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A Comparative Analysis of Five Greek Fountain Houses

A thesis submitted in partial fulfillment of the requirement for the degree of Bachelor of Arts in Classical Studies from The College of William & Mary.

by

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Introduction

In Greece, fountain houses were seemingly a requirement in the development of the structures necessary to have a ‘proper’ polis. This is made clear by the existence of fountain houses in the archaeological record for most cities, as well as their inclusion in a list of buildings deemed necessary for public infrastructure in cities by Pausanias (Paus. 10.4.1). Even in towns in which there was not a readily available spring to be tapped in a formalized manner, fountain house structures were still erected in prominent locations within the city, requiring elaborate systems of pipes to supply and drain the water used.\(^1\) The architectural prominence given to these public water works indicates that water was a precious resource; one that was even valued highly enough to have institutional regulation in some cases.\(^2\) Both Plato and Aristotle mention the regulation of water in official contexts.\(^3\) These examples indicate the importance of water, and its regulation in Athenian society, and given the existence of public water structures in other Greek cities, it is not unfounded to presume that public water and its regulation was a concern of all poleis.

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\(^1\) Hodge, 2000: 24.
\(^2\) Crouch, 1993: 38.
\(^3\) In Aristotle’s *Athenaion Politeia* he mentions that the superintendent of the public water was an office that was not awarded by lot, like many of the other positions in the democracy, but rather it was filled by a direct election (Arist. *Ath. Pol.* 43.1). In his 1996 article, Dillon brings attention to this often overlooked position, and argues that it must have been one of significant importance. There is also a passage in Plato’s *Laws* that lists an overseer of public water as a necessity in a city (Plat. *Laws* 758e cf. 764b) which would indicate that such a position existed in Athens when he was writing for him to take inspiration from to include in his work.
There is a fair amount of literature on Greek fountain houses, although most of it is rather localized, concerned with the excavation and description of one specific building alone, and not necessarily placing it within the greater context of fountain houses at large. Dunkley’s 1936 article in the *ABSA* is concerned mostly with depictions of fountain houses in vase painting and art, and also was written well before the excavations of most of the fountain houses had even begun. Camp’s dissertation and other publications from the Agora do an excellent job of explaining what is known about Athens’ water system, but there is no comparable analysis of the water systems of other Greek cities in the Archaic and Classical periods. Crouch’s book is more concerned with water usage in general, dealing in part with fountain houses, but more often focused on bigger picture urban and geological trends in these ancient Mediterranean cities. Wikander’s *Handbook of Ancient Water Technology* is also a rich and detailed source, extending far beyond the Greek world into Mesopotamia and Rome as well. Franz Glaser’s *Antike Brunnenbauten in Griechenland* compares and discusses the form of many fountain houses across an incredibly vast span of time, and it deals more exclusively with basic architectural structures, without delving into too much analysis of the overarching context of the buildings in relation to each other. Notably lacking in the literature on Greek fountain houses is a study similar to Brenda Longfellow’s, which examines Roman

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4 Dunkley, 1936: 143.
5 Camp, 1977.
7 Glaser, 1983.
imperial fountain complexes both architecturally, and in social and political context. 8

While some fountain structures existed earlier, like the Mycenean fountain on the Acropolis in Athens, 9 the Archaic and Classical periods are when large public water structures first begin to appear in significant numbers in Greece. 10 A significant number of these fountains, and often the most famous ones, were built in sanctuaries, 11 such as the Kassotis and Kastalia Fountains in Delphi. However, the context of a fountain built in a religious sanctuary is very different from one erected in a secular space. In religious contexts the water could be used for ritual bathing and cleansing, for instance, which would most likely not have been the case for public fountains in secular spaces such as agoras. In discussions detailing the typical buildings included in assemblages of public architecture for city-states, fountain houses are often just briefly mentioned, 12 but very little is ever said beyond that.

The agora was obviously an extremely important place in the city-state, and much has been written on the function, use and development of agoras from many different perspectives, including architectural, political, sociological, and otherwise. 13 Thus, the inclusion and use of fountain houses in agoras can be placed into a much larger and richer context of space and identity in the ancient world. In this thesis I seek to examine and compare five different fountain houses from different cities across the Greek world. I have chosen these five buildings because

8 Longfellow, 2011.
10 Wilson, 2008: 293.
they are geographically and chronologically diverse, yet all grounded within the
context of the agora. Also, they are all buildings about which there exists some
amount of modern scholarship, which is not the case for every fountain house.

I will present a brief case study for each structure, which will include an
architectural analysis, along with broader contextualization of the social and
political environment in which the building was erected, as well as existing
assumptions and opinions about the building. I will then consider all five buildings
together, drawing parallels and also noting differences. In this I will show that
despite the fact that fountain houses were prevalent in agoras across the Greek
world, and Greek public architecture was often very standardized, these five
fountain houses are all varied in architecture. Additionally, despite being utilitarian,
public buildings, most of the buildings experienced some sort of creation and
fabrication of a mythologized origin story in both ancient and modern scholarship,
which adds another layer of interest when considering the buildings and their
function within their respective agoras and cities.
The Southeast Fountain House was discovered in 1952, during the seventeenth season of excavations in the Athenian Agora and was originally dated to the last quarter of the 6th century.14 (Fig. 1). In the initial description of the building,

14 Thompson, 1953: 29.
written in 1953, Homer Thompson was hesitant to associate the fountain house with the Enneakrounos, the famed Peisistratid building, though he does say that its apparent Archaic construction would be a more fitting candidate than the clearly later Southwest Fountain house, which was discovered in the Agora in excavations in the 1930s. However, Thompson does point out that it is uncertain whether or not the Southeast Fountain house was even still being used when Pausanias visited the Athenian Agora, due to the construction of a Hadrianic hydraulic installation that potentially would have cut off the water supply to the original fountain house. There also appears to be discrepancies in terms of the placement of the Enneakrounos. Thucydides places it on the south side of the Acropolis, while Pausanias describes it on his way through the Agora via the Panathenaic Way. Nevertheless, the original Archaic dating of the building meant that the association with Peisistratos stuck with the building, and much of the discourse surrounding the building revolves around its position as the tyrant-funded structure. The building has been touted as one of the earliest structures in the development of the Athenian Agora as we conceptualize it today, functioning as part of the Peisistratid building plan. However, Jessica Paga in a forthcoming article calls into question the validity of the Peisistratid connections, and reexamines the dating of the structure.

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15 The direct connection to the Peisistratids is first found in Pausanias 1.14.1.  
16 Thompson, 1953: 35.  
18 Camp, 1988: 43  
19 Ibid.  
20 Ibid.  
21 Ibid.  
22 Paga, 2015: 2.
ultimately concludes that the building is younger than has been previously claimed, and thus its place in the Athenian Agora and its development must be reconsidered.

Figure 2. Actual state and restored plans of the Southeast Fountain House. John Travlos. Hesperia 22 (1953), p. 30, fig. 1.

The Southeast Fountain House is a rectangular structure measuring 6.8 x 18.2 meters (Fig. 2). Practically none of the superstructure and only a few blocks of the Kara limestone foundation, laid in careful polygonal masonry, remain, and none of the walls or flooring for the central chamber is extant. The building is divided into three sections. Two evenly sized smaller chambers, of 3.0 x 5.2 meters, flank a larger open space. Camp suggests that three columns guard the entrance to

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23 Camp, 1986: 42.
the central chamber. The evidence for columns is ascertained from robbing trenches found in the front of the building that suggest steps going up to the building. Camp postulates that the existence of columns can be extrapolated from the presence of steps.\textsuperscript{25} The ubiquitous appearance of columns on depictions of fountain houses on archaic hydriae also indicates the likelihood that the structure had columns. Brenda Longfellow also includes columns in her description of features almost always present in Greek fountain houses,\textsuperscript{26} so it is reasonable to assume that the building had a columnar façade.

The two exterior chambers are interpreted as rooms that held water by the overflow channels cut into limestone blocks at the northern corner of each respective room.\textsuperscript{27} Though each of the outer chambers share the same dimensions, it appears as though they differed in the manner in which water was collected from them.\textsuperscript{28} The western chamber most likely was a basin of water separated from the central area by a parapet, over which people would draw their vessels.\textsuperscript{29} The following archaeological evidence supports this conclusion. At a point in the south side of the building, at the boundary between the western basin and the central chamber, the wall is preserved \textit{in situ} one course high. The remaining block has a cutting .235 m wide, and .05 m deep for its entire height.\textsuperscript{30} This represents the joint where a parapet would have slotted into the wall of the structure. Given the length

\begin{itemize}
\item [25] Camp, 1977: 76.
\item [26] Longfellow, 2011: 11.
\item [27] Camp, 1977: 76.
\item [28] Camp, 1986: 42.
\item [29] Camp, 1977: 78.
\end{itemize}
of the cutting, the parapet would have been roughly .26 m wide, which Camp claims to be consistent with other roughly contemporary parapets in Athens.\footnote{Ibid. The examples Camp cites are that of ‘Dörpfeld’s Enneakrounos’ with a parapet measuring .24-.30 m and the second Dipylon fountain with parapets between .22-.29 m wide (see note 19 on p. 249 of his dissertation).}

Furthermore, the transition between the western basin and the central lobby is done in a similar manner to the treatment of the exterior walls: there is a grooved cutting on the foundation course on which the floor slabs would have lain.\footnote{Camp, 1977: 77.} Camp suggests this placement of floor slabs in the cuttings in the foundation would have allowed for, and perhaps even necessitated other blocks to be placed on top of the floor slabs. Thus, a parapet could have been placed here.\footnote{Camp, 1977: 78.}

This evidence for a parapet is strengthened by the fact that the depth of the transitional course between the lobby and the western chamber is .43 m thick, over four times the thickness of the foundation between the central area and the eastern structure.\footnote{Camp, 1977: 79.} The depths of foundations to support a parapet would certainly have been greater than those that simply supported foot traffic.

The eastern chamber, however, appears to have been open, and supplied water via spouts mounted in the wall.\footnote{Camp, 1977: 79.} Aside from the difference in depth between the transitional courses, as already discussed above, the treatment of the flooring differs in this half of the building. The floor is carefully rendered and dressed to receive paving slabs in a more painstaking manner than on the west side.\footnote{Ibid.}
suggests that the architects were more concerned with the appearance of a floor
that was intended to be walked upon, than of the basin floor in the west chamber.

Camp also mentions a fragment of architecture found in a late fill in the
immediate proximity of the building that perhaps indicates proof of spouts in the
eastern chamber.37 It is a base block, with moulding covered in a thick water deposit
that indicates a steady and consistent flow of water over the block. However, the
lower part of the moulding shows no signs of the water deposit, and instead is worn
smooth. Camp postulates that this block would have been placed beneath a
waterspout, at the bottom of the wall. It would have been directly under the flow of
water, and the worn bottom could be a result of foot traffic.38 According to Camp
this sort of block is often shown in the depictions of fountain houses on black-figure
hydria, with women resting their feet on the stone while collecting the water in their
vessels.39 However, this association is rather tenuous. Even the identification of the
fragment as moulding from a fountain house is not certain. Camp himself says that it
is “tempting” to associate the fragment with the eastern basin.40 Tempting aside, it is
merely informed speculation, and so should not be taken as solid evidence for
spouts in the building.

Interestingly, while Camp mentions some waterproofing measures taken in
the two outer chambers, such as the packing of yellow clay into seams between floor
slabs,41 the inner walls of both chambers flanking the central lobby do not appear to

38 Ibid.
41 Camp, 1977: 75.
have any traces of waterproofing plaster.\textsuperscript{42} One would think that if the western chamber was in fact a basin, with water retrieved over a parapet, that some manner of waterproofing would be used on the interior walls. However, because so little of the building remains, it is possible that some waterproofing technique was used, but simply is not represented in the scant remains we have of the structure.

In regard to the source of water for the fountain, Crouch notes that ground water is always close to the surface in the area of the fountain house during all seasons, so perhaps in the Archaic period there could have been a free-flowing spring that was initially used to supply the fountain house.\textsuperscript{43} Regardless of whether a local source was initially tapped, pipes found in proximity to the building indicate that water was also brought in from further afield. A section of the pipe that supplied the building has been preserved, and ran from East to West. A detailed discussion of the pipes used to supply the building, such as their make, color, painting, and dating can be found in Camp’s dissertation.\textsuperscript{44}

The source of the water is possibly the extensive system associated with the Peisistratids\textsuperscript{45} that brought water into the city, probably from nearby Mount Hymettos.\textsuperscript{46} This system, much like most of the relatively long distance hydraulic structures in the pre-Roman world, ran underground, following the contours and

\textsuperscript{42} Ibid.
\textsuperscript{43} Crouch, 1993: 295.
\textsuperscript{44} Camp, 1977: 68-70. Despite Camp’s best efforts, however, much of the information about the pipe system is still fragmentary and there is a lot we do not know and is impossible to determine based on the evidence we have for the pipes.
\textsuperscript{45} Camp, 1977: 64.
\textsuperscript{46} Camp, 1977: 81.
topography to take advantage of gravity.\textsuperscript{47} However, given Paga’s claims about the dating of the fountain house, the dating of the pipes immediately within the vicinity of the structure is less certain than previously considered. The redating of the sherds associated with the pipes is very convincing, and the stratigraphic context in which they were found is solid enough to assume that the deposition of the sherds was contemporary with the installation of the pipes. Therefore, the pipes immediately connecting to the building should not be attributed to the Peisistratids.\textsuperscript{48}

Though the juncture of the pipe to the building does not remain, the extant pipes near the building are at a slightly higher level, so it can be extrapolated that water entered the building from a height about 2 m above the central floor.\textsuperscript{49} This allowed for the water to flow down through the spouts, and exit the building in overflow pipes placed in the northern corners of each of the two small chambers.\textsuperscript{50} The overflow pipes then met at a Y shaped juncture at a point around 2 m north of the building, and the water then continued north away from the building.\textsuperscript{51} The continuation of this pipeline has been found as far away as 60-80 m NE of the building, under the Library of Pantainos.\textsuperscript{52}

\textsuperscript{47} Crouch, 1993: 33.
\textsuperscript{48} Paga, 2015: 17
\textsuperscript{49} Camp, 1986: 81.
\textsuperscript{50} Camp, 1986: 88.
\textsuperscript{51} Camp, 1977: 82.
\textsuperscript{52} Camp, 1977: 83. This stretch contains around forty sections of pipe found in situ, and the make and positioning of the pipes are what identifies them as the continuation of the fountain house overflow line.
A possible hydraulic structure has been found 27 meters NE of the fountain house, directly in the trajectory of the overflow pipes. It is a sunken area under the terrace of the East building. Two large basins of an early date have been found here. Though there is no clear evidence for the construction, the deposits of pottery found make it clear that the structure went out of use in the second quarter of the fifth century BCE.\textsuperscript{53} Though the connection is only tenuous, the location of this structure, its geographic relationship to the fountain house and the pipeline, and the hydraulic elements found all suggest some sort of relationship between the two.

A second overflow line branches off to the northwest,\textsuperscript{54} but the dating and remains of this pipeline are more problematic because there is less physical

\textsuperscript{53} Camp, 1977: 84.
\textsuperscript{54} I am unsure what the relationship between this pipeline, and the first overflow system, of the water from both sides of the meeting in a Y pipe and continuing on, is. It isn’t explicitly stated, just that it is a separate pipeline. In Homer Thompson’s
evidence.\textsuperscript{55} Two pieces of pipe have been preserved at points under the Middle Stoa, which is about 90 m NW of the fountain house, and under the Metroon, which is 100 m further. While the pieces of are from different series of pipes, Camp suggests that this is irrelevant,\textsuperscript{56} and that the relative position and level of the pipes is enough to prove they are of the same line.\textsuperscript{57} There have been other pipes found as far out as under the Panathenaic way west of the Agora, under the Stoa of Zeus, and near the north side of the Dipylon Gate that Camp seems to indicate are of this pipeline as well.\textsuperscript{58} Excavators dated the pipes found further out to the fifth century,\textsuperscript{59} which is later than the originally proposed sixth century date for the fountain house. The continuity of this pipeline is less certain, as only two small sections have been found, those under the Middle Stoa and Metroon, and they are of different make. Beyond that, it is impossible to reestablish certain context with the completely discontinuous pipes found further to the northwest.

The date traditionally asserted for the building, originally by Thompson and Wycherley and then reasserted by Camp, is 530-520 BCE.\textsuperscript{60} This date was originally supported due to supposed connections of the structure with the famed Peisistratid

\textsuperscript{55} Camp, 1977: 84.
\textsuperscript{56} This is because different sections of the same line could presumably be laid or repaired at different times, which would result in the apparent differences.
\textsuperscript{57} Ibid.
\textsuperscript{58} Ibid.
\textsuperscript{59} Camp, 1977: 85
\textsuperscript{60} Camp, 1986: 42.
fountain house, the Enneakrounos.\textsuperscript{61} However, the identification as the Enneakrounos was never solid. Even in \textit{Agora XIV} the building is described only as the “most likely candidate”, with Thompson and Wycherley then discussing the fact that the architecture of the structure seems unlikely to have supported nine spouts;\textsuperscript{62} and also mentioning the discrepancies between Thucydides and Pausanias’ descriptions of the location of the Enneakrounos.\textsuperscript{63} Despite the fact that the Enneakrounos attribution was never solid, the association with the Peisistratids persisted and the date of the structure went unquestioned.\textsuperscript{64} In her forthcoming reexamination of the Southeast Fountain House, Paga posits that the date of the structure actually falls between 500-480 BCE.\textsuperscript{65} Paga analyzes all aspects of the buildings construction. For instance she points to the well-preserved z-clamp in the northeast corner of the structure. The clamp can be compared to those used in several other buildings in Attica, all of which date from 500-480 BCE.\textsuperscript{66} With the help of Kathleen Lynch, Paga also reexamined the pottery found in the excavation of the pipelines, and determined that the pottery dates to just before 480 BCE.\textsuperscript{67}

As previously mentioned many of the Late Archaic buildings used as comparanda for the architecture have been redated in recent decades, placing the

\textsuperscript{61} The potential associations with the Peisistratids are discussed first in Thompson, 1953: 31. After more evidence was accumulated and synthesized later discussion can be found in \textit{Agora XIV} 197; Camp, 1977: 85-86.
\textsuperscript{62} Though they also note the fact that the dearth of architectural evidence does hinder fully developed assumptions in this regard.
\textsuperscript{63} \textit{Agora XIV}: 197
\textsuperscript{64} Paga, 2015: 2.
\textsuperscript{65} Ibid.
\textsuperscript{66} Paga, 2015: 10.
\textsuperscript{67} Paga, 2015: 18.
projected date of construction later than was originally posited.\textsuperscript{68} These buildings include the Archaic temple of Dionysos, the Old Bouleuterion, as well as the Archaic Telesterion at Eleusis and the Old Athena Temple.\textsuperscript{69} Accordingly, when comparing the Southeast Fountain House to these structures, the adjustment in proposed dates must be taken into account. For instance, if the building does in fact date between 530-520 BCE, the building would exhibit the earliest instance of a Z-clamp used in Attic architecture, and while it is not inconceivable that the clamp could have been used as early as 525 BCE or so, the next known appearance does not occur until the construction of the Old Temple of Dionysos, some 25 years later.\textsuperscript{70}

The original dating of the pottery recovered from the fountain house was not very exact. Excavators described the deposits as "chiefly archaic, 6\textsuperscript{th} (and early 5\textsuperscript{th}??)."\textsuperscript{71} Paga reexamined the pottery much more closely, and found certain pieces that indicate that the structure was not erected until after 500 BCE.\textsuperscript{72} For instance, the presence a salt-cellar with a recessed bottom, which is a form that only begins to occur at the beginning of the fifth century assists in the re-dating of the structure.\textsuperscript{73}

This re-dating of the building changes its perceived function and place in the development of the Athenian Agora drastically. With the later date, the building is constructed after the Agora is fully developed, instead of serving as a structure that

\textsuperscript{68} Paga, 2015: 9.
\textsuperscript{69} Ibid.
\textsuperscript{70} Paga, 2015: 9.
\textsuperscript{71} Agora Notebook E VIII: <http://agora.ascsa.net/research?q=references%3A%22Agora%3ANotebook%3A%CE%95-8%22&t=&v=icons&sort=&s=1>.
\textsuperscript{72} For a complete discussion and analysis of the sherds, see Paga’s article (Paga, 2015: 11-19).
\textsuperscript{73} Paga, 2015: 15.
began the transformation of the space for public use.\textsuperscript{74} There was a well-documented closure of 19 private wells during the course of the sixth century.\textsuperscript{75} While it has been assumed that the construction of the Southeast Fountain House quickly followed these closures, the re-dating also suggests that there was a period of several decades during which the Agora did not have a large public source of water.

\textsuperscript{74} Paga, 2012: 230.
\textsuperscript{75} Paga, 2012: 201.
The Fountain House in Megara was first discovered in 1898 and excavations first began in 1958 under the direction of F. Papademetriou, along with G. Gruben and V. Petrakos.\textsuperscript{76} (Fig. 4) The fountain is situated in between the two acropolises of the ancient city.\textsuperscript{77} Gruben proposes that the date for the structure is the first quarter of the 5\textsuperscript{th} century, on the basis of the style of Doric column capitals that were originally found in the backfill of the east wall.\textsuperscript{78} However not much more than this.

\footnotesize
\textsuperscript{76} Gruben, 1964: 38.
\textsuperscript{77} Hellner, 2009: 78.
\textsuperscript{78} Gruben, 1964: 39.
can be determined, such as the exact start and duration of the construction, because the ceramic evidence does not provide too much insight in terms of chronology.\(^79\)

The fountain house appears to have had two phases, and was renovated at a certain point during its life, though the second phase was much later, after the Herulian sack in 267 AD.\(^80\) The rectangular fountain is roughly 14 m wide and 19 m long. The floor of the tank was cut directly into the bedrock. The interior of the tank had 35 slender octagonal columns that would have supported a roof structure. The columns each had a 4 mm wide red stripe painted on the corners, which Hellner suggests was to draw attention to the rare octagonal shape.\(^81\) The columns were 50 cm wide at the base, which is very slim given the projected height of the columns.\(^82\) Hellner mentions that standard ratios and rules about proportions were not applied here, as they would have been in religious architecture, despite the fact that this is a very impressive feat of architecture.\(^83\)

Water entered the building from pipes on northern side of the building, and filled the large, column-filled tank. There were two inflow points at the back of the building and the tank itself was split into two distinct sections. This would allow for easier access and cleaning of the structure. An inter-columnar wall of limestone slabs 1.37 m high and 20 cm thick ran through the center.\(^84\) It was comprised of

\(^{79}\) Hellner, 2009: 78.
\(^{80}\) Hellner, 2009: 80.
\(^{81}\) Hellner, 2009: 78.
\(^{82}\) Ibid. The excavators extrapolated that the projected column height would have been roughly 4.75m.
\(^{83}\) Ibid.
\(^{84}\) Hellner, 2009: 79.
three slabs between each column. When one side was empty, the pressure the water placed on the dividing wall would have been significant, so this was dealt with by reinforcing the connection between the columns and the slabs with metal dowels. The middle slab between each of the columns was wedge shaped, fitting snugly inbetween its neighbors, and connected to them by Π shaped dowels in order to better sustain the water pressure.

The water was retrieved from separate drawing basins that were fed from the main tanks. These two collecting basins were located on the southern end of the building and were about 1.2 by 7 m, and had a capacity of about 11 cubic m each. Each half of the main tank had a capacity of 164 cubic meters. Hellner says that the fountain was filled during the 7 hours at night, and then the fountain acted during the day as a cistern, from which people would draw water. The input of water into the smaller collection basins from the main tanks was regulated by a bronze mechanism (Fig. 5.) that is thought to be the oldest of its kind in Greece. The mechanism was a paddle-like object mounted against the wall of the basin that could be raised and lowered from above in order to control the flow of water through the supply pipe.

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86 Hellner, 2009: 53.
88 Ibid.
89 Ibid.
90 Hellner, 2009: 55.
The waterproofing techniques used on the fountain are extremely innovative and seemingly unique. The collection basin had coatings of plaster 1.2 cm thick, with reddish inclusions that Hellner describes as brick.\textsuperscript{91} The entire floor of the basin is coated in hydraulic plaster, in some cases, like in the NE corner, directly on the bedrock.\textsuperscript{92} On the floor of the tank the plaster is as thick as 5 cm in some places.\textsuperscript{93}

\textsuperscript{91} Hellner, 2006: 176.
\textsuperscript{92} Hellner, 2009: 34.
\textsuperscript{93} Ibid.
The plaster reached about 1.37 m high on the sides of the tank as well. The dividing wall of limestone slabs also received the same plaster treatment. This plaster has a slight yellow color to it, and Hellner proposes that it is from the inclusion of volcanic earth from Santorini.

Across the entire floor of the tank, and reaching 15 cm up the sides of the walls is a thin black layer, which the excavators believed to be wood tar. This black layer was responsible for preventing the development of a calcite layer, and this can been seen by the calcite deposits on columns that begin immediately above the termination of the black substance. In 2004 samples of the black substance were tested in a lab in Munich, and were revealed to be bitumen, or asphalt, mixed with animal fat.

The melting point of the bitumen was high, and would have been difficult to apply, but by mixing it with animal fat, Hellner proposes that the melting point would have been significantly less, and the mixture could have been applied to the interior of the fountain using tools such as a brush. It is clear that the mixture was applied hot, because of the depth of permeation it has within the plaster, which could not have been achieved had it not been warm. The heat also caused the calcite components of the plaster to create a sort of calcite soap, which is also

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94 Hellner, 2009: 79.
95 Hellner, 2006: 176. It does not appear that this claim is based upon scientific analysis, but is rather an eyeballed assumption.
96 Ibid.
97 Ibid.
98 Ibid. The exact methodology used is unclear, and in fact uncertain. Hellner states that the temperature at which the fat and bitumen mixture would have melted is unknown, and more tests would have to be run in order to determine that.
extremely water resistant. So, by applying this mixture of bitumen and animal fat, the result was to even further reinforce the waterproofing capabilities of the bottom of the basin, as well as render calcite deposits impossible.

Hellner states that in ancient times the only places where the bitumen could have been imported from were the Caspian Sea and Mesopotamia, and it is beyond current capabilities to tell where exactly this substance came from. According to Hellner this is the only example of the use of asphalt in Greek water work structures. The use of this rare and costly material in such an innovation is indicative of how extraordinary this fountain is.

Smith discusses the water source of Megara succinctly. There were channels that led water to the fountain, though not very much archaeological evidence for them remains as they are still under the modern city. The Megarians during Pausanias's time believed that the water for the city was from the mountains above the city, however Mt. Pateras, located to the northeast, has no permanent water supply. Rather the Yeráneia mountain range, located to the southwest of the city, has springs that even today supply the city.

According to Pausanias, the water that feeds the fountain is connected with the Sithnidian Nymphs. Pausanias also speaks of a place called Rhous, or “Stream”, somewhere to the north of the city, where the water for the fountain can be found, and where Theagenes erected an altar to Alcheous (Paus. 1.41.2). However

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100 Hellner, 2006: 177.
102 Ibid.
103 Smith, 2008: 5.
104 Ibid.
105 Ibid.
geographically this doesn’t make the most sense, as Smith posits that it would be more likely for water from the Yeráneia range to enter the city near the Tripodiskos gate in the west because that would be the most direct passage for the water to take. It is possible that water from the Yeráneia mountains could have been diverted artificially in order to supply this Fountain to the north of the city. Indeed in his account Pausanias says that Theagenes “το ὤδωρ ἔτέρωσε τρέψας” or directed the water to the other side (Paus. 1.41.2), so perhaps this vocabulary of manipulation of the water source speaks to the manner in which water was brought into the city.

The famous hydraulic engineer Eupalinos, who is credited with the design and construction of the impressive tunnel at Samos is supposedly from Megara (Hdt. Hist. 3.60) and as a result has been associated with the fountain house in some scholarship. Eupalinos is dated to the 6th century BCE, as is the tyrant of Megara, Theagenes. The fountain structure was long associated with Theagenes, and is described as a building of his construction in Pausanias’s account (Paus. 1.40.1). Theagenes and Megara are mentioned some other times in ancient literature, though without reference to the fountain house. It is also important to note that Pausanias often mentioned the most interesting or important structures in a city first in his description, and the fountain house is the first thing that Pausanias describes from Megara, because that certainly indicates the importance of the fountain house. However, as the archaeological evidence is quite clear that the existing structure was not built until the 5th century BCE. Hellner suggests that it is

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107 Ibid.
108 Hutton, 2005: 134.
possible that an earlier structure erected by Theagenes stood in the same place, and was taken down in order for this grand structure to be built.\textsuperscript{109} Because of the lack of archaeological excavations that have been conducted in Megara it is difficult to say. However there is no evidence pointing to this, and thus this claim perhaps is just an attempt to mitigate the fact that this pre-existing Theagenes connection exists, and yet the archaeological record does not support it.

\textsuperscript{109} Hellner, 2006: 176.
The Southwest Fountain House in Athens was discovered during excavations in 1934, and then further explored during the 1935 season. (Fig. 6). It was first
mentioned in Shear’s 1934 excavation report in *Hesperia*.\textsuperscript{110} It has since been discussed in *Agora XIV*, in John Camp’s dissertation on the water supply in Athens,\textsuperscript{111} as well as in his later publication on excavations in the Athenian Agora.\textsuperscript{112} It is the largest known fountain house in the ancient city.\textsuperscript{113} Indeed, the Agora of Athens, as far as we know only had one other, much smaller fountain house structure, the South East Fountain House, until the construction of this building, roughly 150 years later. The structure is apparently not mentioned in any ancient sources, despite the fact that it was situated in a prominent point near an important crossroads in the Agora.\textsuperscript{114} Camp suggests that the construction of the fountain house is one piece of evidence for the fact that Athens may have undergone a rather severe drought in the third quarter of the fourth century.\textsuperscript{115} This hypothesis is augmented by evidence of increasing well depths in the Agora, and then a transition to cisterns in the middle of the fourth century. Camp also notes documented evidence for a famine, including emergency shipments of food supplies that Athens received from Cyrene in North Africa.\textsuperscript{116}

\textsuperscript{110} Shear, 1935: 360.
\textsuperscript{111} Camp, 1977: 116-130
\textsuperscript{112} Camp, 1986: 156-7
\textsuperscript{113} Camp, 1986: 156.
\textsuperscript{114} Ibid.
\textsuperscript{115} Ibid.
\textsuperscript{116} Camp, 1968: 157.
Figure 7. Agora Archive Number 2004.01.1617. Southwest Fountain House Original Plan. John Travlos 1966.

The Southwest Fountain House is a large structure adjacent to the west wall of the Aiakeion (Fig. 7). Very little of the building remains; it has been almost entirely stripped down to bedrock, or to the lowest levels of its foundations.\textsuperscript{117} The bedrock was carefully prepared, leveled in some places to receive stone paving slabs, and had trenches cut in it to receive the foundations.\textsuperscript{118} The building measures 16.5 m. north to south, and 16.5 m east to west. A small square court at the northwest corner provides access to a large L-shaped water basin via what was

\textsuperscript{117} Camp, 1977: 116.  
\textsuperscript{118} Camp, 1977: 117.
presumably a colonnaded porch. The basin measured 3.85 m wide, with each wing roughly 15.15 m long. The capacity of the basin was large, over one hundred cubic meters.

The foundation blocks are of a soft limestone, while the superstructure consisted of a hard Piraeus limestone. Most of the east wall’s foundations remain intact, but only three blocks of the south wall remain in situ. According to Camp, the best-preserved parts of the building are the walls of the water basin.

Only a single block remains in situ for the wall that divided the colonnaded porch from the water basin. The block is located in the south wing of the building, thus its northern side would have faced out towards the interior crook of the building, where people stood to retrieve the water, and its southern side would have faced the water basin. The block sustains a pressure line from an unfluted column, providing evidence for the fact that a row of columns separated the porch from the basin. There is no pressure line indicating the presence of a parapet in between the columns. However, because there is evidence of footwear on the northern edge of the block, but the southern surface is rough and unsmoothed by foot traffic, Camp

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119 Camp, 1986: 156. Again, explicit archaeological evidence for the columns is lacking, but Camp and others have all included columns in their interpretation of the structure’s plan.
121 Camp, 1977: 123.
123 Camp, 1977: 118.
124 Ibid.
extrapolates that people that one must have stood there, at the edge of a parapet, to retrieve water.\textsuperscript{126}

Four of the five blocks of the toichobate remain \textit{in situ} in the north wall of the east wing of the fountain house.\textsuperscript{127} Each block measures roughly 1.25 m long by .80 m wide and .30 m thick.\textsuperscript{128} Cuttings in the blocks indicate that the thickness of the floor slabs of the basin would have been between .33-.37 m, which is consistent with the .365 m estimated thickness of floor slabs in the southern wing of the basin.\textsuperscript{129} At the points on the blocks where the floor slabs would have met them, the top edges of the vertical faces, there are traces of hydraulic cement.\textsuperscript{130} Pressure lines on the top surface show the presence of a .60 m wide wall. On the line formed by the seam between the wall and the toichobate, on the southern side, which would have been the interior of the water basin, there are also traces of waterproof cement.\textsuperscript{131} Overflow water from the building was carried off from the northwest corner of the building, near which there have been found drainage channels, and off into the western branch of the Great Drain.\textsuperscript{132}

\textsuperscript{126} Camp, 1977: 120.
\textsuperscript{127} Ibid.
\textsuperscript{128} Ibid.
\textsuperscript{129} Camp, 1977: 120.
\textsuperscript{130} Camp, 1977: 120.
\textsuperscript{131} Camp, 1977: 121.
\textsuperscript{132} Camp 1977: 133.
The building also had two small annexes. (Fig. 8). The first was connected to the southern wing of the tank, on the southwest side, and was most likely built very soon after the initial construction of the building. It measures 6.5 m north to south, by 5.00 m east to west, and was approached by a packed clay walkway from the north. The foundations for the southern annex are of a conglomerate stone, which is what suggests that it was not contemporary with the original construction of the structure. Water would have most likely come through the southwest wall of the fountain house, which abutted the annex, via spouts and fallen into a trough or gutter. Camp extrapolates this conclusion based on rather tenuous archaeological evidence. He mentions a block that was found in a medieval wall on the Areopagos,

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133 Camp, 1977: 126.
134 Camp, 1977: 125
135 Camp, 1977: 126.
that can have no certain associations with any know the known fountain houses.\textsuperscript{137}

This piece of breccia has channels for water to be delivered, and for spouts to be fastened, however due to the unassociated context, it is impossible to know whether something of this sort was actually used in the southern annex.

The second annex to the fountain house was added at some point during the second century BCE.\textsuperscript{138} The specific date is uncertain, though the use and placement of the lead pipes used to supply it indicate that it was built after the Middle Stoa was finished in the middle of the second century BCE.\textsuperscript{139} This annex was placed on the northeast end of the building, abutting the Aiakeion.\textsuperscript{140} It is comprised of two rooms, the southern being more intact than the northern. The southern room measure 3.25 m north to south, by 5.00 m east to west. The walls and floor are built out of various pieces of reused stone of mixed types.\textsuperscript{141} A gutter .60 m wide runs along the eastern and southern walls of the room.\textsuperscript{142} Wear at the bottom of the gutter indicates the existence of three spouts on the east wall,\textsuperscript{143} and two or three spouts along the southern wall, which abutted the fountain house’s northern wall.\textsuperscript{144} A section of the

\begin{footnotes}
\footnote{137 Camp, 1977: 126.}
\footnote{138 Camp, 1977: 171.}
\footnote{139 Camp, 1977: 173}
\footnote{140 Stroud, 1998: 94. This building was previously identified as the “Heliaia”, a law court. However this identification is drawn into question by Stroud in his 1998 examination of grain legislation in Athens. He poses that the square building is actually a Sanctuary of Aiakos, and was most likely used for storing grain. It is unclear whether the water from the Southwest Fountain House would have been used for this structure. Potentially to wash the grain, but one certainly would not want too much moisture present near a grain storage location.}
\footnote{141 Camp, 1977: 171.}
\footnote{142 Camp, 1977: 171.}
\footnote{143 Camp, 1977: 172.}
\footnote{144 Ibid.}
\end{footnotes}
supply channel has been preserved within the thickness of the eastern wall,\textsuperscript{145} which gives further proof for the presence of spouts. The excess water was carried away from the west end of the southern room in two lead pipes that head west past the Middle Stoa.\textsuperscript{146} At the north end of the eastern wall a terra cotta channel took the water through the adjacent northern room for 7.50 m before meeting up with one of the aforementioned lead pipes.\textsuperscript{147} The drainage from the gutters headed north, but could not be traced.\textsuperscript{148}

The northern room is in much worse shape, with a 5.00 m wall running from north to south in line with the east side of the building, abutting the Aiakeion.\textsuperscript{149} The floor slabs stop at a point about .80 m from the east wall, and this gap suggests basins along the wall.\textsuperscript{150} The east wall has plaster to a point .40 m above floor level,\textsuperscript{151} which is another indication of basins rather than spouts. The date of the later annex is unclear, though the use and placement of the lead pipes indicates that it was built after the Middle Stoa was finished in the middle of the second century.\textsuperscript{152}

Because the fountain house is in such a poor state of remains, the identification of the structure as a fountain house is largely dependent on the relationship of the building with the stone aqueduct that brought water in from the east.\textsuperscript{153} The aqueduct was constructed out of large slabs of poros limestone, with a

\textsuperscript{145} Ibid.
\textsuperscript{146} Ibid.
\textsuperscript{147} Camp, 1977: 172.
\textsuperscript{148} Camp, 1977: 173.
\textsuperscript{149} Ibid.
\textsuperscript{150} Ibid.
\textsuperscript{151} Ibid.
\textsuperscript{152} Ibid.
\textsuperscript{153} Camp, 1986: 156.
channel large enough for a man to walk through hunched in order to maintain and clean it. The excavations traced it to the east for 220 meters, before the modern city overtakes it.

The dating of the original structure of the Southwest Fountain house is difficult because of the sparse remains of the structure. Because the bedrock was scraped and evened out to receive the flooring, there is very little ceramic evidence under the floor. However the flooring of the paved court in the NW corner provides some ceramic evidence. The sherds found beneath the flooring of the courtyard date around the mid. fourth-century, and perhaps a bit later. A deposit found in the fountain house drain discussed above, K330, consists entirely of early Hellenistic pottery, dating roughly from 325 to 300 BCE. Using ceramic evidence, Camp proposes the initial construction of the building was between 350-325 BCE, which would date this deposit to immediately after the completion of the building.

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154 Ibid.
156 Ibid.
158 See Agora Notebooks K-XV-70 (2927-2928) and K-XXI-17 (which isn’t available online)
159 I examined this deposit this summer, with the help of Kathleen Lynch. It consists of mainly coarse ware pottery, with several hydria handles, as well as an assortment of some black gloss cups and shallow bowls. The latest datable material is the handle of an early Hellenistic kantharos, with a heart shaped tab attached to the top of the fragment, all of which is consistent with the 350-325 date proposed for the structure.
160 Camp, 1986: 156.
A deposit of particular interest is K345, a sack of pottery that dates to the late fifth century BCE. The pottery is almost entirely fine ware, mostly black gloss, but with some small red figure sherds as well. The pottery dates very solidly around 425 BCE, with nothing later than 400. The deposit was found in a square, stone lined pit that was sealed with plaster, and is noted as a water basin in the description in Agora notebook K-XV-72 (2931-2932). A light white film covers all of the pottery, which is seemingly residue from the plaster. The presence of this waterproofed pit indicates a continuity of function on the site that exists for at least 100 years prior to the construction of the fountain house. However, it was not necessarily a continuous one, as there was then a gap of at least 50 years, between the latest datable material in this deposit and the initial phases of construction on the South West fountain house.

As mentioned above, the Southwest Fountain house is the largest known public water structure in Athens, and most likely was built as a reaction to a severe drought. It is interesting that the Agora, as far as we know, only had one, relatively small, fountain house for about 150 years before this structure, with a

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161 Agora Notebook K-XV-72 (2931-2932) <http://agora.ascsa.net/id/agora/notebookpage/%CE%9A-15-72>, Agora Notebook K XII-72 (notebook XII is not online, nor was it in the cabinets when I was there this summer, it is uncertain where the whereabouts of the book is.)

162 My identification of the sherds in this deposit as almost entirely fine ware was corroborated by Kathleen Lynch when she examined them with me. She noted, however, that it is not uncommon for deposits of this time in Athens to be this way, and that a lot of the contemporary pottery we have is similarly fine, in ways that is not seen in other time periods, earlier and later, in Agora deposits.

163 According to Kathleen Lynch (personal communication)

164 I am uncertain about the relationship of this pit to the structure. The notebooks that supposedly clarify that information are not available online, nor were they in the Stoa storerooms when I worked there over the summer.

165 Camp, 1986: 156.
much greater water capacity, was built. This perhaps ties into Crouch’s observation that in comparison to other Greek cities, Athens was relatively poorly watered.\textsuperscript{166}

\textsuperscript{166} Crouch, 1993: 38.
Messene

Figure 9. Plan of Messene. Reinholdt 2009, 4.
The Fountain of Arsinoe is a large structure erected in the late third or first half of the second century in Messene (Fig. 9). While mentioned briefly in some early articles by German excavators, as well as in Brenda Longfellow’s book on Roman fountain structures, the building is discussed in great detail in Claus Reinholdt’s book, *Das Bunnenhaus der Arsinoë in Messene*.

Messene was not established as a city until 369 BCE, after the Thebans defeated the Spartans at the Battle of Leuctra. Messene is an interesting city to study because the entire city was planned and executed all at once. However, despite that, there was a lag of several decades between when the bulk of the city was constructed, and when the fountain house was built.

Figure 10. Later additions to the Fountain of Arsinoe. Reinholdt, 2009 Beilage 9. Reconstruction of what the fountain would have looked like with the later construction.
The fountain was later the subject of a significant renovation effort to transform it into a building more aesthetically similar to that of Imperial Roman Nymphaea (Fig. 10.), and the date of the construction is contemporary with the construction of those structures. The building was dramatically altered by adding small hypaethral basins at the front of the monument, removing the Doric colonnade that obstructed the view of the water basin, and replacing the central part of the Ionic façade on the parapets with a tripartite arch structure (Fig. 8).\textsuperscript{167} These revisions to the building are interesting for a few reasons. First, it is evidence of a changing aesthetic of water display, to one that will become quite prevalent with Roman Nymphaea in Greece. But also, generally, preexisting structures of this sort were not renovated; the elite patrons just constructed entirely new buildings with this outward water display. So, the renovations of Messene’s fountain are unique in this regard.\textsuperscript{168}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure11.png}
\caption{Reconstruction of the Hellenistic Fountain House. Reinholdt, 2009 fig. 143.}
\end{figure}

\textsuperscript{167} Longfellow, 2011: 112.  
\textsuperscript{168} Ibid.
The fountain is a long, thin rectangle measuring about 35.75 m long and 10.725 m wide.\textsuperscript{169} (Fig. 11). In its initial phase the building was approached from the south on a paved, open courtyard. A row of twelve Doric columns screened the front,\textsuperscript{170} and the building was accessed by steps leading up to the colonnade. Past the row of Doric columns was a thin rectangle of open space about 3.33 m deep preceding the basin.\textsuperscript{171} The basin, about 4.55 m wide,\textsuperscript{172} was accessed over a parapet that was punctuated by a row of Ionic columns.\textsuperscript{173} The back wall of the basin was embellished by a row of oblong Ionic columns.\textsuperscript{174} The back of the basin was not, however, the back of the building. The rear wall of the fountain was built into a terrace, and there was a space of approximately 1.3 meters between the rear of the building and the back wall of the basin.\textsuperscript{175} The water was piped through this empty space, and into the back of the basin.

The roof of this structure is somewhat unique. If the initial Doric colonnade and porch were removed, the roof would be like that of a stoa, gabled starting with the interior Ionic columns and ending on the back wall. However the Doric colonnade and porch create an awning like shape, extending further, and at a lower

\textsuperscript{169} Reinholdt, 2009: 166.
\textsuperscript{170} Reinholdt, 2009: Beliage 8.
\textsuperscript{171} Reinholdt, 2009: 162.
\textsuperscript{172} Reinholdt, 2009: 159.
\textsuperscript{173} Reinholdt, 2009: Beliage 8.
\textsuperscript{174} Longfellow, 2011: 109.
\textsuperscript{175} Reinholdt, 2009: 158.
height than the main roof.\textsuperscript{176} (Fig. 12).

The building was situated in the side of a hill, with a terrace wall abutting the rear of the structure. The water was thus protected by being piped in underground from the north through the hill, into the back of the fountain. Pausanias identifies the building on his travels and says that it was fed by the Clepsydra spring (Paus. 4.31.2).\textsuperscript{177} Water was brought into the building in the eastern corner.\textsuperscript{178} (Fig. 13).

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure12.jpg}
\caption{Profile view of the Fountain of Arsinoe. Reinholdt, 2009 fig 142.}
\end{figure}

\textsuperscript{176} Reinholdt, 2009: 162.
\textsuperscript{177} Frazer 1898: 432. In his commentary on Pausanias’s travels, Frazer mentions that a small spring in the nearby hamlet of Mavroumati, which is directly to the east, and a little bit north of where the fountain is located, and suggests that this perhaps is the Clepsydra spring.
\textsuperscript{178} Reinholdt, 2009: 173.
Figure 13. Reconstruction of the water input. Reinholdt, 2009 fig 133 a.

The reconstructions suggest a trough like sluice entering the building, in the space between the back of the basin and the terrace wall, supported by a large limestone slab which was found in excavations.\textsuperscript{179} The water then entered the basin between the last two columns on the eastern side. Once the basin reached its full capacity, water was drained out on the west side through the wall of the building and into a trough, where it then ran south against the wall of the building.\textsuperscript{180} The excavators do not mention where the water goes beyond this.

Reinholdt talks in greater detail about the nature of the waterproofing material than most excavators of the other fountains have. Apparently after the

\textsuperscript{179} Reinholdt, 2009: 141.
\textsuperscript{180} Reinholdt, 2009: 173.
building was remodeled later in its life, new and more advanced hydraulic waterproofing was added. However, originally lime mortar and lime cement were used.\textsuperscript{181} It seems as though some of the chronology for the building can be ascertained by examining the materials used to waterproof the basin. Some of the later waterproofing has a more reddish color, while the earlier substances are yellowy and white.\textsuperscript{182}

For my discussion and analysis, the most important features of the Fountain of Arsinoe are the fact that while the majority of Messene was erected in a single, systematic building plan, the fountain was not built for several more decades. The ability to trace the chronology of the building’s phases with the different waterproofing materials is also important, because the substances used to waterproof the other fountains, except for the one in Megara, have not been described in a similar level of detail. Finally the fact that the structure was adopted and significantly repurposed is unique to most pre-Roman fountain structures.

\textsuperscript{181} Reinholdt, 2009: 42.
\textsuperscript{182} Ibid.
Morgantina

Figure 14. Plan of the agora of Morgantina. M. Pinsley. Bell, forthcoming.
The Northeast Fountain House in the agora of Morgantina was discovered in 1982 and excavated between the summers of 1982 and 1984. (Fig. 14). The building has since been discussed in excavation reports and publications by Malcolm Bell III, the director of excavations at Morgantina, and has also been included in Dora Crouch’s discussions of water usage in urban development. More recently, Malcom Bell has written a forthcoming article that goes into further details about innovations in the building’s architecture.

The building dates to the second or third quarter of the 3rd century, and the initial phase is considered to be a part of the building plan of Heiron II of Sicily. This flurry of construction included at least eleven new public buildings, and resulted in the codification of Morgantina’s agora as an intentionally planned and fully developed public space. Dating of the building has been established by the relationship between the fountain house and the adjoining, earlier East Stoa, which has been dated between 275-250 BC. Excavators also executed a probe beneath the floor of the inner basin, which produced stamped black-glaze sherds typical of the first half of the third century. The second phase of the building is dated by material from the fill of the south terrace, the latest of which are coins belonging to the last decade of the third century.

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183 Bell, 1988: 332.
184 Bell, forthcoming: 8.
185 Bell, 1988: 336.
186 Bell, forthcoming: 1.
187 Ibid.
188 Bell, 1988: 335.
189 Bell, 1988: 336.
190 Bell, 1988: 336.
than 150 BC, probably in the first quarter to mid-century. The last phase is dated by a fill in the central basin of the structure. The latest datable ceramic and numismatic evidence can be placed around the first quarter of the first century BC.

![Plan of the first stage of construction of the Morgantina Fountain House. Bell forthcoming.](image)

Though somewhat similar in appearance to a fountain on Delos, the northeast fountain house has no obvious parallels in its structure and in the way

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191 Ibid.
192 Ibid.
193 Ibid.
water was acquired and presented.194 (Fig. 15). The building is a rectangular structure that housed two large water basins.195 The outer, larger basin is U-shaped, extending from the back wall of the building and encompassing the smaller, square basin in its crook.196 The basins are separated by a thick wall that is capped by a limestone epikrantis. Some of the epikrantis blocks are reused stones cut from Archaic triglyph blocks, but the building from which these blocks originated is unknown.197 The walls and floors of both of the basins were waterproofed with hydraulic plaster.198 There does not appear to have been any connection between the two basins; they were completely separate from each other.

The interior basin served as a cistern, and was apparently not accessible. Cuttings in the epikrantis blocks indicate that a wooden platform covered the square tub.199 The exterior basin, however, was accessible on three sides.200 The outer wall consisted of a parapet over which people could draw water with their vessels.201 (Fig. 16).

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194 Bell, forthcoming: 8.
195 Bell, 1988:333.
196 Ibid.
197 Ibid.
198 Ibid.
199 Bell, 1988: 335.
200 Ibid.
201 Ibid.
Figure 16. Reconstruction a profile view of the Morgantina Fountain House. Bell, *forthcoming*.

Though not initially realized by the excavators, further examination of the building has led Bell to believe that an interior colonnade stood on the boundary between the two basins, helping to support the roof. Some of the superstructure for this remains, and was originally interpreted as an aedicula installed in the latest phase of the building.\(^{202}\) However, in his forthcoming article Bell states that in fact, the columns and superstructure found belong to the first phase.\(^{203}\) Eight unfluted Doric columns supported a Doric freeze, and an Ionic cornice.\(^{204}\) According to Bell, this mixed order is not uncommon in Eastern Sicily during this time period.\(^{205}\)

\(^{202}\) Bell, 1988: 335.
\(^{203}\) Bell, forthcoming: 10.
\(^{204}\) Ibid.
\(^{205}\) Ibid.
The building was approached by a paved terrace.\textsuperscript{206} The exterior of the building most likely had a columnar façade, although no traces of the columns remain. The excavator proposes that they were probably wood, which was common in Western Greek architecture. In the most recent reconstructions of the building, four columns are drawn in the plan.

It was initially thought that the building relied on multiple sources of water for its supply.\textsuperscript{207} Directly to the east of the fountain was a spring behind the building that had clearly been utilized for several hundred years before the fountain house was constructed.\textsuperscript{208} There is evidence for votive activity dating to the third century BCE at the spring,\textsuperscript{209} which indicates that the water source was a focal point of some sort of cult. However, upon closer analysis of rain levels and the geology of the area, S. Hudson has concluded that the spring would not have been capable of feeding the fountain house.\textsuperscript{210} Thus the building was initially only supplied with rainwater that was collected from both the roof of the fountain house, and the roof of the adjoining stoa.\textsuperscript{211}

The inner basin was filled with rainwater that fell onto the roof, which sloped inwards to drain into the cistern.\textsuperscript{212} Water that fell on the outward slope of the fountain house, as well as the adjacent East Stoa was carried via an open sluice that

\begin{flushright}
\textsuperscript{206} Bell, 1988: 333.  \\
\textsuperscript{207} Bell, 1988: 333.  \\
\textsuperscript{208} Ibid.  \\
\textsuperscript{209} Ibid.  \\
\textsuperscript{210} Bell, forthcoming: 8.  \\
\textsuperscript{211} Bell, 1988: 334.  \\
\textsuperscript{212} Bell, forthcoming: 9.
\end{flushright}
ran between the two buildings, into the larger, outer basin.\textsuperscript{213} The capacity of the two basins varied greatly, with the inner basin being only 10,920 dm\textsuperscript{3} and the larger exterior one around 41,000 dm\textsuperscript{3}.\textsuperscript{214}

Though the reconstruction of the upper structure of the building is uncertain, and the later stages of the building probably were not roofed, Bell proposes that a compluviate roof was probably used in the original phase of the building.\textsuperscript{215} Bell suggests that the roof would have had two slopes on the north, west, and south sides of the structure.\textsuperscript{216} At the corners of the outer basin there are cuttings for roof supports that are presumably located beneath the points where the ridge beams of the roof met each other.\textsuperscript{217} The odd construction of the roof indicates that the architects were conscious of a need to try and capitalize on all potential sources of water. A terracotta pipe carried off the excess water from the inner basin, and a cutting in the parapet at the northeast helped aid the overflow from the exterior drain.\textsuperscript{218} This was then channeled into a terracotta conduit.

In later years it seems as though this arrangement of water supply did not continue to provide enough water to the building. This is evidenced by the fact that a new supply conduit was added to the southwest corner of the outer basin, bringing in water from the other side of the agora, probably from a water source in the western part of the city.\textsuperscript{219} The new conduit was above ground, which caused a

\textsuperscript{213} Bell, 1988: 334. 
\textsuperscript{214} Bell, 1988: 333. 
\textsuperscript{215} Bell, 1988: 334. 
\textsuperscript{216} Bell, 1988: 334. 
\textsuperscript{217} Bell, 1988: 334. 
\textsuperscript{218} Bell, 1988: 333. 
\textsuperscript{219} Ibid.
need for adjustments to be made to the structure so as to protect the terra cotta pipe.\textsuperscript{220} According to Bell:

“The south wall was shifted to the north against the outer basin; a low retaining wall continued out as far as the western edge of the terrace; and the space between the new wall and the East Stoa was filled with earth, under which lay the pipe.”\textsuperscript{221}

Because of these construction adjustments, the rainwater sluice was abandoned in favor of a new terracotta conduit that drained into the outer basin.\textsuperscript{222}

In the final phase of the building, dating to the first quarter of the first century BC, the structure was drastically altered. In the northwest corner another drain and supply conduit were added,\textsuperscript{223} and the interior basin was filled up.

Aside from the unique architecture of the fountain house, it is also interesting to note that in Bell’s opinion, the water from the outer basin was most likely not used for drinking, because the outer basin was so exposed, and thus the water would have been too polluted to have been potable.\textsuperscript{224} However it seems as though the inner basin drained into a different distribution location east of the fountain, which was used for drinking.\textsuperscript{225}

The fountain in Morgantina is interesting because of the fact that it initially was only built to receive rainwater, especially given the multitude of other water structures in the Morgantinian Agora.\textsuperscript{226} Its strange architectural makeup was no doubt a result of this hydraulic arrangement. It’s also important to remember the

\textsuperscript{220} Bell, 1988: 335.
\textsuperscript{221} Ibid.
\textsuperscript{222} Ibid.
\textsuperscript{223} Bell, 1988: 335.
\textsuperscript{224} Bell, 1988: 337.
\textsuperscript{225} Ibid.
\textsuperscript{226} Crouch, 1984: 353.
fact that the excavators themselves have placed the associations of a tyrant, Hiero II of Syracuse, upon this structure.
Conclusions

The five buildings discussed span a chronology of several hundred years, and are in a variety of types of city-states. Despite all being in the agoras of their respective cities, and supposedly sharing the same basic function, they all differ greatly. It is clear that a vast span of technology was used in the construction of the buildings. For instance, the materials used to waterproof the buildings are surprisingly diverse.

Very little is written about the Southeast Fountain house in terms of waterproofing, other than the fact that yellow clay was packed in between the seams of floor slabs,\textsuperscript{227} but no traces of hydraulic plaster were found. However, given the state of the building, with very little remaining, it is possible that there was other waterproofing material used that we no longer have. Similarly, the only evidence of waterproofing material in the Southwest Fountain house is traces of hydraulic cement on the extant toichobate blocks where they would have met with the southern wall of the building.\textsuperscript{228} In Messene, Reinholdt discusses the use of both lime mortar and a hydraulic cement with more inclusions in the matrix, though he does not explain much further the physical and chemical makeup of the substances used.\textsuperscript{229} In Morgantina, Bell only mentions waterproofing cursorily.\textsuperscript{230}

\textsuperscript{227} Camp, 1977: 75.
\textsuperscript{228} Camp, 1977: 120.
\textsuperscript{229} Reinholdt, 2009: 42.
\textsuperscript{230} In personal conversation he stated that the substance used was a hydraulic cement with a fair amount of large inclusions as opposed to the more refined texture of the hydraulic plaster seen in the Southwest Fountain House in Athens, or
Of the five, the only building in which waterproofing is discussed in great detail is Megara. The use of bitumen along with hydraulic plaster here is unparalleled in other Greek hydraulic structures until well into the Roman Imperial period. Of especial interest is the fact that this is one of the earliest structures, dating to the first quarter of the fifth century, so the innovative use of foreign materials and technology is astonishing, especially because it was then not seen elsewhere in other, later buildings. This building was contemporary with the Southeast Fountain House in Athens, and yet the disparity between technologies used is substantial.

The supply and means of conveying water is also different in each building. While in part this is not surprising, because the hydraulic landscape of each city is different, and adjustments need to be made in the hydraulic engineering of fountains to account for different situations, the variety is still notable. Even the two structures in Athens are different, the main structure of the Southwest Fountain House definitely housing a large basin, while it appears as thought the Southeast Fountain House contained both a basin and spouts within the interior of the building.

Unfortunately in many cases the excavation of the pipes supplying the fountains has not been documented well, or in some cases, the pipes haven’t been

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231 Hellner, 2006: 177.
232 The annexes added to the Southwest Fountain House supposedly added spouts to that complex, however.
excavated at all.\textsuperscript{233} This makes reconstructing an analysis of the pipe systems difficult, and at times impossible. Certainly the development of technology used for pipes can be seen in Athens, where John Camp studied the pipes in his dissertation.\textsuperscript{234} The Southeast Fountain House has carefully made and maintained terra cotta pipes, whereas the Southwest Fountain House has a mix of terra cotta pipes, augmented by slimmer lead pipes in the annexes, to convey the water to the structure.\textsuperscript{235}

In Megara the original excavators mention some sections of pipes found within a few blocks of the structure, but other than that, the modern city and lack of excavations in Megara have rendered it impossible to reconstruct the pipelines with any degree of certainty.\textsuperscript{236} Similarly, in Messene, if the pipelines were excavated, the excavators do not discuss them in any detail, other than to say that the building was fed in the eastern corner by a source coming in from the north.\textsuperscript{237} Finally, in Morgantina, excavators now believe that the original phase of the fountain was not fed by pipes at all, but was instead entirely reliant upon rainwater channeled into the tank from sluices between the fountain and the neighboring stoa.\textsuperscript{238} Bell thinks that this eventually proved to be insufficient water to consistently provide for the

\textsuperscript{233} The pipes have not been excavated at all in Megara, and were only briefly mentioned in Reinholdt’s book on Messene.
\textsuperscript{234} Even in Athens, however, are there still lots of questions/uncertainties about the pipes and aqueducts feeding the fountain houses
\textsuperscript{235} Camp, 1977: 133 and 172.
\textsuperscript{236} Gruben, 1964: 38.
\textsuperscript{237} Felten and Reinholdt, 2001: 311.
\textsuperscript{238} Bell, forthcoming: 8.
structure, and so the fountain underwent construction to accommodate the inflow of water piped in from the west across the agora.239

In regards to the bigger picture and architectural trends, the physical arrangement of the structures is also incredibly diverse. The Southeast Fountain House in Athens had a small interior chamber in the middle of the structure, and on either side water could be collected. John Camp even proposes that the means of acquiring water on either side was different; one side was a basin, and the other had spouts.240 The Southwest Fountain House in Athens, on the other hand was a large ‘L’ shaped structure, with a very large basin, and water was acquired over a parapet, though the addition of the annexes that most likely used spouts as the means of conveying water gave more options in terms of water retrieval, like the Southeast Fountain House.

In Megara, the building closest in date to the Southeast Fountain House in Athens, the structure is entirely different. Serving as both a cistern, and a fountain, an expansive pool with 35 octagonal columns supporting a roof made up the bulk of the structure, and water was carefully metered into a basin immediately in front of the cistern, from which people drew water over a parapet. Though the fountain house in Megara does not have elaborate fountains and tiers, like many later Roman structures, the sight of the 35 columns rising out of the water must have been quite visually arresting. The fact that the corners of the columns were decorated with small stripes of red paint, for instance, is indicative of the fact that the visual display

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239 Bell, forthcoming: 9.
240 Camp, 1986: 42.
of the water in this building was important, and was not a strictly utilitarian solution to the apparent need to have water in the agora of the city.\textsuperscript{241}

Moving south, but staying on mainland Greece, the fountain in Messene was yet another elaborate building. Of all the structures, the one in Messene most accurately fits Longfellow's description of a stoa-like building, however it is quite grandiose. The upper structure of the exterior held a Doric frieze, and the columns in the interior were Ionic. The rear of the building had another row of oblong Ionic columns, which is something unique to this structure. So, though the water is screened from initial view on the outside of the fountain house, once inside one would have been met with an arresting view of a massive tank, with columns rising out of its rear. The sheer size of this building is beyond what one would expect to be necessary for simple hydraulic needs, and the three sets of columns, especially those in the back belie a simple utilitarian need for a water structure.

Finally, in Morgantina the fountain house was a square structure that housed two basins; one nestled within the other. The smaller interior basin was inaccessible, and was used as a cistern that then was piped out into water structures elsewhere in the agora. A series of elaborate mixed order columns with a frieze stood in the interior of the structure, on the boundary between the outer basin and inner one, and helped to support the compluvium roof. In the first stages of this building, when it only drew from rain-water, there was no particular need for elaborate architecture to contain the water, and yet the building was architecturally complex and unique, with its two disconnected basins.

\textsuperscript{241} Hellner, 2009: 78.
When considering display in these supposedly utilitarian structures, another
thing to consider is how the water was actually used. Malcolm Bell claims that the
water in the larger basin was not potable, given the large surface area and how
exposed it would have been.\textsuperscript{242} I am unsure of this claim, especially because most of
the other fountains had similarly large surface areas, and levels of exposure. Were
they all also purveyors of water that was not meant to be drunk? In that case, why
was there such a need for large and architecturally elaborate structures to hold
water that could not even be consumed? The fountains are pervasive in Greek city
states, yet it is still unclear as to whether or not they were actually necessary in the
functioning of the agora. In fact as I mentioned previously, Pausanias lists fountain
houses among the buildings in the constellation of infrastructure considered
necessary to constitute a proper city (Paus. 10.4.1).

Despite the clear diversity in the structure of these buildings, fountain houses
in Greece prior to the imperial nymphaea are often discussed in a reductive and
overgeneralized manner. For instance, Brenda Longfellow summarizes the standard
architectural form by likening it to a stoa.\textsuperscript{243} She states that the porch with a
colonnaded façade screens the view from the street of the interior roofed basin.
Therefore, though there could potentially be external decoration, the display of
water was not prioritized in buildings until the late Hellenistic period and later. This

\textsuperscript{242} Bell, 1988: 337. He says, however, that the smaller covered basin was piped to
distribution points elsewhere in the Morgantinian Agora, where it was used for
drinking water. Morgantina is unique, however, in the number of water structures it
contains in its Agora, with some specific water fountains for drinking (Crouch, 1984:
353.)

\textsuperscript{243} Longfellow, 2011: 11.
statement is a bit reductive, and does not take into account the variety and ingenuity of architectural forms that the pre-Roman fountain structures exhibited.

While the buildings certainly did not embody the same aesthetics for the display of water that are seen in the later structures that Longfellow focuses on, it is clear that the diversity of the buildings’ structures is a result of some latent desire to display and highlight the water. The diversity of these buildings is surprising, especially when compared to the relative standard and inflexible qualities of many other types of Greek architecture, like stoas or temples. They value a different aesthetic appeal of water display. The mixture of spouts and tanks, for instance, or the visual of columns rising out of large tanks of water, as seen in Megara, Messene and Morgantina, is indicative of this. The inherent and dramatic differences between these buildings cannot be overstated when evaluating them as a whole.

Despite the physical differences in the structures discussed, the fountains share many characteristics in their social and political contexts, as well as the way they have been discussed and considered in literature both in ancient and modern scholarship. While there is no extant ancient literature that has been identified describing the Southwest Fountain House in Athens, the other buildings share many potent themes.

It is common for water sources in Greece to be associated with deities, and there are plenty of water structures within sanctuaries in Greece, such as the fountain houses in Delphi, and the Minoan Fountain House on Delos. However, even for the buildings discussed in this work, fountains that were extremely functional structures in the public center of the city, there are still often sacred associations.
For instance in Messene the fountain is connected to Arsinoe, who according to Messenian tradition is the mother of Asklepios, and daughter of a Messenian king. (Paus. 4.3.2). There are statues to her in the Asclepeion further down the hill from the Fountain House (Paus. 4.31.12). In Morgantina, a spring was located within the immediate proximity that had evidence of votive activity to the goddess Persephone.\textsuperscript{244} In Megara Pausanias connects the water with the Sithnidian Nymphs (1.41.2). In Corinth and Argos, there were also fountains in agoras that similarly had mythological connections.\textsuperscript{245}

However, aside from mythological connections to spiritual entities, it seems as though the narrative surrounding several of these structures has been mythologized to revolve around certain powerful individuals. For instance, when attempting to match buildings excavated in the Athenian Agora with Pausanias’s description of the space, the Southeast Fountain House was tentatively identified as the building he called Enneakrounos; a structure he said was built by the Peisistratids. Thucydides in his description of the Enneakrounos merely claims that it was a tyrant-built structure, however he does not identify it with one specific person.\textsuperscript{246} It is important to note that the building Thucydides describes is not located in the Agora, but rather on the south side of the acropolis. Thus, unless Pausanias was mistaken in his description of the Athenian Agora, in the several centuries between the construction of the Southeast Fountain House and

\textsuperscript{244} Bell, 1988: 333.
\textsuperscript{245} Crouch, 1993: 130; Abadie-Reynal, et al., 1995: 30
\textsuperscript{246} Dillon, 1996: 194.
Pausanias’s description, the association of not just the tyrants, but of a specific group of men moved into the fountain in the agora.

Paga calls this identification into question in her dissertation, as well as her forthcoming article, in which she argues for a reconsideration of the dating of the Southeast Fountain House to the first quarter of the fifth century.\(^{247}\) This would not only render not just the Peisistratid, but any tyrannical connection impossible, but would also place the building in an extremely different political context, one imbedded in the beginning of the Athenian democracy. Thus the ideas about the origin of the structure migrated from one of a community initiative, to the design of a single powerful individual.\(^{248}\)

It is important to remember, however, the context in which Pausanias was describing these structures. He was coming from a culture of individual display through the erection of monuments and structures. This is seen in the context not just of Athens, where we have notable individuals such as Herodes Atticus venerating themselves through structures, but also in the context of the Roman Nymphaeum being erected in Greece at this time by individuals, as discussed by Longfellow.\(^{249}\)

The other structure that is most similar to the Southeast Fountain House in terms of context is the fountain house in Megara. When discussing Megara, Pausanias attributes the structure to the tyrant Theagenes. While there is other,

\(^{247}\) Paga, 2015: 2.
\(^{248}\) However, it can be noted that even in the democracy certain individuals, such as Perikles, were criticized for investing too much personally in public buildings (Dillon, 1996: 197.)
\(^{249}\) Longfellow, 2011: 74.
much earlier, ancient literature discussing Theagenes, Pausanias is the first person to mention the fountain house and connect it with him (Paus. 1.40.1). Again, as with Athens, evidence from the excavation of the building has pointed to a date at the beginning of the 5th century, and thus after the rule of Theagenes. So once again, there is a creation of a mythologized narrative fabricating the connection of the building to a specific person. The political context of the construction of the fountain house in Megara is not known, as there is not a wealth of literary sources informing us as to the political structure and development of the polis as there is with Athens. But it is clear that the actual origin of the fountain was at some point superseded by the mythologizing that created the connection to Theagenes.

What we know of the fountain in Morgantina comes entirely from modern excavations and scholarship. Recent excavators have placed the fountain among a group of buildings that they believe to have been built roughly contemporaneously and as a result of a building initiative by the tyrant Hiero of Syracuse. Are the excavators in this case being influenced by the tendency to connect such buildings with tyrants, or specific influential individuals when making these claims about the construction and origin of the buildings? It seems as though the main motivation for associating these buildings in the Morgantinian Agora is the fact that in excavation of many of them, coins dating to the period of Hiero were found. However, Bell only ever says that it is assumed that Hiero was involved in the administration of

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250 Bell, 1988: 339.
251 Bell, 1988: 339.
Morgantina,\textsuperscript{252} and thus the construction of these buildings. Nothing more concrete is ever claimed.

With the reevaluation of other formerly tyrant-associated fountain houses in Athens and Megara, it certainly calls into question our assumptions and biases about the structures, and how they have impacted modern scholarship on these fountains. Other water structures that have also been associated with tyrants include the Pirene fountain in Corinth, which has been associated with the Kyselid tyrants, as well as the great water tunnel designed by the engineer Eupalinos on Samos.\textsuperscript{253} Clearly it is a well-established trope to connect these large hydraulic structures with tyrants, or more generally elite individuals, however this clearly merits a fair amount of critical observation and skepticism, given the fact that archaeological evidence for several of the buildings precludes the validity of these claims.

Why would citizens of these cities, or modern scholars, find it important to mythologize origin stories for these buildings of incredibly utilitarian function and use? There certainly was a very different perception of fact and “history” in the Classical period than now, for instance the creation of tribes in Athens, or the creation of an entirely new mythology that was adopted when the city Messene was founded. Perhaps people were not as interested in buildings that were built by a collective of people, as opposed to by one specific person for the purpose of raising their own profile and endearing themselves to the population at large. There certainly does not seem to be as pervasive of a narrative surrounding the

\textsuperscript{252} Ibid.
\textsuperscript{253} Dillon 1996: 195.
construction of the other buildings that were all part of the building plan early on in the development of the Athenian democracy.\textsuperscript{254}

A final thing to consider is why there was a necessity for fountain houses in agoras in general. The fountains are all located in relatively prominent locations in their respective agoras. They are generally located in corners, near a major thoroughfare of entry into the public space. What specific need was there for such monumental structures, in such prominent places, whose sole purpose was to hold and provide water? In Athens there is archaeological evidence for the fact that when the space of land that is now known as the Agora was gradually developing to assume that function, a large number of wells were closed en masse.\textsuperscript{255} However, given the re-dating of the Southeast Fountain House into the 5\textsuperscript{th} century, as opposed to the second half of the 6\textsuperscript{th} century, there was then a span of at least several decades in which the Agora existed without any viable source of water. In Messene, the majority of the city was all built in one construction plan; however, the fountain was not built for another decade or so,\textsuperscript{256} once again leaving the agora without a large convenient source of water for quite some time.

Throughout my examination of these five buildings, the most pervasive theme is the lack of complete and holistic information. In some cases, there are merely scant physical remains, from which relatively little concrete information can be gleaned. In others, a lack of literary sources prevents the potential for greater understanding of the structure. However it has been my goal to show that we can

\textsuperscript{254} Paga, 2012: 199.
\textsuperscript{256} Reinholdt, 2009: 159.
apply a more rigorous and extensive contextual framework in order to conceive of and discuss these frequently overlooked and under-analyzed structures. I have raised issues such as the diversity of architecture and technology used in the fountains, the clearly unique aesthetic display of water, and the mythologizing of their origins by both ancient and modern scholars. In all of these categories, the fountains defy expectations and attempts at oversimplification and in fact represent an area of architectural, technological, and political examination that is still in need of much deeper investigation and analysis.


Bell III, M. *forthcoming.* “Commercio e innovazione nell’agora di Morgantina, ca. 250 a.C”.


Dunkley, B. 1936. “Greek Fountain Buildings before ca. 300 BC” *ABSA* 35, 142-204.


