

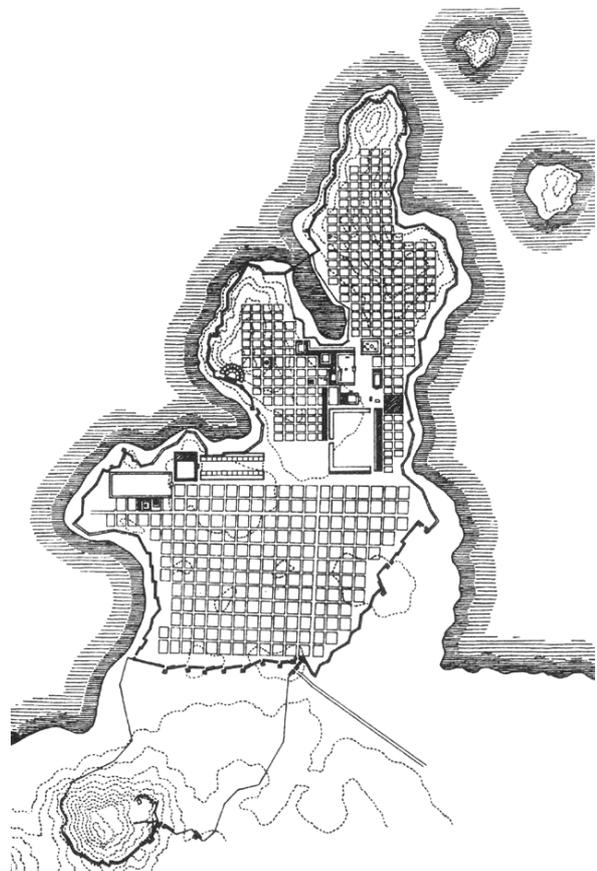
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THE REALITY OF MYTH AN ESSAY ON THE ORIGIN OF THE GRIDIRON PLAN IN ANCIENT ATHENS

The distinctive gridiron plan that guided Hippodamus in the rebuilding of the Ionian settlement of Miletus is well known. Previous claims that the gridiron plan was the “invention” of the ancient Greeks have been refuted and it is clear that the orthogonal street-plan attributed to Hippodamus in ancient literature did not originate in Greece. Alfred Burns, in a paper entitled “Hippodamus and the Planned City,” claimed that scholars have misinterpreted Aristotle’s statement that the Milesian “invented the rectangular city plan” and that, “the invention that Aristotle ascribes to Hippodamus is a functional masterplan allocating in advance the area of the city for various needs.”(1) The argument is reinforced by David Lewis, who has written, “It now seems that his [Hippodamus] main innovation there [the Piraeus] was, not the grid-system of streets with which modern scholars have associated him, but which is certainly older, the concepts of nemésis and diáresis, the systematic allocation of different parts of an area for different purposes.”(2)

Why did Hippodamus adopt the gridiron plan to formalize the spatial relationships that resulted in the strict allocation of different parts of an area for different purposes? The literature suggests that the grid system was the physical manifestation of culturally determined customs governing the treatment of the spaces of settlement throughout the ancient Greek-speaking world. To illuminate the connection between the contributions of Hippodamus and the culture that gave rise to them, this essay will examine how the concept of nemésis (distribution or allocation) and a corresponding conception of the boundary were related to the values held and the norms followed in ancient Athenian society.

Throughout the epic works attributed to Homer, a number of references are made to the concept of nemésis. They suggest that the boundary protected



*Reconstructed plan of Miletus
(Armin von Gerkan. Griechische
Städtenlagen. Berlin: De Gruyter, 1924)*

assets that had been subject to distribution or allocation, whether it was the distribution of household property within the household (oikos) or the distribution of public and private property within the village or town. (3) Given the reliance on agricultural production for sustenance and survival, the protection of arable land through the maintenance of boundaries was paramount and

the failure to preserve holdings would have left households vulnerable.(4) The private property of the oikos (the fields and their yields), not only provided sustenance that ensured self-sufficiency but, as a result of the constitutional reforms of Solon after 594 B.C., land holdings also became the basis for political participation.

Ancient literature suggests that the concern for locating the exact limits of property arose from conflicts concerning grazing ground and fields that were bound to occur in societies relying on pastures for feeding livestock and lands for agricultural production.(5) The sanctity of the boundary was definitively pronounced in The Laws of Plato, which dates from the fourth century B.C., “No man shall disturb the boundary stones of his neighbor, whether fellow citizen or foreigner, in the conviction that this would be “moving the immovable” in the crudest sense. Far better that a man should want to try to move the biggest stone that does not mark a boundary, than a small one separating friend’s land from foe’s, and established by an oath sworn to the gods.”(6)

In ancient Athens, literary sources reveal that the boundary was conceived as a means of preserving holdings that had been subject to distribution or allocation. In the following passage from The Iliad, Homer presents the image of a common field that has been subject to division: “But as two men with measuring-rods in hand strive about the landmark stones in a common field, and in a narrow space contend each for his equal share.”(7) Distribution implies a limitation and, in this case, there is a limited amount of cultivable land: “in a narrow space” the men “contend” for their “equal share,” or that which has been allocated to them. The men measure from landmark stones to establish boundaries. And they “strive” to locate the boundaries properly, for the boundary preserves the property that will ultimately sustain their households. Without the yields that the property provided, dependence on outside sources would be necessary. This would have represented not only potential starvation but also a threat to social status; according to Aristotle, the self-sufficiency necessary to ensure the preservation of the household was the “chief object” for which it existed.

Athenian precedents

Although ancient Athens was not subject to systematic planning, the application of the concept of nemesis is evident within the town, both in the major divisions of space (agora, acropolis, areas for housing) and the allocation of minor areas within

them (e.g., religious precincts, market areas, etc.). The agora at Athens developed sporadically and was not subject to a pre-conceived plan but nevertheless formed a cohesive space with well-defined and easily locatable boundaries. (8) The following lines are from Aristophanes’ The Acharians. Dikaepolis, the aptly named main character, seized control and immediately pronounced the norms governing the agora:

These are the boundaries of my market-place; / And here may all the Peloponnesian folk, / Megarians and Boeotians, freely trade / Selling to me, but Lamachus may not. / And these three thongs, of Leprous make, I set / As market-clerks, elected by the lot. / Within these bounds may no informer come, / Or any other syco-Phasian man.(9)

The boundaries of the agora at Athens were clearly acknowledged by perirrhanteria (lustral basins) and horoi (boundary stones) uncovered during archeological excavations. Boundary stones located boundaries that were, like those of the countryside, protected by both the gods and law like. In Plato’s ideal polis, “If a man obeys the law [relating to boundaries] he will escape its penalties, but if he holds it in contempt he is liable to two punishments, the first at the hands of the gods, the second under the law.”(10)

A variety of activities took place in the agora, as the following passage from Athenaeus indicates, “Again, as Eybulus has said in The Happy Woman: “In one and the same place you will find all kinds of things for sale together at Athens; figs, policemen, grapes, turnips, pears, apples, witnesses, roses, medlars, haggis, honeycomb, chick-peas, lawsuits, beestings, curds, myrtle-berries, ballot boxes, iris, roast lamb, waterclocks, laws, indictments.”(11) Although these functions were distributed within the agora, Aristotle insisted on a more complete division. In the Politics, he prescribed a functional separation with strict boundaries:

It is convenient that below this site [for housing] should be laid out an agora of the kind customary in Thessaly which they call the free agora, that is, one which has to be kept clear of all merchandise and into which no farmer or artisan may intrude unless summoned by the magistrates...The agora for merchandise must be different from the free agora, and in another place; it must have a site convenient for the collection there of all the goods sent from the seaport and from the country...those that deal with the control of the markets and with what is termed policing the city, should have buildings adjacent to an

agora or some public place of resort, and such a place is the neighbourhood of the business agora, for we assign the upper agora as the place in which to spend leisure, and this one for necessary business.(12)

Just as within the household, goods were subject to spatial separation in the agora, “For we know, I take it, that the city as a whole has ten thousand times as much of everything as we have; and yet you may order any sort of servant to buy something in the market and to bring it home, and he will be at no loss; every one of them is bound to know where he should go to get the article. Now the only reason for this is that everything is kept in a fixed place.”(13) This led to a practice in Athens of naming the areas for the goods that were sold there. In Euripides’ *Medea*, a slave speaks of having gone to ‘the draughts’. The Scholia accompanying this passage states, “Going to ‘the draughts’; (this expression is used) since they called places after things in them; here the author calls the places frequented by the gamblers ‘draughts’; just as opson and ‘perfume’ means the places where these commodities are customarily found.”(14) Plato, prescribing the law of sale and exchange in the ideal polis of Magnesia, placed strict controls to ensure that unlike goods were kept to separate distinctly defined areas.(15) He stated, “When one person makes an exchange with another by buying or selling, the transfer must be made by handing over the article in the appointed part of the market place (and nowhere else).”(16) If exchange occurred in any place other than that appointed for the sale of the item, then the rules and regulations protecting commercial activity were no longer applicable.

Religious activities took place in the many shrines and temples located throughout Athens. Shrines and temples formed smaller precincts with clearly defined boundaries, either in the form of boundary stones or enclosing walls. R.E. Wycherley, in the following passage from *How the Greeks Built Cities*, differentiated between the temple and the shrine, emphasizing the significance of the boundary for the latter:

‘Temple’ and ‘shrine’ are very far from being synonyms. The handsome peripteral temples which we think of as characteristically Greek were luxuries possessed by only a few outstanding shrines amongst all the hundreds which were found in any large city. All that was necessary to make a shrine was that a piece of ground or a natural or artificial object should be dedicated to a deity. To preserve the place inviolate the limits had to be defined by simple marks or boundary stones, or more effectively by a

fence or wall, making an enclosure. If the cult was to be regularly carried on, an altar was necessary. Altar and boundary were the essentials...(17)

The religious precincts and the agora were regarded as public space. And, just as the boundaries were clearly defined in areas allocated for public use, so were the boundaries between private space and public space in the town. Unlike Piraeus and the later colonies that were subject to land division in housing areas according to an orthogonal grid, an irregular street network developed in Athens. Philostratus, in his comparison to a city in India, revealed the organization of the residential district at Athens, “I have already described the way in which the city is walled, but they say that it was divided up into narrow streets in the same irregular manner as Athens.”(18) Although irregular, the walls that defined the space of the street formed clear and distinct boundaries and strictly governed both in terms of their encroachment onto the ‘public property’ of the road, both at ground level and above. In the *Athenian Constitution*, Aristotle wrote that there were ten ‘City Controllers’ in Athens and that they were charged to, “...prevent the construction of buildings encroaching on and balconies overhanging the roads, of overhead conduits with an overflow into the road, and of windows opening outward on to the road.”(19) It is perhaps this order that prompted Plato to prescribe the following for his utopian project. Although against the use of fortification walls, he stated, “However, if men are to have a city wall at all, the private houses should be constructed right from the foundations so that the whole city forms in effect a single wall; that is, all the houses should be easy to defend because they present to the street a regular and unbroken front.”(20) While Plato did not prescribe a system for arranging private residences, except that they be grouped in a circular manner around the area containing the shrines, Aristotle gave more careful consideration to the way in which housing should be organized. For safety, he advocated an organic pattern, arguing that it created obstacles for foreign troops garrisoned in the city and made it difficult for them to flee if attacked. In contrast, he stated, “The disposition of private dwellings is considered more pleasant and useful for other activities if it involves straight rows in the newer manner of Hippodamus.”(21) He goes on to tell the reader that Hippodamus, “...invented the division of cities into blocks and cut up Piraeus.”(22) In the following section, the theories attributed to Hippodamus will be explored via their application in the plan for Piraeus and Miletus.

The “Hippodamian Plan”

As established in the introduction, scholars have argued that Aristotle’s statement that Hippodamus “invented the division of cities into blocks” has been subject to misinterpretation and the actual contribution was likely the application of the concept of *nemésis*, or the functional allocation of the land and its population. This claim is reinforced in the following passage from the *Politics*:

His [Hippodamus’] system was for a city with a population of ten thousand, divided into three classes; for he made one class of artisans, one of farmers, and the third the class that fought for the state in war and was the armed class. He divided the land into three parts, one sacred, one public and one private.(23)

Aristotle also attributed the planning of the area known as Piraeus to Hippodamus, and this is supported by both archaeological and literary evidence. Reconstruction of the town plan reveals that the land was divided according to a gridiron. While Athens experienced ‘organic growth’,(24) Piraeus was subject to the systematic planning principles attributed to Hippodamus. After the Persian Wars, the strategic importance of Piraeus increased. It was enclosed and connected to Athens via a series of long walls to ensure that the main town would not be severed from the harbor during attack, “At about this time [461 B.C.] the Athenians began to build their two long walls down to the sea, one to Phalerum and one to Piraeus.”(25) During this rebuilding effort the harbor town was distributed into precincts and land divided according to a gridiron. Whereas the spaces within the upper town of Athens were allocated for different purposes, the lack of a regular spatial ordering system denied the possibility of land distribution according to a consistently applied method of organization. In contrast, Piraeus represented a synthesis of the functional allocation of space and the use of the gridiron. David Lewis, in *Public Property in the City*, listed a series of inscriptions from recovered horoi that reveal the application of *nemésis* and the enforcement of the boundary. The outer boundaries of Piraeus were clearly marked, “up to the road the *asty* has been assigned” (IG i2 893 = i 1111), as were the boundaries for a sacred area, “up to this road is the assignment of *Mounichia*” (IG i2 894 = i3 1113). Other horoi marked public areas (IG i2 887 = i3 1101) and the trading area of the agora (IG i2 890 = i3 1104). According to Lewis, “Two texts (i2 892 + SEG x 380 = i3 1109, 1110) proclaim *apo tesde tes*

hodo to pros tó limenos pas demosion esti, “from this road on the harbor side everything is public”. It is sufficiently clear that, in the planning of Piraeus, the designation of public property was of major importance. At a guess, the point of thus designating it in the case of the last area was at least as much a matter of preventing private encroachment as reserving it for state use...It should be further noted that, as far as I can see, the area between the road and the harbor as Piraeus is the only piece of public land in Attica not designated by function.”(26)

While Piraeus provides an example of the application of the theories of Hippodamus at Athens, it is perhaps useful to briefly examine other examples of “Hippodamian” towns. Fortunately, a great deal of attention has been focused on reconstructing plans from those Greek settlements said to have been influenced by the theories of Hippodamus. The use of the gridiron was not limited to the Piraeus and Miletus, as evidenced by the reconstructions of Olynthus and Rhodes (both attributed to Hippodamus, although perhaps erroneously). Olynthus, founded in 432 B.C and later destroyed in 348, was based on a rectangular grid that was varied to fit the terrain. A series of major (between five and seven meters wide) and minor streets (five meters wide) resulted in blocks measuring approximately 35 meters wide and 86 meters wide. While the orthogonal grid is a common, its use was not limited to the so called “Hippodamian” plans but had been used elsewhere since the latter part of the sixth century B.C.. The use of the grid was particularly prevalent in Ionia and archeologists have uncovered evidence that a grid plan was used to organize the center of the upper city at the Miletian colony of Olbia.

Subject to almost complete destruction by the Persians in 494 B.C. and subsequently rebuilt according to the theories attributed to Hippodamus, the town of Miletus offers what is perhaps the most comprehensive and cohesive example of their application. Certainly the most striking feature of the plan is the clear division of the town into separate and clearly defined zones allocated for trade, civic functions, religious activities and housing. The reconstructed plan also reveals an adherence to an orthogonal grid in the areas allocated for housing. (27) The grid is clearly employed to ensure equal and regular distribution of land in these areas. Where necessary, it defers to the natural landscape, the fortification wall, and the functions located within the town center. Although the civic and religious buildings are organized in accordance with the orientation of the grid, these areas take precedence. In all cases, the boundary has become

regularized and applied as part of a consistently applied ordering system.

The reconstructed plans of Pireaus and Miletus reveal a refined and considered application of the concept of *nemésis*. The gridiron represents a formal device that allowed a systematic approach to the definition of the boundary and, in turn, effectively located and preserved the spaces that had been allocated for use within the town.

Conclusion

In spite of the development of geometrical principles often attributed to Thales, another native of Miletus, the Greeks did not develop formalized systems such as those that would characterize later Roman town planning. Although ancient Greek sources contain traces of general rules in the form of prescriptions for the organization of space at the urban scale, the ancient Athenians never achieved an “ideal” town configuration. The lack of standardization according to a pre-conceived model does not allow a series of verifiable rules to emerge. As a result, one must supplement the reconstructed plans with some understanding of the treatment of physical space at all scales.

Inherent in the premise of this paper is that the treatment of space is determined by the cultural and social structures. As stated in the introduction, this work proceeds from the hypothesis that the theoretical approach to town planning attributed to Hippodamus was a codification of culturally determined customs governing the spaces of settlement throughout the Greek world.

Nemésis, and the boundary that preserved the allocation, allowed the distribution to be measured which, at least conceptually, ensured equality and, therefore, order. These were values upon which Athenian culture was based. Perhaps nowhere is this stated more clearly than in Plutarch’s account of the ruler Solon. During an absence from Athens, the population was split into factions, one of which was led by Peisistratus, who was known to be skilled in the art of deception. His skill was such that, “Even those virtues which nature had denied him were imitated by him so successfully that he won more confidence than those who actually possessed them. He was thought to be a cautious and order-loving man, one that prized equality above all things, and would take it ill if anyone disturbed the existing order and attempted a change.”(28)

Literary sources indicate that the concept of *nemésis* and a corresponding concern for the boundary were determinants in the treatment of urban space in the

ancient Greek world. These determinants resulted from and were sustained by the values and norms expressed in ancient Athenian sources. Rather than imposing a new order, the gridiron plan served to formalize spatial relationships that previously existed but were not subject to a comprehensive planning strategy. While Hippodamus certainly cannot be credited with “inventing” the gridiron plan, he should be acknowledged for recognizing that this strategy represented a clear physical manifestation of culturally determined customs expressed in myths and in reality.

Notes

1 Alfred Burns. “Hippodamus and the Planned City.” *Historia*, 25 (Wiesbaden: Franz Steiner, 1976) p. 415.

2 David Lewis. “Public Property in the City” appearing in *The Greek City from Homer to Alexander*. Oswyn Murray and Simon Price, eds. (Oxford: Clarendon Press, 1990) p. 250.

3 With regard to household property, the boundary preserved property by clearly demarcating limits that ensured order. This is clearly stated by Xenophon in *Oeconomicus*, his treatise on household management. This work articulated two conceptions of the boundary: as a physical construct and as a space of separation. In relation to the former, Xenophon stated, “If I want a type of disorder, I think of the farmer who has stored barley, wheat and pulse in one bin; and then when he wants a bannock or a loaf or a pudding, must pick out the grain instead of finding it separate and ready for use.” (Xenophon. *Oeconomicus*. tr. E.C. Marchant (London: William Heinemann, 1968) Book VIII, 9.) Addressing the boundary as a space of separation, Xenophon wrote, “There is nothing, in short, that does not gain in beauty when set out in order. For each set looks like a troop of utensils, and the space between each set is beautiful to see, when each set is kept clear of it, just as a troop of dancers about the altar is a beautiful spectacle in itself, and the free space looks beautiful and unencumbered.” (Xenophon. *Oeconomicus*. tr. E.C. Marchant (London: William Heinemann, 1968) Book VIII, 20.)

4 In a dialogue from Plato, land was referred to as a “fundamental” and it was revealed that any legislative effort to redistribute land was met with strong opposition. The character representing the Athenian point of view stated, “Suppose a legal code is being framed and someone adopts the policy of a change in the ownership of land and a cancellation of debts, because he sees that this is the only way

in which equality can be satisfactorily achieved. 'Hands off fundamentals' is the slogan everybody uses to attack a legislator who tries to bring that kind of reform and his policy of land-redistribution and remission of debts earns him only curses." (Plato. *The Laws*. tr. Trevor J. Saunders (Harmondsworth, Middlesex: Penguin books Ltd., 1972) 684)

5 With regard to the members of the ancient Greek population that were involved in agriculture, J.K. Davies has written, "...we can be virtually certain, by analogy with other pre-industrial societies, that well over half, perhaps even 90 percent, of the adult population (slave, free, man or woman) will have been engaged in agriculture." (J.K. Davies. *Democracy and Classical Greece* (Cambridge, MA: Harvard University Press, 1993) p. 10). See also Robin Osborne. *Classical Landscape with Figures* (London: George Philip, 1987).

6 Plato. *The Laws*. tr. Trevor J. Saunders (Harmondsworth, Middlesex: Penguin Books Ltd., 1972) 842-3.

7 Homer. *The Illiad*. tr. A.T. Murray (London: William Heinemann, 1971) Book XII, 419-20.

8 The boundaries of the agora were also strictly enforced in cases where a new area was designated. A surviving deme decree illustrates that a citizen named Leukios provided a public gift in the form of funds to construct a new agora. Three men were chosen to "define the space of the agora" and charged to ensure that no one encroached upon the area "within the markers"; "Gods. Theodelos moved; resolved by the Sounians, with good fortune, whereas Leukios is giving to the demesmen (the means) to make an agora, choose at once three men, who will define the space of the agora with Leukios at no less than two plethra in one direction, or than one plethron in the other direction, so that there shall be plenty of room for the Sounians and anyone else who wishes to use the agora, since the present one has become crowded. To build over it is not permitted, neither for the demarch nor for anyone else within the markers. The demarch is to inscribe this decree on a stone pillar, in collaboration with Leukios, and set it up in the agora." (IG ii2 1180 as translated by J.K. Davies. *Democracy and Classical Greece* (Cambridge, MA: Harvard University Press, 1993) p 225-6).

9 Aristophanes. *The Acharnians*. tr. Benjamin B. Rogers (London: William Heinemann, 1967) II 719-27.

10 Plato. *The Laws*. tr. Trevor J. Saunders (Harmondsworth, Middlesex: Penguin Books Ltd., 1970) 843.

11 Athenaeus. *The Deipnosophists*. tr. Charles Burton Gulick (London: William Heinemann, 1970)

Book XIV, 640 b-c.

12 Aristotle. *Politics*. tr. H. Rackham (London: William Heinemann, 1950) Book VII, 11.2-3.

13 Xenophon. *Oeconomicus*. tr. E.C. Marchant (London: William Heinemann, 1968) Book VIII, 22.

14 Schol. Euripides. *Medea*. tr. A.S. Way (London: William Heinemann, 1967) 68. In the area that served as the agora in Athens, boundary stones have been unearthed which clearly define areas reserved for certain trading activities.

15 For the control placed on goods at Athens, see Aristotle. *Athenian Constitution*. tr. H. Rackham (London: William Heinemann, 1971) LI.1

16 Plato. *The Laws*. tr. Trevor J. Saunders (Harmondsworth, Middlesex: Penguin Books Ltd., 1970) 916.

17 R.E. Wycherley. *How the Greeks Built Cities* (London: Macmillan & Co Ltd., 1962)

p. 89. The temples of Athens were concentrated on, or in close proximity to, the Acropolis. Within the boundaries of the Acropolis, space was further allocated into precincts for the various temples. Anthony Krieses has written that, "Even the outwardly conceived temple was enclosed by the sacred precinct." (Anthony Kriesis. *Greek Town Building* (Athens: The National Technical University of Athens, 1965) p 94, n 5). This premise is defended by G.P. Stephens who has argued that the western part of the Acropolis was planned along with the Propylea as a forecourt to the Parthenon. He argued that the forecourt defining the precinct was almost square and partially enclosed with walls (See G.P. Stephens. "The Periclean Entrance Court to the Acropolis" appearing in *Hesperia*, V, 1936.) .

18 Philostratus. *The Life of Apollonius of Tyana*. tr. F.C. Conybeare (London: William Heinemann, 1969) Book II, 23.

19 Aristotle. *Athenian Constitution*. tr. H. Rackham (London: William Heinemann, 1971) 50.2.

20 Plato. *The Laws*. tr. Trevor J. Saunders (Harmondsworth, Middlesex: Penguin Books Ltd., 1970) 779.

21 Aristotle. *Politics*. tr. H. Rackham (London: William Heinemann, 1972) 1267b.

22 *ibid*.

23 Aristotle. *The Politics*. tr. H. Rackham (London: William Heinemann, 1972) 1267 b.

24 The term 'organic growth' is borrowed from A.E.J. Morris. For further discussion and examples of the application the term, see A.E.J. Morris. *History of Urban Form Before the Industrial Revolutions* (New York: John Wiley & Sons, 1994) p 10, n 41.

25 Thucydides. *History of the Peloponnesian War* (Harmondsworth, Middlesex: Penguin Books Ltd., 1972) Book I, 107.

26 David Lewis. "Public Property in the City" appearing in Oswyn Murray and Simon Price (eds). *The Greek City from Homer to Alexander* (Oxford: Oxford University Press, 1990) p 251.

27 See Ferdinando Castaglioni. *Orthogonal Town Planning in Antiquity*. tr. Victor Caliandro (Cambridge, MA: The MIT Press, 1971) and J.B. Ward-Perkins. *Cities of Ancient Greece and Italy: Planning in Classical Antiquity* (New York: George Braziller, 1974).

28 Plutarch. "Solon". *Plutarch's Lives*. tr. Bernadotte Perrin (London: William Heinemann, 1993) XXX, 1.