LIVING FLUIDLY: USES AND MEANINGS OF WATER IN ASIA MINOR (SECOND CENTURY BCE – SECOND CENTURY CE)

by
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INTRODUCTION

Water, moreover, by furnishing not only drink but all our infinite necessities, provides its grateful utility as a gracious gift.

Vitruvius, *De Arch*. 8.1

On May 1, 2010 in Weston, Massachusetts, a catastrophic and unprecedented pipe failure in the aqueduct supplying water to the city of Boston and its 29 surrounding metropolitan towns caused the disruption of water to approximately two million residents. The 'back-up' system was immediately activated, but the tap water delivered through this system was deemed unsuitable for drinking or cooking without first boiling it. In the early hours of the crisis grocery store shelves were stripped of every bottle of water, with people hoarding jugs of Poland Spring as if they contained holy water. Relations among people also became strained as shoppers frantically elbowed each other to get the last bottle of water on the shelf. In this situation, mundane and mindless tasks like washing one's hands or brushing one's teeth became deliberate and thoughtful actions. Indeed, when the availability of clean water was threatened, it became a central focus. The rhythms of people's daily lives were fundamentally altered by the lack of potable water, and in some unexpected ways – dishes could not safely be washed, schools did not offer fruit, and (horror of horrors) Dunkin' Donuts stopped serving coffee because it could not be made with tap water. People seemed surprised to realize how much of their daily lives centered on water, even if they only arrived at such a realization because their expectations had been interrupted by the pipe failure. As a result of this situation, casual conversations centered on the lack of water – how people were coping, in what ways they were surprised that this shortage of clean water was affecting them, and when they could expect the situation would be resolved. For several days, the city of Boston as a collective was captivated by water – the lack of water, the quality of water, and the uses of water.

Within a few days and more quickly than anyone anticipated, the breach in the pipe was fixed and everyone went back to their former lives. Again, Boston residents could unthinkingly turn on their taps and make use of the dependably safe water that flowed from them. When access to water was no longer challenged, the importance of water receded into the background once again.

While this anecdote describes an unfortunate turn of events, particularly since I was one of the affected residents, it underscores the fundamental conceptual underpinnings of this dissertation. First, water serves as a connective element that ties together overlapping dimensions of social life, and impacts people across all social strata. When the aqueduct failed in Boston, the change in the availability and quality of water concomitantly impacted a number of daily habits, from food preparation and consumption, to bathing and hygiene. Second, it raises the question of how the change in the availability and quality of water impacts (or not) its uses and meanings in those intersecting spheres of social life through which water inevitably flows.

* * * * *

Roman water management technologies were readily adopted in the Roman provinces, and the profligate use of water in urban space is often cited as a hallmark of 'Roman' cities throughout the empire (e.g., MacDonald 1986; Parrish 2001b; Purcell 1996). To date, scholarship on water use in the Roman world, however, has tended not to interrogate the ways in which the adoption of new technologies may (or may not) have had implications in the varying, yet interconnected, dimensions of social life. Using a variety of archaeological, art historical, literary, and epigraphic material, in this dissertation I undertake a more holistic study of water in certain cities in Asia Minor during the transition from the Hellenistic to the Roman imperial period (approximately second century BCE to second century CE).[1] Examination of the uses and meanings of water in political, economic, and religious contexts, and in relation to the geopolitical shifts and technological developments that accompanied Roman imperial expansion, offers insight into the impact – or lack of impact – of the formal imperial enterprise on this organization.[2] The division of the uses of water into civic, economic, and religious spheres is a somewhat artificial distinction – as the recent situation in Boston made clear – since a single change in the quality and availability of water has the ability to impact a variety of activities. As the hydrological cycle itself is an integrated system, the different schemes of water use are similarly blended within the cityscape.

With the understanding that uses of water in these different social spheres cannot truly be disentangled, this dissertation examines each aspect of water use within a particular city, in order to shed light on diverse yet interconnected levels of urban hierarchy: civic, economic, religious. Moreover, this dissertation addresses a variety of strategies for water use – from large-scale water provision to the emphasis on local sources – indicating that bigger, more elaborate, 'Roman' technological solutions were not always preferred. The range of activities addressed within this dissertation also provides an opportunity to investigate the uses and meanings of water for people across the social spectrum – from individuals involved in craft manufacturing and production to wealthy elites. True, Rome's influence was manifested in the spread of the technological capability to construct high-pressure, long-distance water lines (and the types of buildings such

[1] The period between the second century BCE and the second century CE forms the broad chronological parameter of this study, however, in the individual case studies that comprise the core of this dissertation there are instances in which I examine evidence and events on either side of these temporal boundaries. This chronological flexibility is due to the fact that Roman presence was variable in Anatolia in the first centuries BCE, and increased steadily over this period of time, making it difficult to set hard and fast temporal limits.

[2] This dissertation is concerned with the impact of Roman imperialism on the uses and meanings of water in the Roman province of Asia, which necessarily engages with questions of 'Romanization'. However, instead of reviewing the vast body of literature on the question of 'Romanization' and provincial identities under the Roman Empire, I hope that the questions addressed by this study, and the conclusions I draw from such an investigation, are able to communicate my position on this issue and to contribute to the broader discourse on the impact of the imperial enterprise on life in the provinces.

infrastructure supported), in the political stability that made it possible for extra-urban (and potentially exposed) water-sources to be accorded to cities, and in the funding of such cost-intensive projects by means of Roman patronage and financial support. There is no doubt that the presence of Roman imperial administration and technological developments changed life in the provinces. Yet, the synthetic approach to the study of water employed in this dissertation offers an opportunity to investigate the subtle and nuanced negotiations of relationships to Roman technological innovation and political organization by tracing water's many uses and meanings, interconnections, and divergences, and its impact on social life. This dissertation makes a contribution to current approaches to water in two fundamental ways: first, in its synthetic methodology for investigating the uses and meanings of water in civic life, drawing on yet departing from previous studies which tend to segregate different aspects of water use and management; and second, in the close level of detail that uses and meanings of water are interrogated, particularly in light of the responses to technological and political developments that accompanied Roman imperial expansion.

With imperial territories stretching from the Atlantic to (modern-day) Armenia, why situate this study in Asia Minor? There are several reasons why Asia Minor, the Roman province of Asia, proves to be a good locale in which to explore relations with water. First, by the time Rome became the uncontested power in the region in the first century BCE, Asia Minor already had an extensive history of urbanization. Because the demand for water by large populations had long been satisfied by the technologies employed by previous regimes, this region offers an opportunity to take a close look at the impact (or lack of impact) of the technological advances and sociocultural developments that accompanied Roman imperial expansion. The long history of urbanism in the east stands in contrast to the western provinces where urbanization developed hand-in-hand with Roman imperialism, and, as a result, the strategies for supplying large, concentrated populations with sufficient water in the west were inextricably linked to Roman influence. Owing to the fact that the cities in Asia Minor already had well-developed water management systems prior to a Roman presence, the choice to adopt new technological solutions and different schemes of water use in civic, economic, and religious spheres can be considered to be significant. Secondly, many cities in Asia Minor have been the subject of long-term archaeological excavations that have excellent records of publication. As a result, this geographical area offers an abundance of raw data and relevant specialized studies that can be utilized in a more synthetic analysis of water use and management.

Three case studies comprise the core of this dissertation: water as an articulation of civic benefaction and its significance within the cityscape of Ephesos; an exploration of the uses of water in craft production and manufacturing in Asia Minor, with a focus on the city of Hierapolis; and the meaning of water and its role in ritual practice and the sacred landscape of Pergamon. The case studies investigated in this dissertation were chosen, in part, because each city had a different trajectory of technological and political development – a significant part of which was influenced by its relationship with the Roman imperial machine. Ephesos was an old Ionian foundation (eighth century BCE), but became a major player in the region, and indeed within the Empire, as a result of support from Rome. Pergamon was the capital of the vast and powerful Attalid kingdom from the third century BCE until it was bequeathed to Rome in 133 BCE. Long the principal city in the region, Pergamon was eclipsed in importance by Roman support of Ephesos. Hierapolis was probably a site of cultic importance long before it was developed into an urban center in the Hellenistic period, but unlike Pergamon and Ephesos, it never rose to dominate the geopolitical stage under the Hellenistic kings or the Roman emperors. As will be addressed more fully within the following chapters, each city's connection to Rome impacted the development of its water management network, but Roman influence did not always dictate the organization of civic, economic, and religious relationships with respect to water. As individual investigations, each of the case studies provides insight into particular arrangements and negotiations with water that resulted from the influx of new technologies and Roman political organization.

When considered as complimentary and mutually reinforcing studies, the broad patterns explored across the case studies begin to answer questions about the interconnectivity of water in civic life. While each case study has a particular focus – civic, economic, or religious – all of the various dimensions of water use are evident in each city. In other words, water was used in each city's civic, economic, and religious spheres, and my emphasis on the particular aspect of water use in each individual city is contingent on the available evidence, which, in turn, is the result of uneven preservation. For example, as one of the principal cities in Asia Minor, Ephesos was the locus in which ambitious elites could publicly and monumentally display their civic benefaction through the provision of water. The preservation of the monumental civic center and an extensive epigraphic record, in combination with the long history of detailed excavation and publication, provides excellent data with which to examine water in the civic sphere. A corpus of funerary inscriptions from Hierapolis mentions several occupational associations and attests to the presence of an active craft and manufacturing community in the city. The literary testimonia also mention that the unique thermal properties of the water at Hierapolis were responsible for its famous wool-dyeing industry. These ancient attestations of craft production and manufacturing activities at Hierapolis, and the study and publication of its epigraphic record, offer a foundation from which to investigate the role of water in the ancient economy. Finally, Pergamon was home to several cults for which water was central. Because it has been the site of continuous excavation for over a century, the information about water supply to the sanctuaries and their associated artifact assemblages have been carefully studied and published. As a result, it is possible to investigate the uses and meanings of water in Pergamon's sacred landscape.

While the approach to water employed in this dissertation is dependent on the available evidence, and thus concentrates on each use of water in a particular urban context, when taken as a whole the case studies that comprise this dissertation provide a fuller picture of the varied yet interconnected uses of water in this region of the Roman Empire. Moreover, the synthetic approach employed in the investigation of each case study is widely applicable. This dissertation, therefore, creates a broad methodological framework within which water can be studied in a variety of contexts, and makes initial inroads in the application of such a methodology to three cities in Asia Minor.

Evidence: Opportunities and Problems

Because water is neither contained nor discrete, it flows through the city in various and interconnected ways. When talking about water – whether from an archaeological or contemporary perspective – it is exceptionally difficult to talk about it as an entity in-and-of-itself. By virtue of its ubiquity and malleability, water is always involved and implicated in a variety of activities, architectures, and relations outside of itself. For example, it is impossible to discuss the use of water in ritual contexts without consideration of the placement and layout of sanctuaries, particularly with respect to water supply, the ritual practices, and other material remains that were involved in the rites. When considering water in urban environments, the water itself cannot be disentangled from the technological apparatus and architecture built to house and dispense it. The task of then situating water's uses and meaning within a cultural landscape that is also constantly changing becomes doubly slippery. Veronica Strang aptly articulates this challenge:

> Locating it in a cultural fluidscape is equally elusive, forcing us to approach the water from a phenomenological perspective that is fully appreciative of the shifting social, economic, political, and religious dynamics of a particular cultural frame and the relationship between these and a local ecological context. From the perspective of landscape archaeology, *it is especially relevant to consider the more materially "concrete" aspects of that environment through which water is controlled, distributed, managed, and used* [Strang 2008, 125, emphasis mine].

Indeed, from an archaeological perspective, in which the objects of study are the material remains of past lives, the investigation of water poses particular challenges. Water itself rarely finds its way into the archaeological record, and even if the water is present, it cannot by itself offer insight into the ways in which people in the past organized their lives in relation to it. A spring is just a spring, and a river is just a river without any information about what people did at it or what they said about it (e.g., Bradley 1990; 1993; 2000). In order to comment on the uses and meanings of water in the past, it is necessary to consider the material manifestations and textual mentions of those relations.

For the study of water, it is impossible to focus on a single type of evidence; rather such an endeavor demands engagement with a broad range of material. The necessity to gather together a variety of evidence is borne out of two fundamental reasons – the first is related to the nature of water itself, and the second is due to the vagaries of the archaeological record. First, because water is managed and employed in a multitude of interconnected ways and for a variety of ends, there are a whole host of materials to which water is connected. Second, because of the fragmentary nature of the archaeological record, it is necessary to piece together the surviving evidence in an effort to create as complete a picture of water use and management as possible. Therefore, within this dissertation I employ a variety of evidence in the exploration of civic, economic, and ritual uses of water in Asia Minor: ancient literature and epigraphy, architecture and visual culture, technology and infrastructure, and material culture, such as votive deposits and ceramic assemblages.

Each line of evidence comes with its associated opportunities and problems; each provides an incomplete picture on its own. For example, a text of crucial importance for scholars of ancient Roman hydraulic systems and technology is Frontinus' treatise on Rome's water system, *De aquaeductu urbis Romae*.[3] This singularly valuable source, however, furnishes statistics that are sometimes conflicting, and in scholarship on water management and infrastructure, the information it provides is often applied indiscriminately to places outside of Rome. The same is true of all literary *testimonia* that address the subject of water; while these sources offer critical insights, they must also be recognized for their biases or shortcomings. Epigraphic sources offer evidence that is both contemporary with the infrastructure to which it refers and locally

[3] Frontinus wrote this treatise in 97 CE, shortly after he assumed his post of *curator aquarum*, or water commissioner under the emperor Nerva (Evans 1994, 2-3).

applicable, but these sources are often limited in the types of information they convey. Equally limited, but for different reasons, are the technical studies on the aqueducts that delivered water to ancient cities. These studies provide critical information, but generally only for a portion of the complex and varied urban water supply. The information provided by each different type of data source therefore provides a piece of the story about the way in which water was used and managed in ancient cities; in combination, they create a more holistic understanding of the uses and meanings of water in the ancient past.

Moreover, the different data sources enumerated above (e.g., literary sources, epigraphy, architecture and visual culture, technology and infrastructure, and material culture) suffer from the archaeologist's penchant for typologizing, and therefore do not sufficiently represent their entanglement within social life. This tendency is reflected within modern scholarship by its compartmentalization of these categories of evidence, and often focuses separately on the sources of water, the architecture of distribution and consumption, and the means of discharge – categories that themselves are sometimes even further subdivided. This approach is perhaps best illustrated in Pompeii, where a picture of water management and distribution has emerged as the result of several detailed studies of the component parts of its water-supply network: for example, *castellum aquae* and aqueducts (Ohlig 1996; 2001), water distribution to private residences (Jansen 1996; 2001), the use of water in private baths (de Haan 1996; 2001) and in public baths (de Haan and Wallat 2006), and the use of water in toilets and latrines (Hobson 2009; Koloski-Ostrow 1996).

A call to arms has been made by Eric Poehler (forthcoming) that water systems should be studied holistically on the level of infrastructure. He argues that the compartmentalization of the system into its component parts prevents the scholar from making inferences about the significance and nuances of infrastructural systems as whole. In this dissertation, I attempt the same holistic perspective, but from a social standpoint. I submit that the significance of water within urban life cannot be fully appreciated if a narrow focus is trained on particular parts of the picture. It should be noted, with gratitude, that a synthetic study such as this would not be possible without the previous close and detailed analysis of the component parts of the system – both infrastructural and social.

Water Scholarship and Interdisciplinarity

The utilization of a diverse array of evidence within this study necessarily demands engagement with a broad range of scholarship. The same interconnectivity of water within social life is also true for water in the scholarly literature, and thus this dissertation draws on wide-ranging bodies of scholarship in order to work on water in such a synthetic manner. First, to carry out this type of study in a Roman setting, one must first address the established traditions of scholarship dealing with Roman imperial expansion and its associated technological and social developments. Further, for an investigation situated in the Roman provinces, it is necessary to engage with the particular geological setting, political history, and technological trajectories of the area under investigation. Finally, in order to situate the material evidence within a broader social framework, it has been helpful to draw on theoretical literature and anthropological approaches to water.

The scholarship of which I have made use for this study can be divided into several broad categories: literature on water use and management, literature on geology as it relates to water resources and settlement patterns, technical studies that synthesize general Greco-Roman technological developments, technical studies that address the water management infrastructure of specific cities, studies that examine a particular type of water management infrastructure or display (which are often architectural historical or art historical in nature , e.g., of aqueducts, baths, fountains, or latrines), uses of water in specific contexts (e.g., water in religion or water in medicine), and theoretical approaches and anthropological studies. Division of the scholarship on water use and management into such categories provides an indication of the previous models for the study of water; the object of study is often compartmentalized in order to create manageable parameters for analysis. The synthetic approach employed in this dissertation, however, would not be possible without these previous specialized studies. The mosaic of different scholarly literature utilized in this dissertation makes this, and any study of water, a highly interdisciplinary endeavor. In what follows, I briefly address the broad categories of scholarship and the critical literature on which I have drawn in this synthetic study of water.

In any study of water, attention to the geology of the area must necessarily be a consideration. In her often-cited study, *Water Management in Ancient Greek Cities* (1993), Dora Crouch explores how the presence or absence of karstic geology and available water influenced the settlement patterns of Greek cities. Her pendant to this first study, *Geology and Settlement: Greco-Roman Patterns* (2003), focuses more intently on geology and settlement patterns for ten sites, in order to produce a broadly comparative investigation. A closer examination of the connection between water and settlement patterns has been addressed by Amanda Kelley (2006) in her analysis of the influence of Roman aqueduct construction on demographic patterns and site location on Crete. This study succeeds in taking into account how settlement patterns were affected by dynamic relationships to 'natural' water sources, and to the built-water management infrastructure that was a corollary of Roman rule in the provinces. However, it fails to address the ways in which these changes were complex processes of negotiation, and how such changes may have impacted lived experience.

The sense of wonder at Roman engineering famously expressed by Frontinus has reverberated through an abundance of scholarship focused on the water management infrastructure that has been signaled as one of the most significant Roman achievements.[4] The authoritative work on aqueducts in the Greco-Roman world is *Roman Aqueducts and Water Supply* (1992) by Trevor Hodge, an essential piece of literature for any study of Roman water

[4] With such an array of indispensable structures carrying so many waters, compare, if you will, the idle Pyramids or the useless, though famous, works of the Greeks!
Tot aquarum tam multis necessariis molibus pyramidas videlicet otiosas compares aut cetera inertia sed fama celebrate opera Graecorum. (Front. *De Aq*. 1.16)

management and infrastructure. Dividing the subject even further are publications that address the component parts of long-distance water-lines, such as studies of pipe typologies in the Greco-Roman world (Fahlbusch 1987a; Kooz 1963). Summarizing the developments in aqueduct studies is an article by R.J.A. Wilson (1996), the title of which refers to Frontinus' above mentioned statement: "*Tot aquarum tam multis necessariis milibus*…Recent Studies on Aqueducts and Water Supply." Since the publication of this article, studies on water management and distribution systems have tended to focus on the water management infrastructure present in specific places rather than on broad syntheses.

The water management infrastructure for particular cities has received considerable attention in recent years. In Asia Minor, such technical studies have been carried out primarily as the result of the activities of the Frontinus Gesellschaft, and were often conducted by scholars with engineering backgrounds. For example, the water management and delivery system of Pergamon has been admirably studied and published by Gunther Garbrecht (1987; 2001). The aqueducts of Ephesos have been surveyed by Gilbert Wiplinger (2006), and some initial attempts to survey the aqueducts around Hierapolis have also been carried out (Scardozzi 2007). Once the aqueducts reached ancient cities, their water was distributed throughout through a series of pipelines; the enormity of such systems coupled with patchy preservation present significant challenges in reconstructing an urban hydraulic network (Jansen 2000, 103-104). For example, Femke Martens (2001) has attempted a synthetic analysis of the urban hydraulic system at Sagalassos, and has also written an exposition on certain methodological considerations and challenges involved in such an endeavor (2006).

Because a holistic analysis of the urban hydraulic distribution network is a difficult undertaking, most studies of urban distribution points tend to focus on a particular type of infrastructure, such as baths, fountains, or latrines. Frequently, such studies tend to be regional studies or larger syntheses. The study of baths and bathing culture in the Roman east has been addressed particularly as an example of 'Romanization' and the adoption of Roman practices

(DeLaine and Johnston 1999). An example of such a study is Fikret Yegül's monograph *Baths and Bathing in Classical Antiquity* (1992) which is a survey of bathing establishments and a study of the Roman 'bathing habit' and its influence on cities in the east. His analysis focuses almost exclusively on architectural remains and does not fully consider the implication of the cultural *mores* and practices associated with bath buildings. The underlying supposition of such studies is that typically Roman infrastructure and architectural types are indicative of typically Roman practices. However, studies on the hybrid architecture of bath complexes in the Roman east begin to explore conditions and processes of negotiation associated with the Roman presence in this long-occupied region (e.g., Steskal 2008; Yegül 1986). Approaching bathing from a social perspective is Garrett Fagan's *Bathing in Public in the Roman World* (1999), which examines public bathing as a social phenomenon explicitly connected to imperial and civic benefaction. Roman bathroom habits have also captured the attention of a number of scholars, who have produced specialized studies on toilets and latrines. For example, Barry Hobson (2009) has surveyed the evidence for toilets and latrines in Pompeii, and Ann Olga Koloski-Ostrow (1996; 2000) has approached the subject of Roman toilet practices from a social perspective.

The fountains and *nymphaea* that were so abundant in the cities of Roman western Asia Minor have been the subject of several studies. Claudia Dorl-Klingenschmid produced a comprehensive survey of all the fountains in the cities of Asia Minor in her 2001 monograph, *Prunkbrunnen in kleinasiatischen Städten*. For the Greek mainland, Franz Glaser's (1983) *Antike Brunnenbauten (KPHNAI) in Greichenland* traces the development of fountain architecture in ancient Greece; he has also produced several subsequent general surveys (1987; 2000a). Brenda Longfellow (2005; 2011) also focuses on monumental hydraulic displays throughout the Mediterranean, particularly in the context of Roman imperialism, as she explores the relationship between local elites and the imperial machine.

There is also a significant body of literature on water as it was employed in specific activities, such as in religion or medicine. For example, attention has been paid to issues of medicine and bathing in the Roman world. These studies rely heavily on textual sources while using some architectural and votive material from the major sources for hydrotherapy in the ancient world – specifically Bath (England) and Baiae (Italy) – to illustrate the information from the literary evidence (Dvorjetski 2007; Jackson 1988). These studies focus on the medical texts, drawing on data from individual sites only in so far as they provide support to the literary sources. Studies that have privileged textual over archaeological evidence have left a void in the scholarship where close attention to the material remains would increase our understanding of medical uses of water.

The perceived connection between water and health was partly a result of the belief that healing gods could operate through the water itself (Dunant 2009, 279). More than just related to healing, water was used in the ritual practice of Greco-Roman cults in a variety of ways. Practically, water was necessary for drinking, to clean the altar and the temple, and to wash the temple's possessions (Dunant 2009); metaphorically, water could operate as a highly symbolic religious tool (Ginouvès 1962). Because it was incorporated into sacred spaces and religious life in a multiplicity of ways, the study of water in religion is a well-developed field. For example, the use of water in ritual practice and sacred space is a particularly popular topic for those studying Egyptian religions, for which water figures heavily into cultic aetiologies and ritual practice (e.g., Amenta 2005; Wild 1981; 1984). For the Greek world, Dunant (2009) examines the role that natural sources of water (particularly springs), played in the construction of Greek religious life and thought. Cole (1988; 1994; 2004) uses evidence for water in the cultic worship of Demeter and Artemis to explore both the use of water in religious practice and, more broadly, issues of gender and sexuality.

Anthropologically-focused studies have made great strides in addressing the impact of water on social life for many regions of the Greco-Roman world, but very few have explicitly focused on examining these questions for Asia Minor (e.g., Kamash 2008; 2010b; Koloski-Ostrow 1996). Work from this perspective for the Greco-Roman world and beyond ranges from addressing issues of settlement and subsistence to investigating the role of water in daily life and its associated ideologies and meanings. Bringing together scholars who work in diverse geographical and regions and time periods, the volume *The Nature and Function of Water, Baths, Bathing, and Hygiene from Antiquity Though the Renaissance* (2009), edited by Cynthia Kosso and Ann Scott, is an excellent example of scholarship that engages questions about the social meanings of water. Contemporary anthropological studies on water have access to information that is unavailable to scholars of antiquity (e.g., perspectives from a range of social classes and a less fragmented material record), and therefore are useful for exploring the nuances of these relationships. For example, in an ethnography focusing on the 'meaning' of water, Veronica Strang (2004) examines its role of water in twentieth-century Dorset, England. While dealing with a modern case study, many of the issues addressed in her investigation are similar to those addressed in this dissertation – for example, water management and control, 'sacred' and 'secular' roles for water, and public vs. private usage.

It is necessary to draw on such a diverse and interdisciplinary body of literature in order to carry out a synthetic study of water in antiquity. This dissertation would not have been possible without the detailed analyses and thematic studies outlined above, and thus it both depends on and departs from such perspectives. Bringing together such disparate information on water in its many uses and incarnations, this dissertation begins to consider how these diverse aspects of water, previously treated separately, informed and influenced each other in the context of ancient life.

Organization: Specific Evidence and Broader Themes

Offering a foundation for the more detailed case studies, Chapter 2 takes into consideration the geology of the study area, linguistic conventions for referring to water and water-related architecture in both Greek and Latin, technological developments, questions of financing, and legal arrangements with respect to water in both Greek and Roman cities. Such analysis yields broad conclusions about 'Greek' and 'Roman' conventions for dealing with, and attitudes toward, water, providing a basis from which to engage in the specific problems presented in each case study.

The connection between Roman imperialism and the increased supply of water to cities is explored in Chapter 3, in which water in the civic sphere at Ephesos is considered in light of the connection between civic benefaction and the Roman imperial machine. The timing of civic donations of water infrastructure was frequently tied to significant events in Ephesos' political history – moments that were often connected to particular events in Rome, or activities of the Roman emperor and provincial administrators. The increase in the supply of water to the city through long-distance pipelines, and the development of innovative architectural forms, provided new opportunities for civic benefactors to convey their generosity through the medium of water. The adoption of new technological apparatus provided expanded possibilities for the expression of civic benefaction through the provision of water, however, local Ephesian traditions continued to inform the material manifestation of such generosity.

Chapter 4 considers the use of water in craft production and manufacturing, with a focus on the city of Hierapolis. The evidence for craft production at Hierapolis offers an opportunity to investigate different arrangements for manufacturing activity. In particular, two production activities at Hierapolis – purple dyeing and water milling – are considered in order to examine their organization with respect to water use and in relation to developments in hydraulic technology. The differing arrangements for craft production at Hierapolis offers an instance in which Roman technological innovation impacted only certain production activities (e.g., water milling), while leaving no discernible mark on others (e.g., purple dyeing). The conclusions arrived at for Hierapolis are then further tested through a synthesis of the data for craft production and manufacturing throughout Asia Minor. The variety in the organizational possibilities for craft production indicates a range of possibilities for manufacturing activity, and suggests that the impact of technological development and/or political organization was contingent on a number of factors, namely, the available water sources (and their particular properties), the type of activity, and the scale of production.

The uses of water in ritual practice and within the sacred landscape of Pergamon are the subject of Chapter 5. Four sanctuaries for which water was central to cultic practice are investigated, with a focus on the source of water and its uses within the sacred space – the Demeter Sanctuary, the Asklepieion, the so-called Red Hall (temple to the Egyptian gods), and Kapıkaya, a rural rock-cut, spring sanctuary. This analysis reveals that local and natural water sources were often preferred and maintained for use in sacred spaces and ritual practice, instead of the reliance on water from the urban piped-water network (from which the source of water was both distant and probably unknown). The consistent use of natural and local sources of water – springs, rivers, and rain – suggests a tacit understanding of particular sources of water as being sacred, or certain types of water as especially efficacious for specific rituals.

In conclusion, Chapter 6draws out the major themes addressed within and across the individual case studies. Each case study on its own contributes to the picture of water use in the Roman province of Asia; when considered together, the case studies begin to bridge the divides created by previous scholarly approaches. As a whole, evidence from water use in the civic sphere, in craft and production activities, and in the sacred landscape points to a variety of strategies for managing the Roman imperial presence and its accompanying technological developments. Such a synthetic approach to the uses and meanings of water that considers both Roman impact and local agency can reveal fresh insights into the connections, complexities, and negotiations of life under the Roman Empire.

CHAPTER 2

WATER SOURCES AND WATER MANAGEMENT TECHNOLOGY IN ASIA MINOR

The connectivity of water in both its hydrological and social capacities means that it enters social life in a variety of ways – from the places it bubbles to the surface, to the way it is described in the literature, to strategies for legislating access to it and for keeping it clean. All of these factors need to be considered both as interdependent and as integral to developing as complete an understanding of water in society as possible. For example, the implications of how water was supplied to craft and manufacturing activities (Chapter 4) cannot be fully borne out without consideration of legal arrangements governing public and private access to water. Similarly, it would be impossible to discern the meanings conveyed by monumental hydraulic displays during the Roman imperial period (Chapter 3) without an appreciation of the processes of technological development and an understanding of previous regimes of civic water use.

Each of the following sections deals briefly with topics that are addressed elsewhere by other scholars, both more extensively and in greater detail: geology, technological development, terminology and descriptive terms, questions of financing, and legal arrangements. The following discussion is not meant to be a definitive statement on any of these topics, but rather, is aimed at creating a basic foundation for understanding the many ways in which water factored into social life and the many considerations that must be addressed before any synthetic study of water can be undertaken. The material addressed in each of the following sections forms critical background information for some or all of the case studies that comprise the core of this dissertation, and thus must be treated together here. As geology determines the type and quality of water available, in order to better understand the hydrological landscape of the study area, it is first necessary to address its geological composition. One of the principal questions of this dissertation is the impact of new hydraulic technologies introduced during the Roman imperial period; so, in order to better appreciate the effect of new developments, it is necessary to trace the trajectory of water management technologies in Asia Minor prior to the Roman imperial period. Also addressing the question of Roman influence on the introduction and amplification of large-scale water management in Asia Minor is an exploration of the financing for such cost-intensive projects. Further, the vocabulary used to describe both water sources and water management infrastructure conveys information about the perception of such things in antiquity. Finally, consideration of the legal strategies for managing water employed in both Greek and Roman cities will provide insight into ancient conceptions of water rights, which has direct implications for understanding the uses of water in civic life, economic activity, and religious practice.

Considered together, these geological, linguistic, financial, technological, and legal trends will aid in the creation of a foundation from which to engage with the complex questions about water in the civic sphere, water in the economy, and water in ritual practice and the sacred landscape of Asia Minor that are the primary focus of this dissertation. While this chapter presents only a cursory treatment of each topic, it provides the basic conceptual underpinnings upon which the case studies build.

Geological Foundations

Any discussion of water must first begin with consideration of its availability and quality, as the abundance and characteristics of water will have a direct impact on the relationships organized around it, and the types of strategies employed to manage it. The geology and hydrology of a region dictate the basic array of options where water use and management are concerned. Therefore, establishing a geological and hydrological foundation is particularly important in a study such as this, for which the ultimate goal is to consider the impact of social choices and geopolitical events as they relate to the uses and meanings of water.

Turkey possesses a relatively well-watered landscape. With a total of 8,300 km of coastline, Turkey is bordered by the Black Sea on the north, the Mediterranean Sea on the South, and the Aegean Sea on the west. From the Aegean Sea, the narrow Dardanelles lead to the Sea of Marmara (Fig. 2.1). The Bosphorous, linking the Sea of Marmara to the Black Sea, was a major artery for trade and led to the success of the cities founded along its length. Because of the country's geologic, geomorphic, and climatic settings, Turkey also has many rivers that enter both the surrounding seas and neighboring countries, such as Iraq, Iran and Armenia (Akbulut *et al*. 2009). The Büyük Menderes River (the ancient Meander) was the major river in the region of primary concern in this study, namely western Turkey in the Roman province of Asia, although there are a significant number of smaller and perennial rivers in the area. Turkey has 26 main drainage basins that lack outflow to the sea (Akbulut *et al*. 2009), and four major lakes: Eğirdir Lake, Beyşehir Lake, Tuz Lake and Lake Van.

Approximately one-third of the land in Turkey is covered by subsurface karst, which belongs to the Alpine orogenic belt (Elhatip 1997, 27). In particular, more than one-third of the water potential of Turkey is karstic, with one-third to two-thirds of the river-flow originating in karst springs (Fig. 2.2; Crouch 1993, 64). With figures such as this, understanding karstic geology is critical for understanding water supply in Turkey. The interrelationship between karstic geology and water has led to a concentration of settlement in karstic regions due to the relative assurance of clean drinking water (Crouch 1993).

Karst is defined as an area of limestone terrain[1] that contains surface openings such as shallow holes or *dolines*, pinnacles, dry valleys, caves, springs, subsurface flow in conduits created by solution, and underground drainage channels (Crouch 1993, 94; Elhatip 1997, 28).

[1] Or 'terrane,' a geological spelling for the general word 'terrain' (Crouch 1993, 64).

These morphological features are typically formed by the chemical action and dissolution of carbonate rocks, usually precipitated by the presence of water (Bloom 1998, 147-165). The karstic landscape in which the city of Hierapolis (modern Pamukkale) is situated is the reason for the abundant natural springs in the area, and the travertines for which the city is famous (Fig. 2.3). However, karstic features may also be developed by the tectonic activity of large faults and fracture systems crossing each other. As Turkey lies on three active earthquake fault lines, tectonic action significantly contributes to the expansion of karst features. Karst is generally divided into covered (subsurface) and exposed (surface) types, with covered karstic features being most prevalent in Asia Minor (Fig. 2.4). Since most karst in Asia Minor is subterranean, these phenomena often do not have pronounced surface expression (Crouch 1993, 67-68). The formation of karst features is often due to the extension of other karstic morphologies (such as caves or underground channels) on a main fracture system or along a fault zone (Elhatip 1997, 28). In other words, the presence of karst features often leads to more karst features.

Karstic geology is formed primarily by the action of water, and therefore is a good conductor of water (Bloom 1998, 148-154). Most of the water in karst comes from the weather cycle or the sea, though some hydrothermal karst is known to have developed from heated waters deep within the earth (Crouch 1993, 67-68). With karstic features there is often more than one water table per region, where an irregular and discontinuous water table interacts with the limestone strata, thus producing karst at multiple levels. Water moves unevenly through limestone rock, since its solubility leads to the enlargement of the conduits over time and across space, with flow fastest both at the physical terminus of the features, and over time. Freshwater springs are often abundant in karst terrains.

Major karst basins are located around Sart (ancient Sardis), Dalaman and along the south coast of Anatolia (Fig.2.2; Crouch 1993, 92-93). In Ionia, the region with which this dissertation is primarily concerned, karst is found as far north as the city of Troy. There, the presence of limestone results in springs at the foot of Mt. Ida, which then flow into the Scamander River that runs around the hill of Troy. Further to the south, the city of Miletos was also supplied with water from karst formations. Based on the high correlation between Greek settlements and karst phenomena, Crouch (1993) contends that, having learned to manage water in the karstic landscape of their homelands (e.g., in Attica, the Peloponnese, etc.), Greek colonizers deliberately sought out places with similar rock formations in which to found their new settlements.[2] By this logic, the colonizers could be confident both that they would be able to find water and that their technology would be adequate to manage it (Crouch 1993, 66). Because much of the west coast of Turkey was occupied by colonizers of Greek origin from at least 1000 BCE, the connection to both karstic geology and to Greek water management technologies and traditions has an impact on the understanding of water use and management in this region (Crouch 1993, 92).

Karstic geology is important for understanding the type and availability of water in the individual case studies. For example, karstic geology often results in springs, which were important in ritual practice and religious meaning across the Mediterranean. Though not themselves the result of karstic phenomena, the springs at the Pergamene Asklepieion were central to the rituals practiced at that sanctuary (Chapter 5). The thermal water that flowed at Hierapolis as a result of karst was a critical component in the success of its famed purple dyeing industry (Chapter 4). Furthermore, the ancients generally expressed a strong preference for limestone-flavored drinking water and thus regularly sought water from karstic sources.[3] Thus, the impact of karstic geology was two-fold: first in the choice to establish settlements in this region and in the particular locations in which they were sited (Crouch 1993), and second in the development of technological strategies and cultural schemes for managing water from karstic sources.

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[2] For example, the Ionian cities of Assos, Priene, and Miletos were all watered by karst phenomena.

[3] The sinter (calcium carbonate or silicate precipitated out of flowing water) deposited in ancient pipes and water channels in both Greek and Roman cities attests to the consistent preference for calcium-carbonate laden water (Crouch 1993, 70).

Development of Hydraulic Technology in Asia Minor

Anatolia's geographic position – between Europe and Asia and bordered by several bodies of water – has always made it a crossroads, serving as a platform for influence and exchange among many different cultures and traditions. Its geographic situation in the middle of a significant number of world powers led to the mixing and mingling of diverse peoples who brought with them different cultural *mores* and technological capabilities. Technological developments in Hellenistic and Roman imperial Asia Minor were heavily influenced by innovations throughout the Mediterranean, and particularly by advances in Hellenistic Alexandria and Republican and Imperial Italy. The introduction of long-distance, high-pressure aqueducts into Asia Minor during the Roman imperial period ushered in more possibilities for water use, and in certain instances, a different relationship to the water itself. Discussion of technological developments in the Hellenistic and Roman imperial periods in Asia Minor, however, cannot begin without first a consideration of the strategies employed by groups who lived in Anatolia in the prior millennium, because the technological strategies employed in Hellenistic and Roman cities drew on these established precedents.

During the first millennium BCE many different groups occupied specific regions of Anatolia and employed their own, if similar, technologies for managing water. There was no significant expansion in the technological strategies for hydraulic management from those developed in earlier periods, with people relying primarily on springs within or close outside city walls, and on wells and cisterns (Coulton 1987, 72). The remains of wells, cisterns, clay pipes, and masonry and rock-cut channels were employed in the cities of the central Anatolian regions of Phrygia and Lydia, and also in the regions of Caria and Lycia in the southwest. As the case studies addressed within this dissertation are primarily in the region of Ionia, the technological development of this region is of principal concern. The remains of wells, cisterns, pipes, and water channels in the region of Ionia may partly date from the beginning of the first millennium BCE, or from the later Persian and Hellenistic periods. According to Öziş (1996; 1987b, 56), most of these features in Ionia, however, may date entirely to the Roman imperial period, or at least were significantly extended or repaired in that time. There were, of course, exceptions to the general pattern of water use and management, with its heavy reliance on natural sources of water, cisterns and wells during the first millennium BCE.

Developments throughout the Mediterranean and particularly in the Greek east and in Rome itself, influenced advances in hydraulic technology in Asia Minor. Until recently, modern scholarship on Archaic and Classical Greek hydraulic technology followed the opinions expressed by ancient authors (e.g., Frontinus *De Aq*. 1.16), which generally underrate Greek achievements in this sphere. It is now widely held among contemporary scholars that Greeks had the technical capabilities to construct modest pipelines, and several are known from the Greek world, especially from Asia Minor. For example, as early as the sixth century BCE water from springs several kilometers away was piped to a fountain in the Athenian Agora. Roughly contemporary with this development in Athens, the tyrant Polycrates on Samos constructed a tunnel beneath the acropolis in order to bring in water from outside the city (Coulton 1987, 72). In Asia Minor, Tales of Miletos (624-548 BCE) is said to be the oldest known hydraulic engineer, on account of his recorded observations on wet and dry periods, and his diversion of a river (Öziş 1987a; 1987b, 55). However, although the Greeks had the technology to build aqueducts, the often unstable political and military conditions prevented Greek cities from relying on external water sources or vulnerable water lines (Coulton 1987; Owens 1995, 91). In fact, Frontinus (*De Aq*. 1.18) himself expressed his belief that the desire to protect water-supply was also employed in pre-Roman Italy. He describes how early Italians laid their aqueducts at a low elevation and suggests this was either because they had not worked out the art of leveling or because they purposely sank their water lines in the ground so they would not be cut during the frequent wars fought in the Italian peninsula.

The development of the long-distance aqueduct in Rome in the fourth century BCE, ensured that the city had a constant and reliable water supply which was of high quality (Hodge 1992; 2000b, 95-99; Wikander 2000d, 653), and this technology began to be employed in Asia Minor beginning in the third century BCE. Like early Rome, many towns brought under the aegis of the Roman Empire for a long time remained partly dependent on a combination of local sources, in the form of springs or river-water (Hodge 2000a, 27-28) and cisterns and wells (Hodge 2000a, 22, 23). Aqueducts, however, are notoriously difficult to date (Wilson 1996), and it is generally held that water provided through long-distance water-lines in the Greek world often dated from the Roman imperial period (Coulton 1987, Lewis 2000b).

A very broad trend that aids in dating water features rests on a general differentiation of preferences in construction techniques. Greek cities throughout the Mediterranean generally used clay pipes for their water-lines, whereas many Greek cities within the Roman Empire preferred to employ built channels, which Romans had used since the fourth century BCE (Coulton 1987, 76). For example, the Pergamene Madra Dağ aqueduct exhibits such a difference between 'Greek' and 'Roman' building techniques. Built in two different phases, the section of the aqueduct that was constructed in the Hellenistic period consisted of a terracotta pipeline, while the portion of the water-line dating to the Roman period was a built stone channel (Garbrecht 1987, 31). There were also some subtle morphological differences in Hellenistic and Roman pipes, which aids in the process of assigning a date to a water-line (Fahlbusch 1987a). The appearance of bricks in Asia Minor in the early part of the second century CE provides a useful *terminus post quem* for any water installation utilizing brickwork (Ward-Perkins 1981, 277). Thus, given these dating difficulties, there are only five cities that are known to have long-distance aqueducts that certainly, or very probably, date to the Hellenistic period. Pergamon had the most advanced water supply network, with five aqueducts (Garbrecht 1987, 22-31), while Smyrna, Methymna, Antioch-on-the-Meander, and Philadelphia each had one (Lewis 2000b).

With increased intercommunication within the Mediterranean basin, particularly after the death of Alexander the Great, the development and use of water management technologies in Asia Minor was connected to advances elsewhere. The third century BCE saw an expanding appreciation for mechanical and industrial applications of water. Alexandria witnessed the invention of a number of mechanical developments that incorporated water power: simple gears, the cam (and therefore the trip hammer), pumps, the organ, water clocks, advanced automata, water-lifting devices, and possibly also the vertical water wheel (Lewis 2000a, 2000b). In other areas of water technology, by contrast, the Hellenistic period saw little advance over earlier developments. For example, wells and cisterns continued to be used with little change (Hodge 2000a, 21-22; 2000c, 29-33) and urban water distribution and drainage systems remained relatively simple (Jansen 2000, 109; Wilson 2000c, 165-167). Bath buildings increased in number and complexity with the spread of Hellenism, but they remained relatively modest until the Roman imperial period and the spread of the 'Roman bathing habit' (Fagan 1999; Lewis 2000b, 640; Yegül 1992). However, three significant developments in urban water distribution and management can be associated with the Hellenistic period. First, water pipes and drains were laid out more regularly and they frequently followed the streets – a feature facilitated by the growing number of towns that were laid out on a grid (Lewis 2000b, 640). Second, more private residences were equipped with their own water supply. And finally, special magistrates were increasingly responsible for the supervision of the urban infrastructure (Bruun 2000a, 565, 567; Lewis 2000b, 640; Saba 2009).

As Örjan Wikander (2000d, 649) notes, while water technology in the Roman Empire appears discernibly more far-reaching than that of the Hellenistic period, this is the result of a quantitative rather than a qualitative change. In other words, most of the technology used in the Roman imperial period had already been developed, but it became much more widely employed under the empire. By the time Rome became the uncontested power in the region, only a handful of cities in Asia Minor were equipped with aqueducts supplying water from a source external to the city and, until the Augustan period, these water lines always ran underground with no significant surface structures. Sometime between 4 and 14 CE the aqueduct bridge of Sextilius Pollio was constructed at Ephesos, marking the first instance in Asia Minor of the above-ground arcades so closely associated with Roman aqueduct engineering (see Figs. 3.10 and 3.11). As J.J. Coulton suggests (1987, 73), the reign of Augustus ushered in a period of peace that allowed for more complex water networks with very visible architectural structures, a development that perhaps was advanced with some official encouragement by the emperor himself.[4]

The water distribution network established by Roman engineers was significantly more complex than that of their Greek predecessors (Jansen 2000; Wikander 2000d, 653). Generally, when this water was brought into a city, it was initially stored in large reservoirs or in a *castellum*, from which it was then distributed to various parts of town (Hodge 1992, 2000d; Jansen 2000, 111; cf. Peleg 2006). Through pipes made of terracotta, lead, or wood, water under pressure was distributed throughout the city to public fountains, public baths, private residences, and in some cases, industrial establishments (Jansen 2000, 111-122). The most detailed picture of an urban water-distribution system under the Roman Empire is derived from the uniquely preserved city of Pompeii,[5] but increasing attention to this issue for cities across the empire is further refining this understanding.

The increase in urbanization that was characteristic of the Hellenistic period continued apace in the Roman imperial period. Cities themselves expanded exponentially and with increasing urban population came the diffusion of urban culture (Wikander 2000d, 652-653). The desire for increased drinking water and sanitation was coupled with the expectation of certain urban

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[4] This hypothesis is supported by the fact that Augustus, along with his adopted son Tiberius, personally sponsored the water-line connected to the aqueduct bridge of Sextilius Pollio in Ephesos (discussed below in Chapter 3).

[5] For detailed studies of the component parts of Pompeii's water-supply network: e.g., *casetllum aquae* and aqueducts (Ohlig 1996; 2001), water distribution to private residences (Jansen 1996; 2001), the use of water in private baths (de Haan 1996; 2001) and in public baths (de Haan and Wallat 2006), and the use of water in toilets and latrines (Hobson 2009, Koloski-Ostrow 1996).

amenities, such as public baths, both in urban centers and in smaller provincial towns. As preserved in the urban fabric of both Pompeii and Herculaneum (e.g., Camardo *et al*. 2006), it is assumed that everyday water needs were satisfied by simple, roofless fountains located relatively close together (Glaser 2000a, 434).[6] Water was also available in sumptuously decorated monumental fountains, which not only offered water to urban constituents but also incorporated it into their displays (as discussed in detail in Chapter 3).

Under the Roman Empire, moreover, productivity grew on account of increasing mechanization and by the introduction and increased utilization of new sources of power, not least water power (Wikander 2000d, 650-651). Greco-Roman hydrotechnology was initially inspired by developments in Anatolia and Egypt, but from the Classical period onwards, progress in this field was an intra-Mediterranean phenomenon. The exploitation of water power developed in the Hellenistic east with water-lifting devices (Oleson 2000, 235-237), and use of the water-mill spread over the whole Empire in the first century CE (see Fig. 4.11; Wikander 2000b, 397-398). Wikander claims that one of the major innovations of the Roman Empire was the application of water-power to various industrial purposes, among them the use of water mills for grinding grain and sawing marble (Wikander 2000c; 2000d, 650). The application of water-power is further discussed in Chapter 4 in relation to the role of water in economic activity. Concomitant, with an increase in the development of hydrotechnology was the growth of increasingly detailed water law, which will be detailed below. The developments in hydrotechnology in the Roman imperial period can generally be characterized by an increase in both scale and efficiency.

This examination of technological developments in Asia Minor only addressed such changes at a very general level; the actual processes whereby technologies were advanced and adopted

[6] Glaser (2000a, 434) has estimated that one fountain in Pompeii would be able to serve approximately 160 individuals, based on the volume of water supplied to the fountains and the frequency with which they were distributed within the cityscape.

must be recognized as incredibly complex and contingent. The technological trajectory of each individual city was dependent on its own natural resources, wealth, technological expertise, and political contacts. A closer look at technological development at a single Anatolian city, Pergamon, will serve as an example of the highly variable and specific circumstances involved in the process of technological innovation and exchange.

A Closer Look at Influence and Exchange: Water Management Technologies at Pergamon

The above discussion considered advances in hydraulic technology principally in terms of 'Greek and 'Roman' developments. However, both the cultural groups to which these terms are applied, and the processes of technological innovation and exchange described, were considerably more complex than implied by these categories. Moreover, these developments did not happen only between a 'Greek' and 'Roman' dyad, but often significantly involved other peoples from other places. This amalgam of cultural influences was particularly the case in a place like western Asia Minor, which was constantly involved in cultural contact and exchange with people from all over the Mediterranean. Therefore, a detailed discussion of the elaboration of Pergamon's hydraulic infrastructure will shed some light on the complexities that necessarily accompany technological advancements. Pergamon's hydraulic network was most likely influenced by technological developments in Rome, while, conversely, the city of Rome may have employed a technology to which it had been first exposed in Pergamon.

In the aftermath of the death of Alexander the Great, the city of Pergamon was re-founded to house the treasure of Antigonus (Hansen 1947, 16). As the primary criterion for the city's foundation was an easily defensible position, the location chosen was not blessed with an abundant provision of water (see Fig. 5.2).[7] Although the city was sited on a high peak above

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[7] In Crouch's (1993) seminal work on water management in Greek cities, she argues that there is a close correlation between the availability of fresh water and the foundation of urban settlement. While it is overwhelmingly true that cities were founded where potable water was available, this

three rivers, there was no potable source of water on the hill itself. To this day Pergamon experiences heavy winter rains, and therefore the early inhabitants in the area channeled this rainwater into cisterns (the remains of which can be seen at the site today). In the Philetairan city (281 – 263 BCE)[8] the streets that ran downhill were outfitted with channels or sewers for dealing with excess water from the rains (Fig. 2.5). The channels beneath the streets were approximately 0.80 m wide and 0.10 m deep, and were either cut from the bedrock, or constructed of ashlar masonry and covered over by large stone slabs (Radt 2001, 45).

The people of Pergamon relied heavily on rain water and cisterns to supply water in the earliest periods of the city's life. A testament to the importance of cisterns is the so-called *Astynomoi* inscription, which is a copy of a second century BCE law that was rededicated in the Hadrianic period. This inscription demands that the citizens of Pergamon keep their cisterns in good shape, with the threat of a fine of 100 drachmas (Bruun 2000a, 565; Saba 2009).[9] Cisterns provided the water supply for the majority of the city, delivering water to civic, domestic and religious structures (Garbrecht 2001; Wulf 1999). By the time that the *Astynomoi* law was re-inscribed in the Hadrianic period, the city of Pergamon had an extensive piped water network. Despite the fact that cisterns were not the primary source of water at the time of its rededication, the very act of reinscribing the law indicates that local authorities still thought cisterns useful (Saba 2009). Saba contends that the *Astynomoi* law was re-engraved in the second century CE precisely because it was still applicable for the city of Pergamon, and that the maintenance of cisterns in the second century CE was part of a strategy for securing water in the event that the long-distance aqueducts were compromised.

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was not exclusively the case, and particularly for Asia Minor where an easily defensible position was often the primary concern.

[8] Philetairos was the re-founder of the city in the early third century BCE, thus the layout of the city under this early ruler represents the first phases of urban development.

[9] Bruun 2000a, 565, n. 38. Bruun also indicates that the inscription was cut during the early second century CE, but reflects a much earlier practice.

Pergamon was the first Hellenistic state to develop an extensive long-distance piped water supply, and Lewis (2000b) suggests that Pergamon's contact with Rome in the late third century BCE was important to the process whereby it developed this technology. In addition to the necessary engineering capabilities, however, the conditions for the utilization of this technology had to be favorable. Therefore, the significant economic resources at the disposal of the Attalid kings, the relative political stability of the region, and access to the vast territory over which they ruled were probably also significant factors in their ability to construct long-distance water lines. Conversely, Lewis proposes that the Romans learned how to employ the inverted siphonfrom their exchange with Pergamon.

The first Roman embassy came to Pergamon in 205 BCE, and the first Pergamene embassy arrived in Rome in 201 BCE (Habicht 2006; Hansen 1947, 50, 58). These diplomatic missions between Rome and Pergamon only slightly predate the appearance of technological innovations in both locations, implying the possibility of mutual spheres of influence and suggesting that the process of technological transfer was an exchange that worked in both directions. The beginning of Pergamene aqueduct construction, around 200 BCE, coincides with the Attalid kingdom's political connection with Rome, suggesting that the idea to tap distant water sources possibly came from the Romans (Lewis 2000b, 647). The first two aqueducts at Pergamon, the Attalos and the Demphon (ca. 200 BCE) were roughly 20 km long. The Madra Dağ aqueduct constructed under the reign of Eumenes II (197 – 159 BCE) was 42 km long. The earliest aqueducts of Rome, the Aqua Appia (312 BCE) was 17.6 km long, and the Anio Vetus (272 BCE) was an impressive 81 km. In contrast, until the late third century BCE, the longest aqueduct known from the Greek world was at Olynthus, and stretched only 8 km (Crouch 1993, 71-5). As Lewis argues, these advances in the construction of long-distance water lines in the east should be viewed in the context of the development of Roman hydrological technology.

The Romans, on the other hand, may have been inspired by the Pergamenes to employ the inverted siphon in their water management infrastructure. When a valley was too deep or wide for a bridge, an inverted siphon was used. The siphon involves crossing a valley by feeding water into a closed pipe that runs down one side, across the bottom, and up the other side of the valley using the accumulated pressure to cross the valley floor (Fig. 2.6; Hodge 1992, 147). The inverted siphon was a technological advance in hydrological engineering that may have been developed in Asia Minor under the Hellenistic kings, which will be discussed further below (Hodge 1992, 32-33). While not unknown from water management systems in classical Greece, these inverted siphons were always of modest depth. In the Hellenistic east, however, siphons were used frequently and were sometimes quite large – perhaps on account of the fact that many cities were located on top of hills and thus needed to find a solution in order to raise the water up to their settlements (Crouch 1993). Hellenistic-era siphons seem to have been fairly common in Asia Minor, being found at Ephesos, Methymna, Magnesia ad Sipylum, Philadelphia, Antioch on the Meander, Balundos, Patara, Smyrna, Prymnessos, Tralleis, Trapezopolis, Antioch in Pisidia, Apamaea Kibotos, Akmonia, Laodicea, and Pergamon (Hodge 1992, 396, n.49; Hodge 2000d, 43).[10] In contrast to the lead pipes which became the signature of Roman inverted siphons, Hellenistic siphons normally ran through terracotta pipes with stone sleeves (Lewis 2000b, 647).[11] Of notable exception to the use of stone in the Hellenistic period is the siphon on the Pergamene Madra Dağ aqueduct, which was comprised of lead pipes – perhaps another indication of influence from Rome. The Pergamene siphon on the Madra Dağ aqueduct, at 3.5 km long and 201 m deep, was the largest of antiquity (Hodge 2000d, 45-46; Garbrecht 2001), and the water pressure on the lead pipes of this siphon would have been equivalent to the working pressure of steam locomotives of the railway age (Lewis 2000b, 646).

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[10] However, as with assigning a date to an aqueduct based solely on internal evidence, dating a siphon is also a very difficult endeavor, and it is possible that some of the siphons extant in Asia Minor are early Roman installations rather than Hellenistic.

[11] Hodge (2000e, 78-79) argues that the use of inverted siphons in the Roman may generally be underestimated because the pipes were usually made out of lead, and thus were robbed in subsequent periods leaving no visible trace.

Lewis suggests that the first inverted siphon installed at Rome in 140 BCE was inspired by its contact with Pergamon. While compelling, this hypothesis must not be accepted uncritically. Though it is likely that at least one was used in the city, there are no archaeological traces of inverted siphons in Rome itself. An inverted siphon may have run between the Quirinal and Capitoline Hills, where one of the terminal points of the Aqua Marcia was located. The use of a siphon in this location has been suggested because no traces of the massive arcade that would have been needed to cross this valley have yet been found. In addition, a siphon may have been used in conjunction with an arcade to deliver water to the Palatine Hill (Aicher 1995, 18). Although not evidence from the city of Rome itself, the water supply of the town of Aletrium in nearby Latium involved a substantial siphon across the Cosa valley, and was constructed in approximately 100 BCE (Coulton 1987, 73). The presence of the siphon in Aletrium proves that inverted siphons were used on the Italian peninsula, at least by the early first century BCE.

It is possible that these technological developments in Pergamon and Rome, respectively, arose independently of each other, because there is no concrete and definitive evidence linking the technological advances in both places. The diplomatic ties and the close temporal correspondence between the embassies and the appearance of new technologies in both locations, however, leave open the possibility that these innovations in water management were the result of mutual spheres of influence. For example, in Pergamon, the early aqueducts were built using closed pipes and siphons, which was the preferred method of the Greek world, whereas the aqueducts built after Pergamon's contact with Rome were constructed in an open-channel system, which was the preferred method employed throughout the Roman Empire (Aicher 1995, 18; Garbrecht 1987).

Indeed, if Lewis' suggestion is correct – that Rome and Pergamon equally influenced each other's development in the sphere of hydrological technology – then Pergamon's adoption of Roman advances in water management technology was the product of free exchange of ideas and not the result of Rome's active presence in the region. While the appearance of long-distance aqueducts in Pergamon is a marker of Roman influence, these aqueducts do not imply 'Romanization' in terms of a concomitant adoption of 'Roman' ideas or behaviors. Indeed, until Rome became the uncontested power in the region, all long-distance water lines in Asia Minor ran in inconspicuous pipelines or channels. These understated early aqueducts were hardly the overtly monumental arcades that generally come to mind when thinking about Roman water management technology. Moreover, there were developments achieved at Rome that were not readily adopted in the Greek east. For example, the elevated arcade, first used at Rome in 144 BCE, only appears in the Greek east in the Augustan period (Lewis 2000b, 648). The increasing visibility of such hydraulic monuments in the Roman imperial period will be taken up more extensively in Chapter 3.

This particular example is but one piece of a long technological trajectory in Pergamon and is a story unique to this city; each city in Asia Minor developed its water management technology and infrastructure differently based on its particular political, geographical and economic situation. For all cities in Asia Minor, however, the question of the extent and impact of Rome's influence on the water management technology is pertinent. This question is particularly apposite after the Attalid kingdom was bequeathed to Rome in 133 BCE, but there is no formula to determine the level of Roman influence on the development of water technology in each particular place. What is not in question is the influence that the relative peace under Roman rule and the benefaction of the Roman emperor and imperial administrators had on the development and profusion of long-distance aqueducts and the amenities they supplied.

Roman Imperial Influence on and Financing of Water Technologies in Asia Minor

The influence of Rome was not only evident in technological developments in water management infrastructure in Asia Minor, but also in their financing. The costs for constructing large-scale water management infrastructure were typically prohibitively expensive, and many communities lacked the technical and engineering expertise to carry out such projects on their own. For example, it cost more than 3 million sesterces for a bath building in Pisa, 2 million sesterces for a water course in Burdigala (Bordeaux), over 200,000 sesterces for a cistern in Side in Pamphylia, and 30,000 sesterces for a fountain in Calama in Africa (Eck 1987, 76). Therefore, when cities lacked the public funds to pay for the construction of an aqueduct, many relied on imperial assistance or the generosity of civic benefactors for the financing of their water delivery systems. The practice of euergetism (civic benefaction by elite patrons) had its roots in the Hellenistic period, but increased dramatically during the early Empire and continued to grow until it reached its height during the second half of the second century CE (Ng 2007, 4-6; Sherwood 2000, 3). In Imperial Asia Minor, where euergetism was the primary driving force in civic construction, the surprising thing is that most aqueducts were *not* sponsored by elite patrons. As suggested by Coulton (1987, 81), the reason for this may be that water lines were very high-cost but had very low visual impact, making them a poor investment for individuals attempting to publicly display their generosity. As most water lines were underground pipelines or rock-cut channels, a more desirable place for benefaction was the delivery point with a monumental fountain. An example of a benefactor making just such a choice is Aelius Philopappus, who supervised the construction of a water line from public funds, but made a private contribution to the fountain building at Hadriani in Mysia (Coulton 1987, 81).

Imperial building is widely attested across the entire empire, and the involvement of the emperor in public building in Italy and in the provinces became increasingly common during the first centuries CE.[12] Numerous inscriptions declare that aqueducts or other waterworks had been constructed or repaired *imperatoris iussu* (by decree of the emperor) or *ex auctoritate imperatoris* (on imperial authority). In such cases it can be assumed that an imperial decision or decree was

[12] The involvement of the emperor in local provincial matters, not only those concerning water management and infrastructure, generally increased during the second and third centuries CE (Bruun 2000b, 604, n. 137).

the impetus for the construction or repair, but that the actual execution of the work was handled by the imperial administration, local magistrates, or the army (Bruun 2000b, 604; Eck 1987, 77-78). Yet, even when the emperor sponsored the construction of a hydraulic installation, future costs were generally the responsibility of the city or of private donors. So, for example, Augustus constructed two aqueducts in Spain which were later repaired by private benefactors (Eck 1987, 76).

A testament both to imperial sponsorship of hydraulic projects and to the vast expense of carrying them out is the aqueduct and fountain for the city of Alexandria Troas (modern Eski Stanboul) constructed by the young Athenian millionaire, Herodes Atticus, when he held the imperially appointed post of Protector of the Free Cities of Asia in 134/5 CE, an administrative post that dealt with both financial and judicial issues of cities (Longfellow 2011, 148; Tobin 1991, 336). Philostratus (*VS* 548) records that Hadrian pledged three million drachmae of imperial funds for the project – funds which were insufficient, causing Herodes to run four million drachmae over budget:

> [A]t a time when Herodes was governor of the free cities in Asia, he observed that Troy was ill-supplied with baths, and that the inhabitants drew muddy water from their wells, and had to dig cisterns to catch rain water. Accordingly he wrote the Emperor Hadrian to ask him not to allow an ancient city, conveniently near the sea, to perish from drought, but to give them three million drachmae to procure a water-supply, since he had already bestowed on mere villages many times that sum. The Emperor approved of the advice of the letter as in accordance with his own disposition, and appointed Herodes himself to take charge of the water-supply. But when the outlay had reached the sum of seven million drachmae, and the officials who governed Asia kept writing to the Emperor that it was a scandal that the tribute received from five hundred cities should be spent on the fountain of one city, the Emperor expressed his disapproval of Atticus, whereupon Atticus replied in the most lordly fashion in the world: "Do not, O Emperor, allow yourself to be irritated on account of so trifling a sum. For the amount spent in excess of three million I hereby present to my son, and my son will present to the town" [trans. Wright 1988].

Philostratus' description of this project also attests to the difficulty in completing a project of such magnitude, both in terms of financing and, perhaps, in securing engineers with sufficient technical capabilities to carry out the project.

The prohibitive expense of aqueduct construction, a lack of provincial technological know-how and the role of the Roman emperor are clearly exhibited in the correspondence between the emperor Trajan and Pliny the Younger, as recorded in the latter's *Epistulae*, while Pliny was serving as Roman provincial governor of Pontus-Bithynia in Asia Minor. Much of the correspondence between Pliny and the emperor Trajan concerned infrastructural projects in the region, in particular at Nicomedia and Sinope (Longfellow 2011; Sherwin-White 1966). The communication between the emperor and Pliny reveals that Trajan supported the development and improvement of the region's hydraulic infrastructure, but he encouraged drawing on local engineers and resources instead of providing Roman financing or technological expertise (Boatwright 2002). Much of the correspondence addressed the needs of the town of Nicomedia, the seat of the Roman provincial council of Bithynia. In one such letter, Pliny wrote to Trajan requesting that he provide a Roman engineer or architect skilled in aqueduct design, because the community needed such a water line, but did not have the financial or technical capacity to complete it:

> The people of Nicomedia, sir, have spent 3,318,000 sesterces on an aqueduct, which was abandoned while still unfinished, and was also demolished; subsequently 200,000 were laid out on another aqueduct. Since this too was abandoned, fresh expenditure is required in order that those who have wasted so much money may get their water, I have myself visited a very pure spring, from which it appears that the water must be brought, as was attempted on the first occasion, and on an arched structure, so that it may not reach just the flat and low-lying parts of the city. A very few arches are still standing; some can also be built up from the dressed stone which was pulled down from the earlier structure; some part of it, in my judgment should be made of brickwork, for this would be both easier and cheaper. But what is needed above all is for you to send out a water engineer or an architect, in order that what has happened may not occur again. This one thing I assert, that both the usefulness and the beauty of the work are fully worthy of your age [Plin. *Ep*. 10.37, translated in Williams 1990].

While, on some level, rhetoric must be considered to inform this correspondence, Pliny's plea to the emperor certainly indicates that the provision of water to a city was considered a basic necessity; a sentiment echoed by Pausanias (10.4.1) who suggested that a city without water descending from a fountain (οὐχ ὕδωρ κατερχόμενον ἐς κρήνην), among other urban amenities, was not a city at all.

There were also instances in which the Roman emperor became personally involved in hydraulic projects in the provinces. The catastrophic earthquakes suffered by the Syrian city Antioch-on-the-Orontes were the impetus for significant imperial assistance in the reconstruction of the city. After an earthquake in 37 CE, for example, Caligula provided Antioch with money and sent a Roman engineer, the prefect Salianus, to build an aqueduct to conduct water from the Daphne springs to a new bath building (Longfellow 2011, 142). The emperor Trajan, who was in the city and experienced first-hand the devastating earthquake of 115 CE, engaged in urban reconstruction by building a public bath which was supplied by the Daphne springs (Boatwright 2002). Hadrian also took up post in Antioch, making the city his gubernatorial headquarters during Trajan's Parthian Wars. Having also experienced the earthquake in 115 CE, Hadrian became deeply involved with urban rebuilding projects, with a particular focus on improving the hydraulic network (Longfellow 2011, 141). Hadrian first completed the aqueduct begun by Trajan after the earthquake and, according to Malalas, a sixth-century chronicler, he constructed a reservoir complex at the source of the Daphne springs that included a Theatron, Theatridion and two temples – one of the Springs and one of the Nymphs (Longfellow 2011, 141-143; Jeffreys *et al*. 1986; Malalas 278).

There are other examples of imperial benefaction for hydraulic projects in Asia Minor. After the earthquake suffered by the Lydian city of Sardis in 17 CE, Tacitus (*Ann*. 2.47) relays how the emperor Tiberius promised the city ten million sesterces and remitted their tax for five years (Hanfmann *et al*. 1983, 141). The emperor Claudius took benefaction at Sardis one step further and sponsored the construction of the city's water supply, while Vespasian or his governors sponsored construction or improvements to the hydraulic network at Balbura and Patara (Coulton 1987, 81).

Private benefactors also regularly sponsored hydraulic projects in Asia Minor. These private donors were generally individuals who were involved in provincial administration or were local benefactors looking to express their concern for civic welfare both to the local population and to the imperial house. While not directly associated with the emperor himself, these projects must be considered as significantly influenced by Roman political organization and by events in Rome, as will be addressed further in Chapter 3. For example, at the Pisidian city of Sagalassos Tiberius

Claudius Piso dedicated a civic fountain to the emperor Hadrian. Piso was the high priest of the imperial cult, the first *agonothetes* for life of the Klareian games, the grandson of the first Sagalassan to become a Roman citizen under Nero, and also probably the first Roman *eques* of Sagalassos under Vespasian (Longfellow 2011, 151; Waelkens 2002). Piso's association with the imperial establishment was clearly a factor in his decision to construct a hydraulic monument and to dedicate it to the emperor.[13]

At the city of Aspendos the dedicatory inscription from a monumental hydraulic project states that it cost two million denarii, and names the donor as Tiberius Claudius Italicus (Fahlbusch 1987b, 172; Piras 2000, 249; 2006, 398-399). The inscription probably dates its construction to the second century CE.[14] The inscription also mentioned the son of Italicus, Tiberius Claudius Erymneus, who donated oil for use in the gymnasium (Piras 2006, 400, n. 9). Though there is no more information about the donor of the aqueduct and nymphaeum at Aspendos, there is a possibility that he is connected to the Tiberii Claudii of Sagalassos (Piras 2006, 398).

Large-scale hydraulic projects and display that were the hallmark of Roman presence in Asia Minor thus not only reflected Roman technological innovations, but also, in many cases, indicated Roman financing by the emperor or other imperial officials and elite donors. However, as will be discussed in Chapter 3, the presence of such monuments in cities of Asia Minor also engaged with local architectural and artistic traditions and long-held associations with water, and therefore were not singular expressions of *romanitas*.

[13] Though, as argued by Longfellow (2011, 154-57), despite communicating a clear association to the emperor, the sculptural arrangement of the fountain perhaps indicates that Piso more closely associated his family's fortunes with the benefaction of the local gods than with the emperor. An over-life-sized statue of the local manifestation of Apollo, Apollo Klarios, occupied the central niche, with statues of other divinities flanking him on the lower register. In the central position on the second story was an under-life-size statue of the emperor Hadrian in bronze which was flanked on each side by slightly over life-sized statues of the donor, Tiberius Claudius Piso.

[14] There continues to be disagreement on the date of the aqueduct, with scholars suggesting a range of possibilities. The earliest date proposed is the end of the first century CE (Eck 1987, 78-79), while other scholars suggest it was constructed as late as the third century CE (Piras 2006, 400 n. 9).

Terminology: Water in Literature and Epigraphy

The vocabulary used to describe water itself, water management technologies, and water-bearing architecture in the Greco-Roman world can provide insight into how each was conceived of in antiquity. Such an understanding is achievable despite the fact that technical and descriptive terms often have multiple or fluid applications and can change by region and/or over time (Dvorjetski 2007, 27). Therefore, the following is not intended to be a definitive list of the terms used to describe water sources, water infrastructure, and water itself in Greek and Roman epigraphic and literary sources. Rather, it addresses general trends and broad themes, and in so doing, highlights the variety of vocabulary used to describe water in many of its manifestations and uses in ancient life. Vocabulary choices can be considered particularly significant in a place such as western Asia Minor where most of the population was native Greek-speaking, but life was probably conducted in a variety of languages. Therefore, the choice to use Greek or Latin, particularly in epigraphy, may have carried a particular set of valences (Adams *et al.* 2002; Cameron 1931).

First, it is useful to have a very brief look at some of the ways in which water itself is described in the ancient literary sources. Water can be extremely variable, a fact that was recognized and commented on by several ancient authors. Comparing the diversity of water to the diversity of human bodies, Vitruvius (*De Arch*. 8.3.26) assigns this variability in water to the variety present in both the soil and the landscape. This changeability manifested itself in practical concerns, such as where the water comes from (e.g., rain, groundwater, and rivers) and the quality of the water – factors which the ancient authors generally understood to be connected. For example, Vitruvius claims that rainwater is the most wholesome, because it is the lightest of all the sources (*De Arch* 8.2.1), but water located in clay and loose gravel is unpleasant, and in black earth is scantily found (*De Arch* 8.1.2). Vitruvius also praises water found at the base of mountains and in flinty rocks (*saxis silicibus*), and claims that springs that flow underground from mountains have a particular sweetness to their taste (*De Arch* 8.1.2). The qualities related to water from mountains and underground channels described here by Vitruvius are features typical of karstic geology, adding more evidence for the ancient praise and preference for drinking water derived from karstic sources.

Like Vitruvius, Seneca also focuses on the mutability of water, describing, for example, the different forms that water can take and the variety flavors that water can have:

> All waters are still, or running, or collected, or occupy various subterranean channels. Some are sweet, others have flavors that are disagreeable in different ways; among them are the salty, the bitter, and the medicinal. In the last category I mean sulphur, iron, and alum waters. The taste indicates the properties [Seneca *Q. Nat* 3.2.1]

Also focused on the different qualities of water, Frontinus describes both the non-potable and the high quality of water being brought into the city of Rome through the urban aqueducts. He uses terms such as "healthy" (*saluber)* and "unhealthy" (*parum salubrem*) to describe the quality of the water itself, referring generally to its quality rather than to specific characteristics. Frontinus says that the Aqua Iulia:

> …is in fact positively unwholesome, and for that reason is nowhere delivered for consumption by the people. It may have been that when Augustus began the construction of his Naumachia, he brought this water in a special conduit, in order not to encroach on the existing supply of wholesome water, and then granted the surplus of the Naumachia to the adjacent gardens and to private users for irrigation [*De Aq* 1.11, trans. Bennett 1997].

Not only were the places where water was found and its flavors considered to be connected, but, similarly, there was a stated interrelationship between the quality of the water and the uses for which it was appropriate. For example, Frontinus describes the uses for which the high-quality water brought into Rome by the Aqua Marcia and the less-wholesome water from the Old Anio aqueduct were suitable:

> …so that first of all Marcia should serve wholly for drinking purposes, and then that the others should each be assigned to suitable purposes according to their special qualities, as for example, that Old Anio, for several reasons (because the farther from its source it is drawn, the less wholesome a water is), should be used for watering the gardens, and for the meaner uses of the City itself [*De Aq*. 2.92, trans. Bennett 1997].

There was an inherent relationship expressed between natural and architecturally mediated sources of water in Greek vocabulary, because the terms used to refer to natural water sources were coopted to denote artificially constructed water infrastructure. For example, the term *krene* (κρήνη) refers to a well, spring, or a fountain that supplied drinking water (Tölle-Kastenbein 1985, 459). A *krene* should be considered distinct both from a *phrear* (φρέαρ), a tank or well, and a *pege* (πηγή), a spring (Dorl-Klingenschmid 2001, 18-20; Glaser 1983, 5). The term *pege* was mostly used in the plural to refer to running water or streams, but can also denote a source of water generally. Naturally occurring hot springs were referred to as *thermae* (θέρμαι or θερμά) in Greek, which was then translated to '*aquae calidae*' or '*thermae*' in Latin (Dvorjetski 2007, 31).

This terminology for referring to naturally occurring water sources was replicated in the way in which Greeks referred to architecturally mediated sources of water. The Greeks designated all types of architecturally mediated sources from which water could be drawn as *krene*, in contrast to a natural spring, which they called *pege* (Glaser 2000a). However, poets sometimes used the term *krene* in place of water itself, which indicates an interesting conflation of architectural term and natural resource, in which the fountain was used as the signifier of the water it provided. As discussed in more detail in Chapter 3, this lack of linguistic distinction in the Greek language is echoed in the architectural arrangement of Greek fountains themselves, which generally conformed to a single fountain type and did not employ water as an element of display.[15] One of the earliest, and certainly most famous, *krenai* from the Greek world was the so-called Enneakrounos (nine-spouted) fountain in Athens. Thucydides famously described the origins of the fountain, the relationship between *krene* and *pege*, and the sacred purposes for which its water was utilized:

> The fountain (*krene*) now called Enneacrounos, or the Nine Conduits, from the form given to it by the tyrants, but originally, before the springs (*pegon)* were covered in, Callirrhoe, or the Fair Stream. The water of this fountain was used by the ancient Athenians on great occasions, it being near the original

[15] For a discussion of the development of fountain architecture in the Greek world, see Glaser (1983), who traces the development of fountain architecture in Greece from the seventh century BCE to the second century CE in *Antike Brunnenbauten (KPHNAI) in Griechenland*.

city; and at marriage rites and other ceremonies the custom is still retained [Thuc. 2.15.5, trans. Jowett 1881]

In sharp contrast to the relative paucity of Greek terms with which to refer to both naturally occurring and architecturally mediated sources of water, the vocabulary used by Latin speakers to denote water sources and hydraulic architecture was significantly more varied and therefore more complex than that offered in the Greek lexicon. As with Greek terms, in Latin the same word is often used to refer to both natural and architecturally mediated sources of water, but the number of terms used to describe these water sources was far greater in the Latin vocabulary. The increase in the variety of terms provided more specificity, such that they now answered the question: what type of spring or fountain or storage tank, etc. is it? For naturally occurring water, this specificity may suggest a sharper focus on its many manifestations in the natural world, and indicates a closer attention to the differentiation of these types. This attentiveness to different water sources may be the result of imperial expansion, such that Roman engineers both encountered and had to manage water in diverse landscapes. The linguistic variety in relation to architecturally mediated water-bearing edifices indicates significant developments and differentiations in water-related architecture under the Roman Empire.

In what follows, I review the range of Latin terms for water sources and architectural types of water management infrastructure and display, indicating an increase under the Roman Empire both in architectural solutions for water management, and in the vocabulary with which such developments were described. This survey of Latin vocabulary here is particularly useful for the analysis of fountain architecture in Chapter 3, because it forms the basis from which the significance of particular terms applied to civic fountains can be appreciated.

In the context of Agrippa's extensive development of Rome's hydraulic distribution system in the in the first century BCE, Pliny the Elder (*HN* 36.24.121) refers to the 700 *lacus* (basins) 500 *salientes* (fountains) and 130 *castella* (distribution points for aqueducts), constructed under Agrippa as aedile. A brief discussion of the terminology used by Pliny the Elder will help tease out some of the nuances in terminology for water sources and water gathering places – both naturally occurring and architecturally mediated. A *lacus* usually referred to either a pool or basin of living water, or a tank or reservoir for storing water. A *lacus* could either be a naturally occurring water source, as a spring, or a man-made structure. For example, the Lacus Juturnae[16] in the Forum Romanum was both a natural spring (*fons*) and a water-gathering place (*lacus*) (Claridge 1998, 95-97; Haselberger *et al*. 2002). This spring was the primary fresh-water source in the area, and was architecturally embellished with an aediculated shrine. The Latin word *fons* is the rough equivalent of the Greek *pege*.

Hydrotherapy at thermal springs became increasingly popular during the Roman imperial period (as will be further addressed in Chapter 5, with analysis of the sacred and healing properties of water at the Pergamene Asklepieion). The terms *fons* and *aquae* were used to denote natural sources of water or springs and were often associated with thermo-mineral sources (Dvorjetski 2007, 32-33). The Latin term *thermae*, derived from the Greek word for hot springs, was applied to bath buildings, whether their water was naturally thermal or artificially heated, and particularly those lavishly decorated establishments often connected to imperial benefaction. *Thermae* were generally owned and operated by the city and were open for all. In contrast, *balneae* were generally smaller bathing establishments and privately owned (Dvorjetski 2007, 33; Fagan 1999). Estee Dvorjetski (2007, 28) traces the possible etymological origin of the Latin term *spa,* used to denote places where an individual could experience bathing by means of naturally occurring or artificially heated water. The term is possibly derived from the verb *spargo* (to bubble up, sprinkle or moisten). The initials S. P. A. from the Latin expression *Salus per Aquas* were found in graffiti in Roman baths. Meaning "health through waters," this shorthand probably

[16] Juturna was a Latin goddess, a 'nymph' of spring water and of good health. She was the mythical wife of Janus, the daughter of the river Volturnus, mother of Fons, and she also appears in the Trojan legend as the sister of Turnus, the king of the Rutuli whom Aeneas had to defeat on his way to found the city of Rome (Claridge 1998, 95).

morphed into the term *spa*, which is used in contemporary parlance to refer to a thermal spring, resort or similar place for relaxation and health.

The term *salientes*, which is derived from the Latin verb *salio* (to leap or spring forth), refers to a type of fountain. As implied in the active name ascribed to this type of fountain, the water in these *salientes* must have sprung forth into the basin. *Castella* have been generally believed to be storage tanks and/or distribution points where aqueducts deposited their water before it was distributed through the urban hydraulic network. Based on a survey of literary and archaeological sources, Yehuda Peleg (2006, 343-47), by contrast, argues that *castella* were not storage tanks, but rather were used as control devices that divided and distributed the water.[17] *Castella* were an integral part of the water management infrastructure in most Roman cities, and despite the scholarly debate about their precise function, are frequent features in cities across the empire.

As monumental civic fountains gained increasing popularity in the Mediterranean during the Roman imperial period, a profusion of different fountain types was established. Despite widespread use of the term *nymphaeum* in contemporary scholarship, in antiquity there was no standard term for monumental fountains, which were variously called *hydrekdocheion*, *hydreion* or *nymphaeum*, incorporating both Latin and/or Greek terms in their dedicatory inscriptions (Glaser 1983, Longfellow 2011). The terms *hydrekdocheion* and *hydreion* first appeared in dedicatory inscriptions in the Roman imperial period, so although Greek words themselves, they are more properly discussed in the context of terms used in the cosmopolitan and polylingual Roman world. The term *nymphaeum* refers to a place for the nymphs, water-loving semi-divine creatures; the word *hydreion* simply refers a place from which water is available; and *hydrekdocheion* can be roughly translated as a “water-spectacle” or a “vision of water.” Indeed, the development of the term *hydrekdocheion* is an example of the linguistic hybridization that

[17] Peleg, however, bases this conclusion about the function of *castella* on the supposition that the Roman water system was an open system (i.e., that the water ran constantly without any means to turn off or curb flow), a subject which is still under debate (cf. Kamash 2010a).

occurred as a result of Roman imperial expansion. The word first appears in the Roman imperial period, but uses Greek to describe a new fountain type that employed water in its display in a theatrical manner. The creation of a Greek word that describes a new Roman technology and innovative use of water for display, "*hydrekdocheion"* – a term that replicates a Latin word (*nymphaeum*), but does not translate or borrow from Latin – perhaps suggests cultural pride or cultural resistance expressed linguistically. The abundance of words with which to refer to monumental fountains, coupled with a lack of a discernible pattern for their use, suggests either a conceptual interchangeability among these terms in antiquity or that there were differences in the deployment of these words that are now imperceptible.

Most of the monumental fountains in Asia Minor date from the end of the first century through the beginning of the third century CE. The earliest datable instance of the term *nymphaeum* used to designate a monumental fountain comes from the Nymphaeum of Trajan in Soada Dionysiade, located approximately 100 km south of Damascus in modern Syria. Little is known about this fountain, which has been neither systematically excavated nor published, but the imperial titulature in the dedicatory inscription dates the fountain to between 102 and 114 CE (Longfellow 2011, 99). The first attestation of the term *hydrekdocheion* in Asia Minor is from the Hydrekdocheion of C. Laecanius Bassus in Ephesos, dedicated in 80-82 CE (see Fig. 3.17). This fountain, along with the Great Nymphaeum of Miletos, marks the inception of monumental façade fountains in Asia Minor. The Hydrekdocheion of Trajan at Ephesos (often erroneously referred in contemporary scholarship as the Nymphaeum Traiani) is also called *hydrekdocheion* in its dedicatory inscription (see Figs. 3.25 and 3.26). The term *hydreion* is attested in several dedicatory inscriptions of monumental hydraulic displays. Built in the reign of Septimius Severus, the monumental fountain constructed by Aurelia Paulina in Perge was labeled a *hydreion* (Fig. 2.7). Also referred to as *hydreion* is the fountain added to the Memmius Monument at Ephesos (see Figs. 3.15 and 3.16). The Memmius Monument, originally joined to the monument during the Augustan period, was assigned this appellation when it was rededicated during the reign of Septemius Severus.

By contrast, the Bakıcak fountain at Keramos in Caria, also dedicated to Trajan, is referred to as *krene* (Longfellow 2011, 95, 99-100), recalling ancient Greek tradition in this name. Recent archaeological investigations inside the city walls of Hierapolis of Phrygia have uncovered an architrave block with part of a dedicatory inscription describing it as a *krene*.[18] This hydraulic installation has been tentatively dated to the Augustan or Julio-Claudian period (Campagna 2006, 387).

As this brief survey makes clear, the Greek lexicon offered more limited options with which to refer to both water sources and the infrastructure for its management and distribution. The explosion of terms in the Latin lexicon for water and its associated architecture developed alongside imperial expansion and increased exposure to water in a variety of geological scenarios. Moreover, due to technological developments during the Roman imperial period, engineers and architects had the ability to experiment with water in a variety of architectural forms, leading to a robust vocabulary with which to describe them. A variety of technological developments for the conveyance, distribution, and access to water are implied in the discussion about vocabulary used to describe water and its associated architecture (e.g., aqueducts and their component parts, strategies for water storage, and fountain architecture). This connection between architectural types and their associated vocabulary will be explored in further depth in the discussion of the civic fountains of Ephesos in Chapter 3. Implied in this interest in typologizing and harnessing water are Roman attitudes about nature and the expression of power implicit in its control (Purcell 1996).

[18] The block is currently preserved in the Museum of Hierapolis. The inscription reads:]N ΕΠΟΙΗΣΕΝ ΤΗΝ ΚΡΗΝΗΝ (dedicated this *krene*).

Legal Considerations

Water use and administration are direct consequences of the legal structures that govern them. A brief discussion of the legal organization for water use and management in the Greek world will address the arrangement for dealing with water resources in Asia Minor prior to Roman presence in the region. This temporal depth will provide the essential foundation from which to examine the ways in which Roman technological developments and Roman legal practices modified water management in Asia Minor and will help to highlight the impact of Roman political and social organization on the region. This section dealing with legal arrangements addresses the basic question: who had access to water and how was it used? Ancillary to this are considerations about the cost of obtaining access to water, the places where a person might have access (and how that access might change based on his or her social station), how legal structures for water use affect relations between people, and the types of water available. The answers to these questions will enable the analysis in the following chapters on water in urban life, economic activity and religious practice.

Greek Water Law and Practice

Although Greek world, of course, was never a politically unified entity to the same degree as its Roman counterpart, certain features were common to water use among the Greeks. As discussed above, Crouch (1993, 63-82) posits that Greek colonists sought out places with similar geological and hydrological conditions to their *metropoleis* (i.e., karstic geology), and therefore developed similar strategies for managing water resources. Western Asia Minor has a (somewhat) similar geological arrangement to mainland Greece and experiences a comparable hydrological cycle, making it a safe assumption that the eastern colonies employed similar strategies and laws in regard to water management. Greeks did not develop the same extensive legal structure as was created in the Roman world, but rather appears to have emerged *ad hoc* and in response to particular situations (Wikander 2000d, 651). The general Greek approach to water law can be discerned from a collection of legal material (Bruun 2000a, 558). This body of literature provides insight into ancient legal thought and strategies for managing water resources, but it cannot be assumed to apply equally to all places in the Greek world.

In his *Laws*, for example, Plato enumerates some of the principles of Greek practice for water use and management, drawing on the *nomoi georgikoi* (agricultural laws) (Bruun 2000a, 557-558):

> Thus, regarding water-supplies also, there are excellent old laws laid down for farmers, which we, in our exposition, need not draw upon. Let this suffice: he that desires to bring water to his own land may do so, from public hydraulic resources (*ek ton koinon namaton*), but he must not undercut the exposed wells of any private person: he may lead it by whatever way he wishes, except through a house, temple, or tomb, and he must do no damage beyond the actual work of channeling. If, in any spot, the rain-water filters through owing to the natural dryness of the soil, and there is scarcity of necessary drinking water, then the owner shall dig his own ground down to the chalk subsoil, and if he fails to find water at this depth, he shall procure from his neighbors just so much as he requires for drinking purposes for all his household; and if his neighbors also are stinted in their supplies, he shall apply for a ration of water from the land stewards and fetch it by day, and so share the water with his neighbors. And if, when rain comes, any dweller on lower ground damages the farmer above him, or the adjoining dweller, by preventing its outflow – or if, conversely, the man on higher ground damages the man below by letting out the floods carelessly – and if, in consequence, they refuse to accommodate one another in this matter, any person who wishes shall call in the city-steward (*astynomon*), if it is in the city, or a land-steward (*tois agronomois*), if in the country, and get an order as to what each party is to do; and the man who does not abide by the order shall be liable to be charged with envy and forwardness, and if convicted he shall pay to the injured party double the damage for refusing to obey the magistrate [Plato *Laws* 845e, trans. by Bury 1961, Vol. 2, 175-11, slightly revised by Bruun 2000a, 558).

These laws outlined by Plato primarily address issues related to water use in the country, though he touches briefly on neighborly behavior in the city. The Greeks considered public water resources to encompass rivers and lakes, and publicly constructed dams, canals and cisterns; Plato states that a farmer needing water for irrigation had the right to draw from any public resources (Bruun 2000a, 559). Although private water ownership did exist among the Greeks (in connection with land ownership), certain legal structures were in place to mitigate against the uneven distribution of water resources across the landscape. As mentioned by Plato, the owner of a functioning well was required to share the water if his neighbors had none. Indeed, as Bruun (2000a, 563) suggests, a fundamental principle of Greek law was to ensure that no one should be deprived of water. This principle of water sharing was established as early as the sixth century BCE in Athens by Solon, as recorded by Plutarch:

> Since the country is not adequately provided with water either by everflowing rivers or by lakes or by copious springs, but most people used artificial wells, he [Solon] made a law that, where there was a public well within horse distance, four stades [over 600 m], people must use it. Where it was farther off, they must try to get a private water supply. But if after digging a depth of ten *orguiai* [c. 18.5m] on their own land they did not find any water, then they were to take it from their neighbor, filling a six-khous jar [c. 20 liters] twice a day [*Sol*. 23.6, trans. Bruun 2000b, 563].

As was the case in the country, cities in the Greek world also offered public water to their inhabitants. Water from public sources was free; however there are recorded cases of water being stolen (Bruun 2000a, 654),[19] so there must have been certain restrictions on access. If a Greek city had no extra-urban aqueduct (which was more often the case than not), the city depended on natural sources of water, such as rivers, private wells and rainfall (which was captured in both public and private cisterns). As discussed above, the *Astynomoi* inscription from Pergamon, originally dated to the second century BCE, attests to the importance of maintaining urban cisterns (Saba 2009).

Both laws relating to the use of fountains and the perspectives expressed by ancient authors suggests that there was a recognition of a direct connection between the purity of water and health (Glaser 2000a, 436), and therefore the quality of the urban water supply was safeguarded against pollution or contamination by a number of rules and statutes (Bruun 2000a, 566-567). Water management infrastructure in the countryside was protected against encroaching buildings and vegetation by the restriction of any activity within a certain distance from the conduit. Public wells were maintained by the prohibition to wash anything, or to throw anything, in them.

Greek cities were generally more liberal in granting access to water than their Roman counterparts. Most sources of water were considered to be publicly available both for agriculture and urban life, and fewer legal conventions existed for the private ownership of water resources.

[19] Bruun (2000a, 564) highlights the fact that people were sometimes dissatisfied with the amount of public water at their disposal, because Plutarch (*Them*. 31.1) tells of Athenians being fined for stealing from the public water supply.

Roman Water Law

Romans developed a comprehensive (and complex, and sometimes contradictory) body of legislation for dealing with water, parts of which were collected in late Antiquity in the Law Codes of Theodosius II and Justinian (Wikander 2000d, 651). Much of the surviving information about Roman water law comes from Frontinus, the *curator aquarum* in Rome under the emperor Trajan, and from legal thinkers in Rome itself (Bennett 1997). Therefore, when considering legal practices related to water and water management in the provinces, the question remains as to what degree such thinking applied to places other than the *urbs*. When dealing with Roman water legislation in the provinces, one must be careful not to assume that legal arrangements would have operated on a local provincial level in exactly the same manner as in Rome itself.

The Romans were generally less generous than the Greeks concerning public access to water resources. The Romans did offer water that was publicly accessible to everyone, but it was normally only under certain conditions. Public water included the sea, some (large) lakes, and most rivers. Water that was conveyed by means of aqueducts or canals was not public, but rather belonged to the person(s) or the authority that had built the infrastructure, regardless of whether the water source was public or private (Bruun 2000b, 578). However, if a river were navigable, gathering water from it was restricted, presumably so as not to infringe on the transport of goods. Despite the declaration of sources of water as public, drawing water in the countryside frequently required permission from the authorities – sometimes when the source was natural but public (e.g. a river or lake as opposed to a cistern or well), and always when it was channeled through a public conduit (Bruun 2000b, 585).

Roman laws regarding private property allowed water to be held privately (usually as part of landholdings) and, like private property, rights to such bodies of water could be bought and sold (Bruun 2000b, 577). Some of the smaller or seasonal rivers could be held in private possession, and most springs were also privately held, usually as part of the land on which they were located.

This privately held water could not be used by others without permission from the proprietor or by the authority in whose power it was to grant access. Following from this, the Roman legal concept of servitude (*servitus*) gave the right to extraneous parties to draw water from private sources (Bannon 2009; Bruun 2000b, 576-577). A servitude "consisted in a right of a person, other than the owner… to make a certain use of another's land" (Bruun 2000b, 582). Already in the *Twelve Tables*, Rome's first law code, the cultivation of land was central to the concept of servitudes (Bannon 2009, 237). This legal concept provided a limitation on private ownership and served as a vehicle for water resources to be shared. The concept of a servitude offered an alternative to a purely social system of managing local water supply and provided neighbors with a means to articulate their relationships with respect to available water resources (Bannon 2009, 236).

Legal arrangements for managing water in the Roman imperial period reflect a clear understanding of its economic importance. For example, Frontinus (*Aq*. 9.4-5; see also Bannon 2009, 80-84) identifies various strategies for mediating competition for water resources. He describes one case in which water from a public stream in Tusculum, the Crabra, was allotted to the villas along its course at different times of day and in specified amounts. A fee was imposed for the use of this water which, Bannon (2009, 81) notes, indicates that monetary calculations in establishing a price for water show that it could be considered in financial terms. In Rome, private use of surplus water from the city aqueducts was also subject to a fee or tax which, according to Frontinus (*Aq*. 94.2-4), was an old practice from a time when there were no private grants, and overflow water was available only for commercial use in baths and laundries (Bannon 2009, 82). As Bannon suggests, the city probably expected to earn revenue from the fee, indicating that businesses were willing and able to pay, probably either because the cost was offset by profit, the fee being less costly than other alternatives, or there were no other good alternatives.

Although the Romans had many more legal structures in place for land and water to be held in private possession, they also clearly demonstrated that there were instances in which public demand for water (e.g., the construction of water conduits and sewers) justified restrictions in private rights of possession and, in extreme cases, expropriation (Bruun 2000b, 581-585, 595-604; Wikander 2000d, 651). Moreover, water supply was normally a public matter in Roman towns and cities. Aqueducts always, at least principally, fed public fountains and other public buildings where water was accessible to the population. The majority of information about these arrangements comes from the city of Rome itself, but the situation of other urban centers in the Roman world seems to have been similar.[20] From public fountains, the urban population had to use portable vessels for collecting water and therefore no great quantities of water could be gathered. Those urban residents who did not receive water piped directly into their homes either depended on private cisterns, had to gather sufficient water for their daily needs from public water sources such as fountains and wells, or employed a combination of such methods.

Secondary conduits branching off the main line would have supplied water for manufacturing and industrial activities (e.g., fulleries, commercial baths; see Frontinus *De Aq.* 2.94 and Chapter 4) and elite residences. However, an official water grant was needed for individuals who wanted a private conduit, or, after Augustus, an act of grace (*beneficium*) by the emperor (Bruun 2000b, 586-587). In smaller urban centers permission was normally granted by local authorities and not by the emperor or by imperial officials (Bruun 2000b, 590). At least for the city of Rome, jurists considered the pipes that supplied a private house and its cistern (*castellum*) as inseparable from the house itself and, thus, the water supply and house could not be sold separately (Bruun 2000b, 588). Moreover, the right to a private conduit in Rome could not be inherited, bought or sold, though it seems the situation in the countryside was different (Bruun 2000b, 589). According to Frontinus, a fee (*merces*) was paid for private water rights in Rome, which Bruun (2000b, 589) supposes was primarily paid by industrial establishments. The question of whether or not craft

[20] There is very little written information on the distribution schemes of Roman towns (Bruun 2000b, 591), and increasing attention to archaeological data for urban water distribution systems in cities across the *provincia romana* will shed additional light on the particularities of such organizations (e.g., Beltrán Lloris 2006).

production and industrial establishments had access to water from the urban piped-water network for the city of Hierapolis and across the Mediterranean will be addressed in more detail in Chapter 4.

Summary and Conclusion

This chapter has addressed water from a variety of perspectives: geology, water in language, technological developments, financing, and legal considerations. Each of these sections provides a critical perspective on understanding water in ancient society and, taken together, form the foundation on which a close analysis of uses and meanings of water in urban life must necessarily rest.

The geological and hydrological basis of water in Asia Minor was considered, and the presence of karstic geology in Asia Minor has been proven to be important for its settlement history and in the development of water management technologies.

Tracing the development of water management technologies in Asia Minor revealed that, for millennia, people generally relied on similar water infrastructure. The development of the long-distance aqueduct in Rome, in combination with the political stability of the Roman Empire, allowed for the construction of extra-urban pipelines in most cities of Asia Minor. Financing from the Roman emperor or other imperial officials and local elites also aided in the diffusion of such cost-intensive infrastructural projects.

Examination of water in literature and epigraphy demonstrates that, in both Latin and Greek, vocabulary used to denote natural water sources and those that are architecturally mediated were often the same terms. The relative paucity of water-related words in Greek gave way to an explosion of water terminology in Latin. I have suggested that this may be connected to imperial activity in the exposure to diverse geographies and the desire to solve engineering problems, as well as the development of a diverse array of architectural types for water use, management and display.

Finally, consideration of the legal arrangements relating to water in both the Greek and Roman world provides insight into how water policy was established. In the Greek world, access to water was considered to be a public good and there were certain stipulations in place to ensure that everyone had fair access to this resource. The Roman legal arrangement was less egalitarian, with provisions for water held as private property and bought and sold. Although water in Roman cities was more abundantly available than in Greek cities and was considered to be a public good, the circumstances under which water was available were much more restricted.

Some general patterns have emerged from this analysis, which are important to highlight as they have implications for the understanding of the following case studies. Generally, there was an increase both in the architectural modes of water distribution and in the vocabulary used to refer to water sources the Roman imperial period – increases that were probably concurrent developments. As I have argued, this phenomenon may be attributed in part, to the dissemination of ideas and expertise that accompanied Roman imperial expansion. The spread of long-distance pressure-pipelines throughout Asia Minor provided the necessary water with which to experiment with new architectural forms in elaborate terminal fountains and lavish bathing establishments. Increases in architectural modes for water distribution and display concomitantly demanded a broader vocabulary with which to refer to these edifices for hydraulic display. The augmentation of water supply to urban centers in the Roman provinces, both through the provision of new aqueduct lines and the construction of civic access points, in many cases, was made possible by means of financial support from emperor, imperial administrators, and local civic elites. In addition, with the expansion in the amount of water flowing into cities, legal strategies for dealing with increased water supply were also developed in the Roman imperial period.

All of this evidence points to an increasing engagement with water, its sources, and possible architectural arrangements for its storage and display from the Hellenistic to the Roman imperial period. The nuances of these engagements – in the civic sphere, in craft and manufacturing activities, and in sacred space – will be the subject of the following three chapters.

CHAPTER 2

FIGURES

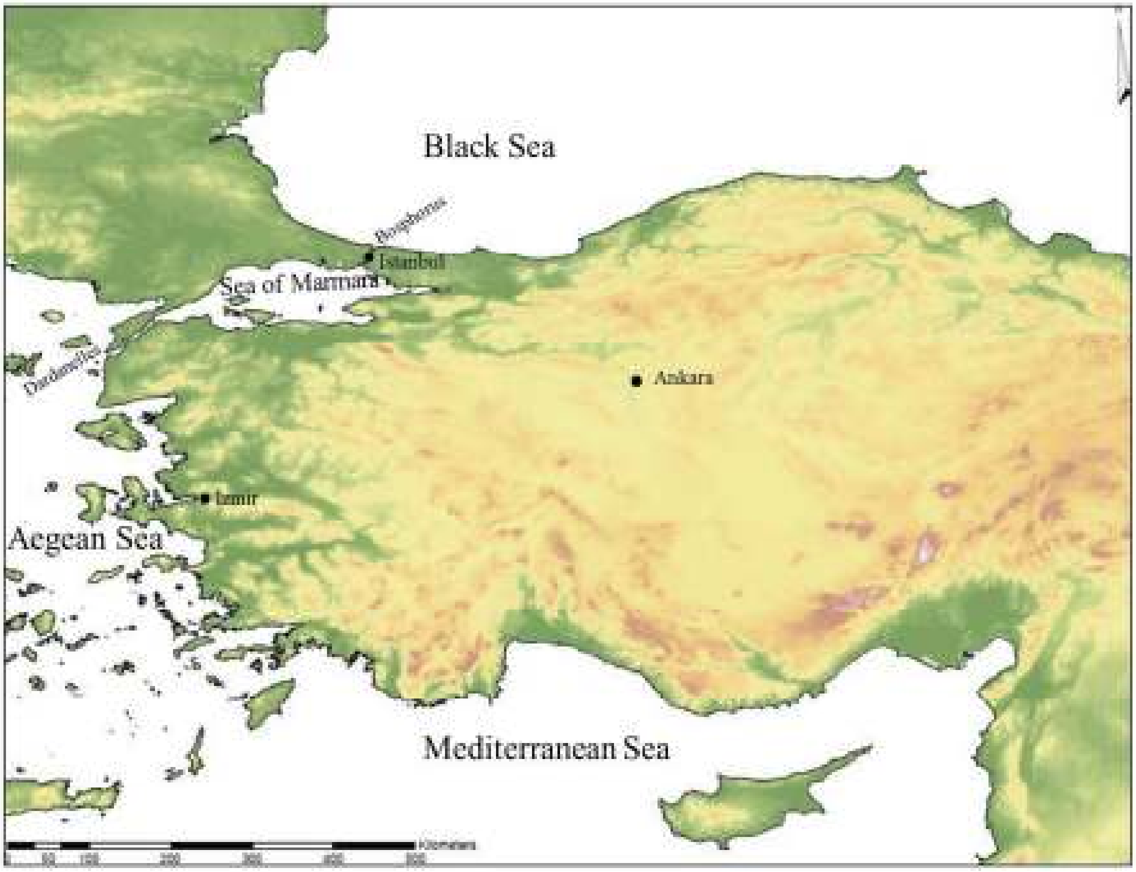

Fig. 2.1 Map of Turkey with major surrounding bodies of water

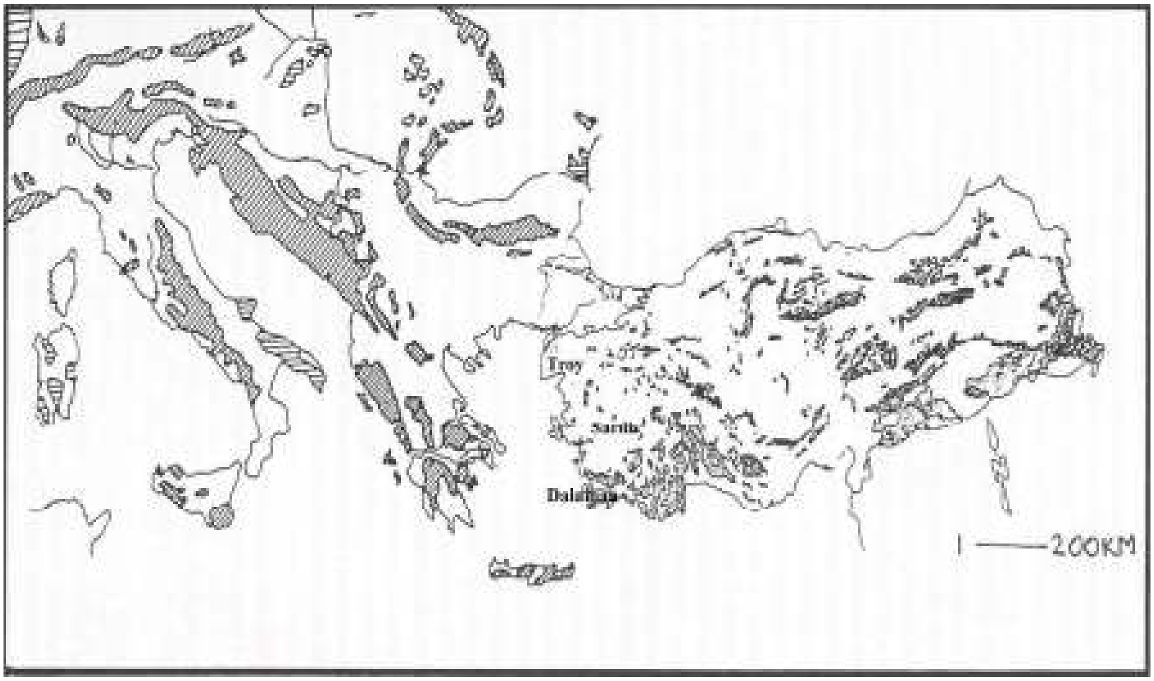

Fig. 2.2 Map of Karst in Italy, Greece and Turkey (after Crouch 1993, Fig. 7.1)

Fig. 2.3 Natural pools and travertines at Hierapolis (Pamukkale) (author photo)

Fig. 2.4 The cave at Kaklık Mağarasi (near Pamukkale). A clear expression of karstic geology, this cave was formed by the chemical action and dissolution (and precipitation) of carbonate rocks (author photo).

Fig. 2.5 Drainage canal (collapsed) running under the street at Pergamon (author photo)

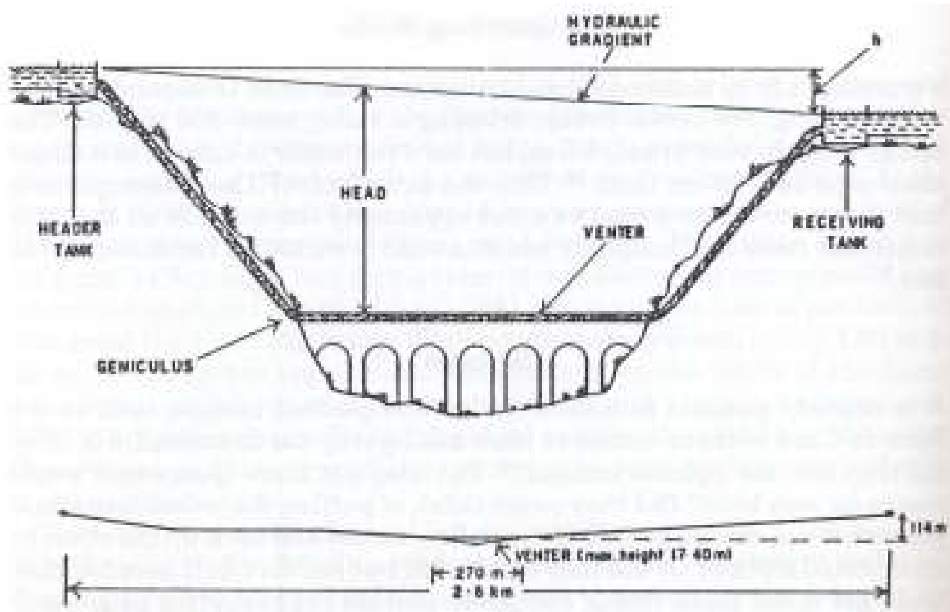

Fig. 2.6 Schematic of a typical inverted siphon (h = loss of head) (after Hodge 1992, Fig. 102)

Fig. 2.7 *Hydreion* of Aurelia Paulina at Perge (Severan 193-211 CE) (author photo)

CHAPTER 3

WATER IN THE CIVIC SPHERE: THE POLITICS OF MUNIFICIENCE AND THE USES AND MEANINGS OF WATER AT EPHESOS

Water, the most basic human necessity, in Roman Ephesos was transformed into a clear expression of the city's prosperity and power and also served as a means to underscore the wealth, generosity, and civic status of the individuals who supplied it. This chapter traces the development of Ephesos' water management infrastructure in an investigation of the possible motivations for the choice to bring water into the city (through the construction of an aqueduct pipeline) and to develop water-related infrastructure, while also interrogating the spatial, architectural, and iconographic aspects of these donations. In her article "Water Luxury in Roman Times: Simply a Matter of Excellent Planning and Engineering or of Politics and Philanthropy," Susanna Piras (2000) suggests that there is an inherent dichotomy between technological capability and political motivation in the impulse to increase water in Roman cities. In contrast, I argue that the choice to bestow water to the city and to provide elaborate fountains to distribute it was influenced both by imperial politics *and* by artistic and technological developments derived from Rome. Certainly, the monumental hydraulic displays that became the hallmark of Roman imperial cities would not have been possible without the technological advances and political stability provided by *pax romana* (Coulton 1987, Mitchell 1995), and the donation of hydraulic infrastructure was often directly connected to events in Rome. However, previous studies have tended to focus too intently on the influence of Rome in these developments, failing to consider the local meanings and contexts in which these developments were played out (e.g., Longfellow 2011; Sherwood 2000). The use of water as a political expression and an articulation of civic benefaction in Ephesos simultaneously drew on a long tradition of providing water for civic well-being and invoked local artistic traditions and meanings, and thus was not a singular expression of *romanitas*. Water, with its many valences, was a potent symbol that expressed associations with imperial Rome while simultaneously conjured Ephesian civic mythology and mythological topography. The following analysis of the civic uses and meanings of water in Ephesos necessarily investigates these issues as they specifically pertain to this city; however, the questions and methodology are broadly applicable to all cities in the Roman provinces.

Ephesos was a city whose successes and fortunes were largely interdependent with those of the Roman Empire. With the transfer of the Attalid territories to Rome in 133 BCE, Ephesos nominally gained back its freedom while living under the aegis of Rome. Along with many other cities in Asia Minor, Ephesos found itself embroiled in the wars between Mithridates VI of Pontus and Rome in the Mithridatic Wars of the first century BCE. The Ephesians did not initially choose the winning side in a series of conflicts in the first century BCE. At first, the city took the side of Mithridates VI against Rome, and in 88 BCE the Ephesians carried out a massacre of the Roman residents, some of whom had sought asylum in the Artemision. This offense against Rome was punished by Sulla in 84 BCE when he imposed harsh punitive measures against the city. Ephesos again aligned itself with the losing side when the city sheltered the assassins of Caesar and then Cleopatra and Marc Antony, who they welcomed as the new Dionysos (McGing 1986; Ng 2007, 188). Ultimately having chosen to align itself with Rome, Ephesos was rewarded for its allegiance when Rome emerged victorious from the conflict as the uncontested power in the region.

Two major events during the early principate changed the urban landscape of Ephesos, and indeed, the hydroscape within it. ‘Hydroscape’ is a term taken primarily from environmental studies and marine biology and connected to the terms ‘landscape,’ ‘cityscape’ and all other ‘-scapes,’ implying a connection among the places where water was available in the city and between this water infrastructure and the urban environment more broadly. The first major event to have an impact on the Ephesian cityscape was in 29 BCE when Augustus declared the city 'capital of Asia,' replacing Pergamon as the principal city in the province.[1] The establishment of Ephesos as the capital of the province of Asia simultaneously indicated its status as a nominally free city and as a part of Rome and its new world order (Scherrer 1995b, 5).[2] The second principle event that changed Ephesos' position within the Roman world, and concomitantly its urban landscape, was after Domitian awarded the city its first *neokoros* status (Imperial cult warden) in the year 88/89 CE. A boom in building activity followed each of these events. In particular, civic benefactors chose to outfit the city with water management infrastructure and monumental fountains to distribute the newly abundant water being brought into the city.

The activities of the emperor and Roman officials were significant in shaping the Ephesian cityscape in the Augustan period. Under the Julio-Claudian emperors, the majority of construction was either the result of a grant by the emperor or one of his officials, including imperial freedmen or was sponsored by the city itself (White 1995, 54). In contrast, Hadrian and the early Antonine emperors continued a widespread practice, begun under Trajan, of promoting local Greek and Asian elites into public office and eventually into the Senate. This can be seen at Ephesos from the Flavian emperors through the Antonines, where the building projects were primarily sponsored by local benefactors and imperial administrators, whether citizens or noncitizens of Ephesos; their gifts significantly outnumbered imperial grants (White 1995, 56).

The hydroscape of Ephesos was not a unified program conceived and carried out at one time, but rather was developed piecemeal over the centuries. In this chapter, I explore the chronological

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[1] Most of the city seems to have been destroyed by an earthquake in 23 CE and, as a result, the Tetragonos Agora (Fig. 3.1, no. 61) had to be rebuilt from the foundations up and at least parts of the administrative district and probably also the theater (Fig. 3.1, no. 75) and stadium (Fig. 3.1, no. 104) had to be repaired (Scherrer 1996, 7-10; Scherrer 2001, 73). Thus it was probably a combination of geopolitical and tectonic events that led to the total rebuilding of several areas of the city.

[2] The only potential rival to Ephesos in its supply and display of water was Pergamon. Pergamon's water management and delivery system was well-developed by the time that the city was usurped by Ephesos as the capital of the Roman province of Asia in 29 BCE. In the first century BCE Pergamon was supplied by five long-distance aqueducts, but its water infrastructure development fell behind Ephesos in the centuries following its eclipse.

development of Ephesos' water management infrastructure and delivery system to examine how the choice to bestow water through aqueducts and elaborate fountains was simultaneously influenced by geopolitical events, imperial politics, and artistic and technological developments in Rome, and yet was also deeply connected to local artistic and architectural customs and to Ephesian foundation myths and Ephesian mythological topography. The development of Ephesos' hydroscape was intimately connected to the broader geopolitical situation; as will be discussed in detail below, increases to the water supply and distribution system were often directly linked to significant events and were bestowed by politically powerful and influential individuals. Beginning in the Augustan period, patrons of Ephesos – both native Ephesians and members of the Roman governing class – developed a significant network of aqueducts and fountains that delivered an abundance of water to the city. The construction of water management infrastructure and hydraulic displays was impelled as much by political competition as a genuine need for an increase in water supply, and thus articulates the relationship between water and power, and materializes the agreements between benefactor and urban constituents.

Many of the most prolific donors to Ephesos adorned the city with numerous monuments, and a few notable individuals created coherent programs of water-related gifts to the city. The number of monumental fountains from which water was available (seven fountains by the early second century CE) was significantly larger than that of other cities in Asia Minor. This phenomenon was probably due, at least in part, to the fact that Ephesus boasted a larger population than many of its contemporaries, with its elite on the whole wealthier and better connected to the Imperial house that those of other cities. A close examination of the donors themselves, their lives and careers, in combination with the choices made for the type of monument, its urban context, and architectural and decorative elements, reveals insights into the culture of civic benefaction and, in particular, the meanings and associations engendered by these hydraulic monuments as they connected to the broader urban landscape and to the social political culture and context. In particular, such an examination has revealed a trend within the Ephesian cityscape where an implied connection was made between the benefaction of water and the arrangement of fountains that recalled the mythological founder of the city. This connection was echoed in a number of ways through the provision of water and architectural choice. However, once part of the urban landscape, these monuments became more than an expression of the motivations and intentions of their donors. As individual buildings, they were received and perceived by the diverse population of Ephesos. As components of the urban landscape, the collection of these monuments comprised Ephesos' public hydroscape, and a dialogue was created among these edifices that spanned time and space.

What was the motivation to provide water to the city instead of some other type of benefaction? In the period between the first century BCE and the third century CE, Ephesos received six aqueduct pipe-lines and seven monumental outlets from which water flowed (e.g., nymphaea and fountains).[3] This does not include other places at which water was available, such as bathing establishments and latrines, which I do not include in this analysis both because of their ubiquity in Roman cities and because these establishments involve a whole host of cultural mores and practices, the exploration of which is not the aim of this chapter. Generally, fountains, baths and latrines were the places where the average person in an ancient city would have had access to publically-available water. William MacDonald (1986, 99-103) suggests that public fountains should be considered functionally similar to exedras and porticoed courtyards, because as way stations they all acted as "urban caesuras," made for pausing and resting. However, the water that public fountains provided carried different ideological significance than other components of the urban armature. Likewise, the donation, construction and use of baths most

[3] Archaeological investigation at Ephesos has concentrated on the monumental civic center, which therefore cannot preclude the possibility that there were smaller, more utilitarian fountains added to the Ephesian cityscape that have yet to come to light. This number of installations cited above also does not include baths or latrines or the fountains already constructed by the first century BCE: the Fountain House by the Theater, the Fountain House in front of Terrace House 2, the so-called Nymphaeum (Hexagon) (date contested), and the Heroon and Fountain of Ktistes Androklos. These earlier fountains will be discussed in various levels of detail below. This figure also does not include rededications of pre-existing water installations. The issue of rededication or renovation is also taken up as part of the discussion of individual monuments, where applicable.

certainly is implicated within the category of the political and civic uses of water, but is a subject complex enough on its own that it should be treated separately – as, for example, in Fikret Yegül's monograph *Baths and Bathing in Classical Antiquity* (1992) which is a survey of bathing establishments, or Garrett Fagan's *Bathing in Public in the Roman World* (1999) which examines public bathing as a social phenomenon that was explicitly connected to imperial and civic benefaction..[4] In contrast, while visits to fountains were certainly a culturally-mediated activity, the act of gathering water at public fountains demanded a different type of engagement than did latrines and baths. Therefore, it is possible to investigate the notable features in civic hydraulic monuments and infrastructure such as the availability and quality of the water itself and the architectural and iconographic packaging of the monument.

The issues explored within this chapter are specific to the city of Ephesos in their particularities, but this approach can be readily applied to other cities in the Roman provinces. Within Ephesos' cityscape, the provision of water and the construction of monumental distribution points were intimately connected to politics and power, and transformed water into a polyvalent symbol, a signifier of Ephesos' mythological and sacred topography, wealth and power, and *romanitas*.

A Few Words on Euergetism

The provision of water to the cities of the Greek east during the Hellenistic and Roman period was primarily accomplished by means of gifts from the elite, in other words, by means of euergetism. The phenomenon was dubbed 'euergetism' by modern ancient historians after the Greek honorific title *euergetes* (benefactor) that was often a title bestowed on publicly generous members of the civic elite (Zuiderhoek 2009, 4).

[4] For scholarship on latrines in Pompeii, see especially Hobson (2009) and Koloski-Ostrow (1996); for latrines in the east, see Kamash (2010, 129-155).

Through the analysis of epigraphic material from cities of Asia Minor, Arjan Zuiderhoek, in *The Politics of Munificence in the Roman Empire* (2009) has made some broad, yet convincing, claims about how and why euergetism functioned in Roman Asia Minor.[5] He suggests that, in the Greek cities of the Roman east, the institution of euergetism provided the oligarchic political system with two critical requirements for its legitimation: namely, the justification of the distribution of power, and the public expression of consent with the system by politically free subordinates (2009, 150). An unprecedented accumulation of wealth in the hands of a few members of the elite families produced a system where the wealthy provided gifts and amenities in exchange for power and honors. This exchange of gifts for honors between the ruling elite and non-elite citizenry generated an "elaborate discourse of praise, centered on the notion of elite moral excellence, which was rooted deeply in ancient Greek ideas of good and just behavior of the rich man towards his community" (Zuiderhoek 2009, 151). Conversely, this arrangement provided the non-elite with a rhetoric with which praise for the generosity of the elite could be expressed, a discourse that emphasized the fitness of the rich to rule.

Zuiderhoek (2009, 151-153) suggests that this system, particularly prolific in the first centuries of the Common Era, functioned because of three fundamental reasons, all of which will be borne out in the case studies discussed in this chapter. The first is that, because of high and unpredictable mortality, a degree of social mobility was required to be able to maintain sufficient numbers of the wealthy ruling class. The result was that, in order to justify their social position, elite individuals and families emphasized the rightfulness and naturalness of their position, which they articulated in a discourse of moral elite superiority. The second, also linked to high mortality, was the claim of social continuity in power, which was most often expressed in

[5] Zuiderhoek's study is not a thorough, empirical survey of the institution of euergetism, but rather puts forward a loose model for analyzing the increase in public giving in provincial urban society during the early and high Roman Empire using Roman Asia Minor as a test case (2009, 2). For other scholarship on euergetism, see, for example, Lomas and Cornell (2003), Ma (1999, 182-193), and Newby (2005).

inscriptions in the form of ancestor clauses that list the offices held and benefactions made by the ancestors of the honorand. Zuiderhoek argues that this expression of continuity contributed to the legitimation of political power held by elite families, since it was generally believed that descent from a family of office holders was itself an important qualification for holding office. Finally, Zuiderhoek suggests that the reason the urban elite's claim to rule was considered, and continually affirmed, to be legitimate by the urban non-elite citizenry was based primarily in the social, economic, and political relations between the urban landowning elite and the urban and rural lower classes. The urban elite generally derived the majority of their income from their landholdings, resulting in a relation of direct economic exploitation of the rural lower classes. However, the absence of exploitative relations between urban elite and urban non-elite provided the elite members with "ample scope to use the medium of euergetism to present a benign image of themselves as the natural leaders, saviors and benefactors of the community" (2009, 135). The provision of water was not only incredibly cost-intensive, necessarily implying the wealth of the individuals who provided it, but it was also a particularly potent symbol for communicating a concern with civic well-being.

Not considered by Zuiderhoek to be a primary driving force in civic benefaction, but almost certainly both influenced by Greek models and serving as a significant stimulus in their perpetuation, were the activities and gifts of the Roman emperor and the Roman imperial house (cf. Longfellow 2011, 5-8). While especially true for a city such as Ephesos, which was singled out as a significant player on the imperial stage, evidence from a number of urban centers throughout the Roman Empire suggests that many elites sought to fashion themselves on the model of the Roman emperor. Despite the fact that the Roman emperor was the "supreme patron," very infrequently did the emperor himself sponsor building projects in cities other than Rome (Longfellow 2011, 12; Mitchell 1987). The imperial model of civic benefaction served as a prototype for the emulation of local elites, while simultaneously, it created a need for local and elites and administrative officials to fill this role in individual cities across the empire.

While there were undoubtedly any number of motivating forces that impelled the system of euergetism, and equally many motivations that compelled individuals to donate (a part of) their wealth to the benefit of a city, the impact of this arrangement for cities of the Roman Empire is significant. It is within this system of public benefaction that the majority of aqueducts and fountains were brought into Greco-Roman cities, and into Ephesos.

Development of Water as Civic Benefaction and within Aesthetic Display in the Mediterranean

In order to put the development of Ephesos' water management infrastructure in context, it is first necessary to trace the use of water as a means of civic benefaction and the development of monumental fountain architecture for the Mediterranean world in general. Beginning as early as the seventh and sixth centuries BCE, a tradition was firmly established in the Greco-Roman world whereby individuals and civic leaders provided water to cities for public benefit. Greek tyrants such as the Bacchiad (eighth century BCE) and Kypselid (seventh century BCE) rulers in Corinth, and the Peisistratids in Athens (545 – 527 BCE), constructed public fountains to convey a sense of concern for public welfare and to solidify public support (Longfellow 2005; 2011; Pomeroy *et al*. 1999; Robinson 2001);[6] the most famous of these were the Peirene Fountain in Corinth and the Enneakrounos in Athens. Both of these early fountains were erected over natural springs and primarily functioned to keep the water protected from pollution. Although nothing of the Enneakrounos survives, Thucydides reports that the nine-spouted fountain house was fed by the Kallirhoe Spring and was constructed outside the walls of Athens (*Thuc*. 2.15.5; Longfellow 2005; 2011).[7] The Peirene Fountain was built over the Peirene Spring and took advantage of the

[6] Tyrants from Megara and Samos also supplied their cities with water in the second half of the sixth century BCE (Glaser 2000a).

[7] The Peisistratids probably also constructed the Southeast Fountain House which was supplied by a terracotta pipeline, thus allowing it to be more conveniently located in the Classical Agora (Longfellow 2011, 214, n.2).

natural grotto so that it was partially natural and part constructed. Although this fountain was remodeled several times in antiquity, its first iteration was largely utilitarian in form (Robinson 2001). The main benefit provided through the construction of these fountain houses was to keep the water sources free of pollution. The tyrants did not supply the water itself, nor did they take this opportunity to embellish these water sources with architectural or sculptural elaboration.

After the appearance of these early models of civic fountains, Greek city-states began to regularly incorporate fountains into their building programs. These early Greek fountains generally conformed to a similar architectural form. By the middle of the fourth century BCE, the Greek civic fountain was typically constructed over a natural source of water or was fed by a short pipeline. For these early hydraulic displays, water sources in the vicinity of settlement were tapped; there were very few long-distance water lines (Crouch 1993). Typically, these fountains were formed by a roofed basin fronted by a porch with a columnar façade – the so-called "Fountain in Hall-Form" (Dorl-Klingenschmid 2001, 28-30; Glaser 1983; Longfellow 2011, 11).[8] The decorative potential of water was not explored in this utilitarian fountain type, but rather water simply flowed into the basin and was often hidden from view.

In addition to the development of the civic fountain, the acknowledgement of the display potential of water and its use as a decorative element was also a major innovation of the Hellenistic east. Early hydraulic displays used water primarily as a landscaping element to provide a particular setting for sculpture and to heighten the drama of sculptural scenes (Longfellow 2005, 23; Longfellow 2011, 12). The earliest known sculptural decoration associated with a fountain is a mid-seventh century BCE lion from Olympia (Glaser 2000a, 432). A fountain at the entrance to the Asklepieios temple in Epidauros probably also incorporated statuary into the fountain display; however only the statue base, which was fitted with a water pipe and a pair of

[8] Examples of Greek civic fountains in Hall Form in Asia Minor are the Hellenistic fountain house at Sagalassos (Dorl-Klingenschmid 2001, Kat.-Nr. 97), the Fountain House at Labranda (Dorl-Klingenschmid 2001, Kat.-Nr. 53), and the Fountain House outside of the city of Ariassos (Dorl-Klingenschmid 2001, Kat.-Nr. 10).

feet, have been preserved (Glaser 2000a, 433). Associated with the healing properties of water, a temple to Asklepios was an appropriate location for experimentation with the incorporation of water and fountain statuary. Generally, during the Classical and Hellenistic periods fountain statuary was primarily limited to nymphs, Aphrodite, Dionysos, members of their entourages, and other figures associated with the sacred nature of water (Kapossy 1969; Longfellow 2011).

The mechanical ability of water was also explored in Hellenistic Alexandria (Lewis 2000a; 2000b). Although water was thus first utilized aesthetically in the east, it was always on a modest scale. The true capability of water's kinetic and aural properties to enhance aesthetic displays was more fully developed in the context of late Republican domestic fountain architecture in Italy. The earliest known fountains on the Italian peninsula had architectural forms derived from Greek precedents, but they also incorporated elements that conveyed the display potential of water (Longfellow 2011, 13). By the end of the first century BCE the country villas of wealthy Italians were outfitted with fountains, baths, pools, and fishponds (Longfellow 2011, 15). Experimentation with the artistic capabilities of water first occurred in Italian fountain architecture, where water was incorporated into axial displays with niches used as a framing device (Ginouvès 1962, 140-42).

In the public sphere, monumental artistic water displays began to appear in urban spaces, in addition to their initial and more common uses in sanctuaries, baths, and residences in Republican Italy. In contrast to the lavish water displays of Italian villas, late Republican public fountains generally lacked architectural and decorative elaboration. A few notable exceptions to this are a fountain on the Via Appia, just outside of the city of Formia, and a fountain in the Porticus of Pompey, the first public garden in Rome (Longfellow 2011, 16). Although not on a monumental scale, Hartnett (2008) argues that public fountains were used as a medium to express civic identity in Roman-period Herculaneum. Rome already had an extensive system for piped water supply by the Augustan period, which was significantly increased under Agrippa (Pliny *HN* 36.24.121), providing the technology for the combination of this basic provision with elaborate aesthetic displays. In other words, the city of Rome already had the infrastructure in place to create monumental hydraulic displays using water under pressure.

There is less of an apparent causal relationship, however, between high-pressure water systems and the development of monumental hydraulic displays in the Greek east. Because of the *pax romana* and increasing civic benefaction on the part of the urban elite, cities in the east began to be outfitted with long-distance pressure water-lines, which put the infrastructure in place for hydraulic displays to incorporate water as a decorative element (Coulton 1987; Glaser 2000b; cf. Longfellow 2011).[9] However, the frequent dedication of long-distance aqueduct and monumental terminal point together, as part of a comprehensive program, suggests a mutually reinforcing relationship between a water-course and its very visible expression (e.g., monumental fountain) within the cityscape. This relationship between high-pressure water-lines and complex displays led to the increasing development of urban hydraulic networks that incorporated both long-distance aqueducts and terminal points with elaborate displays in cities across the Mediterranean.

By the second century CE the supply of water to cities, through aqueduct construction and the erection of monumental fountains, was a well-developed form of civic benefaction and elite competition throughout the Roman world (Longfellow 2005, 23; Ng 2007; Rogers 1991). Ephesos' hydroscape was developed through just such a means – by the donation of water supply lines and hyrdraulic termini by elite patrons who were both native Italians connected to Roman provincial administration and local Ephesian elites. Mutual spheres of influence between Rome and Ephesos blended to create a watered cityscape, appropriate for the capital of one of the wealthiest Roman provinces. Patrons of Ephesos drew on the well-established Greek tradition of providing water for the populace, first expressed in the fountains of Corinth and Athens, and

[9] To these two reasons for the expansion of long-distance aqueducts in Asia Minor, I would also tentatively suggest that Roman policies of land ownership and the development of legal practices with respect to allocating water resources allowed for large tracts of land to be purchased and/or for a person other than the landowner to make use of the land, putting in place the legal structures for these extensive overland constructions (see, especially Bannon 2009; Bruun 2000b).

combined it with Roman-inspired pressure hydraulic systems and fountain architecture that utilized water under pressure in its display. This combination, along with architectural innovation, sculptural display, and inscriptions, created a type of monument that was able to express a multiplicity of meanings, not least of which was the wealth and generosity of the donor, and his claims to be among the most honored civic benefactors.

Pre-Augustan Water Supply in Ephesos

Ephesus was a city surrounded by water. Immediately west of the city, the harbor fed into the wide expanse of the Mediterranean Sea. On the eastern side of the urban center the Selinos, Marnas, and Kaystros Rivers all flowed through a low valley around the city. Not only was Ephesos graced with an abundance of natural sources of water in its immediate vicinity, but over the course of several centuries its water management infrastructure and delivery system was developed into the largest and most lavish in Asia Minor.

Water was not only practical, but also sacred. Sacred water was integral to Ephesos' foundation myths. Strabo recorded that Androklos, son of King Kodros of Athens, was the leader of the colonists who eventually settled in the area that would become Ephesos (Strabo *Geog*. 14.1.3, 4, 21). The legend recorded by Athenaios (*Deipnosophist*. 7.62) reports that the colonists sought answers from the oracle about a good place to establish their settlement. The oracle's response was "Where a fish will show and a boar will lead." Later, while fishermen were preparing their meal near the Hypelaian spring, a fish and a piece of burning coal fell into dry brushwood, which began to burn. The fire caused a sleeping boar to flee from the brush and Androklos pursued it, eventually killing the boar at the spot where the Temple to Athena now stands and around which the colonists founded the city which would become Ephesos (Thür 1995a, 171). A Late Classical or Early Hellenistic prostyle temple located at what once was probably the outermost cape on the harbor was partly constructed over a deep rock-crevice that had been used as a sacred well since the Archaic period. Scherrer (2001, 66) suggests that this well may be identified as the Hypelaian Well where Androklos killed the boar (Strabo *Geog.* 14.1.4, 21), while Thür posits that the location of the Heroon of Androklos along the Embolos may have been considered to mark the location of the Hypelaian Spring. As I will show through the discussion below, the connection between the heroic founder of Ephesos, Androklos, and the significance of the Hypelaian spring was echoed in subsequent fountains within the Ephesian cityscape, creating a close association between civic hero and water.

Scholars have focused on the technological, architectural, and iconographic aspects of water installations such as aqueducts, fountains, and baths, due both to the long tradition of 'Bauforschung' (architectural analysis) and, probably in part, because these are the things that have survived in the archaeological record. What has not been addressed to the same extent is the water that these installations dispensed. It is both impossible and unnecessary to attempt to determine which was more important in these installations: the water or the architecture. Instead, if water and architecture are considered to have operated in tandem, each playing with and reinforcing the importance of the other, then the true significance of these installations may be further explored.

All of the monumental fountains in Ephesos were located along the city's principal "urban armature" (MacDonald 1986). Fountains dating primarily to the early stages of Ephesos' urban development in the Hellenistic period were located in the vicinity of the Tetragonos Agora (Fig. 3.1, no. 61), which was the commercial center of the city (Scherrer 2001, 66). The civic fountains constructed after the accession of Rome primarily clustered around the so-called State Agora (Fig. 3.1, no. 18), which was associated with civic activities and was the locus of the Imperial cult, and along the Embolos (also called "Curetes Street", Fig. 3.1, no. 36), the major thoroughfare connecting the State Agora to the Tetragonos Agora. Though a simple observation, this arrangement of fountains within the cityscape holds both practical and ideological significance. Practically, public fountains should be located in areas where there is a concentration of activity, providing ease of access to the fresh water. Moreover, siting a fountain in a heavily-trafficked area would produce maximum visibility of the monument to the benefit of the donor. It seems likely that fountains were located near the Tetragonos agora in the Hellenistic period because that was at the time the heart of the city. However, as will be discussed below, the Hellenistic fountains were also intimately connected to Ephesian mythological topography connected to this part of the city, thus making their placement in this location doubly meaningful.

New associations to Rome were created by the construction of the new civic center coupled with the Imperial cult in the State Agora. In fact, there was no developed urban district east of the Tetragonos Agora before the Roman Imperial period (Scherrer 2001, 68). With the busy commercial harbor and associated agoras located quite some distance away, it is unclear how much daily activity may have shifted to the State Agora. Indeed, the choice to construct such a concentration of fountains near the State Agora may have been, in part, to impel the civic non-elite *to go there* if they had no other compelling reason to do so. Equally, the individuals who dedicated fountains in the Roman imperial period all made claims to a Roman connection; the concentration of fountain buildings near the civic center and the Imperial cult buildings must also have been a factor in their siting. Therefore, the visibility of each monument was a result of its location in the city, and the meanings of these monuments were further enhanced by the dialogue created by the surrounding buildings (Fig. 3.2).

Hellenistic Fountain Houses

The earliest surviving fountains in Ephesos conformed to the common type of "Fountain in Hall form" found throughout the Mediterranean in the Classical and Hellenistic periods. Dated to the second or first century BCE, the Fountain House near the Theater (Fig. 3.1, no. 72) displays all of the characteristics typical of these earlier Greek civic fountains (Fig. 3.3). Rectangular and roofed, the fountain was constructed of unmortared ashlar masonry. It was closed on three sides and open to the west with two Ionic columns *in antis*. A parapet extended across the front of the structure, creating a water basin in the interior space, and a waterproof floor was established by rectangular limestone blocks as paving. Water flowed into the basin out of three lion's-head spouts along the back wall.[10] Only the central spout was directly connected to the water supply-line, with a secondary channel distributing the water to the other outlets (Dorl-Klingenschmid 2001, 179). The water delivery system has yet to be explored, but an inscription on a column from a second-century CE expansion of the fountain provides a hint about the source. Inscribed on the column are the words: ἐκ του Μάρνατος, from the Marnas River. If this inscription referred to the 'New Marnas' water line that was dedicated in the Flavian period, the inscription should also include the word 'kainos' (new). Moreover, when the New Marnas line was opened the Klaseas River was also tapped, and in general both rivers are mentioned in tandem in Ephesian inscriptions. Therefore, as Dorl-Klingenschmid (2001, 180) suggests, it is most likely that the inscription alludes to an independent imperial water-supply pipeline, which was probably maintained with the addition to the fountain, but was original to the Hellenistic fountain in its earliest phases.[11]

A second Hellenistic Fountain House, very similar to the one by the Theater, is located along the Embolos (Fig. 3.1, no. 35; Fig. 3.4). At the end of the Late Antique Alytarchos Stoa and below its street level lies the fountain, which in late antiquity was reused as Taverns 2 and 2a (Scherrer 1995a, 124). Akin to the Fountain House near the Theater, this water outlet was closed on three sides, its walls comprised of unmortared marble blocks. The basin lies at a depth 2.75 m below the level of the side walls, which led Thür to suggest that a roofed forecourt preceded the water basin itself (Thür 1999). Based on formal similarities with the Hellenistic fountain at

[10] In the Hellenistic period, the development of sculptural decoration on fountains further helped establish their function within urban contexts. Lion's-head spouts on the sima or on the back wall of the fountain were by far the most popular, although there were variations of this type such as satyr masks as on the Theater in Kos, deer heads on the Artemis Temple in Magnesia, and goat's-head water spouts on the sima of the Alexander Sarcophagus (Dorl-Klingenschmid 2001, 35).

[11] Dorl-Klingenschmid (2001, 180) suggests that if, in fact, this fountain was still supplied with spring water in the imperial period, it would have been particularly significant to the population of Ephesos, because this would have been the only place from which to draw fresh spring-water from within the city.

Sagalassos, Dorl-Klingenschmid (2001, 180) posits that two columns *in antis* would have articulated the front of the building. Remains of a lion's-head spout with small, round openings for the outflow of water are preserved along the back wall. Like the Hellenistic Fountain near the Theater, the basin was probably supplied by three water spouts.

As mentioned above, very few buildings dating to the Hellenistic period in Ephesos survive, but interestingly many of the surviving buildings are water-related structures. This may be due to their continued use, their ideological significance, or a combination thereof. The lower end of the Embolos, the main road leading from the Magnesian Gate, was lined with a group of Late Hellenistic to Augustan commemorative buildings, the majority of which were fountains (Scherrer 2001, 68; Thür 1995a, 157-199). Now standing in front of the Terrace Houses, these monuments must be imagined without these imposing domestic structures behind them. Hilke Thür suggests that the structure commonly known as the 'Fountain House' or 'Heroon' with reliefs of the Androklos myth in the pediment was built in the late second or early first century BCE and was a fountain from its earliest phases (Fig. 3.1, no. 48; Thür 1995a; 1995b). To the east of this structure was the octagonal tomb of the Egyptian princess Arsinoe IV, the younger sister of the famous Cleopatra, which was erected after her assassination in Ephesos in 41 BCE (Fig. 3.1, no. 47; Thür 1990, 43-56; Thür 1995a, 180-183). Yet further to the east are the remains of the so-called Nymphaeum (Hexagon) (Scherrer 2000, 122 no. 46). Steps to the street were constructed over an earlier hexagonal monument. To the south (and now abutted by the wall of Terrace House 2) are marble basins which drained into large pithoi which stand in small, vaulted and tiled chambers (Fig. 3.5).

These early public hydraulic outlets in Ephesos conformed to the dominant architectural *koine* shared by fountains on the Greek mainland and in Hellenistic Asia Minor. Participation in the shared common visual vocabulary in fountain construction at Ephesos tied this city to other Greek urban centers through a similar architectural vocabulary, outwardly expressing their inclusion in a shared 'Greek' identity. Unlike the monumental fountains with dynamic water displays that would succeed these early fountains, the architectural elaboration was the most striking visual element of these fountains. The water in these early fountain houses was hidden from view, but rather was signified by the common architectural type that expressed 'fountain'. In what follows, I closely examine a number of fountains within the Ephesian cityscape in order to unpack the local and 'Roman' associations with water and water management infrastructure employed within their architecture and design. Such an analysis provides an opportunity to investigate the Roman imperial influence and local traditions employed within Ephesos' hydroscape.

Heroon of Androklos

The pi-shaped Heroon of Androklos is located at the three-way intersection of the Embolos, the Marble Street and the Sacred Way (Fig. 3.1, no. 48; Fig. 3.6), near the Triodos gate dedicated by the freedmen Mazaeus and Mithridates, where civic processions departed the city *en route* to the legendary birthplace of Artemis and Apollo,[12] and thus literally sited at a metaphorical place between myth, sacred topography, and architecture. Placing this monument at this particular location within the cityscape may have been an intentional choice to capitalize on pre-existing meanings associated with Ephesian mythological topography and to situate it within a rich tapestry of civic events both sacred and mundane. In the following pages, I argue that the Heroon of Androklos established a type of honorific monument specific to Ephesos that incorporated water into its architectural and sculptural programs and set a precedent for subsequent honorific monuments within the cityscape of Ephesos.

[12] The Cycladic island of Delos was more widely held to be the birthplace of Artemis and her brother Apollo. Or, according to the *Homeric Hymn to Delian Apollo* (15), Apollo was born on Delos and Artemis was born in Ortygia, commonly believed to be located near Syracuse, Sicily. However, the Ephesians maintained that the twin gods were born in the groves outside their city walls, an opinion echoed by Strabo (*Geog*. 14.20): "On the same coast, slightly above the sea, is also Ortygia…where Leto is said to have bathed after the birth of her travail. For here is the mythical scene of the birth, and of the nurse Ortygia, and the holy place where the birth took place, and of the olive tree nearby, where the goddess is said first to have taken rest after she was relieved from her travail" (transl. H.L. Jones).

The heroon was first mentioned by Ernst Curtius in 1872 as a "city fountain" (1872, 35; Thür 1995a), and was first systematically excavated in 1904 by Heberdey (1905), who interpreted the structure as a tomb or heroon. Byzantine-period modifications to the structure, including a water basin comprised of panels with characteristically late antique cross-and-lozenge decoration, have led to the interpretation of the structure as a late antique fountain. However, Hilke Thür's (1995a, 1995b, 2006) careful reexamination of the archaeological material, in conjunction with analysis of textual sources describing burial places of city founders, has led to the convincing reinterpretation of the structure as a Heroon of Androklos, the mythological founder of Ephesos. Thür's analysis suggests that in its original phases, the structure was both a monument honoring a hero and a fountain.

The heroon is probably one of the oldest preserved monuments at Ephesos. In contrast to the mid- to late-first century BCE date proposed by Lauter (1978), Thür's analysis of the construction techniques and style strongly suggest a date in the second century BCE and a *terminus ante quem* of 80 BCE, established through excavation. On the basis of the fact that no Eastern Sigillata pottery, which began to appear in Ephesos around 80 BCE, was found beneath the 30 cm layer of water-resistant mortar under the floor flagstones, it is possible to conclude that the heroon was constructed before this time (Thür 1995a, 161). Now convincingly dated to sometime in the second century BCE, the construction of the Heroon of Androklos corresponds to the period of time when the Attalid kingdom bequeathed its vast territory to the growing Roman Empire, and Greek cities on the western coast of Asia Minor (nominally) gained back their freedom. This monument was constructed at a period of civic autonomy in Ephesos, but a time in which Roman influence was increasing in Asia Minor. The basic combination of honoring a civic hero with the provision and display of water first expressed within this monument was then echoed throughout the Ephesian cityscape in the early centuries of the principate.

Surviving today to a height of 4 m in its southwest corner, the monument originally stood to a height of 13 m (Fig. 3.7). The structure had a pi-shaped plan with the long front side interrupted in the middle where it was recessed from the street. Measured at the base, the building's total length is 10.35 m, and its depth is 5.8 m. Projecting 2.3 m from the middle section of the heroon, the east and west wings measure 3.55 m each. The core of the building was constructed of limestone ashlar blocks. The first floor was faced with a marble façade in the Doric order with a triglyph and metope frieze. The second story of the Ionic order had a triple fasciated architrave, above which was a frieze of alternating deer heads and bucrania connected by a thick garland. Similar to other Hellenistic funerary monuments, the decoration of the structure with bucrania and garlands suggests a sacred or votive function for the monument, such as a heroon or tomb (Ng 2007, 193). In Thür's reconstruction, a vaulted niche punctuated the space in the middle portion of the Ionic second story. The entablature of the second story was topped with a broken pediment, the corners of the tympanum rested on the projecting wings, and the central portion supported a small triangular pediment on which a round shield was carved (Thür 1995a, 162).

Thür's careful re-examination of the archaeological remains of the heroon suggests that the monument was a fountain from its earliest phases. In 1988, a trench sunk under the flagstone paving of the Byzantine fountain uncovered a 30 cm-thick layer of water-resistant mortar (Thür 1995a, 161; 1995b). Leading from the back of the structure through its central core is a water channel, which Thür identifies as original to the building because it could not have been cut secondarily through it (Fig. 3.8). The available architectural fragments, however, did not allow reconstruction of the original shape of the water basin (1995a, 161), though the surviving pedestal blocks probably belonged to the original fountain basin and provide information about its original size (4.8 m x 8.8 m) (Dorl-Klingenschmid 2001, 180; Thür 1995a, 164). Thür argues that the basin of the fountain would have been hypaethral (or open to the sky). This arrangement with a large, open water basin significantly departed from the early fountain structures in the Ephesian cityscape where the water was hidden from view.

Relief panels found in the excavation of the monument in 1904 offer a key piece of evidence in Thür's identification of the monument as the Heroon of Androklos (Thür 1995a, 166-169).[13] These six relief panels were part of a frieze that decorated the two pediment halves above a horizontal cornice in the recessed middle section (Thür 1995a, 167). Depicting battle scenes, these relief panels show a charioteer, a fallen figure in heroic nudity, and both heavily and lightly armed soldiers. Thür identifies a panel (H 376) as depicting Androklos, the mythological founder of Ephesos (Fig. 3.9). A rider, wearing a short chiton with a belt at his waist and a short *chlamys* which flows behind him, raises his right arm backwards to throw something, probably a lance or spear. The lower right side of the panel is broken, leaving in question the intended target of the rider's throw. Despite the missing target, this depiction closely corresponds to iconographic parallels of Androklos on horseback dating to the Roman period. In particular, the rider's pose on the panel H 376 echoes that on a coin from the reign of Marcus Aurelius, and also on the frieze of a 300 CE renovation of the so-called Temple to Hadrian in Ephesos (also on the Embolos) (Thür 1995a, 172-3). On the coin, Androklos on horseback chases a boar running below the horse in the foreground. The rider on the relief from the Temple to Hadrian is nearly identical to that on the panel from the Heroon, with similarly charging horse and fluttering cape. Though Thür's argument for the identification of the rider in H 376 as Androklos is based on later iconographical depictions, and is therefore working backwards, Ng's study of civic iconography suggests that representations of local deities or legends tend to remain relatively stable within a community over time (Ng 2007, 197), lending support to Thür's conclusion.

[13] Heberdy (1905) mentioned "pieces of roughly cut frieze- and pediment-reliefs with battle scenes" in his 1904 excavation report. These reliefs were then lost in the Selçuk Museum until the early 1970s when they were re-discovered and analyzed by Lautner (1978). In 1991 another relief was discovered in the area of St. John (Thür 1995a, 167). The association of these reliefs with the heroon was established by means of the distinctive blue-grey patterned marble, quarried nearby at Belevi, out of which they were carved; this same material was used for stone benches associated with the monument. The size and shape of the reliefs fit perfectly into Thür's reconstruction of the building, which further supports this conclusion.

As mentioned above, based on its archaeological remains Thür reconstructed the heroon as a fountain with a monumental hypaethral basin which, she suggested, did not function primarily as a place from which to remove water. Rather, Thür (2000, 126) has suggested that this fountain may mark the actual location of, or was constructed to conjure associations with, the mythical place where Androklos founded the city – the Hypeleian Spring (Dorl-Klingenschmid 2001, 181; Thür 1995b). Whether this fountain was built at the actual spring site or, rather, that the open basin of water simply created a visual reference to it, this monument served to connect myth and topography through its materiality.

The combination of the figural depiction of Androklos and the mythological civic foundation on the frieze panels and the architectural arrangement of the monument signifying the spring at which the action occurred creates a visual effect whereby the story of the founding of Ephesos gets replayed *ad infinitum*. The movement of Androklos and his companions suggested by the stylistic treatment of the frieze in combination with the movement of the water into the basin may have created in the viewer a sense of perpetual motion. Though chronologically later, examples of the use of water to generate an impression of pictorial motion in Roman mosaics perhaps conveys a shared paradigm for creating and perceiving action in artistic displays (Molholt 2008, 159-192). Thus, through the architectural arrangement of the fountain, its sculptural display and the use of water to tie the composition together, Androklos perpetually slays the boar at the site of the Hypelaian Spring.

It has been suggested that this monument was built to celebrate Ephesos' "new foundation" as a free city after the dissolution of the Attalid dynasty (Thur 1995a, 177). Its form combining an honorific monument with a hypaethral water basin, however, was unusual among other contemporary monuments in western Asia Minor. Water figured into the Ephesian foundation myth and Androklos' ability to develop fresh water sources was part of his characterization as a *ktistes*, or founder. This connection between civic founder or patron and water was one that was capitalized upon and resonated in subsequent honorific monuments throughout the Ephesian cityscape.

Water Supply in Ephesos, the Capital of Asia

In 29 BCE Octavian spent half the year in Ephesos. As a result he made the city the residence of the proconsul and thus the new 'capital of Asia,' replacing Pergamon in this role (Scherrer 2001, 69). With this change, Ephesos became a key player in the region and more visible within the developing geopolitical landscape. As a result of the city's position as 'first in Asia,' a whole new city quarter, the so-called State Agora (Fig. 3.1, no. 18), was constructed under the Julio-Claudian emperors. This area of the city combined the government (*boule*) and traditional cult of the city (in the Prytaneion) with the new imperial cult (Scherrer 2001, 69). The increase in building activity, primarily sponsored by elite patrons, continued throughout the city. The choice to supply the city with water was, in part, impelled by an increase in population and the concomitant need to supply the growing number of people with fresh water and, in part, a strategy for tapping into the long-standing precedent for the provision of water to cities in the Greek world. Appropriate to the new geopolitical situation, these benefactions were expressed in a hybrid Roman/Ephesian visual vocabulary, drawing both on traditions endemic to Ephesos and those influenced by developments in Rome.

The development of Ephesos' hydroscape was significantly influenced by the city of Rome and the benefaction of Augustus, under whom Rome's water supply network was famously expanded (Pliny *HN* 36.24.121). Rome itself benefitted from the patronage of a single and powerful benefactor and its water supply system was extensively developed under Agrippa as *aedile* during the reign of Augustus. Old aqueducts were repaired and expanded and three new aqueduct lines were constructed: the Aqua Iulia (33 BCE), Aqua Virgo (19 BCE), and Aqua Alsietina (2 BCE) (Aicher 1995, 33-41). Furthermore, Pliny the Elder (*HN* 36.24.121) relays that, as *aedile* in 33 BCE, Agrippa extensively contributed to the hydraulic distribution system within the city of Rome, constructing 700 *lacus* (basins), 500 *salientes*, (fountains) and 130 *castella* (distribution points for aqueducts).[14] In particular, in addition to supplying fountains and basins as distribution points for the new water lines, Agrippa adorned them with 300 bronze or marble statues and 400 marble columns (Pliny the Elder *HN* 36.24.). Not simply comprised of utilitarian structures, the decorative elements included as part of the water distribution network were certainly intended to impress, in addition to their supply of a basic necessity (Longfellow 2011, 19).

Augustus also extended his public benefaction to Ephesos and installed two long-distance aqueduct lines, the Aqua Throessitica and the Aqua Iulia.[15] All that is known of the Aqua Iulia is derived from a Latin inscription on a marble base found in the northwest corner of the Tetragonos Agora which mentions Augustus himself as donor (Scherrer 2006, 45-46). Unfortunately, there is no concrete information about what type of building(s) this aqueduct served. Based on the location of the surviving inscription, and the clear indications that the Aqua Throessitica supplied the eastern part of the city, it is likely that the Aqua Iulia provided the harbor region with water.

More is known about the Aqua Throessitica. A bilingual inscription found in a secondary location by the west side of the Vedius gymnasium, probably reused in a Byzantine city wall, mentions the installation of a water line under Augustus (*IvE* II 402).

1 Imp. Caesar Aug. et Ti.
2 Caesar Aug. f.
3 aquam Throessiticam
4 induxerunt curam
5 agentibus C. Sextilio P. f. Pollione
6 et C. Ofillio Proculo
7 Αὐτοκράτωρ Καῖσαρ
8 Σεβαστὸς
9 καὶ Τιβέριος, Σεβαστοῦ
10 υἱός,
11 τὸ Θροεσσειτικὸν ὑδωρ εἰσήγογο[ν]
12 ἐπιμεληθέντων Γαίου Σεξτιλ[ίου]

[14] See Chapter 2 for discussion about terminology used to describe water sources, both ‘natural’ and architecturally mediated.

[15] Significantly, Aqua Iulia was the name given to both the Roman and Ephesian aqueducts.

13 [Ποπλίου υἱοῦ, Πολλίωνος καὶ Γαίου]
14 [Ὀφιλλίου Πρόκλου]

The Aqua Throessitica, dated to between 4 and 14 CE, names both Augustus and his adoptive son and successor, Tiberius, as donors of the water line. The inscription also mentions that the new water line was brought into the city under the curatorship (ἐπιμεληθέντων) of C. Sextilius Pollio. Augustus paid for the whole aqueduct channel, but C. Sextilius Pollio paid for and constructed (*de sua pecunia*) an aqueduct bridge that spans the Dervenddere River valley to the east of Ephesos (Fig. 3.10).[16] A monumental inscription, also bilingual, was inscribed on both sides of the aqueduct bridge (Fig. 3.11) (*IvE* VII 3092).

> Danae Ephesiae et Imp. Caesari Aug. et. Ti. Caesari Aug. f. et civitati Ephesiae C. Sextilius P.f. Vot. Pollio cum Ofillia A. f. Bassa uxore sua et C. Ofillio Proculo f. suo cetereisque leibereis sueis pontem de sua pecunia faciundum curavit

> Αρτέμιδι Ἐφεσ[ί]αι καὶ Αὐτοκράτορι Κ[αί]σαρι Σεβαστῶι καὶ Τιβερίωι Καίσαρι Σεβαστοῦ υἱῶι καὶ τῶι δήμωι τῶν Ἐφεσίων Γάιος Σεξτίλιος Ποπλίου υἱὸς Οὐοτουρία Πολλίων σύν Ὀφελλία Αὔλο[υ] θυγατρὶ Βαάσσῃ τῇ ἑατοῦ γυναικὶ καὶ Γαίωι Ὀφ[ελ]λίωι Πρόκλωι τῶι ἑατοῦ υἱῶι καὶ τοῖς λοιποῖς τεκνοις τὴν γεφύραν ἐκ τῶν ἰδίων ἀνέθηκεν

The inscription names C. Sextilius Pollio as the donor along with his son, C. Ofillius Proculus, and his wife (and the mother of Proculus), Ofillia Bassa. As their names imply, this family was originally from Italy but had immigrated to Ephesos (Scherrer 2006, 46). Dated to the last ten years of Augustus' reign, the bridge was dedicated to Artemis Ephesia, Augustus and Tiberius, and to the community of Ephesians. Significantly, this bridge was the first above-ground, monumental arcade to be constructed in Asia Minor (Coulton 1987). All other extra-urban water-lines in Asia Minor were inconspicuous underground pipelines, so as to protect the water-supply against enemy attack. The intentionally visible architecture of the aqueduct bridge must have been a potent symbol of prosperity and peace and a clear signal of a changing relationship with respect to water.

[16] C. Sextilius Pollio also paid for the construction of the Stoa Basilica in the State Agora.

The Pollio Building

A terminal fountain for the watercourse paid for by Pollio was erected on the northwest side of the newly-built State Agora, the location of the other building project he sponsored, the so-called Basilica Stoa, built in 13 CE (Scherrer 2006, 47) (Fig. 3.2, no.6). The choice to site this monument at the corner of the new civic center of Ephesos, a project inextricably tied to Roman fiat, cannot have been without significance. In contrast to the Heroon of Androklos, that occupied a place within the urban topographical matrix associated with ancient ritual processions and Ephesian foundation myths, the so-called Pollio Building literally stood at the edge of the new world order. This monument was most likely constructed in combination with the Aqua Throessitica, suggesting an Augustan date for this terminal fountain.[17] Moreover, the provision of the water through the aqueduct and the monumental distribution point from which it was gathered should be considered part of the same building program in which the water course and the honorific monument were conceived and carried out in tandem.[18] The Pollio Building was the first monumental public fountain to be added to the Ephesian cityscape after the Heroon of Androklos and, as I argue, the Pollio Building drew upon many of the associations conjured by the heroon and established a precedent in Ephesos where honorific monuments were combined with monumental hydraulic display.

Constructed of large ashlar blocks, the Pollio Building was rectangular in plan with its center punctuated by a vaulted niche (Fig. 3.12). According to Thür's reconstruction of the monument, the niche was framed by engaged pilasters. The niche was flanked by two broadly identical inscriptions – Latin to the left of the niche and Greek to the right – which name C. Ofillius

[17] In contrast, Bammer (1976-77) argues that the parapet blocks were spoliated, and therefore that the fountain was a post-Neronian addition to the Pollio Building.

[18] From this connection between the water course and Pollio Building, Strocka (1991) claimed that there was an Augustan decorative fountain in the immediate vicinity, which he proposed to be the apsidal fountain (the so-called Fountain of Domitian, known now to date to the Flavian Period).

Proculus the donor of the monument.[19] Signficantly, Proculus is the son of C. Sextilius Pollio who paid for the Pollio Aqueduct Bridge and water line (*IvE* II 405):

> C. Sextilio P. f(ilius) Vot(ura) Pollioni C. Ofillius A. f(ilius) Cor(nelia) Proculus patri dato a civit[ate loco]
>
> [Γαίου Σεξτιλίου Ποπλίου][υἱὸν Οὐοτουρία Πολλίωνα][Γαίος Ὀφιλλίος Αὔλου υἱὸς Κορ]νηλία Πρόκ[λος τὸν πατέρα] τόπου δοθ[έντος ὑπὸ τοῦ δήμου].

Instead of being built by Pollio and dedicated to himself, his son sponsored the construction of the Pollio Building as the monumental terminus of the aqueduct line and named his father in the dedication.

On the west side of the Pollio Building lay five parapet blocks, each with a multiple stepped head-profile. These blocks can neither be ascribed to the neighboring apsidal fountain (the so-called Fountain of Domitian) nor to the Flavian fountain courtyard of the Pollio Building (Dorl-Klingenschmid 2001, 189-90, Kat.Nr. 27). Thus, Thür (1997, 72) argued that these blocks should be reconstructed as forming a water basin on the west side of the Pollio Building. She posits that the original place of installation was directly to the north of the memorial. Here, *anathyrosis* (the treatment of drafted edges of stone to prepare blocks for unmortared joints) shows the position of the south parapet block and, following this, it is possible to determine the size of the basin (3.5 m x 1.2 m). The floor of the basin was covered with marble tiles. Its back wall also served as the marble cladding of the Pollio Building. In its extremely poorly preserved state, the water installation or position of outflow does not survive. Thür conjectured that the outflow of water fell just below the vaulted niche in the pedestal. If an honorific statue were installed in the vaulted niche (for which no evidence was uncovered), this proposed arrangement would have provided flowing water from just below the feet of the statue, signaling a visual connection between image and water. Evidence suggests that the Pollio Building was not adorned with an intricate sculptural

[19] Notably, bilingual inscriptions on water management infrastructure largely cease to appear in the public sphere after the Augustan period. Perhaps the presence of Latin was critical in the early stages of the principate as a physical reminder of Rome's hegemony within the urban fabric of Ephesos, but after Roman power was firmly sedimented the necessity for Latin inscriptions diminished.

program and its ground plan is simple, thus making the flow of water into the open basin the most visually striking element and the central focus of the ensemble. Poured from a source high above the settling basin, the movement of water was highlighted and its potential to create aural effects explored.

Architecturally, this fountain emulates elements both from the Hellenistic fountain houses in Ephesos and, significantly, from the Heroon of Androklos (Fig. 3.13). Rectangular in plan and constructed of ashlar blocks, the Pollio Building recalls the Hellenistic fountain houses that were previously prevalent in Ephesos and throughout the Greek world. However, instead of the water being hidden from view as in its Hellenistic predecessors, the water here was the primary focus.[20] The Pollio Bulding also echoed elements central to the Heroon of Androklos. Both monuments contained a vaulted niche in its center framed by columns. Significantly, both fountains contained a hypaethral basin into which water flowed from above.

As the Pollio Building was the only other definite monument in Ephesos at this time to have an open basin of water (with the probable exception of the Memmius Monument which will be discussed below), this formal similarity must have engendered a conceptual connection between the Heroon of Androklos and its associations with Ephesos' mythological foundation at the Hypelaian Spring, and the provision of water by Pollio. The Heroon of Androklos occupied a location within the cityscape connected with Ephesos' mythological foundations, and the Pollio Building stood at the new locus of civic activity – their locations essentially forming bookends within the urban fabric.

Moreover, this is the first fountain in the Ephesian cityscape that names the donor, thus associating the provision of water with a specific individual. This terminus for the Aqua Throessitica conveyed a literal and material connection to the benefaction of Augustus, since

[20] Longfellow (2011, 68) argues that the Hydrekdocheion of C. Laecanius Bassus (discussed below) and the Great Nymphaeum at Miletos were the first fountains in which water flowed into an open basin. If Thür's reconstructions are correct, the Heroon of Androklos and the Pollio Building both attest to this arrangement significantly earlier.

both emperor and Pollio contributed to the construction of the aqueduct line that fed the fountain. The bilingual inscription – like those also placed on the water lines donated by Augustus and the aqueduct bridge paid for by C. Sextilius Pollio – underscores the family's dual connection to Italy and to Ephesos.

The siting of the Pollio Building, its architectural layout and decoration, and its arrangement and use of water make a clear statement about the dual centripetal and centrifugal tendency of empire and negotiations of imperial presence on a local, provincial level. Having been named the new capital of Asia, Ephesos experienced a "new foundation" in 29 BCE. Augustus and Pollio echoed the actions of Androklos by tapping a new source of water for the city, just as Androklos found a water source for the future colonists at the Hypelaian Spring. By creating a monument that drew on mythological and topographical associations through its architectural arrangement and manipulation of water, C. Ofillius Proculus was able to make the claim that his father Pollio and his family, too, were founders of the city. Siting the Pollio Building at the edge of the new State Agora further emphasized the new status quo, while simultaneously making reference to the mythological foundations on which the city was built.

This arrangement was then echoed in a number of other aqueducts sponsored by elite Ephesians and the construction of monumental fountains – the Fountain to Domitian after the city was awarded its first *neokoros*, and the Fountain of Trajan, perhaps in connection with the Aqua Traiana in Rome and the emperor's visit to the city in 113 CE. Subsequent Ephesian monuments also drew on this trend established between civic hero and water, a connection that continued to reverberate within the cityscape.

Memmius Monument

Discussion will move next to another early imperial monument in the Ephesian cityscape that made explicit connections to Rome while simultaneously drawing on the visual and sensory vocabulary provided by water. The addition of a large hypaethral basin to the monumental heroon for C. Memmius, the so-called Memmius Monument, incorporated water installation and Augustan aqueduct with honorific monument. The Memmius Monument was approximately contemporary with the Pollio Building and probably also fed by the Augustan Aqua Thoressitica.

The Memmius Building drew on the precedent set by the Heroon of Androklos in its incorporation of a hypaethral basin into an honorific monument. Unlike the Pollio Building, however, which was constructed as the monumental terminus for a new water line, a fountain basin was secondarily added to the Memmius Monument. Constructed for the grandson of the great Roman general Lucius Cornelius Sulla, this monument conveyed both a clear connection to the west and a recognition of Rome's influence on the city's fortunes. Having chosen to align itself with the Sulla in the Mithridatic Wars (88 – 63 BCE), the city of Ephesos found itself on the winning side of the conflict, but in a position where its success was even more co-mingled with that of Rome.[21] Through its architecture and inscription, this monument signaled a connection and allegiance to Rome, suggesting that Sulla and his family were considered to be among the civic heroes of Ephesos. The monument's polyvalence, however, is evident in the incorporation of fountain with heroon.

Excavated by Franz Miltner (1960, 24-27) from 1957-1958, the monument was originally called the 'Sullabau,' based on a misinterpretation of a fragmentary inscription. The most extensive reconstructive work on the building has been carried out by Wilhelm Alzinger and Anton Bammer. The definitive publication on the monument is a study by Alzinger, *Das Monument des C. Memmius* (1971), and Alzinger has published several subsequent articles (1972, 1974). Bammer has also written a few additional articles on this monument (1972-3; 2007). More

[21] Ephesos' allegiance during the Mithridatic Wars was not always on the side of Rome. Appian (*Mith*. 21) names Ephesos, along with Cos, Magnesia and Mytilene, as initially inviting Mithridates into their city (McGing 1986, 112). Mithridates had established himself at Ephesos and was stationed there when he issued his (in)famous order to the cities of Asia impelling them to kill all resident Romans and Italians along with their families and freedmen. Ephesos, however, subsequently revolted against Mithridates in an attempt to show loyalty to Rome and to win back Italian favor.

recently, Ulrike Outschar (1990) has identified additional architectural fragments associated with the monument and has posited some modifications to the original reconstructions suggested by Alzinger and Bammer.

The Memmius monument is located at the northwest corner of the State Agora and positioned at the intersection where the end of the Basilica Stoa (donated by Sextilius Pollio) met the so-called Domitian Street and the Embolos (Fig. 3.1, nos. 32 and 33; Fig. 3.2, no. 5). However, at the time of the monument's construction building activity for the State Agora had not yet commenced, and the center of civic activity was in the Tetragonos Agora. Therefore, there is no evidence to indicate any specific ideological significance implied in the initial placement of the Memmius Monument. However, the shifting nature of the urban environment resulted in changes in the monument's surroundings over time. Beginning with the Julio-Claudian emperors, this area of the city was established as the nexus of civic activity; standing at the edge of this area, the Memmius monument acted as a fulcrum between the State Agora and the main urban artery of the Embolos.

Constructed for C. Memmius, the grandson of Sulla, this building is identified through a Latin inscription on the frieze of the entablature naming Memmius as the dedicant (Bammer 1972-73, 220). The fragmentary inscription reads:

C.MEMMIO.C.F.SVLLAE.FELICIS.N.EX.PECUNI(A) [and C.ME[

Alzinger (1974, 17) suggests that there were probably two identical Latin inscriptions on both the east and west sides of the building, while the south side of the building contained an inscription in Greek. The inscription states that the building was erected for C. Memmius, the grandson of Sulla, who was monetary magistrate in 51 BCE and elected consul in 34 BCE. As already discussed, Ephesos had been a key player in the wars between Mithridates VI of Pontus and the Roman general Sulla, and it emerged from the conflict as one of the principal cities in the region

(McGing 1986). The monument was likely constructed both as a thanksgiving for the benefits bestowed on the city by the general and as a clear expression of the city's allegiance to Rome.

The Memmius Monument was a multi-story marble building standing on a three-stepped rectangular base composed of rusticated limestone. The central component of the monument originally stood at a height of 8.92 m and resembled a triumphal arch with niches covered by half domes on the three main facades. Arches on the three sides were supported by piers ornamented by caryatids in high relief and were flanked by unfluted pilasters. Engaged fluted columns resting on Attic bases adorned the corners of the monument. The attic was decorated on each of its chief sides by five reliefs flanked by pilasters. A frontally-standing *togatus* probably occupied the central position on each of the three sides. Four reliefs of men dressed in *exomis* and *chlamys*, representing warriors or heroes, flanked the *togati* and faced inward toward them (Alzinger and Bammer 1971; Kleiner and Kleiner 1974). The figures have been interpreted as members of Memmius' family and personifications of his virtues (Outschar 2000, 96).

Alzinger and Bammer (1971) situate this monument as one in a series of Greco-Roman funerary monuments that were widespread both in Asia Minor and in the West, and suggest that it is an early example of concave façade architecture known from later monuments such as the Monument of Philopappos in Athens and La Conocchia in S. Maria Capua Vetere (Kleiner and Kleiner 1974). Alzinger (1974, 19) estimates that the monument was constructed after 30 BCE, based on the development of the triumphal arch as a canonical architectural form during the Augustan period. As the triumphal arch was an innovation of the Roman west, the architectural form of this monument must have been perceived as both imported and cutting-edge. However, more recent investigation by Ulrike Outschar (1990) has identified additional architectural elements which suggest that the monument was a more composite structure that incorporated elements of Roman triumphal architecture with typical features of Hellenistic tombs and honorific monuments. Fragments of a round structure decorated with garlands and bucrania found in the immediate vicinity have been assigned to the Memmius Monument by Outschar (1990), suggesting that the building had a third story recalling tower-like Hellenistic heroa. The presence of bucrania and garlands on this monument both suggests a sacred function as a heroon or tomb and also recalls the frieze on the Heroon of Androklos (Fig. 3.14). As it was typical only to bury or construct cenotaphs for civic founders or heroes within the limits of the city walls, it is possible to claim particular high status of the people honored both in the Heroon of Androklos and the Memmius Monument (cf. Knibbe 1993; Thür 1995a). This connection further implies that Memmius was honored as a civic hero at Ephesos.

While not originally conceived as part of the honorific monument, on the west side of the building a tripartite basin was added (Fig. 3.15). Based on architectural analogies, Miltner (1960, 24) argues that this water basin must have been erected during the Augustan period and no later than the first half of the first century CE. Thür (1995a) follows Miltner's dating, but Alzinger (1972) is critical of such an early date. Because a Flavian period addition to the fountain obscured the earlier construction, Alzinger then conservatively dates the basin to this Flavian reconstruction in the late first century CE. However, support for an earlier, Augustan date comes from the fact that the water basin seems to have been supplied by the Augustan Aqua Throessitica (Dorl-Klingenschmid 2001, 186; Scherrer 2006, 47). On the basis of this evidence, along with Miltner, Thür and Dorl-Klingenschmid, I prefer an Augustan date for the addition of the water installation. Thus, with the Pollio Building, this Augustan-period hypaethral basin was the next subsequent (or contemporary) departure from the "Fountain in Hall" form at Ephesos after the Heroon of Androklos (cf. Longfellow 2011, 67). Indeed, the Aqua Throessitica seems to have been the water source supplying this fountain, with the water-line arriving at the monument from the southwest (Dorl-Klingenschimid 2001, 185). While not constructed as the monumental terminus of this aqueduct, the basin added to the Memmius Monument was probably contemporary or near-contemporary with the terminal installation at the Pollio Building.[22]

The fountain consists of a long basin, stretching 11.7 m, which is divided into three sections; the middle of which is the longest at approximately 5 m. (Fig. 3.16). Behind the retrieval basin in the central portion of the fountain is a semi-circular apse covered by a vaulted dome. To the left and right of the long middle section are two smaller basins which were framed by Corinthian columns erected on their own bases. Above the north-most (left) section of the tripartite basin is an apsidal niche, and on account of the fountain's symmetrical ground plan a corresponding niche to the south can be assumed. This fountain conforms to the so-called 'Sigmabrunnen' type of Dorl-Klingenschmid's typology.[23] The Memmius Monument, equipped with fountain basin and semicircular niche in the center of the back wall, is one of the earliest incidences of a 'Sigmabrunnen,' or apsidal fountain, in Asia Minor (Dorl-Klingenschmid 2001, 37 Abb. 12). Indeed, the presence of an apsidal basin was highly unusual for this time period in Asia Minor, with most other known examples of apsidal arrangements coming from villas on the Italian peninsula (Longfellow 2011, 67). The unusual shape of the basin further suggests an Italian connection, though those Ephesians who encountered it may not have perceived this specific origin but rather simply recognized it as "different." This type of fountain gained increasing popularity in the region in the succeeding centuries.

The arrangement for the water inflow in the apse does not survive, but the water was probably initially fed into the apsidal basin, the bottom of which is approximately 2 m higher than the rectangular retrieval basins. It is possible that there was a water spout in the parapet from

[22] There has been no work yet carried out on the course of the water lines within the city. Such an investigation would be able to clarify whether the pipeline delivering water to the Memmius Monument was originally conceived as part of the aqueduct or whether it was added secondarily.

[23] Named for the Greek letter, 'Sigma' fountains are characterized by their half-circular ground plan and apsidal settling basin. They were usually covered with a half-dome, and often were outfitted with rectangular retrieval basins (see Dorl-Klingenschmid 2001, 39-48).

which water was then directed into the retrieval basin below. Approximately 2 m above both of the side basins was an aediculated apse, access to which was impeded by the arrangement of the water basin (Dorl-Klingenschmid 2001, 185-186).

Unfortunately, there is no inscription naming the initial dedicator of this fountain basin which limits the conclusions that it is possible to draw securely. The specific relationship between Memmius himself and Ephesos is unclear; however the legacy of his grandfather Sulla was unequivocally critical to the city's success. The initial dedication of the Memmius Monument as a tomb or heroon was probably intended as a celebration of Sulla's family and an expression of allegiance to Rome. The architectural arrangement of the monument that incorporated hybrid Italian and Eastern forms further signaled an interconnection between Ephesos and Rome. I suggest that the addition of a fountain with a hypaethral basin to this honorific monument dedicated to C. Memmius, the grandson of Sulla, was further drawing on the connection between civic hero and water. The incorporation of garlands and bucrania into the design of both the Memmius Monument and the Heroon of Androklos further supports this contention, as such adornments were typical of heroa, and both monuments were outfitted with an open basin.

As was the case with the Pollio Building, this connection between civic hero and the provision of water was communicated both through architectural arrangement and the offering of water in a hypaethral basin. However, unlike the Pollio Building which was built as the terminus of the new water line, there was no readily perceivable indication that the fountain attached to the Memmius Monument was supplied by the Augustan Aqua Throessiticia, either in the form of a dedicatory inscription or an explicit visual connection. Indeed, as this building was clearly not originally intended to serve as a terminal fountain for the water line, the addition of a fountain to the building further supports the identified pattern between civic hero and the provision of water. There is no evidence yet to suggest that either Sulla himself or his grandson Memmius contributed to expanding the water supply network of Ephesos, which, perhaps, indicates that it was deemed appropriate to incorporate a hypaethral water basin into this monument specifically because this building signaled the presence of a civic hero. The Pollio family increased the supply of water to Ephesos and therefore was able to make an explicit claim that they were civic heroes through the architectural arrangement of the terminal monument for their water line. Perhaps the Memmius Monument was outfitted with a fountain basin precisely because this family was considered to be civic heroes in their elevation of Ephesos to one of the principal cities in Asia.

Unlike the fountains that previously supplied the city of Ephesos, with covered basins that were set back from the street, the Heroon of Androklos, the Pollio Building and the Memmius Monument – with their hypaethral basins – all put the water front and center. In these three fountains, the water was not hidden from view, but rather was a central element in the composition. Moreover, it seems likely that the Aqua Throessiticia supplied both the Pollio Building and the Memmius Monument; suggesting their relative contemporaneity and, equally, their connection to the developing empire.

The continued use and importance of the Memmius Monument indicated through subsequent rededications suggests that this monument held ideological importance within the Ephesian cityscape. A new architrave dedicated in the second century CE carried an inscription that named the imperial family and the city of Ephesos as recipients of the donation of the fountain, and the *asiarch* (high priest of the imperial cult) Ti. Meander as the donor and financer (Miltner 1960, 25-26). Of more significance for this study, the monument was rededicated specifically as a *hydreion* by Flavios Menander and T. Flavios Leukios Hierax at the end of the second or the beginning of the third century CE. These two men were either brothers or a father and son and hailed from Hypaipa and Alexandria.[24] It was rededicated again under Diocletian when statues of the emperor were erected to the north of the basin (Longfellow 2011, 205; Miltner 1960).

Although the Augustan fountains at Ephesos were explicitly connected to individuals and events associated with Rome, they simultaneously drew on the connection between civic hero and

[24] *IvE* II 436-37; *IvE* III 801, *IvE* VII 3244.

water that was first expressed in the arrangement of the Heroon of Androklos. The location of the Pollio Building and the Memmius Monument in the vicinity of the new administrative center further underscores their connection to Rome, yet their architectural arrangement and open water basins recalled the civic founder's heroon. Significantly, all three of these early fountains were either heroa or cenotaphs (or recalled the architecture and decoration of such monuments) and they were all located within the city walls, which forbidden except when the honorand was a civic hero. Moreover, all of these monuments incorporated water in a very visible manner. Each fountain had an open basin into which water flowed from some distance above, thus incorporating the water into the fountains' decorative program; and it is further possible that the movement of water was used to achieve a sense of action in the sculptural display. Marking the presence of monumental aqueducts in Asia Minor was the Pollio Aqueduct Bridge, jointly sponsored by C. Sextilius Pollio with his family and the emperor Augustus. The visual presence of the aqueduct bridge may have signaled a different relationship with respect to water – both that communities did not need to protect their extra-urban water lines as before the ascension of Rome, and that water would be more abundantly available for both use and display. Through their monumental hydraulic displays, the individuals who provided this water were making a claim about the fundamental importance of water for civic life; a claim that was clearly expressed in the connection between civic founders and the supply of water.

Hydrekdocheion of C. Laecanius Bassus

The donation of the Hydrekdocheion of C. Laecanius Bassus marks a significant change both in the type of fountain architecture and the patterns of euergetism in Ephesos. Up until this point, fountains at Ephesos were relatively modest in both size and decoration. The dedication of the so-called Hydrekdocheion of Laecanius Bassus introduced monumental façade nymphaea into the Ephesian cityscape, and indeed, into Asia Minor. However, the motivation for donating this monumental hydraulic monument cannot be connected either directly to an emperor or to a significant civic or political event. The circumstances surrounding the dedication of the Hydrekdocheion of Laecanius Bassus were different from the construction of the Pollio aqueduct and terminal fountain, which were directly connected to Augustus' augmentation of Ephesos' hydraulic network, and from the Fountain of Domitian (discussed below), which was dedicated to the emperor and connected to the first *neokorate* of the city. Rather, the construction of this Hydrekdocheion is probably best linked to the attainment of the proconsulship of Asia by C. Laecanius Bassus, thus a personal expression rather than a broader political statement. This monumental façade nymphaeum is discussed here briefly because it continued the tradition of Italian patronage in Ephesos, yet its influence significantly changed the architectural arrangement of subsequent civic monuments.

Who was C. Laecanius Bassus? An inscription discovered in 1960 in the vicinity of 'Domitian Street' in the immediate vicinity of the fountain has been interpreted as being associated with the monumental fountain. The Greek inscription names Gaius Laecanius Bassus Caecina Paetus as the donor of the monumental Hydrekdocheion; its erection dates to 80-82 CE, the years during or immediately following his tenure as proconsul of Asia. Bassus probably was the son of A. Caecina Paetus who was consul in 37 CE. Bassus himself was consul in 70/71 CE, superintendent for the banks of the Tiber (*curator riparum et alvei Tiberis*) in 74 CE, and proconsul of Asia in 78/79 CE or 80/81 CE (Jung 2006, 80-81). Bassus had no discernible familial ties to the region; thus his sponsorship of this monumental aedicular fountain can best be associated with his service as proconsul of Asia.

The Hydrekdocheion of C. Laecanius Bassus is located at the southwest corner of the State Agora, at the intersection of the road leading from the Magnesian Gate and Domitian Street (Fig. 3.1, no. 29). Monumental both in its proportions and its architectural and sculptural adornments, the Hydrekdocheion of C. Laecanius Bassus would have dramatically punctuated the urban landscape while offering refreshment to people entering or exiting the city through the Magnesian

Gate and to those conducting business in the new civic center of imperial Ephesos, the State Agora (Foessel and Langmann 1972-5, 1983; cf. Uğurlu 2009, 75).

The dedicatory inscription names the monument specifically as a hydrekdocheion and, significantly, was written solely in Greek (*IvE* III 695; Scherrer 2006, 48 no. 4). This is in contrast to the earlier imperially-connected fountains, the Memmius Monument and the Pollio Building, which communicated their dedications in bilingual inscriptions (Greek and Latin). As Bassus was a native Italian, the choice to use only Greek must be considered significant (as, equally, would be the choice to use a bilingual inscription). The low levels of literacy among the majority of the population need not preclude the notion that those encountering the dedicatory inscriptions would have been able to recognize the characters as, respectively, native and foreign (e.g., Güven 1998).

The pi-shaped fountain consists of a large hypaethral basin measuring 12.35 m by 8.3 m, surrounded on three sides by a monumental two-storied aedicular façade measuring 16 m by 14.6 m (Fig. 3.17) (Foessel and Langmann 1972-5, 306; Scherrer 2000, 76-78, no. 29).The rear façade was crowned with a broad pediment arranged over five bays, which was repeated across the open side-wings. Columns framed each aediculated niche, within which statues were placed. This fountain, along with the Great Nymphaeum at Miletos (ca. 80 CE), were the first monumental façade nymphaea to be constructed in Asia Minor. With an architectural arrangement recalling the *scenae frons* of theaters, such fountains articulated the theatrical capabilities of water.[25]

The sculptural program of the fountain largely contained imagery connected to water (Aurenhammer 1990, 17 and Kat.Nr. 84f. 88-92). In addition to portraits and statues of goddesses were representations of sea creatures and river-gods, parts of which served as water outlets. At least five Triton statues adorned the Hydrekdocheion. As creatures thought to inhabit the sea, the

[25] It took nearly a century for façade (or tabernacle) fountains on this model to become popular in Asia Minor. The Hydrekdocheion of Trajan (to be discussed below) was constructed in Ephesos between 102 and 114 CE, but it was only in the mid-to late second century CE that the majority of cities built such monumental fountains.

watery realm created by this monumental fountain was an appropriate context in which for them to be placed (Fig. 3.18). Aphrodite also appears prominently in the decorative program, with at least four statues of the goddess adorning the fountain. Aphrodite was a popular goddess used in the decoration of fountains and other hydraulic displays. Her statues have been associated with civic fountains in cities across the Mediterranean, including Rome, Ostia, Athens, Corinth, and Gortyn. Aphrodite was frequently incorporated into civic hydraulic displays in Asia Minor at, for example, Miletos, Perge, and Side (Aurenhammer 1995, 260; Longfellow 2011, 76). Aphrodite was also featured in domestic fountains as, for example, a statue of the goddess found in Terrace House 1 (Ephesos) that was fitted with a pipe so that water poured from her breast (Aurenhammer 1995, 261; Longfellow 2011, 277 n. 47). The association between Aphrodite and fertility would have invoked this quality of water. Taken together, the sculptural decoration of the Hydrekdocheion included images that were typical of fountain architecture and lacked a particular specificity connected with Ephesos.

Longfellow (2011, 68) suggests that this fountain, along with the Great Nymphaeum at Miletos sponsored by Ulpius Traianus (the father of the emperor Trajan), were the first fountains in the Roman east for which the retrieval basin, once hidden from view beneath a roofed aisle, was moved to the front of the monument in a hypaethral arrangement. Claiming this to be an aesthetic choice limited to the Roman west until this point, Longfellow points to these two fountains as a Roman-influenced contribution by Flavian provincial administrators in the east. While there is no doubt that these two fountains mark the presence of monumental, façade nymphaea in the Roman east, however, as I have argued above, the incorporation of a hypaethral basin was already a long-standing tradition in Ephesos – a tradition that had deep connections to Ephesian mythological topography and civic identity. This was not the first such fountain within the Ephesian cityscape to incorporate an open basin, but rather was participating in an already-established architectural vocabulary.

Ephesos' Neokoros and the Fountain of Domitian

After Domitian's Germanic victory (83 CE), Ephesos won the competition for a *neokoros* temple, or temple to the imperial cult, of the province of Asia, which was consecrated in 88/89 CE (Friesen 1993; Scherrer 2001, 75). The entire building program for the *neokoros* cult was directed and sponsored between about 90 and 110 CE by Ti. Claudius Aristion, whom Pliny the Younger called *princeps Ephesiorum*, first among the Ephesians (Pliny, *Ep*. 6.31.3). Aristion's contribution to Ephesos' hydraulic infrastructure will be discussed below.

As a part of the massive civic construction boom after Ephesos was granted its first *neokoros*, several fountains along the Embolos were constructed, enlarged, or restored. The earliest of these fountains were finished in 92/93 and undoubtedly claimed a connection to the emperor who granted the city the *neokoros*, Domitian. Most notably, two of these hydraulic monuments, constructed by C. Calvisius Ruso, were explicitly dedicated to the current emperor. These hydraulic outlets were the first such monuments to be explicitly dedicated to the emperor (Longfellow 2011, 74).[26] Despite some significant departures from other fountains in the Ephesian cityscape in its simple apsidal form and unconventional sculptural display, there were elements of previous trends echoed in this imperially-dedicated fountain. If the emperor Domitian were considered to be the founder of the *neokorate* of the city, this dedication of a hydraulic display to him can be considered another monumental fountain honoring a founder in the long continuum of similar monuments beginning with the Heroon of Androklos.

While proconsul of Asia, C. Calvisius Ruso both contributed new water installations and extensively renovated Ephesos' hydraulic network. Not known to have any familial ties to Ephesos or the region, Ruso's decision to dedicate a vast amount of personal resources to the city's water supply is best connected to his attainment of the proconsulship of Asia, the apex of

[26] These were the first fountains to be dedicated to the emperor, but, as discussed above, the Pollio Aqueduct was dedicated to both Augustus and Tiberius.

his senatorial career (Longfellow 2011, 65).[27] However, Ruso was a member of a wealthy and prominent family that was intimately connected with politics in Rome. His step-uncle may have been Frontinus, who became *curator aquarum* of Rome under Nerva and Trajan and, through marriage, his son Publius Calvisius Tullius Ruso became the grandfather of the future emperor Marcus Aurelius (Longfellow 2011, 73; Syme 1984).

Ruso oversaw the construction of an aqueduct line, known as the New Marnas Aqueduct, which carried water east from the Marnas and Klaseas Rivers into the city. This same year, 92/93 CE, personifications of the Marnas and Klaseas Rivers appeared on civic coins, thus, as it were, bringing the rivers into the city both through the new water line and in people's pouches (Karweise 2006) (Fig. 3.19). The new water line terminated at the so-called Föntane, a semi-circular reservoir that Ruso dedicated to the city.[28] Ruso then extended the line of the New Marnas Aqueduct into the city where it supplied the recently renovated Hellenistic fountain near the theater, the Fountain of Domitian, and the fountain court on the terrace above the Pollio monument (Longfellow 2011, 64; Scherrer 2006, 48-53).

The so-called Fountain of Domitian is a single apsidal fountain facing the so-called Plaza of Domitian (Fig. 3.2, no. 9). This new fountain was placed directly adjacent to the Pollio Building honorary monument and fountain (Fig. 3.20), and a short walk down so-called Domitian Street from the Hydrekdocheion of C. Laecanius Bassus. With two public fountains already located on this street (and the *hydreion* attached to the Memmius Monument not far away), the choice to site the Fountain of Domitian in this spot must have been driven more by ideology than pure necessity. The Plaza of Domitian was the location of the newly minted *neokoros* temple (probably still under construction at the time the fountain was dedicated), so the fountain

[27] Ruso and his family most likely originated from northern Italy or Gaul (Longfellow 2011, 225 n. 15).

[28] *IvE* II 414, 416. The Föntane was significantly enlarged and rededicated by the proconsul L. Caelius Montius during the reign of Constans or Constantius II (Dorl Klingenschmid 2001, 182-184; Scherrer 2006, 51 no. 5.7).

dedicated to the emperor would have served to enhance the honorific program. Sandwiched between the State Agora and the Plaza of Domitian, this fountain was a thoroughly imperial monument: its donor, Ruso, was part of the Roman provincial government; its location was connected to the locus of Imperial activity in the city; and its sculptural program, as argued by Longfellow, echoed Italian precedents and declared Ruso as part of the emperor's close circle (though the extent to which the latter would have been perceived by ordinary Ephesians is questionable). As Longfellow (2011, 65) suggests, "the pioneering decision to dedicate the so-called Föntane and the Fountain of Domitian to the current emperor allowed Ruso to link his name with that of the emperor and thus draw a connection between himself and the emperor that was visible across the city." Despite its heavily Roman imperial influences, this fountain still must have had resonance with the people of Ephesos, specifically on account of the architectural precedents in fountain architecture already present within the cityscape. That is to say, whether intentional or not on the part of the donor, the connection between monumental civic fountain and dedication to the emperor may have signaled the status of Domitian as a civic hero to any Ephesians who encountered this monumental hydraulic display.

The dedicatory inscriptions for the fountain were discovered during excavations in an area near the Fountain of Domitian (Bammer 1978-80). Two identical inscriptions, one on a marble slab and the other on two fragments of a cornice block, provide a date for the fountain of 92/3 CE based on imperial titles:

> Ἀρτέμιδι Ἐφεσίᾳ καὶ Αὐτοκράτορι [[Δομιτιανῶι]] | Καίσαρι Σεβαστῶι [[Γ[ερμανικῶι]] | ἀρχιερεῖ μεγίστῳ δημαρχικῆς ἐζουσίας τὸ ιβ', αὐτοκράτορι τὸ κγ', | ὑπάτῳ τὸ ις', τειμητῆ, πατρ[ὶ πα]τρ[ί]δος
>
> To Ephesian Artemis and Emperor Domitian Caesar Augustus Germanicus, pontifex maximus, year twelve of his tribunician power, emperor for twenty-three years, consul for the sixteenth time, consul, father of the fatherland [*IvE* II 413.1 and 413.2].

A third inscription identifies Calvisius Ruso as the proconsul of Asia and the donor of the fountain (*IvE* II 419). It also states that the water line was brought into the city during his proconsulship (Longfellow 2011, 64; Scherrer 2006, 48-49). As with the Hydrekdocheion of

Laecanius Bassus, the dedicatory inscriptions associated with the Fountain of Domitian were written only in Greek.

The architectural arrangement and sculptural display of the fountain itself are highly unusual for its time and place in Asia Minor. The large apsidal settling basin (approx. 3.5 m x 9.5 m) was framed by an arch supported by pillars decorated with acanthus leaves (Fig. 3.21) (Dorl-Klingenschmid 2001, 184-185 no. 22; Scherrer 2000, 90 no. 28). The apsidal settling basin of the Fountain of Domitian was only the second such in the Ephesian cityscape (after the highly Roman-influenced Memmius Monument) (Longfellow 2011, 67).[29] The settling basin is closed off by a high parapet, and water was thus gathered from a smaller retrieval basin resting on the third step of the krepidoma. Water would likely have flowed from the apsidal settling basin into the retrieval basin below through small holes in the orthostats (Longfellow 2011, 66-67).

The sculptural program of the Fountain of Domitian depicts the Homeric story of Odysseus offering wine to the giant Polyphemos (Fig. 3.22, Selçuk Museum nos. 1093, 1557-7562; Aurenhammer 1990, 168-173). The statuary group was displayed on a podium located along the apsidal wall of the fountain and was arranged at a height that required the viewer to look upward into the shadows created by the domed roof (Longfellow 2011, 69-69). In the center of the group Polyphemos sits on a rock and reaches out for the cup offered by Odysseus. Sprawled across the lap of the giant is the disemboweled body of one of Odysseus' dead companions, and two more lie fallen at his feet. Following behind Odysseus are two more companions, one dragging a bloated wine skin and the other reaching for it. Opposite Polyphemos a man drags the stake that will be used to blind the Cyclops. Key places in narrative were accentuated by means of the water flowing through the composition; for example, lead pipes were located in the shoulder of

[29] The fountain associated with the Demeter Sanctuary at Pergamon was also constructed with an apsidal settling basin (Bohtz 1981, 15-16; Dorl-Klingenschmid 2001, 224-224, Kat. nr. 81). The dating of the Pergamene fountain is inconclusive and therefore makes it difficult to determine whether there were mutual spheres of influence operating on the choice to build fountains with clear Italian architectural precedents. See also Chapter 5.

Odysseus, in the wine sack, and at the feet of one of the two dead companions. Thus the water was transformed into the wine offered to the giant and the blood flowing from the wounds of the dead (Dorl-Klingenschmid 2001, 185; Longfellow 2011, 68-71).

Longfellow (2011, 72-76) argues that the statuary program of the Fountain of Domitian was influenced by Italian trends in villa architecture, and therefore declared that the donor Ruso was within the emperor's close circle. The vast majority of instances in which this mythic statuary group appears are from imperial residences, including those of Claudius, Nero and Domitian.[30] She suggests that Ruso chose the Polyphemos group to decorate his civic fountain dedicated to Domitian because he was aware of the scene's meaning in the context of imperial residences. Further, Longfellow suggests that, in addition to this imperially-charged imagery, there were minor additions to the composition that evoked Ephesian meanings. For example, the shafts of the pillars along the façade are adorned with acanthus vines. Among the vines are mythological scenes depicting gods that were significant for the Ephesian pantheon, such as Eros (associated with Aphrodite) and Actaeon (connected to the city's patron deity, Artemis). These additions are so small, however, that they probably would not have been readily perceived. That the fountain of Domitian did not have any significant architectural or iconographic parallels in the Ephesian cityscape (or Asia Minor) suggests that, at the very least, it would have been considered different, and possibly that its Italian influences were easily identified. It is possible, moreover, that a connection to Ephesos, its traditions and its urban landscape, was made through an apsidal basin similar to the one attached to the Memmius Monument, and more generally through association between civic hero and water created by this fountain.

Given this fountain was dedicated by the proconsul of Asia to the emperor who awarded Ephesos with its first *neokoros*, and given that the *neokoros* was a significant moment in the trajectory of Ephesos, it is possible that – through the associations engendered through fountain

[30] Examples include the grotto at Sperlonga, the Villa of Claudius at Baiae, the Ninfeo Bergantino in Domitian's villa at Castelgandolfo, and later in the Serapeum in the Villa of Hadrian at Tivoli.

architecture – Domitian was subtly hailed here as another founder of the city in the tradition of Androklos. The new aqueduct, its terminus at the so-called Föntane, and the Fountain of Domitian are the only civic infrastructures known to have been donated by C. Calvisius Ruso, suggesting that his civic benefaction was limited to increasing the hydraulic infrastructure of Ephesos.

Neither C. Laecanius Bassus who constructed a monumental Hydrekdocheion nor Ruso had any identifiable ties to the region, and both men significantly increased Ephesos' hydraulic network during or immediately following their tenure as proconsul of Asia. In this, there are several points worth mentioning. The first is that there seems to be a pattern for civic benefaction at Ephesos connected to the attainment of the proconsulship of Asia. Further, at least in the two cases discussed here, there seems to be a further focus on water – either increasing the amount of water being delivered to the city (as with the New Marnas Aqueduct of Ruso), or with increasing the outlets from which water could be publicly accessed (the Hydrekdocheion of Laecanius Bassus and the Fountain of Domitian). Both of the infrastructural monuments dedicated by these proconsuls conveyed their dedicatory inscriptions only in Greek, as opposed to the earlier fountains that carried bilingual inscriptions.

Bassus introduced monumental façade nymphaea to Asia Minor, and Ruso dedicated the first fountain to an emperor. However, although the fountain to Domitian was dedicated to the emperor, there were no iconographic depictions of Domitian incorporated into its sculptural program. Discussion will now move to the significant benefactions by T. Claudius Aristion; benefactions that incorporated the monumentality of the Hydrekdocheion of Laecanius Bassus and the honorific nature of the Fountain of Domitian.

T. Claudius Aristion and his Program of Water

Under the emperor Trajan, one high-ranking municipal official, T. Claudius Aristion (and his wife Julia Lydia Laterane), was responsible for the construction of several buildings, paid for out of his own funds. In particular, Aristion and his wife sponsored the construction of a new water line, the so-called Aristion Aqueduct, and two monumental fountain buildings, the fountain on the road to the Magnesian Gate, the so-called Strassenbrunnen and the Hydrekdocheion of Trajan[31] (Fig 3.2, nos. 10 and 11) (Dorl-Klingenschmid 2001, 187-189; Longfellow 2011, 77-95; Quatember 2006; 2007; 2008a; 2008b), thus creating a program of civic benefaction that centered on the provision and distribution of water. Relatively contemporaneous and similar in architectural arrangement, both fountains were probably meant to be readily recognizable, programmatic expressions of Aristion's generosity that employed local imagery while simultaneously expressing his loyalty to the emperor.

Aristion and Laterane were exceptionally active in the administrative and sacred spheres of Ephesos and their positions can be reconstructed through the extensive epigraphic record (Scherrer 1997; 2006; Sherwin-White 1966, 392-93; Thür 1995a, 184-85; cf. Friesen 1993, 45-47). For this reason, it is possible to recreate the progression of their political careers, their social connections, and their civic benefactions to a much higher degree than is possible for the other civic benefactors discussed in this chapter. Inscriptions name Aristion as the individual connected both to the building and equipping of the Harbor Baths (Keil 1964, 74-82; Scherrer 1997, 117-119; Thür 1995a, 185) and its associated gymnasium. Aristion is named as a *prytanis* (the eponymous office of Ephesos) in an inscription in the "Imperial Hall" in this complex, suggesting that perhaps he also financed the hall in the Harbor Baths. Based on the timing during which he filled specific civic offices, it is also possible to relate him to the building of the monumental temple complex for the emperor Domitian (Thür 1995a, 185).

Like many of the leading Greek families of Asia Minor, Aristion and his family received citizenship from Claudius or Nero (Sherwin-White 1966, 392-93). Unlike the other significant

[31] This fountain is most often referred to as the Fountain of Trajan or the Nymphaeum of Trajan. However, following Longfellow (2011), here it will be referred to as the Hydrekdocheion of Trajan because the dedicatory inscription identifies it as such: as a 'ὑδρεκδοχῖον.'

civic donors discussed in this chapter so far who were closely connected to Rome and the west, Aristion and his wife were probably native Anatolians who rose through the ranks in the local municipal government. In 88/89 and 90/91 CE Aristion was *archiereus* (high priest) of the state cult and from 89 to 91 he was *neokoros* (temple warden). In 92/93 he held the top urban office of *grammateus* (secretary of the people's council), during which time he was connected to the construction of the Harbor Baths. The inscription on the Hydrekdocheion of Trajan names Aristion as three-times *asiarches* (high priest of the provincial imperial cult), whereas the Fountain near the Magnesian Gate calls him *archiereus* of Asia. The term *archiereus* refers to the high priest of either the provincial or local imperial cult, so the insertion of the modifier "of Asia" indicates that the terms *asiarches* and *archiereus* here are being used interchangeably, and the two terms refer to the same office: high priest of the provincial imperial cult (Longfellow 2011, 80). Aristion is known not only from numerous Ephesian honorary and building inscriptions,[32] but also from a letter written by Pliny the Younger, who was assessor to a lawsuit against this notable Ephesian (Plin. *Ep.* 6.31.3). With this long list of civic service and extensive outlay of personal funds for civic construction, it is no wonder that Pliny refers to Aristion as "*princeps Ephesiorum, homo munificus et innoxie popularis*" (first of the Ephesians, a generous man and blamelessly popular).[33]

Julia Lydia Laterane, the wife of Aristion, also had an active civic life and was the recipient of high civic honors. The dedicatory inscriptions on both the Hydrekdocheion of Trajan and the Fountain near the Magnesian Gate name her as *prytanis* and *archiereas* and daughter of Asia. Both the *prytania* and *archiereia* were positions that were renewed annually and could be held over the course of many years. The prytania was the eponymous office of Ephesos which required

[32] *IvE* II 234, 235, 239, 424, 424a, 425, 425a, 461, 508; *IvE* V 1489; *IvE* VII 5101, 5113.

[33] Aristion, however, was not popular with everyone. The reason Pliny wrote about Aristion is because, as mentioned above, Pliny was serving as the assessor in a law suit against him. Aristion had been cited before the Emperor Trajan in Centumcellae (Civitavecchia) by people who accused him of abusing the people's benevolence (Thür 1995a, 184).

religious duties throughout the year, including participation in and funding of civic sacrifices and banquets connected with religious events. The position of *archiereia*, or high priestess of the imperial cult, was usually held by women who had already served as *prytanis* or as priestess of Artemis (Longfellow 2011, 80-81; Van Bremen 1996, 316-22).[34]

As asiarch, T. Claudius Aristion and his wife Julia Lydia Laterane sponsored the construction of a new aqueduct in Ephesos.[35] The water line terminated at a monumental civic fountain, the Hydrekdocheion of Trajan, on which the dedicatory inscription makes specific mention of the 210 *stadia* (*c*. 32 km) long supply-conduit that delivered the water. This new water-line originated northeast of Ephesos at the Kuçuk Menderes River near the modern village of Büyükkale and extends approximately 20 miles to the city (Longfellow 2011, 77; Quatember 2006, 73; Scherrer 2006, 53-56, no. 6; Wiplinger 2006b). This new aqueduct joined three existing lines: the Aqua Julia sponsored by Augustus, the Aqua Throessitica jointly sponsored by Augustus and Tiberius, and the New Marnas Aqueduct probably sponsored by Domitian and brought into the city by P. Calvisius Ruso (Longfellow 2011, 77; Scherrer 2006; Wiplinger 2006b). Public building projects of such magnitude needed the explicit approval of the emperor; however, outside of Ephesos hydraulic projects such as this were infrequently dedicated to the emperor himself (Longfellow 2011, 77).[36]

The new water-line terminated at the monumental Hydrekdocheion of Trajan. A building inscription and two inscribed statue bases are associated with the original installation of the

[34] Through analysis of the epigraphic record, Van Bremen (1996) has shown that the *prytania* and the priesthood of Artemis were the two most common offices held by women in Ephesos.

[35] Although Julia Lydia Laterane was named on the dedicatory inscription, the use of third-person singular verbs ('he' as opposed to the third-person plural 'they') and the phrase "with his wife" ([με]τὰ… τῆ[ς γυναικός]) indicate Aristion alone paid for the aqueduct and terminal fountain. This formula, where the husband is named as the primary benefactor and the wife is a secondary associate of the project is the most common way that wives are identified with building projects in Ephesos (Longfellow 2011, 78-79; Van Bremen 1996, 289).

[36] In contrast, the Fountain of Domitian, paid for by C. Calvisius Ruso, which was dedicated both to Ephesian Artemis and to the Emperor Domitian, constructed a few decades before the Fountain of Trajan (Longfellow 2011, 62-76).

fountain. The building inscription is preserved on the frieze in the entablature above the first story. As outlined above, the building inscription mentions Aristion and Julia Lydia Laterane and their offices, and dedicates the fountain to the emperor, Artemis and the Fatherland:

> [Ἀ]ρτέμιδι Ἑφ[ε]σίᾳ κα[ὶ] Αὐ[τοκράτορι] Νέρυᾳ Τραιανῷ Κα]ίσα[ρι Σεβαστ]ῷι Γερμ[ανικ]ῷ Δακικῷι καὶ τῇ πατρίδι Κλαύδιος Ἀριστίων τρὶς ἀσιάρχης καὶ νεοκό[ρος] | [με]τὰ Ἰυλίας Λυδίας Λα[τερνῆς – ίλ]λης τῆς γυναικός] θυγα[τ]ρὸς Ἀσίας, αρχιε[ρείας καὶ πρυτά]νεως [ ] ὕδωρ [εἰς]αγαγὼν δί οὗ κ[ατεσκεύασεν ὀχ]ετοῦ διακοσίν καὶ δέκα σταδίων καὶ τὸ ὑδρεκδοχῖον σὺν παντὶ τῷ κόσμῳ ἀνέθηκεν ἐκ τῶν ἰδί[ων]
>
> Claudius Aristion, thrice *asiarch* and *neokoros*, with his wife, Julia Lydia Laterane,…ille, daughter of Asia, archiereia and prytanis, he dedicated the [-] water, having brought it 210 stades through the water conduit he constructed, and the Hydrekdocheion, with all of its decoration, at his own expense, to Ephesian Artemis and to the Emperor Nerva Trajan Caesar Augustus Germanicus Dacius and to the Fatherland [*vE* II 424]

Based on the imperial titulature, the fountain was dedicated between 102 (when Trajan adopted the victory title "Dacius") and 114 CE (when he adopted the victory title "Parthicus" and the title "optimus"), both of which are absent from the dedication (Fig. 3.23). The dedication also makes explicit that Aristion funded this expensive project with his own money (ἐκ τῶν ἰδίων), rather than donating it as payment for a priesthood or public office (Longfellow 2011, 79). The so-called Fountain near the Magnesian Gate or the 'Strassenbrunnen' is also attributed to Aristion and Julia Lydia Laterane by an inscription on the architrave block. The dedication reads:

> [Ἀρτέμιδι Ἑφεσίᾳ καὶ Αὐτοκράτορι Νέρυᾳ Τραιανῷ Καίσα]ρι Σεβαστῷ Γ[ερμανικῷ] Δακικῷ καὶ τῷ δ[ή]μῳ Ἑφεσίων Τιβ. [Κλαύδιος Ἀριστίων αρχιερεὺς] τῆς Ἀσίας καὶ νεοκόρος μετὰ Ἰυλίας Λυδίας Λατερνῆς αρχιερείας καὶ θυγατρὸς Ἀσίας [σὺν παντὶ] τῷ κόσμῳ
>
> Tiberius Claudius Aristion, high priest of Asia and *neokoros*, with his wife, Julia Lydia Laterane, archiereia and daughter of Asia, [dedicated this monument] with all of its decoration, to the Ephesian Artemis, to the Emperor Nerva Trajan Caesar Augustus Germanicus Dacicus and to the demos of Ephesos [*IvE* II 424a]

The imperial titulature and Aristion's titles suggest that the Fountain near the Magensian Gate may have been dedicated contemporaneously with the Fountain of Trajan, and the similarity in ground plan certainly signal that both fountains were part of the same architectural program (Fig. 3.24). However, it was almost definitely not fed by Aristion's new aqueduct on account of its location at the east side of the city. Instead, this fountain was probably fed by the Marnas or

Throessitica Aqueduct which approached the city from the southeast (Longfellow 2011, 80; Quatember 2008, 255). Indeed, Aristion not only constructed an entirely new aqueduct, but also expanded the pre-existing hydraulic network through the extension of an older line to a new terminal point. It is possible that these fountains, along with the new aqueduct, were constructed to coincide with Trajan's visit to Ephesos in 113 CE while the emperor was *en route* to fight in the Parthian War (Scherrer 2006, 55). Regardless of any specific impetus or motivation, Aristion created a program of civic benefaction that centered on the provision of water and that made a clear claim about the necessity of water for the public good, the role of the individual who supplied the water as a civic benefactor. Moreover, as argued by Longfellow (2011, 86-87), the sculptural program declared the emperor Trajan to be the ultimate patron and placed him at the center of the civic and mythological landscape of Ephesos.

The pi-shaped Hydrekdocheion of Trajan was located on the Embolos, one of the major thoroughfares in the city running between the heavily-trafficked State Agora and the market district (Fig. 3.1, no. 38). The fountain, therefore, would have been frequently encountered in circumstances both secular and sacred, as the Embolos served as part of the main processional route within the city. It would have been difficult not to notice this monumental façade fountain with its base stretching 17 m long, particularly because the retrieval basin projected out into the street.

Mimicking the *scenae frons* of theater architecture in the style of the Hydrekdocheion of C. Laecanius Bassus, the Hydrekdocheion of Trajan combined water, architecture and statuary in a theatrical expression (Fig. 3.25; Fig. 3.26). The back wall of the fountain was formed by a two-storied aedicula, topped by a triangular pediment, which framed the space above which the water flowed. Water first entered a settling basin (11.90 m x 5.20 m), and then flowed into a smaller draw basin (17 m x 0.90 m) from which the people of Ephesos could have access to the fresh, flowing water (Dorl-Klingenschmid 2001, 188; Quatember 2006, 73-76). The lower story was divided into five niches which were framed by columns with composite capitals. The entablature carried by the columns was broken in the center by a two-story niche, with a wider intercolumniation than the other niches, in which a colossal statue of Trajan was placed.

A surviving statue plinth with a globe and a bare right foot reads, 'The Emperor Caesar Nerva Sebastos Germanicos Dacius, son of a god' (Longfellow 2011; Miltner 1959, 328; Ng 2007). In addition to the inscribed plinth, a now-lost fragment of a bare chest is all that survives of the imperial portrait. The statue of Trajan has been reconstructed as being twice-life-sized and heroically nude with a mantle slung over his left shoulder. The globe and Trajan's bare feet are features that invoke both his divinity and his influence over the known world. The fountain has been reconstructed with this statue occupying the two-story niche in the center of the back wall – the center of attention in this water theater.

Water gushed into the large central basin beneath the feet of the emperor Trajan, whose statue was positioned in the center of the back wall. Analysis of the hydraulic management and delivery system by Ursula Quatember (2006, 74–76; Quatember *et al*. 2008) has identified the location at the back of the fountain where the water conduit met with the building. A pipe system carried water from the main channel of the aqueduct to openings in the back wall of the fountain. The majority of the water supplied by Aristion and Laternae's aqueduct entered the basin through an opening beneath the central niche. Thus, water flowed from beneath the divine feet of Trajan, suggesting that he had power over both man and nature (Longfellow 2011). Quatember suggests that a low wall, which acted as a dam, would have provided sufficient hydrostatic pressure to push the water to the level of the pedestals on which statues rested, giving the impression that they walked on water. Other than the colossus of Trajan, no sculpture can be assigned to the lower story of the back wall of the façade. However, Quatember (2006, 74) has identified small openings about 25 to 30 cm above the floor level in at least three of the four *aediculae* framing the central niche in the rear wall. These openings probably housed lead pipes, which suggests that other statues were incorporated into the hydraulic display.

Various other statues of divine, imperial, and Ephesian notables occupied the surrounding *aediculae* (Aurenhammer 1990; Longfellow 2011, 89-93). In particular, a statue that has been identified as Androklos occupied the central *aedicula* in the lower story of the western lateral façade (Fig. 3.27). A pendant to the emperor, the statue of Androklos was centrally positioned in the sculptural program.[37] Like Trajan, this fragmentary sculpture is depicted in heroic nudity with a *chlamys* around his shoulders. Use of a flowing *chlamys* to indicate the movement of Androklos in hot pursuit of the boar was a popular iconographic device in other representations of this myth, such as those on the Heroon of Androklos, the so-called Temple to Hadrian, and coins from the reign of Marcus Aurelius. Of the surviving statues from the Hydrekdocheion of Trajan, only the statue of the emperor and the statue of the mythological founder of the city are depicted in heroic nudity, suggesting a further association between them.[38] From the extant evidence it is unclear whether there was a water outlet below the statue of Androklos. However, the association between Androklos and the water of the Hypelaian Spring had a deep resonance within the Ephesian cityscape.[39] Indeed, the position of the statue of Androklos over an open basin of water may have recalled the arrangement of the Heroon of Androklos located further down the Embolos. Moreover, the placement of the Androklos statue on the western lateral façade created a relationship through sightlines between this fountain and that dedicated to the mythological founder of the city. Upon approaching the Hydrekdocheion from the east, the viewer would have been facing the statue of Androklos while the Heroon of Androklos would have been visible (or

[37] This arrangement in which the emperor is placed together with the hero of the city and in the company of the gods was also replicated at Miletos with a statue of the emperor Trajan (Glaser 2000a, 443-445).

[38] Although the only heroically nude sculptures, the statues of Trajan and Androklos were not, however, the only plainly nude statues. Of the surviving sculptures, a statue of Bacchus (Selçuk Museum no. 769) was also represented without clothes.

[39] An explicit connection was made between Androklos, water and a civic 'hero' in the second century CE Baths of Vedius. In the so-called Marble Hall, a statue of Androklos was placed alongside a portrait statue of the benefactor, Vedius Antoninus, and a statue base of Androklos was excavated from in front of the baths (Aurenhammer 1990; Longfellow 2011, 90).

nearly visible) at the base of the hill. Adding further symbolic charge to this connection, this is the direction from which the fountain would have been approached during civic and ritual processions.[40]

The donors of the monument may have also included portraits of themselves within the statuary display (Longfellow 2011, 90-91). A female portrait statue with a Trajanic hairstyle has been tentatively identified as Julia Lydia Laterane (Fig. 3.28a, Selçuk Museum no. 1404). The statue flanked a figure of Dionysos, which was located in the lower story of the eastern lateral wing and directly opposite the statue of Androklos. Balancing the statue of Laterane would have been a complementary statue of her husband and donor, Aristion. The only possible candidate is the headless statue that wears a Greek *himation* without a tunic (Fig. 3.28b, Selçuk Museum 1403). This costume, typically worn by civic elders and philosophers, conveys a sense of tradition.

The hydraulic program sponsored by Aristion and Laterane employed water, architecture, and sculpture in a theatrical display that celebrated both the emperor and the city's heroic founder (among other notable gods and Ephesians) – both embracing the imperial present and commemorating its gloried past. Through a new aqueduct line, Aristion increased the quantity of water available within the Ephesian cityscape. In addition to expanding the quantity of water, the couple expanded the places within the cityscape where water could be obtained. The over-life-size statue of the emperor at the center of the composition of the Hydrekdocheion of Trajan expressed Aristion's loyalty to the empire. Including Androklos, the city's civic founder, in a place of prominence communicated an appreciation for the city's origins. Water was used as a connective compositional element, tying the statues of Ephesian gods and notables together into a comprehensive program, as they all appeared to dance on the water above the settling basin.

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[40] The civic processional route is preserved in the Salutaris dedication from 104 CE (Rogers 1991).

Including their portrait statues within the composition, Aristion and Laterane claimed a place for themselves within the divine hierarchy.

Conclusion: Imperial Influences and Local Meanings

This chapter examined the presence of water in the civic sphere, investigating its local and imperial meanings, and the polyvalent social relationships materialized through its provision. By the Roman imperial period, water had long been used as political currency throughout the Mediterranean. As an expression of civic concern, Greek tyrants constructed fountain houses to protect the civic water supply. At Ephesos, the discovery and supply of water by the civic founder, Androklos, was an integral piece of their foundation myth. Drawing on these precedents, the individuals who provided water to Ephesos in the Roman imperial period made claims about their particular civic status, or that of the emperor. As I have argued here, these claims signaled a connection between the provision of water and the status of the benefactor as a civic hero.

The development of Ephesos' hydroscape was clearly connected to Rome – both through a close temporal association between the donation of hydraulic infrastructure and significant geopolitical events, and through the benefaction by individuals closely associated with Roman imperial and provincial administration. For example, after Augustus named Ephesos the capital of the province of Asia, along with Tiberius he sponsored the construction of two new long-distance water-lines. Associated with the benefaction of Augustus, C. Sextililus Pollio built a monumental aqueduct bridge and terminal fountain for the new aqueduct. However, while Pollio's project was clearly connected to Augustus and Rome, the architectural arrangement the terminal fountain recalled local precedents and served to connect Pollio to the local civic founder. Similarly, after Ephesos was given its first *neokoros* during the reign of Domitian, the proconsul Ruso donated a new pipeline and two terminal fountains which he dedicated to the emperor; signaling the role of Domitian in "re-founding" the city as the center of the imperial cult. Such hydraulic displays would not have been possible without Roman technological innovations and the political stability that accompanied Roman rule in the region; providing the proper circumstances for the development of hydraulic infrastructure and display that are considered to be the hallmark of Roman cities. Moreover, the development of long-distance, high-pressure pipelines both increased the availability water and the opportunities for monumental hydraulic display, providing more opportunities for civic donors to express their generosity through this medium.

However, the connection between the development of hydraulic infrastructure under the Roman Empire and the influence of Rome is a connection that many previous studies on public hydraulic infrastructure have tended to take for granted. Tracing the development of the civic hydraulic network at Ephesos and interrogating the specific relationships between the donor and the city, the donor and Rome, and the architectural and sculptural arrangement provides a means with which to address the nuances of the meanings of water within the civic sphere. Taking as a foundation the meanings and associations engendered by water that were specific to Ephesos, a deeper understanding both of particular architectural and iconographic choices and of the further significance of water emerges.

CHAPTER 3

FIGURES

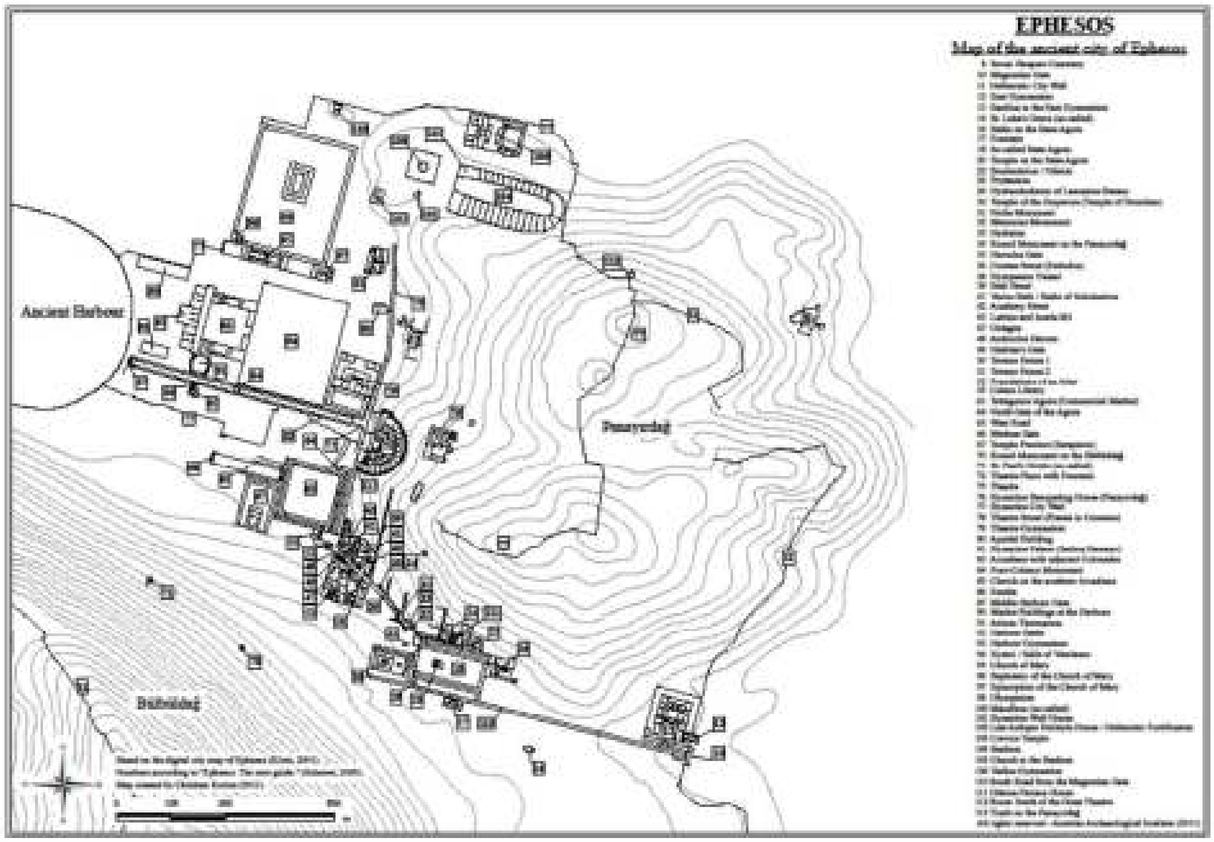

Fig 3.1 Ephesos city plan (image courtesy of the the Österreichisches Archäologisches Institut)

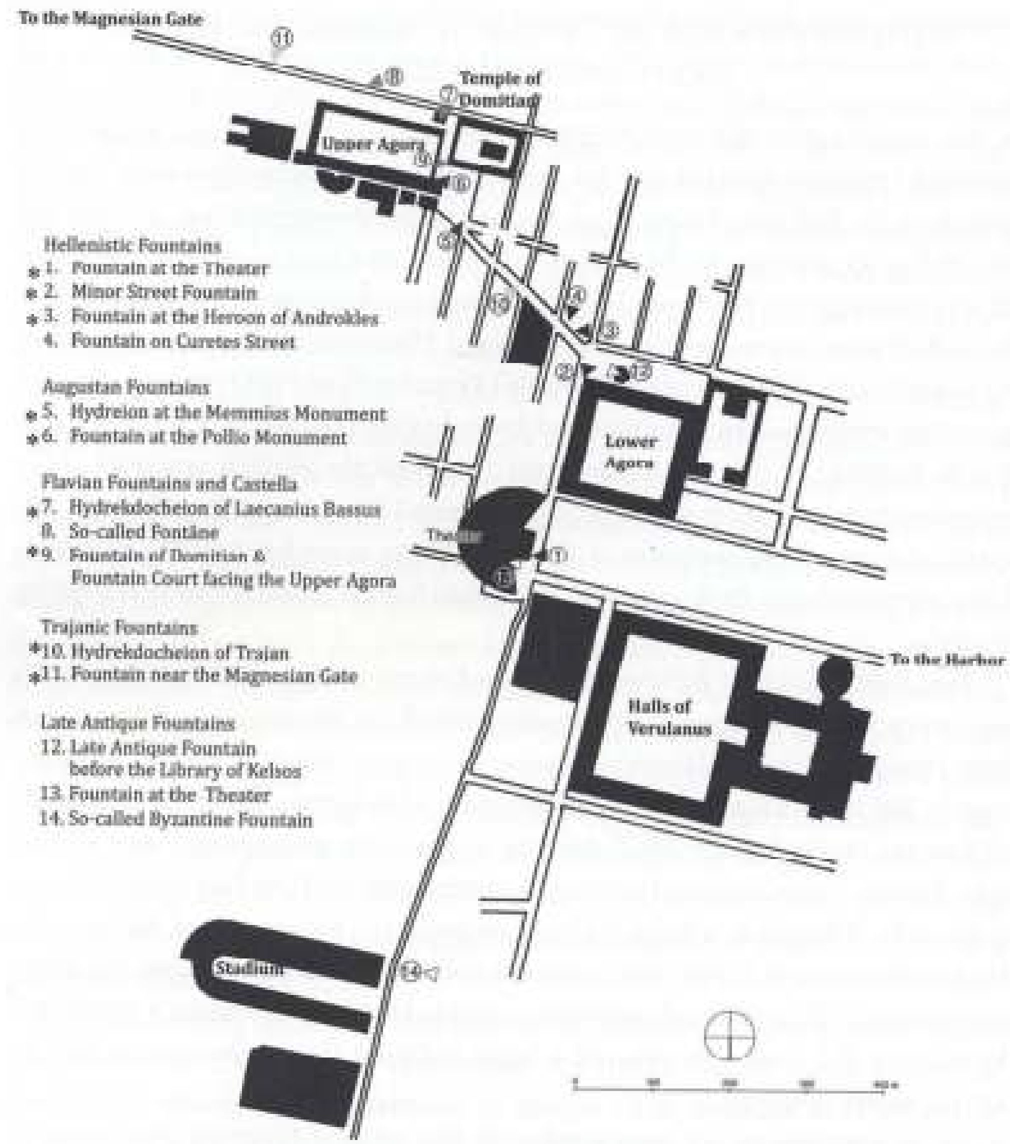

Fig. 3.2. Ephesos city plan with civic fountains indicated, those discussed in the text are marked with a * (after Dorl-Klingenschmid 2001, Abb. 85a)

Fig. 3.3 Hellenistic Fountain House near the Great Theater, Ephesos (author photo)

Fig. 3.4 Hellenistic Fountain House in front of Terrace House 2, Ephesos (author photo)

Fig. 3.5 Street view with remains of Hellenistic monuments (author photo)

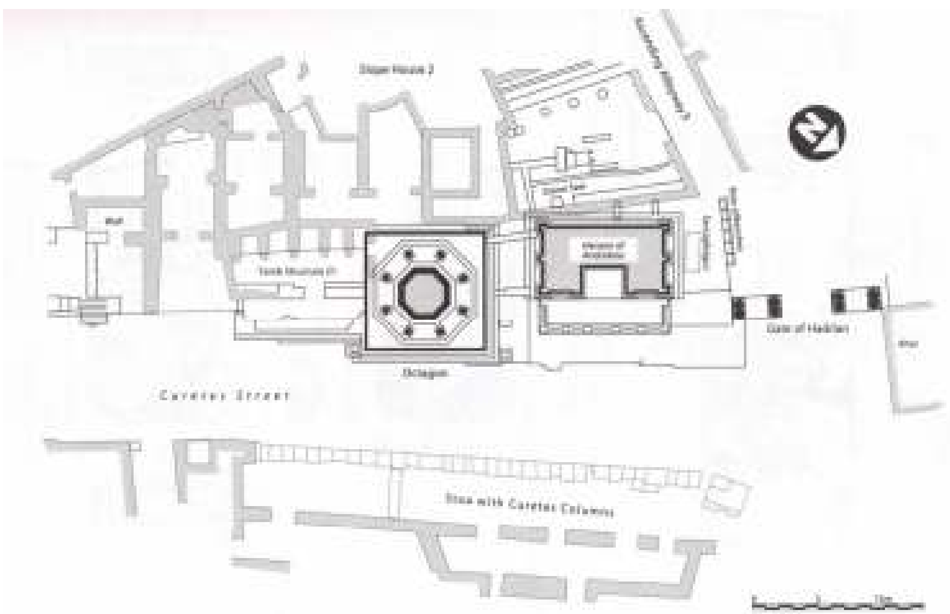

Fig. 3.6 Location of the Heroon of Androklos within the cityscape of Ephesos (after Thür 1995a, Fig.5)

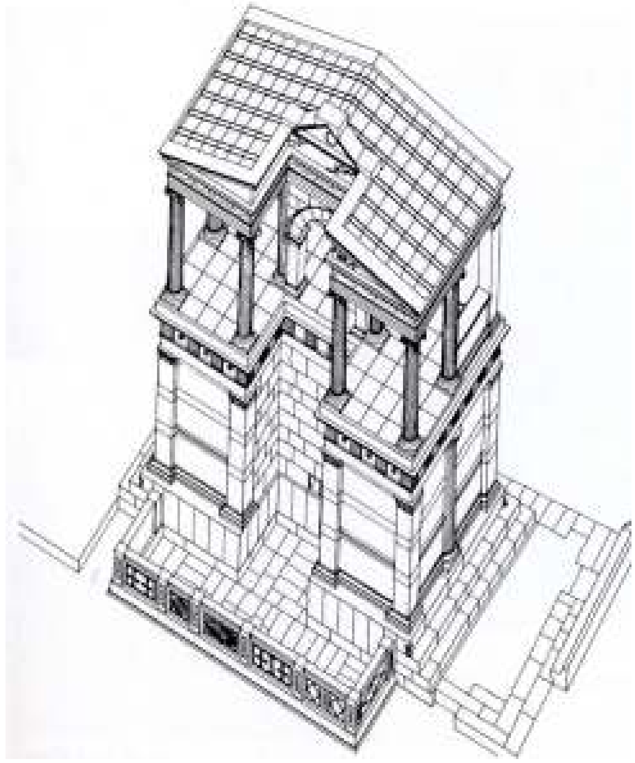

Fig. 3.7 Reconstruction of the Heroon of Androklos, Ephesos (second-first century BCE) (after Thür 1995, Abb. 16)

Fig. 3.8 Water Channel through the Heroon of Androklos (author photo)

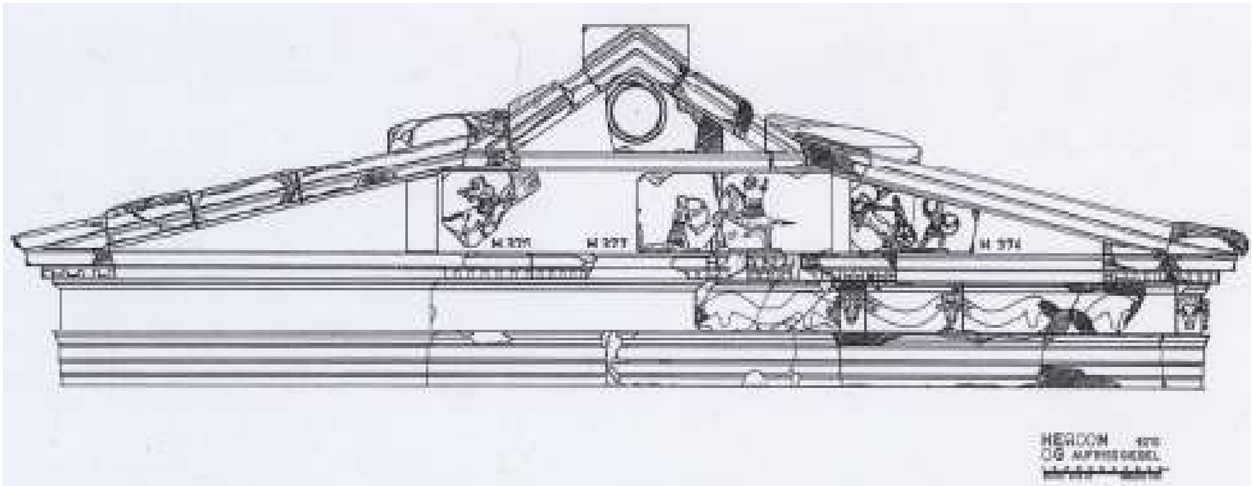

Fig. 3.9 Reconstruction of the Pediment and Decorative Frieze from the Heroon of Androklos, Ephesos. Androklos on horseback (panel H375) (after Thür 1995b, Abb. 17)

Fig. 3.10 Pollio Aqueduct Bridge, Ephesos (Augustan, 27 BCE – 14 CE) (author photo)

Fig. 3.11 Pollio Aqudeuct Bridge (above) and detail of dedicatory inscription (below) (author photo)

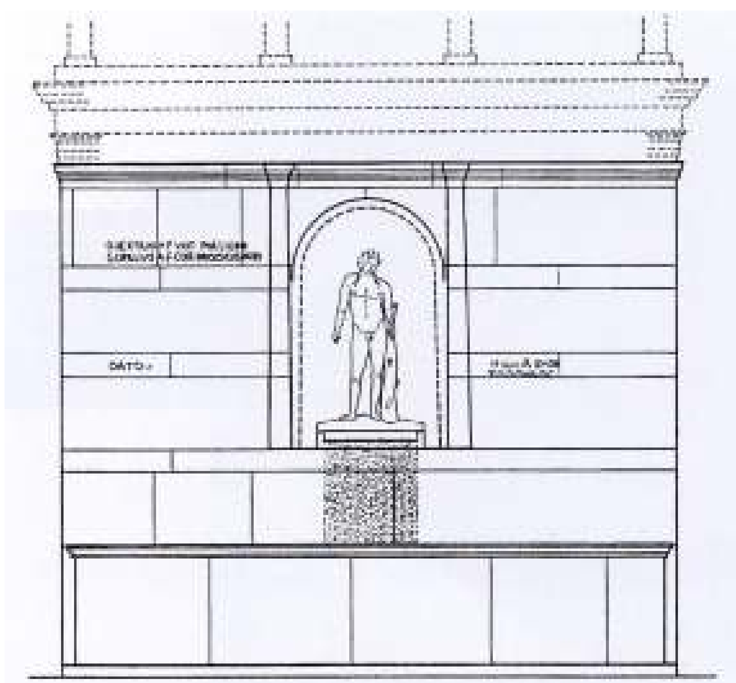

Fig. 3.12 Reconstruction of the Pollio Building in Ephesos (Augustan, 27 BCE – 14 CE) (after Thür 1997, Abb. 28)

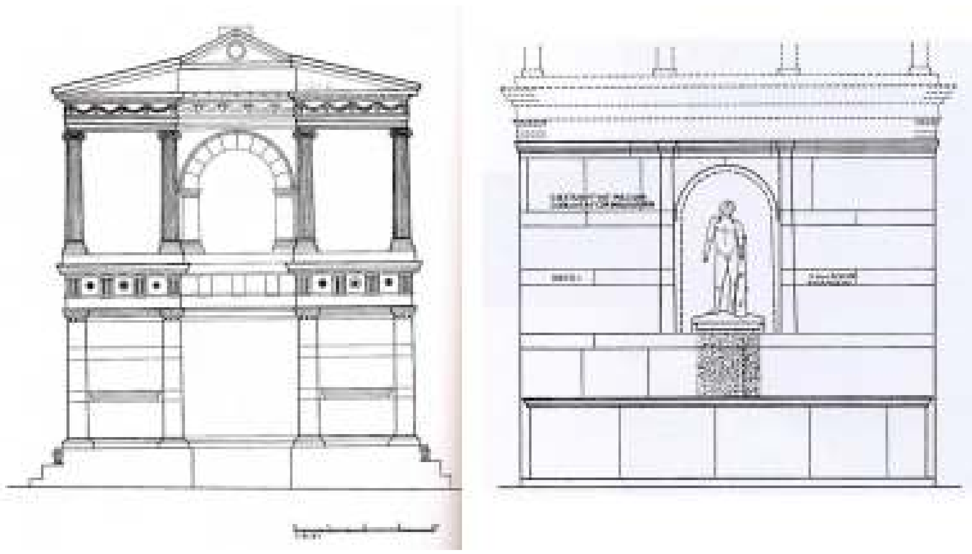

Fig. 3.13 Reconstruction of the Heroon of Androklos (left) (after Thür 1995a, Fig. 4) and Reconstruction of the Pollio Building (right) (after Thür 1997, Abb. 28)

Fig. 3.14 Reconstruction of the Memmius Monument in Ephesos (Augustan, 27 BCE – 14 CE) (after Outschar 1990, Abb. 13)

Fig. 3.15 Hypaethral basin added to the west side of the Memmius Monument, Ephesos (author photo)

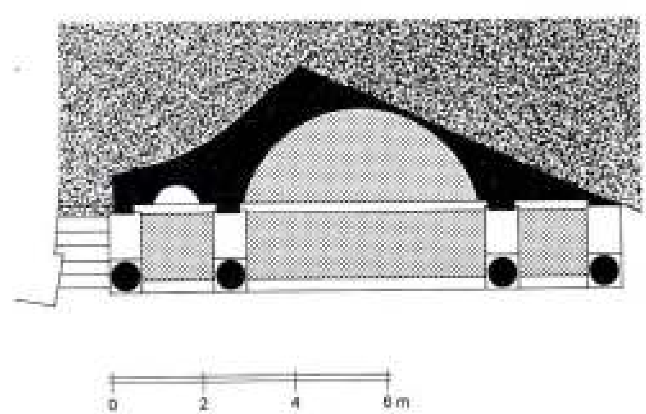

Fig. 3.16 Ground plan of the apsidal fountain of the Memmius Monument, Ephesos (after Dorl-Klingenschmid 2001, Abb. 112a)

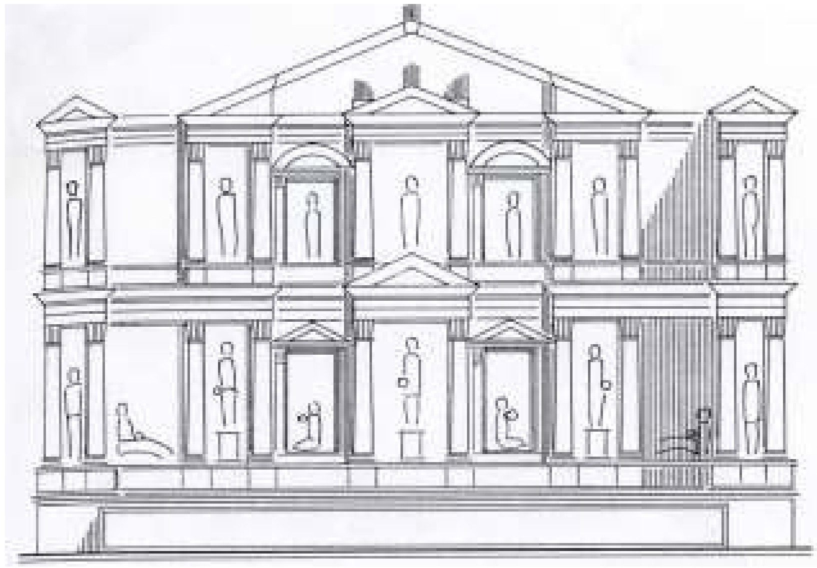

Fig. 3.17 Reconstruction of Hydrekdocheion of C. Laecanius Bassus (80-82 CE) (after Foessel and Langmann 1972-5, Abb. 5)

Fig. 3.18 Tritons and Satyrs from the Hydrekdocheion of C. Laecanius Bassus (Selçuk Museum nos. 1576, 1577, 1578, 1579) (author photo)

Fig. 3.19 Domitianic coins depicting the Marnas and Klaseas Rivers (after Karweise 2006, Abb. 1 and 2)

Fig. 3.20 Pollio Building (a) and Fountain of Domitian (b), Ephesos (author photo)

Fig. 3.21 Fountain of Domitian, Ephesos (92/93 CE) (author photo)

Fig. 3.22 Sculptural program of the Fountain of Domitian, Ephesos (Selçuk Museum nos. 1093, 1557-7562) (author photo)

Fig. 3.23 Dedicatory inscription from the Hydrekdocheion of Trajan, Ephesos (detail) (author photo)

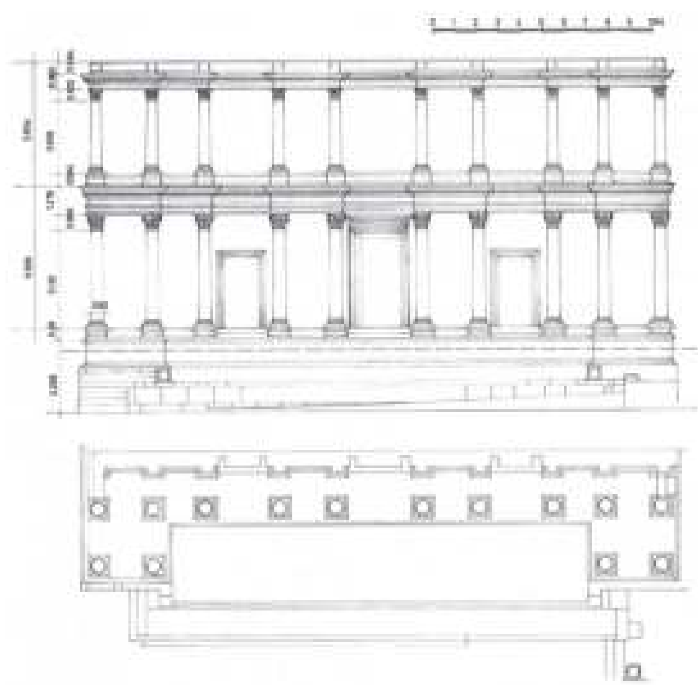

Fig. 3.24 Ground plan and reconstruction of the fountain near the Magnesian Gate, Ephesos (102-114 CE) (after Longfellow 2011, Fig. 27)

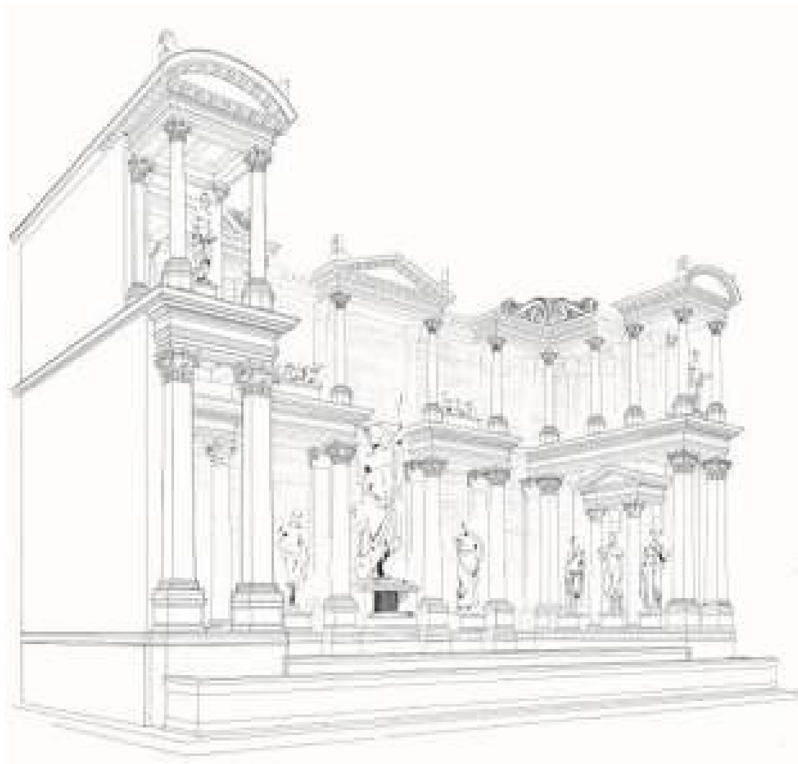

Fig. 3.25 Reconstruction of Hydrekdocheion of Trajan, Ephesos (102-114 CE) (image courtesy of the Österreichisches Archäologisches Institut)

Fig. 3.26 Hydrekdocheion of Trajan, Ephesos (author photo)

Fig. 3.27 Androklos as Hunter sculpture from the Hydrekdocheion of Trajan, Ephesos (Selçuk Museum no. 773/1-2) (author photo)

(a) (b)

Fig. 3.28 (a) Trajanic female statue found in the east wing of the Hydrekdocheion of Trajan (Selçuk Museum no. 1404), (b) Male statue from the Hydrekdocheion of Trajan (Selçuk Museum no. 1403), Ephesos (author photos)

CHAPTER 4

WATER IN CRAFT PRODUCTION AND THE ECONOMY OF HIERAPOLIS AND WESTERN ASIA MINOR

This chapter investigates the evidence for water use in craft production and industry in western Asia Minor, with particular focus on the city of Hierapolis of Phrygia. In contrast to agricultural activity, for which water was recognized as an unequivocal necessity, the role of water in craft production and manufacturing has been generally underestimated. Moreover, agriculture typically represents rural use of water, while craft production involves water use in more urban environments. Thus, examination of urban craft production provides an opportunity to make a case for the significance of manufacturing activities in the ancient city. In assembling the patchy evidence for craft production and manufacturing from archaeological material, epigraphic sources and literary testimonia, a picture emerges of a productive cityscape in which water figured as a critical and central component. A principal question for this investigation is whether the influx of Roman technological advances, in particular long-distance water-lines and the utilization of hydrological power, and Roman political and legal organization influenced the constitution of production activities themselves, and/or the professional organization of craft producers. In the following chapter, I argue that there was very little impact on either in the technological or organizational arrangement of craft and manufacturing activities in Asia Minor under the Roman Empire when those activities were undertaken on a relatively small scale. However, Roman technological developments did have an effect when production was carried out on an industrial scale and when the craft and manufacture activities were necessary for the public good (e.g., grain milling and fulling); often these two factors occurred in tandem.

This chapter is divided into three major sections. The first sets the stage for an investigation of water in craft production in Asia Minor by situating this study in relation to previous scholarship on manufacturing activities and the ancient economy. This is important because past debates on the ancient economy have framed the scholarship on craft production and manufacturing, and thus influence the literature on which this case study draws. The second section delves directly into the primary case-study in this chapter, the examination of water use, craft production and industry at Hierapolis of Phrygia. There is sufficient data for craft manufacturing and production at Hierapolis to begin to answer questions about the organization of such activities with respect to the available water resources and technological advances. After training a lens on one particular city, the third section expands its scope outwards to include a general discussion of the different types of production activities that used water in their processes, and the available evidence for these activities in Asia Minor. In this third section, the disparate evidence for urban craft production and manufacturing activity and its relation to water is synthesized in order to illustrate the ubiquity of such activities. This study makes a case for the presence and importance of water in local industry and economy, argues that a significant amount of productive activity occurred in urban environments and offers a picture of a productive landscape which has heretofore been under-acknowledged for Asia Minor. Within this landscape of production, water was a central element in these activities.

Craft Production and the Ancient Economy

Water was a necessary element for most craft production in the ancient world. For example, water was employed in significant quantity for the manufacture of pottery and plaster and in paint preparation. Water was also an essential element in dyeing and cleaning textiles, cleaning raw materials in the process of ore-washing, glass-making, fish-processing, tempering metals, preparing skins, and cleaning equipment and places of production (Wilson 2000a, 127). Evidence for harnessing and utilizing the energy in moving water appears in the Roman period in the use of water's erosive power in the mining industry and in water-mills employed for a variety of purposes (e.g., milling grain, sawing stone; Wikander 2000b, 397). For many societies the only recognized archaeological evidence for the use of water for industry or craft production are the finished products whose manufacture clearly required water (for example metals, ceramics, food products, cement and plaster, textile products, etc.; Wilson 2000a, 128). It is possible to infer the prevalent use of water for industrial activities and craft-making in Greco-Roman society simply by the sheer number of products that required water during the production process (despite the lack of evidence for the means by which these items were created and the places in which they were produced). This chapter focuses on those products and activities involving water for which there is evidence for Asia Minor – namely, ceramic production, textile production, fulling, dyeing, and water milling.

Despite the ubiquitous use of water in ancient manufacturing, and an implicit understanding that this must have been the case, almost no comprehensive study has been made of the subject (Wilson 2000a). Much ink has been employed in studying artifacts from ancient cultures but little attention has been devoted to physical structures associated with craft production, the sources from which water was obtained, the ways in which the water was used, the location and organization of workshops themselves, and the relation of workshops to the broader urban environment, and the social and economic implications of craft production activities for ancient society as a whole.[1] This study addresses questions regarding water supply, such as: where was the water employed in craft or industry obtained (e.g., from rivers and springs, wells, cisterns, or piped-water supply)? Which types of activities relied on local water supply found in rivers and

[1] There are, of course, exceptions to the general dearth of scholarship on the archaeology of production. For Asia Minor, the work of Jeroen Poblome *et al*. (1998; 2000; 2001) at the sigillata manufactory at Sagalassos stands out as exemplary. Also of note are the study of fulling establishments in Pompeii an Ostia (Flohr 2003; 2006; Wilson 2003), the spatial analysis of industrial spaces at Pompeii (Robinson 2005), analysis of the supply of water to the water-mills on the Janiculum Hill in Rome (Wilson 2000b), and the investigation of spaces for textile production in Timgad (Wilson 2001).

springs or captured in cisterns and wells, and which were supplied by aqueducts? In what ways does the source of water (and other raw materials) have implications for the organization of particular activities? This study engages with questions about the prevalence of such craft and industrial activities for the local and imperial economy and, following from this, with questions about the prominence of individuals involved in craft production and industrial activities within the community. It should be noted immediately that while such a comprehensive list represents a 'best practice' scenario, this study makes an attempt at addressing as many of these issues as the evidence allows.

In the course of the exploration of the role of water in craft production, industrial activity and the ancient economy, this chapter engages with several wider debates about the ancient urban economy and the role of craft manufacturing and production from both practical and social perspectives. For decades the question of whether cities were producers or consumers has been the topic of debates on the ancient economy. On the one side, cities were held to be consumers of water resources, particularly those from aqueducts and other municipal water supplies (Hodge 2000d, 47; Kamash 2010). This perspective argued that the productive activities in the *chora* were not supported by municipal water supplies *and* that cities reaped all the benefits both through the aqueduct and the goods produced in the countryside. However, extant evidence suggests that, (1.) in several cases subsidiary lines running off a main aqueduct channel suggesting that municipal water lines also supplied agricultural production in the *chora* (Kamash 2010, 91-97), (2.) most of urban craft manufacturing and production did not into tap into these water sources at all, but rather gathered water in cisterns and wells, or utilized water from large natural bodies of water such as rivers and the ocean. For example, Kamash (2010) synthesized the role of water in the economy of the ancient Near East from the first to sixth century CE, arguing that there was a much more symbiotic relationship between urban centers and their hinterlands as it related to water supply in the Near East, and, as such, both *asty* and *chora* were economic producers. If cities were also economic producers (just producing different products), then it is necessary to consider the possibility of large-scale production and that urban water resources might be used to such an end. Conversely, despite the fact that the piped-water supply system terminated in urban environments, it is also possible that craft and production activities did not tap into it for their water needs.

While a dichotomous view of cities as either producer or consumer may thus be broken down, it remains a historiographical problem that besets this study. Although it has been convincingly established that cities contributed to the productive landscape of the ancient economy and that *asty* and *chora* existed in more of a symbiosis than in opposition (e.g., Kamash 2006; 2010; Mattingly and Salmon 2001), these debates nonetheless continue to loom large in any study on production and economy. While determination of the significance of craft production in the ancient economy is not the explicit object of this study, a concise discussion of the relative importance of manufacturing provides a background against which to talk about the economic importance of water and its role within the city.

Not only has the role of water in manufacturing been under-explored, but the role of manufacturing and craft production in the ancient economy in general has also tended to be underestimated. Trade within the Roman economy is increasingly accepted as a major mechanism for the circulation of goods and people (Levick 2004; Parkins and Smith 1998). However, the understanding of the role of craft production and industry within local economies, both inter-urban and intra-regionally, is still underdeveloped. Bringing this issue to the fore is the 2001 volume *The Productive Past: Economies Beyond Agriculture* edited by Mattingly and Salmon.[2]

[2] Wilson (2001, 272) criticizes Finley's approach on three counts. Firstly, Finley tended to establish his argument based on the economy of Attica in the fifth century BCE, and then assume it could be equally applied to the entire ancient world. However, the situation for fifth-century Athens was drastically different from that of the Roman Empire, and therefore should not be utilized as a universal model. Second, Finley recognized that the next step in the inquiry was to examine variations of (or from) the ideal type (based on fifth-century Athens), but instead used examples that reinforced the validity of the consumer city (Engels 1990) as the ideal type (Finely 1977, 305). Third, Finley largely neglected archaeological data. In addition to the conceptual problems with Finley's argument, his model is beginning to be destabilized with an exponential increase in archaeological data for urban craft production and manufacture.

Both Mattingly and Salmon (2001), and Parkins and Smith (1998) are responding to the debate about the nature and organization of ancient economies. This debate was dominated for decades by Moses Finley (1977; 1985) and A.H.M. Jones (1960), on one side, representing adherence to the argument for a ‘minimalist’ economy, which contended that agriculture was the dominant mode of production in antiquity and that, for this reason, there was little interest or motivation in developing industrial activities or craft production. In this model towns and cities were consumers drawing resources from the productive landscape. This view also assumed that the ancients made decisions about money, trade and agriculture not on the basis of economic interests, but for other reasons (Bannon 2009, 28-29). This minimalist perspective championed by Finley and Jones was a counterpoint to a ‘modernizing’ or ‘maximalist’ conception of the ancient economy, associated primarily with Rostovtzeff (1957). The ‘maximalist’ perspective contends that economic actors were rational and sought to maximize efficiency and profits akin to a contemporary capitalist economic structure. However, as Saller (2002, 252) has argued, framing the debate in terms of these two polarities both misrepresents the views of Finley and Rostovtzeff and fails to represent the full spectrum of possibilities for the ancient economy.

One of the major questions with which studies on the ancient economy are concerned is the scale of production. Mattingly and Salmon (2001) suggest that, although the majority of non-agrarian productive activity was organized in small workshops with probably ten workers or fewer, the *aggregate* production of such units could have been significant (Mattingly and Salmon 2001, 10 [original emphasis]). Following Mattingly and Salmon, Poblome (2004) sets out a framework within which to establish the contribution of both textile and pottery production to the economy of Roman Asia Minor. By identifying similar regulatory factors and production organization, Poblome makes a case for the interdependence between agricultural activity and craft production. In *Roman Working Lives and Urban Living*, Mac Mahon and Price (2005) collect a number of papers that address both the social aspects of craft and artisanal production and the evidence for the arrangement of such activities within urban environments. This collection of studies addresses the range of organizational possibilities for craft production and manufacturing within urban space.

Indeed, manufacture by relatively small units seems to have been the norm in the ancient world, which makes their recognition within the archaeological record exceptionally difficult. This has repercussions for our understanding of the role of craft production in urban environments as it raises questions about our ability to discern the presence and significance of urban manufacturing activities. By extension, this ambiguity in the archaeological record has implications for our understanding of the role of water within the productive landscape. A scant few large factories have been identified, such at the second-century milling establishment at Barbegal in Provence (Wikander 2000b, 393-394), but the vast majority of craft production took place in household-sized units. As Wilson (2001, 288) points out, when such a small workshop is excavated it is impossible to know whether it is a single unit or one of many, without excavating the surrounding *insulae*. If it were a single workshop, it could be of minor importance, but if it were one of many, the aggregate of these units could imply a significant contribution to the urban economy. This also has implications for our understanding of urban planning, and concomitantly, for the use and management of water sources for manufacturing and other activities. For example, at Pompeii workshops were interspersed within residential and commercial establishments (Robinson 2005), whereas at Timgad in Algeria the northwest portion of the city appears to have been a concentrated industrial quarter (Wilson 2001, 288).

The generally small scale of manufacturing also has implications for the quantities of water used and the methods by which it was procured. As will be discussed below, most manufacturing units were able to obtain the water necessary to produce their products by traditional and private means, such as cisterns and wells. Only in the cases of large-scale production units or significantly water-intensive activities did the water come from the piped urban water supply network. This arrangement was probably dictated in large part by the legal and financial structures that governed access to water. Under Roman governance, water was either considered private property, publicly accessible to everyone (but normally only under certain conditions), or privately held but accessed by extraneous parties through a *servitus* (Bruun 2000b, 577).[3] At least for the city of Rome, Frontinus (*Aq*. 118.2) says that rent was paid to the city for water rights, which Bruun (2000b, 589) assumes must have been provided by industrial establishments that bought the water. These different arrangements with regards to water management and overall organization have implications for our understanding of the relationship between craft production and the support of governing bodies (imperial or otherwise) for these activities.

Table 1 outlines the sites for which there is evidence for water in craft and industrial production in Asia Minor, and the variety of types of evidence found at these sites. A diverse set of evidence, such as the remains of water-related infrastructures, iconographic representations, epigraphy, literary sources, and artifact scatters etc., have here been gathered together in an effort to elucidate the role of water in craft production and the economy. While no one type of evidence on its own is sufficient to build a clear case for the prevalence of water in craft production, when all sources are considered in aggregate, a picture emerges of a productive landscape where people were significantly involved in non-agricultural activities. The productive landscape in which people were engaged in a variety of non-agricultural activities can be referred to a 'taskscape;' a term coined by Tim Ingold (1993) to convey the patterns of activity and dwelling within the landscape. Nevertheless, due to the lack of archaeologically identifiable workshops, the following discussion of production activities can only delve as deeply as the evidence allows.

With a foundation established for the role of production and manufacturing in the ancient economy, the arrangement and organization of water for craft production and manufacturing will now be addressed. Investigating craft production in the context of Hierapolis of Phrygia offers an opportunity to examine nuances in the utilization of water with different properties for specific

[3] According to Bannon (2009), a *servitus* was granted only for agricultural uses and, therefore, this method of procuring water may not apply at all to other production and manufacturing activities.

activities, the arrangement of such activities in relation to their water sources, and issues pertaining to the social lives of craft producers.

Hierapolis: 'Mistress of Nymphs, adorned by splendid springs'[4]

In order to explore the implications of industrial and craft activities that demanded water for their use, an intimate look at a single city, Hierapolis in Phrygia, allows for the exploration of water use in an example of an urban community for which craft production and industry were central. As preserved in its epigraphic record principally on funerary monuments (dating primarily to the second and third centuries CE), Hierapolis provides critical information about professional activities within its cityscape, the relative social status of the individuals involved, and the interrelations between different professional and social sectors.

Hierapolis was investigated briefly by Germans in the nineteenth century (Humann *et al*. 1898) and since 1957 by the Italian Archaeological Mission. Work at the site is currently being carried out under the direction of Francesco D'Andria. The majority of archaeological work at the site has concentrated on analysis and anastylosis (reconstruction) of the theater. In addition, geophysical surveys within Hierapolis and in the surrounding landscape have been carried out with the specific aim of uncovering evidence of cultural activity within the region (e.g., Leucci *et al*. 2002) and investigation using geophysical techniques has also been conducted on the Temple of Apollo, in order to gain a more complete understanding of the long-term phases of construction (e.g., Negri and Leucci 2006).

The extensive study and publication of the epigraphic material from Hierapolis has sparked an interest in the city's professional guilds and in craft production and manufacturing (for example, Cichorius 1898; Harland 2009; Ritti 1995; Ritti *et al*. 2007). Without the extensive and careful publication of this epigraphic material, the following analysis would not be possible.

[4] This celebratory epigram adorned the *scenae frons* of the theater at Hierapolis (Judeich 1898, no. 1; Ritti 1985, 114, no. 1).

Hierapolis provides an excellent case in which to examine questions of the role of water in craft production, the economic importance of such activities within the city, and the impact of new technological developments in water management infrastructure on their organization. The social implications of the use of water for manufacturing and craft production, and how those activities influenced social status and individual identity will also be considered. The relationships between people and professional associations preserved on the funerary monuments of Hierapolis also offer an opportunity to investigate the interconnectedness between individuals and among professional guilds. At the center of all of this craft production and industrial activity is water, without which these individuals would not have been able to carry out activities that were integral to both the economy and social organization of Hierapolis.

Historical Background and Urban Development at Hierapolis

Hierapolis is situated on a large calcareous plateau dominating the Lycus Valley. As a result of the karstic geology of the region there is an abundance of thermal springs (35-36 degrees Celsius) in the area, which emerge from extensive open fissures (Elhatip 1997, 30). The precipitation of calcium from the thermal water that runs down the side of the plateau results in the presence of the gleaming white travertine basins for which the modern city gets its name, Pamukkale, or 'Cotton Castle' (Fig. 4.1) (D'Andria 2001). Vitruvius (*De arch*. 8.3) notes that the calcareous incrustations served a practical function, being used to establish agricultural plots in gardens and vineyards. By digging trenches between plots of land, the water would be naturally channeled through these depressions. By the end of a year a calcareous crust would have formed in the depressions, creating divisions between fields.

Hierapolis of Phrygia was founded in the Hellenistic period, probably sometime during the third century BCE by the Seleukids.[5] Located at the intersection of several regions, some ancient

[5] The first historical document uncovered at Hierapolis dates to the first half of the second century BCE and names queen Apollonis of Pergamon (Ritti 1987, 28). This inscription, along with two

authors were unclear as to whether Hierapolis was located in Lydia, Caria or Phrygia (D'Andria 1987, 15). By the Roman period, however, it seems that most authors agreed that Hierapolis was located in Cibyratic Phrygia (Pliny *HN* 5.105; see also Ritti 1985, 3-6). Hierapolis was never as politically important as Pergamon or Ephesos, and was listed by Pliny (*HN* 5.105) as one of many cities in the region ranked below "most famous" Laodicea.

At the time of the city's foundation, the area was probably already sacred to the native Anatolian goddess Cybele, which both Strabo (*Geog*. 13.4.14) and Cassius Dio (63.27) connect to the area's thermal springs (D'Andria 2003; Scardozzi 2008), and several famous cults were subsequently developed in association with the city's striking natural features. Because of the karstic geology in the region and the fault line on which the city is situated, Hierapolis and its environs exhibit thermal waters and vapors seeping from the earth. The Plutonium, a fissure in the earth from which sulfurous gasses emanated, was considered to be sacred to Apollo, and had already reached significant fame by the Hellenistic period, as perhaps is reflected in the city's name: Hierapolis or 'Holy City'. The geological irregularity of Hierapolis was noted by several ancient authors (Pseudo Aristotle *De Mundo* 4.395; Strab. *Geog*. 12.8.17, 13.4.14; Pliny *HN* 2.207; Apul. *De Mundo* 17; see also Ritti 1985, 7-11) who highlighted the connection between the gasses emanating from the fissures in the earth and the oracle at Hierapolis, which was thought to be as effective as that at Delphi (Pseudo Aristotle). Although the area had long been sacred to Cybele (probably stemming from native Phrygian traditions of mother-goddess worship), the importance of Apollo eclipsed the native goddess, and Apollo Archegetes (Apollo the Founder) was designated Hierapolis' patron deity (Ng 2007, 100).

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portraits of the Attalid dynasts Attalos and Eumenes that were incorporated into the sculptural program of the Roman-period theater, were used as evidence to support the claim that Hierapolis was founded by the Pergamene King Eumenes II. However, many of the names of the Hierapolitan tribes inscribed on the steps of the Roman-period theater indicate a connection to the Seleukid dynasty, leading the excavators of the site to suggest that the city was founded shortly after the Seleukids established the nearby city of Laodicea in the second century BCE (D'Andria 2003, 9, 33; Ng 2007, 99; Ritti 1985, 118-125; Scardozzi 2008).

With the treaty of Apamea (188 BCE), the territory formerly under Seleukid control was ceded to Pergamon. After the death of the Pergamene dynast Attalos III in 133 BCE, all lands held by Pergamon were bequeathed to Rome. It is difficult to trace the urban development of Hierapolis, because very little of the Hellenistic city has been preserved in the archaeological record. This lack of preservation is likely the result of a significant earthquake, recorded by Tacitus (*Annales* 14.27), that devastated Laodicea, and, it can be assumed, Hierapolis along with it. Among these few Hellenistic remains are traces of ceramic workshops in the area of the North Agora (to be discussed in more detail below) and some tombs in the northern necropolis (D'Andria 2001; 2003). The visible remains of the city date largely from the post-earthquake Flavian period reconstruction, as well as subsequent additions, all of which were primarily overseen by imperial personnel (Fig. 4.2) (D'Andria 2001; 2003; Ng 2007). The city gates and main street (variously referred to as Frontinus Street or 'the plateia') were built under the supervision of the proconsul Frontinus (82-83 CE), who was later to take the post as *curator aquarum* in Rome and become famous for his treatise on its water system. Both gates and the thoroughfare carry inscriptions naming Frontinus as donor and highlighting his benefaction to the city (D'Andria 2001, 101-103). Öziş (1996) suggests that Frontinus may have cut his teeth (so to speak) on some of the hydraulic projects in Hierapolis before taking up his post in Rome. Many of the buildings along this major thoroughfare, such as latrines and warehouses, were united by a Doric colonnade running the length of the street. These buildings were completed under the reign of the emperor Domitian and a new city gate was dedicated to Domitian in recognition of his generosity (Ritti 1983, 173).

The construction boom of the first century CE continued into the second century, with particular activity during the reign of Hadrian. The peripatetic emperor may have visited Hierapolis on an itinerary that included the neighboring city of Laodicea in 129 CE (Ritti 1983, 77). An agora measuring 280 m by 170 m was constructed during this period. The enormity of this space, coupled with the lack of marble flooring and the absence of a stadium in the city, has led to the suggestion that the agora may have doubled as a venue for athletic competitions (D'Andria 2001, 105-106). At this time a bath complex was also added to the urban fabric (D'Andria 2001, 104; 2003). The construction activity during the reign of Hadrian has tentatively been linked to the emperor's presence in the city, though there is no explicit evidence that he paid Hierapolis a visit (Ritti 1983).

Hierapolis continued to prosper under the Severan emperors. Significantly, two monumental nymphaea were constructed, the so-called Nymphaeum of the Tritons and the Nymphaeum of the Sanctuary of Apollo (Campagna 2006; D'Andria 2003, 120-125). During this time the *scenae frons* of the theater was completely renovated and redecorated with relief panels depicting scenes of both local and panhellenic significance (Ng 2007). Both the Nymphaeum of the Tritons and the *scenae frons* were dedicated to the imperial family (no dedicatory inscription for the Nymphaeum of the Sanctuary of Apollo survives), naming Septimius Severus, Julia Domna and the two princes, employing the usual honorific titles (Ng 2007; Ritti 1985, 108-113).

Hierapolis earned its first *neokoros* (temple to the imperial cult) in the third century CE under Elagabalus,[6] and continued to be a prosperous center until the fourth century. An earthquake in the second half of the fourth century caused major damage to the urban center, and much of its formerly opulent architecture and public spaces fell into ruin (D'Andria 2001, 111). Subsequent to this, Hierapolis became an important center for Christianity in Asia. The next section will consider the presence of water at Hierapolis and strategies for managing and supplying it in further depth.

[6] There is some debate about the date of Hierapolis' first *neokoros*. Ritti (1987, 28) gives a date of the first half of the second century, but most others agree that Hierapolis received this honor in the third century under the Severans (Burrell 2004, 135; D'Andria 2003, 11).

Water at Hierapolis

Water at Hierapolis was always integral to its history and development. The earliest activity at the site was probably in connection to the worship of Anatolian Cybele at the thermal springs and the consultation of the Phoebic oracle, which made use of the sulfuric gasses. Literary sources allude to the abundant thermal waters at Hierapolis (Ritti 1985, 16-22). In the theater a celebratory epigram refers to the city as 'Mistress of Nymphs, adorned by splendid springs' (Judeich 1898, no. 1; Ritti 1985, 114, no. 1). Literary sources also associate some of the natural phenomena in the area with the abundant sulfuric thermal waters. For example, Philostratus (*Eikones* 1.12.10) sought to account for the varied colors of the local stone by suggesting that the thermal waters entered the quarries, submerged the rocks, and filled the stone with water, which in turn turned the stone various colors. Strabo (*Geog*. 9.5.16) notes that the variegated marbles from Hierapolis were used to adorn the city of Rome in the form of monolithic columns. As noted earlier, Vitruvius (*De arch*. 8.3) outlines the dual uses of the calcium-rich waters of Hierapolis in agricultural activity, both for irrigating the fields and serving as boundary markers.

Although the city gained notoriety, in part, because of its thermal and sulfuric waters, the inhabitants of Hierapolis probably did not depend on these waters for daily consumption (i.e, drinking, cooking, etc.).[7] While there was no potable source of water on the plateau on which Hierapolis sits, the hills east of the town are rich with springs and small rivers (Ritti *et al*. 2007, 141-142). At least two aqueducts, coming from the north and east brought fresh water into the town (D'Andria 1987, 64-69; 2003, 117-26, 132-35, 183-84; Scardozzi 2007). These aqueducts were probably fed from Cevizli springs, located approximately 4 km to the northeast (Öziş 1996, 364). These water-lines consist of simple canals and tunnels dug out of the living rock in the surrounding hillsides, terracotta pipelines, and a few bridges (Scardozzi 2007, 337-349). Once inside the city, the water would first settle in the *castellum aquae*, which was built at a high-point

[7] While the water at Hierapolis was not appropriate for consumption, Strabo (*Geog*. 13.4.14) indicates that the water at neighboring Laodicea was potable.

on a hill to the east of the city (Fig. 4.2, no. 22 and Fig. 4.3). The water then traveled into the heart of the town through clay pipes branching from the *castellum aquae*. This main line consisted of pipes running alongside the street in dirt tracks and brought fresh water to the nymphaea and baths. A smaller, secondary piping network conducted fresh water into houses. Grey water was directed through channels running underneath the streets, which were paved with stone slabs. Clay access covers allowed for periodical inspection and cleaning (D'Andria 1987, 68) (Fig. 4.4). The internal water management and distribution system at Hierapolis has yet to be studied in detail; this is an endeavor that would increase knowledge of the management and distribution of water within the city.

Like most cities of the Roman provinces, Hierapolis was outfitted with fountains and bath buildings. These fountains and baths are the most obviously water-intensive structures that survive in the archaeological record. However, as I show below, there were certainly other activities and architectural installations that required and employed considerable quantities of water. The two Roman-period bath complexes at Hierapolis, the so-called Baths-Basilica (Fig. 4.2, no. 2) and the Large Baths (Fig. 4.2, no. 25), were both constructed in the second century CE. Neither on the bath buildings have yet been fully excavated, leaving only limited information about their architecture and water supplies. According to D'Andria (2003, 192), the Large Baths exploited the natural spring water that flows in the area.

Named for the relief figures of tritons that decorated its façade, the Nymphaeum of the Tritons can be securely dated to the proconsulship of C. Aufidius Marcellus in 220/221 or 221/222 CE, during the reign of Elagabalus (Fig. 4.2, no. 12 and Fig. 4.5) (Campagna 2006, 390; Ritti 2006, 82 no. 12). Given that it was dedicated to the emperor and is massive in size, it is possible that this monumental fountain was built in celebration of the city being awarded its first *neokoros* (Campagna 2005). Strategically located just inside the city from Frontinus Gate and along the main thoroughfare near the agora, the Nymphaeum of the Tritons would have served the needs of a host of people moving in, out and around the city. The fountain is enormous, with an overall length of 65 m (basin measuring 51.1 m x 4.7 m), and is the largest of those so far discovered in Asia Minor (Campagna 2006, 387-391). The long back wall of the fountain joined with rectangular wings at each end, creating an elongated pi-shape. Analysis of the architectural fragments has indicated that there were two stories, the lower in the Corinthian order and the upper story with composite capitals, with the possibility of a third level as well. The decorative program of this nymphaeum echoed that of the Severan theater at Hierapolis. There are no precise data in regards to the connection of the nymphaeum to the urban water network, but rather only the organization of pipes within the fountain is apparent. Within the fountain itself, water entered the basin through three outlets along the back wall. The central outlet consists of a rectangular well (1.75 x 1.00 m) cut vertically through the back wall of the podium into which a pipe is placed. It is safe to assume, then, that water was under sufficient hydrostatic pressure so as to gush into the basin, taking it up to the level of the podium (Campagna 2006, 390).[8] The monumental façade, in combination with the massive hypaethral basin and spurting water, makes this monument a real *theatra aquarum*, or water theater.

The second major civic fountain constructed in Hierapolis was the Nymphaeum of the Sanctuary of Apollo (Fig. 4.2, no. 16 and Fig. 4.6). Located along the western side of the temenos of the sanctuary and built by demolishing part of the portico that had previously served as the boundary of the sacred area, this monument should be considered in the context of the development and transformation of the sanctuary dedicated to the city's principle deity (Campagna 2006, 391).[9] The water from the fountain was perhaps used in the context of ritual activities, and certainly could have satisfied the thirst of any pilgrims approaching the sacred precinct. The nymphaeum is pi-shaped and stands two stories tall, with Corinthian capitals decorating the lower story and composite capitals on the upper story. Much smaller than the

[8] Campagna (2006), the primary investigator of the Nymphaeum of the Tritons, suggests that the arrangement for this fountain is similar to that of the nymphaeum at Aspendos.

[9] The Sanctuary of Apollo is currently being excavated under the direction of Francesco D'Andria.

Nymphaeum of the Tritons, the back wall only measures 30.5 m,[10] approximately half the size. No dedicatory inscription for this fountain has been uncovered, leading to a debate about its date. Campagna (2006, 393) places it in the Severan period based on architectural similarities to the theater. However, Verzone and De Bernardi Ferrero insist that it must be a later construction, dating to between the fourth and fifth century CE (De Bermardi Ferrero 1999, 699-702).Very little remains of the water supply system to this fountain. A hole punctuates the back wall of the nyphaeum, through which a pipe was probably fed. At a height approximately mid-way up the first storey, this water outlet would have conveyed water into the basin in a considerable stream (Fig. 4.7).

As this brief discussion of water infrastructure and water distribution points at Hierapolis has shown, water was displayed in a monumental fashion in the fountains and public baths. However, water also had a significant presence in life in Hierapolis in other, less immediately apparent ways. Discussion will now move to the role of water in craft production and industry at Hierapolis and the communities and associations involved in such activities. As the following analysis will show, each manufacturing activity required a different type of water, and therefore craft producers organized themselves around obtaining this water in different ways. As the following examination will show, the organization of some production activities were impacted by new water management technologies, in particular long-distance piped water-lines and the use of water-power, and some remained unaffected.

Water-Related Industry at Hierapolis

The majority of information related to craft production and industry at Hierapolis is obtained through the epigraphic record and, in particular, from funerary inscriptions. Hierapolitan funerary

[10] Only a few fragments from the original basin of the Nymphaeum of the Sanctuary of Apollo remain – some of the floor paving and patches of hydraulic mortar – making it very difficult to determine its size (Campagna 2006, 393).

inscriptions conformed to the general pattern in Asia Minor, where the interred (individual or family) called upon guilds and professional associations in order to ensure the proper funerary practices and grave maintenance. It was standard practice in Asia Minor for occupational associations to be involved in funerary practices in three general ways (Harland 2009). Professional associations often played a role in the burial of their members, sometimes collecting ongoing fees for later use in funerary-related-expenses – for example, for the actual burial or for funerary banquets (Harland 2009, 134). A second funerary role involves professional associations being named as recipients of fines for any violation of the grave; and often professional associations were involved in such grave maintenance in association with other civic institutions (e.g., civic treasury, council (*boule*), people (*demos*), or the elders' organization (*gerousia*) (Harland 2009, 135; Ritti *et al*. 2007, 145). Finally, professional groups were often designated as the recipients of a foundation that made them responsible for visiting and maintaining the grave, including yearly (or more frequent) ceremonies at the site (Garland 2001, 104-120; Harland 2009, 135).

Sixteen extant funerary inscriptions refer to occupational associations at Hierapolis (Harland 2009, 137).[11] There are sarcophagi that mention several guilds on one epitaph, and in all there are a total of ten guilds mentioned in connection with funerary arrangements: dyers, nail-workers, coppersmiths, purple-dyers, livestock dealers, water-mill operators, farmers, wool-cleaners, carpet-weavers, and an unknown "guild." Although these inscriptions provide an admittedly small sample, it is still possible to make some inferences based on these attestations of professional associations at Hierapolis. Of the ten guilds mentioned in Hierapolitan funerary inscriptions, half of them are associated with activities that certainly require water: dyers, purple-dyers, water-mill operators, farmers, and wool-cleaners. Several of the remaining guilds are involved in activities for which water may have been required for other steps in the production

[11] Of the sixteen, ten are epitaphs, and six involve a guild or guilds in ongoing grave ceremonies or in the maintenance of the grave.

process (e.g., nail-workers, coppersmiths), even if water was not necessarily a fundamental or central element in the execution of their particular craft. For example, while nail workers may not have used water in their production activities, water was required in great quantities for mining and processing metal ores.

From the guilds mentioned on the funerary inscriptions it is also possible to infer interrelationships and interdependencies among the different activities. For example, carpet-weavers must have been closely involved with the wool industry; Strabo mentioned the fame of the wool industry at both Hierapolis and Laodicea. Both the wool-producers and the carpet-weavers must have relied heavily on the work of the wool-cleaners or fullers, which would have been a necessary intermediary step in the manufacturing process. Likewise, the fullers, who required large quantities of water for washing and dyeing, are likely to have been linked to the water-millers at Hierapolis. The fullers may also have utilized water to power trip hammers for beating clothing or grinding pigments (Ritti *et al*. 2007, 145; Wilson 2002, 12).

A closer examination of two industries attested on the funerary monuments at Hierapolis, purple-dyers and water-millers, provides an opportunity to investigate questions related to the role of water in craft production and the role of craft producers in Hierapolitan society. The following discussion will address questions regarding the source of water employed in particular craft-production and industrial activities, the impact of technological advances on these manufacturing pursuits, and how organization in relation to water (and other raw materials) had broader economic and social implications for these activities and the individuals who engaged in them. The prevalence of such craft activities for the local economy will be addressed in terms of the interrelations and interdependencies between different types of production activity. Following from this analysis, are questions about the prominence (or lack thereof) within the community of the individuals involved in craft production and industrial activities.

Purple-Dyers

According to Strabo, "…the water of Hierapolis is also marvelously adapted for dyeing wool, so much so that the color from roots (*rizon*) can compete with wool colored by the murex; and the quantity is abundant because the city is full of natural baths (*Geog*. 13.4.14)."[12]

Strabo thus suggests that the purple-dyeing industry took advantage of several of the available resources in the region. Based on this, it seems that the particular properties of the water in the region were integral to the quality of the production of purple cloth, and that natural sources of water (as opposed to piped water-supply) were utilized in the process. The high-quality dye was produced by the combination of the thermal water and plant roots, tentatively identified by Cichorius (1898, 50) as the plant referred to as *coccygia* in Pliny (*HN* 13.121, or *rhus cothinus*), a vegetable that is indigenous to both Greece and Asia Minor (Ritti 1985, 21). This suggests that there were probably dye-works located in areas where considerable quantities of water could be obtained, channeled and/or stored. No such installations have been found in Hierapolis or the surrounding region, though a targeted survey in areas with the appropriate criteria (e.g., available thermal waters, space for processing and storage) may be able to identify places of production.

As Pliny (*HN* 38.133-5) observed, the odor from the production of purple dye with the *murex* sea-snail was repugnant. Excavated dyeworks on Crete (Alberti 2007; Apostolakou 2008) and in North Africa (Wilson 2001) were found to be located either outside of densely populated areas or strategically downwind, which may have been due to the need to reduce the effect of the offensive odor. There is currently no information about the location of dyeworks in Hierapolis. However, because the Hierapolitan purple dye was produced with plant roots rather than *murex*, it is possible that the same necessity to place the dyeworks far outside of urban settlement was less pressing. This leaves us with the unanswered question, did these activities occur within the city

[12] See the section below on textile production for more discussion of different methods for obtaining a purple dye.

(*asty*), in the countryside (*chora*), or both? Regardless of where the dyeing activities took place, it is clear that the individuals involved in purple-dyeing were active in the civic sphere, as is attested in their frequent invocation in the performance of funerary rites.[13]

Moreover, with the essential ingredients for the production of textiles of the highest quality, namely high-quality wool, plant matter to produce the dyes, and thermal water for setting the dyes – both readily available and obtainable at little to no cost – the purple-dyers were well-positioned for economic success. As discussed above in Chapter 2, both Greek and Roman water law considered spring water to be publicly available, unless it was owned as part of private land holdings (Bannon 2009; Bruun 2000a; 2000b). Whether or not the water was in the public domain or privately held (or some combination thereof), the extensive system of springs at Hierapolis and in the surrounding region would have furnished the considerable quantity of water necessary for such a robust dyeing industry. Unlike other dyeing installations where water had to be heated to set the dye, the thermal water at Hierapolis was naturally at a sufficient temperature. This particular source of water, therefore, required no additional energy or resources to heat it, making it both an efficient and cost-effective element in the dyeing process. Thus, the activities involved in purple-dyeing at Hierapolis were not dependent on new technological innovations or the utilization of hydrological power, but rather were relatively simple operations that relied on basic and readily-available resources.

The attractive economic proposition of raw materials at a nominal cost which allowed for the sale of the finished product at a significant margin is probably what led to the considerable wealth of the purple-dyers at Hierapolis. The textiles produced in Hierapolis were famous for their high quality and were probably exported as far as Italy. For example, at the end of the first century CE, the merchant T. Flavius Zeuxis wrote on his tomb that he had traveled to Italy by sea 72 times. It

[13] There were other dyers mentioned in the epigraphic record at Hierapolis, but the purple-dyers are mentioned specifically in the request to oversee ongoing funerary rites and on the dedicatory inscription in the theater (Harland 2009).

has been suggested (D'Andria 2003, 66-68; Judeich 1989, no. 51; Ritti *et al*. 2007, 144 n. 31) that he must have been involved with the export of expensive merchandise, in particular purple cloth.

Indeed, the purple-dyers (*porphyrabaphoi*) at Hierapolis must have been quite prosperous, because they partly covered the expense of the marble decoration of the *scenae frons* of the Severan-period remodeling of the theater (Ritti 1985, 108-113). The purple-dyers' association joined with the city and dedicated two levels of the architrave to Apollo Archegetes, to other gods of the homeland, and to the emperor Septimius Severus and the imperial house.[14] This very visible civic benefaction to the city's theater is echoed in the relative frequency with which the purple-dyers were invoked in funerary monuments, indicating that the purple-dyers were significantly involved in the civic sphere and were a well-respected guild. Nearly half of the grave inscriptions (four out of ten) mention the purple-dyers' association as recipients of fines or bequests for visitation ceremonies. This indicates that the purple-dyers were a stable and well-run association and managed by a capable board of directors and could be depended on to carry out the requests of the deceased (Harland 2009, 137).

Water-Millers

The inherent power created by moving water was probably utilized extensively at Hierapolis. The application of water-power was a significant development of the Roman imperial period, and in the first century CE this technology, particularly in the form of water-mills, had spread widely across the Mediterranean **(**Wikander 2000b, 397-398). The attestation of water-millers on a few funerary monuments at Hierapolis suggests that the utilization of water-mills to carry out a variety of tasks was likely a significant part of the city's industrial activities by the second century CE.

[14] This dedication probably dates to between 207 and 209 CE based on the titulature and the local and imperial administrators mentioned (Harland 2009, 138; Ritti 1985, 110).

The water-mill is not a standard structure appropriate to all contexts, but rather there are a number of variants adapted to each particular site with its differing water supply, height of fall, etc. (Wikander 2000b, 373-378). Water-mills can be divided into two main types, according to the position of the water-wheel: vertical mills, which require a right-angle gear; or horizontal mills, in which the rotating millstone can be attached directly to the vertical shaft. In vertical mills, the gearing can be adapted to the speed of water by the ratio of the two cogwheels. Vertical mills have three functional variants based on the location of the water source. Undershot wheels are immersed in a watercourse and are powered by the running water. The earliest mention of an undershot wheel is the description by Vitruvius in 40/10 BCE.[15] Overshot wheels are powered by water conducted through a chute above the wheel, moving it through both weight and impulse. Finally, the breastshot wheel is powered by water hitting the back of the wheel, and thus is a sort of middle ground between the two other types. The undershot wheel is thus more frequently found in rural areas where it could take advantage of the natural velocity of water in rivers or streams. Both overshot and breast mills are better suited to conditions with limited water supply and a high head, in other words, to urban environments (Wikander 2000b).

Water-milling was involved in a variety of activities that required mechanization. In this case, the members of Hierapolis' *hydraletai* (water-mill operators) probably engaged in a variety of tasks that used water power. As was the case for the rest of the empire, it is likely that the majority of water-millers were involved in grinding grain. There must have been a close working relationship between the Hierapolitan flour-millers and the bakers who utilized the flour produced through the grinding of grain (Ritti *et al*. 2007, 145). In addition to grinding grain, Pleket (1988, 28) surmises that water mills might have been used for irrigation of gardens and vineyards, water-supply for baths, and the cleaning and dyeing of clothing. No evidence exists that definitively

[15] See excerpt and translation below, n.37.

supports or refutes these suggestions, and therefore at this point they must be considered to be informed yet conjectural.

A few sarcophagi from the northern necropolis at Hierapolis provide evidence of water-milling activity in the city (Pennacchietti 1966-67; Pleket 1988, 28; Ritti *et al*. 2007, 143-146). The sarcophagus of a man named Marcus Aurelius Apollodotos Kalliklia[nos] was inscribed with an epitaph which ended with the threat of a fine to any would-be tomb violators of a fine payable to the water-millers, a formula which was typical of funerary inscriptions at Hierapolis (Harland 2009):

> This sarcophagus and the (surrounding area)] belong to Mar. Aur. Apollodotos Kalliklia(nos); Apollodotos shall be buried in it, and also his wife Aur. Tertia, and their children and their son-in-law Aur. Tatianos; burying and being buried in it is not permitted to others, except if Apollodotos will give his consent; anybody transgressing shall pay to the most holy *fiscus* 500 *denarii*, *and to the water-miller's association 300 denarii.* A copy of this inscription has been registered in the archives [trans. Ritti *et al*. 2007, emphasis mine].

The sarcophagus and its attendant inscription most likely date to the third century CE; the *nomen* Aurelius probably establishes it after the Constitutio Antoniniana of 212 CE. The inscription states that there was to be a double fine for breaking the owner's instructions, for which 500 *denarii* was to be paid to the imperial *fiscus* and 300 *denarii* to the guild of those who own and/or work in water-mills (*syntechnia hydraleton*). Pleket (1988, 27-28) rightly points out that, at least for third century CE Hierapolis, there must have been enough water-millers to justify founding the *syntechnia* of *hydraletai*.

Although the relation between Kalliklianos and the association of the *hydraletai* is not clear from the inscription, Ritti *et al*. (2007, 145) suggest that he was probably a *hydralates* himself. As noted above, professional associations were involved in funerary rites in a variety of ways. Sometimes the deceased invoked a professional association to which they belonged. However, it was equally likely that guilds to which the deceased had no relation would be made responsible for the performance of funerary rites. Ritti *et al*. (2007, 145) aver that if Kalliklianos were not himself part of the *hydraletai,* however, he would probably have chosen a better-known guild to carry out his request (e.g., bakers, fullers, or the purple-dyers).

In particular, stone-sawing by means of a water-powered mill must be added to the attested uses of water power at Hierapolis. A recent discovery of a sarcophagus lid with an iconographic representation of a water-powered stone saw mill at Hierapolis provides an illustration of the use of water power in the city (Fig. 4.8).[16] The inscription on the sarcophagus identifies as it belonging to a man named Marcus Aurelius Ammianos.

> M. Aur. Ammianos, citizen of Hierapolis, skillful as Daedalus in wheel-working (?), made (the represented mechanism) with Daedalean craft (or: with the skill of Daedalus); and now I'll stay here [trans. Ritti *et al*. 2007]

Based on the dimensions of the cover and the *praenomen* and *nomen,* the sarcophagus probably dates after the Constitutio Antoniniana, and is likely from no later than the end of the third century when the *praenomen* and *nomen* were considered redundant (Ritti *et al*. 2007, 139-40; Vanhaverbeke and Waelkens 2002). This puts this sarcophagus broadly within the same period as that of Kalliklianos the water-miller. The description here does not identify Ammianos himself as a mill-worker, but rather identifies him as the person who constructed the stone-saw mill visually depicted on the sarcophagus. This suggests that there were both individuals or organizations that constructed and maintained these water-milling machines (i.e., Ammianos) and associations of people who utilized them (i.e., Kalliklianos).

The funerary inscription surrounds a relief of a twin water-powered stone saw mill. The schematic relief shows a mill with a large, vertical spoked wheel with a long, horizontal shaft extending to the left. The horizontal shaft connects to two smaller wheels which, together, form a gear. Extending to the right and the left of the gear are two slanted rods that connect to vertical saw frames, making it a twin-saw. The frames consist of two vertical supports connected by two

[16] Other archaeological examples of stone saw mills from Asia Minor (Ephesos) and the Near East (Jerash) will be discussed below.

horizontal beams with a saw that has progressed about half-way through a rectangular block. Based on the linear dimensions of the blocks, Ritti *et al*. (2007, 148) suggest that the blocks are supposed to represent stone, as opposed to tree trunks or wooden beams. In order to operate the saw, the rotation of the gear must be transferred into reciprocal linear motion (e.g., movement back and forth), which was accomplished by a crank or crank disc (Ritti *et al*. 2007, 148; Wikander 2000b). Sufficient friction for the saw to cut through the stone was provided by adding sand or water to the surface of the stone itself. The proposed reconstruction of the stone saw mill by Paul Kessener interpolates the schematic representation on the sarcophagus into a perspectival view, thus clarifying the relationships between the component parts (Fig. 4.9).

Clearly visible in the upper right-hand corner is a chute for channeling the water onto the mill. By the position of the chute, it appears as if this mill is an overshot or breastshot mill. The question yet remains as to the source of water that supplied this water mill, and by extension, to water mills at Hierapolis in general. Based on the position of the chute above the wheel, it is possible to rule out the option that this mill took advantage of the power of naturally moving water in a river or stream. Therefore, it most likely depicts a mill that was utilized in an urban setting. This mill could have been supplied with the local thermal water simply channeled to a sufficient height so as to provide enough head to power the wheel. However, the extremely high level of carbonates in the thermal water at Hierapolis would have probably resulted in heavy encrustations after prolonged use, thus decreasing the machine's efficacy (Ritti *et al.* 2007, 142). Indeed, as described by Vitruvius (*De arch*. 8.3) the thermal water running through irrigation ditches around Hierapolis produced a thick crust after only one year. Therefore, it seems most likely that this urban water-mill was supplied by the city's aqueducts. This suggestion is further supported by the fact that it would have been easier to arrange the mill with the necessary head and velocity through the piped water supply from aqueducts, rather than from local sources of thermal water.

Provisioning stone-saw mills with water power from the urban piped-water supply would also have allowed the machines to be located close to the city itself, therefore decreasing the distance the finished stones would have needed to be transported for use in the city. Hierapolis was famous for its variegated marbles, making it likely that there were a significant number of people involved in the quarrying and preparation of these stones for architectural adornment. The quarries at Thiounta in the hilly region to the east of Hierapolis, mentioned in several funerary inscriptions in the north necropolis, probably provided most of the marble used in the city (Ritti *et al*. 2007, 142). During the imperial period, public monuments and temples at Hierapolis were decorated with marble, and marble veneer was used extensively in the North Agora and for the *scenae frons* of the theater. The monumental baths in the city center were also adorned with local marble, as were the houses of wealthy inhabitants (Ritti *et al*. 2007, 142). Hierapolitan marble was not only used locally, but according to Strabo (*Geog*. 9.5.16), the variegated marble quarried and prepared at Hierapolis made its way to the city of Rome, where it adorned the *urbs* in the form of monolithic columns. This, perhaps, suggests a market for the export of marble, which is supported by Strabo's praise of the marbles at Hierapolis by comparing it to the marble of Karystos in Greece and to the highly-praised imperial marble quarries of Docimeion in Turkey (*Geog*. 9.5.16). Thus, the production of marble veneer through stone-sawing served to benefit both local interests and imperial needs.

The probable provision of water-mills through the urban water network suggests civic investment in the supply of water for milling activities. It is possible that water-millers paid a fee for the use of urban piped-water, as described by Frontinus (*Aq*. 94.2-4) for the city of Rome (Bannon 2009, 82). The provision of stone-saw mills with aqueduct water suggests that there was both a logistic and economic benefit to such an arrangement. Channeling water from the urban piped-supply meant that the stone-saw mills could be located close to the urban center (Ritti *et al*. 2007, 142). The profits from an arrangement utilizing piped-aqueduct water must have outweighed the costs associated with the expense of securing water supply through the civic network.

The supply of water to water-mills involved in other activities was probably primarily in connection with grinding grain, possibly along with fulling. Sufficient grain and clean clothes were critical for the successful functioning of a city, and therefore were necessary activities for the public good. Instances of such civic investment in the form of water supply are evident in other places across the Roman Empire. For example, both the Janiculum Mills in Rome and Barbegal Mills in France were industrial-scale grain-milling establishments that were supplied by an urban aqueduct.

Civic investment in the production of grain, clean clothes, marble for local use and export, among possibly many other industries, through the provision of water-mills with water from the urban supply, stands in contrast to the infrequency with which the water-millers association is mentioned on funerary inscriptions. This evidence suggests that the water-millers were neither as wealthy nor as widely respected as those involved in dyeing purple textiles. The professional association of the water millers (*syntechnia hydraleton)* was called upon to ensure the integrity of only one grave, that of the water-miller and likely guild member Kalliklianos, who was discussed above. This single mention of the water-millers association among the sixteen extant funerary inscriptions that mention civic guilds suggests that the water-millers' association may not have been as stable or dependable a guild as the purple-dyers, or, perhaps, that the water-millers were not as practiced at ensuring that grave rites were honored and tombs were not pillaged. In addition, this notion that the water-miller's guild was neither particularly wealthy or civically active is further suggested in the fact that there are no surviving accounts of civic benefactions made by this occupational association.

From this brief discussion of two guilds at Hierapolis, purple-dyers and water-millers, whose professional activities were intimately linked to water, a deeper understanding of the various ways in which water was employed in craft production and industrial activities emerges. The purple-dyers utilized the naturally occurring thermal and sulfuric waters in the area. The utilization of these naturally occurring and public water resources suggests that the purple-dyers incurred minimal to no cost in obtaining the water necessary for their activities. Further, their production activities were neither reliant on technological innovations nor heavily dependent on civic resources. While the particular properties of the water at Hierapolis contributed to the success of the purple-dyeing industry, as will be discussed below, the small-scale organization and reliance on natural (e.g., rivers or springs) and/or private (e.g., cisterns or wells) water sources was replicated in other dyeworks across the empire. Moreover, the unique properties of the water (according to Strabo) aided in the production of a luxury product, and probably contributed to the wealth of those involved in this trade. The wealth of the purple-dyers' association was materialized in the dedication of the *scenae frons* of the theater. The stability of the association of purple-dyers is attested in the frequency with which they were called upon for the performance of funerary rites and the maintenance of graves. Of further consideration are the locations in which these activities were carried out, which have yet to be discovered archaeologically.

From only two attestations of water-millers at Hierapolis, a whole host of professions and activities that employed water power can potentially be inferred (professions such as grain-millers, fullers, dyers, and water-supply for irrigation or public baths). There were individuals who constructed and maintained the water mills (the mills would have needed regular maintenance, especially if the highly carbonate thermal waters were used to power them), and people who used the mechanical power of the mills to carry out a variety of tasks such as milling grain, cleaning clothes, sawing stone, etc. The use of water power was an innovation of the Roman imperial period, and the use of water-mills in urban environments was probably largely dependent on urban aqueducts. The supply of water-mills through the urban piped-water supply network suggests the diversion of civic resources to these activities, even if fees were paid by water-mill operators for the use of water. Despite the investment of civic resources for water-milling, the occupational association of water-millers was not frequently mentioned in funerary monuments. This suggests that the water-millers were neither as well-organized nor as wealthy as the purple-dyers' association.

The sheer number of professions involved, in some way, with water listed on the funerary monuments of Hierapolis attests to a whole class of people who were involved and invested in the water supply on a daily basis. This class of people – class here used not to denote socio-economic status, but rather to refer to those people involved in these types of professional activities – are often underrepresented in the archaeological record, or do not appear at all. This, albeit limited, exploration of the role of water in craft production at Hierapolis is a first step in the recognition of the prevalence of craft production and industry within urban environments, the large numbers of people who engaged in such activities, and the necessity for vast amounts of water with which to carry out these tasks. The geo-political and technological developments that accompanied Roman imperial expansion significantly impacted some types of production activities (e.g., increased mechanization in the use of water-mills), while others were left unaffected by such changes (e.g., purple-dyeing).

Water in Craft Production and Industry in Asia Minor

Discussion will now move to a broader investigation of production activities in the cities of Asia Minor for which water was a central element. I have attempted to draw together the evidence for such activities in Asia Minor in order to begin to develop a picture of water in craft production in the region at large. The largely urban bias of archaeological investigation coupled with the fact that these production activities often do not leave archaeological traces results in the relative paucity of data on which to draw. Where there is limited evidence for craft production and industrial activity from Asia Minor, examples from other places in the Roman world are used as illustration.

Pottery Production

Water, clay, and fuel are the three essential elements for pottery production. Water is necessary in considerable quantities in the preparation of clay, in order to make it workable. Clay is slaked either in a pit or a vat of water, or by shaping it into a mound with a central depression into which water is poured.[17] After slaking, the clay is purified by adding enough water to put the clay in suspension, at which point the coarse clay particles are removed by sieving or by allowing the slip to settle. Even finer clay can be obtained by levigation, a process in which the slip is channeled into a vat through a long shallow trough equipped with cross-walls behind which coarser particles settle (Wilson 2000a, 129). Not only is water necessary for dilute slips and washes, it was also central to the production of paint for the decoration of ceramic objects (Wilson 2000a, 128-129).

Ceramic production in the Greco-Roman world was carried out on scales ranging from modest enterprises centered on the household, to large-scale industrial workshops. According to Peacock (1982, 90) household pottery-making was probably more important than is generally acknowledged, even though the majority of Roman pottery was the product of organized workshops. The lack of evidence for household production may simply be an artifact of the archaeological record, with a heavy bias away from exploration of domestic spaces coupled with the archaeological invisibility of many of these activities. A further distinction should be made in the scale of distribution between individual workshops, which distributed pottery locally within the community, and larger industries, whose wares were often found widely disseminated across the empire (Peacock 1982, 90).

As a general trend, ceramic production was carried out on a relatively small scale in the Classical period, and, following Hellenistic precedent, workshops expanded during the period of

[17] Wilson (2000a, 129) points out that clay preparation for pottery production is unlikely to leave an archaeological trace when it uses the method whereby the clay is piled into a mound into which water is poured.

Roman imperial expansion (Poblome *et al*. 1998, 54). The increase in the scale of production during the Roman period may, in part, be due to increased nucleation in urban areas. Asia Minor under the Roman Empire, and particularly the province of Asia, was one of the most heavily urbanized regions of the Roman world (Alcock 1989; Levick 2004).[18] This intensification of urban settlement resulted in an overall increase in population, providing both growth in the availability of human labor and an upsurge in the need for ceramic goods.

The amount of water needed for ceramic production was commensurate with the scale of the operation. In a few instances the provision of urban aqueducts supplied ceramic workshops with the high volumes of water required for production. This arrangement was the case for Sagalassos, which produced pottery in large volume (Owens 1995; Poblome *et al*. 2001). However, the organization at Sagalassos is not the norm and it was rare for piped water to be used in pottery production. Rather, natural water sources or other water storage devices such as cisterns, wells, *pithoi* or vats were more frequently employed (Wilson 2000a, 132). This more common arrangement, in which ceramic were workshops responsible for gathering and storing their own water, suggests the prevalence of workshops operating on a smaller scale and outside of the immediate influence of the civic government. As local water supply was generally regarded as a common good, the community shared rights to it (Bannon 2009).

The extant evidence for pottery production in Asia Minor conforms to this paradigm, with a range in the scale of production and distribution, though the landscape seems to have been dominated primarily by small workshops that supplied local and regional economies (Poblome 2004, 499). Patterns of ceramic use and distribution reveal a largely regional circulation. For example, at Troy, the majority of pottery types and wares used during the Augustan period were sigillata-type vessels from Pergamon and other centers, cooking wares came from nearby Phocaea and elsewhere, in addition to other regional products (Hayes 1995). To further illustrate

[18] Indeed, Alcock uses the phrase ‘compulsory urbanization’ to describe the phenomenon of urban development of Asia Minor under the Roman Empire (1989, 94).

the broad regional involvement in ceramic production, evidence for the local manufacture of 'Megarian bowls' has also been uncovered at Ephesos and Hierapolis. At Ephesos, soundings in the commercial agora uncovered wasters from a kiln that produced Megarian bowls (Gates 1997, 101). Geophysical prospection around the area of the Hierapolitan second century CE agora revealed evidence of an earlier pottery workshop, also involved in the production of Megarian bowls (D'Andria 2003).

The identification of many ceramic production centers in Asia Minor has predominantly rested on ceramic type and chronology, rather than by locating the pottery workshop(s) through excavation. In fact, many of the physical points of production have yet to be located (Poblome 2004, 495). Using a range of evidence, Table 2 outlines the places for which evidence for ceramic production has been identified in Asia Minor.

An example of ceramic manufacture on a large scale is the region of Pergamon, which was famous for its high-quality pottery in antiquity. Many indications of pottery production have been found, illustrating the involvement of the entire region in the making of Megarian bowls and West Slope ware, "Applikenkeramik," several varieties of table and common wares, amphorae, lead-glazed pottery, *oinophoroi*, oil lamps, and terracotta figurines (Poblome *et al*. 2001, 145).

Significantly, Pergamon was also one of the primary centers for the production of eastern terra-sigillata C (ESC) (Bounegru and Erdemgil 1998).[19] Production waste excavated near ancient Pitane (modern Çandarlı), located approximately 30 km southeast of Pergamon (Loeschcke 1912), was typologically, chronologically, and technologically similar to that of Pergamene sigillata (Poblome 2004, 496), suggesting a regional involvement in the production of ESC.[20]

[19] While the production of coarse or common wares was likely an activity that took place at a number of scales and in a number of locations, the manufacture of Sigillatas requires much more investment for skilled workmen, raw materials and infrastructure. As a result, there were only a few centers at which sigillata was produced, despite its ubiquity across the eastern Mediterranean (Poblome *et al*. 1998, 59).

[20] Loeschcke (1912) excavated and identified the ceramic from this area as Çandarlı sigillata.

Poblome *et al*. (1998, 62) suggest that the workshop at Pitane was established by Pergamene craftsmen in the Augustan period after they had attained a high level of skill and quality, thus establishing Pergamene influence in regional ceramic production.

A close consideration of the archaeological remains of two excavated large-scale ceramic workshops, at Pergamon and Sagalassos, reveals information about the organization of these manufacturing activities and about the arrangement of their water supply. A potter's quarter covering approximately 2,000 m^2 was found along the north bank of the Ketios River in the valley below the Pergamene acropolis. Four workshop units, complete with kilns, were identified, along with additional isolated features associated with pottery production. In total, 24 kilns and other installations were discovered (Bounegru and Erdemgil 1998, 264; Poblome *et al*. 2001, 151). These workshops date to around the first half of the third century BCE and continued to operate until the Augustan period. During this period of production, the majority of ceramic types produced were Megarian bowls, "Applikenkeramik", and sigillata. Another potter's workshop was located nearby, at the foot of Niyazitepe Hill. This second workshop, however, was not thoroughly excavated and therefore offers little information about specific production activities. However, the presence of two ceramic workshops in close vicinity to each other and on the banks of the Ketios River suggests that this whole area was one dedicated to ceramic production to take advantage of the abundant water (and potentially clayey deposits) provided by the river (Karagöz *et al*. 1986).

A detailed examination of the individual units within the ceramic workshop reveals the variety of ways in which water was captured and channeled within the industrial space. Several methods were employed for channeling water and many different types of storage containers were found within each of the four units comprising the workshop area (Fig. 4.10) (Poblome *et al*. 2001, 151-156). Within Unit 1, including Kilns 1 and 2, Feature A was regarded as a cistern, but data were inconclusive. It was unclear whether the interior was waterproof or the bottom was dug out. A segment of water pipe was also recorded in the area. If Feature A is not a cistern, it is unclear where water was stored. A segment of a water-pipe was discovered immediately south of Feature A, but neither the locations of water's ingress to, or egress from, the cistern have been determined.

In Unit 2, within which were Kilns 3, 4, 5, and 6, a *pithos* was found in front of the entrance to Room A. In the same area, a second storage vessel was located with a terracotta water-pipe leading to the entrance of the workshop; a second segment of water-pipe was also noted in this area. These *pithoi* with associated pipes have been interpreted as being for the storage and distribution of water. The south part of Unit 2 is thought to have functioned independently from the northern section. Space E contained a stone-lined feature which has been interpreted as possibly being used for preparing or soaking clays. Within room H was a large *pithos* with which a terracotta water-pipe was associated, again suggesting water storage. In considering the spatial lay-out of Unit 2, Poblome *et al*. (2001, 154) suggest that the more spacious southern section could have provided all the necessary infrastructure for pottery manufacture, indicating that it may have been an independent unit. Both water and clay were stored in the southwest corner of the complex, and it is possible that the space was uncovered for the *pithos* in Room H to collect rain water. Unit 3, Kilns 7 and 17, contained a mudbrick basin with limestone corners set in the middle of the courtyard, which has been interpreted as possibly a clay preparation or soaking pit. Further, two *pithoi* were noted in space C, and another *pithos*, associated with a terracotta water pipe, was noted along the west wall. Finally, although no infrastructure for water storage was noted within Unit 4 (Kilns 8, 9, 10, 11), at the north end of space A was a rectangular basin, possibly for clay preparation or a soaking pit. In space F a rectangular clay basin was installed along its southern wall, against the northeast corner of another unit.

While this arrangement is specific to this particular set of workshops, the strategies involved in securing water and the types of material culture associated with storing it were likely employed in various other workshops across the Mediterranean. The location of the pottery workshops along the bank of the Ketios River suggests that the river water was the primary water source utilized in the production process. There was no evidence for large-scale water management infrastructure to bring water to the workshops, and according to Wilson (2000a, 132) piped supply for pottery workshops was rare and natural sources were more frequently preferred. As water was needed in large quantities for the preparation of clay, it seems logical that the workshops would have been sited near a readily abundant source of water. The concentration of ceramic workshops in this area attests to this rationale.

The craftsmen may also have utilized Pergamon's seasonal weather patterns to collect water during the winter rainy season. As Poblome *et al*. (2001, 154) suggest, some of the spaces could have been left open in order to collect rain water. The pattern at these workshops of *pithoi* and storage tanks with associated water-pipes suggests that water was channeled to and/or from these features. Reliance on river and rain water suggests that these workshops operated independently of any large-scale, civic-built water infrastructure such as long-distance pipelines. The wide regional distribution of Pergamene sigillata suggests that this region was a significant producer of ceramics. However, the lack of investment in this workshop in the form of the provision of water from civic sources suggests that, perhaps, the ceramic manufactories at Pergamon were independent operations.

The other major pottery workshop excavated to date is at Sagalassos in Pisidia. The potters' quarter is located in the eastern part of the site, in the vicinity of the theater. The area covers about 6 ha, across which are large quantities of ceramic waste. The area was first established in the Augustan period, but was subsequently abandoned in the mid-Imperial period, during which a *naiskos* tomb was constructed. Then again, in the Late Roman period, the area was re-occupied by those producing ceramics in organized manufactories (Poblome *et al*. 2001, 159-164).

The water supplied to the potter's quarter was probably brought into the area from the east by three aqueducts (Owens 1995, 91-113; Poblome *et al*. 2000, 42; Poblome *et al*. 2001, 163-164; Waelkins and Owens 1994, 182-183). Six aqueducts have been identified that brought water to the ancient city of Sagalassos, three from the east and three from the west. In contrast to the site of the industrial quarter at Pergamon, the workshop at Sagalassos was not located on the banks of a river for which the necessary water was supplied to the pottery workshop. It is possible that the industrial area at Sagalassos was supplied by natural springs, but it is more likely that the water involved in ceramic production was introduced to the area through the aqueducts (Poblome *et al*. 2001, 163). One aqueduct was discovered that runs east to west along the foot of the mountain slope in the higher northern part of the potter's quarter. A rim sherd, which was embedded in the mortar of the outer wall of the aqueduct, provides a first-to early second-century CE *terminus post quem* for the construction of this section of the channel (Owens 1995, 94).[21] A section of another aqueduct that runs north/northeast to south/southwest on the higher part of the eastern slope of the potters' quarter was also uncovered. A middle imperial dolium fragment had been placed over part of this section, probably as a temporary repair, providing a *terminus ante quem* for the construction date. Secondary systems were also laid out, using clay water-pipes to convey the water. At least two of these pipe-lines ran into the potters' quarter (Poblome *et al*. 2000, 42). The provision of water through aqueducts implies a major investment of civic resources in the ceramic manufactories of Sagalassos. It has been argued that the local ceramic industry in its production of Eastern Sigillata significantly contributed to the economic prosperity of the city during the Roman imperial period (Poblome *et al*. 2000; Poblome *et al*. 2001).

The choice of clay for the ceramic produced at Sagalassos also has implications for water use. The local ophiolitic clays located in the vicinity of the potters' quarter may have been used to produce local common wares. For finer wares clays from the Çanaklı valley were preferred because they needed little preparation. Though procuring the clays from Çanaklı required transport of the clays from 8 km away, it seems this labor investment was preferable to preparing

[21] It is unclear whether this water channel was, in fact, ever utilized. Only one coat of rough plaster lined the channel, whereas sections of the same line discovered outside of the city had several coats of smooth plaster. Moreover, although the channel was not cleared of fill, neither calcification nor water marks were visible on the exposed walls (Owens 1995, 94).

and washing enormous amounts of ophiolitic clays (Poblome *et al*. 1998, 57). It is likely that it was a combination of conserving water resources and decreasing labor that led to this choice.

While the ceramic manufactories at Pergamon and Sagalassos were some of the largest in Asia Minor and as a result have received close scholarly attention, indications of pottery production have been uncovered at a number of other locations. For example, at Ephesos, excavations in the upper part of Terrace House 2 revealed that the whole area covered by dwelling units WE 1 and WE 2 functioned as a workshop with a series of pottery kilns until the Augustan period (Landstätter 1998),[22] and evidence for ceramic production has been found in the Tetragonos Agora (Rogl 2004). Scherrer (2001, 68) contends that such workshops would not have been allowed in a densely populated area, thus suggesting that this area was sparsely settled during this phase of use.

The discovery of a ceramic workshop at Tekır, near Knidos, provides a little more color about the way water was supplied for ceramic production. This workshop was situated on a steep plateau lying above a small beach on the coast. The workshop was identified by several kilns and other detritus typical of a pottery production facility. In the area to the northwest of the workshop were canals cut into the rock (Tuna *et al*. 1991a, 33). From the available evidence, it is unclear where the water for this workshop originated; however, given its location on the coast, it is possible that sea water was used for the preparation of clay.

Most of the other indications of areas of ceramic production in Asia Minor are based on artifact scatters, and therefore little information about the organization of the workshops is available. When areas of production are identified, there is often little attention to the procurement and use of water. With an increased interest in these issues and an archaeological

[22] It seems that beginning in the Augustan period Ephesos largely imported its ceramic, based on the high concentration of Italian sigillata and Eastern Sigillata B types (Zabehlicky-Scheffenegger 1995).

eye trained on the evidence, there should be an increase in the amount of data we have for these things in the future.

From the limited archaeological information about ceramic manufactories in Asia Minor, it can be concluded that they generally operated on a small scale, drawing on natural water resources and probably providing pottery for local consumption. The larger manufactories at Pergamon and Sagalassos both produced pottery on more industrial scale and supplied a wider region with the wares they produced. However, Pergamon drew on natural and public water resources while Sagalassos was supplied with water from secondary lines running off the urban piped-water network. The different arrangement in relation to water-supply at these two workshops may indicate varying levels of civic investment and civic involvement in activities of the manufactories.

Textile Industries

Textile Production. Water was used in a number of ways in ancient textile production, dyeing, and cleaning. In many cases, water was a necessary component in the preparation of plant or animal products so that they could be turned into cloth. For example, Pliny (*HN* 19.3.16-18) discusses the process by which flax was soaked in water for several weeks to loosen the fibers from the stem. Before woolen clothes could be dyed, they needed to be prepared by the process of fulling, which is extremely water-intensive. The majority of the extant evidence for individuals involved in textile production and preparation comes from epigraphic sources (Pleket 1988, 31-33). As such, inscriptions attest to a number of corporations of specialized textile workers such as fullers, dyers, and purple-dyers that were active within the city.

The organizational landscape for textile production and preparation in Asia Minor is similar to that for ceramic manufacture (Poblome 2004). Scholars generally agree that textile production was locally based with no significant long-distance market for textiles, with some notable exceptions (e.g., the purple cloth produced at Hierapolis, discussed above). Textile production certainly was carried out at the household level (Trinkl 2007). Domestic weaving is attested in upper class Greco-Roman households, the epitome of which was Augustus' demand that the women of the Imperial house occupy themselves with weaving wool (Jones 1960, 184). Weaving, sewing, and spinning are attested archaeologically among the elite at Ephesos, for example, with the discovery of loom-weights and sewing needles in the Terrace Houses (Trinkl 2007). It is also highly likely that this activity occurred in households at every position on the social ladder, although evidence is less secure (Poblome 2004, 492). In such an organization, towns or villages fulfilled their own need for clothes or they produced for their own needs in addition to providing for the larger area beyond their territories. Thus, urban production of textiles seems not to have been carried out on a large scale (Pleket 1988, 31; Wilson 2001, 271).

As with ceramics, however, there are some cases for which it seems there was larger-scale textile production with concomitant wider distribution. Based on epigraphic evidence, Pleket (1988, 31) has demonstrated that textile centers produced goods for export at Laodicea, Hierapolis and Aphrodisias, and that the individuals involved in such activities formed professional associations or guilds. For example, at Aphrodisias in Caria linen workers were attested in texts found in the stadium, referring to an organized group of λινουργοί (Pleket 1988, 31; Reynolds and Tannenbaum 1987, 121, no. 11). Wilson (2001, 285) suggests that Timgad, in Algeria, probably produced textiles for more than immediately local consumption and contributed significantly to the urban economy. However, the majority of evidence suggests that people probably spun wool at home and specialized weavers produced garments.

Dyeing. As discussed in the context of dyeing at Hierapolis, the preparation of dye and its application to textiles requires considerable quantities of water. Many ancient dyes were produced by the maceration of plants in water, which was often heated (Wilson 2000a, 144). As water was central to the production and application of dyes, the archaeological indicators for washing and/or dyeing workshops include washing equipment such as water supply, basins, vats, drains, heating mechanisms, and drying areas (Alberti 2007, 60; Barber 1991, 239-240). However, it is always possible that such indicators were multi-functional and therefore the most unambiguous evidence for dye-works includes the chemical presence of dyes, mordants, or detergents.[23] Most dye-works identified from archaeological remains are those producing purple dye, which are identifiable by the crushed shells of *murex* sea snails from whose hypobronchial gland the dye is extracted. Dye-works are usually associated with cisterns, tubs, drains, and occasionally an apparatus for heating. In most cases, water for dye-works was supplied by wells or cisterns, although the two Roman dye establishments at Cuicul (Djemila, Algeria) were supplied by the city's piped-water network (Wilson 2000a, 146).[24]

Most of the information on the production of purple dyes is obtained by literary sources. Purple-dyers or *purpurarii* seem to be the only dyers who specify the color they produce on their inscriptions (Hughes 2007, 91, n.6). However, literary sources, namely Plautus (*Aulalaria* 510, 521), indicate a variety of dyers. According to Pliny (*HN* 9.38.133-5), the preparation of purple dye first involved separating the flesh of the *murex* shellfish from the gland that contained the dye. This process included heating a mixture of the *murex* and salt in water that was kept at a moderate and constant temperature. A pungent odor akin to garlic accompanies the development of the color, an odor which Strabo (*Geog.* 16.2) complained at the dye-works at Tyre.[25] The awful smell is also probably why the Bronze Age dye-works at Pefka on Crete were oriented downwind of settlements (Apostolakou 2008).

[23] Alberti (2007, 63) concludes that the security of an assignation of an installation (particularly pre- and proto- historical) as one used for the preparation of dyes is directly proportional to the availability of data for chemical analysis and the size of the installation.
[24] Only a handful of Hellenistic and Roman dye-works have been identified by means of literary and archaeological information. In Greece Hellenistic dyeworks producing unknown colors were located at Mycenae, Halieis, Isthmia and Chorsiai. Roman-period establishments are known at Pompeii, and from North Africa at Cuicul (Djemila, Algeria) and Carthage (Wilson 2000a, 144).

[25] In antiquity Tyre was famous for its dye-works, with the color sometimes referred to as Tyrian purple.

While purple dye was most often produced with *murex* shell, literary sources do attest to other processes as well. As noted earlier, the purple-dyers at Hierapolis were able to manufacture a plant-based dye that rivaled the purple produced with the murex shell. Cichorius (1898, 50) identified the root that produced such a high-quality dye at Hierapolis as an indigenous Mediterranean plant, referred to as *coccygia* in Pliny (*HN* 13.121, or *rhus cothinus*) (Ritti 1985, 21), while Strabo (*Geog*. 13.4.1) credited the quality of the dye to the thermal properties of Hierapolitan water. Herz (1985) has argued that *rizai* are likely to have been a plant called madder (Krapp in German) which was the same plant that in pre-industrial Holland was used to dye the famous Leiden textiles (Pleket 1988, 34). In Strabo's account, however, it is primarily the properties of the water to which the high quality of the textile products are attributed.

For Asia Minor, the presence of dye workers is primarily attested epigraphically. Although no establishments in which dyes were produced have been securely found archaeologically, one must assume that it is necessary to have dyeworks for there to be dye workers. Inscriptions from the Lydian city of Saittai (modern Icıkler) reveal a number of associations of textile workers such as fullers, weavers, wool-workers and linen-workers. An inscription from Aphrodisias, found in an area thought possibly to be a Jewish quarter, mentions three fullers (Γναφ(εύς)), a linen worker (?),[26] and a purple dyer or seller (Πορφυρ(ας)) (Reynolds and Tannenbaum 1987, 119-121). At Aphrodisias a purple-dyer was able to rise in the social ranks to just below the level of the *boule* (Pleket 1988, 33).

As discussed above in the context of Hierapolis, through the epigraphic record it is possible to suggest that the purple-dyers were a wealthy professional association that employed its wealth to the benefit of the city. In the neighboring Phrygian city of Laodicea a purple merchant is attested as a member of the town-council in the third century CE, suggesting that this individual, too, was active in the civic sphere (Pleket 1988, 33). With such a famed textile industry, other

[26] The use of abbreviations in the inscription leads to ambiguity concerning the trade designation to which they refer. The text simply reads: Λι, which could be interpreted a number of ways.

dyers were probably also active within the city (Pleket 1988, 33). Laodicea is also mentioned in Diocletian's price-edict as being famous for its expensive woolen garments.

The lack of archaeological evidence for the arrangement of dye-works and their supply of water impedes the ability to draw any significant conclusions about the organization of these production activities in relation to water sources. As discussed above, it is likely that purple-dyeing at Hierapolis took advantage of public sources of water and probably operated on a relatively modest scale. Based on comparanda of other dyeworks, it seems likely that dyeing activities in Asia Minor also drew on public sources of water (springs, rivers and streams), or secured water supply through cisterns and wells (Wilson 2000a, 146). The significant number of epigraphic attestations of individuals involved in dyeing activities and the assembly of these craft producers into occupational associations points to a well-established dyeing industry in Asia Minor, and the wealth of the purple-dyers at Hierapolis and Laodicea suggests that such activities could be economically successful.

Fulling. Woolen cloth is finished and prepared for dyeing by fulling, which is the process whereby animal fats and grease are removed by trampling the cloth in tubs containing an alkaline solution of water and fuller's earth, urine, or some other agent. The process of fulling is generally understood to include both the finishing of woolen textiles products and the commercial cleaning of dirty clothes, though there is some debate about the activities of fullers. Bradley (2002) argues that Roman fullers were not involved in the finishing of cloth as part of the textile manufacturing process, but rather acted solely as commercial laundrymen. In contrast, Wilson (2003) and Flohr (2003) point to the multiformity of fulling establishments, which suggests that different workshops engaged in different activities and catered to different types of customers. For example, several of the larger establishments at Pompeii, as well as the large *fullonicae* at Ostia, can be interpreted as large-scale wool-finishing establishments, both on account of their size and their lack of any reception space to handle individual customers dropping off or collecting clothes for cleaning. Some of the smaller establishments in Pompeii, in contrast, were located along major thoroughfares in areas that had several other shops with doors that opened onto the street, suggesting that they were commercial establishments that dealt primarily with private customers (Flohr 2003, 448).

Flohr (2006, 193) characterizes much of the previous scholarship on fulling as primarily interested in the literary record, from which most of the information about the processes involved in fulling have been obtained. However, the result of this literary focus was an attempt to incorporate all activities ascribed to fullers by Roman authors (washing, drying, rinsing, beating, shaving, sulphuring, carding, pressing, etc.) into a single model of standard Roman fulling practice. In contrast, Flohr (2006; 2003) and others (Bradley 2002; Wilson 2003) concentrate on the archaeological and iconographic material in an attempt to understand the fulling process. A shift in focus from the literary record to archaeological material revealed considerable variations in the fulling process from one *fullonica* to another.[27] However, scanty archaeological evidence for fulling exists before the Roman period and most of the extant evidence of fullers' workshops is from the Italian peninsula, namely at Pompeii, Herculaneum and Ostia, making it difficult to look at the fulling processes in a cross-temporal or regionally comparative manner. Within the extant examples, one of the most notable archaeological features associated with *fullonicae* are many small tubs for trampling the cloth and several large vats for rinsing it afterwards.[28] The most consistent feature of *fullonicae*, however, was the heavy reliance on water with the attendant evidence for water supply.

[27] The fulleries at Pompeii, Herculaneum, and Ostia are all morphologically relatively similar, but there are differences between fulleries on the Italian peninsula and in the provinces. For example, in the northern provinces it appears that treading of clothes happened in wooden tubs, and even in wooden stalls. North Africa seems to exhibit a regional type of fullery with treading tubs sunk into the floor with more space around them than in the Italian versions (Wilson 2003, 445). The water for the fullery at Timgad was supplied from wells (Wilson 2001, 275).

[28] The absence of these features – namely stalls for trampling and vats for soaking and rinsing – does not necessarily deny identification of a *fullonica*. It is possible that there were temporary or moveable apparatuses for trampling and/or soaking (Bradley 2002, 26), and perhaps made of materials that have not survived (Wilson 2003, 444).

All evidence for fulling in Asia Minor is derived from epigraphic sources. Unfortunately no archaeological evidence for fuller's workshops has yet been identified in Asia Minor, but the mention of fullers in epigraphic material attests to the practice in several locations. An inscription from Aphrodisias mentions three 'fullers' or 'carders' (Γναφ(εύς)) as dedicants of a public monument, thought possibly to be a synagogue. The names of the three men were placed near the bottom of the list of dedicants and in proximity to each other, which possibly suggests a workshop or group. From the location of the names on the list, Reynolds and Tannenbaum (1987, 120) propose that the men were more likely to be employees – whether slave, freed or free and paid – than the owners of fulling establishments.

Due to the fact that no examples of *fullonicae* have been excavated in Asia Minor, there is presently no archaeological evidence regarding their spatial organization or arrangement for water supply. The close archaeological investigation of the well-preserved *fullonicae* in Pompeii and Ostia provide information about the activities and the use of water carried out in the process of fulling in another part of the Roman world. Though it is tenuous to make an argument for Asia Minor based on the information available from the Italian peninsula, it will have to suffice until more data are obtained for Asia Minor. If Pompeii is considered to be an average Roman city with average amenities and an average population, then the 14 fulleries so far identified for this city may be taken as a rough guideline for the number of such establishments in the urban landscape.

The process of fulling was extremely water-intensive. Generally, clothes were soaped first, and then rinsed of detergents. Fulling stalls were used to soap the clothes with a mixture of chemicals and probably some water (Flohr 2006, 195). In most *fullonicae* the fulling stalls are located directly adjacent to or around the rinsing complex. Clothes were rinsed in large vats, usually one or two in small workshops, three or four in larger establishments. In most *fullonicae* the basins were sunk into the floor in order to make them more accessible. Not only was a vast amount of water necessary for soaping and rinsing, but the preparation of fullers' earth (*creta fullonica*) also required copious amounts of water (Pliny *HN* 35.193; Bradley 2002, 34).

The main purpose of the rinsing vats was to rinse the soaped clothes in fresh water. Therefore, most fulling workshops at Pompeii and Ostia were directly connected to the urban water network which supplied the rinsing vats with the necessary fresh water. The aqueduct at Pompeii, bringing approximately 2,500 m^3 of water into the city on a daily basis, supplied 14 fulleries, as well as the public fountains. In each workshop the entire complex was fed with water from a single point.[29] Workshops were also equipped with substantial drains, from which all the water from the complex was emptied. Based on the single entry and exit for water and the lack of taps to control flow,[30] Flohr (2006, 195-196) suggests that water most likely flowed constantly through the *fullonicae*. The rinsing basins were laid out adjacent to each other, suggesting that water overflowed from one into another. As outlined by Flohr (2006, 195-196), if the clothes were first rinsed in the basin furthest from the fresh water supply just after they were soaped, that water would be the 'dirtiest.' The presence of several basins suggests that, after soaping, clothes moved from 'dirty' to 'clean' water during the rinsing process. Flohr (2006, 196) suggests that the arrangement of basins makes a case for differentiation in the fulling process, whereby each basin was used for a different cleaning activity, with intensity of the cleaning decreasing with the progression of the rinsing process. He suggests that brushing and scrubbing probably took place in the first stages of the rinsing process, whereas the last stage consisted primarily of soaking.

A few examples of fulleries from the eastern provinces provide comparanda. Lewis (1997, 96-99) has argued persuasively that the 'fullers' canal' at Syrian Antioch, known only from

[29] In the large *fullonica* in the Via degli Augustali in Ostia (V, vii, 3) are indications of the possible presence of a tap with which the supply of water could be regulated. In most other *fullonicae* the mouth of the water supply was built into the wall, and for which the presence of a tap is unlikely (Flohr 2006, 195).

[30] However, Flohr (2006, 195) notes that the archaeological difference between flowing and stagnant systems is not unambiguous, as a flowing system could be turned into a stagnant one by blocking the tap and/or drain.

epigraphy,[31] must have driven fulling mills, which were used as part of the beating process of fulling. The canal was built in 73/74 CE and was a massive undertaking in the labour required to produce it. Its 2.5 km total length required that 9,000 m^3 of earth be dug out, offering a testament to the quantities of water required by the fulleries (Bradley 2002, 38; van Nijf 1997, 89-90). Although a good water-supply is requisite for fulling, the estimated 300,000 m^3 of water supplied by the Antioch channel, moving at a velocity of almost one meter per second, would be far in excess of what was needed for regular fulleries. The sheer size of this canal suggests the possibility that fulling was being carried out in Antioch on an industrial scale as early as the first century CE (Wikander 2000c, 406).

Unlike other types of craft production which, for the most part, supplied their own water by means of wells and cisterns, there is substantial evidence suggesting that fulling operations were supported by the urban water supply network. In the seasonally dry Mediterranean climate, it is unlikely that cisterns collecting rain water would have provided sufficient quantities of water to operate a *fullonica*. The capacity of just one large rinsing vat, which would need to be refilled regularly, might equal the volume of a domestic cistern, which would only be filled to capacity a few times per year (Wilson 2003, 444). An often-quoted passage in Frontinus' *De Aquaductu* is a testament to the huge quantities of water that must have supplied the fulleries at Rome. Frontinus mentions that, prior to his tenure as *curator aquarum*, the run-off water from public fountains was reserved only for the baths and for fulling establishments.[32] Explicitly, Frontinus is expressing his negative opinion about the increase in distribution of water from public fountains to private ends.

[31] Twelve Greek inscriptions line the channel.

[32] Front. *Aq.* 2.94 *Apud quos omnis aqua in usus publicos erogabatur et cautum ita fuit: "Ne quis privatus aliam aquam ducat, quam quae ex lacu humum accidit" –haec enim sunt verba legis—id est quae ex lacu abundavit; eam not caducam vocamus. Et haec ipsa non in alium usum quam in balnearum aut fullonicarum dabatur, eratque vectigalis, statute mercede quae in publicum retur.* "With them all water was delivered for the public use, and the law was as follows: 'No private person shall conduct other water than that which flows from the basins to the ground" (for these are the words of the law); that is, water which overflows from the troughs; we call it "lapsed" water; and even this was not granted for any other use than for baths or fulling establishments; and it was subject to a tax, for a fee was fixed, to be paid into the public treasury" (trans.C. Bennett).

Implicitly however, by talking about public baths and *fullonicae* in tandem, he is suggesting that, like the baths, fulling required huge quantities of water. Moreover, because fulling establishments and public baths were permitted to use water from the urban supply network, it also suggests that he considers fulling critical to the public good, even if he confines it to the baser categories of water use. Despite the utility of fulling to the city, Frontinus regards the cold, clean waters of the Aqua Marcia of too high quality to serve baths, fullers, 'and even purposes too vile to mention' (Front. *Aq*. 2.91). Therefore, under his guidance the Marcia was reserved solely for drinking, while 'the Old Anio, for several reasons (because the farther from its source it is drawn, the less wholesome a water is), should be used for watering the gardens, and for the meaner uses of the city itself.'[33]

Water-Milling

Once thought to have been an invention of the later Roman empire (fourth century CE or later), the water-mill is now held to have been widely used by the late second century CE and invented several centuries prior. Wikander (1984) has advanced the most thorough argument that this technology came about through the combination of the water-mill and the rotary-mill, probably in the first or second century BCE. Through an appraisal of archaeological and literary evidence Wikander makes a case for the broad adoption of this technology squarely in the high imperial period.[34] The examples of water milling from the funerary inscriptions at Hierapolis attest to the practice of water milling in Asia Minor, and put the utilization of this technology several centuries earlier than previously thought. Wikander argues that the water-mill was

[33] Front. *Aq*. 2. 91-92. *Anio Vetus pluribus ex causis (quo inferior excipitur minus salubris) in hortorum rigationem atque in ipsius urbis sordidiora exiret ministeria.*

[34] The water mill was a technology that has been used in Turkey until quite recently. With the introduction of electric mills, water mills are beginning to disappear and mill houses are being converted into stables or shelters. An ethno-archaeological study by Donners, Waelkins, and Deckers (2002) explores water mills in the area around Sagalassos in an effort to shed light on the capacity of the mills and the kind of grain that was ground in them.

probably more pervasive than our sources suggest; however the double-problem that most water mills were probably located in rural settings (where there has been less archaeological attention) and the majority of literary sources are urban focused (where there was probably less milling activity) likely skews the evidence.

Water-mills were most frequently powered by rivers and other natural sources of moving water, and as such were most often located in rural areas where such water sources were abundant. As the limited evidence suggests, it is generally more common for water-mills found in urban environments to be overshot or breastshot wheels in order to capitalize on limited water supply. These mill designs can be channeled to produce higher head, as was the case for the water-mill depicted on the sarcophagus of Ammianos at Hierapolis. Examples of the overshot wheel in Asia Minor come from Hierapolis (discussed above) and Ephesos.[35] For those water-mills located in urban areas, the water used to power the mills was obtained by a variety of sources. For example, the fifth – sixth century CE water mill established in the pronaos of the Southeast temple in the Athenian Agora was provided from an aqueduct. The water was supplied by an aqueduct that crossed the Late Roman fortification and, having turned the wheel of the mill in the temple, was carried northward to drive another mill approximately 50 m distant (Thompson 1960, 349; Wikander 2000b, 393). The mills on the Janiculum Hill in Rome were also fed by aqueduct water,[36] but only in the case of Barbegal in Provence was an aqueduct constructed explicitly for this purpose (Wikander 1991). As with fulling, the source of water for milling establishments has implications about municipal involvement with the operation. In the cases where an aqueduct supplied the mill, whether diverted from a pre-existing channel or constructed

[35] Overshot wheels from outside Asia Minor can be found at Barbegal, Provence, the Baths of Caracalla, Rome (third century CE), and in the Coemeterium Maius, Rome (late third century?) (Wikander 2000b, 375).

[36] The Janiculum Mills were powered by the Aqua Traiana. There had been some debate about whether the mills were powered by the Traiana or the Aqua Alsietina (2 BCE), but the debate was put to rest when pottery dating to the early centuries CE was discovered in the backfill of the aqueduct's construction trench. This confirms that the Janiculum Mills were fed by the Aqua Traiana, ruling out the earlier Alsietina (Wilson 2000b, 221).

explicitly to power the mills, it suggests a higher level of commitment of shared resources on the part of the urban community. It seems that there is a correlative relationship between the scale of the mill operation and the water source by which it was powered.

It is assumed that the majority of water-mills operated to grind grain. The earliest description of a vertical water-wheel for grain-milling is described by Vitruvius (*De arch*. 10.5.2) dating approximately to 40/10 BCE.[37] Two large mill establishments are known from archaeological remains to date from the Roman Empire. Barbegal, in Provence, was equipped with sixteen mills within one building. Though fewer survive, the mills on the Janiculum hill in Rome were thought to be even larger. The Barbegal mills date to the beginning of the second century CE and the Janiculum mills to a century later. Wikander (2000c, 393-394) suggests that the size of the Janiculum mills indicates their connection to the *annona* in order to supply grain for the inhabitants in Rome. The purpose of the Barbegal mill is less clear and is still being debated. The epigraphic attestation of the water-millers' association on a funerary monument at Hierapolis provides evidence for the presence of water-millers in Asia Minor and their professional organization into a guild. What was once thought to be possible remains of a water-mill in the city of Andriake in Lycia is now held to be a water cascade (Murphy and Mengel 2000, 155).[38]

While it is likely that water-mills were primarily used for the grinding of grain, water power was also utilized for other means. Wikander (2000c, 401-410) argues that the prevalence of

[37] *Eadem ratione etiam versantur hydraletae, in quibus eadem sunt omnia, praeterquam quod in uno capite axis dentatum est inclusum. Id autem ad perpendiculum conlocatum in cultrum versatur cum rota partier. Secundum id tympanum maius item dentatum planum est conlocatum, quo continetur. Ita dentes tympani eius, quod est in axe inclusum, inpellendo dentes tympani plani cogunt fieri molarum circinationem. In qua machine inpendens infundibulum subministrat molis frumentum…*
Mill wheels are turned on the same principle, except that at one end of the axle a toothed drum is fixed. This is placed vertically on its edge and turns with the wheel. Adjoining this larger wheel there isa second toothed wheel placed horizontally by which it is gripped. Thus the teeth of the drum which is on the axle, by driving the teeth of the horizontal drum, cause the grindstones to revolve. In the machine a hopper is suspended and supplies the grain, and by the same revolution the flour is produced [trans. Granger 1999].

[38] A water cascade allows an aqueduct channel to change height easily and rapidly (Murphy and Mengel 2000, 155).

industrial applications of water power is probably significantly underestimated for antiquity due to lack of evidence. It is possible that water mills might have been used for irrigation of gardens and vineyards, water-supply for baths, and the cleaning and dyeing of clothing (Pleket 1988, 28). The depiction of a stone saw-mill dating to the third century CE from Hierapolis indicates that water power was used in the preparation of veneers, probably connected to the famed variegated marbles of the region.

The existence of saw-mills in late antiquity was based for a long time around a passage from Ausonius (*Mosella* 359-364) in CE 367 that describes saw-mills on the Moselle River (Simms 1983; Wikander 1989; Wikander 2000b; Seigne 2002). A passage from Gregory of Nyssa (*In Ecclesiastem* III, 656A: referring to Cappadocia) may also allude to water-powered saw-mills in the fourth century CE (Wikander 1989, 190).

Stone saw-mills have been attested archaeologically for late antiquity at Jerash (Jordan) and at Ephesos. The saw-mill at Jerash was inserted into the southeast corner of the cryptoporticus of the Temple of Artemis complex, and therefore must date between the fifth-century abandonment of the Temple of Artemis and the great earthquake of CE 749 (Schiøler 2005; Seigne 2002). This mill was powered by a vertical wheel fed by water which was led from a reservoir above the room which was fed by an aqueduct. The Jerash mill was used to saw up column drums for use as veneer. A seventh-century sawmill may also have been identified at Ephesos, in association with ten overshot watermills, which points to a large-scale operation (Vetters 1984, 225; Wikander 1989, 190).

A late-antique stone saw-mill was discovered at Ephesos in a room on the lowest level of Hanghaus (Terrace House) 2 (Fig. 4.11). This mill was the last in a series of at least five water-mills built in a row on the slope of the Bülbul Dağ. This mill has also been dated to the sixth or seventh century CE, making it contemporary with the mill at Jerash. A channel at the top of the room carried water by means of a chute. This chute lined up with a water channel in the floor, parallel to which were two marble blocks standing *in situ*.

Utilization of the inherent power in moving water was a major innovation of the Roman imperial period, and the use of water-mills had spread across the Mediterranean already by the first century CE (Wikander 2000c; 2000d, 650). The evidence for water-milling activity in Asia Minor suggests that mills were used for a variety of purposes, from grinding grain to sawing marble. The extant evidence for urban water-mills in Asia Minor at Hierapolis and Ephesos suggests that they were most often powered by the urban piped-water network, which is further confirmed by comparanda elsewhere in the Mediterranean (e.g., Janiculum Mills in Rome, Barbegal Mills in France). The industrial scale of the Janiculum and Barbegal Mills and their supply by the civic water supply suggests a civic investment in the products of the mills. Evidence suggests that organization with respect to civic water supply was similarly the case at Hierapolis, implying that the activities of the water-millers may have also been deemed necessary for the civic good.

Conclusion: Water in the Productive Cityscape

This chapter investigated evidence for the use of water in craft production and industrial activity, both within Asia Minor and in the wider Mediterranean. A range of activities that required water are attested within urban environments: ceramic manufacturing, textile production including dyeing and fulling, and the use of water-power in the operation of water-mills. Individuals involved in craft production and manufacturing were often organized into occupational associations, suggesting that a considerable number of people were engaged in such activities. Analysis of evidence for manufacturing activities at Hierapolis of Phrygia provided a closer look at the possible organization of such activities with respect to water, indicating that each industry took advantage of different sources of water. The mention of a number of occupational associations on funerary monuments at Hierapolis provided critical evidence with which to explore the interrelationships among craft producers, and also supplied information about their relative social position. Taken together, the evidence presented for Hierapolis and other cities in Asia Minor adds to the picture of different types of non-agricultural activities that took place both within the city and in its surrounding territories.

Analysis of the archaeological evidence indicates that the majority of water used for craft production was obtained through publicly available sources (springs, rivers, or streams) or through cisterns and wells, suggesting that craft producers generally operated on a small-scale and independently of civic involvement. The purple-dyers at Hierapolis utilized the thermal waters at the site to produce the purple textiles praised by Strabo (*Geog*. 13.4.4), probably at little- to no- cost. The luxury goods they produced were most likely sold by merchants in a long-distance exchange, leading to the considerable wealth of those involved in the industry. The organization of the large-scale ceramic manufactory at Pergamon also utilized publicly available water sources in its operations. Located on the bank of the Ketios River and with several units outfitted with *pithoi* and tanks for storing water, the pottery workshops also secured their own water supply.

There are several potential reasons explaining why craft and manufacturing activities tended to utilize public water sources, or private wells and cisterns. Simply, it may have been more economically sensible to draw on water sources for which there was no fee. Further, these choices may have been dictated by practical necessities and the understanding that different sources of water were best utilized for activities based on the particular properties of the water itself. Such a sentiment was explicitly expressed by Frontinus (e.g., *De Aq*. 1.11, 2.92) in his exposition on the best uses of the different quality water brought into Rome through its extensive aqueduct system. Perhaps it was recognized that some water was best to drink, while less palatable water could be reserved for production activities.

There were, of course, exceptions to the general trend of craft production that utilized an independent water supply. These exceptions tend to be cases for which production was carried out on a large-scale, when the activities were connected to civic well-being and the public good, or both. The industrial-scale ceramic manufactory at Sagalassos, which provided the region of with the majority of its pottery, was probably supplied with water from the urban aqueduct (Owens 1995; Poblome *et al*. 1998; Poblome *et al*. 2000; Poblome *et al*. 2001). The iconographic representation of a stone-saw mill from Hierapolis indicates that it was powered by water that was channeled to a high head, thus suggesting that it was supplied by the urban piped-water supply. Marble in considerable quantities was used to adorn Hierapolis, and the city may also have exported this stone across the empire. Epigraphic attestations of water-millers at Hierapolis indicate that there may have been other activities that utilized water-mills, such as grinding grain or fulling. Increased mechanization which, in turn, increased the scale of production and the use of water-power were major innovations of the Roman imperial period (Wikander 2000c; 2000d, 650). The examples of industrial-scale production at Sagalassos and the utilization of water-mills at Hierapolis attest to the influence of these technological developments on the productive landscape of Asia Minor.

Water played a fundamental role in craft production and industrial activity. The collection of evidence from a variety of sources points to an ancient cityscape in which craft manufacturing and production activities were a significant part of the economic landscape. The organization of such pursuits with respect to water sources depended both on the type of activity and the scale of production. Increased mechanization and an increased scale of production during the Roman imperial period were aided by technological developments such as the water-mill, and made possible by the political stability and, in many cases, engineering expertise and financing from Rome. Moreover, the economic value of water was appreciated in antiquity, as is clear by legal structures put in place to mitigate against competition and to provide individuals with access to water sources.

CHAPTER 4

FIGURES

Fig. 4.1a Hierapolis plateau from a distance (author photo)

Fig. 4.1b Travertines with ancient city in the background (author photo)

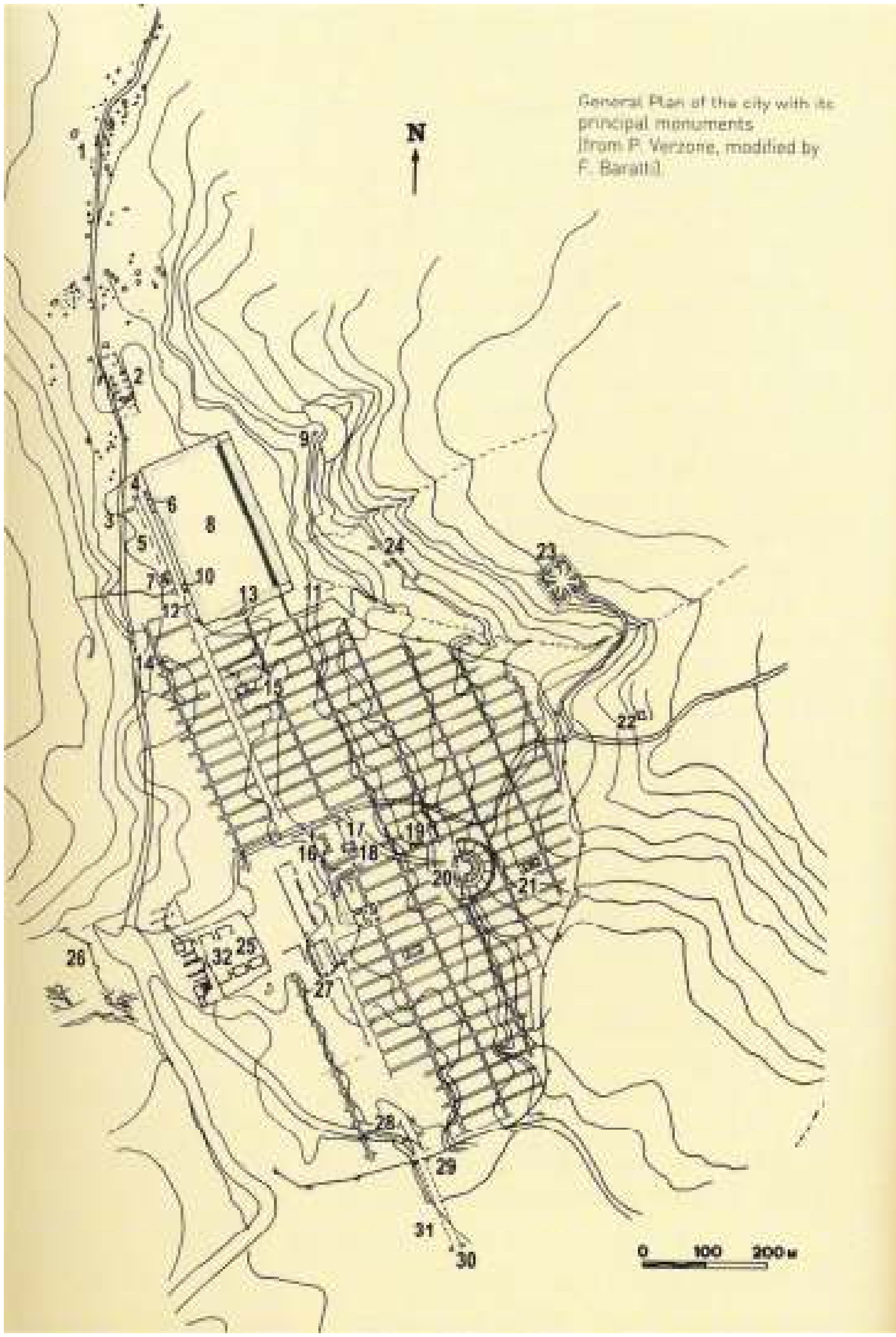

Fig. 4.2 Hierapolis city plan (after D'Andria 2003).
1. Northern Necropolis, 2. Basilica Baths, 4. Frontinus Gate, 5. Frontinus Street, 8. Agora, 12. Nymphaeum of the Tritons, 13. Byzantine Baths, 16. Nymphaeum at the Temple of Apollo, 17. Temple of Apollo, 18. Plutonium, 22. *Castellum aquae* (water reservoir), 25. Large Baths

Fig. 4.3 *Castellum aquae* at Hierapolis (author photo)

Fig. 4.4 Drainage canal under the street with hole for access, Hierapolis (author photo)

Fig. 4.5 Nymphaeum of the Tritons at Hierapolis (220-222 CE) (author photo)

Fig. 4.6 Nymphaeum of the Sanctuary of Apollo at Hierapolis (author photo)

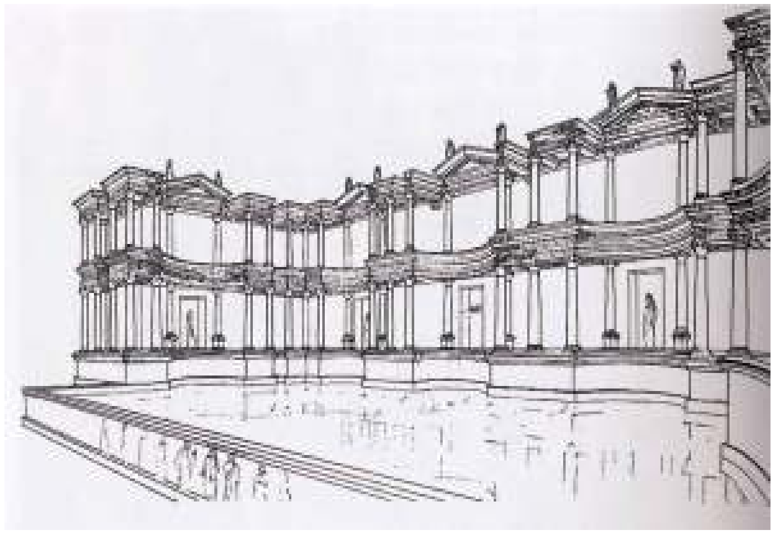

Fig. 4.7 Graphic Reconstruction of Nymphaeum of the Sanctuary of Apollo at Hierapolis (after De Bernardi Ferrero 1999, pl. 177.2 reprinted in Campagna 2006, Fig. 8)

Fig. 4.8 Lid of sarcophagus of M. Aur. Ammianos with stone saw mill from Hierapolis of Phrygia (after Ritti et al. 2007, Fig. 2, photo by K. Grewe)

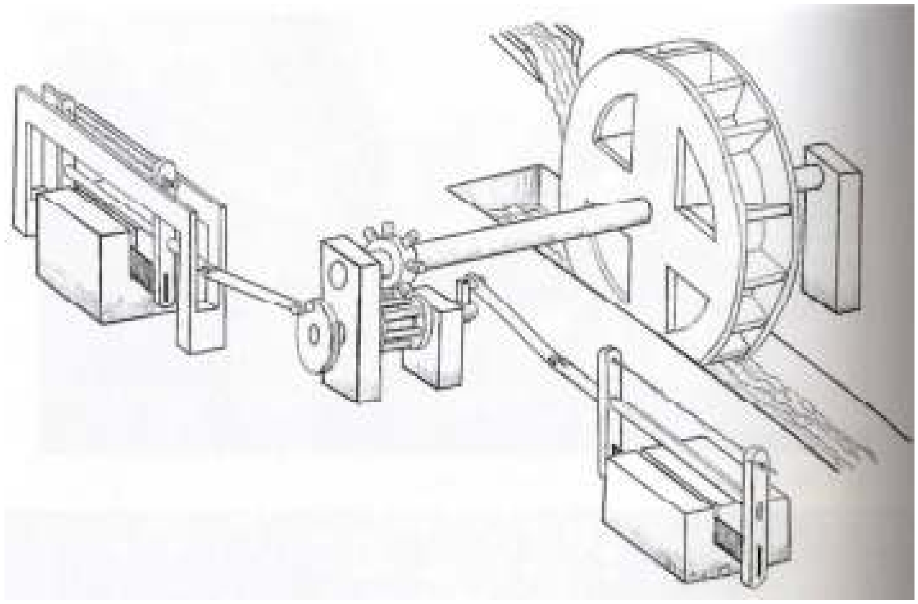

Fig. 4.9 Proposed reconstruction of the Hierapolis twin saw-mill from the sarcophagus of M. Aur. Ammianos (after Ritti et al. 2007, Fig. 10, reconstruction by P. Kessener)

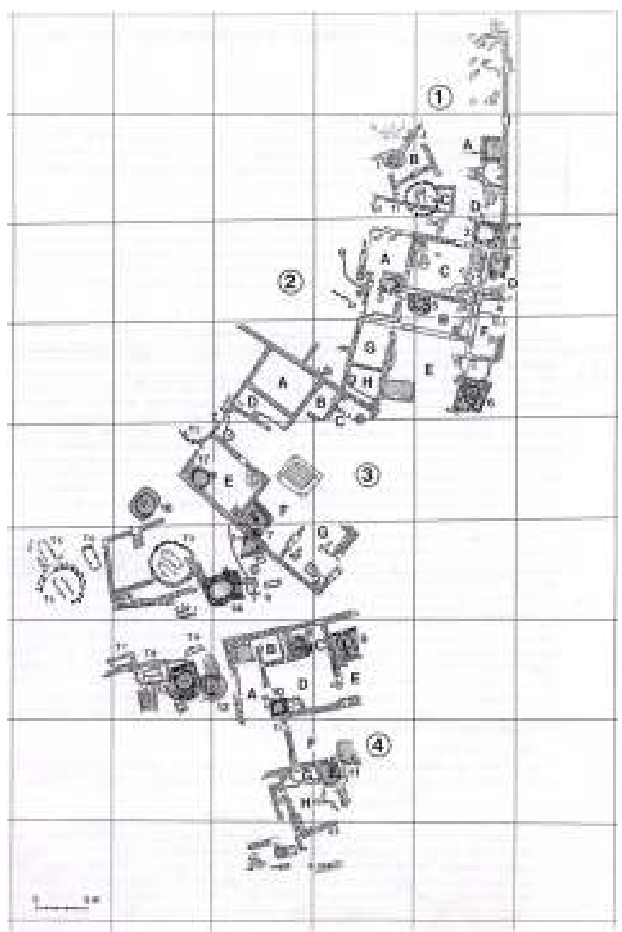

Fig. 4.10 Plan of the potters' quarter at Pergamon (after Poblome *et al*. 2001, Fig. 5)

Fig. 4.11 Remains of a late antique twin-powered stone saw water-mill from Terrace House 2 at Ephesos. Water channel in the center with stone blocks on either side (author photo)

CHAPTER 5

WATER IN RITUAL PRACTICE AND THE SACRED LANDSCAPE OF PERGAMON

This chapter investigates the uses and meanings of water in sacred space and ritual practice in Hellenistic and Roman Pergamon. As discussed in Chapter 3, the city of Ephesos displayed its water-richness by means of an abundance of fountains and nymphaea within the civic sphere. Pergamon, on the other hand, contained relatively few monumental fountains in its cityscape (despite having developed several long-distance pressure-pipelines already in the Hellenistic period, see Chapter 2, p. 29-34). Rather, in the Roman imperial period, vast amounts of water were integral for cultic practice and were channeled into some of Pergamon's sacred spaces in a monumental and theatrical manner, a development that occurred alongside a shift in ritual practice in the second century CE. A principal question of this analysis is whether developments in hydrological technology and geopolitical resulting from Roman imperialism influenced the significance of water in ritual practice and sacred space in Pergamon. The abundance of sanctuaries, extensive excavations of these sacred spaces, and the excellent record of publication at Pergamon makes it an excellent case study within which to explore the religious uses and meanings of water.

In this chapter, I investigate four cults for which water was integral to ritual practice – examining the siting, architecture, and water supply of each sanctuary, as well as literary *testimonia*, epigraphic evidence, and indications of ritual practice (e.g., votive deposition and ceramic assemblages). I argue that despite an increase in piped-water supply and a more theatrical aesthetic with respect to water display, water from originally sacred sources – springs, rivers, and rain – continued to supply Pergamon's sanctuaries, thereby suggesting a clear articulation of the inherent sacredness of specific water sources and their importance for ritual purposes. Moreover, the developments in religious thought and practice that resulted in changes to Pergamon's sacred landscape and ritual practice were a product of religious trends in the second century CE, several centuries after it first was subsumed under the power of Rome. While these changes were still ultimately a product of the increased interconnectedness as a result of the *imperium romanum,* this late ritual shift suggests that religious practice was less influenced by a strictly 'Roman' presence, as it was by the religious trends that swept broadly across the Mediterranean in this period. Focusing on those cults for which water was integral in the placement of a sanctuary and/or in ritual practice provides a lens through which to examine religious continuity and change, and the role of water as tied to conceptions of ritual efficacy, place, politics, and identity.

This chapter is divided into three sections. The first deals generally with the literature on water and sacred space in order to provide a foundation for the subsequent analysis. The second section offers a brief history of Pergamon and lays the groundwork for discussing the development of the cultic landscape more specifically. The third section then trains a lens on four sanctuaries within the Pergamene cultic landscape (Fig. 5.1): the agricultural and civic cult of Demeter and Kore, the healing sanctuary of Asklepios, the cult of the Egyptian gods (the so-called Red Hall), and the extra-urban spring sanctuary at Kapıkaya. Each of these four cult places was dedicated to different god(s) with diverse properties, and each occupies a unique position in relation to the urban center. Therefore, each sanctuary complex reflects a different relationship to the city itself and to the urban population (e.g., Alcock and Osborne 1994; de Polignac 1984), and articulates how relations with water intersect with religion, politics, and place. The final section of this chapter synthesizes the analyses of the different sanctuaries to make a broader argument about the role of water in the cultic landscape of Pergamon, and the implications of technological and geopolitical developments on such sacred meanings of water. Exploring the use of water in sacred contexts engenders a fuller understanding of the continuity and change in religious life in Pergamon from the Hellenistic through the Roman imperial period, and specifically of the significance of water in ritual practice. These themes, however, are broadly relevant for all cities in the empire, with variance only in the specific manifestations of water's use and meaning. In this way, as with the other case studies in this dissertation, the examination of water in the sacred landscape of Pergamon can serve as a model with which to explore similar questions in different urban contexts.

Water, Sacred Space, and Ritual

Water was an essential component in ritual worship of several cults in the Greco-Roman world and was incorporated into sacred spaces and employed in ritual practice in a variety of ways. On a practical level, water was necessary to supply drinking water for religious participants, to clean the altar and temple (particularly after a sacrifice), and to wash the temple's possessions (Dunant 2009, 294). As a means by which the body was purified before participation in ritual, water – in some form – was a feature of most Greco-Roman sanctuaries.[1] Water was also used in other ritual actions such as the pouring of libations, drinking, bathing and washing the cult statue (Cole 1988, 161-165; Dunant 2009, 278). Entangled in these practical uses and meanings, water can be a highly charged symbolic and religious tool. Ginouvès (1962) suggests that water operated on three levels within religious thought and practice: for general rites of purification, to cleanse the body or soul for ritual rebirth, and as a symbol of fertility, regeneration, and health.

Surely, however, other socio-political factors beyond the organization of relationships with water were at play in shaping cultic landscapes and ritual practice. As Alcock says of sacred landscapes, "[they] emerge as both culturally constructed and historically sensitive, immensely variable through time and space. Far from being immune to developments in other aspects of

[1] The use of water for purification purposes is attested by the wide distribution of *perirrhanteria* (water hand-basins) found in Greek sanctuaries. As will be discussed below, Cole (1994) makes an argument for the relative importance of water for purification purposes at a given sanctuary based on whether or not these *perirrhanteria* are permanent features.

human life, they can reflect a very wide cultural and political milieu" (Alcock 1993, 172). Several theories have been put forward regarding the organization of sanctuaries and their relationship to the landscape. For example, Cole (1994, 201) proposes that the placement of sanctuaries within the city proper and in the broader landscape depended on the combination of the function of the divinity, the demands of ritual, and the social organization of the community.[2] Edlund (1987, 29), in her distinction between urban, extra-urban, and rural sanctuaries, recognizes that function may have played a role in the placement of sanctuaries within and just outside of the city walls. However, she describes rural sanctuaries in terms of the 'mysterious forces of nature.' In this, she relies on Eliade (1957) who argues that sacred places are the result of 'hieraphony,' where the divinity reveals itself to human worshippers, and as such, sacred spaces are defined by an absolute and divinely inspired holiness. According to Eliade, these places are then marked by human use, but their sacrality is not the result of human activity.

While Eliade has been criticized for his lack of attention to the social circumstances under which sacred spaces were created, Cole's purely functionalist argument for the placement of sanctuaries also lacks an appreciation of how such choices may have been considered as divinely inspired. In many instances throughout the Greco-Roman world, sanctuaries sited at or near natural sources of water were located in such places because the water and the deity were thought to be ontologically equivalent entities, such that "one was the manifestation and expression of the other" (Dunant 2009, 279). For example, attention to the specific placement of the Asklepieion in Pergamon reflects this conflation of god and water source and attests to the perceived manifestation of the god in a particular place. Equally, however, the placement of the Temple to Demeter was determined by other factors, and the water necessary for ritual worship was brought

[2] Cole acknowledges other potential motivations for the placement of sanctuaries, as addressed by other scholars. For example: power of the landscape (Edlund 1987), political competition with other cities for space and territory (de Polignac 1984), or rational planning (Malkin 1987, 135-186).

into the complex from external sources. As the following discussion will address, the relation between the deity and water could be expressed in a variety of ways.

Dunant suggests that sense of place is incorporated into the broad conceptions of the religious use of water – that water necessarily comes from somewhere (Dunant 2009, 294-295; Ginouvès 1962). Implicated in this, argues Dunant, are expectations that Greeks must have had from places with a spring, a river, or any natural source of water. In particular, he suggests that these water sources must have held some sort of religious significance, whether explicitly and materially expressed, or vaguely conceived. Secondly, this sense of place must have implied an idea of locality, and therefore allowed for a diversity of experience in ritual practice from one particular location to another (Dunant 2009, 295). A sense of place could also be achieved through the construction of built ritual environments, such as temples. Within the sacred space delimited by the *temenos* of a sacred precinct, elements such as water were able to take on new meaning and significance by means of the attention focused on them (Smith 1987, 104).

All water sources, however, were not inherently considered to be sacred, and there were different strategies employed for imbuing water with sacred qualities; in particular, ritual action served as a vehicle through which water could be transformed. The presence of a sacred source of water did not strictly determine the placement of sanctuaries for which water was central, and other means were used to secure the water necessary in cultic practice. The consideration that water is not always inherently sacred, but rather is made sacred through ritual action, is expressed in Tertullian's comments on baptism under the Christian god. Though pertaining to a different religious context, the use of water for purification rituals certainly arose out of the same epistemological tradition, and therefore serves to reinforce this flexible perception of the sacred nature of water:

> …accordingly it makes no difference whether a man be washed in a sea or a pool, a stream or a fount, a lake or a trough; nor is there any distinction between those whom John baptized in the Jordan and those whom Peter baptized in the Tiber…All waters, therefore, in virtue of the pristine privilege of their origin, do, after invocation of God, attain the sacramental power of sanctification; for the Spirit immediately supervenes from the heavens, and rests over the water, sanctifying them from Himself;

> and being thus sanctified, they imbibe at the same time the power of sanctifying [*De baptismo* 4, transl. Roberts and Donaldson 1869]

Thus, water could be deemed sacred by virtue of its location in a sacred place, or by means of its consecration through ritual practice mediated by a perceived connection with a divinity (Malley and Barrett 2003; McCauley and Lawson 2002; 2007). In this way, ritual action was a means by which water could be made sacred for use in ritual practice. The sacred nature of water was not necessarily always tied to place, but equally tied to the actions people perform on water – actions which then made it efficacious within sacred contexts.[3] Conversely, the Romans provided legal stipulations to deal with instances in which water that was considered to be sacred on account of its source and/or location was also needed to satisfy practical necessities. For example, Pliny (*Ep.* 8.8.6) provides insight into the Roman legal conventions for dealing with water with sacred associations. He states that sources and tributaries of a spring could be considered sacred, while the lower courses of the same spring, though consubstantial with the water that had flowed from a sacred origin, was considered profane (Taylor 2000, 55).

This brief discussion highlights the general connections among water, sacred space, and ritual practice and provides a foundation from which to investigate these issues in a particular place, with a more detailed consideration of these factors as they were manifested in Pergamon. Like most old and venerable cities of the Greco-Roman world, the city of Pergamon had a complex cultic landscape for which water was a central component in the placement and layout of several sanctuaries.

Brief History and Urban Development at Pergamon

In order to explore the role of water in ritual practice and sacred space, a brief look at the history of urban development of Pergamon will provide the necessary context in which to

[3] And, as argued by Sraughn (forthcoming), sacred space *is* ritual practice and not merely a product of, or a container for, ritual action. In the articulation of this connectivity, he highlights the inextricable interconnectedness between ritual action and sacred space.

investigate continuities and changes within its sacred landscape. Due to the fact that the site has been under nearly continuous excavation since the late nineteenth century, an extensive amount of information has been collected about its urban and extra-urban development. The first systematic exploration concentrated on the Great Altar in 1878, and under Alexander Conze, efforts were made to uncover as much of the city as possible. In 1900 investigation of the site was transferred to the German Archaeological Institute (DAI), under whose auspices archaeological work is still being carried out. Research in the early twentieth century concentrated on the monumental civic center of the city, and on several of the major sanctuaries. Wolfgang Radt directed the excavations from 1971 to 2005, during which time work was carried out in the so-called residential quarter. Currently, the Pergamon excavations are led by Felix Pirson, who is interested in gaining an understanding of the Hellenistic city as it operated as a complete organism, and thus has focused on extra-urban survey and the less monumental areas of the city. Although there has been a decidedly Hellenistic focus to the investigation of Pergamon, the depth and breadth of work carried out is noteworthy and the record of publication is exceptional. In combination, the long record of excavation and the recent focus on the non-monumental aspects of the city allow for a project such as this dissertation to synthesize much of the work that has been carried out previously.

The city of Pergamon is located on a 300 m-high andesite massif at the confluence of three rivers: the Caicus, the Ketios, and the Selinus.[4] The valley through which the Caicus flows is surrounded on all sides by mountains: on the north rises the Madra Dağ, where south-most projecting spur was known in antiquity as the Pindasus. The boundary of the plain to the south is formed by the Jund Dağ, which was called Aspordenon in antiquity. To the east and northeast lay the spurs of the Temnus, where the Caicus River originates. The port city of Elaia is located where the Caicus empties into the Aegean Sea (Fig. 5.2) (Hansen 1947, 3-4).

[4] Plin. *HN*. 5.126: *Pergamum quod intermeat Selinus, praefluit Cetius profusus Pindaso monte*

The impetus for Pergamon's foundation in this location was easily defensible position, on a high hill and surrounded by several rivers. Established to house the treasure of Antigonus (Hansen 1947, 16), Pergamon served as a fortress during the competition for power among the *diadochoi* (successors of Alexander the Great). After the death of Seleukos in 281 BCE, Pergamon was handed over to the native Anatolian Philetaerus, who made several strategic alliances and had gained secure control over the city by the mid-third century.[5] Under Philetaerus and his successors of the Attalid dynasty, Pergamon was fashioned as a new Athens and became a Hellenic city *par excellence*.

The Attalid dynasty turned Pergamon from a remote Anatolian town into a center of Hellenic culture, in part through stressing its fabricated connections to a heroic Greek heritage. As did many new civic foundations, the Attalid dynasty played up the connections between Pergamon's civic origins and a Greek legacy by creating for itself a foundation myth that associated the city's origins with the activities of the hero Achilles. The so-called "Telephos frieze" depicts the foundation myth of Telephos as part of the sculptural program on the Great Altar of Pergamon (Dreyfus and Schraudolph 1996; Ng 2007).

Pergamon's *flourit* was in the third and second centuries BCE under the Attalid dynasty. The city served as the capital of the Attalid Kingdom, which, at its greatest extent, reached from the west coast of Asia Minor into central Anatolia. The city took on its monumental character primarily under the reign of the dynast Eumenes II (197-159 BCE). Under the rule of Eumenes II, the area of the city was expanded further down the mountain through the construction of a new monumental city wall, covering an area approximately four times larger than the older town of

[5] Although the majority of archaeological remains at Pergamon date from the beginning of the Attalid dynasty, the site, however, had been inhabited before the accession of the Attalid dynasty. Patchy evidence attests to early inhabitation of the site. Northeast of the Sanctuary of Hera is a gate in the line of the Archaic city wall. This gate can be dated to the fifth century BCE by pottery discovered in the foundation trenches associated with the Archaic wall. This gate is the only architectural evidence left by the Gongylides family, who ruled the city in the fifth century BCE. The coins the Gongylides struck in this period also attest to their dominance and the fact that at this time Pergamon was already an established city (Radt 2001, 45; Radt 1992, 177-178).

Philetairos (Radt 1999, 81; 2001, 47-48). Within these new walls additional city quarters and public buildings were established. Shortly after the erection of Eumenes' city wall, the Lower Market was constructed in the new center of the expanded area (Fig. 5.3). In addition, this period saw the building of the Gymnasion with its accompanying three terraces and public buildings. The theater with a five-story buttressing terrace on its west side and the Temple to Dionysos were also erected under Eumenes II. Several elite domestic structures were built in this region of the city during this time of rapid urban development. There were also new constructions and modifications to existing religious structures under the reign of Eumenes II. The temple to Athena, the city's patron goddess, was significantly expanded, and the Great Altar to Zeus was also constructed under the Attalids (Radt 1999, 79).

As discussed in Chapter 2, Pergamon developed a sophisticated water-management infrastructure under the Attalids, beginning in the early second century BCE. Cisterns supplied water on the Acropolis, but already under Eumenes II the quantity of water they supplied was insufficient for the growing population (Fig. 5.4) (Garbrecht 1987, 21). Construction of the Selinus aqueduct was initiated at the beginning of the second century BCE and consisted of two pipelines, one of which fed the large public fountain beneath the entrance to the Middle Gymnasium (Garbrecht 1987, 22-24). Over time, several other lines were added to the Selinus aqueduct, one of which may have fed the Nikephoron Temple, based on a stamp reading NAOY ("of the Temple") (Garbrecht 1987, 30-31). The Hellenistic Madra Dağ aqueduct was probably built under Eumenes II in connection with the large-scale building projects on the Acropolis. The pipeline is 42 km long and made use of a massive inverted siphon in order to bring water up to the top of the Acropolis, possibly to the gardens of the royal palaces (Conze *et al*. 1913; Garbrecht 1987, 27). The Geyikli Dağ aqueduct was a late Hellenistic or early Roman-period construction and supplied water to the region of the Asklepieion in the southwest part of the city (Garbrecht 1987, 28-30). In the Roman period three new water-lines were added to the city: the Madra Dağ, the Kaikos, and the Aksu aqueducts (Garbrecht 1987, 31-43).

When the last of the Attalid kings, Attalos III (138-133 BCE), died without a successor, the kingdom of Pergamon was bequeathed to Rome in 133. The resulting alliance was one of the major catalysts for Rome to extend its reach into Asia Minor.[6] Although Pergamon was subsumed into the burgeoning Roman Empire at a relatively early date, in 29 BCE it was eclipsed by Ephesos as the leading city in the Roman province of Asia (Scherrer 1995b). As a result, Pergamon saw little change in its urban infrastructure until a significant urban construction boom in the city began in the second century CE under the emperors Trajan and Hadrian. On the Pergamene acropolis, an imposing temple to the imperial cult was begun under Trajan and finished under Hadrian (Radt 2001, 49; Schowalter 1998). With the political stability brought by Roman rule, settlement spread past the city walls and into the plain below. A Roman theater, stadium, amphitheater, and a number of domestic structures date to this period. Other building activity during the reign of Hadrian consists of the erection of the massive sanctuary complex dedicated to the Egyptian gods (and possibly also to the emperor), the so-called Red Hall, and a major remodeling of the sanctuary to Asklepios. Both of these sanctuaries will be discussed in more detail below. The Roman city seems to have existed in this extensive form until the middle of the third century CE, when settlement again contracted and was concentrated on the area of the acropolis (Radt 2001, 82).

Pergamon began to use what was essentially 'Roman' technology relatively early, but only experienced big changes in its ritual landscape in second century CE. The changes and consistencies in the ritual use of water can be seen as an expression of needs impelled by socio-political factors and changing cultural milieu, rather than simply by technological characteristics. The following section will investigate the use of water in sacred spaces and ritual practice at four

[6] The early connection between Pergamon and the burgeoning Roman Empire may be one of the reasons that contemporary scholars, romanced by the glory of the Hellenistic kingdom of Pergamon, tend not to focus on post-Attalid periods. Considerably less scholarly attention has focused on the period of time between 133 BCE, when the Pergamene kingdom was bequeathed to Rome, and the early second century CE, when the city experienced a renaissance.

sanctuaries in Pergamon in order to unpack both the individual nuances and broad patterns in the organization of sacred spaces with respect to water, the practice of religion, and the influence of imperial politics on these dimensions of social life.

Water in the Sacred Landscape of Pergamon

Water and Fertility: The Demeter Sanctuary

Significant for its connection to fertility and agricultural success, water figured prominently in the aetiologies and rituals of cultic practice for Demeter. One of the oldest Pergamene civic cults, the sanctuary of Demeter offers an opportunity to investigate the use of water in ritual practice over time. The Demeter sanctuary at Pergamon underwent two major phases in its construction and use. The first was during the third century BCE under the Attalid dynasty, and the second major phase was in the second century CE during the reign of Antoninus Pius, which also ushered in a period of significant change in ritual practice. The alteration in ritual practice had a concomitant impact on the role of water within the sanctuary. I contest that this change was a result of Mediterranean-wide trends in religious thought of the second century CE, rather than a result of technological innovation or geopolitical changes associated with Roman imperialism.

The Demeter sanctuary was excavated in the early twentieth century by Wilhelm Dörpfeld, and the interim reports were published in the *Mitteilungen des Deutschen Archaologischen Instituts, Athenische Abteilung* (Dörpfeld 1910, 345-400; 1912, 233-276; Hepding 1910a, 401-493; 1910b, 492-523; Ippel 1912a, 277-303; 1912b, 304-330). Not until 1981 were these data synthesized in a publication on the Demeter Sanctuary by Carl Helmut Bohtz in the *Altertümer von Pergamon* series (no. 13).

Although several festivals associated with the worship of Demeter filled the agricultural year, the Thesmophoria and the Mysteries were the two major festival complexes (Brumfield 1981;

Clinton 1992; Nixon 1995; Thomas 1998, 279).[7] These two principal festival complexes were closely tied. The Mysteries related specifically to a subset of the cult legend, namely the rape and return of Persephone, and, until the Roman imperial period, occurred exclusively at Eleusis (Clinton 1993; Nixon 1995). The Thesmophoria are generally understood to have been widely practiced throughout the Mediterranean, and in antiquity were considered to have been an essential ritual for ensuring the health of the *polis* – a ritual in which citizen women of child-bearing age helped to ensure the survival of the *polis* by encouraging fertility both of the land (by means of agricultural production), and of their bodies (through the production of legitimate heirs). The Mysteries are considered to have a slightly different focus, with their significance usually thought to relate to the cycle of growth, death, and rebirth, both agricultural and spiritual (Nixon 1995, 75-76). Thomas (1998) considers the evidence for ritual practice at the Demeter sanctuary at Pergamon and suggests that, over the course of several centuries, practice within the sanctuary shifted away from women's ritual aimed at ensuring agricultural success (i.e., Thesmophoria), to mysteries of the Eleusinian type, which instead stressed the ritual drama of death and resurrection and personal empathy with the gods. Supporting Thomas' claim that there was a change in ritual focus from agricultural concerns to ensuring life after death is the fact that water – as a necessary element in both agricultural practice and ritual purification – became less central for cultic practice, alongside changes in votive deposition which suggest a similar ritual shift.

The Demeter sanctuary at Pergamon reflects a combination of the prevailing trends in the siting of sanctuaries to this goddess and idiosyncratic features reflective of its particular context. Water was a necessity for agriculture, and, as such, sanctuaries to the goddess Demeter were often located near a spring or stream (Cole 1988; 1994; 2004). As a deity whose purpose was to mitigate against agricultural concerns, the placement of sanctuaries to Demeter often reflects this cultic role. It has been argued that the typical sanctuary of Demeter was located on the side of a

[7] For full discussion of festivals of the Attic cult of Demeter and their relation to the agricultural year, see Brumfield 1981.

hill, and de Polignac (1984) observed that, during the formative stages of the *polis*, Demeter sanctuaries were located just outside or near a city's walls, providing a transition between the inhabited city and its agricultural territory. While these are typical properties of Demeter sanctuaries, not every sanctuary fit such a description. Pausanias mentions sanctuaries of Demeter in 51 cities on the Greek mainland; 21 had sanctuaries of Demeter inside the city (*asty*), either on the acropolis or in the agora, 18 had a sanctuary of Demeter in a village outside the city, and 24 had sanctuaries of Demeter deep within the countryside (Cole 1994, 205).

Located immediately outside of the city, on a terrace below the acropolis and immediately outside of the Philetairan walls (third century BCE), the Pergamene sanctuary of Demeter conforms to the placement of others from the Classical Greek world (see Fig. 5.1). Demeter sanctuaries located immediately outside of the city were common in Greek colonial cities, especially in Ionian Asia Minor and Sicily, during the two great periods of diaspora and colonial expansion (Cole 1994, 211). In its siting, even though Pergamon was not itself a colonial foundation, it is quite likely that the location of this sanctuary was modeled on its Ionian neighbors and was aimed at suggesting a further connection with the Greek mainland.

The earliest activity at the sanctuary to Demeter predates the great Hellenistic temple and altar that were constructed by Philetairos, the founder of the Attalid Dynasty (Radt 1999, 181). This earliest sanctuary was a simple *temenos* with altars, which were constructed of the same stone that comprised the city walls, suggesting that it may date to the late fourth century BCE and to the first period of urban construction (Radt 1999, 181; Thomas 1998, 284). In addition to the altars, a *bothros* (offering pit) may have been located to the north of the main altar, but was subsequently covered over by the constructions in the succeeding phase (Dörpfeld 1910, 378).[8]

The first major phase of construction was during the Hellenistic period, first under Philetairos, and then under Queen Apollonis, the wife of Attalos I (241-197 BCE) and mother of

[8] Dörpfeld (1910, 378), Thomas (1998, n. 20) interprets the ditch as a Byzantine cistern, but Bohtz (1981) argues that it must be a *bothros*. There were an abundance of offering pits in the sanctuary.

Eumenes II (Fig. 5.5). This building phase is dated by means of inscriptions on the temple and altar that mention Philetairos and his brother, Eumenes I (Radt 1999, 181). Philetairos built a stoa to the north of the complex with a *theatron* (row of spectator seats) on the eastern end of the stoa. A cistern for cultic washing was installed in the courtyard to the east, just outside of the sanctuary. Under Apollonis the sanctuary was enclosed on all sides, addressing the need for seclusion as the city began to expand towards the once-remote sanctuary. Apollonis also augmented the water supplied by the cistern with a fountain, though its architectural arrangement and source of water-supply are unclear. As there were no natural sources of water on the hill itself, the water for the fountain was probably brought into the sanctuary from an external source. Apollonis also built a permanent offering pit (*bothros*), constructed of rectangular stone blocks and located near the fountain in the lower courtyard (Radt 1999, 183; Thomas 1998, 286).[9]

Evidence suggests that, from its earliest phases until the first-second century CE, ritual practice at the sanctuary centered on rites aimed at ensuring agricultural success. The *bothros* and fountain were integral to the performance of these rites. As the Thesmpohoria was an agrarian festival celebrating fertility, nurturing, and growth, a central element of the festival was the sacrifice of piglets into the *bothros* and the subsequent hauling up of the rotted remains (probably from the prior year) to be mixed with the earth to ensure agricultural success. As Thomas (1998, 282) points out, this sacrificial practice may be the root of the meaning of the word Thesmophoria: “thesmos” is something laid down, and “phoria” is the act of lifting this up again and placing it on the altar.

While there was no natural source of water at the Pergamene sanctuary, as at other cult sites to Demeter, the cistern and fountain in the courtyard supplied water necessary for purification rites. The second day of the Thesmophoria involved fasting after ritual purification in water, and sitting on the ground near a spring or well (Clinton 1992, 34 n. 107). In relation to the activities at

[9] The Propylon west of the fountain may have been in use as early as Philetairos (Dörpfeld 1912, 247; Bohtz 1981, 15, 154).

Eleusis, Pausanias (1.38.6) relates that the women danced and sang to the goddess (Demeter). Clinton proposes that the initiates dance by the well happened at the beginning of the festival and expressed a polarity between the joy and anticipation of the initiates and the sorrow of the goddess because of the loss of her daughter (Clinton 1992, 27-28). Although there is no definitive evidence to support this suggestion, it is possible that the water from the two different sources at the Demeter sanctuary at Pergamon – the cistern (probably supplied by rain, runoff from the fountain, or both) and the fountain (probably supplied by an aqueduct pipeline) – were used for different cultic purposes.

The fountain in the Demeter Sanctuary was located on the east side of the forecourt. The remains as seen at Pergamon today (Fig. 5.6) probably date to the early Roman imperial period; however, Dörpfeld identified several large blocks, reused in this Roman reconstruction, that he suggested were probably borrowed from an earlier fountain located in the same place (Bohtz 1981, 15; Dörpfeld 1910). Bohtz suggests that this earlier fountain may have been rectangular in form, similar to the Hellenistic fountain at the exit to the Gymnasion (Bohtz 1981, 15, Taf. 43a; Dorl-Kligenschmid 2001, 222, Kat.-Nr. 77).

Further reflecting the concern for purity through ritual contact with water, *hydriskoi* – i.e., miniature *hydriai* (water vessels) – were characteristic votive dedications (Bohtz and Albert 1970, 403, pl. 26). Votive offerings from the Philetairan and Attalid periods at the Demeter sanctuary at Pergamon are not abundant, but the presence of these votive *hydriai* support the conclusion that the space was dedicated to celebration of an agricultural festival at which fertility and purity were of central concern; concerns which were symbolically and practically expressed through water. Though not abundant at Pegamon, *hydriai* are frequent dedications to Demeter from the early fifth century until the Hellenistic period (Cole 1988, 165; Nixon 1995), a phenomenon which is geographically widely attested at several sanctuaries to Demeter and Kore. An abundance of these miniature vessels was found at the Sanctuary of Demeter and Kore on Acrocorinth, which should be viewed in contrast to the scarcity of such finds at Corinth in general (Clinton 1992, 34, n.

106)). Votive *hydriai* were also popular at Kyparissi on Cos and at Cydonia and Knossos on Crete. In the earliest phases of the Thesmophorion at Bitalemi by Gela on Sicily, *hydriskoi* were the most common type of vessel (Clinton 1992, 34 n. 106).

Diehl (1964) has pointed out that *hydriai* often appear in scenes showing the Eleusinian goddesses and observed that many of these scenes also include Triptolemos, whose role in the mysteries is still contested by scholars, but whose association with wheat is secure. Further, Pausanias (4.33.4) mentions the dedication of a bronze *hydria* in a grove near Megalopolis, where there was a statue of Hagne, an epithet associated with both Demeter and Kore that suggests chastity or purity (Cole 1988, 164). Cole argues that two ideas are implied in these two pieces of evidence: the association of *hydriai* with Triptolemos highlights the recognition of the need for water in agriculture, while the connection of a spring with Hagne indicates the need for purification by water (Cole 1988, 164). This connection between the cult of Demeter and Kore, votive *hydriai* which contained and/or symbolized water, and water itself were integral components of ritual practice in the early phases of the sanctuary at Pergamon.

At some point between the first century BCE and the first century CE the courtyard of the sanctuary complex was enlarged and the size of the fountain was increased (Fig. 5.7) (Bohtz 1981, 59). Pink waterproof plaster (*opus signinum)*, is preserved along the back wall of the settling basin, leaving no doubt as to its function as a fountain. During this Roman-period renovation, the fountain was remodeled with an apsidal basin with a hemispherical upper-story.[10] No decorative elements have been uncovered, suggesting that the fountain was not adorned with a sculptural display. Dorl-Klingenschmid (2001, 225, Kat.-Nr. 81) posits that the lack of sculpture, in combination with the placement of the water outlets only a few centimeters below the upper cornice and high above the settling basin, would have made the water the single decorative element. Indeed, perhaps limiting the architectural and sculptural elaboration was a conscious

[10] In her typology of fountain types in Asia Minor, Dorl-Kligenschmid (2001) calls this type of apsidal fountain 'Sigmabrunnen.' See also Chapter 3.

choice meant to draw attention to the water itself. Rather than creating a setting for sculpture, the water in this fountain would have been the sole and central decorative feature.

The architectural arrangement of this Pergamene fountain is similar to that of the Fountain of Domitian at Ephesos, constructed in 92/3 CE. In particular, the apsidal settling basin of these two fountains is highly unusual compared to contemporary structures in Asia Minor. Previously, apsidal fountains were limited almost exclusively to the Italian peninsula, whereas fountains in Asia Minor were largely rectangular in form (Longfellow 2011, 67).[11] A more secure date for the fountain at Pergamon would offer clarity about the direction of influence (from Ephesos to Pergamon or *vice versa*); however, in its architectural arrangement it seems certain that this edifice echoed Italian predecessors and Ephesian contemporaries (see Chapter 3, Fig 3.21).

Only the immediate organization of the pipes that supplied water to the fountain has been investigated; the origins of the water have not yet been determined. However, based on the position of the Roman-period Madra Dağ waterline, it is possible that its endpoint was at this fountain at the Demeter Temple and that, at least in the Roman imperial period, this fountain may have been supplied with water that originated outside of the sanctuary (Garbrecht 1987, 34; 2001, 160-161). The water-supply pipe to the fountain probably dates to the Hellenistic period, to which the later Roman construction was linked (Bohtz 1981, 15). Following Dörpfeld, Bohtz suggests that the inflow of water to the fountain came from the east along a canal (Bohtz 1981, Taf. 44). The pipes supplied two water basins on either side of the façade. The inflow of water followed along the Roman building behind the façade through a level canal and out of three water spouts. The spouts in the side niches show a small perforation, which possibly housed an outflow pipe. According to Bohtz's reconstruction of the fountain, the outflow pipe ran into the cistern located

[11] Dorl-Klingenschmid (2001) has identified the typical types of rectangular fountains in Asia Minor: a variation of fountain found in Caria in which a fountain sheltered a spring usually emanating from a rock fissure; a rectangular fountain sunk into the ground; and the fountain in hall form. The typology of fountains from Hellenistic and Roman Asia Minor is discussed in more detail in Chapter 3. Of course, there were exceptions to this rule. An apsidal basin was added to the Memmius Monument in Ephesos, probably in the Augustan period (as discussed in Chapter 3).

to the south of the propylon. While this hypothesis cannot be confirmed without excavation, if Bohtz's reconstruction is correct, it suggests that water which was brought into the sanctuary through the fountain was stored in the cistern, and most likely reused.

There is no evidence to suggest a change in the organization of ritual practice for the cult of Demeter until sometime around the second century CE. The change in ritual practice occurred alongside a major remodeling of the sanctuary and has implications for the use of water and for understanding how the changes in cultic organization relate to other phenomena in religious belief and ritual practice. The second major phase of construction at the sanctuary of Demeter probably dates to the period of Antoninus Pius (Fig. 5.8). The dedicant of the temple was Gaius Claudius Selianos Aesimos, who offered the renovations from his own money while holding the office of *prytanis*, and his name also appears in other inscriptions and on coins from the Antonine period (Hepding 1910a, 442-444, no. 25; Thomas 1998, 289). During the Antonine reconstruction, the cult temple was restructured as a prostyle temple with a double courtyard. Both the great altar and the south stoa were clad in marble, and the stoa was outfitted with console slabs in between its columns. The temple maintained its dedication to the Thesmophoric pair, Demeter and Kore (Thomas 1998, 290).

Approximately contemporary with this reconstruction, votive *hydriai* ceased to be offered and a different type of votive dedication began to appear. Inscriptions are most abundant from the mid-second century CE, from which it is possible to reconstruct a picture of cult personnel. Specifically, cult personnel connected to the Eleusinian mysteries appear for the first time at Pergamon in the Roman period (Thomas 1998). These dedications are inscribed on the altars and the console slabs of the south stoa. The majority of the dedicants have Roman names with the typical *trinomium*, and very few bear simple Greek ones.[12] Interestingly, the offices of the

[12] Among the dedications are found the *hierophant* (cult teacher), *dadouchos* (torch bearer) and various individuals identifying themselves as *mystai* (initiates). These offices are all attested at Eleusis throughout the Hellenistic and Roman period, *hierophantes* and *dadouchos* being two of the most significant (Clinton 1974; Thomas 1998, 292).

mystery cult are attested on votive altars usually dedicated to divinities other than Demeter and Kore. Some of the dedications were to gods who were at least loosely connected with the mythic complex – such as Zeus Ktesios, who was the protector of household goods, and thus of stored grain. Others, such as "to the Pantheon" or "to the unknown gods" portray a more panhellenic concern, while there exist several dedications to abstract concepts, "fidelity and harmony" or "virtue and moderation," conveying more intellectual concerns which were characteristic of thought during the second century CE (Thomas 1998, 293). With one or two exceptions, these votives were dedicated by male Roman citizens who held an office in the hierarchy of cult personnel.

The epigraphic and iconographic remains point to the inclusion of males in cult practice and an increasing focus on afterlife and rebirth. For example, a parapet relief from the terrace of the Demeter Sanctuary depicting Cerberus, the three-headed dog who guards the gates of Hades, attests to this concern (Bergama museum, no. 2044, Fig. 5.9). There is clearly a new emphasis on the mysteries, or the qualities of cultic practice which are also prevalent in the other mystery religions that were becoming increasingly popular in the second century CE. If Thomas' contention is correct, and the shift in ritual practice did follow the Eleusinian model, it also implies new cult offices, the participation of male worshippers, and shift of attention away from focusing primarily on Demeter and Kore to include other gods. As Clinton says of the Mysteries, they:

> …represent a transformation of the much older Thesmophoria and similar cults open only to women. Several elements and themes of the older cult remain in the new creation – sorrow, fasting, a sacred well, ritual mockery, deposition of piglets in *megara*, agrarian prosperity – *but now these are given new emphases, arranged in a rite that has a divine drama at its center, and which looks toward death and the afterlife.* The initiates suffer as the Goddesses suffer and finally share in the Goddesses' extraordinary joy. And so they enter into a special relationship with each of them and naturally with Kore's other self, the Thea in the underworld, who will look after them in the life to come [Clinton 1993, 120, emphasis mine].

The shift in focus from the agrarian ritual associated with the Thesmophoria to the Mysteries, suggests changing concerns both within the context of individual cities and more broadly in the Greco-Roman world. Thomas argues that adoption of the Mysteries at this time is an expression of "general Greekness, panhellenism of the second-century variety, an almost nostalgic affirmation of Greek culture" (1998, 295). This more panhellenic focus stands in contrast to the cult of Demeter as practiced in the Hellenistic period, which was concerned with the life cycle and agricultural cycle of an individual *polis* community.

As noted above, the trend observed at Pergamon mirrored similar developments throughout the Greco-Roman world. The Mysteries were widely popular at this time and may have been a clear and outward expression of 'being Greek under Rome.' The Mysteries were based on the Eleusinian model, noteworthy for the close connection with ritual practice at Athens itself.[13] In fact, the Eleusinian Mysteries in their true form took place only at Eleusis. Therefore, the rites based on the Eleusinian model that were practiced throughout the Greco-Roman world necessarily invoked a connection to Eleusis itself. It may be that the increase in popularity of this particular subset of Demeter cult was an explicit articulation of ties to Athens. Further, the focus specifically on the Mysteries may have been a consciously archaizing form of ritual practice, as the Mysteries were an old and venerated form of Demeter cult which had been recorded in the *Homeric Hymn to Demeter* as early as the seventh century BCE. Moreover, although the Eleusinian Mysteries were in vogue across the Greco-Roman world, it may have held special significance for the city of Pergamon, which at its founding fashioned itself as a new Athens. From this connection to Athens, the shift to practice may have acted as means to express a connection to the original ideals of Hellenism on which the city itself was founded.

[13] The notion that Eleusis was independent from Athens until the early sixth century is based on the *Homeric Hymn to Demeter,* which was probably composed around the end of the seventh century. The *Homeric Hymn* sets much of its story in Eleusis, but says nothing of Athens. Clinton (1993, 112) argues that following Thucydides, Athenian law, and Athenian political institutions, Athens and Eleusis should be understood as closely connected. He suggests that the author of the *Hymn* does not mention Athens because he had no particular interest in its relation to Eleusis, not because they were fundamentally distinct.

The changes in cultic organization with respect to water further support the argument that cultic practices shifted from those with a focus on agricultural success to more panhellenic rites. In the earliest periods of activity at the sanctuary, votive *hydriai* were frequent dedications, thus suggesting the importance of water as connected to ritual purity and success in agricultural pursuits. Dedications of votive *hydriai* ceased in the Roman imperial period, alongside a concomitant increase in inscriptions naming male dedicants and invoking a number of panhellenic gods. At this time the fountain in the courtyard may have been supplied by the Madra Dağ aqueduct, supplying water that was, as Aelius Aristides claims in his Panegyric on the Water in Pergamon, the "most abundant and fairest of all that any city ever received" (Behr 1981, 354-355, no. 53). The decrease in importance of water for ritual practice may have modified the need to have water supplied from a specifically sacred source.

Helping to explain this apparent shift in ritual practice to Demeter is that within the Eleusinian Mysteries is an undercurrent of individual relationship with the Gods which may have been impelled by the increased popularity of Christianity,[14] and of other cults for which secrecy, initiation, and personal contact with the god were central. In the second century CE, Mithraism and the cult of the Egyptian gods was gaining more traction in the Roman world, and at this time in Pergamon the worship of Asclepieios was experiencing a resurgence.

Water and Healing: The Asklepieion at Pergamon

Water was central to both the efficacy of Asklepios, a god of healing, and in practices associated with his worship. In many cases, the god and water were considered to be conterminous, such that the god was manifest in the water or worked through water (Dunant 2009, 279). As such, the source of water at sites where Asklepios was worshipped was often considered critical to the efficacy of the god. Such an arrangement was exhibited at the

[14] This is a point that Clinton (1993) alludes to at the end of his article; however, our contemporary Judeo-Christian perspective sometimes gives too much emphasis to the importance of Christianity in this period. In the second century CE Christianity was one mystery religion among many.

Pergamene Asklepieion, in which specific sources of water were utilized within the cultic precinct, even at the exclusion of other easily obtainable sources.

Excavations at the Pergamene Asklepieion began in the early twentieth century under the direction of Theodore Wiegand. Work ceased during the Second World War, after which research resumed again under the direction of Eric Boehringer (Zeigenaus and De Luca 1968, 3-5). The architecture, inscriptions and small finds have been published in five volumes in the *Altertümer von Pergamon* series (vol. 11.1-11.5), but very little secondary literature exists on the sanctuary (e.g., Agelidis 2009; Hoffmann 1998; Jones 1998).

The Asklepieion is located in the valley below the acropolis, approximately 3 km from the urban core of the city (see Fig 5.1). The sanctuary was approached by the Sacred Way that ran from the Acropolis through the lower town in a southwesterly direction. Excavations around the Roman theater within the sanctuary complex revealed several Hellenistic houses dating to the second century BCE, suggesting that the sanctuary was not as secluded as originally conceived by the excavators (Radt 1988, 254). Moreover, a Roman-period house that fits into the grid of the Roman city plan was excavated to the east of the complex, suggesting that the gridded street system reached all the way to the sanctuary itself (Radt 2001, 51).

The Roman architect Vitruvius describes criteria for choosing a suitable location for a sanctuary, and particularly one dedicated to gods of healing:

> In the case of all sacred precincts we select very healthy neighborhoods with the suitable springs of water in the places where the *fanes* are to be built, particularly in the case of those to Aesculapius and to Salus, gods by whose healing powers great numbers of the sick are apparently cured [Vitr. *De arch.* 1.2.7, trans. Morgan 1914].[15]

The placement of his sanctuaries to gods of medicine and healing near natural springs or wells reflects the understanding of the healing properties of water. The use of hot springs for medicinal purposes is first attested in the teaching of Hippocrates (ca. 460-370 BCE), who is traditionally

[15] S*i primum omnibus templis saluberrimae regiones aquarum que fontes in hic locis eligentur, in quibus fana constituantur, deinde maxime Aesculapio, Saluti, et eorum deorum quorum plurimi medicens aegri curare videntur*.

considered to be the father of medicine (Dvorjetski 2007). Hippocrates' ideas about medicine were subsequently developed by Galen (129 - ca. 199 CE), who was born in Pergamon and spent several years as a physician at the Pergamene Asklepieion (Sarton 1954).[16]

In general, there are very few common patterns in the architecture and layout of Asklepieia other than the provision of water (Hoffmann 1998, 51-52), but it is possible to identify a number of components generally present within an Asklepieion. In addition to the cult buildings for Asklepios, other gods, and heroes with their altars, there are often fountains, sleeping chambers, and resting and waiting rooms. In older Greek sanctuaries there were also often banqueting halls and guesthouses. From the Roman imperial period onwards, sanctuaries for Asklepios were often supplied with bath buildings.

The earliest activity at the Pergamene Asklepieion dates to the first half of the fourth century BCE, and was centered on a natural pool on the 'Felsbarre,' or rock outcrop (Fig. 5.10, Fig. 5.11, no. 4) (Ziegenaus and De Luca 1968, 6). The spring water abundant in this particular location was undoubtedly central to the understanding of this place as holy to Asklepios and provided the necessary fresh water for rituals associated with his worship. According to Ziegenaus and De Luca (1968, 6), the water found in the area of the Asklepieion is very cool and of excellent quality. On the basis of the dedicatory inscriptions it seems that the earliest activity at the site, when the region was still under Persian control and in the earliest years of the Attalid dynasty, was private in nature (Habicht 1969, 1).

The earliest temple to Asklepieois was an Ionic building erected under Philetairos in the early third century BCE, at the same time that the sanctuary of Demeter on the acropolis was being built. The main temple of Asklepios Soter (Asklepios the Savior) (Fig. 5.11, no. 25) was

[16] Other writers who ascribed to the medicinal benefits of bathing were: Celsus (ca. 25 BCE–50 CE), an encyclopediast whose medical writings are extant; Soranus of Ephesos (90-150 CE), who studied in Alexandria before moving to Rome to practice medicine; Oribasius, a Greek physician and medical writer also from Pergamon in the fourth century CE, and Caelius Aurelianus, who lived in the fifth century CE and preserved Soranus' treatise (Dvorjetski 2007, 84).

constructed on the ‘Felsbarre,’ and the natural spring was transformed into a rusticated bathing-pool (the so-called ‘Felsbrunnen,’ Fig. 5.11, no. , 29 and Fig. 5.12), forming the religious and ritual core of the precinct (Ziegenaus and De Luca 1975, 16-17). The Asklepios temple was constructed with a well in the cella so that the healing waters could be gathered from within the main temple building. Probably around the beginning of the second century BCE the temple to Asklepios was reconstructed with its decoration stylistically similar to that of the Great Altar of Pergamon, suggesting dynastic sponsorship, or at least a dynastic relationship (Radt 1988, 250). North of the main temple on the Felsbarre were two other unidentified cult buildings. It has been suggested that these buildings were possibly dedicated to Hygeia, the goddess of health and often a counterpart to Asklepios, and to his son Telesphoros (Radt 1988, 252). To the south of the Asklepios temple were incubation chambers for the administration of sleep therapies and dream interpretation (Fig. 5.11, nos. 27 and 28) – activities which were central to the healing regimen associated with the god (Ziegenaus and De Luca 1968, 17-19). With the development of the sanctuary over the centuries, frequent additions and modifications were made to the incubation rooms.

The Felsbrunnen provided water from the earliest phases of the sanctuary’s use (Dorl-Klingenschmid 2001, 217-218, Kat. Nr. 68). The rectangular basin is partly hewn out of the living rock, and partly lined with quadratic blocks (Fig. 5.12). This arrangement echoes the combination of natural and architectural features employed in the earliest phases of the Peirene Fountain at Corinth (Robinson 2001). The basin of the Felsbrunnen would have been approached by four steps leading from the east, the last step approximately 1 m above the bottom of the water reservoir. As the basin was almost certainly protected by an enclosure, Dorl-Klingenschmid postulates that it may have been sheltered by a three-walled structure that was open to the east. Based on the shape and size of the basin, either a flat or gabled roof is a possibility. A roughly rectangular canal hewn out of the rock leads to the basin from the northwest (Ziegenaus and De Luca 1975, 16). The rusticated treatment of the basin itself stands in contrast to the architectural treatment of the subsequent water basins established in the sanctuary, and thus suggests that this original spring was intended to stand out against the other water features, its arrangement possibly signifying its age or its 'naturalness.' Indeed, Ziegenaus (1975, 16) posits that this water basin may be the one at which Aelius Aristides, in the second century CE, refers to "holy bathing by people dressed all in white."

Probably roughly contemporary with the development of the incubation rooms, another fountain house, the so-called 'Schöpfbrunnen,' (retrieval basin) was established in the mid-second century BCE (Fig. 5.11, no. 22 and Fig. 5.13) (Dorl-Klingenschmid 2001, 218, Kat. Nr. 69; Ziegenaus and De Luca 1968, 22-24). This basin (4.42 m x 6.22 m) was a typical arrangement in Hellenistic Asia Minor, the so-called 'Stufenbrunnen' in Dorl-Klingenschmid's typology (2001, 24-26). This type of fountain is usually constructed over a spring or is located in a place with a relatively high water-table, as was the case at the Pergamene Asklepieion. Located at the lowest-lying point in the area and sunk into the ground, the Schöpfbrunnen took advantage of abundant water in the area. The basin is approached on the north side by a set of descending stairs. The overflow from the basin exited the fountain through its south wall and ran into a stone channel, located to the southeast (Ziegenaus and De Luca 1968, 24). Constructed of andesite blocks and possibly clad in marble orthostats, an above-ground structure protected the water in this fountain from pollution. The overtly architectural features of the Schöpfbrunnen contrast the sense of 'naturalness' conveyed in the earlier Felsbrunnen.

In the early Roman period, but before the major renovation in the second century CE, another water basin was established at the sanctuary, the so-called 'Badebrunnen' (bathing fountain) (Fig. 5.11, no. 23 and Fig. 5.14; Dorl-Klingenschmid 2001, 219, Kat. Nr. 70; Ziegenaus 1975, 54-55). Although slightly larger (3.5 m x 6.80 m) and clad in marble, this early Roman fountain was closely modeled on the Hellenistic-period Schöpfbrunnen. Its rectangular basin was cut directly into the bedrock. Steps from the east side lead down to a platform, from which the water basin could be accessed. A water-supply line ran over the top of the balustrade, which Ziegenaus (1975,

54) suggests was for the purpose of drinking. Dorl-Klingenshmid (2001, 219) points out that the channel is too narrow to draw water either with one's hands or with a water vessel. Therefore, she suggests that perhaps this channel was to provide running water for bodily or ceremonial cleansing.

The abundance of natural water sources at the site itself were used in ritual practice, however, the surrounding buildings of Pergamene Asklepieion may have been fed by the Geykli Dağ aqueduct in both the Hellenistic and Roman periods. This aqueduct was 4 km long and ran from west to east. Because the aqueduct was cut by the Selinus River it was not able to supply the acropolis and only served the parts of the city on the west bank of the Selinus (Garbrecht 1987, 28-30; 2001, 42). The aqueduct probably fed the fountains located along the Sacred Way, and it is unclear whether the water from the aqueduct was channeled into the sanctuary itself (Garbrecht 1987, 30). However, it seems unlikely that aqueduct water was utilized within the sanctuary as an extensive system of pipes and conduits attests to the desire to capture and channel the water that originated in the sanctuary complex.

By the middle of the second century CE the sanctuary of Askepieos was the most popular place of worship at Pergamon, as Habicht argues is clearly expressed through the epigraphic record (Habicht 1969, 6 – 18; Hoffmann 1998, 41). Toward the end of the first century CE, a series of miraculous cures were reported to have occurred at the Asklepieion which seem to have created a fervent upswing in the sanctuary's popularity (Hoffmann 1998, 42).[17] At this time, too, the sanctuary had undergone a major remodeling begun in the reign of Hadrian. The emperor visited the city in 123 CE, and, while it is contested as to whether or not he initiated the reconstruction himself, the remodeling suggests unequivocal imperial connections in its local

[17] This upswing in popularity came after a series of devastating events at the sanctuary. In 88 BCE, Mithridates VI ordered the massacre of all the Roman residents of Pergamon, which the Pergamenes carried out willingly, even inside the sacred precinct of Asklepios where the Romans had sought refuge. The desecration of the sanctuary led to the loss of its asylum status, which was not restored until 44 BCE under the proconsul P. Servilius Isauricus and reconfirmed by Tiberius (Habicht 1968, 4-6; Hoffmann 1998, 42).

benefactors and architectural inspiration (Fig. 5.11). This project was sponsored by several leading Pergamene citizens, but particularly significant were the benefactions by two men accepted into the senate under Hadrian: Claudius Charax, who dedicated the propylon, and Rufinus, who dedicated the Temple to Zeus Asklepios (Thomas 1998, 295).

This remodeling of the Asklepieion was a wholesale affair – only the essential components of the original sanctuary were spared (Hoffmann and De Luca 2011; Ziegenaus 1981). Most importantly, the sacred spring and the other drinking and bathing pools around which the sanctuary grew were maintained, if slightly refurbished. Also left unmodified were the Temple to Asklepios Soter and the incubation chambers, which were the earliest buildings of the sanctuary complex. Everything else was completely demolished. The area was then leveled and extended to the north and south (Hoffmann 1998, 45). Along the north, west, and south sides a uniform series of Ionic porticoes were erected. On the east side of the complex, all facing the central court, were a library in the north, the large treatment center in the south, and the propylon and Temple to Zeus Asklepios in the center. The theater was built into the slope in the northwest corner. In the southwest, wisely placed downwind, were the latrines (Hoffmann 1998, 45).

The newly-built Roman period temple, as Habicht points out, was dedicated to the universal god Zeus Asklepios (Fig. 5.11, no. 6) (Habicht 1969, 11; Hoffmann 1998, 49). This connection to Rome is further suggested in its architectural form, as it was an exact replica of the Pantheon in Rome also constructed during the reign of Hadrian, although only half the size (Fig. 5.15). As its name implies, the Pantheon was dedicated to all of the gods. This tendency toward panhellenism evident in the Demeter sanctuary is also expressed here at the Asklepieion by means of an architectural analogy to the well-known building in Rome. However, despite this expression of pahnellenism on the part of the dedicators and architects, the new Temple to Zeus Asklepios never gained real popularity. In fact, there are just two votive dedications to Zeus Asklepios compared to the enormous number to Asklepios Soter. As Habicht (1969) asserts, this is a clear demonstration of preference for the traditional god of healing, while the more intellectually inspired Zeus Asklepios attracted only a small circle of followers (Hoffmann 1998, 52).

However, despite the thoroughgoing remodeling of the sanctuary, as Hoffmann (1998, 49) suggests, the paramount interest of the patrons and architects was not only "in dutifully preserving the time-honored nucleus of the Pergamene Asklepieion, but in enhancing it architecturally and stressing it as a focal point." I argue that the same underlying principle manifest in the architectural focus was also reflected in ritual practice at the Asklepieion: namely, the Roman renovations did not fundamentally change the organization of cult practice which still centered on the original cult buildings, and significantly, on the natural spring and bathing and drinking pools. While the Roman period renovations clearly engage in an architectural conversation with the Imperial capital, both in stylistic terms and in the connection between the donors and the Imperial house, the remodeling of the Asklepieion did not reflect fundamental organizational changes in ritual practice with respect to water.

The same adherence to traditional forms of worship can be seen expressed in the so-called 'Lower Round Building,' which was also part of the Roman-period remodeling of the sanctuary (Fig. 5.11, no. 9). Due to its many basins and extensive pipe-system the Lower Round Building was certainly used for water treatment, which suggests the increased need for a facility in which people could undergo hydrotherapy (Fig. 5.16). It, therefore, also indicates the increased need for water. Its circular ground plan is in keeping with the Roman penchant for curved structures and echoed the form of the Temple to Zeus-Asklepios. Although there were Roman-style bath buildings at both Epidauros, the major Asklepios sanctuary in the Greco-Roman world, and Kos, the major sanctuary in the region, there were no such buildings constructed for the Asklepieion at Pergamon. Instead, the construction of the Lower Round Building seems to be responding to the increased popularity of the sanctuary and need for bathing facilities, while at the same time consciously employing a different solution than the Roman-style architectural answer to this need for increased water. Furthermore, instead of being supplied by piped-water from an aqueduct, this building relied on water gathered from the sanctuary itself. This was accomplished through the construction of a large cistern adjacent to the Temple to Zeus Asklepios (Fig. 5.17) (Ziegenaus and De Luca 1968, 72). Indeed, Ziegenaus and De Luca indicate that the cistern would have doubled the amount of water available to the south and east regions of the sanctuary where the Lower Round Building is located. It is clear that the Lower Round Building was fed with water by pipes and channels running from the cistern; however, the tangled mass of water-lines in the area precluded the excavators from being able to trace the specific paths (Ziegenaus 1981, 98). Located at the lowest point in the sanctuary complex, the Lower Round Building also received runoff water from the Schöpfbrunnen, which was channeled through the underground tunnel. In this careful arrangement to secure water from the natural springs and rainwater that fell on the sanctuary itself, it seems that the fundamental integrity of worship at the Asklepieion was associated with the water from *this very place.*

The centrality of the water from the original sources around which the sanctuary was constructed for worship was maintained, despite the Roman-period reconstructions with decidedly Roman imperial architectural precedents. The sanctuary inherited the external trappings of the Roman Empire in its architecture, but the old and venerated places which formed the kernel of ritual practice – the springs and cult buildings on the Felsbarre – remained central to the worship, and probably also to the efficacy, of the god Asklepios. The evidence indicates that, in part, religious worship and ritual practice at the Asklepieion remained constant despite a significant rebuilding program is because the sanctuary centered on healing waters that were specific to the place. This differentiation between water sources indicates that that were water sources that were appropriate for general uses (e.g., water from the Geykli Dağ supplied the fountains along the Sacred Way) and water that was reserved for sacred purposes.

The second-century hypochondriac orator Aelius Aristides was a frequent pilgrim at the Asklepieion at Pergamon and his *Hieroi Logoi* (Sacred Tales), provides information about his personal connection to the god. Further, this work offers general information about the hydrotherapy and other types of healing treatments patients of Asklepios would undergo. The five books of the *Hieroi Logoi* are a meditation on Aristides' relationship with the god Asklepios, and generally parallels similar phenomena observed in the worship of Demeter at Pergamon in the second century CE, which also focused more intently on personal empathy with the gods. As a result of his neurosis, Aristides spent much of his adult life traveling to treatment centers, mainly in western Anatolia. He frequently stayed in residence at the Asklepieion at Pergamon which, at this point, would have been newly renovated (Behr 1981).

Aristides offers information about the movement of health pilgrims within the Anatolian landscape, where travel to healing waters serves as the connective element. Aristides describes his visit to a site called Allianoi,[18] an ancient thermal spa settlement located 120 stades away from Pergamon.[19] Excavators believe they have located the site of Allianoi mentioned in the *Hieroi Logoi* approximately 18 km to the northeast of Bergama, on the road leading to the town of İvrindi.[20] Although no epigraphic attestation has been found at the site to confirm this identification, it seems relatively secure to suggest that this site is the one mentioned in the text on account of its naturally occurring hot springs and extensive bathing facilities.

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[18] Behr translates as Aliani. For the spelling cf. *Revue des Etudes Grecques* III (1982), 51-52; Behr 1981, 432, n.2.

[19] 'Again I accomplished what was a total of two hundred and forty stades round trip' [Aelius Aristides *Hieroi Logoi* 3.6, trans. Behr 1981]. Allianoi is first attested in the scholarly literature by Schuchhart (1913, 131-133) as the site Paβcha-Ludβcha. He describes how, in the early twentieth century, visitors would come to the spa from the surrounding environs to take advantage of the naturally warm waters. The visitors would sleep in wooden barracks on beds and bedding that they would bring with them. A bath host would offer the visitors coffee, after which he would lead them down a rickety wooden staircase into the bathing space filled with naturally warm water. Schuchhart states that he finds the contrast between the Roman bath building, outfitted with luxurious materials, and the rickety infrastructure built by the local population in the early twentieth century a jarring juxtaposition.

[20] Excavated beginning in 1998 as part of a rescue mission before its impending inundation with the construction of the Bergama Yortanlı dam, Allianoi is likely to be completely covered by water within the next few years. The excavations were conducted by Ahmet Yaraş of Trakya University with a team from Istanbul University, Middle East Technical University (METU) and the Bergama Museum.

Although the dates are contentious, it seems that Aristides visited Allianoi during his visit to his home town of Hadrianotherai, located in the vicinity of Pergamon, in the winter of 145/146 CE (Yaraş 2006, 443). The number of public works constructed in Allianoi increased in the second century CE, consistent with the erection and amplification of a multitude of urban centers in Anatolia, and also with the remodeling of the Asklepieion at Pergamon. With its hot water springs, cold water supply, and the İlya River flowing through the middle of the site, the bath complex at Allianoi must have been an exceptionally well-appointed healing facility.

Aristides' discussion of his visit to Allianoi is brief, though no less detailed than his treatment of episodes in other locations. He makes two explicit references to the warm springs at the site, and it seems that he made visits on two separate occasions. He first visits Allianoi as a result of Asklepios impelling him to stay there. Aristides recalls the dreams he had while in residence at Allianoi and claims that through these dreams he was cured of his ailments, at least for a time. His says of his second visit to the warm springs:

> I went on a journey to the warm springs in the height of summer, and it was foretold to me to return immediately, once I had bathed and chopped up some cassia and smeared it about my neck. Again I accomplished what was a total of two hundred and forty stades round trip, while it was remarkably stifling, and I endured the thirst more easily than someone going home from the baths. Again he sent me, after commanding me to drink cold water. And I drank it all. [Aelius Aristides *Hieroi Logoi* 3.6, trans. Behr 1981].

Aristides' frequenting the thermal bathing facility at Allianoi and the Asklepieion at Pergamon forms a concrete link between the two facilities, and suggests that pilgrims may have moved with ease between them.

Hydrotherapy was widely popular in the ancient world, though most did not subscribe to its benefits with the same zeal as did Aristides. The connection between water and bodily health is attested by the widespread presence of baths by the Roman imperial period. However, the attestation in the ancient literary sources of particular benefits associated with water in specific places suggests an epistemological distinction between bathing in general and the benefits accorded to certain places. This differentiation implies an ancient understanding of the intimate connection between sources of water, their particular properties and the benefits they afforded, and the specific gods who manifested themselves through different water sources. For example, the intensely cold water of Aquae Cutiliae near Rome was particularly singled out for its healing benefits. These springs were praised by both Pliny the Elder and Celsus for healing paralysis and stomach disorders. The sulfurous springs of Aquae Alublae, located between Rome and Tivoli, were described by Vitruvius, Strabo, and Martial, and were recommend by Pliny the elder for healing wounds. Suetonius mentions that Augustus often frequented these hot springs 'every time that his nerves required relief' and when he suffered from rheumatism, he 'contented himself with sitting on a wooden bathing seat…and plunging his hands and feet in the water one after the other' (Allen 1998; Dvorjetski 2007, 84-92).

The efficacy of the healing waters of the Asklepieion at Pergamon should be considered within this broader Greco-Roman context. By the mid-second century CE Asklepios was probably the most popular god in Pergamon, drawing locals and pilgrims alike to his healing waters. Despite the upswing in popularity and imperial attention, worship at the Asklepieion clung to its old forms, occurred in its original buildings, and continued to use the water that originated from the sanctuary itself. Despite the outwardly Roman appearance of the new buildings at the sanctuary, the forms of worship maintained their original character (though it is impossible to discern from the material record whether the old forms of worship continued to maintain their previous meanings).

Most importantly, ritual practice and the healing regimen associated with Asklepios continued to revolve around the natural springs that initially gave rise to the sanctuary. Despite the new building program, the water that was used in the administration of therapies at the Pergamene Asklepieion was rarely if ever gathered from outside the sacred precinct, and great care was taken to channel the spring water and collect rain water in cisterns for use in hydrotherapy. This suggests that not any water would do, but rather that it was critical that particular sources of water be used.

This analysis indicates that water originating in the locality of the Asklepieion was critical for its divine efficacy. While water coming from outside the sanctuary may have been introduced into the complex in order to supply the needs of the many pilgrims and residents, this evidence implies that these worshippers believed there was an ontological connection between the local sources of water and Asklepios' powers to heal.

I will now consider a different relationship to the source of water used in a third sanctuary in Pergamon: the so-called Red Hall (the Temple to the Egyptian Gods). The architectural organization of the sanctuary complex articulated the power of the gods as manifested through water, and conveyed instances in which the efficacy of ritual action was used to make water sacred.

Water and Divine Power: The Red Hall (Temple to the Egyptian Gods)

The sanctuary of the Egyptian gods at Pergamon (the so-called Red Hall) is one of the largest and most impressive religious complexes from the Greco-Roman world. Within it, special attention was paid to capturing and channeling water in and around the sanctuary in a manner that differed markedly from other complexes dedicated to the Egyptian gods in the Roman Empire. The Red Hall contains several permanent water installations as well as large water-storage facilities, and it is clear that much care was taken to capture and channel rainwater in the sanctuary. Moreover, the siting of the sanctuary complex, in which part of the *temenos* (the sacred precinct) actually bridged the Selinus River, therefore incorporated the river into the cultic space itself. Only rainwater (and possibly river water) were utilized within the sanctuary, and as such, it offers an opportunity to investigate a clear articulation of the importance of the source of water for ritual practice. A close examination of the organization of the sanctuary itself, in combination with consideration of the ancient practice and belief of Egyptian religion under the Roman Empire, helps to better understand the use of water and the role of the Nile River in this Pergamene sanctuary.

The sanctuary complex was partly excavated by Otfried Deubner and Oskar Ziegenaus in the years 1934-1938, but many of the records and plans of the site were destroyed during the second World War. The excavators moved onto other projects and thus the complex had remained unsystematically explored (Koester 1998,78) Ulrich Mania has recently undertaken some targeted excavation and published several articles on the architecture of the sanctuary (Mania 2005; 2008), and the complex has been the subject of several recent studies (e.g, Brückner 2005; Hoffmann 2005; Lembke 2005). In addition, Deubner (1977; 1984), one of the original excavators of the sanctuary complex, published an overview of its architectural layout, stylistic details and the few artifacts uncovered. A few, but significant, secondary treatments of the sanctuary have been published in the past three decades. The most thorough study is Robert Wild's 1981 analysis of the sanctuary complex in light of evidence for water use; this study was part of his larger investigation of the role of water in cultic worship of Isis and Sarapis in the Greco-Roman world.[21] In addition, Salditt-Trappmann (1970) discusses the sanctuary within the context of her study of temples to Egyptian gods in Greece and on the western coast of Asia Minor. A handful of subsequent general architectural analyses have been carried out by Koester (1995) and Nohlen (1998). Radt (1988; 1999) discusses the sanctuary within the framework of his larger work on the art and archaeology of Pergamon.

The Red Hall complex in Pergamon, so-called because of the red bricks used in its construction, is one of the largest and most impressive structures in the Roman East. Ceramic material found in a construction trench now definitively dates the complex to the second century CE, during the reign of Hadrian. In addition to being associated with the Egyptian gods, Brückner *et al*. (2008) have speculated that the construction of this monumental temple was undertaken in connection with the imperial cult (Brückner *et al*. 2008, 183; Mania 2008).[22] The sanctuary

[21] See also Wild 1984 for a survey of Roman period Isis and Sarapis sanctuaries.

[22] Even before it could be dated on the basis of ceramic evidence, the sanctuary was always ascribed to the Hadrianic period based on stylistic grounds (Grew *et al.* 1994, 349). Conze mentioned this building in the

complex was located in the ‘lower city’ at the base of the Pergamene acropolis, an area that was probably a residential zone prior to its construction (see Fig. 5.1, no. 2). Core civic, religious, and administrative activity continued on the acropolis as it had since the city’s foundation in the third century BCE, but an increase in population probably impelled settlement expansion down the slope and into the valley below. Deubner (1977, 245) has argued that the Roman-period temple may have been sited in this location because of the existence of an earlier temple dedicated to Isis. He has posited that this early temple was located in the western part of the Red Hall *temenos* based on the discovery of a figurine of Isis, who was depicted wearing a headdress with clear Hellenistic iconographic traits.

The monumental *temenos* (Fig. 5.18, d), which extends approximately 270 m from east to west and approximately 100 m from north to south, encloses the entire sanctuary complex, including a main temple building (Fig. 5.18, a), two smaller buildings flanking the central temple (Fig. 5.18, c), courtyards and porticoes (Fig. 5.18, b). According to the reconstruction of the city grid, the Red Hall occupies three urban *insulae* (Radt 2001, 51). The dimensions of the entire complex dwarf even those of the Temple of Jupiter in Baalbeck and the Temple of Ba’al in Palmyra, making it one of the largest in the ancient world (Deubner 1977; Koester 1995, 266; Nohlen 1998).

As water and the Nile River figured prominently into the aetiologies of Egyptian cults, extensive provisions for water were provided by permanent water facilities within sanctuaries to the Egyptian gods. The monumental sanctuary complex of the Red Hall provided a grand setting in which the water infrastructure was situated. The Red Hall itself is the main central temple within the much larger sanctuary complex. The main temple building is flanked on both sides by

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initial volume of *Altertumer von Pergamon* (1912, 284), and dated it to the reign of Hadrian. A Hadrianic date has also been argued on stylistic grounds by Klaus S. Freyberger (1990, 131) and Jens Rohmann (1995, 109-121, on the capitals of the Red Hall, see especially pp. 112-113). A Hadrianic date seems to be further supported by the phenomenon of ‘Egyptomania’ during the Second Sophistic and the spreading popularity of so-called ‘mystery cults’, particularly those of Isis and Sarapis (Wild 1981, 7) in the second century CE.

smaller, Round Buildings, possibly also temples. On both sides of the main building, and positioned on axis with the Round Buildings, are two square Side Courts. Each Side Court was covered by porticoes around its edges, its open center outfitted with two identical water basins. These three structures – the Red Hall and the two Round Buildings with their associated courtyards – stand at the far eastern end of the monumental *temenos.* At a right angle to the main temple buildings and stretching north to south along the width of the *temenos*, the Great Portico separates the outer court from these main temples. At the opposite end of the sanctuary complex from the cult buildings, the northwest corner of the *temenos* wall, reaching a height of 13 m, is still standing today in the midst of the old part of Bergama. In the massive space created by the *temenos* one might imagine, perhaps, altars or an avenue of sphinxes (akin to Sarapeion C on Delos) (Nohlen 1998, 85); there may also have been a Hellenistic temple to Isis here (Deubner 1977, 248), as well as surrounding stoas along the outer walls which were common in Alexandria and on Delos (Nohlen 1998, 85).

The Red Hall sanctuary complex at Pergamon exhibited an intricate arrangement of water infrastructure and storage facilities. A canal system runs throughout the Great Portico and the Side Courts, channeling water in and around the sacred space. In my personal autopsy of the canal system, I identified two forms of canals, differentiated in both construction and material. The visible canals in the Side Courts were primarily rubble-built, vaulted channels, and therefore must have been covered. In contrast, many of the channels in the Great Portico are preserved as only parallel walls constructed of andesite blocks (Fig. 5.19). In particular, two channels in the Great Portico run parallel to the main axis of the sanctuary, their side walls comprised of andesite stone blocks. Marble slab paving as high as the former *crepidoma* was laid over the floor of the Great Portico (Nohlen 1998, 87), remains of which are patchily preserved near the entrance to the main temple. The preserved marble slab paving, at a level several centimeters higher than the top of the channels in the Great Portico, suggests that the channels, too, were probably also covered with a layer of rubble foundation and marble paving stones. Therefore, though an unlikely scenario, it is yet an interesting proposition that there may have been a steady flow of water running through the portico in uncovered conduits, in the style of the channels of water in the garden of the House of Loreius Tiburtinus at Pompeii (Fig. 5.20) (Regio II.2.2, also known as the House of Octavius Quarto; Tran 1964; Zanker 1998,145-148). Designed to invoke the Nile River, the arrangement in the House of Loreius Tiburtinus consists of one long, narrow basin that runs the length of the garden and meets another basin arranged perpendicularly, forming a T-shape (Maiuri and Pane 1947). According to V. Tam Tinh Tran (1964, 45), these channels were constructed so as to allow the production of an artificial inundation which would submerge plants, flowers and statues placed in them. While it is a great geographic leap from southern Italy to western Turkey, and from garden to sanctuary, it is possible that these formal similarities suggest a common way of architecturally re-presenting the Nile.

The Side Courts on either side of the central axis were each outfitted with large water basins. Only one basin in each Courtyard is currently visible, but the axial symmetry of the complex suggests the presence of a second basin in both Courtyards. Clad in white marble, the floors and walls of these water features measure approximately 1 m deep. The basins boast double-round ends and have separate circular basins, approximately 0.85 m deep, that crown each basin (Deubner 1977, 236; Nohlen 1998, 95). Deubner (1977, 237) posits that the separate round basins were covered, but the long basins with double-round ends were left open. The inlet/outlets for these basins are still extant, and probably were connected to the extensive canal system running underneath the courtyard and the portico. To the north and immediately before the entrance to the main building is another deep basin clad in white marble. The purpose of the basin is unclear, though, based on formal similarities to other water basins in the sanctuary in its shape, size, and marble facing, it is likely that it contained water. No inlet/outlets are currently visible, making it unclear whether this basin was filled and drained by means of the canal system, whether it was filled with rainwater, or whether it was filled from water contained in portable vessels.

The arrangement for the flow of water within the main temple building directed attention to the presence of water (Smith 1987, 103). Rectangular and constructed of massive brick walls, the interior space of the Red Hall was roughly divided into two sections: from the entrance, niches (five on each side) divide up the lower section of the side walls, while the axis of each niche corresponds to a window in the wall above; this windowed section, illuminated by natural light, gives way to a darker portion of the temple where walls are flat and there are no side windows (Nohlen 1998, 91). This transition from a light to dark interior space marks the place where a deep, alabaster-clad water basin is set into the temple floor. Beyond the water basin is the high podium on which the cult statue stood (Fig. 5.21, c). Approximately halfway between the entrance of the basilica and the platform for the cult statue was a depression in the floor that may have served as a shallow basin; however no inflow pipe or drain has been associated with this depression (Fig. 5.21, a and Fig. 5.22, a). It measures approximately 11.30 m from north to south, 5.20 m from east to west, and has a depth of 22 cm – enough to hold 15-20 cm water. Located approximately 2 m beyond the shallow depression, and marking the transition from the bright end of the main hall closest to the entrance to the darker, galleried section where a platform for the cult statue was located, there is a deep basin (1.37 m), which was originally lined with Egyptian alabaster (Fig. 5.21, b and Fig. 5.22, b) (Nohlen 1998, 91; Salditt-Trapmann 1970, 5; Wild 1981, 57). This basin is of equal width to the shallower one (c. 11.3 m), but is much narrower, measuring 1.40 m. The single inflow or outflow point within this basin is located in the center of its west wall (Fig. 5.22, c). This opening is quite large, measuring 1 m high and 0.45 m wide. From this opening, Salditt-Trapmann (1970, 6) was able to trace a channel running west toward the entrance of the temple; however, she provides no additional detail or speculation as to its function.

This deep basin was certainly intended to hold water and there are signs that may suggest the water contained within it was associated with, or used for, the mimetic invocation of Nile water (Wild 1981, 57-58). Unlike all of the other water features, which were clad in marble, this basin was faced with Egyptian alabaster. This stone, quarried in Egypt itself, may have conveyed both a physical and semiotic connection with its place of origin. The choice to adorn *only this* basin with Egyptian alabaster differentiates it and marks it as more significant than the other water features within the sanctuary complex. Moreover, this basin may have been designed to overflow, mimicking the Nile flood. Wild points out that such a wide channel (1 m high and .45 m wide) is incongruous in relation to the small capacity of its associated basin (only 21 m^3). Wild (1981, 58) suggests that an explanation for the size of the channel incommensurate with the basin is that this channel served to convey considerable quantities of water from outside the temple into the basin, filling it perhaps to the point of overflowing. If this basin were designed to overflow, it is possible that the excess water from the basin would have been captured in the adjacent shallow depression in the floor.

The source of the water that filled this alabaster-clad basin is also significant. If the water from the Selinus River were channeled into the sanctuary, there may have been a direct connection between the flooding of the Selinus and the filling of this basin, in an imitation of the Nile flood. The evidence, however, suggests that water from the Selinus River was probably not channeled into the sanctuary (see Trexier 1849). Considered by Wild (1981, 58) to be a more likely possibility, the basin may have been filled when thunderstorms sent water coursing through the drains in the courtyard. This particular suggestion may be bolstered by Deubner's (1977, 246) assessment of the flow of water through the sanctuary. The system for draining water from the roof is still extant (Nohlen 1998, 87), indicating that rainwater was channeled from the roof of the temple, the Great Portico and smaller Side Courts, as well the rain that fell directly into the open space created by the *temenos*, through a series of variously-sized canals and eventually into two cisterns (located in the substructure of the foundations of the south Round Building).

The importance of rainwater is further indicated by significant provisions for the storage of rain that fell into the sanctuary complex. Under the cult platform in the area in front of the base for the cult statue is a cistern over 4 m deep (Nohlen 1998, 92; Salditt-Trappmann 1970, 15; Wild

1981, 57).[23] On the south side of the cult platform, Salditt-Trappmann discovered an arched opening through which she could not only see the water in the cistern but also a similar arch with two outlets below it in the interior wall on the opposite side (Salditt-Trappmann 1970), indicating an extensive system of underground conduits. The facilities for capturing and storing rainwater within the sanctuary suggest that rain was the primary source of water used in ritual practice. Therefore, the action of the rainwater as it flooded into the basin in the main temple, and its simultaneous contact with the stone from Egypt itself, may have served to ritually transform the rainwater into Nile water.

Wild convincingly argues that the Egyptian gods Isis, Sarapis and Osiris and their consorts were considered to have provided for lands outside of Egypt through their power over the elements . According to theology expressed during the Greco-Roman period, the Nile River's annual inundation was both caused and controlled by Isis herself (Bianchi 2007, 504). However, Isis, the "mistress over the rivers and the winds and the sea," was also connected with sources of water aside from the Nile River (Wild 1981, 68). From the ancient *testimonia*, it is clear that the Greco-Roman conception of Egyptian religion allowed for the power of the Egyptian gods to extend over many different sources of water, not only the Nile River in Egypt. In Egypt this power took the form of the annual Nile inundation, while in the Mediterranean fertility was assured by sufficient rainfall (Wild 1981, 64-65). In support of this notion, one of the most popular literary *topoi* which focused on the Nile was the "Rivalry between the Nile and the Rain" (Sauneron 1952; Wild 1981, 88). Sauneron (1952) identified passages from 12 ancient authors who addressed this theme; Wild suggests 11 other examples could be added to this collection (Wild 1981, 64). The ancient literary *testimonia* identified by Sauneron that address this theme extend from the fifth century BCE to the early first century CE, and include authors writing in

[23] Salditt-Trapmann (1970, 15) noted that the cistern's water level remains constant at approximately 2 m in winter and summer. However, she provided no other dimensions and did not indicate the location of the cistern on her plan of the sanctuary.

both Greek and Latin.[24] The literary connection between the Egyptian gods and their power over rain is further echoed in the arrangement of the Red Hall sanctuary complex, with its extensive provisions for capturing and storing rainwater.

Indeed, the power of the goddess Isis was considered to extend over rivers as well, and one of the most striking features of the sanctuary complex is the bridging of the Selinus River in order to create the level platform for the *temenos*. The Selinus River was channeled into two vaulted tunnels, over which the *temenos* platform was built (Fig. 5.23). A bridge at the southern extent of the tunnel is still in use today. Each barrel-vaulted channel is nearly 10 m wide and would have been able to provide ample drainage for even the most severe floods (Oziş 1987, 59).[25] The tunnel then passes diagonally underneath the *temenos* from southeast to northwest for a distance of approximately 150 m (Grewe *et al*. 1994; Koester 1995, 268). This feat of engineering was exceptional both in terms of the double tunnel and the distance which it covered (Grewe *et al*. 1994). Despite the massive undertaking involved in bridging the river, however, it seems that river water was not brought into the sanctuary complex for use in cultic practice.

Because no systematic study of the tunnels through which the Selinus River was diverted or the channel system in the courtyard of the temple complex has yet been carried out, it is impossible to say with certainty whether these channels served only to direct the river under the sanctuary, whether they provided drainage for the water from the surface of the *temenos*, whether they were utilized for some cultic purpose inside the courtyard, or whether they served any combination of these purposes (Nohlen 1998, 84). Charles Trexier (1849, 2, 224) walked through

[24] The authors identified by Sauneron are: Herodotus (2.13), Euripides (*Hel.* 1-3), Aristophanes (*Thesm.* 855-856), Isocrates (*Bus.* 13), Tibullus (*Elegies* 1.7.21-26), Pomponius Mela (*De Chorographia* 1.9), Seneca (*Q. Nat.* IV a, II, 2), Martial (*Epigrams* 1.61), Pliny the Younger (*Tra.* 30), Philo (*De Vita Mosis* 2.36), Heliodorus (*Aeth.* 9.9.3), and Claudian. To these Wild would add Deut. (11:10-12), Theophrastus (*Caus. Pl*. 3.3.3), Apollonius Rhodius (*Argon*. 4.270), Theocritus (*Id*. 17.77-80), Schol. Pindar (*Pyth*. 4.99), Ovid (*Ars. Am* 1.645-52), Lucan (8.445), Aelius Aristides (*Or*. 36.123), Aristaenetus (*De Nili bonis*, cited in Eudocia, *Violar*. 698), Himerius (*Disc*. 1.8) and Schol. Lucan (8.826) (Sauneron 1952; Wild 1981:222, Note 37).

[25] Indeed, Grewe *et al*. (1994, 351-52) stress the capacity of the tunnels to support 720 m^3 of water per second (Nohlen 1998, 84).

the length of the tunnels running beneath the *temenos* to view their construction and does not seem to have discovered any water outlets or connections within the tunnels (Wild 1981, 220, n. 12). This cursory exploration of the tunnel system indicates that it is unlikely that the river water was channeled into the sanctuary itself, and therefore, the significance of incorporating the Selinus River into the complex must be explained by other reasons.

A few theories have been offered to explain the impetus for constructing a sanctuary that required such a massive feat of engineering in order to create the bridge and tunnel system for the Selinus River. Radt (1988, 230-231) identifies the bridging of the Selinus River as the principal problem in the construction of the sanctuary. Drawing an analogy to the Trajanum on the Pergamene Acropolis which necessitated the construction of a massive terrace, Radt suggests that the motivation for building the sanctuary in such a demanding location sprang from a desire to tackle engineering challenges. Koester (1995, 268) proposes that the reason for constructing the water tunnels is most likely that the patron of the building wanted to situate the sanctuary in the center of the city rather than in an outlying district. Koester suggests that using the area over the river would have reduced the number of houses that would have needed to be torn down in order to create sufficient space for this massive project. Echoing Koester's proposition, Nohlen (1998, 84-85) also supposes that the community directing the construction of the sanctuary would have wanted an impressive site for the cult complex. He suggests that at the time of construction, spacious building plots were only available on the outskirts of town, so the fact that they succeeded in constructing the sanctuary in the midst of urban habitation attests to the influence of the sponsors of the sanctuary.

Indeed, while not in the monumental civic center of town, the location of the sanctuary was certainly not in the far outskirts of Pergamon. Certain irregularities in the layout of the complex indicate that this area was already significantly built up at the time of the sanctuary's construction. Ulrike Wulf (1994, 157) suggests that the alignment of the sanctuary complex was determined by the pre-existing urban grid. Therefore, if the gridded city plan served both to direct and constrain building, the Red Hall complex must have been constructed in the center of considerable urban habitation. Indeed, observing the unusual position and spacing of the two main gates on the far western extent of the *temenos*, Wulf posits that the reason for this must be that these were the end-points of two streets which converged on the Red Hall. If, as Wulf suggests, the placement of the gates was modified to align with these two streets, this would imply that these routes pre-dated the construction of the sanctuary complex. This evidence points to the idea that urban settlement had extended as far as this area of the lower city by the time the Red Hall complex was constructed. If available open space or concern not to displace large numbers of people were not primary considerations for siting the sanctuary, then the choice to build in this location is significant.

The question remains: if the monumental complex could have been constructed anywhere in the lower town, why was it sited in a place that necessitated bridging the river? As mentioned above, it is possible that the Red Hall was constructed in this location because of an earlier sanctuary in the vicinity (Deubner 1977, 245). Surprisingly, however, the choice to build the sanctuary so that it spans the Selinus River has been accepted rather uncritically and no one to date has suggested that the sanctuary complex was constructed in this place precisely *because* of the Selinus River (Weiss forthcoming).

I posit that, with the Nile River serving, in effect, as a signifier of Egypt, the construction of the sanctuary complex with the great local river flowing through it served to re-present and re-place the Nile River in a different locality. However, of all the known Greco-Roman temples to Egyptian gods located outside of Egypt, only the Red Hall complex at Pergamon and Serapaeum A on Delos were constructed so that a local river flowed as part of the sanctuary complex.[26] In

[26] Serapaeum A on the Cycladic island of Delos dates to the Hellenistic period. It was constructed at the east end of a narrow courtyard, approximately 11 m west of the Lower Reservoir of the Inopus River (Roussel 1916; Wild 1981, 35). A tradition attested by the Alexandrian poets viewed the Inopus River as physically linked with the Nile itself (Wild 1981, 35; Strabo *Geog*. 6.2.4; Pliny, *HN* 2.229; Pausanias

Pergamon, through the incorporation of the Selinus into the sacred space of the sanctuary complex, the attention-focusing nature of sacred space and the action of the river were able to create a relationship of equivalence, such that the Selinus could stand in for the Nile (Smith 1987). By bringing the river "within the temple, the ordinary (which to any outside eye or ear remains wholly ordinary) becomes significant, becomes 'sacred,' simply by being there. A ritual object or action becomes sacred by having attention focused on it in a highly marked way" (Smith 1987, 104). Through its incorporation into the sacred precinct, the Selinus ceased to be itself; and through the attention focused on the river by means of its inclusion in sacred space, it can simultaneously invoke the Nile. The Selinus River is both itself and not itself; both in Pergamon and evoking Egypt.

The architects of the Red Hall complex certainly possessed the engineering capabilities to bring significant amounts of water into the sanctuary, which is exemplified by the immense skill required to bridge the Selinus River. Therefore, the exclusive utilization of rainwater for ritual practice within the sanctuary itself indicates that the source of water employed in cult activities was intentionally limited. Water was used extensively within the sanctuary complex, as indicated by the abundant facilities for storing and displaying water, and it seems that rain water was the preferred source for supplying water for cultic activities. Moreover, with the Selinus River essentially serving as a means to invoke the Nile, therefore, it must be considered significant that ritual practice within the sanctuary was provisioned with water solely from rain. Therefore, it is possible to surmise that rain water held particular significance for the cultic worship of the Egyptian gods.This arrangement echoes that employed at the Pergamene Asklepieion, where efforts were made to secure rainwater that fell within the sanctuary complex, as opposed to relying on the urban piped-water network. The effort to secure rainwater for ritual practice, and

2.5.3). In this way, the river was incorporated into the sanctuary, both through its proximity and by means of the inlet that (probably) channeled river water into the basin below the temple.

the incorporation of the Selinus River into the sanctuary complex attests to the meaning associated with particular types of water and water from specific sources.

The Red Hall was a large-scale, imperially-sponsored project within the center of Pergamon. The same importance of water, despite a significant shift in ritual practice, is also evident in the extra-urban sanctuary of Kapıkaya. The role of water in ritual practice at this sanctuary will be the subject of the next section.

Water and Place: Kapıkaya

Kapıkaya is an extra-urban sanctuary which was outside of official imperial patronage, yet it also provides evidence of changes in the sacred landscape and ritual practice that resulted from the changing geopolitical situation in the second century CE. This sanctuary offers a critical counterpoint to the other monumental, and often imperially connected, sanctuaries addressed in this chapter. Kapıkaya is important for this analysis for several reasons: (1) it is an example of a small, rural sanctuary, (2) there was a clear change in the nature of ritual activity that took place over time, yet (3) the importance of water remained consistent throughout the sanctuary's use.

After evidence of looting was observed at the site, the rock-spring sanctuary site at Kapıkaya was excavated as a salvage mission over six weeks in the fall of 1972 under the direction of Klaus Nohlen and Wolfgang Radt (1978, 1-2). Perhaps *à propos* of the particular focus of this dissertation, the timing of the rescue mission in early October resulted in the excavators having to contend with the seasonal rains. Despite these difficulties, however, a clear picture of religious change over time emerged at Kapıkaya. An initial report was published in 1973 by Wolfgang Radt, and the architecture and topography of the site and a catalogue of the small finds were published by Nohlen and Radt in *Altertümer von Pergamon*, no. 12 (1978). This publication is a sensitive and through treatment of the site, especially considering the circumstances under which it was excavated. The investigation of Kapıkaya here would not have been possible without the time and attention dedicated to the site by Nohlen and Radt. I am greatly indebted to their work, even if in some places my conclusions ultimately diverge from theirs. Beyond this initial site report, however, Kapıkaya has received no substantive additional scholarly attention and there is virtually no secondary literature on the site. As a consequence, the initial conclusions drawn by the excavators have been accepted without question in the subsequent yet passing references to the site.[27] As such, their interpretations have become part of the scholarly canon on sanctuaries and religious life in and around the city of Pergamon during the Hellenistic and Roman eras (e.g., Agelidis 2009; Roller 1999; Williamson [unpublished]).

Today the sanctuary is reached by a five-minute drive along a road winding through the low valley outside of the modern city of Bergama, which is located at the base of the ancient Pergamene Acropolis (Fig. 5.24). The site is located on the side of the hill, approximately 60 m above the valley. It is likely that its position was chosen (at least in part) because of its intervisibility with the citadel, as the sanctuary at Kapıkaya looks directly onto the western slope of Pergamon's Acropolis (Fig. 5.25).

The presence and availability of water was clearly a factor in the selection of this place for ritual activity. The site lies above the confluence of two streams and is situated where a spring emerged from the mountain out of the back of a natural grotto. It seems, however, that the amount of water flowing at the site may be linked to the seasons, and particularly connected to the heavy rains that fall in the autumn and winter months. During the rescue mission (carried out in the rainy season), the excavators noted how the many channels carved into the rock quickly filled with water during each deluge (Nohlen and Radt 1978, 11). In contrast, the spring at the site was dry when I conducted a personal autopsy in the month of August (2009). It is possible, therefore,

[27] Kapıkaya is mentioned by Agelidis (2009, 51-54) and Roller (1999, 211). Radt (1988, 272-4) dedicates a short section to Kapıkaya and Mamurt Kaleh (the major mother-goddess sanctuary lying approximately 30 kilometers from Pergamon), though this is synthesis of previous work at the sanctuaries and not a thorough treatment or reassessment. Christina Williamson of the University of Groningen addresses Kapıkaya extensively in her doctoral dissertation (ongoing). Her particular interest is in the strategic and ideological significance of extra-urban sanctuaries in relation to urban settlement as they were used as a means to express civic identity and territorial ownership.

that the natural spring was a seasonal occurrence and that there was only fresh running water during the rainy months of the year.

The concern with manipulation and regulation of the running water at Kapıkaya is attested by several conduits cut into the rock and basins for water collection. These efforts to control and collect the water at the site speak to the centrality of water to ritual practice here. Significantly, over the course of the sanctuary's use the change in material culture attests to a shift in ritual practice, while the concern with the manipulation and storage of water remained consistent throughout.

Because of its striking natural features and the shelter offered by the cave, the excavators suggest that this was probably a sacred place long before it was monumentalized in the Hellenistic period (Nohlen and Radt 1978, 69). The Western part of the site consists of a natural grotto formed by a crevice and a large fallen boulder – the 'koca taş' or 'great rock' as it is called by the shepherds of the area (Fig. 5.26 and Fig. 5.27, a) (Nohlen and Radt 1978, 70). The interior of the grotto is roughly rectangular, measuring about 4 m deep and 4.5 m wide. The underside of the roof was left unworked, leaving barely enough room for a person to stand fully upright. The floor has been polished to a relatively smooth, even surface (Fig. 5.28). Two narrow steps were shaped from the northwest wall of the grotto. Into the southwest wall, several rectangular niches of differing size were hewn into the living rock. The north wall, which the excavators refer to as the 'Sickerwand,' (seeping wall), must have deserved this moniker. A semicircular niche was fashioned into this northern wall, below which a channel was carved into the rock (Fig. 5.29). This channel measures approximately 10 cm wide, and presumably was made to direct the water that flowed from the north wall. This channel curved along the back wall of the grotto; its course can be traced at various points. The water channel ran toward the southwest, and down the front of the rock-carved steps. The excavators suggest the water may have flowed down the stairs, creating a cascade, and today stains on the rock attest to the former presence of water (Fig. 5.30)

(Nohlen and Radt 1978, 6).[28] Nohlen and Radt point out that the highest point of the channel lies not in the middle of the 'seeping wall' but more towards the east, so that the greater quantity of water must have flowed toward the west and down the stairs. Past the channel's high point on the northeast side of the wall the course of the channel gets lost but reappears again further to the south and continues to run beneath the 'koca taş' (Fig 5.31). The smoothed front edge of a large platform carved along the northeastern wall suggests that a water basin was located on it. The platform displays a type of anathyrosis that suggests there was something resting or joined to the edge (Fig. 5.32) (Nohlen and Radt 1978, 7). The water basin must have received its supply from overflow from the east, out of the 'seeping wall.' From this arrangement, it is clear that water was directed from the apex of the slightly sloping channel both toward the east into the basin, and to the west over the stairs. To the east of the grotto is a relatively even rock surface into which another channel was carved. Nohlen and Radt (1978, 11) observed that, when it would rain, water would run constantly through this channel, positing that this channel also originated near the 'seeping wall.' From this channel the water ran toward the north where a holding basin was constructed, using the existing bedrock and a small retaining wall to the east.

Adjacent to the cave is a flat and spacious platform located to the south, which was transformed into a rock-cut terrace (Fig. 5.33 and 5.27, b). The terrace was outfitted with stone benches along the northwest and southwest sides. Running between these two stone benches is a channel measuring approximately 0.22 m, presumably for directing the flow of water. A vertically-cut cliff with a large niche at its back formed the western extent of the terrace. Several post-holes in the rock in front of this west face suggest that there may have been a shelter located in front of the niche. Subsequently, additional niches were carved into the rock faces. These

[28] The earliest attestations of water staircases are from the Italian peninsula and date to the first century CE, suggesting that this may have been a development inspired by the empire. Despite the difficulties of assigning a date to rock-cut features, the staircase at Kapıkaya may be the earliest attestation of such an arrangement, shifting the date of this development several centuries earlier than previously thought, and also the first location of this feature from the Italian peninsula to Anatolia, cf. Longfellow 2011, 52-56.

niches were supplied with votives, indicated by the installation of steles and bases, and also date to the Hellenistic period.

The pottery found at the site indicates that this cult place was in use from the first half of the third century BCE into the first century CE, with sporadic use perhaps as late as the fourth century (Nohlen and Radt 1978; Wright 1980, 113-115). The earliest datable find at the sanctuary comes from the first half of the third century BCE, a time when the Attalid dynasty had secured its political status at Pergamon (Nohlen and Radt 1978, 70). Nohlen and Radt believe that during the Hellenistic period, from the early third to first centuries BCE, Kapıkaya was a sanctuary dedicated to the goddess Meter, variously known in Asia Minor as Kybele or Meter Theon, and they interpret the evidence from the sanctuary as indicative of practices associated with her worship and that of her semi-divine consort, Attis (Nohlen and Radt 1978, 69-73). Nohlen and Radt's interpretation of this cult rests primarily on Hugo Hepding's 1903 publication, *Attis: seine Mythen und sein Kult,* which uses a mélange of both Greek and Roman literary and epigraphic sources to create a picture of cult practice. This process of reasoning from literary and epigraphic material is akin to the approach taken by Maarten Vermaseren whose invaluable work identifying and cataloguing iconographic examples nevertheless mixes Classical, Hellenistic, and Roman objects rather indiscriminately (Vermaseren 1977). The result is a universalizing depiction of cult practice that lacks specificity in both time and place.

There are many aspects of the sanctuary at Kapıkaya during the Hellenistic period that support Nohlen and Radt's contention that it was dedicated, at least in part, to Meter. A vessel inscribed *Ματρ[ί] Θεων,*[29] Mother of the Gods, is the only explicit attestation of her worship at Kapıkaya, but a secure one. Nohlen and Radt see the location of the sanctuary on a mountainous peak as indicative of the Phrygian origins of the cult of Meter, in which a female divinity was worshipped as the *genius loci* of a mountain (Ohlemutz 1968, 174-191; Roller 1999, 63-115). The

[29] Nohlen and Radt 1978, 21 n.35, Taf. 15e Abb. 12 and 13.

stepped altar and niches carved into the rock on the terrace and within the grotto are reminiscent of the niches carved into rock cliffs for the installation of votives dedicated to mother goddesses at cities of Hellenistic Ionia, such as Phokaia and Ephesus (Fig. 5.34; Roller 1999, 211). Recent survey on the eastern slope of the Pergamene acropolis has identified several places where the rock is similarly carved (Pirson 2009).

Nohlen and Radt suggest that the terracotta assemblage at Kapıkaya is indicative of typical votive dedications to the goddess (Nohlen and Radt 1978, 71); however, upon closer examination there are more anomalous iconographical pieces than canonical ones. Terracotta figurines from Mamurt Kaleh, located approximately 30 km from Pergamon, and attested by Strabo to be the region's major sanctuary to the Mother Goddess exhibit the typical form of votive dedications.[30] The predominant Hellenistic representation of a Mother Goddess depicts her enthroned holding a *tympanum*, sometimes within a *naiskos*, and usually surrounded by lions. Meter is frequently portrayed with a mural crown, indicating the Phrygian origins of one of her many roles as protectress of gates and boundaries (Roller 1999, 207). At Kapıkaya, there are only three terracotta votive fragments (out of approximately two dozen) that can be securely identified as a woman wearing a mural crown. The remains are too fragmentary to determine with any clarity whether she was positioned within a *naiskos* or surrounded by lions; however, the discovery of several lion fragments may point to such a conclusion.[31]

A significant proportion of the terracotta figurines at Kapıkaya depict what Töpperwien dubs 'sitting dolls;'[32] iconographically similar to but perhaps functionally different from the votives of the mother goddess. These figurines portray a seated woman, usually nude and grasping one of

[30] The terracotta votive dedications from Mamurt Kaleh are published by Töpperwein as an addendum, "Die Terrakotten von Mamurtkaleh," 79-87, Taf. 34-37, within Nohlen and Radt's 1978 monograph.

[31] Nohlen and Radt 1978, Taf. 26 Abb. 11-13, 14a and b, 20-24. All but one of the stone statuettes and terracotta figures depicting Meter from Pergamon show her in the seated position (Roller 1999, 207; Töpperwein 1976, 49-53, nos. 188-202).

[32] For a description of these 'sitzpuppen' or 'sitting dolls,' see Töpperwein 1976, 56-60.

her breasts. There were approximately 120 fragments of such 'sitting dolls' found at Pergamon, the majority of which came from the sanctuary of Demeter on the Pergamene acropolis and from the extra-mural Asklepieion (Töpperwein 1976).[33] The remaining fragments were found scattered across the whole region, though significantly none were found at the major Mother Goddess sanctuary in the area, Mamurt Kaleh (Töpperwein 1976, 57). From the scanty available evidence, it seems that these figurines are associated with fertility and/or healing cult, functions that were certainly within the purview of the Mother Goddess. Moreover, 'sitting doll' figurines were found at both the Demeter sanctuary and the Asklepieion; sanctuaries that, like the sanctuary at Kapıkaya, were also cults that employed water in their rites (Steiner 1992). However, these dolls are also attested in domestic spheres and in funerary contexts, strongly suggesting a wide and flexible range of possible uses (Töpperwein 1976, 56). The presence of sitting dolls at Kapıkaya does not necessarily argue against the worship of Meter in this place, but rather attests to a likely multiplicity of cultic meanings associated with this cult site.

The ceramic assemblage at Kapıkaya also consisted of many unguentaria (approximately 700 fragments) which Nohlen and Radt suggest were used as part of the annual ritual celebration of Attis's death by castration. Unguentaria are often found in grave deposits, and the rites honoring Attis's death were funerary in nature. Nohlen and Radt suggest that the large number of lamps from the site (some 800-1000 fragments) further support this contention, by arguing that the rites probably took place at night. However, there is no attestation of Attis' presence at Kapıkaya. The worship of Attis was a phenomenon that developed on the Greek mainland and thus he rarely appears among the finds from the Hellenistic cult of Meter in western Asia Minor (Roller 1999, 212). A statue of Attis was found on the Pergamene acropolis, suggesting the possibility of his worship there. However this single statue, from the probably more Hellenized urban center, should be considered in contrast to the more than 60 representations of Meter uncovered at the

[33] For 'sitting dolls' found at the Pergamene Asklepieion, see Zeigenaus and De Luca 1968, Taf. 51 nos. 299, 300, Taf. 53 no. 368, Taf. 58 nos. 418, 419

same sanctuary (Töpperwein 1976, 49). Two possible fragments indicating Attis were found at Mamurt Kaleh: a single arm clothed in a long-sleeved garment characteristic of Attis depictions, and a vessel inscribed with the name Αττιν – though both of these fragments could be interpreted differently. As Roller suggests, the arm could come from a figure such as an Amazon, which like Attis, were traditionally dressed in eastern costume. Furthermore, the name Attis was a common personal name in Anatolia and the inscribed bowl could refer to a human, not the god (Roller 1999, 212). Taken together, the meager evidence for the presence of Attis at Pergamon and its extra-urban cult sites in the Hellenistic period indicates shaky ground on which to rest interpretation of ritual practice at Kapıkaya.

While it is clear that a mother goddess was worshipped at Kapıkaya during the Hellenistic period, the evidence suggests a more complex picture of ritual practice at the site. There are several aspects of the layout of the sanctuary and material culture at Kapıkaya that are typical of places dedicated to a mother goddess – its location, votive niches carved in the rock, terracotta offerings, and the inscribed vessel dedicated to the goddess – most of which were previously noted by Nohlen and Radt. However, the presence of the 'sitting-doll' figurines, which were predominantly found at the Demeter Sanctuary and the Asklepieion at Pergamon and, significantly, not at other known Meter sanctuaries, is anomalous. The connection between the 'sitting dolls' and the cults of Demeter and Asklepios, in combination with the high incidence of unguentaria and the running water at Kapıkaya potentially indicates more general rites at the sanctuary associated with fertility and/or healing, or necessitates a broader understanding of the types of ritual practices associated with the worship of a Mother Goddess at small rural sanctuaries. These data hint at practices outside of those mentioned in the literary cannon and, significantly, indicate the importance of water for the performance of such rites.

The importance of capturing and channeling water at the sanctuary remained central to cultic activities, despite the fact that the location and type of finds dating to the first through fourth centuries CE indicate a significant shift in ritual practice. Roman-period finds were located further to the east of the grotto, where the remains of a free-standing stone building were found. This shift in location suggests that the focus of activity at the sanctuary centered on the grotto and the adjacent terrace in the Hellenistic period, and was relocated to the stone building constructed on the eastern part of the hill around the first century CE. However, looting activity was concentrated in the eastern part of the site where the remains of the Roman-period building are located and, as a result, the evidence for Roman-period ritual practice at the site is limited.

The form of the stone building, contend Nohlen and Radt (1978, 73), leaves no doubt as to its purpose as a Mithraeum (Fig. 5.35 and Fig. 5.27, c).[34] The rectangular building measured approximately 44.5 m^2. It is oriented in an east-west axis with its entrance on the west, which would likely have been approached from the grotto lying further to the east. This speculation about the building's orientation is confirmed by the discovery of two threshold stones on the west side of the building. The northern wall of the stone building forms a terrace, below which is a flat podium, or bench, running parallel to this wall. A second, symmetrical podium was identified on the southern side of the building, though it was badly damaged by the robber's trench. The outer walls of the podia are constructed of more finely-worked stones than those used in the walls of the building itself. Three niches, approximately 0.5 m wide and 0.5 m deep, were constructed at the base of each podium. In front of the northern podium, placed in the middle of the wall were two courses of stones, possibly acting as stairs, by means of which the upper surface of the podium could have been reached. Placed symmetrically on either side of the entrance along the north and south podia, were two long, laterally positioned stones decorated with a herringbone pattern. Corinthian roof tiles covered the building (Nohlen and Radt 1978, 14-15). A few ceramic sherds dating to the first century CE uncovered in the construction trenches of the building provide a rough date for its construction in the first or second century CE. In the thin fill above the rock floor were ceramics dating from the Hellenistic period, with a concentration of those

[34] In their site report Nohlen consistently refer to this building as a Mithraeum. Because I am less certain about their conclusion than they are, I continue to refer to it here as the 'stone building.'

dating to the first and second centuries CE. A coin found in the fresh robber's trench dated to the fourth century CE, and probably reflects the last phases of the building's use (Nohlen and Radt 1978, 32, 73).

The architectural form of the building is certainly characteristic of the interior space of Mithraea. The space within Mithraea is typically divided by a central isle with symmetrical benches on either side. There is usually, but not always, an altar at the end of the corridor (Vermaseren 1956). The spaces dedicated to the worship of Mithras were either located in caves or grottos, or these natural features were re-created through the location and layout of constructed sanctuaries. However, because Mithraism was a mystery cult and worship was often more private in nature, there was significant architectural variation in the places where people came together in the worship of this god. What most securely identifies buildings as Mithraea is iconographical evidence. The stone building at Kapıkaya lacks any secure attestation of the god worshipped in this building.

The ceramic evidence also points to a change in cultic practice at the sanctuary. In contrast to the pottery dating to the Hellenistic period, there was a conspicuous decline of oil lamps and unguentaria and a concomitant increase in Roman-period cooking and eating vessels (Nohlen and Radt 1978, 73). Along with the cooking and eating vessels dating to the first centuries CE, there was also a significant quantity of water pitchers. The type of water vessel found at Kapıkaya is high with a narrow neck and a small foot. It was widely observed at the Athenian Agora, where its general form and development has been most extensively studied (Nohlen and Radt 1978, 51). At Kapıkaya fragments of these vessels were found to date from the first to the fourth centuries CE, with the majority dating within the second century CE (Nohlen and Radt 1978, 51). These water pitchers are significant because they signal a different type of relation with water at this site than was observed in the previous period. The water pitchers point to the ingestion of water; the earlier water basins are more suggestive of the practice of ritual lustration. It is true that there are other ways to drink water that do not have material correlates (using one's hands, for example).

Yet taken together, the presence of cooking and dining vessels, and the appearance of water pitchers, indicate that consumption of food and water were part of the ritual activities that took place at Kapıkaya in the first centuries CE.

Although it is clear that water was consumed as part of ritual activities in the Roman imperial period, there were no permanent water storage features securely identified within this free-standing structure at Kapıkaya. Nohlen and Radt (1978, 75) identified a narrow pedestal to the left of the entrance to the interior of the stone building, which they suggest could have possibly served as the foundation for a water basin, based on comparanda from the entrances to other Mithraea (Nohlen and Radt 1978, 76; Vermaseren 1965, 31, 48). Two channels carved into the rock are extant, but it is unclear where to, or from, they carried the water. Moreover, the possibility must be considered that those people who frequented the stone building in the first and second centuries CE continued to use the running water, channels, and water basins that were constructed in the Hellenistic period. Thus, the absence of any Roman-period water storage facilities does not conclusively indicate a lack of concern for gathering and storing water in considerable quantities.

There are several good reasons why Nohlen and Radt arrived at the conclusion that this sanctuary was a Mithraeum. The layout of the interior space within the stone building is characteristic of the organization of Mithraea. Additionally, both water and rock were significant in the mythic complex of Mithraism; the sanctuary at Kapıkaya was located on a rocky peak, near a natural grotto which was supplied with running water. The importance of grottos and secrecy are evidenced in the construction of several underground Mithraea, which re-created a grotto-like atmosphere.[35] Finally, prevalence of cooking and eating vessels dating to the Roman imperial period suggest the practice of communal meals, which was also a part of the practice of Mithraism. However, Nohlen and Radt use their interpretation of the stone building as a

[35] See Vemaseren 1958; the majority of the extant examples of such Mithraea are located on the Italian peninsula.

Mithraeum to explain other evidence at the site instead of looking at the evidence in order to interpret practice. Not only is there no secure attestation that this building was a Mithraeum, but there is only one tenuous piece of evidence for the worship of Mithras at Pergamon. A round altar, identified by Vermaseren (1958, 51 n. 24) as relating to Mithras, was found in the middle of the sacred precinct of the Demeter sanctuary.

Through all of these questions about the specific forms of ritual practice that may have taken place at the sanctuary at Kapıkaya, the critical role of water is uncontested. The channels carved into the rock and the presence of basins for water storage attest to the energy expended to secure fresh water. The specific nature of religious worship at Kapıkaya may never be recoverable with the evidence at hand, but it is possible to assert with confidence that, over the centuries of its use, water remained central. I contend that in the Hellenistic period the water was primarily used for ritual purposes – bathing the bodies of ritual participants or the cult statue. In the Roman imperial period, the high incidence of water jugs suggests that the water at the site was probably consumed in conjunction with ritual feasting. Despite the different uses of the water at the sanctuary over time, it is clear that the water and the place together drew people to worship.

Conclusion: The Sacredness of Water

In this chapter the uses and meanings of water within the sacred landscape of Pergamon and the ritual practice within its sanctuaries have been examined.

The Demeter sanctuary exhibited a clear shift in ritual practice in the second century CE – a shift in which the importance of water for ritual purity and its symbolic value related to agricultural success was eclipsed by a form of worship that stressed ritual drama and personal empathy with the gods. These changes were influenced by Mediterranean-wide phenomena in religious thought and practice and perhaps express the shift in urban culture away from concern with the success of the *polis* (through both agricultural success and increased population), to more intellectual and panhellenic concerns. Within this ritual shift, the importance of water was diminished.

The Asklepieion at Pergamon was first developed around the rock outcrop of the 'Felsbarre' and the sacred spring, features which maintained their sacred quality despite a large-scale, imperially-connected renovation of the complex in the second century CE. The care taken to supply the Lower Round Building with rain water captured in the cistern also attests to the importance of using water associated with the specific location of the Asklepieion in ritual practice.

The use of rain water in the Red Hall also suggests that there was a perceived connection between the power of the Egyptian gods to provide for lands outside of Egypt through the rain (as opposed to the benefaction of the Nile waters in Egypt). However, the use of the Selinus River to mimetically invoke the Nile River also indicates the ability of ritual action and the power of sacred space to transform the meaning of water.

Finally, the rural sanctuary of Kapıkaya offers evidence for continued activity at a rural site over several centuries, even though the nature of the practice at the place changed in the interim. The sanctity of the location and the importance of water remained constant over the centuries of use of the sanctuary, suggesting that these features were of fundamental importance to those who frequented it.

In aggregate, the evidence from these four sanctuaries at Pergamon reveals critical insights into relations with water in the sacred sphere. Despite increases in the technological capability to bring significant amounts of water to sacred spaces through long-distance, pressure-pipelines, on the whole, sacred spaces at Pergamon were not supplied with aqueduct water. Rather, the sanctuaries tended to rely on the water naturally flowing at the site, or captured from the rainwater that fell on it. This observation has significant implications for understanding the impact of hydrological technology on the organization of relationships with respect to divine power and the sources of water with which they were thought to be associated: developments in technology did not necessarily influence the organization of water use in sacred contexts. Further, the impact of Roman presence on ritual thought and practice in Pergamon also seems to have been limited for the first several centuries of life under Roman rule. Only in the second century CE were there significant changes in the ritual landscape; changes which were certainly the result of wide-spread religious phenomena evident throughout the Mediterranean. My observations – that Roman technological developments and Roman religious beliefs did not substantially change ritual practice, particularly with respect to water – highlights the potential limits of imperial influence in both colonial encounters and situations of cross cultural contact and exchange.

CHAPTER 5

FIGURES

Fig. 5.1 Map of Pergamon with three urban sanctuaries indicated, 1. Demeter Sanctuary, 2. Asklepieion, 3. Red Hall Sanctuary (after Mania 2008, Abb. 1)

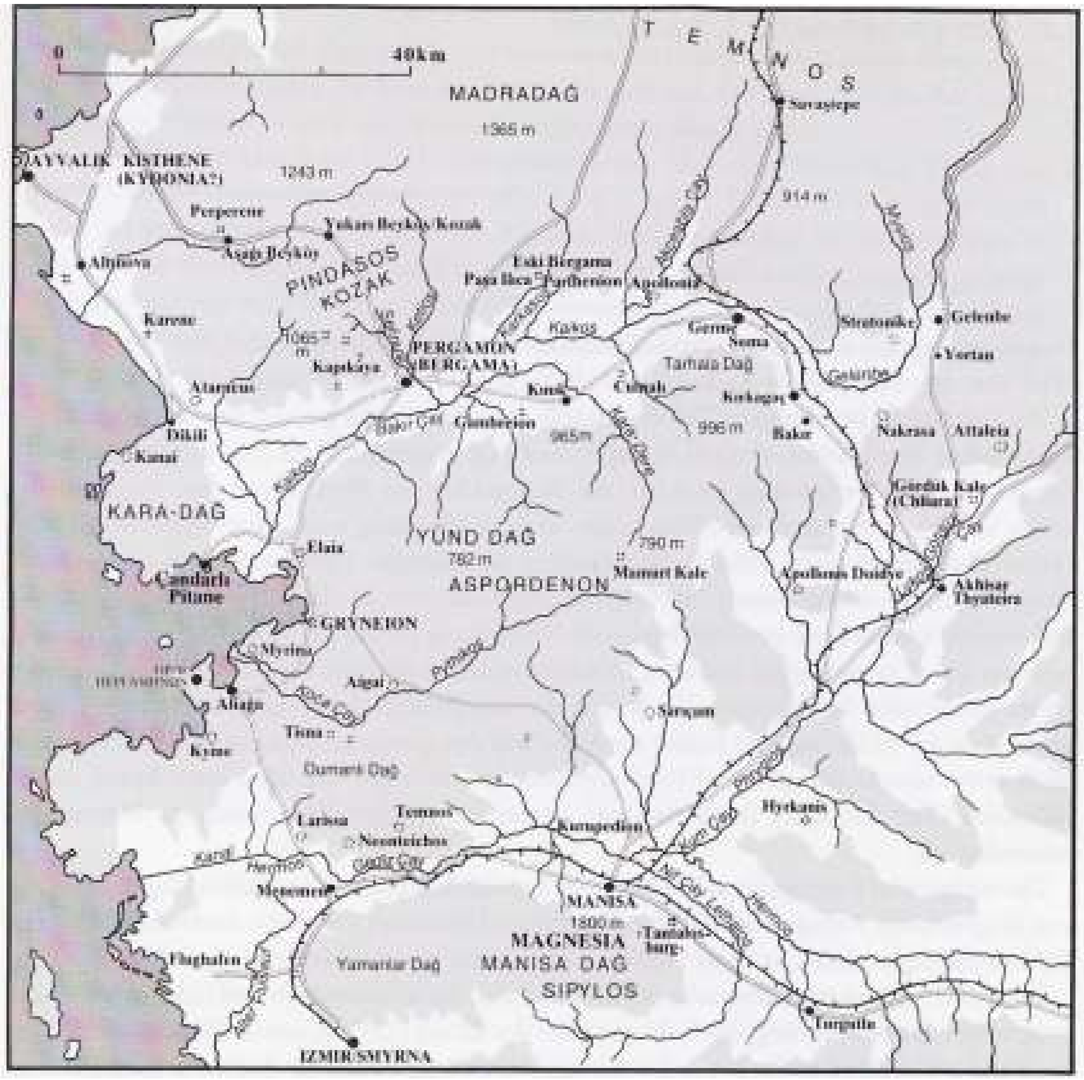

Fig. 5.2 Pergamon and its surrounding landscape (after Radt 1988, Abb. 3)

Fig. 5.3 Pergamon Lower Town (after Radt 1988, Abb. 22)

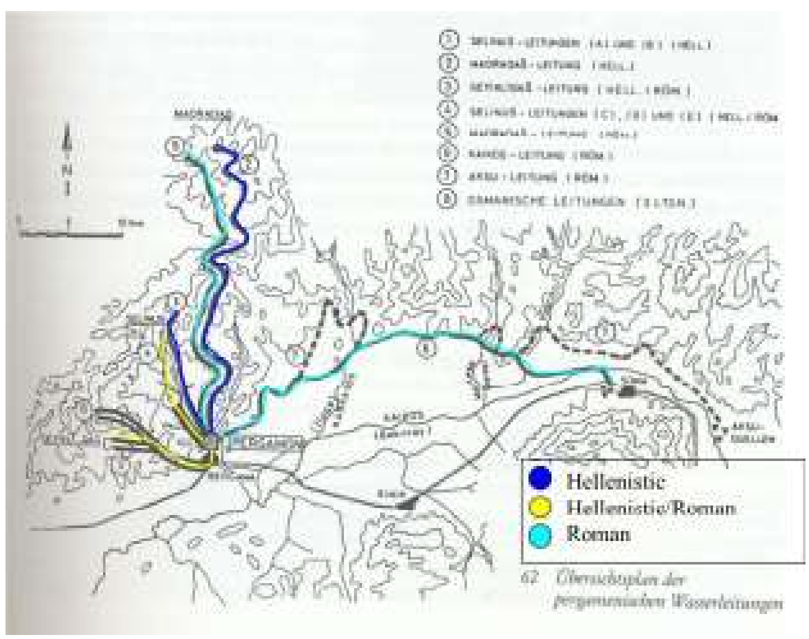

Fig. 5.4 Pergamon Aqueducts (after Radt 1988, Abb. 62)

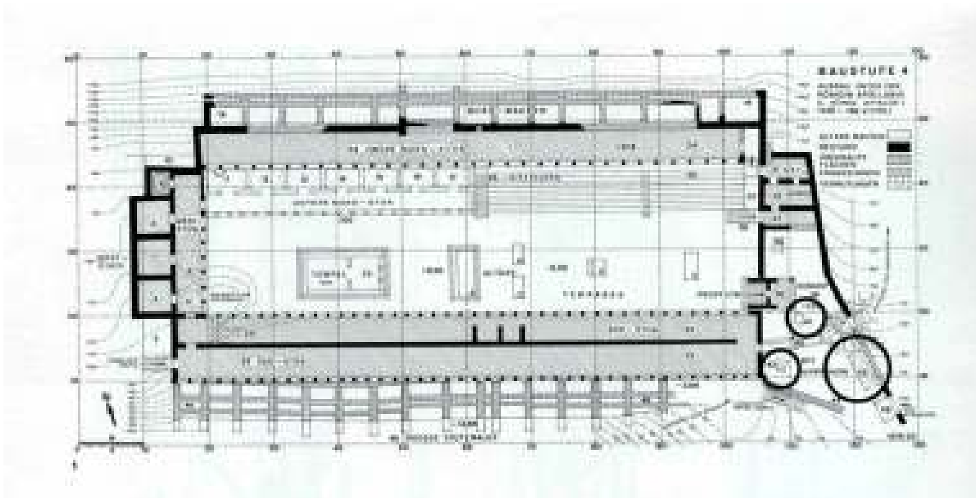

Fig. 5.5 Hellenistic phase of Demeter sanctuary at Pergamon with *bothros* (no. 43), cistern (no. 41), and fountain (no. 42) indicated (after Bohtz 1981, Taf 43)

Fig. 5.6 Fountain at the Demeter Sanctuary, Pergamon (author photo)

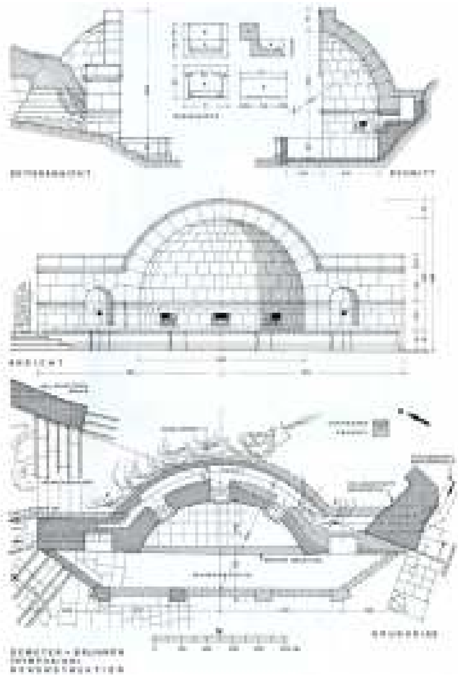

Fig. 5.7 Architectural reconstruction of the fountain in the Demeter Sanctuary at Pergamon (after Bohtz 1981, Taf. 44)

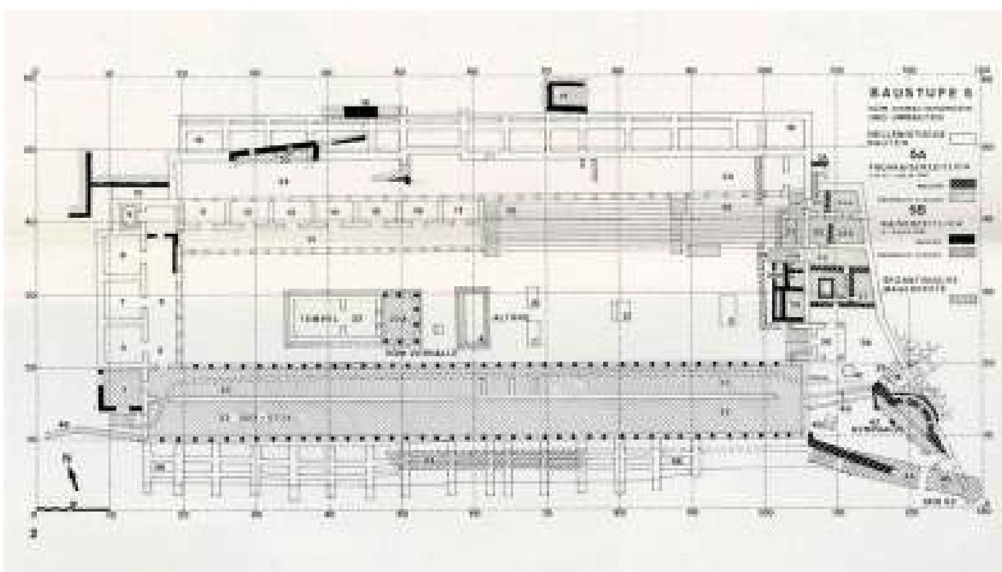

Fig. 5.8 Antonine reconstruction of the Demeter sanctuary at Pergamon, (no. 41.) cistern , (no. 42.) nymphaion, (no. 43.) bothros, (after Bohtz 1981, Taf. 41)

Fig 5.9 Parapet relief of Cerberus from the Demeter Sanctuary at Pergamon. Bergama Museum (no. 2044) (author photo)

Fig. 5.10 Asklepieion at Pergamon with initial core of the sanctuary, the so-called 'Felsbarre' (rock outcrop) indicated (author photo)

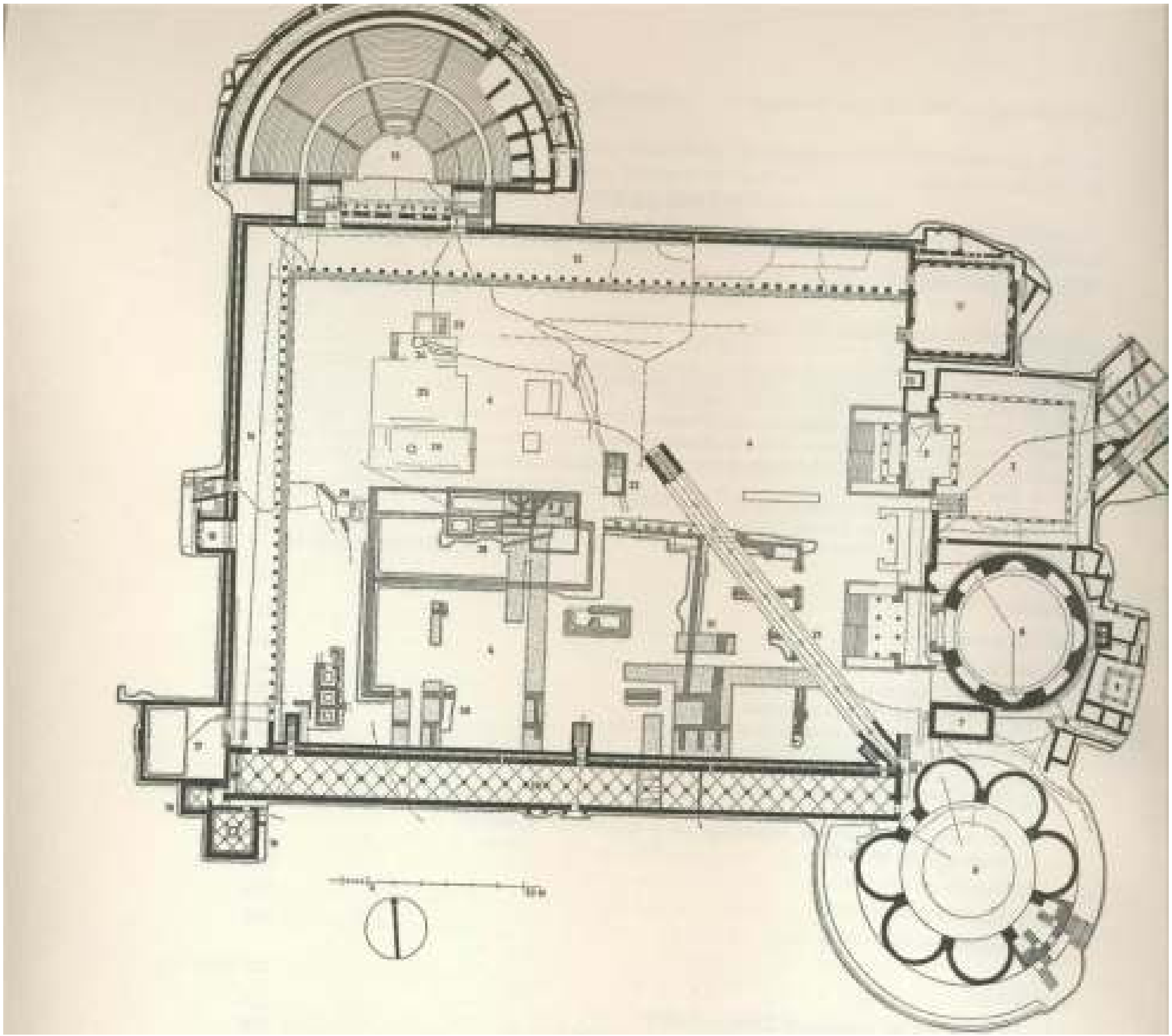

Fig. 5.11 Second century CE remodeling of the Asklepieion, with Hellenistic buildings preserved: 1. Sacred Way, 2. Forecourt, 3. Propylon, 4. 'Felsbarre,' 5. Cult niche, 6. Temple to Zeus-Asklepieios, 7. Cistern, 9. Lower Round Building, 10. Cult niche, 11. Kaisersaal (Library), 12. North Stoa, 13. Theater, 14. West Stoa, 18. Small Latrine, 19, Larger Latrine, 20. South Stoa, 21. Underground passageway, 22. Hellenistic 'Schöpfbrunnen'(water retrieval fountain), 23. Roman 'Badebrunnen' (bathing fountain), 24. 'Felsbarre' (rock outcrop), 25. 'Felsbarre' – Hellenistic Temple (?), 26. 'Felsbarre' – Hellenistic Temple, 27. and 28. Incubation Complex, 29. 'Felsbrunnen' (rock fountain), 30. Hellenistic South Hall, 31. Hellenistic East Hall (after Habicht 1969)

Fig. 5.12 The so-called Felsbrunnen from the Pergamene Asklepieion (author photo)

Fig. 5.13 The so-called Schöpfbrunnen from the Pergamene Asklepieion (author photo)

Fig. 5.14 The so-called Roman ‘Badebrunnen’ from the Pergamene Asklepieion (author photo)

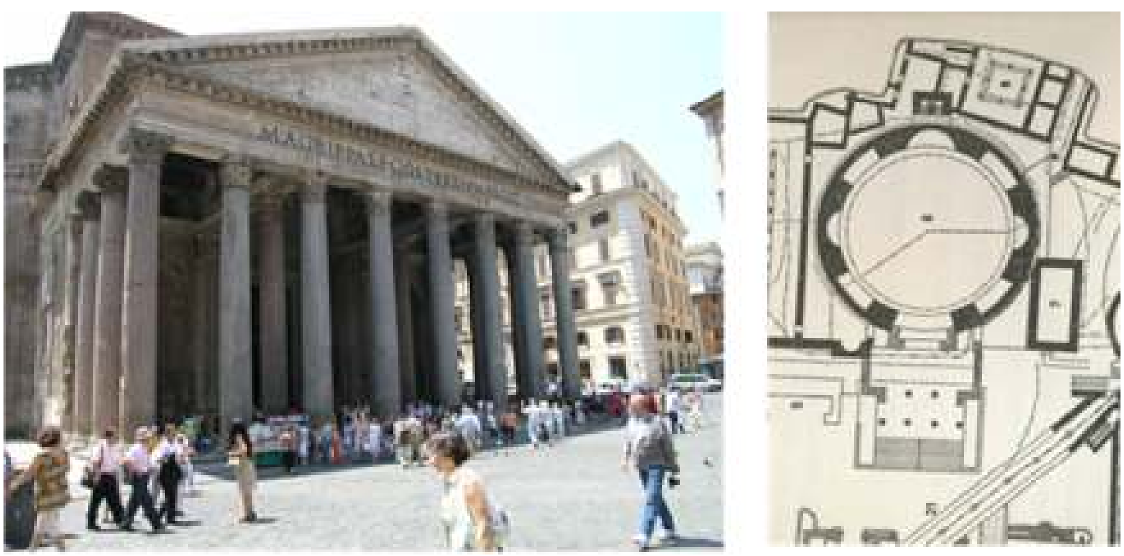

Fig. 5.15 Pantheon in Rome (left) (author photo) in comparison to the Temple to Zeus Asklepios at Pergamon (right) (detail, after Habicht 1969)

Fig. 5.16 Water basin in Lower Round Building at the Pergamene Asklepieion (author photo)

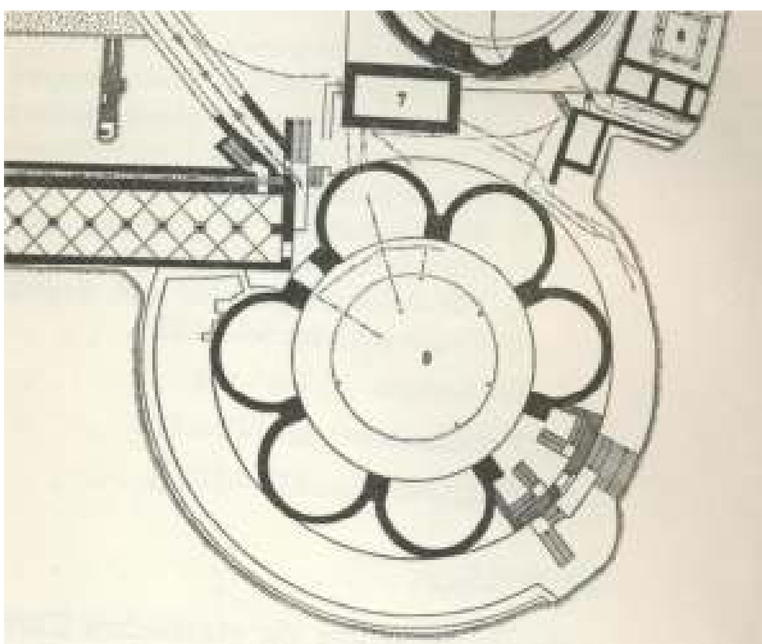

Fig. 5.17 Plan of the so-called Lower Round Building from the Pergamene Asklepieion., no. 9. Lower Round Building, no. 7 Cistern (detail, after Habicht 1969)

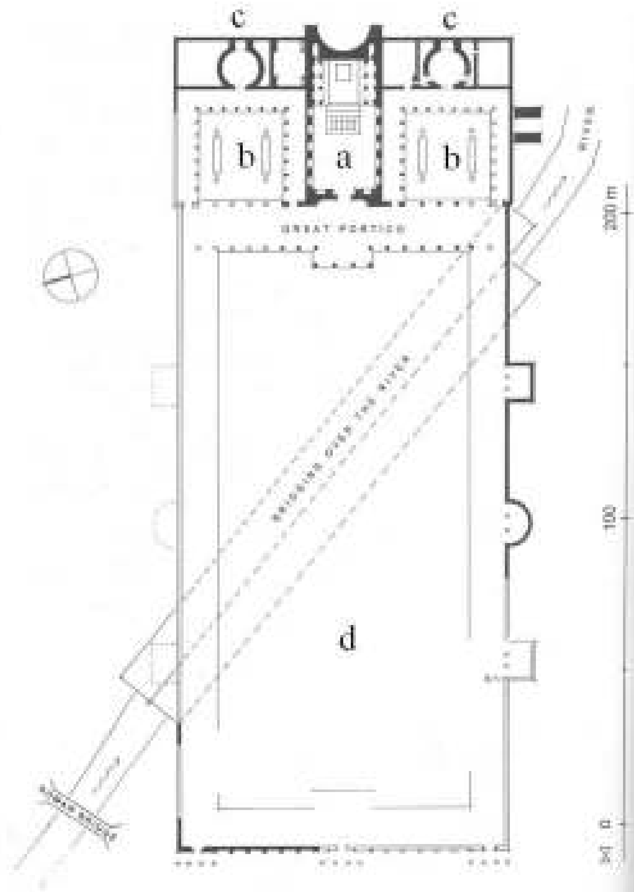

Fig. 5.18 Ground plan of the Red Hall sanctuary complex at Pergamon, a). Main Temple, b). Side Courts (with water basins), c). Round Temples, d). Temenos (after Nohlen 1998, Fig. 1)

Fig. 5.19 Canals in the Portico of the Red Hall at Pergamon (author photo)

Fig. 5.20 Nilotic garden from the house of Loreius Tiburtinus at Pompeii (author photo)

Fig. 5.21 Interior of the main temple in the Red Hall complex. a) shallow basin, b) deeper, alabaster-clad basin, c) podium for cult statue (author photo)

Fig. 5.22 Interior of the main temple in the Red Hall complex a) shallow basin, b) deeper, alabaster-clad basin, c) inflow/outflow opening

Fig. 5.23 Bridge over the Selinus River, Pergamon (author photo)

Fig. 5.24 Rural Sanctuary of Kapıkaya in relation to the urban center at Pergamon (after Radt 1988, Abb. 3)

Fig. 5.25 Pergamene Acropolis as seen from Kapıkaya (author photo)

Fig. 5.26 Kapıkaya (general view) (author photo)

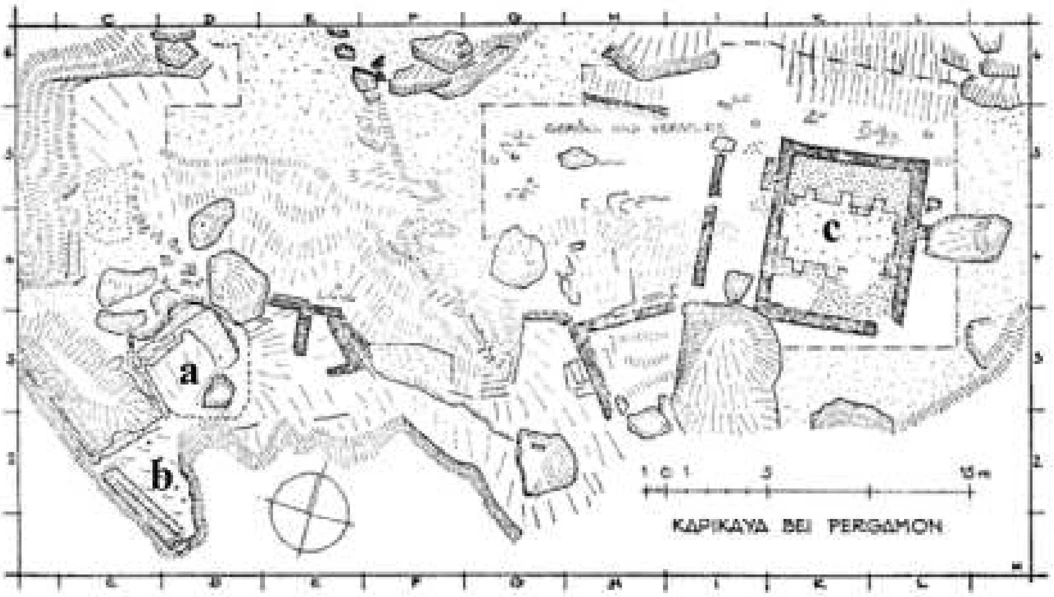

Fig. 5.27 Plan of Kapıkaya. a) grotto, b) rock-cut terrace, c) so-called Mithraeum (after Radt 1973, Ill. 1)

Fig. 5.28 Interior of grotto at Kapıkaya with calcium stains indicating running water, facing north (author photo)

Fig. 5.29 Water channel along the west wall of the grotto at Kapıkaya (author photo)

Fig. 5.30 Interior of Grotto with water channel along the west wall (right) with water stains on the stairs (left) (author photo)

Fig. 5.31 Water channel running under the 'koca taş,' Kapıkaya (author photo)

Fig. 5.32 Interior of the grotto at Kapıkaya with the position of the water basin indicated (after Nohlen and Radt 1978)

Fig. 5.33 Rock-cut terrace with water channel indicated, Kapıkaya (author photo)

Fig. 5.34 Votive niches at Kapıkaya (left) and at Ephesos (right) (author photos)

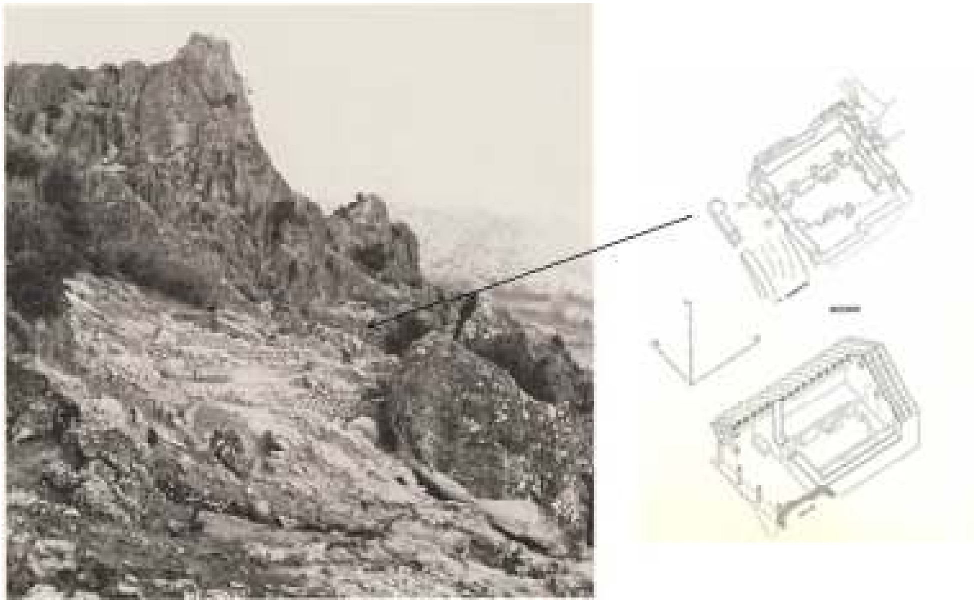

Fig. 5.35 Stone building at excavation (1970) and reconstruction drawing (after Nohlen and Radt 1978, Abb.24)

CHAPTER 6

CONCLUSION: USES AND MEANINGS OF WATER IN ASIA MINOR

At the outset of this dissertation I invoked a contemporary anecdote about a water shortage in Boston to illustrate two points that served as undercurrents for this study: first, that given its inherent properties and ubiquity of uses, water can serve as a connective, and sometimes controversial, element within a society; and second, because of this connectivity, changes in the availability or quality of water may have implications that reverberate through many dimensions of social life, and may impact individuals across all levels of a social hierarchy. For the Roman world, however, scholarship on water use and hydraulic technology has tended to be partitioned into studies of, for example, Greco-Roman technological developments, particular types of infrastructure (e.g., aqueducts, baths, fountains), or uses of water in specific contexts (e.g., water in religion, water in the economy). This tendency toward specialized studies or particular topics is due to the fact that water is both pervasive and a connective element, and thus, it has been necessary to create manageable parameters for scholarly analysis – ironically, the very interconnectivity of water in urban life has led to its compartmentalization within the scholarly literature. Drawing together these often disparate, but mutually reinforcing, specialized studies on water in in an effort to explore nuances of ancient relationships across several dimensions of social life, this dissertation is an interdisciplinary endeavor that begins to break down the walls erected by previous scholarly approaches; however, the synthetic approach attempted here would not have been possible without such earlier investigations.

Moreover, the presence of large-scale water management technologies in provincial cities is often cited an index of Roman imperialism. Iconic for their 'Romanness,' long-distance aqueducts, monumental *nymphaea*, and opulent bathing establishments are frequently invoked as hallmarks of 'Roman' cities across the empire. While there have been countless studies on the technology of Roman water management and display, none have yet asked how Roman imperial expansion, with its geopolitical and technological changes, impacted the uses and meanings of water within and across intersecting spheres of urban life. Indeed, there is often a tacit assumption in the scholarship that the presence of large-scale Roman water management infrastructure in cities across the Empire indicates a Roman way of life in terms of 'Roman' attitudes toward, and uses of, water. In order to add nuance to this picture, this dissertation interrogated whether, and in what ways, the formal imperial enterprise impacted the uses and meanings of water in the Roman province of Asia. The close analysis of the impact of 'Roman' hydraulic technologies on three dimensions of social life – water in the civic sphere, economic activity, and ritual practice – for three principal cities in Asia Minor – Ephesos, Hierapolis, and Pergamon – has shown that technological developments did not universally influence uses of, or attitudes toward, water.

After a brief summary of the principal findings for each chapter and the broader themes generated by this methodological approach, the implications of such results for Asia Minor as a whole will be discussed. The general conclusions arrived at in this dissertation give way to a discussion of the contribution of such a study to the field of archaeology, and possible future directions and contemporary applications for such an approach.

Chapter Summaries and Broader Themes

Providing a foundation for the more detailed case studies, Chapter 2 took into consideration a variety of broad topics necessary for the specific arguments presented within the case studies: geology of the study area, linguistic conventions for referring to water and water-related architecture in both Greek and Latin, technological developments, questions of financing, and legal arrangements with respect to water in both Greek and Roman cities. Such analysis yielded broad conclusions about 'Greek' and 'Roman' conventions for dealing with, and attitudes toward, water. Generally, the Roman imperial period saw an increase in both the vocabulary used to refer to water sources and the architecture employed for water distribution – increases that were probably concurrent developments, in part as a result of Roman imperial expansion. In contrast to the relative paucity of water-related vocabulary offered in Greek, under the Roman Empire, more precise linguistic terms were developed (in both Greek and Latin) in order to describe water in its many manifestations. The spread of long-distance pressure-pipelines throughout Asia Minor (and the other Roman provinces), and the experimentation with water in monumental terminal fountains and lavish bathing establishments led to a proliferation of vocabulary with which to refer to these new architectural forms. Increases in the types of architecture for water distribution and display were made possible in the provinces primarily through the financial support from emperor, imperial administrators, and civic elites. With the expansion in the amount of water flowing into cities, legal strategies for dealing with increased water supply were also developed in the Roman imperial period. The picture created by this analysis of Greek and Roman conventions for managing and using water provided a basis from which to engage in the more specific topics addressed within each case study.

The clear connection between Roman imperialism, the increased supply of water to cities, and the use of water as a public display of civic benefaction through monumental fountains was explored in Chapter 3. This chapter considered water in the civic sphere at Ephesos, in light of the connection among technological development, civic benefaction, and the Roman imperial machine. As I have shown, the donation of programs of hydraulic infrastructure was often associated with significant events in Ephesos' political history – moments that were frequently connected to particular events in Rome, to the Roman emperor, or to provincial administrators. The increase in the supply of water to the city through long-distance pipelines and the development of innovative architectural forms provided new opportunities for civic benefactors – both local elites and imperial administrators – to convey their generosity through the medium of water. However, civic benefaction through the provision of water had long history in the

Mediterranean and investigation of the development of fountain architecture in Ephesos revealed the use of local iconographic and architectural conventions that communicated local meanings. The result was a hybrid Roman/Ephesian visual vocabulary and meanings associated with water that were both imperially influenced and locally grounded. Thus, the adoption of new technological apparatus provided expanded opportunities for the expression of civic benefaction through the provision of water, but local traditions continued to inform the material manifestation of such generosity.

Several points emerge from Chapter 4's investigation of water in craft production and manufacturing, with a focus on Hierapolis. The evidence for craft production at Hierapolis, derived primarily from literary sources and the epigraphic record, in combination with the city's unique geological and hydrological conditions, provided an opportunity to investigate different arrangements for manufacturing activity with respect to water and developments in hydraulic technology. Close examination of manufacturing at Hierapolis revealed that Roman technological innovation impacted only certain production activities (e.g., water milling), while leaving no discernible mark on others (e.g., purple dyeing). The variety of arrangements for craft production at Hierapolis indicates a range of organizational possibilities for manufacturing activity, and suggests that the impact of technological development and/or political organization was contingent on a number of factors: the available water sources (and their particular properties), the type of production or manufacturing activity, and the scale of production.

The conclusions arrived at for Hierapolis were further tested through a synthesis of the data for craft production and manufacturing in Asia Minor. A number of broad inferences about the organization of such activities were developed, both through the close examination of the evidence and by means of the broader synthesis of the available data for these activities in Asia Minor. First, it is possible to argue that a significant amount of craft production occurred within the ancient cityscape. From this perspective, the city can also be considered a locus of economic productivity. From the available archaeological and literary evidence it is possible to conclude that small-scale craft operations tended to rely on publicly available sources of water or on individual water-supply in cisterns and wells. When the scale of production was large, or when the activities were connected to civic needs (e.g., grain milling, fulling on a large-scale) then the civic water supply network was often used to support these endeavors. Aiding in the ability to increase the scale in production was the development of alternative sources of power, such as the harnessing of water. The presence of pressure-pipelines in ancient cities allowed for such pursuits to take place in urban environments, as opposed to being limited to places where there was sufficient natural water supply. As the majority of production activities tended to be carried out on a small scale, however, the technological developments in pressure-pipelines and water-power did not radically impact the organization of production activities in Asia Minor. Such a variety of arrangements for securing water for craft production and manufacturing suggests a certain rationality in the selection of water resources both for particular types of activities and for different scales of production.

The analysis of the uses of water within the sacred landscape of Pergamon in Chapter 5 revealed that local water sources were often preferred and maintained for use in sacred spaces and ritual practice, despite the technological capacity to bring large amounts of water to the city through long-distance pressure-pipelines. The consistent use of natural and local sources of water – springs, rivers, and rain – suggests a tacit understanding of the sacrality of particular sources of water. In addition to the consistent use of specific types of water, these particular sources were maintained for religious practice and within sacred space despite significant changes in Pergamon's ritual landscape in the second century CE – changes that were certainly influenced by Mediterranean-wide phenomena in religious thought and practice.

The examination of four different sanctuaries for which water was central within the Pergamene landscape revealed that water could take on a variety of meanings in different sacred contexts. In the Demeter sanctuary, water operated as a symbol of agricultural success and was used to achieve ritual purity, though as the nature of cultic practice shifted, water became less integral to its symbolic milieu and ritual practice. The Pergamene Asklepieion was developed around the salubrious water at the site and, despite a thoroughgoing remodeling in the second century CE, much care was taken to use *only* the water that came from the sanctuary itself – either from the natural springs or from the rainwater that was captured in the sanctuary's cisterns. The effort to secure water only from the sacred area of the Asklepieion indicates that it was considered to have particular healing properties, and that the god was only able to manifest his efficacy through *this* water. Within the Red Hall sanctuary complex, the Selinus River was made to stand in for the Nile River, and rain water was channeled into the sanctuary in order to serve as a vessel through which the Egyptian gods could act. The meaning inherent in the water itself, the unique nature of the sacred space, and the transformative power of ritual action were able to create heightened significance for these sources of water within the sanctuary complex. The centrality of water for ritual activity at the rural sanctuary of Kapıkaya remained constant over approximately four centuries, despite evidence of a significant shift in the nature of religious activity at the site. The maintenance of this place as a sacred site, and the consistent utilization of the natural spring water that flowed there, attest to the importance of place in the selection and perpetuation of sacred spaces.

Each case study in its own right makes a contribution to the picture of water use and meaning in the Roman province of Asia; when considered together, they begin to bridge the divides created by previous scholarly approaches. Through the collection and analysis of diverse existing datasets in the consideration of water within and across a variety of sectors of social life, this dissertation illustrates water's varied yet interconnected uses in this region of the Roman Empire.

Although this dissertation attempted a more synthetic approach to the study of water, certain limitations hinder the equal exploration of each dimension of water use and meaning. The disparity in the ability to investigate all aspects of water use in all places is due to two main factors – the first is related to the organization of ancient cities, and the second is due to the focus of archaeological exploration and the types of evidence such endeavors produce. First, not all cities exhibited the same arrangements with respect to water, and thus certain sites best lend themselves to the investigation of particular aspects of water use. For example, Ephesos is a city in which an abundance of monumental fountains were constructed, while Pergamon never channeled water into such public hydraulic displays. Thus, Ephesos proved to be a better site in which to explore water as a means of civic benefaction – a difference in the use of water between these two principal cities of Asia that in-and-of-itself is significant. Second, archaeological projects have their own agendas and constraints, and therefore have diverse foci and produce different types of data. For example, excavations at Pergamon have focused on its urban and extra-urban sanctuaries, making this city an ideal candidate for investigating water in the sacred sphere. While it is clear that all three dimensions of water use explored within this dissertation – civic, economic, religions – occurred simultaneously in all cities, both because of the variety of ways in which relations with water were manifested and the disparity in data produced through archaeological investigation, it is not possible to investigate all dimensions of water use equally in all places.

Water in Asia Minor: Contributions and New Directions

The synthesis of diverse existing datasets and an interdisciplinary approach can bring new insight to old material. Several major themes emerge from the case studies that provide a foundation for subsequent synthetic approaches to water in urban life, and establish groundwork for more broadly comparative studies on the uses and meanings of water in other regions of the Roman Empire. Such a synthetic approach to the uses and meanings of water that considers both Roman impact and local agency can reveal fresh insights into the connections, complexities, and negotiations of life under the Roman Empire.

The analysis of the influence of Roman imperialism and its associated water-management technologies has shown that these developments effected relationships with respect to water in Asia Minor in several intersecting and interrelated ways. The increase of urban water-supply through long-distance aqueducts impacted urban living in a variety of dimensions. The provision of cities with water through construction of long-distance, high-pressure aqueducts increased both the availability of water and the possibilities for its public presentation within the cityscape. Urban elites and imperial administrators took advantage of these technological developments in their programs of civic benefaction, using water's semiotic associations with abundance, fertility and health to augment their urban buildings. Certain craft and manufacturing activities benefitted from the ability to increase efficiency in production through the use of the water-power achieved through pressure pipelines. As a result of urban piped-water supply, it was possible for more production activities to be located within urban environments, thus intensifying the concentration and variety of economic activities that could take place within the ancient cityscape. The proliferation of water available within urban environments also led to the development of more detailed legal strategies for negotiating access to and competition over this resource.

Despite these changes, our picture of water use in Asia Minor after the influx of Roman imperial government reveals that there was not a wholesale modification of relationships with respect to water. An increase in the availability and quality of water and the appearance of new technological apparatus did not always indicate change in the organization of civic water management. For example, the technological innovations that amplified the availability of water in the civic sphere and provided for increased mechanization and larger-scale craft production and manufacturing had little impact on the use of water in sacred spaces and ritual practice. Moreover, this study has indicated that Roman technologies were not always preferred, and that pre-Roman technological choices often continued to be the chosen method for securing water supply. This has been demonstrated for small-scale craft and production activities, where it was probably both more economical and easier to rely on natural bodies of water and individual water sources, such as cisterns and wells. The same unmediated sources continued to be preferred for use within ritual practice at Pergamon, suggesting that there was religious, but variable, significance associated with each particular water source used within sacred contexts.

As a whole, this evidence from water use in the civic sphere, in craft and production activities, and in the sacred landscape points to a variety of strategies for managing the Roman imperial presence and its accompanying technological developments. Such strategies were contingent on the particular needs of individuals and the community, and reflect the multiplicity of ways in which water could be incorporated into the cityscape and social life. Sometimes dictated by practical concerns (e.g., maximizing economic profits) and sometimes impelled by sacred meanings (e.g., securing water through which the gods were thought to operate), and sometimes, perhaps, active strategies of resistance, the arrangements with respect to water were complex and nuanced.

This dissertation, of course, provides detailed evidence and analysis for only three cities in the diverse urban landscape of Hellenistic and Roman Asia Minor. Examination of these same types of data in other cities would create the foundation upon which to identify similarities and differences in the uses and meanings of water in different places, and could begin to satisfy broader questions about individual and regional variations in the functional and epistemic roles of water and the impact – or lack of impact – of the formal imperial enterprise on this organization.

The synthetic approach to the study of water employed in this dissertation, and the conclusions reached for Asia Minor, further provide a point of departure for broadly comparative analyses regarding the use of water in other regions of the Roman Empire. For example, Roman North Africa provides considerable material for such a comparative study. The climate, geology and pre-Roman social and cultural landscape of this region are quite distinct from those of Asia Minor; differences through which the influences of a Roman presence in the organization of, and attitudes toward, water can be more readily perceived. Factors such as geological and climatic variability, technological, cultural and religious traditions, the involvement of any Roman bureaucratic and military presence (and the types of 'Romans' present) must have had a stake in shaping these relationships.

This dissertation has made inroads in the exploration and articulation of nuanced relations to water, Roman technological developments, and Roman political administration in the province of Asia. While the imposing aqueducts and bath houses that have been considered the hallmarks of any Roman city certainly changed the urban fabric and modified particular relationships with respect to water, they did not ring in a wholesale change in the ways in which people in Asia Minor related to, found meaning in, and used water.

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This synthetic approach to the study of water in Hellenistic and Roman Asia Minor can also serve as a model for considering contemporary problems. The importance of water in societies both past and present is gaining increasing attention both in academic discourse and on the world stage (e.g., Horden and Purcell 2000; Lowi 1995).[138] As fresh water supplies are diminishing and global sea levels are rising, questions of water conservation, management, and meaning are becoming central topics for political leaders and policy makers. For example, as a result of both climate change and political unrest, the interconnectivity engendered by water is currently creating conflict in the Middle East. The main river supplying Jordan, the Jordan River, has lost 95% of its natural flow because of upriver diversion in both Syria and Israel (Anetlava 2009). The protracted drought, from which the Middle East is currently suffering, in combination with the political conflict between countries, has resulted in each country siphoning as much water as they can – with the disadvantage going to the countries downriver. An appreciation of the interconnections created by shared water resources, and an attentiveness to the variety of ways in which water can be used and imbued with meaning, can be critical tools in creating solutions to contemporary problems.

[138] Several interdisciplinary conferences and symposia on water have been convened in recent years. For example, the Research Center for Anatolian Civilizations at Koç University in Istanbul held an interdisciplinary symposium on Istanbul and water in December 2010. Water was the 2009-2010 annual theme at the Institute for Advanced Study at Durham University in the UK.

Within academic communities such questions have always been explored, but now they are approached with a growing awareness of their contemporary relevance.[139] I believe such research is critical as it provides data about past choices and the long-term impacts of those choices – deep temporal perspectives that have the potential to inform future decisions. Thus, this dissertation on uses and meanings of water in Hellenistic and Roman Anatolia has the ability to contribute to broader discussions of water's importance – both in the past and for the future.

[139] The relevance of archaeological exploration for contemporary problems and the potential for archaeology to contribute to political discussions has been explored, for example, by Barbara Little in *Public Benefits of Archaeology* (2002) and *Archaeology as a Tool of Civic Engagement* (2007), and by Jeremy Sabloff in *Archaeology Matters: Action Archaeology in the Modern World* (2008).

APPENDIX A: TABLES

Site	Type of activity	Date	Evidence	Evidence for Water Use	Comments	References
Aizanoi	Pottery Production	1st c. BCE to 1st c. CE				Atik 1995
Antioch (Syria)	Fulling	1st c. CE	Fuller's canal		Epigraphically attested in 2 inscriptions which commemorate the canal's construction (Vespasian)	Lewis 1997
Amorium	Pottery Production				Micaceous red-slipped ware thought to be local or regional in origin	Tomber 1992, 1993
Aphrodisias	Dyeing	3rd c. CE	Epigraphic		Purple dyer or purple seller mentioned	Reynolds and Tannenbaum 1987
Aphrodisias	Fulling	3rd c. CE	Epigraphic		Three cases of 'fuller' or 'carder' mentioned on a dedication of a public monument (synagogue?)	Reynolds and Tannenbaum 1987
Astra (Tamasalik)	Pottery Production	Roman period	Several kilns found on the north and north-east slopesof Tamasalik hill, where the ancient town was located			Zoroglu 2000
Çandarlı (Pitani)	Pottery Production					Loeschcke 1912
Ephesos	Pottery Production		Wasters from kiln that manufactured 'megarian bowls'			Gates 1997
Ephesos	Stone Sawing	6th or early 7th c. CE	2 rectangular (2.2 m long, 0.6 m wide, 1.2 m high) marble blocks parallel to each other, to the left and right of a water channel in the floor. Cuttings on each block indicate sets of parallel saw blades	Water channel in the floor	Located in lowest level of Hanghauser 2 at the end of at least 5 water mills built in a row on the slope of Bulbul Dağ (Schioler 2005, 34)	
Hierapolis	Dyeing		Epigraphic, literary	"…the water of Hierapolis is also marvelously adapted for dyeing wool, so much that the color from roots can compete with wool colored by the murex; and the quantity is abundant because the city is full of natural baths" (Strabo 13.4.14)	Purple dyers association mentioned on several sarcophagi, architrave of the theater	Harland 2009, Ritti 1985
Hierapolis	Stone Sawing	3rd c. CE	Sarcophagus with relief of water-powered stone saw mill		Stone saw relief on sarcophagus of M. Aur. Ammianos,water-miller's association on sarcophagus of M. Aur. Kalliklianos located in the north necropolis	Ritti *et.al*. 2007

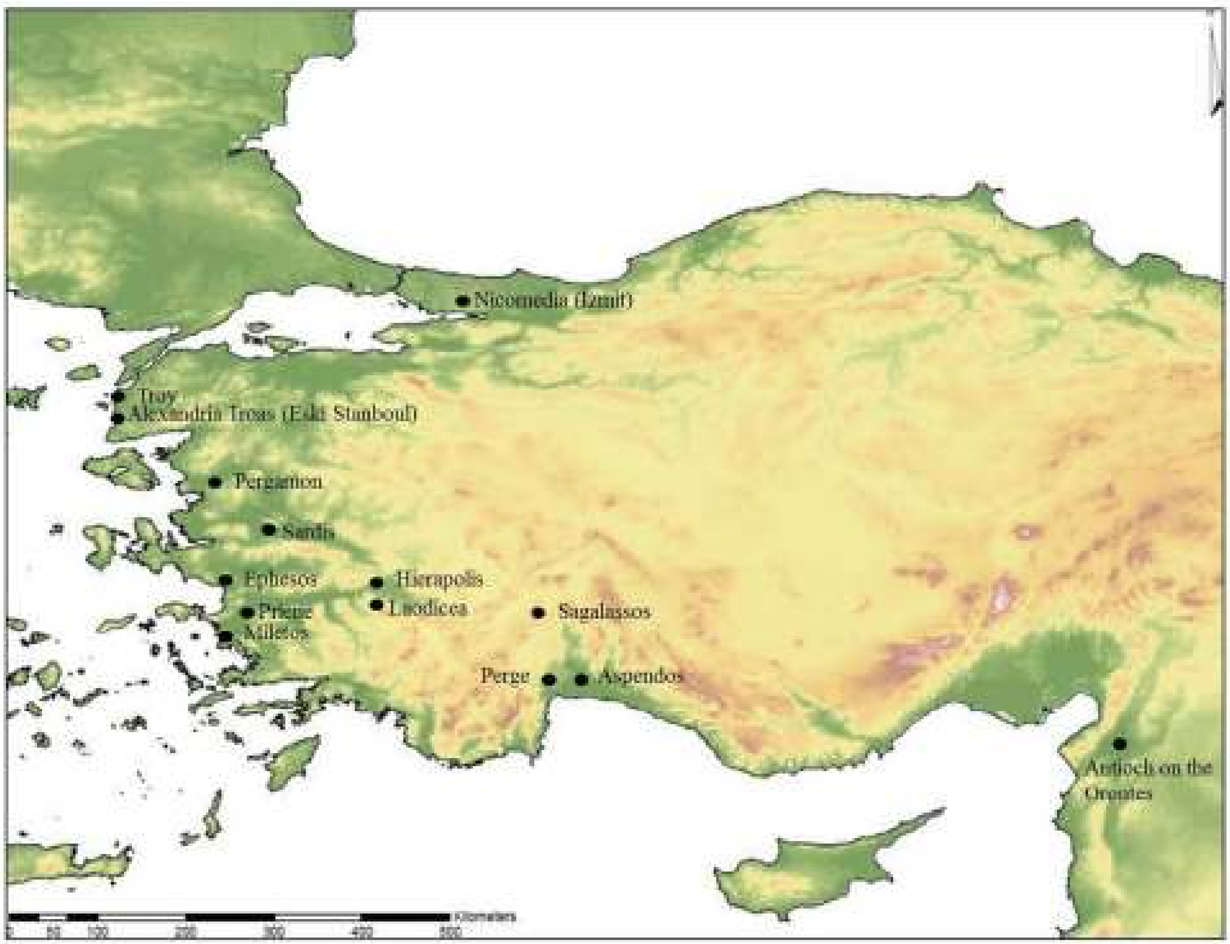
Site	Type of activity	Date	Evidence	Evidence for Water Use	Comments	References
Hierapolis	Pottery Production	Pre-Domitianic urban remodeling	Production of megarian bowls		Geophysical prospection in the area of the 2nd c. CE agora revealed evidence of an earlier pottery workshop	D'Andria 2003
Hierapolis	Fulling				Fuller's guild mentioned on sarcophagi epitaphs	Harland 2009
Hisarönü-Marmaris	Pottery Production	3rd c. BCE	Industrial production center for Rhodian Amphoras		Potter's stamps covering a 30 year period	Gates 1995, 1997
Jerash (Jordan)	Stone Sawing	6th or 7th c. CE (Justinian?)	Aqueduct fed a reservior above the room, and the water led down to a vertical water wheel. Two limestone drums (1.51 and 1.67 m long, 1 m in diameter) with several saw-cuttings		Located in SE corner of cryptoporticus of the Temple of Artemis of Artemis	Ritti et al. 2007, Seigne 2002
Kibyra	Pottery Production	Late Hellenistic - early Byzantine periods	Vessels with identical characteristics of surface and fabric together with numerous misfired pieces		Located in the northwestern part of the city close to the theater	Japp 2009
Knidos	Pottery Production	1st-3rd c. CE	Locally produced 'Oinophorenware'			Mandel 2000
Laodicea	Textile production					
Miletos	Pottery Production	Early archaic	Potter's quarter with kiln	Geophysical survey revealed ancient water supply system		Gates 1995
Pergamon	Pottery Production	First half of 3rd c. BCE to Augustan period	Four workshop units, complete with kilns, and additional isoalted features associated with pottery production.	Located on the bank of the Ketios River. Pithoi for water storage, pipes.	Located on the north bank of the Cestius River	Poblome *et al*. 2001
Reşadiye	Pottery Production	4th - 3rd c. BCE		possible settling basins and tank with waterproofing		Tuna *et al*.1991b
Sagalassos	Pottery Production	Augustan period, abandonment in mid-Imperial period, re-occupation in Late Roman period		Water was brought to the quarter from the east from pipelines extending from 3 aqueducts (164, Owens Saga III: 91-113)		Poblome *et al*. 2001
Sagalassos	Textile production		Epigraphically attested sountechnia bapheon (IGR III 360)			Poblome *et al*. 1998
Saittai (Icikler)	Textile production					
Sinop (Zytinlik)	Pottery Production (amphora)	ca. 300 BCE - early 2nd c. BCE	Thick layers of ceramic discards, four or five kilns		50 potters known, as many as 5 active under the same magistrate	Garlan and Tatlican 1997, Gates 1997, 294-5
Sinop (Demirci)	Pottery Production	Second quarter of 4th c. BCE - late 6th c. CE				Garlan and Tezgör 1996; Tezgör 1996; Gates 1997, 295
Yerik Kuyu (Tekir)	Pottery Production		Several kilns and lots of ceramic fragments	Canals cut into the rock		Tuna *et al*.1991a

Table 1. Evidence for craft production and manufacturing in Asia Minor

Site	Type	Date	Evidence	Water use	Notes	References
Aizanoi	Pottery Production	1st c. BCE to 1st c. CE				Atik 1995
Amorium	Pottery Production				Micaceous red-slipped ware thought to be local or regional in origin	Tomber 1992, 1993
Çandarlı (Pitani)	Pottery Production					Loeschcke 1912
Ephesos	Pottery Production		Wasters from kiln that manufactured 'megarian bowls'			Gates 1997
Hierapolis	Pottery Production	Pre-Domitianic urban remodeling	Production of megarian bowls		Geophysical prospection in the area of the 2nd c. CE agora revealed evidence of an earlier pottery workshop	D'Andria 2003
Kibyra	Pottery Production	Late Hellenistic - early Byzantine periods	Vessels with identical characteristics of surface and fabric together with numerous misfired pieces		Located in the northwestern part of the city close to the theater	Japp 2009
Miletos	Pottery Production	Early archaic	Potter's quarter with kiln	Geophysical survey revealed ancient water supply system		Gates 1995
Hisarönü-Marmaris	Pottery Production	3rd c. BCE	Industrial production center for Rhodian Amphoras		Potter's stamps covering a 30 year period	Gates 1995, 1997
Pergamon	Pottery Production	First half of 3rd c. BCE to Augustan period	Four workshop units, complete with kilns, and additional isoalted features associated with pottery production.	Located on the north bank of the Ketios River. Pithoi for water storage, pipes.		Poblome *et al*. 2001
Reşadiye	Pottery Production					Tuna *et al*.1991b
Sagalassos	Pottery Production	Augustan period, abandonment in mid-Imperial period, re-occupation in Late Roman period		Water was brought to the quarter from the east from pipelines extending from 3 aqueducts		Owens 1995; Poblome *et al*. 2001
Sinop (Zytinlik)	Pottery Production (amphora)	ca. 300 BCE - early 2nd c. BCE	Thick layers of ceramic discards, four or five kilns		50 potters known, as many as 5 active under the same magistrate	Garlan and Tatlican 1997, Gates 1997, 294-5
Sinop (Demirci)	Pottery Production	Second quarter of 4th c. BCE - late 6th c. CE				Garlan and Tezgör 1996; Tezgör 1996; Gates 1997, 295
Yerik Kuyu (Tekir)	Pottery Production			Canals cut into the rock		Tuna *et al*.1991a

Table 2. Evidence for pottery production in Asia Minor (excerpted from Table 1)

APPENDIX B: MAP



Map of Turkey with significant cities mentioned in the text

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