

URBAN PLANNING AND CULTURAL IDENTITY IN POMPEII:
FROM THE *ALTSTADT* TO VITRUVIUS

A Thesis

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by

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ABSTRACT

This thesis addresses the urban planning of Pompeii's *Altstadt*, or oldest settlement, and its place in a larger narrative on Mediterranean urbanism. The first phase of this research utilizes Stephen Marshall's techniques to quantify the *Altstadt*'s urban form, and implements additional architectural analysis to uncover the original street network. These techniques reveal that the ancient city utilized traditional grid forms but was forced to accommodate for irregular terrain. Oriented regardless of topography, its layout has a similar rotation to Vitruvius's ideal city even though it predated *De Architectura* by five centuries. This specific orientation connects Pompeii's urban development to that of other archaic cities around the Mediterranean. Because Pompeii's culture is best defined as a triangulation of Greek, Etruscan, and Oscan, this research complicates previous assumptions that Vitruvius' intellectual precursor was wholly Greek and questions the scholarly tendency of attributing strict cultural boundaries to various ancient practices.

BIOGRAPHICAL SKETCH

Juliana van Roggen graduated from the University of Massachusetts Amherst with bachelor's degrees in Anthropology and Classics. Her primary area of research is urban planning and development in the ancient Mediterranean. As an undergraduate, she was deeply invested in exploring how technology can better archaeological theory and practice, and was awarded a Five Colleges Digital Humanities Fellowship in 2015 to apply GIS analysis to an element of street infrastructure in Pompeii. She has taken part in a variety of archaeological sites including a Byzantine church near Syracuse, an underwater Roman port off the coast of Menorca, and an Etruscan site in Tuscany. Additionally, she has worked for three years in Pompeii for both the Pompeii Quadriporticus Project and the Pompeii Archaeological Research Project: Porta Stabia. It was her research and experience at Pompeii that influenced her the most, fostering her interests in urban planning and city infrastructure. She continues her research into Pompeian urbanization at the Cornell Institute of Archaeology and Material Studies where she will be completing her master's degree.

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Introduction

Pompeii's earliest settlement, the *Altstadt*, has been a crucial tool for understanding the growth and development of the ancient city. Unfortunately, exploration into the *Altstadt*'s own urban development has gone underappreciated, with scholars preferring to use the old city as an interpretive tool to examine how the part affected the whole. The *Altstadt* holds great potential for understanding urban planning and development in pre-Roman Italy.

Altstadts are the oldest or "original" settlements of an urban environment and are usually assumed to be formed organically, characteristic of their chaotic and haphazard streets. However, Pompeii's earliest settlement retains some semblance of urban planning, and because of its importance to the understanding of pre-Roman Pompeii, its organization warrants exploration. This research attempts to answer the central question: how was Pompeii's *Altstadt* planned?

This paper first situates its research in the context of previous scholarship on Pompeii's urban fabric and places an emphasis on the work conducted on the *Altstadt*. From there, it refutes underdeveloped but commonly cited interpretations of the ancient city's organization and supports von Gerkan's theories of an orthogonal plan hidden underneath years of reorganization and new construction. Applying Marshall's method to quantify street networks on the extant urban form of the *Altstadt*, the ancient city reveals its adherence to traditional grid formations. These grids are further supported by architectural analysis, a method that examines the layout of buildings and *insulae* (city blocks) to extrapolate previous arrangements of the urban form. Using these methods, it becomes apparent that the *Altstadt* was planned with the intention of using grids; however, the irregular topography forced some compromises and later construction obfuscated the original plan. Finally, this paper explores alternative explanations for urban orientation, concluding that the

peculiar rotation of its central axis 23° west of north follows instructions from Vitruvius' *De Architectura*.

In a common oversight, scholars have regularly ignored Vitruvius' works when analyzing Pompeii's urban form. By examining the *Altstadt* through the lens of Vitruvian urban planning, Pompeii becomes linked to the development of other archaic and pre-Roman cities, thus joining a larger Mediterranean narrative on urban planning. These cities provide evidence for an early planning tradition which would eventually influence the writings of Vitruvius centuries later. While this precursor is often assumed to be Greek in nature, Pompeii's ambiguous cultural background casts doubt on that distinct identification.

History of Pompeii's Urban Planning

Due to the lack of excavations into pre-Roman layers, interpretations of Pompeii's urban development rely primarily on its street network and its organization of city blocks (also known as *insulae*) that were present at 79 CE. As these pieces of evidence can be utilized in vastly different ways, models describing Pompeii's urban form have been aggressively debated and dramatically changed within the past two centuries.

Fiorelli proposed the first model. It argued that Pompeii as a whole was created using a single design. At the time of Fiorelli's work, most of Regions I, II, III, IV, V, and IX remained unexcavated. However, inferring from the uncovered gates and fortifications, he proposed that four major arteries divided the city into 9 regions.¹ Agreeing with Fiorelli, Mau observed that the

¹ Fiorelli, Giuseppe, *Descrizione di Pompei* (Napoli: Tipografia Italiana, 1875), 24. While Fiorelli's interpretation of the urban fabric has been disproven by later excavations, his system of *regiones* set the foundations for the current building identification system.

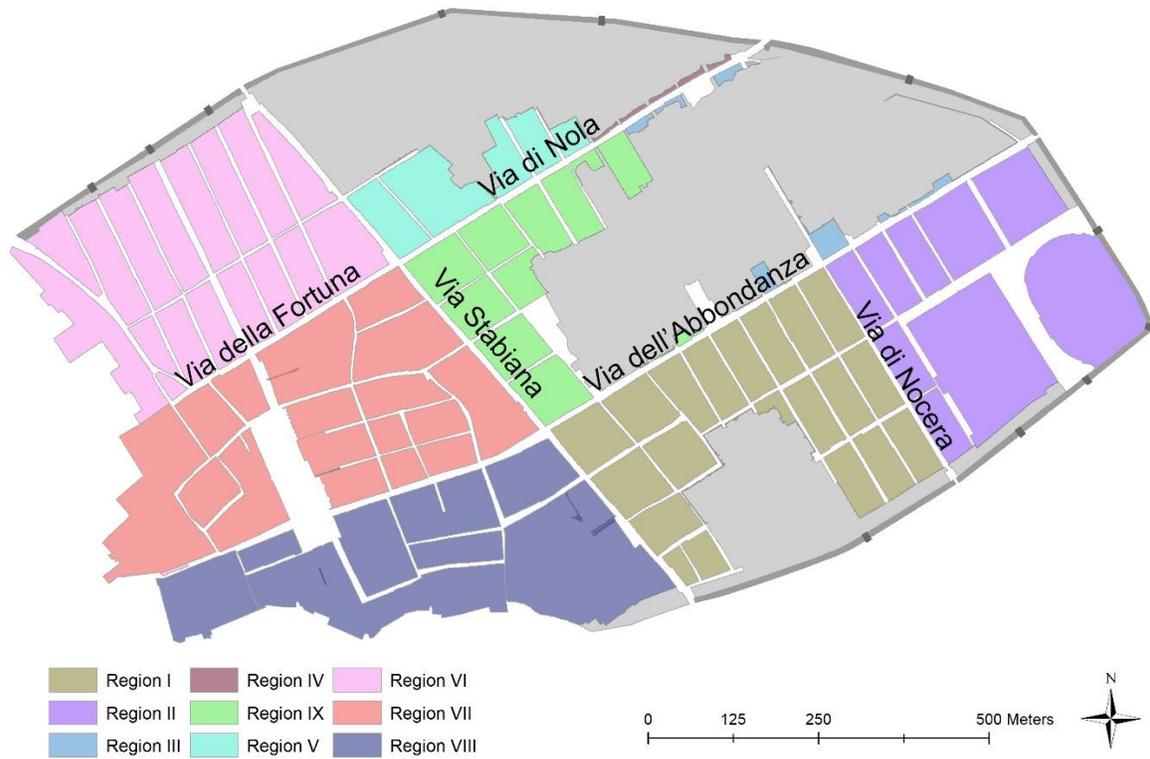


Figure 1. Map of Pompeii with regions and major streets labeled

symmetry and order of the city’s layout implied that Pompeii could not have been the result of gradual development “from a small beginning,” but the product of a deliberate plan.²

A decade later, Haverfield revolutionized the model by arguing that Pompeii grew in at least two stages: the old city, also known as the *Altstadt*, and everything that developed after and independently of the old city, later called the *Neustadt*.³ Rejecting previous assertions that the *Altstadt* was Etruscan, Haverfield described it as an Oscan town.⁴ At the heart of Haverfield’s thesis was the stress placed on street organization and irregularities in insula shape to determine phases of urban development. While the streets in the *Neustadt* had obvious patterns and uniformity, the streets of the south west corner were “hardly regular even in their relations to one

² Mau, August, *Pompeii, Its Life and Art* (New York: The Macmillan Company, 1904), 32-37.

³ Haverfield, F., *Ancient Town-Planning* (Oxford: The Clarendon Press, 1913), 64.

⁴ *Ibid.*, 66.

another and [were] wholly irreconcilable to the rest of the town.”⁵ By looking at these characteristics, Haverfield dramatically changed the narrative of Pompeii’s urban development. Continuing the work of Haverfield, von Gerkan supported the *Altstadt/Neustadt* dichotomy while also being the first scholar to propose a fortification wall around the original *Altstadt*, a theory that has been met with some resistance.⁶

Later models applied Haverfield’s technique to the *Neustadt*, attempting to section out phases of development. Most of these outlined two additional phases after the *Altstadt*: development north of the old city and then development east of via Stabiana.⁷ The most complicated of these models, proposed by Geertman, presented a seven phase plan.⁸ These models stressed a gradual, yet organized, progression of urban development, utilizing the shape of insulae to differentiate each phase.

More recently, scholars have rejected models outlining gradual development, returning to unitary plans. The *Altstadt* and the Triangular Forum are still generally recognized to have preceded the *Neustadt*. However, the current models take coherence in the street layout of the *Neustadt*, regardless of insula shape, as indicative of a single plan. This single plan manifested as a re-foundation of the city around the 4th century BCE.⁹ The uniqueness of the insula shapes,

⁵ Ibid., 66-67.

⁶ Gerkan, Armin von, *Der Stadtplan von Pompeji* (Archäologisches Institut des Deutschen Reiches, 1940); Poehler, Eric E., *The Traffic System of Pompeii* (Oxford University Press, forthcoming).

⁷ Castagnoli, F., *Orthogonal Town Planning in Antiquity* (Cambridge: MIT Press, 1971), 25.

⁸ Geertman, Herman, “The Urban Development of the Pre-Roman City,” in *The World of Pompeii*, ed. John Joseph Dobbins and Pedar William Foss (London; New York: Routledge, 2007), 86-88.

⁹ Poehler, *The Traffic System of Pompeii*; Richardson, Lawrence, *Pompeii: An Architectural History* (Baltimore: Johns Hopkins University Press, 1988), 36-43; Coarelli, Filippo, and Fabrizio Pesando, “The Urban Development of NW Pompeii: The Archaic Period to the 3rd C. B.C.,” in *The Making of Pompeii: Studies in the History and Urban Development of an Ancient Town*, ed. Steven J. R. Ellis (Portsmouth, R.I: Journal of Roman Archaeology, 2011); Pedroni, Luigi, “Excavations in the History of Pompeii’s Urban Development in the Area North of the so-Called ‘Altstadt,’” in *The Making of Pompeii: Studies in the History and Urban Development of an Ancient Town*, ed. Steven J. R. Ellis (Portsmouth, R.I: Journal of Roman Archaeology, 2011).

particularly the square insulae of Regions I and IX, can be explained as responses to topography instead of chronology.¹⁰ The scant pre-Roman excavations support the re-foundation theory, placing many of the *Neustadt* buildings and streets to the 4th through 3rd centuries BCE.¹¹

While the majority of the re-foundation models accept the *Altstadt* as an isolated urban development, recent excavations into pre-Roman Region VI question the traditional *Altstadt/Neustadt* narrative. These excavations returned little to no archaeological remains between the 5th and 3rd centuries BCE.¹² The lack of archaeological material has led some to propose that the city had originally filled the *Neustadt* walls in the archaic period and that the city experienced a regression and de-population between the 5th and 3rd centuries BCE due to Samnite aggression.¹³ At that time, the population condensed in the south-western section and built a defensive wall around itself. In the 4th or 3rd century BCE, the city repopulated the full extent of the *Neustadt* walls during the re-foundation.

These studies all accepted the notion of a small settlement in the south-western corner of Pompeii. However, because the focus of their arguments has been chronology, they did not speak definitively on the nature of the *Altstadt*'s design. The general consensus was that the area of the *Altstadt* existed early in Pompeii's history as a unique unit of urban development. The questions

¹⁰ Poehler, *The Traffic System of Pompeii*; Holappa, Maija, and Eeva-Maria Viitanen, "Topographic Conditions in the Urban Plan of Pompeii: The Urban Landscape in 3D," in *The Making of Pompeii: Studies in the History and Urban Development of an Ancient Town*, ed. Steven J. R. Ellis (Portsmouth, R.I: Journal of Roman Archaeology, 2011),182.

¹¹ Poehler, *The Traffic System of Pompeii*.

¹² Pedroni, "Excavations in the History of Pompeii's Urban Development," 159-160.

¹³ Esposito, Domenico, Pia Kastenmeier, and Catello Imperatore, "Excavations in the Caserma Dei Gladiatori: A Contribution to Our Understanding of Archaic Pompeii," in *The Making of Pompeii: Studies in the History and Urban Development of an Ancient Town*, ed. by Steven J. R. Ellis (Portsmouth, R.I: Journal of Roman Archaeology, 2011), 130-133. Esposito claims that the early settlement was the culmination of several indigenous tribes under Etruscan rule.

remain: was the *Altstadt* planned and if so, how? Very few scholars interested in Pompeii's urbanization have addressed these questions in any detail.

The *Altstadt*'s Urban Planning

The organization of the *Altstadt* is frequently an afterthought to researchers. To Castagnoli, the *Altstadt* had only an impression of a plan; it had two intersecting central axes, but the rest of the urban fabric was without order.¹⁴ Haverfield never explicitly argued for a planned or unplanned *Altstadt*. He merely remarked that the streets were irregular while also acknowledging that they must “have been added, altered, enlarged out of all resemblance to the original plan.”¹⁵ Richardson argued that the *Altstadt* was deliberately organized, but only after the re-foundation.¹⁶

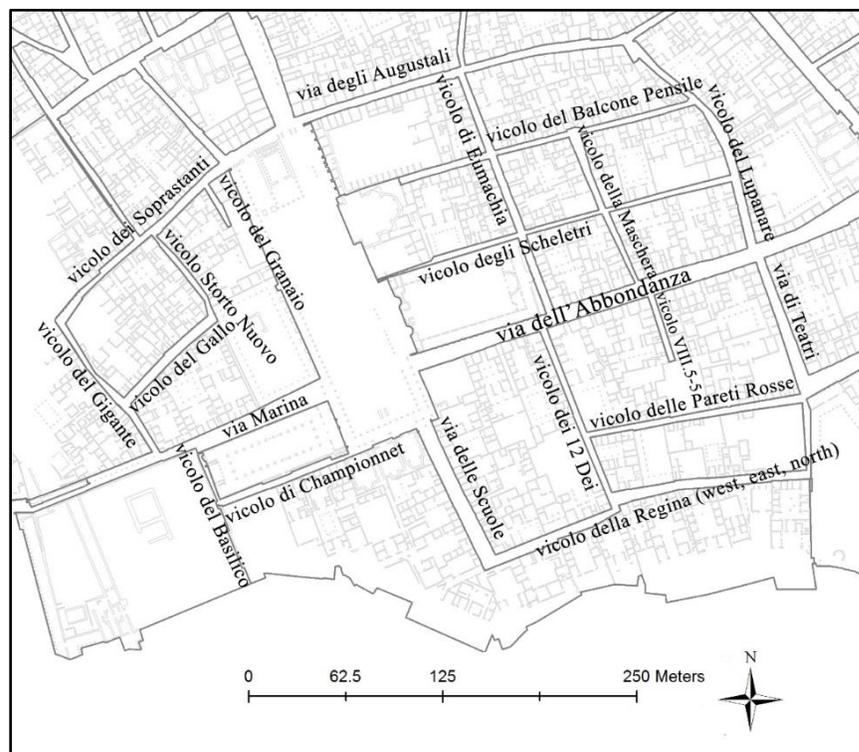


Figure 2. Map of the old city with streets labeled.

¹⁴ Castagnoli, *Orthogonal Town Planning in Antiquity*, 32.

¹⁵ Haverfield, *Ancient Town-Planning*, 66.

¹⁶ Richardson, *Pompeii: An Architectural History*, 41. He argues that the grids were formed during the re-foundation so that the urban fabric of the earliest settlement would match that of the rest of the city.

Those who argue for a more cohesive organization generally subscribe to one of two models. The first describes a “herringbone” or “fishbone” shaped plan. The other, proposed by von Gerkan, describes a traditional orthogonal plan with two major intersecting axes, reminiscent of typical Greek and Roman urban planning.

The term “herringbone” or “fishbone” appears to be a makeshift coinage designed specifically for Pompeii’s *Altstadt*; it has not been used to describe any other ancient city. The vague definition describes a network where streets “align at oblique angles to others.”¹⁷ The “herringbone” form could also be referencing the central spine, the combination of via dell’Abbondanza and via Marina, which divides the city and connects to most of the streets, or ribs, in the *Altstadt*. Although the term “herringbone” was created for Pompeii, it is a lazy description; neither of the possible definitions appear to match the *Altstadt*’s actual form. Intersections make right or close to right angles, as will be discussed below. Furthermore, while the combination of via dell’Abbondanza and via Marina functioned as a central street, it would be misleading to argue it functioned like a spine. Vicolo degli Scheletri, vicolo del Balcone Pensile, and vicolo della Regina (west) all run parallel to via dell’Abbondanza and via Marina. Vicolo del Gallo, vicolo delle Pareti Rosse, and vicolo della Regina (east) share that east/west orientation but are not aligned with it. These streets imply a grid organization, not the proposed “herringbone.”

While categorizing street networks, Marshall defines the route structure of the general *Altstadt* as being “oriented in a variety of directions” that “generates a rudimentary radiality.”¹⁸ These ancient urban centers had irregular networks symptomatic of their “organic growth” and

¹⁷ Guzzo, Pier Giovanni, “The Origins and Development of Pompeii,” in *The Making of Pompeii: Studies in the History and Urban Development of an Ancient Town*, ed. by Steven J. R. Ellis (Portsmouth, R.I: Journal of Roman Archaeology, 2011), 15.

¹⁸ Marshall, Stephen, *Streets and Patterns* (Taylor & Francis, 2004), 84.

lack of urban planning.¹⁹ However, recently scholars have drifted away from the planned/unplanned dichotomy, and now recognize the many ways a city can be organized. Smith, for example, identifies three ways to define ancient urban planning: the deliberate actions of builders and the formal layouts of their buildings, the standardization of urban form, and the coordination among buildings.²⁰ These indicators reflect the degree to which a city was planned and better represent the varying cultural and governmental bodies responsible.²¹ An *Altstadt* without an obvious street pattern may still be the result of small scale coordination among locals, and thus the product of a certain degree of urban planning.²²

Pompeii's *Altstadt* shows some standardization in its urban form with its vague use of grids. Thus, the old city will be analyzed based on this feature, particularly because Mediterranean urbanism of that time is characterized by its use of orthogonal plans. Smith stresses that there is also a degree to which a plan can be orthogonal. *Semi-orthogonal urban blocks* are urban forms which require less organization and are the result of buildings abutting other buildings.²³ *Integrated orthogonal plans* utilize more organized planning and are formed when streets and buildings are aligned orthogonally in respect to other urban features.²⁴ *Modular orthogonal plans* require the highest level of planning and utilize highly regularized street plans.²⁵

Marshall proposes a method to quantify street network patterns and his technique can help identify if the *Altstadt* primarily used grid formations, and if so, to what degree. His technique

¹⁹ Morris, A. E. J., *History of Urban Form: Before the Industrial Revolutions* (Harlow, Essex, England: Longman Scientific & Technical, 1994), 8.

²⁰ Smith, Michael, "Form and Meaning in the Earliest Cities: A New Approach to Ancient Urban Planning," *Journal of Planning History* 6, no. 1 (2007): 3–47, 6-7.

²¹ *Ibid.*, 7.

²² Batty, Michael, and Paul Longley, *Fractal Cities: A Geometry of Form and Function* (London; San Diego: Academic Press, 1994), 28.

²³ Smith, "Form and Meaning," 13.

²⁴ *Ibid.*, 15.

²⁵ *Ibid.*, 16.

contrasts the ratios of X-junctions and T-junctions with the ratios of cells and cul-de-sacs.²⁶ These ratios help determine the degree to which a system is tree-like or grid-like, and while this method cannot differentiate between linear, radial, and tree systems, it will be sufficient for this study to contrast grids with all other urban forms.²⁷ Figure 3 depicts the abstracted configuration of Pompeii's *Altstadt*.²⁸ It shows the location of the seventeen T-junctions, eight X-junctions, thirteen cells, and four cul-de-sacs. Based on these ratios, the *Altstadt* street network resembles a T-cell structure.

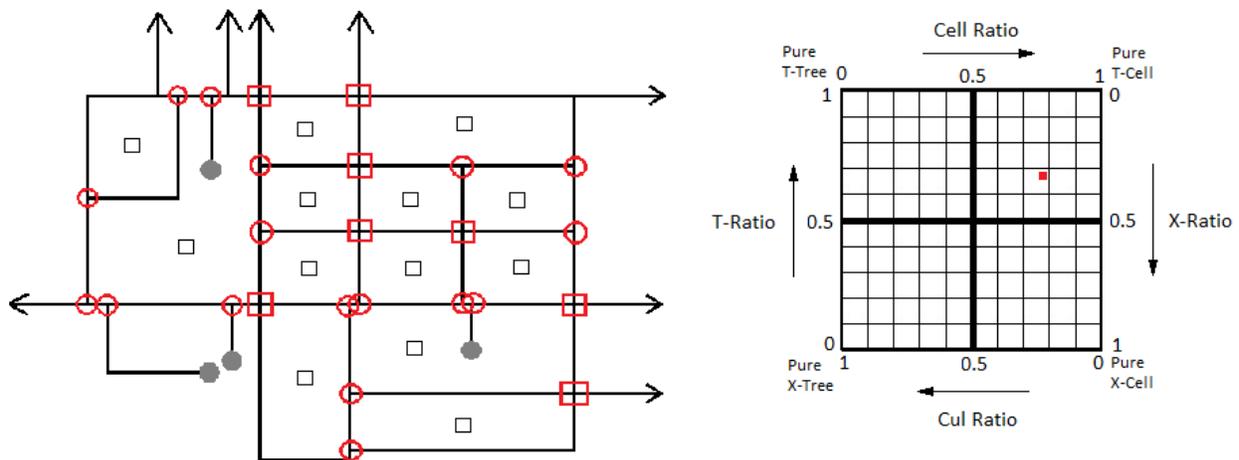


Figure 3. On the left is a simplified depiction of Pompeii's *Altstadt*. Red circles are T-Junctions, red squares are X-Junctions, grey circles are cul-de-sacs, and white squares are cells. On the right the *Altstadt*'s ratios are plotted.

While a useful tool, Marshall's technique fails to account for the angles produced by intersecting streets. A pure orthogonal grid would consist of X-cells formed by right-angle intersections. As mentioned above, it is common to assume the *Altstadt* intersections do not form

²⁶ Marshall, *Streets and Patterns*, 89. X-junctions are intersections of four streets, T-junctions are the intersections of three streets. Here, cells represent insulae while cul-de-sacs represent alleys and dead-ends.

²⁷ *Ibid.*, 90. He argues that radial and linear forms are topologically trees.

²⁸ It is important to note that streets which intersect the *Altstadt*'s proposed fortifications from the outside and do not interact with streets within the circuit have their intersections omitted. The forum has been removed and instead is represented as an extension of via delle Scuole. Vicolo del Foro is also included in this abstraction even though it is frequently omitted from street maps. Also, it is assumed that vicolo del Balcone Pensile and vicolo degli Scheletri intersected the original north/south axis, see pg. 13-14.

right angles. While only five intersections make perfect right angles, seven more are within five degrees of a right angle. Only three are more than 10 degrees off from a right angle, and these are intersections formed with the exterior circuit. In general, the surveyors of the early city attempt to make right angles with their intersections. Even streets that bend do so in right, or almost right, angles. The *Altstadt* is a right-angle, T-cell city; and as such, it is not radial, as Marshal had defined *Altstadts* in general, and displays a certain degree of urban planning.

Cities are living manifestations of culture and, as such, change as the people and their needs change.²⁹ Alterations to Pompeii's urban fabric have already been documented in Region II where four rectangular insulae were combined to make two square insulae: II.4 and II.5. von Gerkan was the first to identify previous urban arrangements in the old city, locating where streets had been erased by later development or cut off to form dead-ends. Although von Gerkan never used the terms "orthogonal" or "grid" to define the *Altstadt's* urban planning, his description of the earliest street network and the accompanying map depicted it as such. Completing the paths of cul-de-sacs and locating where streets probably continued pushes the *Altstadt* closer to a pure cell structure than tree structure and includes more X-junctions. von Gerkan's proposed changes suggest that the *Altstadt's* original form would have been closer to a pure X-cell street network, and given the angle of their intersections, closer to an integrated orthogonal plan.

The most obvious change to the urban fabric of the *Altstadt* occurred in insula VII.12 (Figure 4).³⁰ This city block has a clear dividing wall down its center, which is comprised of the wall east of buildings VII.12-6, VII.12-30, and VII.12-23; and west of buildings VII.12-7, VII.12-9, VII.12-22, and VII.12-21. It is no coincidence that this wall continues the northerly trajectory of vicolo della Maschera. To the west, the buildings utilize the land in regular ways, making

²⁹ Laurence, Ray, *Roman Pompeii: Space and Society*. (London: Routledge, 2007).

³⁰ von Gerkan, *Der Stadtplan von Pompeji*, 16.

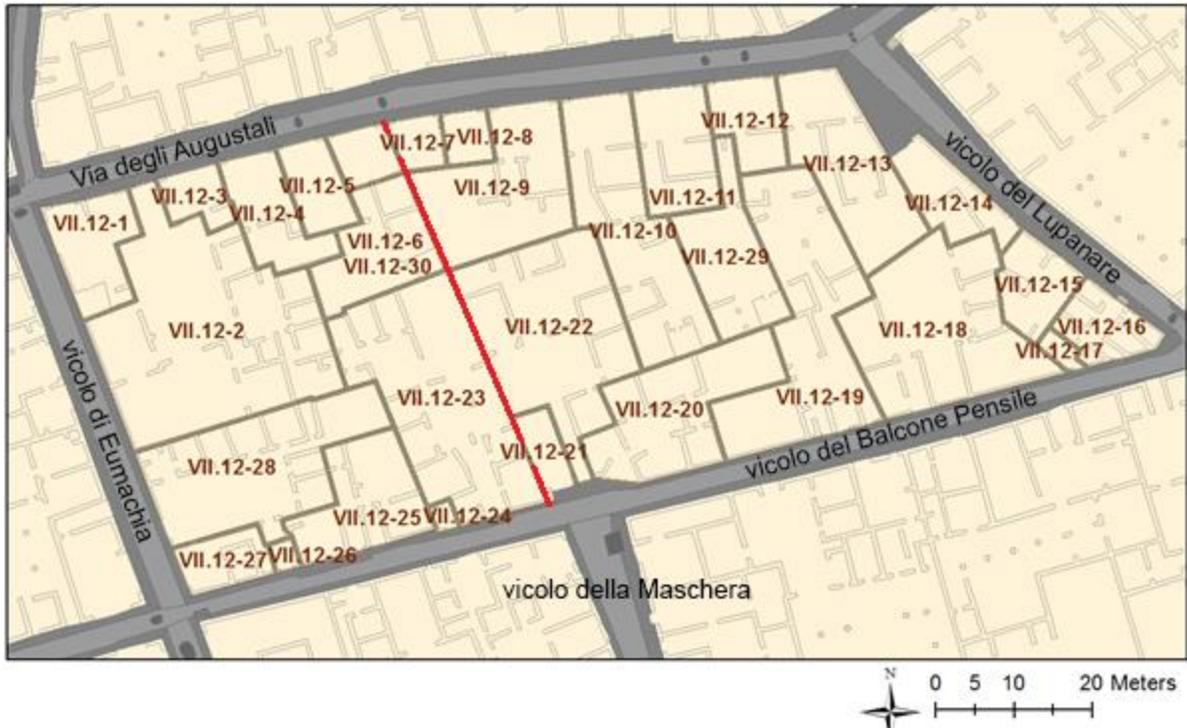


Figure 4. Insula VII.12. The red line represents the location of the original road.

expected building shapes. To the east, buildings have haphazard corners and irregular building axes—their jagged forms battle each other for space. It is almost impossible to make any sense of the layout of the eastern buildings based on their plans alone. Vicolo della Maschera original traversed insula VII.12 and separated two instances of urban development; the western half displays the expected parceling of land by a governing body while the eastern half might have remained as a public garden or market space which eventually was encroached upon by later building development.³¹

The grid produced north of via dell'Abbondanza can be replicated south of it. Insula VIII.5 is the product of four insulae merging together (Figure 5).³² Like insula VII.12, clues to previous street alignments can be seen in the organization of the standing architecture. An east/west street

³¹ This mirrors Geertman's interpretation of irregularities found in insula V.1. "The Urban Development of the Pre-Roman City," 90-92.

³² von Gerkan and Poehler both include this alteration in their maps, but never discuss it fully.

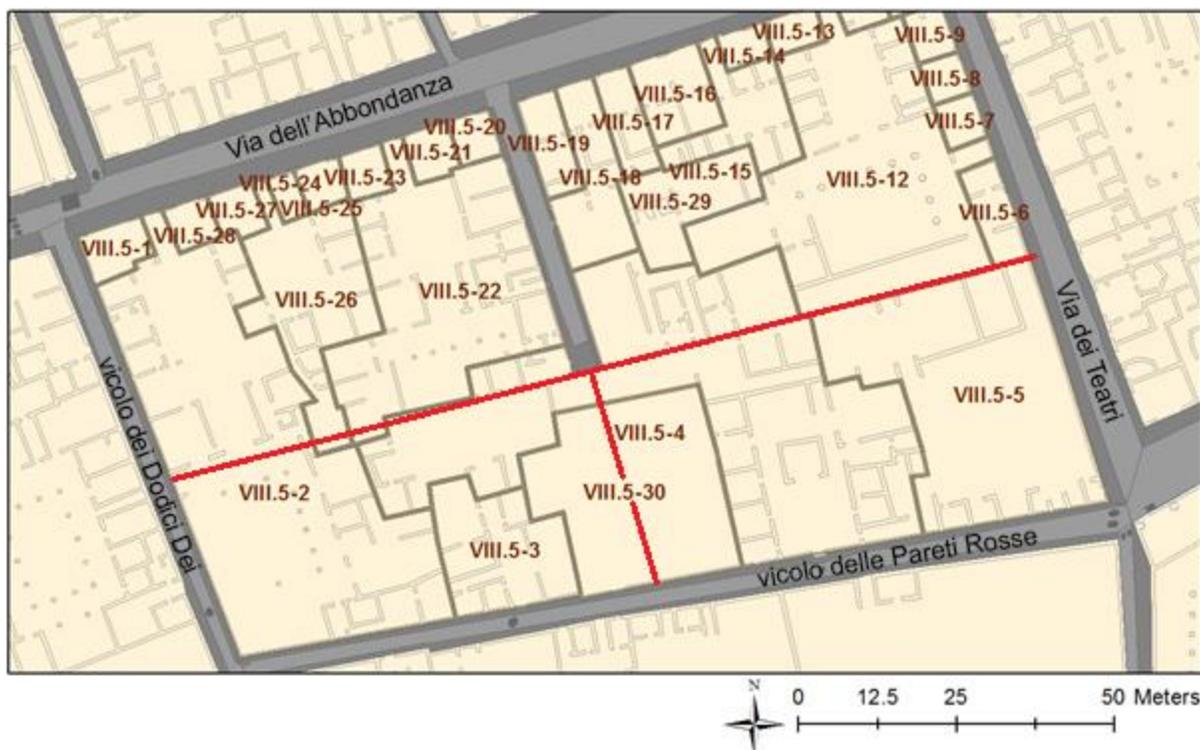


Figure 5. Insula VIII.5. The red lines represent the location of the original roads.

existed south of building VIII.5-12, crossed vicolo VIII.5-5 and eventually intersected vicolo dei Dodici Dei. The line of walls bisecting insula VIII.5 could be the artifact of a previous delineation of properties, one which got altered as time progressed. The extension of vicolo VIII.5-5 southward is blocked by buildings VIII.5-30 and 5-4. The central axes of these two buildings are starkly different from those of their neighbors, buildings VIII.5-2, 3, and 5.³³ While their neighbors continue the alignment of central axes seen in the northern section of the insulae, buildings VIII.5-30 and 5-4 instead make right angles with vicolo delle Pareti Rosse. Their construction overtook the bisecting street and they preferred to orient themselves with their façades in the south. Building VIII.5-3 displays the struggle and compromise in axial changes as its interior walls match the angles produced in the west and north, while its external walls match the alignment of buildings

³³ Of interest is also building VIII.5-22. Its axial alignment does not match perfectly with buildings VIII.5-4/30, VIII.5-2/12/5, or even vicolo VIII.5-5. Like building VIII.5-3, it could be the product of a compromise between the old and new development.

VIII.5-30 and 5-4. The division of insula VIII.5 into four parts would produce insulae similar in shape and size to those north of via dell'Abbondanza.

Similarly, insula VIII.3 could have been laterally bisected (or even trisected), creating insulae similar in shape to those of insulae VII.9a-c. Only so much can be argued on the reorganization of space in insulae VIII.3, VIII.5, and VII.12 through this study of standing architecture and central building axes. Further analysis, either by excavations into pre-Roman stratigraphic layers or metrology paired with architectural chronologies, is still needed.

More difficult to support is von Gerkan's assertions that another north/south street traversed insulae VII.9a-c. The Roman buildings constructing the eastern façade of the forum—the Eumachia building (VII.9.1), building VII.9.2, building VII.9.3, and the Macellum (VII.9.8)—erase any evidence there could be for the proposed street.³⁴ Their central axes are not parallel with each other and they require “wedges” to make their façades flush with the colonnade of Popudius.³⁵ Because their axes are unique to their construction and because they absorbed large amounts of space in their insulae, they cannot be used to infer orientations of earlier buildings or the location of proposed streets. Therefore, while von Gerkan proposed that another north/south street west of and parallel to vicolo di Eumachia would cross insulae VII.9a-c, with the current knowledge, it is almost impossible to argue for the validity of his claims.

While we cannot know for certain if vicolo del Balcone Pensile and vicolo degli Scheletri connected to the forum (and the abstracted north/south axis), as von Gerkan proposed, it seems logical that they did. The Eumachia building and the Macellum are both flush with their bordering

³⁴ Dobbins, John Joseph, “The Forum and Its Dependencies,” in *The World of Pompeii*, ed. John Joseph Dobbins and Pedar William Foss (London; New York: Routledge, 2007), 173; Ling, Roger, “Development of Pompeii's Public Landscape in the Roman Period,” in *The World of Pompeii*, ed. John Joseph Dobbins and Pedar William Foss (London; New York: Routledge, 2007), 124.

³⁵ Dobbins, “The Forum and Its Dependencies,” 170.

streets, and their walls continue that alignment. It is only with the construction of buildings VII.9.2 and VII.9.3 that these streets are cut off. The blocking of these two streets is indicative of a significant change to the forum: at a certain point in its life, it became a pedestrian thoroughfare and was inaccessible to wheeled traffic.³⁶ While via dell'Abbondanza, via Marina, via delle Scuole, vicolo delle Terme and via del Foro use guard stones to prohibit wheeled traffic, streets like vicolo del Balcone Pensile, vicolo degli Scheletri, vicolo del Gallo, and vicolo del Granaio utilize later construction. The latter opportunistically expanded their building footprints along the façades of the forum while also enforcing the pedestrian zone.

Unfortunately, no consensus can be made on the evolution of the forum itself, the dominant feature of the *Altstadt*.³⁷ Richardson argued that the relatively large scale of the forum proved that the *Altstadt* was reorganized during the re-foundation of Pompeii to fit the city as a whole. However, excavations into the forum provided few architectural remains until the second century BCE, contradicting Richardson's hypothesis.³⁸ Instead, the forum in the archaic age functioned as a large market place for trade attracted by the Sanctuary to Apollo.³⁹ The form it took is still under debate.⁴⁰

The urban fabric west of the forum underwent dramatic change as well, heavily influenced by the irregular topography of the area (Figure 6).⁴¹ It is generally accepted that the temple of

³⁶ Poehler, Eric E., "The Organization of Pompeii's System of Traffic: An Analysis of the Evidence and Its Impact on the Infrastructure, Economic and Urbanism of the Ancient City," (Charlottesville: University of Virginia, 2009).

³⁷ Dobbins, "The Forum and Its Dependencies," 167. Dobbins attributes this to the lack of archaeological evidence and the utterly divergent opinions of scholars on such scant information.

³⁸ Arthur, Paul, "Problems of the Urbanization of Pompeii: Excavations 1980–1981," *The Antiquaries Journal* 66, no. 1 (1986): 29–44.

³⁹ Ball, Larry F., and John J. Dobbins, "Pompeii Forum Project: Current Thinking on the Pompeii Forum," *American Journal of Archaeology* 117, no. 3 (2013): 467.

⁴⁰ Dobbins, "The Forum and Its Dependencies."

⁴¹ This map shows the projected topography which arcMaps extrapolated from elevation points. Because some areas are deficient in data, the contour lines are incorrect in the south where the cliff follows the curve of the insula VIII.2. See Holappa and Viitanen for additional topographic maps.

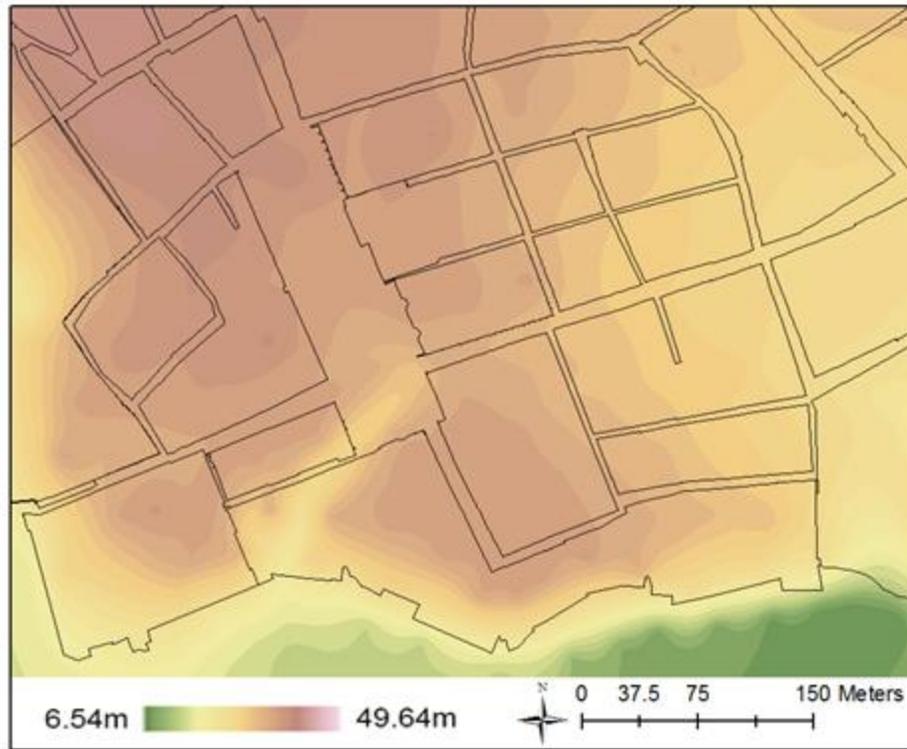


Figure 6. Projected topography of the Altstadt. Reds represent areas of higher elevation and greens represent lower elevation.

Apollo had a street to the north and to the west of its *temenos*, as extensions of vicolo del Gallo and vicolo Storto Nuovo.⁴² Originally, Porta Marina was situated farther south, resulting in a wider angle for via Marina, causing the street to be closer to the alignments of vicolo del Gallo and vicolo del Soprastanti.⁴³ While this reorientation and the missing streets around the Temple of Apollo would not have created a perfect grid, as seen elsewhere in the *Altstadt* and Pompeii as a whole, the street network would be more conducive to one than the current angles. It is likely these angles were created to form right angles with the pomerial road.⁴⁴ Here, the direction of the exterior circuit deviates south to address the irregular topography: the slight decline south-westward of vicolo dei

⁴² Ball and Dobbins, "Pompeii Forum Project: Current Thinking on the Pompeii Forum," 476; von Gerkan, *Der Stadtplan von Pompeii*, 17-18.

⁴³ Arthur, "Problems of the Urbanization of Pompeii," 31.

⁴⁴ Poehler, *The Traffic System of Pompeii*.

Soprastanti and the extending bulge of the cliff.⁴⁵ The interior of the western section adopts the change in direction created by the exterior circuit but still attempts to maintain a grid formation. It is not uncommon for ancient cities to have multiple orientations because of the topography.⁴⁶ The large space of the early marketplace helped buffer the differences in orientation of the two grids.

Topography explains the skewed angles created along the southern cliff as well. Via della Regina (east) and vicolo delle Pareti Rosse are at odd angles with via dell'Abbondanza creating the unusual placement and shape of insula VIII.6. The two streets break the traditional orthogonal planning for the insulae. While it is possible that the streets have changed course and originally conformed to the orthogonal layout, they could also be acting in response to the irregular shape of the land. The cliff of the south creates an obtuse angle with via delle Scuole, the north/south axis. It curves to eventually form the limits of the Triangular Forum, another obstruction to the grid in the south. Vicolo della Regina (east) conforms to this change in orientation.

The *Altstadt* was the product of urban planning. The city's planners utilized an integrated orthogonal plan to manage the city's space. The forum and via delle Scuole created the north/south axis while via Marina and via dell'Abbondanza created the east/west axis. These central axes dictated the orientations of smaller streets and their grids. The planners attempted to replicate grid formations in the west and south but had to account for the restrictions of topography.

City Orientations

It is peculiar that the major street alignments pay no regard to the natural topography, forcing the grids to adjust to that negligence. The old city's orientation seems almost arbitrary. So, why was the *Altstadt*, as a planned entity, oriented as it was? For the purposes of this paper, the

⁴⁵ Richardson, *Pompeii: An Architectural History*, 39.

⁴⁶ Castagnoli, *Orthogonal Town Planning in Antiquity*; Smith, "Form and Meaning," 16.

orientation of a city is defined as the angle produced by its north/south axis in relation to north, represented here by degrees clockwise from north (°N).⁴⁷ The forum and via dell Scuole were rotated 337°N. In general, narratives of Pompeii's urban planning rarely attempt to explain the motivation behind any of the orientations found in the city, which is an odd oversight.

Topography was a large concern for centuriation. In central Italy, it was not unusual for cities to utilize the coast line to orient their street grid.⁴⁸ Herculaneum was an excellent example of this; it was built right on a cliff-side coast and its streets either ran perpendicular or parallel to that feature. The major topographic obstacle hindering the *Altstadt*'s urban development was the remnants of a lava promontory upon which Pompeii was built. This feature elevated Pompeii from the surrounding fluvial plains and created the cliffs along city walls in the south, west, and some of the east. These cliffs acted as a limiter but do not appear to be the basis of the *Altstadt*'s grid orientation.⁴⁹ Unlike at Herculaneum, the old city's main grid system was not parallel to its cliffs. Pompeii did rely heavily on its port on the bay of Naples and the River Sarno for much of its economic livelihood, but the actual location of its harbor is still debated and neither water feature was close enough to dramatically affect Pompeii's urban development.⁵⁰ Topography, as explained earlier, acted more as an inconvenience, creating the exceptions to the grid, and did not account for the *Altstadt*'s orientation in general.

⁴⁷ All references to north in this paper will be describing true north (geographic north) and not magnetic north.

⁴⁸ Dilke, O. A. W., *The Roman Land Surveyors: An Introduction to the Agrimensores* (Newton Abbot: David and Charles, 1971), 87.

⁴⁹ Richardson proposed that the right angle in the south-eastern corner of the walls may have provided the orientation of the eastern-most grid of the *Neustadt. Pompeii: An Architectural History*, 37.

⁵⁰ Vogel, Sebastian, and Michael Märker, "Reconstructing the Roman Topography and Environmental Features of the Sarno River Plain (Italy) before the AD 79 Eruption of Somma-Vesuvius," *Geomorphology* 115 (2010): 76.

The most common way to orient a city settled on virgin soil was to align the major axes with the cardinal directions. Roman *castra* were the quintessential example of this. Setting the standards for Roman urban planning, *castra* were highly regularized and followed the strict rules of castrametation. The rules dictated that the camp ought to be rectangular and divided into four sections by the intersection of two major axes: the *decumanus* as an east/west street and the *cardo* as a north/south street.⁵¹ It was expected that these main axes would face the cardinal directions.⁵² While *castra* originally started as military camps, many grew into complete cities and their original planning remained intact.⁵³ The streets of the *Altstadt* divide the city into fourths and meet at the location of the forum, as is usual of the *castrum* design; however the central axis deviates significantly from a perfect north orientation. Additionally, while Pompeii and its *Altstadt* share many features with *castra*, their urban plans both precede Roman military imperialism by a few centuries.

An alternative method was to align a city with an extant country road. Tarracina is a famous example of this as it utilized the via Appia as its *decumanus*.⁵⁴ While this method has been used as a blanket explanation for the orientations of Campanian cities,⁵⁵ it is unlikely that Pompeii's *Altstadt* was oriented based on previous streets. Only one of its major axes aligns with a gate—via Marina with Porta Marina—and this gate led directly to Pompeii's harbor and descended down a cliff. No other gate fits into the scheme of the *Altstadt*. Porta Vesuvio may have connected with the *Altstadt* through vicolo dei Vettii but the route jogs by way of via Storto and only connects to a minor street, vicolo di Eumachia. It does not take a straight path. It is possible that the forum

⁵¹ Morris, *History of Urban Form*, 39; Dilke, *The Roman Land Surveyors*, 86.

⁵² Dilke, *The Roman Land Surveyors*, 86.

⁵³ Morris *History of Urban Form*, 39. Timgad the quintessential example of castrametation.

⁵⁴ Castagnoli, *Orthogonal Town Planning in Antiquity*, 103.

⁵⁵ Dilke, *The Roman Land Surveyors*, 87. Dilke claims Castagnoli discusses this but provides no reference.

connected through via di Mercurio to a gate which was later replaced with a tower.⁵⁶ However, the closure of this gate is indicative of that route's inferiority to those of Porta Ercolano and Porta Vesuvio which would have taken on its traffic load. Porta Ercolano connects with the forum through via Consolare, an artifact of an archaic footpath; however, its route awkwardly curves and does not connect to another gate.⁵⁷ It is unlikely that these streets continue the orientations of pre-existing roads.

Alternatively, the *Altstadt* could have been oriented in relation to religiously or politically important geological formations.⁵⁸ Vesuvius sleeps north-north-west of Pompeii, in the general direction of the north/south streets of the *Altstadt*. The volcano holds potential religious significance, being not only tied to Hercules, the mythical founder of Pompeii and Herculaneum, but also to Jupiter.⁵⁹ Unfortunately, due to its explosive eruptions, the location of its archaic peak remains a mystery and so it is impossible to know for certain if the grid points in its direction.⁶⁰

Other proposed explanations for Pompeii's orientation are astronomical. There are two common methods to consult the heavens when organizing urban space. The first involves forming an alignment with the solstices. This technique already manifests itself in the *Neustadt*: via di Nola and via dell'Abbondanza both align with the summer solstice while via Stabiana aligns with the winter solstice.⁶¹ The alignments of these streets in the *Neustadt* differ from those present in the

⁵⁶ Graaff, Ivo van der, "The City Walls of Pompeii: Perceptions and Expressions of a Monumental Boundary" (The University of Texas at Austin, 2013), 70.

⁵⁷ Richardson, *Pompeii: An Architectural History*, 40.

⁵⁸ The inspiration of this idea comes from De Caro, who proposed that via di Nola aligned with Monte Torrenone and its federal sanctuary of Foce Sarno; "Lo Sviluppo Urbanistico Di Pompei," *Atti E Memorie Della Società Magna Grecia* 3 (1992): 67–90. van der Graaf's summarization of De Caro's thesis and the argument against it is worth a read; "The City Walls of Pompeii," 92.

⁵⁹ Waldstein, Charles, and Leonard Knollys Haywood Shoobridge, *Herculaneum, Past, Present & Future* (London: Macmillan and Co., 1908), 97–98; Diodorus, *The Library of History*, IV.22.6; *CIL* x. 1, 3806.

⁶⁰ Waldstein and Shoobridge, *Herculaneum, Past, Present & Future*, 95.

⁶¹ Eschebach, Hans, *Pompeji, vom 7. Jahrhundert v. Chr. bis 79 n. Chr.* (Köln: Bohlau, 1995), 56–58.

Altstadt and so it is impossible for the *Altstadt* to be aligned based on the solstices. Another astronomical concern for urban planning was sun exposure. When a city in Italy rotates its orientation 22°N, its insulae will get sun exposure on all façades.⁶² However, the *Altstadt* is oriented 337°N, and thus solar concerns did not dictate its planning.

Vitruvian Urban Planning

The rotation of Pompeii's *Altstadt* 337°N cannot be explained through traditional methods of urban orientation. However, there is one Roman literary source which advocates for a similar alignment: Vitruvius' *De Architectura*. His work is one of the few surviving manuscripts detailing the procedure for urban orientation and general planning. So far, Vitruvius has been dismissed in discussions on Pompeian urbanism as being "theoretical and not always practiced."⁶³ However, the similarities between Vitruvius's instructions and the planning of Pompeii's *Altstadt* warrant exploration.

Concerns for a healthy urban environment dictated the sixth chapter of Vitruvius' first book in *De Architectura* and his instructions on urban orientation. To Vitruvius, winds were the biggest detriment to healthy cities and should be kept out of urban environments.⁶⁴ His instructions are to create a windrose, or wind compass. Surveyors should divide a circle into halves along the north/south axis of the desired city, and locate the spots on the circle 1/16th (or 22.5°) of the circumference on either side of the southern central axis. By connecting those two dots with a line, they create the southern face of an octagon and find the location of *Auster*, the southern wind.⁶⁵

⁶² Vinaccia, Gaetano, *Il Problema dell'Orientamento nell'Urbanistica dell'Antica Roma* (Istituto di Studi Romani, 1939), 32-40.

⁶³ van der Graaf, "The City Walls of Pompeii," 89.

⁶⁴ Vitruvius, *De Architectura*, 1.6.1.

⁶⁵ Vitruvius, *De Architectura*, 1.6.13.

The resulting octagon became a windrose that informed the surveyors about the locations and origins of the eight winds (Figure 7).

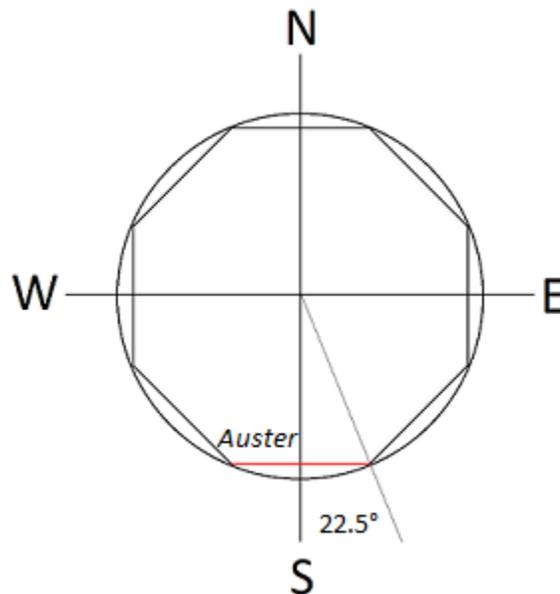


Figure 7. Creating a windrose and the location of Auster.

The octagon was an important surveying tool to ensure that winds were dispersed before reaching the interiors of a city.⁶⁶ While the octagonal city shape, with concentric rings of *insulae*, popular in Renaissance urban planning would prohibit winds from entering a city, Vitruvius explicitly says that winds should hit the corners of the *insulae*, not the *façades*. Vitruvius’s use of “*plateae*” and “*angiportus*” instead imply a “*per strigas*” orthogonal plan—one which utilizes major thorough-fares and minor streets to create oblong city blocks.⁶⁷

Therefore, to avoid dangerous winds, a city could not align with north, south, east, or west, as well as angles which bisect these directions. The correct alignment for the streets is created by

⁶⁶ Vitruvius Pollio, Ingrid D. Rowland, Thomas Noble Howe, and Michael Dewar, *Vitruvius: Ten Books on Architecture* (New York: Cambridge University Press, 1999), 173.

⁶⁷ *Ibid.*, 167-173.

placing the gnomon on two alternating corners of the windrose.⁶⁸ The ideal orientation for a city was thus on a rotation of 22.5° away from any of the cardinal directions. The central north/south axis of Pompeii's old city is 337°N, following Vitruvius' instruction.

It is striking, then, that the planning of an archaic city proves evidence for techniques explained over five centuries later in an Augustan-era treatise. However, Pompeii's *Altstadt* is not the only city to do so. A few prominent Greek cities utilize Vitruvius' rotation, including Naples and Alexandria in Egypt.⁶⁹ Naples holds great significance for the understanding of Pompeian urbanism because the two cities were interconnected through trade and historical background. Haselberger has identified the same geometry in the urban plans of Miletus, Kyrene, and later developments of Pergamon as well, while Hamberg advocates for further investigation into Magna Graecia in the hopes of identifying more.⁷⁰ These two scholars have spear-headed a theory that claims a "lost Greek treatise on town-planning" formed the literary foundation for Vitruvius' urban orientation instructions. Although links to Greek intellectual tradition are already evident in much of Vitruvius' work, Haselberger and Hamberg's theses are the first attempts at locating a Greek predecessor for Vitruvius' theories on urban planning.⁷¹

The ideas fueling Vitruvius' instructions for city orientation can be traced to Greek science and health concerns. The planning of the aforementioned cities coincided with an era when Greek

⁶⁸ Vitruvius, *De Architectura*, 1.6.13.

⁶⁹ Haselberger, Lothar, "Geometrie der Winde, Windige Geometrie: Städtebau Nach Vitruv und Aristophanes." In *Stadt und Umland: neue Ergebnisse der Archäologischen Bau- und Siedlungsforschung: Bauforschungskolloquium in Berlin Vom 7. Bis 10. Mai 1997 Veranstalter Vom Architektur-Referat Des DAI*, ed. Ernst-Ludwig Schwandner, Klaus Rheidt, and Deutsches Archäologisches Institut (Mainz: P. von Zabern, 1999), 93.

⁷⁰ Haselberger, Lothar, "Geometrie der Winde," 94; Hamberg, Per Gustaf, "Vitruvius, Fra Giocondo and the City Plan of Naples: A Commentary on Some Principles of Ancient Urbanism and Their Rediscovery in the Renaissance," *Acta Archaeologica* 36 (1966): 105–25. Miletus's orientation could be a coincidence and the result of the topography as its grids follow the trajectory of the peninsula.

⁷¹ Wallace-Hadrill, Andrew, *Rome's Cultural Revolution* (Cambridge; New York: Cambridge University Press, 2008), 145.

urban planning was entwined with philosophy and medicine.⁷² Winds, the driving force behind Vitruvian urban planning, were an explicit concern to Hippocrates, who, in *Airs, Waters, and Places*, differentiates between the damaging effects of the northerly, southerly, and westerly winds, while praising the health benefits of the easterly winds.⁷³ Aristotle adopts Hippocrates' emphasis on the health benefits of the easterly winds by recommending that cities face east.⁷⁴ He also argued for an eastern facing city because the morning sun was healthy for the people, air, soil, and water. Haselberger projects Greek hygienic concerns onto the works of Hippodamus, having extrapolated from Hippodamus' epithet: μετεωρολόγος ("one who talks of the heavenly bodies").⁷⁵ It is possible Hippodamus incorporated his understanding of the link between the skies and health into his urban designs.⁷⁶

Pompeii's *Altstadt* fits into Haselberger and Hamberg's narrative of a lost scientific document forming the foundation for Vitruvian urban design. It becomes another city displaying Vitruvian urban planning during the late archaic and 5th century BCE, significantly before Vitruvius was writing. As a distinctly planned entity, it utilized the rotation of 337°N to arrange its insulae, mirroring the alignment of its neighbor, Naples.

Conclusion

Scholars have often sought a one-to-one correspondence between distinct characteristics of urban form at Pompeii and specific cultural or political shifts in the city's history. Section two

⁷² Hamberg, "Vitruvius, Fra Giocondo and the City Plan of Naples," 112.

⁷³ Hippocrates, *Airs, Waters, and Places*, 1.1-6.

⁷⁴ Aristotle, *Politics*, 1330a.

⁷⁵ Castagnoli, *Orthogonal Town Planning in Antiquity*, 75; Haselberger, "Geometrie der Winde," 96. Hamberg is hesitant to ascribe this rotation to Hippodamus or any other Greek figure specifically.

⁷⁶ Castagnoli, *Orthogonal Town Planning in Antiquity*, 67; Haselberger, "Geometrie der Winde," 96. Both bring up a possible reference to Hippodamus in Aristophanes' *The Birds*. Their discussions are a bit tangential to this research, but worth a read.

of this paper briefly mentioned only a few of the cultural assignments inferred from the urban fabric of the old city; additionally, many more have been projected onto later developments in the *Neustadt*. The incorporation of a planned *Altstadt* into Haselberger and Hamberg's narrative of a "lost Greek treatise" would appear, at first glance, to provide evidence supporting Carrington, Mau, and other scholars who propose a Greek (or heavily Greek-influenced) origin for the early city.⁷⁷ However, Pompeii's cultural identity was far more ambiguous than these scholars have assumed, and it would be improper to assign it a distinct cultural characterization.

Pompeii's old city has evidence that points to a variety of cultural backgrounds, not just in urban form but in architectural orders and archaeological remains.⁷⁸ As Wallace-Hadrill remarked, it is an "odd thing" to assume that the cultures that built and affected Pompeii were "mutually exclusive."⁷⁹ By outlining stark boundaries in cultural shifts, these scholars have assumed homogenization or the erasure of local identity post-conquest, ultimately failing to adequately address the complexity of Pompeii's cultural makeup and the constant process that is the creation of identity.⁸⁰ In this sense, Pompeii no longer looks strictly Greek, Oscan, or Etruscan. Instead, the city shows a "cultural triangulation"; its identity and cultural makeup are unique to its geographical and historical situation.⁸¹

Therefore, while the antecessor to Vitruvian urban planning has many roots in Greek scientific theory, its influence on the old city of Pompeii suggests that its origins may in fact be

⁷⁷ Carrington, R. C., "The Etruscans and Pompeii." *Antiquity* 6, no. 21 (1932): 7-8; Mau, *Pompeii, It's Life and Art*, 9. It is important to note Mau seems to argue in the beginning for an Oscan origin, but that the Oscans adopted Greek cultural norms. He claims later that the 'Kalksteinatrien' was Etruscan and so does not appear to connect Oscan peoples with the foundation of the earliest urban form.

⁷⁸ Wallace-Hadrill, "Pompeian Identities: Between Oscan, Samnite, Greek, Roman, and Punic," in *Cultural Identity in the Ancient Mediterranean*, ed. Erich S. Gruen (Getty Publications, 2011), 415-422.

⁷⁹ *Ibid.*, 422.

⁸⁰ Wallace-Hadrill, *Rome's Cultural Revolution*, 6.

⁸¹ Wallace-Hadrill, "Pompeian Identities," 422.

pan-Mediterranean. Instead of being purely Greek, Vitruvius' works grew from a larger Mediterranean urban planning tradition, reflecting the cultural complexity of the region.

Exploring Pompeii's archaic city not only expands the understanding of its local history, but also illuminates new cultural and intellectual exchanges between Greeks and Italians. It becomes evident through urban planning that there were shared standards and desires for shaping urban environments that crossed cultural and geographic boundaries. This research illustrates more ways in which the archaic Mediterranean was vastly connected.

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