Hilltops, heat, and precipitation: Roman urban life and the natural environment

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Roman urban life and the natural environment

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According to Vitruvius, the town of Mytilene on Lesbos was elegantly built and magnificent in its appearance. Yet for its inhabitants, it was not a particularly good place to live:

> In that community when the wind is south, the people fall ill; when it is northwest, it sets them coughing; with a north wind they do indeed recover but cannot stand about in the alleys (*plataeae*) and streets (*angiportus*), owing to the severe cold.
>
> (Vitr. *De arch.* 1.6.1; translation: Morgan 1914)

The architect explains what has gone wrong: the orientation of the street grid had not been adapted to the prevailing wind regimes, so that the Mytileneans unduly suffered from cold and sickness. In designing the urban street network, Vitruvius emphasizes, prevailing winds need to be kept as much as possible out of the narrower streets—the *angiportus*—where many houses had their main entrance. Later on, in his discussion of domestic architecture, Vitruvius returns to the issue of climate and weather, pointing out that differences between houses in different parts of the world stem from differences in climatological conditions. Hence, houses in Egypt are bound to differ from those in Hispania, and those in Pontus will be designed according to other priorities than those in Rome: *aliter Aegypto, aliter Hispania, non eodem modo Ponto, dissimiliter Romae* (Vitr. *De arch*. 6.1.1). For Vitruvius, urban development was, more than anything else, about designing the right city for the right environment and, thus, about limiting the extent to which adverse conditions could complicate urban life: the very location of the city, the layout and orientation of the street grid, the placement and design of the most important civic buildings, all were to be adapted to the natural environment in which the city was to be situated. Much of his advice is well known: cities should be built on higher ground, and they were not to be situated near marshes, unless these could be (and were) drained (*De arch*. 1.4.1); the forum should be situated right in the middle of the city, unless the city was a port, in which case it was to be situated close to the harbour (1.7.1); bath buildings were to be situated in the warmest possible location

and organized in such a way that they received direct sunlight in the afternoon, as this was the ideal time for bathing (5.10.1).

The emphasis on the role of environmental circumstances throughout *De Architectura* highlights how urban life in antiquity could be, and often was, shaped by a range of environmental factors, including, but certainly not limited to, prevailing weather patterns. Vitruvius is clear as to what needed to be done about this: careful planning of the location and layout of the city and a smart use of architectural tricks made it possible to achieve reasonably good living conditions even in potentially hostile environments. While Vitruvius' text is unique in its detail and scope, his emphasis on the potentially complex relation between urbanism and the environment is echoed by a wide range of Roman authors of the late Republic and early Empire—as is clear from the innumerable references to Roman towns situated in, or surrounded by marshland (Borca 2000). By consequence, the natural environment in which cities developed—and its impact on the urban landscape—is a key element in Roman urban history. Indeed, if scholarly discourse on Roman urbanism is increasingly interested in the functioning of urban space, and in the realities of urban traffic and movement (Newsome 2011), and if Roman scholars are increasingly studying urban landscapes from a multisensory perspective (Haug and Kreuz 2016; Betts 2017), it is clear that the natural background against which all of this is happening needs to be factored in as well. If built structures contributed to the 'atmosphere' of the urban landscape, so did the natural environment, both in the way in which it conditioned urban development, *and* in the way in which it complemented and interacted with the built environment.

Urbanism and the environment in Roman archaeology

It is the aim of this chapter to offer a rough sketch of how Roman urban experiences could be shaped by the environment, and how responses to natural challenges posed by the environment appear to have developed over time. This means, to some extent, moving into uncharted territory: neither Roman archaeologists nor Roman historians have devoted a lot of explicit attention to the actual impact of environmental factors in urban contexts. The spatial turn in Roman urban archaeology, and the discourse on movement and sensory studies that followed from it, have rightly given pride of place to the urban street as the key element in Roman urban life, and this has led to a range of perspectives—structure-based or agent-based—on the ways in which streets were used and on how they functioned as the defining social environment of the Roman city—particularly at Pompeii, and to some extent at Ostia (Laurence 1994; Kaiser 2011; Laurence and Newsome 2011; Stöger 2011; Hartnett 2017; Poehler 2017). However, scholars have not yet begun to assess how environmental circumstances conditioned the experience of people navigating these streets, or how they guided them in their decisions about which routes to take or not to take, nor has it been explored to what extent historical

developments in Roman urban planning and architecture contributed to mitigating the effect of adverse circumstances. Roman urban life as it is envisaged by modern scholarship seems to take place in a planned, flat city in a plain or a valley, where it is sunny, with a temperature of perhaps about 20–25° C—certainly not warmer—and where there is no real wind or rain. Reality, of course, was considerably more varied, and, quite often, much less ideal. It will be argued here that thinking about such less-than-ideal environmental circumstances makes it much easier to understand certain developments in Roman urban planning and adds to our understanding of the way in which urban landscapes functioned in practice. Indeed, it makes sense to think of urban space as consisting of both the 'built environment' and the 'natural background', and of the urban experience as being fundamentally shaped by both. This means that the *ratio* between the natural background and the architectural foreground is a key variable in making sense of urban life: cityscapes may to a greater or a lesser extent be dominated by built structures, and this leaves more or less space for the natural environment, and conditions the visual (and the real) impact of the weather—good or bad.

The following pages will particularly highlight the urban impact of two environmental factors, both of which have a clear potential to guide or limit movement. The first factor is the terrain, and the extent to which urban landscapes were defined by internal height differences. Height differences have a logical and proven impact on urban movement: ascending and descending are more complicated than moving over a flat surface and cost more energy; studies of modern (pedestrian) traffic invariably show that the presence of (steep) slopes has a negative impact on the quantity of traffic (Cervero and Duncan 2003; Meeder et al. 2017). Consequently, the number of slopes in an urban street network, and their length and steepness have a direct impact on patterns of movement, and on the role and integration of higher- and lower-lying parts of the urban area, and the cohesion between them. The second factor to be discussed in this chapter is the weather, including temperature and precipitation in particular. Adverse meteorological conditions may discourage people from leaving their house and may guide people on the move to opt for routes that offer protection against the elements, when available. Again, modern urban geographers have shown that especially rain and temperature can have a significant (negative) impact on movement patterns—even though this impact may vary from place to place and from season to season (Aultman-Hall et al. 2010; Montigny et al. 2012; Vanky et al. 2017). The chapter is not exhaustive: other environmental factors play a role as well. For instance, the daylight rhythm—particularly darkness (Cervero and Duncan 2003)—and seasonality (Vanky et al. 2017) have a clear impact on urban life. Yet for reasons of space, and given the nature of the evidence available, the primary focus in this chapter will be on terrain and weather. Geographically, there will be an emphasis on peninsular Italy, including particularly Latium and Campania, and the chronological focus will be on the late Republic and the early imperial period. This is not for lack of evidence from elsewhere or

from beyond this period, but peninsular Italy offers a large and internally varied ensemble of rather well-excavated cities, and it was not only the region that played a crucial role in the development of the Roman urban (architectural) vocabulary, but it also has been central to scholarly discourse on Roman urban life.

Taming the terrain: urbanism on hilltops and plateaus

As approaches to Roman urban landscapes from the spatial turn onwards have mostly focused on Pompeii and Ostia, they have devoted relatively little consideration to the everyday impact of sloping in the urban landscape. Ostia, of course, is almost entirely flat (Jansen 2002, 123–125). Pompeii was situated on a low plateau overlooking the Sarno Plain, and slopes from a height of ca. 30m above sea level in the northern part of the town to ca. 10m above sea level at the lowest point of the city (Pesando and Guidobaldi 2006, 4–5). Yet though a natural depression in the middle of the plateau determined the orientation of the major north-south road through the city—the Via Stabiana—, Pompeii was essentially laid out as a flat city and practically functioned as such, even if its drainage system was meticulously adapted to the sloping of the lava plateau underlying the city (Poehler 2012). The situation in many other cities where larger parts of the urban area were excavated early on is comparable: Roman archaeologists have traditionally, to some extent, and perhaps for understandable practical and financial reasons, privileged the excavation of cities situated in plains or on low plateaus above settlements on slopes or hilltops—archaeologically well-known cities like Saepinum, Herculaneum, and Paestum also had few meaningful internal height differences.[1] Fortunately, later twentieth-century excavations have improved our understanding of Roman cities situated in more challenging topographical environments. Besides the well-known American excavations at the Roman hilltop colony of Cosa, Belgian teams have revealed large parts of, first, Alba Fucens (Mertens 1981) and, later, Herdonia (De Ruyt et al. 1995). In recent years, Italian archaeologists have excavated sections of hill-top cities like Rusellae (Liverani 2011) and Norba (Carfora et al. 2008), and there has been a Spanish project at Tusculum (e.g. Dupré Raventos 2004). Following the spatial turn, scholars have also become increasingly interested in the internal viability of the Roman metropolis, which of course was decisively influenced by the hills on which the city first emerged, and the lower-lying valleys in between (Malmberg 2009; Malmberg and Bjur 2011).

All this work leaves little doubt that Roman urbanism in practice was much more complex than the right-angled, regularized street grids that have long dominated scholarship suggest: in many cities, navigating urban space meant negotiating sometimes rather steep slopes; throughout Italy, cities were separated from their direct environment by a climb (or descent) of significant length. These intra-urban or peri-urban height differences were not trivial: climbing or descending a slope steeper than a few percent is demanding,

and significantly increases movement costs, not only for wheeled transport but also for pedestrians. The presence of slopes within a city can therefore lead to differences in the intensity in which certain parts of the urban road network were used, and to a fragmentation of the urban landscape, which in turn can foster neighbourhood formation (Galster 2001, 2112). Indeed, the strong local identity that has been ascribed to a hill like the Aventine in the Roman metropolis can hardly be seen apart from its relative physical isolation from the rest of the city (Mignone 2016, 3–6). Both in the urban movement economy, and in urban development, steeper slopes in practice often act as a boundary—within the city, or between the city and its immediate environment: the very boundaries of Rome were, up to the late Republic, mostly determined by natural height differences, as were the south- and west boundaries of Pompeii.[2]

The city of Tusculum, built on a narrow ridge high up the Alban hills, south of Rome, offers a good example of a place where the organization of urban space and patterns of movement were decisively shaped by the environment. Situated on a completely isolated hilltop and at a significant distance from all major roads, Tusculum was the intended destination for all people entering the city and did not have any meaningful through traffic. The height difference that needed to be overcome to reach the city was substantial: in its final 10km, the Via Tuscolana climbed more than 500 metres; even the villas and farmsteads in the city's territory were situated at a much lower altitude.[3] The long and narrow shape of the urban area reduced the internal street network, essentially, to one central road that ran westward from the forum in the direction of a large temple and an amphitheatre situated at the other end of the plateau on which the city had emerged—the first metres of this road are visible in the excavated section of the forum (Figure 4.1); it is clear that there was no other connection between the forum and the rest of the city.[4] This meant that urban movement in Tusculum was basically a linear affair, with the forum and the theatre at one end of the town's central axis, and the terraced temple and the amphitheatre on the other end. Thus, on the one hand, its remote location undoubtedly isolated the town from its environment, while at the same time, the sheer paucity of through roads within the city made the city itself highly integrated—basically, everyone on the move within the city would be using the same road.

Tusculum is perhaps an extreme case, but it was by no means exceptional. Norba, a much larger city, was also situated high up the mountains, and had substantial internal height differences, with two hilltops occupied by temples, a partially excavated lower city organized around one central through road (Figure 4.2), and a slightly oddly placed forum at an intermediate altitude (Quilici and Quilici Gigli 1988). Not enough is known about Norba's urban street grid to fully understand the city's traffic network, but from many places in the city, one needed to climb to reach the forum, and most internal traffic probably bypassed the forum. The position of two of the major urban sanctuaries on hilltops—which was common throughout Roman Italy, and, as

Figure 4.1 Tusculum: forum with first section of the central road that crossed the urban area (M. Flohr).

Figure 4.2 Norba: height differences in the urban area seen from the so-called minor acropolis in the south part of the city (M. Flohr).

Figure 4.3 Alba Fucens: view on the central public zone and the eastern hill from the west hill (M. Flohr).

suggested by Vitruvius (*De arch*. 1.7.1), probably a conscious choice—also made sure that they were peripheral to everyday urban movement patterns. At Rusellae, in Etruria, the city was also situated in an elevated position: it covered two hilltops towering above the coastal plain, and the main access road climbed around the entire town before reaching the city gate. Here, however, the forum was situated in the low depression that separated the two hills, close to the point where the main access road to the city entered the urban area, and it had direct connections to both hills, which as the excavated remains suggest, were mostly covered with houses (Liverani 2011). This, indeed, was the more common arrangement—in cities like Alba Fucens and Herdonia, the forum was also situated at or close to the lowest point of the urban area, directly connected to roads of supralocal relevance (Figure 4.3).[5] It is worth noticing that in terms of connectivity, these low-lying fora were to a significant extent integrated into the urban traffic system through their position: they became the places that kept a spatially divided city together—as indeed was the role initially played by the Forum Romanum, situated conveniently between several of the most densely populated hills of the Roman city (see Claridge 2010, 64). In terms of connectivity, such a position made it easy to get to the forum, and made it harder to get back up the hill again. This disbalance may have impacted on the way in which people used the forum, and on the extent to which they decided to hang around after business was done, or when they were in between things.[6]

Thus, even if Roman urban planning, in ancient theory and in modern scholarship, was mostly about laying out regular cities with an orthogonal street grid in plains and valleys, in practice, many cities throughout Roman Italy (and elsewhere in the Roman world) were not situated in such a flat environment, and the historical development of Roman urbanism was to a large extent shaped by cities built on ridges and hilltops. Two historical points may be made. First, in the long term, it is true that the direction of development in Roman urban history gradually moved away from hilltops, and towards plains and valleys: from the later third century BCE onwards, almost all newly founded Roman cities were situated on relatively flat surfaces that could more easily be turned into orthogonal, rigidly structured Roman cities (Lackner 2008, 240–244; Sewell 2010, 57). Still, however, throughout Italy, and indeed in many places elsewhere in the Roman world (with the exception of Roman Europe), many cities that had emerged on less easily manageable locations continued to exist and flourish until well into the imperial period—and beyond.[7] Second, over time, Romans increasingly were able to mitigate the practical impact of excessive height differences on the urban landscape through smart engineering, including the construction of artificial terraces and plateaus, the partial removal of natural slopes and the development of architecture that operated on multiple levels. In Rome itself, the imperial fora are an extreme example of this capacity to adapt the environment to urban needs, and both the Forum of Caesar and the markets of Trajan show how several street levels could be accommodated within one building. Elsewhere in the Roman metropolis, one can point to the Porticus Liviae, which not only was constructed on an artificial plateau, but also managed to bridge the height difference between the *Clivus Suburanus* and the Oppian Hill—it had an access on both sides, and the shops lining its lower entrance probably extended underneath the main courtyard (cf. Coarelli 2008, 240–241; Claridge 2010, 339–340). This type of architecture, though massively expensive, was not restricted to Rome itself: the early imperial forum at Terracina was partly built on top of an artificial plateau (Lackner 2008, 198–199), as was the forum at Carsulae, which towered over the Via Flaminia around which the city had emerged (Morigi 1997). The height difference between the plaza and the road was such that underneath one of the two temples on the forum, a set of *tabernae* could be carved out along the Via Flaminia (Figure 4.4). Through such large-scale interventions, Roman urban authorities created relatively spacious and well-integrated urban environments, even when the terrain was characterized by substantial height differences. Of course, such projects reflect state-driven imperial power play rather than bottom-up innovation in urbanism: the model—terracing—had been around for some time; it simply was applied more often and on a larger scale from the late Republic onwards.[8] Yet this does not change the impact of such interventions on the functioning of urban landscapes. Moreover, it remains true that developments in construction technology—and particularly the emergence of *opus caementicium* (cf. Mogetta 2015; Flohr 2016)—made such large-scale engineering works

Figure 4.4 Carsulae: *tabernae* along the Via Flaminia in the platform supporting the temples on the forum (M. Flohr).

much cheaper than they had been earlier on. Still, of course, despite these interventions, many urban landscapes—such as at Herdonia, Alba Fucens and, indeed, in Rome itself—remained divided and fragmented because of the impact of internal height differences on urban movement. Other cities, like Rusellae, Cosa, and Tusculum, always remained isolated from their environment because of their position on a hilltop.

Bad weather: urbanism and meteorological circumstances

While Roman literature is full of references to extreme weather events, it is impossible to evaluate how bad weather could impact upon everyday urban life on the basis of literary texts. Indeed, thunder- and hailstorms belong to the literary world of the countryside; besides the references to extreme Tiber floods (Aldrete 2007), Roman authors do not evaluate the effects of the weather on urban life. Understanding these effects therefore depends on evaluating—on the basis of material remains—how cities functioned under the most common types of weather, and how urban infrastructure and architecture contributed to mitigating (or, theoretically, worsening) the effect of adverse weather conditions. While our understanding of the Mediterranean climate in antiquity remains limited, it has been suggested, on good grounds, that Mediterranean weather patterns in antiquity bear at least some resemblance

to the present—it may have been a little bit colder than nowadays, and there may have been a little bit more precipitation, but it is all in the same order of magnitude (Sallares 2007, 17–20; Hin 2013, 73–85). As far as Roman Italy is concerned, this implies that several commonly recurring meteorological conditions are of particular relevance. The first of these is, of course, precipitation: the Mediterranean climate as we know it is characterized, throughout the year, but particularly in the late summer and autumn, by extreme precipitation events that can be very disruptive as they happen and lead to large quantities of water that need to be evacuated from the urban environment (Rebora and Molini 2012; Mariani and Parisi 2014). A second key issue is heat: the summer months tend to bring longer periods of high temperatures, leading to extreme circumstances in the central hours of the day, especially in environments where there is little or no shade.[9] In autumn and winter, coastal areas in particular may suffer from cold winds—as stressed by Vitruvius in his discussion of the urban layout of Mytilene—whereas more mountainous areas, including the Apennines, may have to deal with freezing temperatures, and snowfall.[10] These conditions were all common enough in Roman Italy to warrant planning and adaptation (as, again, is suggested by Vitruvius' discussion about the layout of new cities), At the same time, they were inconvenient enough to have a direct, negative impact on the urban atmosphere when they occurred: as highlighted above, modern research suggests that lower temperatures, strong winds, and precipitation could lead to decreased urban movement, and could diminish the amount of social interaction going on in public space, except in places that offered protection.

As was true with slopes and height differences, the built environment could be adapted to mitigate the impact of the most common types of bad weather by constructing architecture and infrastructure that offered protection. Over time, as the Roman architectural vocabulary developed, Roman builders were increasingly able to do so, and urban life became a bit more weather resistant in some places. Inevitably, from early on, cities throughout the Italian peninsula were developed with integrated drainage systems to evacuate excess rainwater. In several cities, streets were used as drains, and stepping stones would be used as crossing points when rainfall had made the street surface unusable for pedestrians (Figure 4.5), but the early construction of the Cloaca Maxima and the gradual spread of underground drainage systems over the peninsula shows how considerable effort could be made to diminish the impact of extreme precipitation events.[11] As far as urban movement is concerned, three developments are particularly worth highlighting: the construction of *porticus* around fora from the early second century BCE onwards, the emergence of the *basilica* in the late Republican period, and the spread of the street-side *porticus* in the imperial period. The appearance of *porticus* around the fora of Roman Italy was a major step in the development of the forum: the oldest known fora of Roman Italy initially did not have *porticus*. At Paestum, the third-century BCE forum was simply constructed as a plaza surrounded by *tabernae* (Figure 4.6). The *porticus* of which the remains are visible nowadays

Figure 4.5 Pompeii: south end of the Via Stabiana, which served as the city's major water outlet (M. Flohr).

Figure 4.6 Paestum: overview of the forum plaza and the early imperial *porticus* surrounding it (M. Flohr).

is thought to have been an addition of the Augustan period (Torelli 1999, 33). At Pompeii, the first *porticus* around the forum was constructed in the late second century BCE, whereas there had been *tabernae* along at least part of the east side from the third century BCE onwards (Pesando and Guidobaldi 2006, 51–52). Livy (41.27) records how, in the 170s BCE, Roman *censores* constructed *porticus* around plazas in Rome itself, and in several other cities in Italy, including Sinuessa and, probably, Calatia and Auximum.[12] In Cosa, the reconstructed forum after the refoundation of the colony in 197 BCE was equipped with *porticus* on four sides, whereas the earlier forum seems to have had none (Brown 1980, 31–46; Fentress et al. 2003, 21–23; Lackner 2008, 84–85). Arguably, the addition of *porticus* decisively changed the viability of a forum: the *porticus* offered protection against precipitation, heat, and wind, and when they completely surrounded the plaza, they offered uninterrupted circulation space for the entire forum area. While the visual focus of excavated Roman fora often lies with the main plaza, it should thus be kept in mind that in reality, on many days, the social emphasis on a forum was on the *porticus* rather than on the main plaza, and the presence of *porticus* meant that circulation of pedestrian traffic was unaffected by rain, heat, or cold winds.

In a somewhat related development, the second century BCE also saw the gradual spread of the *basilica* over Roman Italy (Nünnerich-Asmus 1994; Laurence et al. 2011, 171–176). The first *basilicae* had been constructed around the Forum Romanum at Rome in the late third century BCE, but the subsequent century saw the construction of *basilicae* on fora throughout Italy, such as at Pompeii, Cosa, and Ardea (Gros 1996, 235–240). By the Augustan period, the *basilica* had become a standard part of forum complexes, and a model had been developed in which newly constructed fora were built with an integrated *basilica*—as can be seen at, for example Ruscino in southern Gaul, and Veleia (Figure 4.7) in Aemilia; the first and early second century of our era saw the construction of such porticated *forum-basilica* complexes in a great number of cities throughout Roman Europe (Gros 1996; Laurence et al. 2011, 178–189). While this development has been acknowledged by many Roman archaeologists and historians, it is important to emphasize the practical impact of the *basilica*: a large, covered hall, closely connected to the forum and the *porticus* surrounding it, in many cases separated from the main square by a colonnade rather than by a closed wall, the *basilica* could very much function as a covered continuation of the forum itself. It could host all the processes that took place on the forum plaza itself if weather circumstances required so. Thus, whereas *porticus* offered all-weather circulation, *basilicae* made sure that all core civic and economic processes that took place on the forum plaza itself could go on independent of the weather conditions: the basilica offered protection against rain and cold wind, but also offered a (relatively) cool and shady environment on hot summer days. Interestingly, precisely this point is emphasized by Vitruvius, who highlighted the need for *basilicae* to be situated on the warmest side of the forum, 'so that in winter business men may gather in them without being troubled by

Figure 4.7 Veleia: large *basilica* occupying the entire south end of the forum (M. Flohr).

the weather' (*De arch*. 5.1.4; translation: Morgan 1914, 132). As the *porticus* and the *basilica* developed into standard elements in its design, the forum area became an all-weather environment, where circumstances erred within the margins of acceptability, so that planned business could always go on.

In the early imperial period, the *porticus* also began to spread beyond the forum: throughout Italy, and in smaller as well as larger urban centres, *porticus* began to be constructed alongside streets, creating covered walkways that facilitated pedestrian traffic under adverse meteorological circumstances (see also Frakes 2009). An early example can be found at Herculaneum, where a covered walkway was constructed along the entire north-east side of the 'Decumano Massimo', connecting the area of the presumed forum of the city with the large public building that marked the south-east boundary of the urban area—the so-called *Insula Orientalis* II. Additionally, covered walkways were built along the adjacent sections of two of the three *cardines* that crossed the Decumano Massimo. The oldest of these—alongside cardo V—has been dated to the late Republic; the two *porticus* around the first part of the central cardo IV both date to the first century CE (Figure 4.8; Monteix 2010, 320–327, 339). It is worth pointing out that these covered walkways were private rather than public in nature: they are associated with private houses and generally respect property boundaries. Possibly, their columns supported the

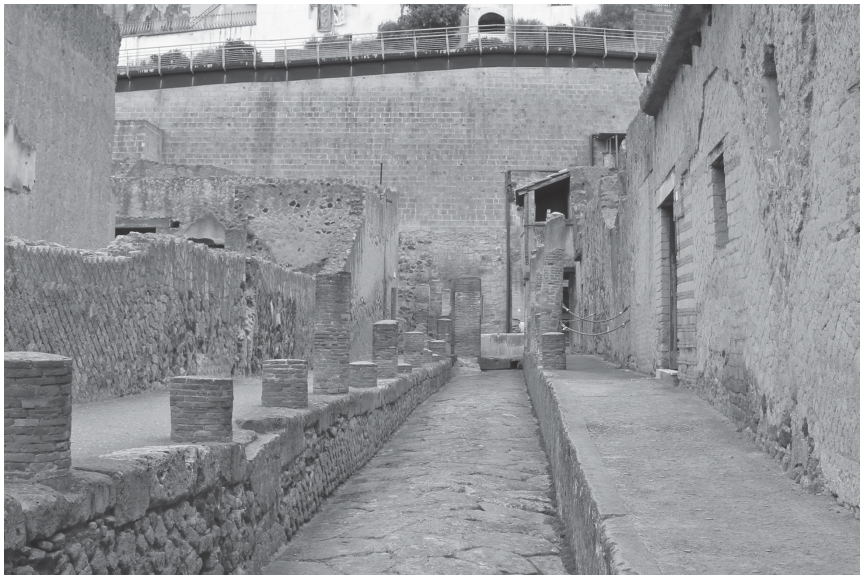

Figure 4.8 Herculaneum: Cardo IV surrounded by *porticus* supporting the upper floors of the adjacent houses (M. Flohr).

upper stories belonging to these buildings, and their construction at least partially reflects a desire to maximize space on upper floors more than a desire to create covered walkways. For the urban impact of these walkways, however, this does not really matter. At Ostia, the second-century CE makeover of the city centre resulted in what appears to have been an entire network of covered walkways around the heavily commercialized corridor between the Tiber and the south end of the forum; a second network of covered walkways centred on the eastern decumanus and the theatre (Figure 4.9). The interconnectedness of these two groups of covered walkways, and their all-weather reliability, marked a significant improvement to the urban movement network. While the networks of covered walkways at Ostia were a patchwork of public and private initiatives, in Alba Fucens, the authorities created a comparable network of covered walkways that extended along the two long sides of the forum and continued along the roads south of it—the Via del Miliario and the Via dei Pilastri—thus surrounding the public area that occupied this part of the city (Mertens 1981). The south end of the forum, which included not only the *basilica* but also a covered square that has been identified as a *chalcicidum*, in practice functioned as a crossing point, where pedestrians could easily switch sides. Given the location of Alba Fucens at a high altitude in the Apennines, this system had a clear functionality, preventing a complete paralysis of civic life in times of snowfall in the winter.[13]

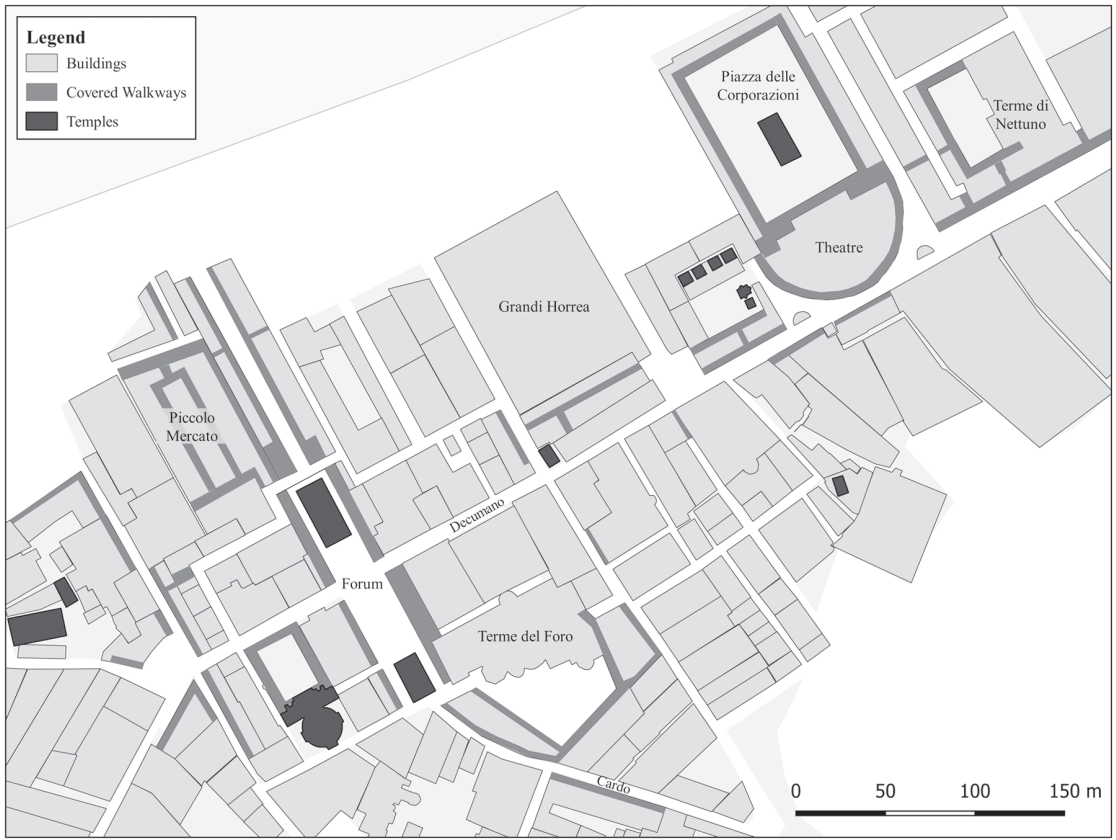

Figure 4.9 Ostia: plan of the excavated urban area highlighting the covered walkways (M. Flohr).

A vanishing natural background?

This chapter has argued that the history of Roman urbanism cannot be seen apart from the natural environment, both at the level of individual cities, *and* at the level of urban culture as a whole. For individual cities, the accessibility of their location, the natural sloping of the terrain, and the climatological environment had a decisive impact on the way in which a city developed, and, more importantly, on the way in which the urban landscape was used and experienced at an everyday level. Sometimes the direct environment of Roman cities was so imposing that it automatically had an impact on the cityscape—one can hardly see the urban experience in Pompeii apart from the background scenery set by both Mount Vesuvius and the Monti Lattari. Wide views over the Pontine marshes were an inevitable component of urban life at Norba; in Tusculum, views over the Roman Campagna were equally impressive. In many other cases, the impact of the terrain was subtler, and expressed, simply, in the organization of the urban road system, and in the location and layout of the public heart of the town. The Forum Romanum remains a key example of a place in which architecture and the microrelief of the natural environment worked together to shape a dramatically monumentalized (and choreographed) spatial experience.[14]

In a way, one message that could be taken from this chapter is that in Roman urbanism the ratio between the natural background and the architectural foreground often remained quite balanced, especially in smaller cities: the urban experience always came mixed with a location-specific, non-urban background, and many cities offered relatively limited protection against the elements. The frequent flooding of the Campus Martius in Rome in periods of excessive precipitation (Aldrete 2007, esp. 13–50) perhaps symbolizes this: even in the very heart of the Roman empire, urbanism was a compromise, and Roman control over the environment was never total. If in many cities rainwater was drained via the street rather than through sewers, this even strengthened the presence of the natural elements in the urban landscape (see e.g. Poehler 2012). Roman cities could be, and often were, exposed to the elements.

However, this point should not be stretched too far. In fact, it can be argued on the basis of the evidence discussed in this chapter that the balance between the built environment and the natural background shifted, particularly in the late Republican and early imperial period, in favour of the former. Part of this was a consequence of the locations chosen for newly founded cities from the late Republic onwards, as there was an increasing preference for sites where the urban landscape could be laid out without complications. At the same time, however, developments in architecture and construction practice also played a role: more was done to minimize the impact of internal height differences within cities, through terraces and multilevel architecture, and the emergence of the street-side portico and covered halls like the *basilica* limited

the impact of adverse meteorological conditions on everyday urban life. These developments were not universal—only the *basilica* became a standard hallmark of urbanism and can be found in almost all Roman cities that are archaeologically known—and they can be more easily and more frequently detected in larger urban centres than in smaller ones. Yet it is the direction of development that matters: all in all, these developments made Roman cities decidedly more 'urban' in character: from the later Republic onwards, the natural environment, which had long been a prominent part of the urban experience throughout the Italian Peninsula, was gradually marginalized. Arguably, this is a significant development in Roman urban history.

Notes

1 Saepinum was situated in the wide the upper valley of the *Tamarus*, on a flat surface; De Benedittis et al. 1993, 7. Paestum was founded on a coastal plain, Torelli 1999, 85. Herculaneum was, like Pompeii, built on the (flat) top of a low volcanic plateau overlooking the coast. Cf. Pesando and Guidobaldi 2006, 292.
2 The Servian walls as much as possible followed the contours of the hills that they surrounded. Cf. Coarelli 2008, 7–12. On the south-west edge of Pompeii, see e.g. Stevens 2017.
3 The urban area of Tusculum was situated at an altitude of ca. 600m. Cf. Gras 2014. For an overview of the villas around Tusculum, see Marzano 2007, 590–627. Many of these villas, in fact, cluster around modern Frascati at an altitude of around 300–350m.
4 On the forum of Tusculum, see Dupré Raventos 2004.
5 The forum of Alba Fucens was situated in the depression between the two main hills of the site; the rest of that area was used for public and religious buildings. Cf. Mertens 1981, 30–32. For Herdonia, see Mertens 1983.
6 If it is true that slopes have a negative impact on traffic, it follows that one of the ways in which this expresses itself is through people postponing their trip if they can.
7 Besides the examples discussed in this chapter, one can think of places like Puteoli, Thugga, Sagalassos, and, perhaps especially, Pergamon.
8 Substantial terracing was of course used for the construction of the temple of Jupiter Capitolinus in the sixth century BCE. Cf. Coarelli 2008, 29–31.
9 As, e.g. is suggested by Frontinus' recommendation to avoid maintenance work to aqueducts in the hottest part of the summer (*Aq.* 123): moderate weather was necessary for the durability of the construction.
10 See e.g. Barker's discussion of the impact of snow in (modern) Molise. Barker 1995, 28. Cf. Potter 1987, 16.
11 On the mixed drainage system at Pompeii, see Poehler 2012. Stepping stones are attested in cities throughout Italy—e.g. at Paestum and Norba. Underground drainage systems can be found at Herculaneum, Pompeii, and Ostia. Cf. Jansen 2002. On the 'underground rivers' of Rome, see Strabo 5.3.8.
12 Livy mentions the *porticus* explicitly at Sinuessa, but the construction of *tabernae* around the fora at Auximum and Calatia in this period suggests the construction project also included *porticus*.

13 The forum of Alba Fucens was situated at an altitude of about 950m a.s.l.. Cf. Mertens 1981, 77.
14 On the choreographed environment of the Forum Romanum in the Augustan period, see e.g. Favro 1996, 198.

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