ancient city had reached its limits.

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