Public Space in Roman Pompeii

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The small Campanian town of Pompeii was destroyed in 79 AD by the volcanic eruption of Mount Vesuvius When houses, temples and baths were covered by ashes and brimstone a specific moment was frozen in time. A disaster, of course, for the people of that time, but for us a unique opportunity to know something about their lives and actions. The realities of both the urban dweller and the rustic visitor express themselves in the built environment, and the ruins of Pompeii are sufficiently well preserved for us to be able to follow in their traces.

In this study, which is part of a planned larger project[1], we have chosen to concentrate on movement opportunities. How are these made possible – and even directed – by the townscape? And how could this kind of information be extracted from the archaeological remains? We have used a method called Space Syntax, which brings new data to what is already known.[2] Our interpretation of the result sheds light mainly on the final phase before the destruction, but we also pose some hypotheses about Pompeii's earlier periods.

The final part of the article is an experiment in "real life empathy", as archaeology is not only "dry bones". To illustrate what an analysis of the interface between inhabitant and stranger can bring, we there attempt to follow two travellers about town.

The town of Pompeii

Pompeii was situated in the fertile landscape of Campania, south east of Mount Vesuvius. The town was strategically placed at the river mouth of the Sarno. In the surrounding country, intensive agriculture was possible, and the road net connected Pompeii to other nearby towns.

At the time of its destruction the estimated number of inhabitants was about 10.000 inhabitants (Wallace-Hadrill 1994, 98). Pompeii was a functionally diversified town, comprising houses of varying standards, through traffic, commerce, different crafts, civic centres for politics, administration , culture and religion and even some agricultural activity within the town walls.

The extension of the town was about 1.300 m in the east to west direction, and 700 m in the north to south direction. Inclination was primarily from north-west to south-east (average about 5%), but there were also obvious

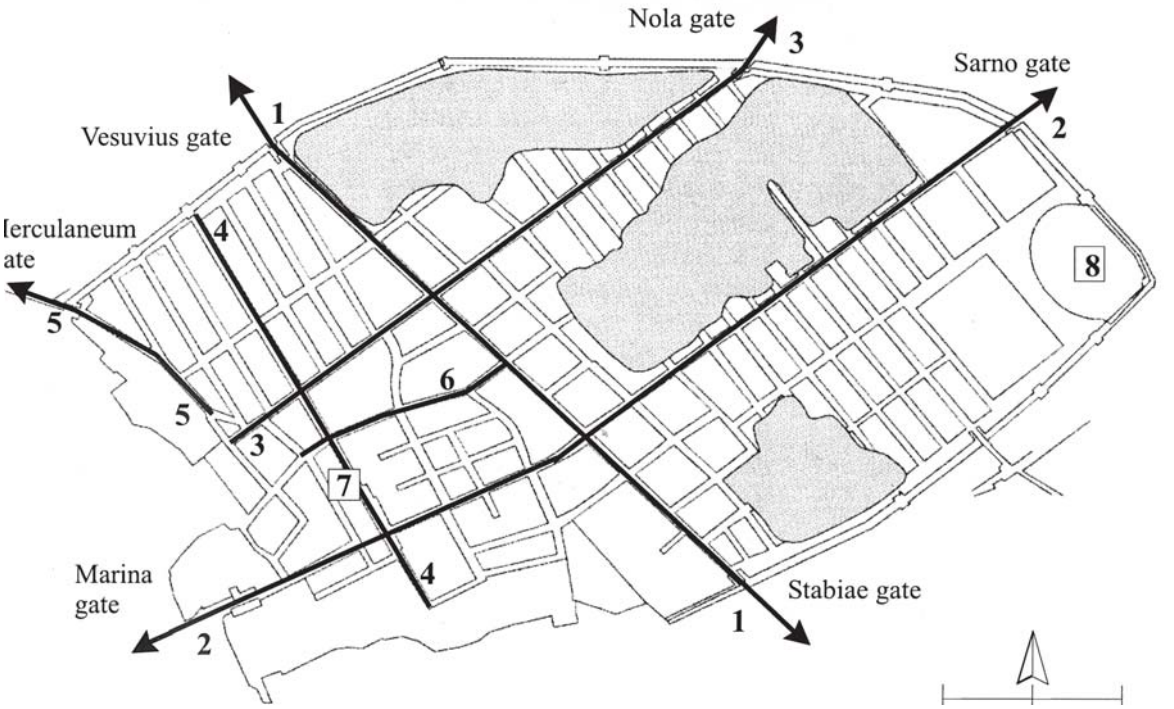

Figure 1. Map of Pompeii's principle outlines, after Geertman 1998, 17. Important streets and other features of the town are marked to facilitate the reader's orientation. 1 = Via Stabiana/Vesuvio, 2 = Via dell'Abbondanza/Marina, 3 = Via di Nola/della Fortuna/delle Terme, 4 = Via di Mercurio/del Foro/delle Scuole, 5 = Via Consolare, 6 = Via degli Augustali, 7 = Forum, 8 = amphitheatre. The street names are not ancient. Unexcavated areas marked in grey.

height differences in other directions. The south-west part of the town, where the Forum was placed, consisted of a marked hillock.

The town was confined within a town wall, which in the final phase was non-existent along several stretches, but nevertheless can be seen as the town's border. This wall had seven gates.[3] The street net was primarily ordered into grid like sections, with slight differences in orientation in different parts. The Forum hillock had, however, a completely different lay out. This has been interpreted as vestiges of an original, unplanned, town (Eschebach 1970, 17–40; Geertman 1998).

Buildings usually comprised more than one storey, and combined different functions under the same roof. There were also larger, official buildings such as baths, temples, theatres and an amphitheatre.

Establishing a usable map

A pre-condition for an analysis of the urban structure of any town or city is a correct map. Especially when using Space Syntax as a method (see below under *Space Syntax method*), it is important to be as sure as possible about the actual lay out of the street pattern. Regarding Pompeii, this posed some important problems, although a detailed plan (CTP) [4] was published as recently as 1988.

First of all, only about 2/3 of the area is excavated. The street structure in the unexcavated area has been variously reconstructed on the maps available.[5] The logic of these reconstructions is not always evident when compared to observations made in Pompeii itself or to CTP 1988. Also, even the excavated parts of Pompeii are not consistently rendered, for instance when it comes to street width, the angles of street crossings and irregularities along the extensions of the streets. The widely spread "common plans" of Pompeii could therefore not be used in our analysis.

The large and detailed CTP-map (CTP 1988, below called *CTP map*) could arguably have been used, but there were some problems.

The upshot of this was the necessity of a fairly detailed street pattern survey on the site itself, in order to determine a plan solution possible to use in an urban analysis. This was carried out in the summer 2000. The survey entailed establishing sight lines and axial lines possible to walk along, for all streets in the pattern. Where actual sighting and walking was not possible due to unexcavated terrain, we used compass to determine possible street directions starting from excavated street crossings. Our survey turned out to agree with the CTP map in all matters except those, where the scale of the plan made observations on the spot necessary. Therefore, we decided to base the Space Syntax analysis essentially on the detailed CTP map, augmented with the survey's observations of line continuity.

Space Syntax method

The method used in this study is Space Syntax, which describes certain qualities of space in a quantifiable way. The method and the theory behind it were presented by two British architects, Bill Hillier and Julienne Hanson in *The Social Logic of Space* (1984) and further developed by Hillier in *Space is the Machine* (1996). The basis of the theory is that there is an interdependence between societal relationships and spatial configuration. Through representation, measurement and quantification Space Syntax describes certain aspects of spatiality within a society. These data offer a starting point for analysis of the social pattern as deployed in space, and may be combined with other, not predominantly spatial, data.

Analysing the archaeological remains of a society long since gone, poses problems inherent in the nature of these remains – there is no way in which to correlate the data obtained with a functioning reality. In Pompeii, as opposed to in living cities, there are no inhabitants and no visitors to ask for the uses and abuses of space, no people to be counted on certain places in the street pattern or to be observed in their daily tasks. Also, the spatial pattern itself is partially defunct due to the ravages of time, when it is excavated at all. Given these limitations, in a town as extensively excavated and preserved as Pompeii, there is still a lot Space Syntax can tell.

A Space Syntax analysis starts with determining the *spatial system* to be analysed. In this study we have chosen the public space of Pompeii within the town walls. Other choices of Pompeiian spatial systems are possible (Pompeii including its suburbs, a few blocks etc.) and would yield other results.

The next step is to identify the *convex spaces* and the *axial spaces* within the spatial system.[6] A *convex space* is a space without any concavity in its outline. The shortest path between any two points in the convex space thus never can pass outside the borders of this space (Hillier & Hanson 1984, 97–99). Examples of convex spaces are triangles, circles and rectangles and all other kinds of "fat" spaces. On the contrary, the patterns of a moon sickle or a star are *not* convex spaces.

The entire spatial system analysed is made up of series of convex spaces, small and large. These convex spaces form the framework for stationary activities. They are used by people performing an activity – but they can also be useless or not used by choice. Therefore, a convex analysis expresses the inhabitants dimension of the system. It reflects the spaces where they live and work – in our case Pompeii's streets and open places.

The *axial dimension* is expressed by drawing the longest and fewest lines that connect all the convex spaces of the system. Those lines are the so-called *axial spaces*. Each axial space passes through two or more convex spaces, stringing them up like beads on a string. (Hillier & Hanson 1984, 99–100). The axial dimension of the public space is primarily the dimension of movement. It reflects the possibilities for passing through the town, choosing a series of axial lines to move along. This means that an axial analysis primarily reflects the visitor's use of space.

By defining the convex and the axial structure of the spatial system, the prerequisites of a deeper analysis are created. For analysing the public space of a town, axial structure often gives the most valuable information. It focuses on movement, which is natural for a system consisting mostly of thoroughfares and other streets. The convex dimension must not be forgotten, however, as the interface between the two dimensions mirrors the potential of contact between inhabitants and visitors.

Many convex spaces threaded upon a few axial lines means that movement is facilitated. It implies that the traveller would easily pass many inhabitants in some sort of activity and would grasp a large part of the town's structure. On the

other hand, if the axial lines each string up only a few "beads", the stationary dimension is stressed (Hillier et al. 1983, 50–55). A traveller in such an environment would not easily pass through so very many convex spaces, and his knowledge of the town structure and his confrontation with the inhabitants would be limited.

The relationship between different spaces (convex *or* axial) in the system can be calculated and measured. As already mentioned, in this study we have concentrated upon the axial dimension, and our further explanation of Space Syntax method concerns axial spaces only.[7]

For all Space Syntax calculations the notion of *distance* is important. Distance is seen as the number of axial spaces that must be traversed in order to move most economically from one axial space to another. A central measure based on distance is *integration*. The integration value for a specific axial space expresses its total distance to all other axial spaces in the system.[8] A high integration value shows that a axial space is central to the spatial system and offers the possibility to conceive the spatial system as a totality. A low integration value instead points to an axial space that is in some sense also separate from the system of which it is part. Such an axial space is called *segregated*.

Apart from the ones discussed above, Space Syntax includes a variety of other measures and concepts. Our present study is, however, limited to the integration of axial space and some aspects of the interface between convex and axial configuration.

The establishment of the public space in Pompeii

The establishment of Pompeii's public space is based on some assumptions and decisions.

As public space we have defined streets and sidewalks, open spaces directly connected to streets, porticoes framing streets and open spaces, or jutting out in front of various buildings. We have also included five large buildings around the Forum, whose functions are seen as extensions from the open public space.[9] In these cases we have treated the interior of the buildings as one single convex space, disregarding internal subdivisions. The same goes for three temple precincts, namely those of Apollo and of Venus on the Via Marina, and the so-called "Foro Triangolare" in the south of the town. All other structures are considered as non-public space.[10]

In the unexcavated parts of the town we have assumed that streets continue as straight lines, if there is no evidence contradicting this. The pattern of streets and blocks, *insulae,* in these areas has been assumed to be similar to that of the neighbouring areas. To create a working hypothesis, we have not assumed any unknown subdivisions of insulae, side streets or larger open spaces.

A special problem is the existence or not of a street following the town wall, as this is only partly excavated. We have assumed such a street in areas where there is some evidence of a passage between town wall and house blocks – that is, in the north-east and in the south-east of Pompeii. The whole of the west and the south-west part of the town, as well as the area around the amphitheatre do not possess such a street.

In the north-west a town wall street seems to have existed in an epoch prior to the last, but to have been closed off at some time from the rest of the street system. This is indicated by antique walls blocking the north to south going streets[11] and by windows and possible walled up doors facing the now blocked area immediately inside the town wall. Thus, between the Herculaneum and the Vesuvius gates no town wall street is included in our analysis.

The space surrounding the town is considered as one single space carrying the spatial system of Pompeii. This is called the *carrier space*.

Pompeii's axial plan

All the axial spaces of Pompeii, numbering 114, are shown in Fig.2. The most integrated lines are shown in Fig.3. The axial plan shows the following important characteristics:

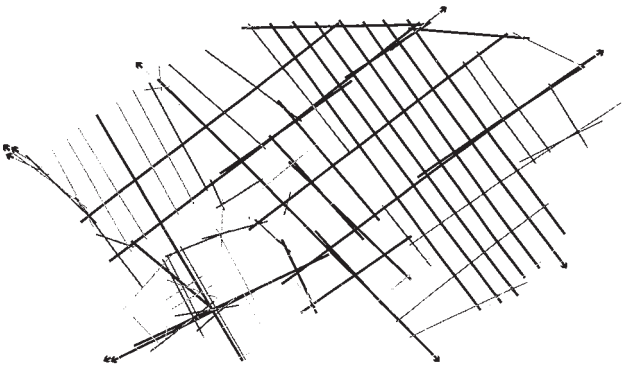

Figure 2. The axial plan of Pompeii. Fatter and darker lines indicate higher integration, in fractions of 25%.

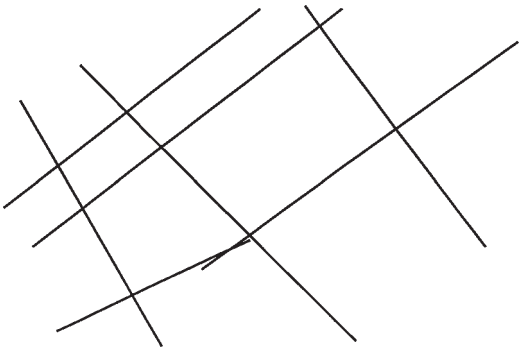

Figure 3. The most integrated axial spaces in Pompeii. These lines show the basic *spoked wheel* pattern.

- The axially most integrated spaces come very close to the *spoked wheel* pattern discussed by Hillier. In this pattern the axially most integrated spaces surround and radiate from a less integrated town core. Hillier and other researchers using Space Syntax have shown that this pattern is typical for a category of spontaneously grown, unplanned towns, both historically and today.[12]
- The *spoked wheel* pattern is not valid in the east part of the town, where there are several highly integrated axial spaces going north to south. Their uniform rather high integration is in part caused by a repeated pattern of crossings with the most integrated east to west lines. Using Space Syntax this is a mathematical effect of regular grid plans.
- The streets leading to the town gates, have, with one exception, among the longest and most integrated axial lines. If these long lines do not actually pass the gates onto the *carrier space*, they are only one axial step from it. The exception to this pattern is the Via Consolare leading out through the Herculaneum gate in the north-west. Here the street is broken up into several axial spaces of medium integration.
- The axially most segregated spaces are mainly found in the areas close to the Forum and around the amphitheatre.
- The *carrier space* is one of the most integrated spaces of Pompeii, which indicates that interconnections with the countryside was an important aspect of the town's life.

Out of this axial plan there arise several interesting points for discussion.

1. Via di Mercurio

The streets necessary to the spoked wheel pattern are all among the very most integrated lines (See Figure 3) There are other slightly less integrated lines forming part of the pattern, but this persists even when these lines are removed. The necessary lines are in the east to west direction:

- the well known Via dell'Abbondanza/Via Marina in the south
- Via delle Terme/della Fortuna/di Nola in the north

In the north to south direction the streets are, from the east:

- Via Stabiana/Vesuvio
- Via di Mercurio/del Foro/ delle Scuole (here called *Via di Mercurio*). This last line also comprises the eastern part of the Forum proper.

With one exception, all these streets and their axial spaces are connected to the carrier, either directly or by one axial step consisting of a short line passing the city gate. The exception, Via di Mercurio, is an interesting anomaly as it does not lead to any gate. It crosses the Forum, but to the north traverses a segregated area, and ends up blindly against a tower in the town wall. In the south it again goes through a segregated neighbourhood and ends in the corner of a small alley. Along this axial line are placed two arches, one at the northern perimeter of the Forum and one in the crossing with Via delle Terme. In crossing the Forum, this line is flanked by the east Forum colonnade and its décor, as well as by the temple of Jupiter to the west. The view along the axial line is thus unique, giving the illusion of big cityscape, masses of important architecture and likeness to imperial Rome itself (Zanker, 112–114).

Why has this street, leading from nowhere to nowhere, been invested with all these features, as well as with one of the highest integration values ? One possibility is a conceptual importance, partly to be derived from the fact that the street crosses the Forum. If this is so, it is strange that the street does not connect this civic centre to the town gates and the world outside. Could it be hypothesised that the Via di Mercurio once *did* have this connection? As has been suggested, the south-west part of the town may once have been the original ancient town core, later augmented by new districts. In this case the Via di Mercurio would be the old main street of an italic town, and its northward con-

nection with the surrounding countryside. Thus, the Space Syntax analysis could support the view of a gradual development of Pompeii, and make Laurence's suggestion of a town simultaneously laid out less probable (Laurence 1994, 15–17).

2. Via Consolare and the Herculaneum gate

Via Consolare is the only street leading to a town gate, where the axial lines are not among the 25% most integrated. Further, the axiality of this street is much broken up, contradictory to the straight lines coming from other town gates. The Herculaneum gate is not a back gate, however, but an impressive structure with one carriage entrance and two walkways. The street also shows heavy traces of wheeled traffic, which suggests it was much used. Its fairly low integration in this analysis could be connected with the fact that the town clearly continues outside this gate, with shops, houses and colonnades – not only with a necropolis, as seems to be the case outside the other gates. An axial analysis including this "suburban" area would show higher integration values for Via Consolare.

Another reason could be defence purposes. The wall between the two northern gates, the Herculaneum gate and the Vesuvius gate, seems to have been additionally fortified at some point in the town's history. We have already mentioned the blocking of the streets going southwards, from what was once a street following the town wall. There are also indications for an added strengthening of structures in the area. Our hypothesis is that the much broken up axiality leading from the gate to the Forum may have served the same defence purpose.

Obviously, defence was no longer needed once Pompeii became a Roman colony in 80 BC. The north-west part of the town should thus predate colonisation, as is the general opinion (e.g. Zanker 1995, 38, Abb. 2). Such strengthening of defence features have not been observed in other parts of the town. The relevance and the implications of this difference need further discussion.

3. The grid pattern neighbourhoods in the north-west and in the east

The two areas where a planned grid pattern is clearly evident, are the above mentioned north-west part of the town and the more extensive eastern area. The form of the blocks (*insulae*) is similar in both areas, but there is a slight difference in street direction.

In spite of the superficial similarities, there are important differences between these two parts of the town. The integration pattern of the axial spaces shows much higher integration in the eastern part. Also the noticeable character, status and functions differ: In the north-west patrician town villas dominate the picture, and while the east also features fine houses, there is a more agricultural set-up. Vineyards and gardens are found in this district. This difference in pattern remains to be more thoroughly investigated.

4. The amphitheatre and its surroundings

Lastly, there is an interesting but rather uncomplicated feature to be mentioned: the amphitheatre's setting in a segregated area. This spot must have been popular and attractive for visitors from both within and outside the town, its attraction enhanced by the proximity of town vineyards with serving possibilities. But the amphitheatre could also be disruptive to the town's tranquillity, as is witnessed by the famous wall painting, depicting a brawl between Pompeians and the visiting inhabitants of neighbouring Nocera (Ramage & Ramage 1995, 160). A segregated area minimised the risks of such a brawl spilling out into the town. For further good measure, the segregation could be made almost total: streets leading to the area from the integrated thoroughfares had portals possible to close with heavy doors!

The interface between convex and axial configuration – a preliminary discussion

In the introductory discussion on method, we mentioned the relationship between convex spaces and axiality. Here, the concept of *convex articulation* is an important one. A high degree of convex articulation means that many convex spaces are threaded upon one single axial line. This phenomenon means that a diversified and interesting environment is created for the visitor passing through, an environment easy to remember because of its variation. This facilitates finding the way in the town (Hillier et alii, 1983, 48–64; Hillier & Hanson 1984, 100).

The degree of articulation possible to detect from a plan depends on the scale of the plan, and on the researchers decisions about the size of details to be considered as boundaries for convex spaces. These decisions in turn depend on

the purpose of the study: a more overarching study of a large city need not include minor subdivisions of convexity, that would be interesting on the level of, say, a block. For Pompeii we have chosen a very high level of detailing, as the town would have been experienced primarily on foot, on a mule-cart or possibly on horseback. This means slow passage, which enables the traveller to notice minor boundaries and detailed articulation.[13] A further object for study is the non-spatial articulation of domains by such means as colour, façade decoration and changes in the pavement of streets and sidewalks – also important in a town of slow moving traffic.

Regarding convex articulation we have hitherto not made a complete study, but a few preliminary conclusions can already be drawn. One is, that axial spaces with low convex articulation occur predominantly in the grid plan areas (i.e. few "beads" on each string, but the lines are long nevertheless). High articulation may be found both along integrated and segregated lines.

Non-spatial means of articulation are used very differently in different parts of the town. The Via dell'Abbondanza/ Via Marina may serve as one example. Convex articulation is high along the whole street, with a slight falling off in the area closest to the Forum. Non-spatial articulation re-enforces this pattern: The eastern part and the most western part are highly differentiated by such means as the colour and form of the façades. As a contrast to this, in the Forum part of the Via dell'Abbondanza/Via Marina the facades show uniformity, which further enhances the lower convex articulation. This underlines the official and grandiose character of the Forum.

Another highly integrated street and strongly articulated street is the Via Stabiana, shown in Fig. 4.

Along this street there is no marked break in the convex articulation, although the theatre façade near the Stabiae gate offers uniformity of non-spatial articulation – in other words, the theatre is clearly made noticeable through a large façade differing from that of surrounding houses. Several small informal open places along this street created foci for encounters between inhabitants and strangers.

Since our study is focused on movement, let us now visit some of these places together with two fictive strangers in Pompeii. Following them we can see how axial lines and convex articulation worked out, bringing together stranger and inhabitant, and helping the visitor to find his way. Of course this is not meant to imply that people thought in Space Syntax terms. But as we cannot interview these people about their feelings and reactions we can at least hope to capture some of it. To that end we describe different spatial and non-spatial qualities discovered in our Space Syntax analysis, in the literature and in the practical experience of walking Pompeii. The interpretation of the fictive visitor's feelings in meeting these qualities finally has needed some general knowledge of the time and its culture as well as the intuition important in this kind of research.

Inhabitant and stranger – an illustration of the interface

Our first traveller is a woman, as Pompeii certainly was not only visited by men. She owns a small vineyard some miles out in the country, and travels together with her overseer. She reaches the Vesuvius gate, but before entering the town, she rests for a while in an *exedra* (half circle formed marble bench) conveniently set up by a local benefactor. Here she chats with some of the local people going out to the *necropolis* to honour their dead, and so she is already drawn into the orbit of communication while still technically outside

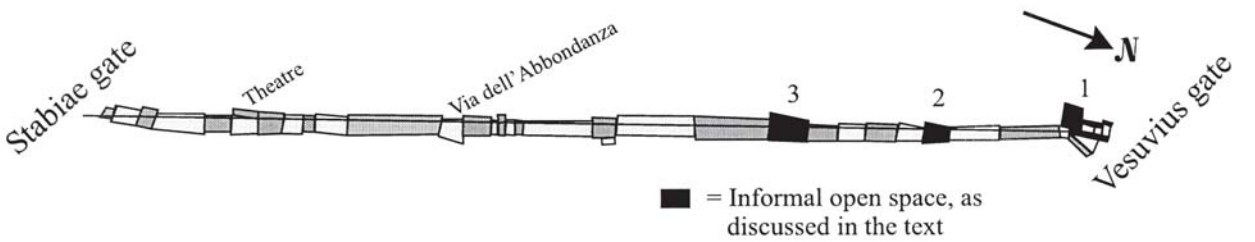

Figure 4. The series of convex spaces strung up along the axial space of the Via Stabiana, not to scale.

town. She passes the gate which clearly marks the boundary, and after this sees the Via Stabiana sloping steeply to the south.

She has immediately entered into the first of the convex spaces forming an informal small square. This is the open area in front of the *Castellum aquae,* where the aqueduct of Augustan times arrives in town (marked with black in Figure 4). This is a likely spot to fetch water for the houses nearby, if these are not directly connected to the aqueduct. An area in front of the castellum is outlined by large upright stone blocks, certainly meant to stop wheeled traffic, but possibly also delineating an area of some activity – water fetching or some work connected to water suggests itself. Here is also the grape gatherers post on the south side of the open place (Wallace-Hadrill, 1994, 215–216). This is a house with many entrances around a central room, suggesting communal activities and much comings and goings – it is plausible that the activities inside would spill out into the public space.

So, there would be abundant opportunity to talk to people, ask for information, pass the time of day and perhaps even to hire labourers for the vineyard, or arrange for the dusty travelling clothes to be washed. A stable for travellers entering or leaving the town is also at hand to the west, there are shops and bars for food and drink, as well as a fine *lararium*[14] on the east side of the small square, should the traveller feel inclined to honour the gods of the place. A whole array of activities possible to observe, and to a greater or lesser extent to participate in, thus confront our visitor.

If she, however, goes on southwards the traveller will in time arrive at the next little informal square. This is situated just before the Via Stabiana crosses the northernmost of the west to east axes, the Vicolo di Mercurio (marked with black in Figure 4). Here a large private house opens up with its main entrance, providing benches for its visitors, or for customers to the bar dependent on it. A shop entrance also opens onto the square, and stepping stones provide access to the east side of the street (Wallace-Hadrill 1994, 214–216). Just to the south of this, the convex articulation singles out the area of the street crossing. It is defined by a well and a tower for the distribution of aqueduct waters, but offers no other special incitement to stop for a longer while.

The next clearly marked informal square, providing a place of temporary standstill, follows already at the next crossing to the south, with the Via di Nola (marked with black in Figure 4). Here a workshop complex and a large shop are accessible (Wallace-Hadrill 1994, 211–212), as well as a small sanctuary to the *lares* and a well, decorated with a sculptured head. Stepping stones cross the street to the south and to the east, where there are several shops and a *caupona* for food and drink.

For the traveller, the street continues to unfold its various activities on her way south: informal places with mixed activities interchange with convex spaces devoted mainly to commerce. One of the commercial spaces is the stretch of the Via Stabiana following immediately to the south of the Via di Nola, where our traveller can shop according to her means. I some places the official Pompeii also makes its impact: the Holconian *tetrapylon*[15] at the crossing with the Via dell'Abbondanza does not only provide shade and a convenient overview of shops, bars and local altars, but also reminds the visitor of law and order and the possibility to take part in politics, if only by admiration.

Thus, meeting people going about their everyday work, participating in some sense in these activities by watching, talking, drawing water, resting and frequenting the same places to eat and drink, was eminently possible in the convex spaces provided along the entrance to town. The informal could certainly be combined with the economically profitable, as the shops, workshops, the stable and the bars show.

At the *tetrapylon* we leave our vineyard matron, contemplating the possibilities of encounters in town. In the stream of people passing by on the Via dell'Abbondanza, she may notice an elderly farmer, with his mule packed with country produce. Let us now follow his way, and see him safely back after his errands are done.

Articulation as a means of finding your way

The man with the mule is in Pompeii for the first time. How can he find his way in the town, safely reach his destination and dare to explore the city without fear of getting lost?

He reaches the town from the eastern countryside and enters through the Sarno gate. Once he has climbed the slope through the gate he can see the street, Via dell'Abbondanza, stretch out before him as a seemingly endless straight line. This in itself helps him to understand that he stands on an important thoroughfare. He can confidently continue to walk – or to ride his mule – knowing that this street will take him towards the core of the town. He can also observe that there are many other people doing precisely the same thing.

Soon, however, he will reach crossings with other streets. They are long and straight, just as the Via dell'Abbondanza, but their character is so different that he will hardly be tempted to turn into any of them. The main street is highly articulated, both spatially and by other means. Facades jut out into the street or are drawn in from it, forming a series of small convex spaces along the length of the street. Houses are differently coloured, and some of them have painted decorations, porticoes or sculptural architectural attributes. Also the activities demonstrate themselves with clear signals – broad openings to various shops, glittering marble counters for street side eating and drinking, and, for those who understand the signals, exclusive premises for various types of recreation.

The crossing side streets have an altogether different character with undecorated facades, few openings and ever fewer shops, and a largely unarticulated convex space. Some of these alleys even seem semi-private, with doors that can seclude them totally from the hectic movement on the thoroughfare. It is obvious that entering these streets would be to venture into the local, private life of the inhabitants, and as our visitor is a stranger in town he does not hesitate to follow the main stream straight forward.

One of the crossing streets, Via di Nocera, is more similar to Via dell´Abbondanza, with shops appearing to sell local wine. But although this might call for a temporary deviation, our visitor can clearly see that this street would lead him out through another gate – and that is not where he is aiming.

After following the highly integrated Via dell'Abbondanza over a score of crossings, the visitor will eventually find himself in the very centre of the town. In the crossing with Via Stabiana he meets a street that is just as highly integrated as the one he has come on, and which shows similar abundance of articulation, commerce and people. To his left it slopes down towards a gate, and the steep rise to his right also seems to lead to a far off town gate. If he turns to the right here, he will continue through a highly integrated and articulated street.

He has now got an overview of an abundance of shops and open places where he could sell his produce.

But maybe the elderly farmer is not only interested in shops and entertainment, but would also like to see the more official parts of Pompeii. In that case, the very formation of the townscape can tell him to continue straight on along Via dell'Abbondanza. He passes under the imposing double arch of the Holconian *tetrapylon*, and finds himself in a street flanked by uniform stone facades. Although there are still shops and commerce, the scale is larger and the street not as articulated as in its eastern part. This is the neighbourhood of the Forum, the grandeur of which is influencing also the street leading up to it. Closer to the Forum the Via dell'Abbondanza is closed for vehicles, and those who want to enter the official town centre have to do it on foot.

After finishing his errands our visitor wants to return along the same way as he came. Finding this would hardly be a great problem, as the straight axial lines will lead him in the right direction and the articulated street with many convex spaces will make him recognise places were he has already been.

How to continue?

This study has primarily been concerned with establishing an axial map of Pompeii and analysing the axial spatial system in terms of integration/segregation. In our planned larger project, we intend to continue with a corresponding analysis of convex spaces. A comparison between these two studies would show the relationship between convex and axial integration. Do the most integrated axial lines traverse the most integrated convex spaces – that is, do the most visitor-frequented parts of the town correspond to those where the inhabitants most often use the public space for their activities? A development of the research would be to define the activities of the various convex spaces, both in the spaces themselves and in the buildings opening into them. The character of the spaces traversed by different axial lines could then be more clearly defined.

Also, the study of the relationship between convex articulation and axial integration/segregation is to be pursued for selected parts of the town, in order to increase understanding about the visitor's possibility of finding his way in town. Further understanding of these matters can be obtained by a survey of facade colour, materials and other means for non-spatial articulation.

Notes

1. The study has been made possible by the generous financial support from Helge Ax:son Johnson's foundation, which enabled us twice to visit Pompeii for our fieldwork. Thanks are also due to Prof. Anne-Marie Leander-Touati, head of the Swedish Institute in Rome for friendly and scholarly advise, and to Stefania Renzetti and Pia Letalick of the Institute for administrative help. We also wish to thank the Soprintendeza Archeologica di Pompei, for providing the authorization to visit the entire street net.
2. The town of Pompeii has been much studied and researched upon, but the social aspects of space have not been the main target for this. Notable exceptions are the works of A. Wallace-Hadrill (1994), R. Laurence (1994) and P. Zanker (1995).
3. There are hypotheses about an eighth town gate to the north, investigated by, among others, Japanese scholars (Opuscula Pompeiana, different articles from 1991 onwards). As long as these hypotheses are not confirmed, we suppose only seven gates.
4. Corpus Topographicum Pompeianum (CTP) is an extensive collection of plans, publication data and summaries of research agreements and diputes for about half of the excavated buildings, plus a large plan (scale 1:1000) for the whole excavated city.
5. Such maps are found on the covers of CTP 1977–1987, in Richardson 1988 (cover), Laurence 1994, Geertman 1998, Zanker 1995 and other works on Pompeii. They appear to be based on different hypotheses about the angles of streets and house blocks in the unexcavated north-east area.
6. Axial space is a term that will provoke many readers. We do however use it, as it is used in established Space Syntax terminology. The term axial line is sometimes used as a synonym. A convex space is also not a three-dimensional space, but an area, but strangely enough this term seems more acceptable.
7. The procedure of analysing convex spaces is exacly the same and will hopefully be explored by us in a later part of the project.
8. The mathematical reasoning and formulas for integration are found in Hillier & Hanson 1984, 108–123. The integration value is most often inverted, to give high integration the highest mathematical values. Here we use the term integration value in this sense.
9. These are, on the east side: the Eumachia hall, the sanctuary for the imperial cult, the so-called Lararium (possibly also a temple of the imperial cult) and the Macellum (Zanker 1995, 93–110). On the west is the covered market.
10. Many other, less important decisions, had to be made in order to define the public space of Pompeii. This is not the place to discuss them, but they will be enumerated in our forthcoming comprehensive study.
11. From the west Vicolo di Modesto, Vicolo della Fullonica, Via di Mercurio, Vicolo del Fauno, Vicolo del Labirinto and possibly Vicolo dei Vettii just west of the castellum aquae. The most western street, Vicolo di Narcisso, is at present subject to excavation in its northernmost part.
12. Hillier 1989 deals specifically with this pattern, also see Hillier 1985, 174–177. In Hillier & Hanson 1984, 115 such a wheel pattern is shown for the French village Gassin, although this specific terminology is not used. The same goes for the thorough description of integration patterns given in Hillier 1996, 149–181, cf. also 366.
13. Our level of detailing in this preliminary study is based on the CTP map. Every shift in space boundaries, detectable by minute study of the map is included. For further investigations this has to be checked in reality. A few tests have been made in town, and the results were compatible with the CTP map.
14. The lares were local gods, protecting a household or a neighbourhood. A lararium was a sancturay to the lares.
15. Large arch supported by four solid pillars, raised by the influential Holconian family.

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