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Going against the flow

Wells, cisterns and water in ancient Greece

Edited by Patrik Klingborg

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ABSTRACT

Despite the prevalent picture of the water supply in the ancient world as being dominated by fountains and aqueducts, the large number of excavated wells and cisterns show that these were the primary water sources for most individuals. Yet, little research has been done on their construction, function and use. This prompted the organization of the workshop *Going against the flow. Wells, cisterns and water in ancient Greece*, held at the Swedish Institute at Athens on 28–29 September 2017, and subsequent publication of the contributions in this volume. The ten papers presented here offer new evidence as well as a wide range of new perspectives on the use and function of wells and cisterns in ancient Greece. Considering the ubiquity of these installations in every type of setting during antiquity, from pan-Hellenic sanctuaries and civic centres to domestic workshops and remote farmhouses, it is hoped that the breadth of interest among the authors will allow other scholars to advance their own work further, illuminating new and exciting aspects of life in ancient Greece.

Keywords: wells, cisterns, water supply, ancient Greece, archaeology, climate, sanctuaries

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Cover illustration: section of typical ancient Greek cistern, by Patrik Klingborg
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STEPHANIE KIMMEY

6. The Nemean wells

Water management and sanctuary deposition

Abstract

The Sanctuary of Zeus at Nemea is located within an inland valley and relied upon water for a range of activities. Water management for the sanctuary is evident through the manipulation of the Nemea River, the construction of a large, stone reservoir, and the simple aqueduct from a spring in the hills to the east of the sanctuary. The most visible intervention comprised the twelve wells constructed throughout the sanctuary. Since Nemea had two separate phases of large-scale activity, the wells, as relatively undisturbed deposits, are the best record of the activities occurring at the site. This chapter explores wells that preserve artifacts from the full range of the site's Greek history (from the end of the 6th to the 3rd centuries BC), documenting the changes to and developments of the activities at Nemea. The scope of this study is to treat the wells as discrete units within their larger sanctuary context to examine their construction, location and use, and eventual abandonment. This approach creates a more nuanced history of the Nemean Sanctuary of Zeus.*

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Introduction

Wells found in Greek contexts provide troves of materials for archaeologists to study, yet few studies have focused on the well itself as a complete context. At the Sanctuary of Zeus at Nemea in the north-eastern Peloponnese (see map in *Chapter 1*, *Fig. 3*), excavations uncovered twelve wells that preserve artifacts originating from the full chronological range of the site's history.[1] Analysis of the contents of the wells provides a new approach to study the changes to and developments of the activities taking place at Nemea, ranging from ritual and feasting to craft production and clean-up. The scope of this chapter is to treat the wells as discrete, individual units within their larger sanctuary context to examine their construction, use, and abandonment and thus create a more nuanced history of the Nemean Sanctuary of Zeus.

Nemea's history provides a distinct perspective on Greek religion and sanctuaries

* I must begin by thanking Kim Shelton for permission to work with the material from Nemea and access to the Nemea Excavation Archives. I would also like to thank Patrik Klingborg for the invitation to participate in this volume. This chapter presents a small selection from my dissertation research, which would not have been possible without the funding and support of the Department of Art History and Archaeology at the University of Missouri-Columbia.

[1] By contrast, at Olympia, the sheer number of wells stands in stark contrast to Nemea. As of 2011, 240 wells have been found at Olympia (Kyrieleis 2011, 114). It appears that the number of wells increased as the Olympian Games grew in popularity, with 21 from the first quarter of the 5th century BC compared to the seven from the early 7th century BC (*OlForsch* 8, 243). Cf. Mallwitz 1988, 98, n. 85.

during periods of major change, such as the end of the Classical to the Early Hellenistic periods. The festival and games were removed from the sanctuary for almost a century during the Classical period, resulting in two separate phases of large-scale ritual activity: the first in the 6th–5th centuries BC and the second in the 4th–2nd centuries BC. Yet, due to Nemea's history during the Late Roman, Byzantine, and Early Modern periods, very few deposits associated with the second phase were preserved intact. The wells, as relatively undisturbed closed contexts that span the topography of the site, are the best contexts with which to study the transition between the two phases of the festival and games. The wells and the finds in them therefore depict the life of the sanctuary over time, including ritual activity and the use of space as both dynamic and adaptive.

Water sources at Nemea

Between 1964 and 2000, twelve wells were excavated at Nemea.[2] From the present extent of excavation around the main part of the sanctuary, it appears that these twelve represent all the wells dug there in antiquity. Of these, ten will be discussed here.[3] Many lie in close proximity to one another, nearly in a line, suggesting ancient knowledge of an underground water source that provided water for the sanctuary.[4] This is best seen by the wells between the *oikoi* and *xenon*, in squares L17, M17, N17, O17, O16, and the additional one in E18 by the Heroön (*Fig. 1*).[5] The other wells discussed here are located by the south-west corner of the temple in square K14 and in House 3 in square L19. In addition to their locations, most of the wells have a top elevation around 332 m above sea level (masl) and were dug to an average depth of 8.10 m.[6] The similarity in placement and depth supports ancient knowledge of the location of the water sources around the sanctuary. Additionally, the similarities in construction and comparable depths for the wells suggest the use of the same, possibly local, construction techniques.

Several other water features throughout the sanctuary demonstrate the abundance of the natural resource. Located within an inland valley, the sanctuary relied upon water for a range of activities. Water management is evident through the manipulation of the Nemea River, the construction of a large stone reservoir in the south-west area of the sanctuary, and the simple aqueduct from a spring in the hills to the east of the sanctuary. The river, which

[2] Currently all the wells are either backfilled or sealed by large concrete slabs for the safety of visitors to the site; thus, all physical descriptions come from the excavation notebooks and reports.

[3] Wells K14:3 and K17:1 are not included in this discussion as both date to a much later phase of the sanctuary. K14:3, next to the temple, preserved artifacts from the 3rd and 4th centuries AD. K17:1, located near the *xenon*, was very shallow with the entire context dating to the Byzantine period.

[4] Seven wells were constructed along an east–west axis. They are all located within the site grid between lines 17 and 18 in multiple squares—K17:1, L17:1, L17:2, M17:2, N17:2, O17:1, and O17:2. An eighth well was found in K17 but had collapsed badly and was not excavated (Miller 1979, 87).

[5] If ancient knowledge existed about the underground water source, it is very likely that the wells were constructed to take advantage of the source. The water source could also have had implications for the layout of the sanctuary, as these wells are located in areas of high traffic. No official geological studies of this groundwater have been conducted. Miller has referred to it as an "underground river" (Miller 1978, 82; 1979, 83). Recently, Miller did suggest that "the smaller stream courses found below the Heroön must have been tributaries of this larger [Nemea] river", perhaps accounting for the underground water sources utilized by the wells (Miller 2015, 319).

[6] This average was calculated without O17:2, which was barely 1 m in depth, and least likely of all ten wells to actually have been a well. If included in the calculation, the average is 7 m.

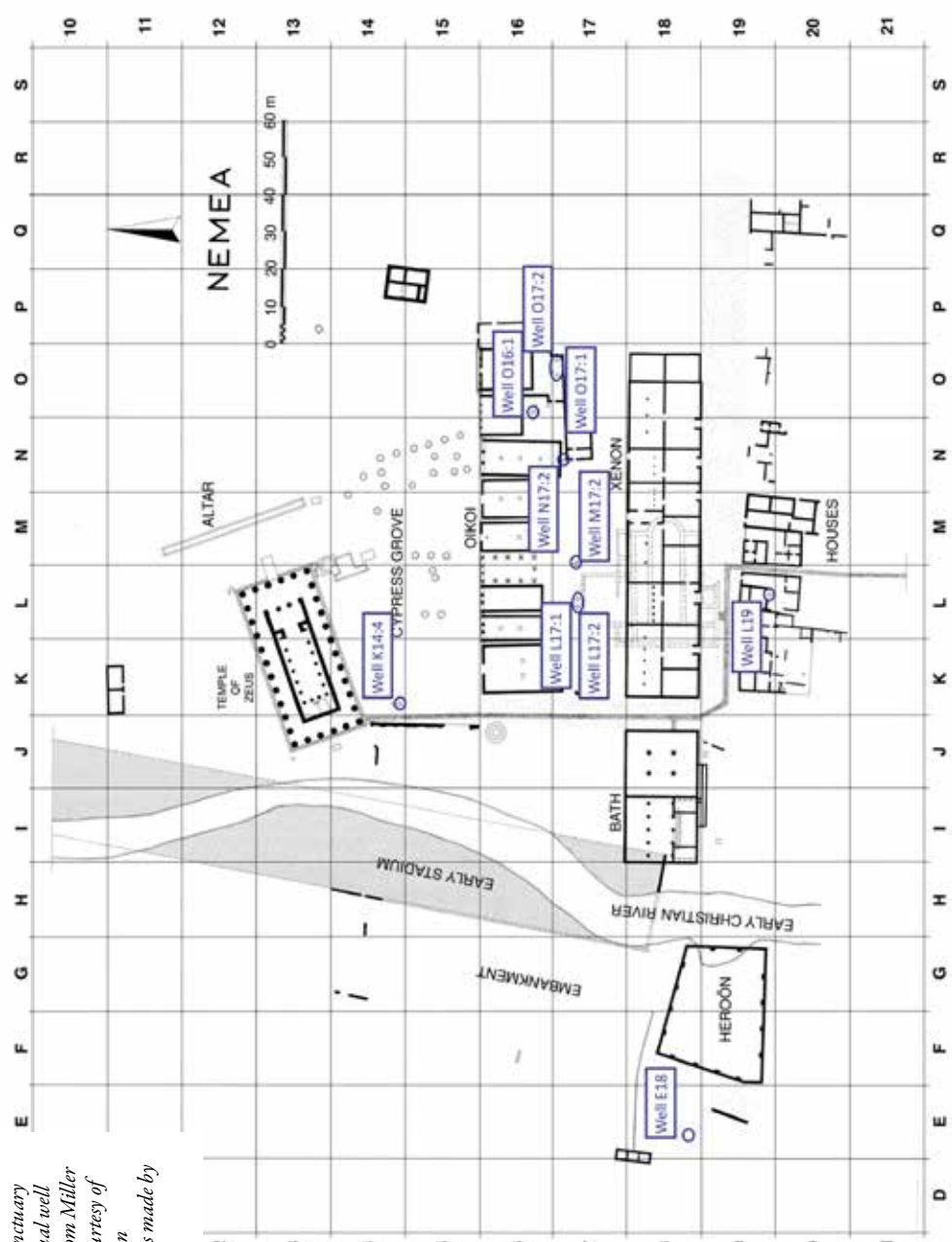


Fig. 1. Plan of the Sanctuary of Zeus with individual well locations. Adapted from Miller 2015, 278, fig. 1. Courtesy of the Nemea Excavation Archives. Adaptations made by Stephanie Kimmey.

Table 1. The wells at Nemea.

Well	Depth	Elevation	Construction	Diameter	Date range for the deposit
L17:1	9.95 m	332.760–332.720 masl	Rubble	Top: 0.54 m Bottom: 1.30 m	Late 6th to early 3rd centuries BC
L17:2	9.90 m	332.637–322.737 masl	Rubble	Top: 0.54 m Bottom: 1.35 m	Late 6th to 2nd centuries BC
M17:2	9.70 m	332.676–322.876 masl	Rubble	Top: 0.70 m Bottom: 1.21 m	6th to 2nd centuries BC
K14:4	8.05 m	331.660–323.610 masl	Rubble	Top: 0.88 m Bottom: 1.46 m	6th century BC to Roman
O17:1	6.80 m	332.650–325.850 masl	Earthen	n/a	5th to 4th centuries BC
O17:2	0.93 m	333.640–332.710 masl	Earthen	n/a	5th to 4th centuries BC
E18	7.10 m	332.134–324.934 masl	Earthen	Top: 3.20 m Bottom: 0.95 m	5th to end of 4th centuries BC
L19	7.10 m	334.556–327.457 masl	Rubble	Top: 1.15 m Bottom: n/a	5th to early 3rd centuries BC
O16:1	4.91 m	333.010–328.100 masl	Earthen	Top: 1.40 m Bottom 2.50 m	5th to mid-3rd centuries BC
N17:2	10.00 m	333.190–323.190 masl	Rubble	Top: 0.74 m Bottom: 1.40 m	5th to 1st centuries BC

fluctuates and often changed course, was redirected away from the sanctuary several times throughout history.[7] The 4th-century BC reservoir, measuring roughly 3 × 9.75 m, was built of good isodomic masonry slightly north-west of the Heroön with three square chambers to a depth of 8 m with central basins.[8] This reservoir was supplied by several water sources, including the water table, the collection of rainwater, and the terracotta aqueduct built from U-shaped tiles and Corinthian-style roof cover tiles.[9] The aqueduct also supplied water to a smaller reservoir for the bath complex.[10] Water was an important resource needed during the festivals, and the evidence shows the extent to which the Nemeans manipulated the natural sources.

The wells

Ten wells preserve artifacts from the end of the 6th to beginning of the 2nd centuries BC. Some wells have more material dating to the first phase (Wells L17:1, L17:2, M17:2, and K14:4), the 6th–5th centuries BC, while others the second phase (Wells O17:1, O17:2, E18, L19, O16:1, and N17:2), the 4th–2nd centuries BC. The presence of 4th–3rd century BC artifacts in all ten wells supports that all were open to some extent during the second phase of the festival. Each well has its own narrative of construction, use, and abandonment. A microanalysis of the assemblages of each individual

[7] Even with human intervention to manipulate the river's course, the river damaged several features in the west side of the sanctuary, including the Heroön, bath house, and early stadium (Miller 2015, 279–286). To the west of the Heroön were a series of embankments and drainage features (Shelton 2011a; 2012), and the Early Christian community constructed a dam north of the bath house (Miller 2015, 282–285).

[8] Miller 2015, 335, 339.

[9] Miller (2015, 339) notes that there was no trace of plaster on the walls or within the fills, which would allow underground water to enter the chambers.

[10] *Nemea* 1, 216–220 (for the reservoirs), 221–232 (for the aqueduct and spring).

Fig. 2. Well M17:2, interior of well, view from above. Photograph by Stephanie Kimmey.

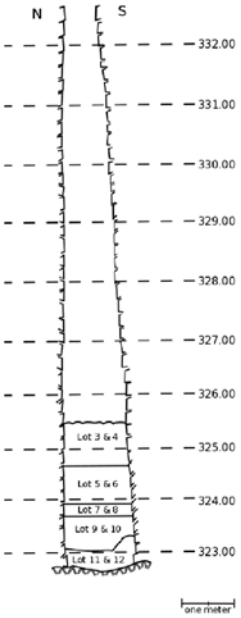
well shows a different story of deposition, while a macro-analysis of the wells as a single group reflects the sanctuary as a whole and the activities occurring throughout it. The aim here is to briefly present analysis of the wells individually and then demonstrate how wells, as a group, can better contribute to the reconstruction of a site's history.

Of the ten wells, six were constructed with rubble and are circular in section (*Fig. 2*; *Table 1*).[11] Four of the rubble wells (L17:1, L17:2, M17:2, and N17:2; *Fig. 3*) are located along grid line 17 and are nearly identical in depth, *c.* 10 m, and construction. The two additional rubble wells differ in location and depth. Well K14:4 is located near the southwest corner of the temple (*Fig. 3*). Well L19 is located near the southern limit of the excavated area within a row of buildings that have been called houses.[12] Well L19 is unique within the Nemean examples; the rubble construction of the walls only continued to a depth of 5.75 m, below which the well was unlined (*Fig. 3*).[13] The bottom of the well was dug into soil that contained more clay, as a layer of red clay, *c.* 0.65 m thick, was found at the eleva-

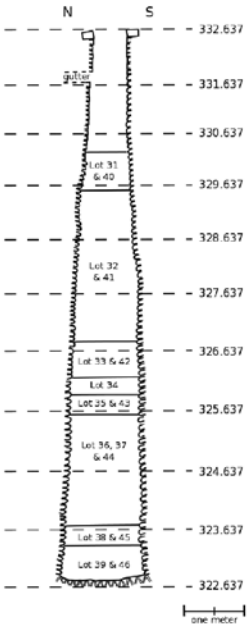
[11] In these cases, the rubble construction refers to the use of irregularly shaped, unworked field stones, mostly limestone, without any mortar. While poros stone wells have been found in the Kerameikos, those used cut masonry and a corbeled technique (Stroszeck 2017, 49–50). According to Camp, the earliest wells in Athens were generally sunk into the bedrock, but those of the Geometric period were the first attempts to line the shaft with field stones set in mud, though these were the rare exceptions (Camp 1977, 175, 177). At Olympia, the majority of the 240 wells were unlined and dug directly into the earth (Mallwitz 1988, 98; Frielinghaus 2016). However, four examples of masonry-constructed wells were identified on plate 1 of *OlBer* 10 (nos. 2, 8, 84, and the well in A1). Of the ten Late Archaic- to Hellenistic-period wells at Lerna, only two were stone lined, with Hellenistic fills (*Lerna* 8, 111–112, table 5).

[12] These structures accommodated the priests, judges, and caretakers of the sanctuary, which is why they have been given the label "houses" (Miller 1988, 10–19). Cf. Excavation Notebook L19 (IV). As unpublished sources, all field notebooks from the Nemea excavations will be cited as such.

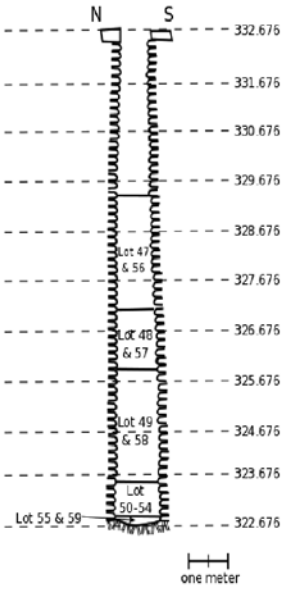
[13] Miller 1988, 13.



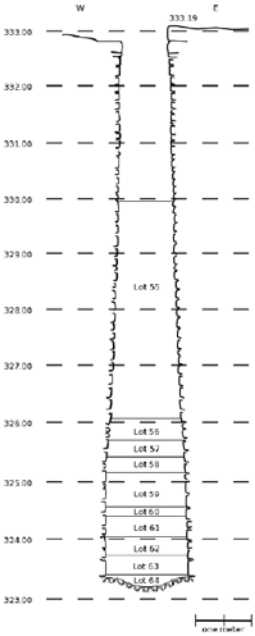
Well L17:1



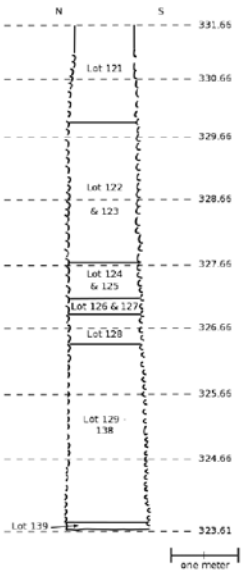
Well L17:2



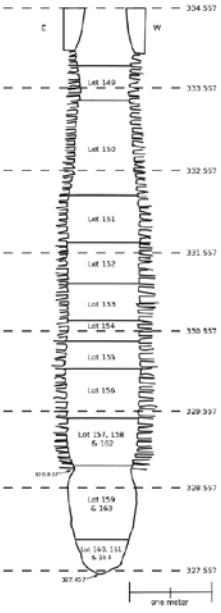
Well M17:2



Well N17:2



Well K14:4



Well L19

Fig. 3 (left). Sections of Well L17:1 looking west (adapted from Excavation Notebook L17 [1], p. 28); Well L17:2 looking west (adapted from Excavation Notebook L17 [III], p. 440); Well M17:2 looking west (adapted from Excavation Notebook M17 [III], p.448); Well N17:2 looking north (adapted from Excavation Notebook N17 [III], p. 526); Well K14:4 looking west (adapted from Excavation Notebook K14 [III], p. 464); and Well L19 looking south (adapted from Excavation Notebook L19 [IV], p. 639). Adaptations made by Stephanie Kimmey.

Fig. 4 (right). Wellhead for Well N17:2, view from north-west. Photograph 75-35-5. Courtesy of the Nemea Excavation Archives.

tion where the stone rubble stopped.[14] The clay matrix might have been useful as a wall lining. While it appears that, in general, more architecturally sophisticated wells are associated with the Classical to Hellenistic periods, the Nemean wells cannot securely be dated by construction alone.[15]

Five wellheads, of varying construction, were preserved for the rubble-built wells. Well N17:2 was the only well to have two phases of construction. The first consisted of two worked rectilinear blocks with circular cuttings for the mouth, while the second one used roughly worked, small limestone blocks radiating out from the opening and then packed with rubble, mudbrick, and tile fragments (*Fig. 4*).[16] The wellhead of Well K14:4 had five worked blocks (*Fig. 5*).[17] Well L19 had a large block surrounded by cement and pebble flooring suggesting the well was integrated into the construction of the house. The wellhead of Well L17:1 is no longer *in situ*, since, in 1977, the excavators removed the stones and replaced them with a cement collar.[18] Photographs taken prior to the dismantling show that the wellhead was constructed from field stones (*Fig. 6*). For Well L17:2, the foundation blocks for the wellhead were still *in situ* at time of discovery, with only one block having fallen to the east of its original position. The largest block may have been reused from the 5th-century BC temple, and, if so, could indicate the date of construction or a later modification (*Fig. 7*).[19] While the shafts of these wells are very similar in construction, it

[14] Miller 1988, 13–14. The difference between the unlined walls at the bottom and the lined, rubble walls for the majority of the well did not seem to have any relevance to Miller's conclusion, nor did he provide any suggestions for the difference in construction. The unlined portion of the well could be a result of needing to deepen the well to reach a lower water level.

[15] The earliest materials in all the wells date to the late 6th or 5th century BC. But these artifacts are often found throughout the fill of the deposit rather than solely at the bottom in use fills. Cf. Camp 1977, 178–179; *Lerna* 8, 112, n. 6; Stroszeck 2017, 48–51.

[16] Miller 1976a, 189.

[17] Miller 1979, 77.

[18] Excavation Notebook L17 (1), 11, 15.

[19] The block had holes made for lifting the block are "of the archaic style—to be lifted as if by ice tongs" (Excavation Notebook L17 (1), 105–107).

Fig. 5. Wellhead for Well K14:4, view from west. Photograph 78-19-16. Courtesy of the Nemea Excavation Archives.

Fig. 6. Wellhead for Well L17:1, view from north. Photograph 75-35-8A. Courtesy of the Nemea Excavation Archives.

Fig. 7. Wellhead for Well L17:2, view from south. Photograph 78-11-22. Courtesy of the Nemea Excavation Archives.

does appear that the wellheads were not identical. This may indicate either that construction occurred at different times with varying techniques or that construction relied heavily on locally sourced materials, which led to variations.

Handholds or other physical attributes that would aid in the cleaning of the wells appear to be absent.[20] From the excavation notes, nothing suggests the presence of handholds. Thus if the wells were cleaned on a semi-regular basis, which is highly likely, no evidence is preserved for how this occurred. The rubble stones are small and would not support human weight. It is most probable that ladders or removable elements were used to enter and exit the wells.

The four earth-cut wells vary the most in size and depth. Well E18 is west of the Heroön and is the only Nemean well that narrows significantly at the bottom.[21] One suggestion is that the walls became less stable as digging continued and so the top was expanded in diameter. While deep (7.10 m), the well was never lined, suggesting a temporary use. It appears that the well was only in use until the nearby stone reservoir was constructed.

The final three wells were identified as such during excavation, and thus, they have been included here, but it is very possible that none had such a function. Other possibilities are that wall collapse during construction led to subsequent abandonment or an initial intent to construct a pit or *bothros*. Regardless, it is clear that these features were not open for long and were quickly filled.[22] Well O16:1 was excavated to the full depth of 4.91 m with a considerably wider diameter than the other wells. During excavation, it was first identified as a pit but changed to an unlined, poorly constructed well.[23] While no explanation for this was given, it is likely that the depth influenced the reidentification. Well O17:1's location at grid line 17 increases the probability that this was meant to be a well that would tap into the underground water source. While it also has a top elevation similar to all the wells along this grid line, its depth only reaches 6.80 m, which might not have been deep enough to reach water. Finally, Well O17:2 is the least likely well, as it was only dug to a depth of 0.93 m. These three unlined, earthen wells likely functioned for a short period of time on a more temporary nature. Caution should also be applied when discussing these as wells. Their location supports the view that they were intended to tap into the underground water source, but for one reason or another, they never reached a depth that would have hit water, unless the water table was particularly high.[24] It is more likely that these were either aborted attempts, due to collapse or other structural issues, or were always intended as pits.

Location and use

As a group, the wells' primary function was to provide an easily accessible source of water during the festival and games.[25] The wells offered

[20] In Athens, hand- or footholds are first attested in the Geometric period and continued as a common feature (Camp 1977, 176). At Lerna, of the historical wells, only one of the ten wells featured handholds (*Lerna* 8, 111). Cf. Hodge 2000, 30; Shear 1993, 403.

[21] Miller (2015, 333) has suggested that the well's diameter was meant to be less than a meter, but "that the edges collapsed, creating the larger diameter at the top." For a section drawing, cf. Miller 2015, fig. 75.

[22] At Olympia, the wells were constructed as earthen shafts. Mallwitz (1988, 98) argues that since the majority of these wells were simple, earthen shafts that were not reinforced, they were planned for a short period of use.

[23] There was no period of use, perhaps due to collapse during construction, and thus, the well was abandoned and filled in all at once (Excavation Notebook O16 [III], 425). On the other hand, Miller (2004, 147) has suggested that the well could have been used for only a short period of time when the water table was high.

[24] From personal experience living and excavating at the site, the water level still fluctuates year to year.

[25] Wells certainly could have been used at the times between the festivals, which occurred at Nemea every

the easiest access to water for human use within the sanctuary, primarily for drinking, cooking, craft production, or rituals. The river water was not reliable because it fluctuated both in location and amount. The aqueduct carrying water from the spring to feed the bath house for the bathing of athletes and trainers was inaccessible along its route as it was covered by tiles. The aqueduct continued to the west to feed the large stone reservoir, which would provide a similar water source to the wells. It was, perhaps, fortuitous that the underground water source ran through the heart of the sanctuary allowing the wells to be centrally located between the *oikoi* and *xenon*. Placing the wells between these particular buildings would have important, site-wide implications by providing convenient access to water for the visitors, the athletes and trainers, the sanctuary caretakers, and the craftsmen for basic human needs, rituals, and production.[26]

Well E18, located next to the Heroön, may provide the clearest connection between water and ritual activities. The assemblage and its construction both suggest a short span of use, likely at the end of the 4th century BC. Since no earlier well has been found in the area around the Heroön, the installation of Well E18 suggests a new need for a water source in the south-western part of the sanctuary. With the construction of the stone reservoir nearby, it is evident that water played a major role in activities occurring in this area, perhaps associated with the Heroön. The other possibility, though more speculative, is that the wide, open space to the west of the sanctuary center was highly suitable for temporary accommodations for visitors to the festival.[27] If we are to imagine the space, where little to no architectural remains have been found, as the location where visitors stayed during the festival, then nearby water sources would have been essential for basic human needs.

In addition to general water consumption, water sources were important for food preparation. No kitchen has been identified at Nemea, but evidence of cooking has occasionally been preserved. The back part of *oikos* 9 appears to have functioned as cooking space, evidenced by a roasting pit filled with carbon, ash, and bone.[28] While *oikos* 9 was constructed in the first half of the 5th century BC, by the third quarter of the 5th century, the back space had been remodeled to accommodate bronze-casting activities, as seen in the two pits cut into the west wall.[29] Wells O17:1 and O17:2 are

two years. During the "off" months, the site, as a sacred place to Zeus and Opheltes, would receive religious visitors, likely local ones, at a much smaller scale than during a festival. While the well deposits cannot accurately preserve each two-year festival cycle, the much longer gap dating to the end of the 5th century to the beginning of the 4th century BC, when the festival was moved to Argos, is somewhat better preserved. While it has been suggested that the sanctuary was completely abandoned at this time (Miller 1978, 83; 1979, 79–81, 90, 92–93; *Nemea* 1, 71), ceramics from the wells show that there was activity, but more limited, corresponding to small-scale activity (Kimmey 2017, 266–270). It has similarly been argued by Frielinghaus (2016) that the wells at Olympia were most likely for the festival and games, rather than for religious visitors to the site when the games were not held.

[26] Unlike the water-related rituals associated with other gods and sanctuaries, there does not appear to be a single specific ritual at Nemea that relied on water (Cole 1988). The spring to the east of the sanctuary was a sacred space, with a 6th–5th-century BC deposit of more than 1,000 vessels, 72% of which are miniature kotylai, hydriai, and kalathiskoi (Barfoed 2017, 651, 654).

[27] In 2010, I supervised the excavation in D/E–11/12 to investigate the use of the western area in different periods of the site's history, specifically if this is the location of the hippodrome. Geophysical survey and sub-surface investigation were also undertaken and did not identify anything on the west side of the site; thus the different subsurface strata do not provide supporting evidence for the existence of the hippodrome in this area. It seems that the west side of the sanctuary did not contain any major features, making it a suitable location for temporary accommodations (Shelton 2011b).

[28] Miller 2004, 149.

[29] Miller 1975, 167; 2004, 136–137, 151. The exact histories of the *oikoi* are unclear, but some remodeling

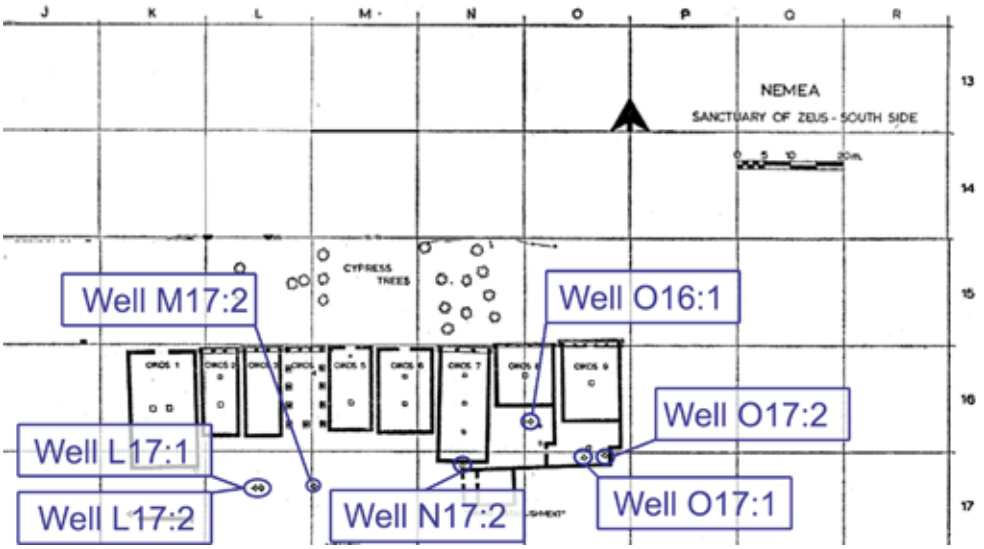


Fig. 8. Restored plan of the oikoi with wells marked in blue. Adapted from Miller 1978, 66, fig. 2. Courtesy of the Nemea Excavation Archives. Adaptations by Stephanie Kimmey.

located within this part of *oikos* 9, perhaps as a water source for food preparation or for the later bronze-working (*Fig. 8*). While neither well may have functioned as a water source due to their shallow and earthen construction, their location within the *oikos* suggests a strong relationship.

Water use in the sanctuary was also an important component of craft production. In addition to bronze-working, the kiln complex relied on Well N17:2 as a water supply.[30] The complex consisted of three different kilns, two rectangular and one circular, Well N17:2, and a *bothros*, possibly functioning as a settling basin for clay (*Fig. 9*).[31] The kilns were constructed to manufacture tiles for the rebuilding project at the end of the 4th century BC that included the temple, bath house, *xenon*, the houses, *oikoi*, and *apodyterion*.[32] The debris from within the kilns themselves, such as loom weights and pottery, show that the kilns were used for a wide

and use occurred during the second phase of the festival. Even if *oikos* 9 was destroyed, Miller suggests that the back room continued to be used (Miller 2004, 148–149).

[30] As Miller notes, "A construction date for the well in the third or fourth quarter of the fourth century BC would suggest that it had been intended originally as a source of water for the kiln complex" (Miller 1976a, 192). While some 5th-century material was found in the well, it only accounts for 19% of the total datable artifacts, suggesting that the earlier material was a secondary deposit within the well rather than evidence of its construction (Kimmey 2017, 233). I, therefore, agree that Well N17:2 was mostly likely constructed at the same time as the kiln.

[31] The kilns are designated by location and shape: the South Kiln, the North Kiln, and the Circular Kiln. The kiln complex was covered over by Miller in order to preserve it; thus, any discussion of the complex relies on the excavation notebooks, *Hesperia* reports, and subsequent publications (Miller 1975, 147, 161–167, 187–193; 1976a, 188–192; 1976b, 71–73; 1978, 80–71; Graybehl 2014, 187–197), specifically the guide to the site (Miller 2004, 151).

[32] Miller (1976b, 72) was able to identify at least six other sizes of tile in addition to those identified as roof tiles for the temple.

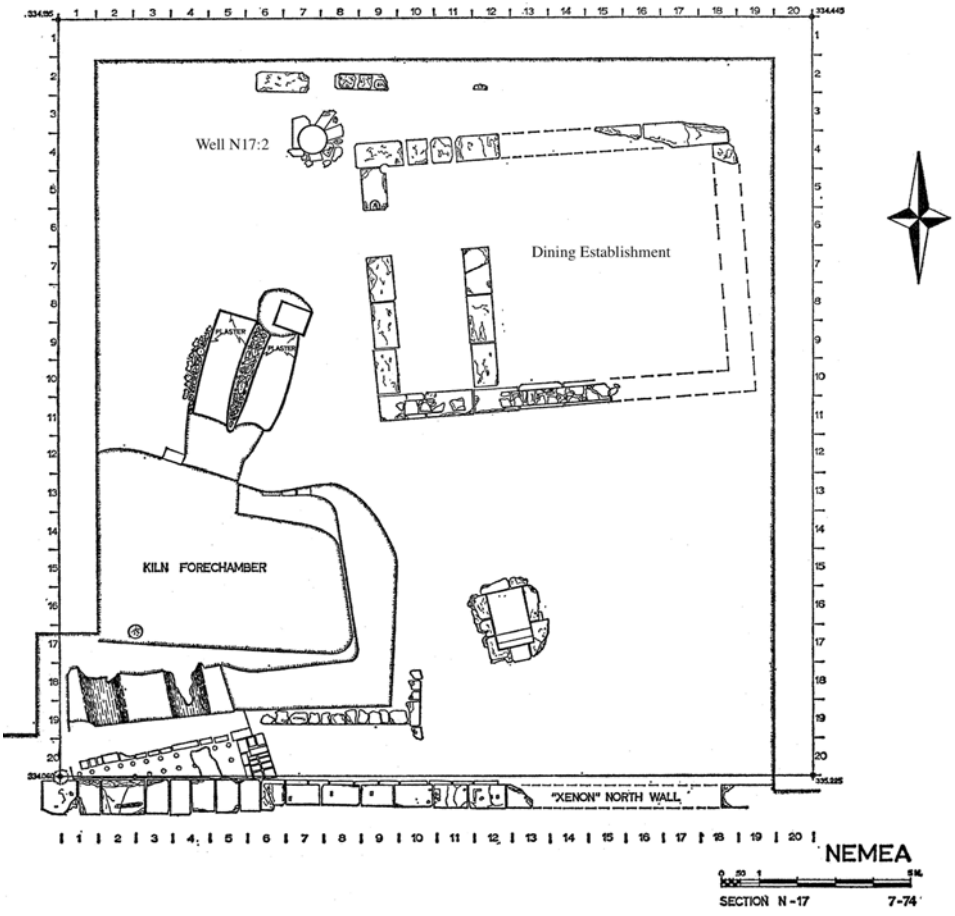


Fig. 9. Restored plan of dining establishment, Well N17:2, and part of the kiln complex. Adapted from Miller 1975, 163, fig. 2. Courtesy of the Nemea Excavation Archives. Adaptations by Stephanie Kimmey.

range of craft production.[33] Well N17:2 was constructed in close proximity and with additional features in order to facilitate production. Of the six rubble-lined wells, it is the only one with walls packed with clay, which was beneficial in maintaining the water level.[34] At the bottom the well also had a settling basin.[35] The well

[33] Graybehl discovered two fabrics through petrographic analysis, mudstone and micrite, that produced a range of products beyond tiles, including loom weights, and vessels such as lekanai, mortaria, pithoi, and jugs. She argues that within the sanctuary, these vessels were related to craft production, food storage, and preparation. The kiln was producing vessels in the same style as those from Corinth and the Argolid, especially the vessels primarily used for food storage and preparation (Graybehl 2014, 216–220).

[34] The only discussion of the clay lining is in the original excavation notebook (Excavation Notebook N17 [III], p. 525). As the well has been sealed, there is no present way to confirm the addition of the clay.

[35] Excavation Notebook N17 (III), p. 525. The bottom of the well has a diameter of 1.40 m with the settling

Fig. 10. Baptistery, view from the south. Photograph 78-11-21. Courtesy of the Nemea Excavation Archives.

continued to function as a water source for at least another century after the kiln was dismantled in the early 3rd century BC, as evidenced by the very high-quality ceramics dating to the early 1st century BC recovered from its fill.[36]

A few of the wells were used later in the site's history. As noted earlier, two wells were not included in this discussion as their full assemblages dated to the Late Roman/Early Christian period.[37] One instance shows evidence for the reuse of an earlier well. The majority of Well L17:2's assemblage dates from the Archaic to Early Hellenistic period, but the well was reused by the Early Christian residents of the valley. Nearly one meter from the top of the well was a cutting into the side of the wall lined with a Lakonian-type tile as a gutter.[38] This gutter was cut from the baptistery to the well to act as a drain for the baptismal pool. The basilica was constructed in the 5th century AD with the baptistery added soon after.[39] Baptisms did not require full submersion, so the shallow basin in the center was sufficient (*Fig. 10*). Thus the channel to the well was only needed to drain the basin rather than as a water source for the baptismal pool. While not a direct use of the water sources in the valley, this reuse shows how the wells were repurposed during the site's later history.

basin measuring 0.68 m.

[36] The kiln complex was paved over to create a *platia* to the north of the *xenon* (Miller 2004, 151). The latest datable ceramics are the remains of at least seven mold-made bowls, dating to the end of the 3rd century to the early 1st century BC (Kimmey 2017, 225–226). The production of mold-made bowls in Greece dates to the full range of the Hellenistic period, with those at Nemea falling comfortably within that range. Rotroff notes that the chronology of these bowls are beset with problems and as such the context in which the bowl was found is the most important piece of information (*Agora* 22:2, 10).

[37] Since these wells were not part of my study, my familiarity with them is limited. Thus I cannot comment on their date of construction or use. It is equally possible that they either were fully cleaned and reused or date in their entirety to the 3rd and 4th centuries AD.

[38] No photographs of the gutter were taken during excavation. Since the well has been sealed for safety, I am relying on the original publication of the well for the discussion of this gutter. The only documentation available is the section drawing of the well from the excavation notebook. According to Miller, "An opening was seen on the south side of the well at a depth of 0.80 m. This opening measures 0.17 x 0.32 m and [...] seems to have served as the egress for the drain of the baptismal pool in the Baptistry which [...] was found to have a small lead pipe as a drain on its north side" (Miller 1979, 89).

[39] Miller 2004, 102. The baptistery was built against the north wall of the basilica, rather than as part of it.

The archaeology of wells

In order to study well assemblages, I employ a methodology that relies on wells as discrete, individual units within a larger functional context. Since the wells were fully excavated between 1964 and 2000 and only preliminarily studied, I first conducted a complete study of all artifacts from each well by their excavated units to recreate the excavation process and to identify or confirm any stratigraphic units.[40] Although some stratigraphy was associated with depositional events, these levels were not always discrete. Several vessels were mended with joining sherds found throughout a single well, demonstrating the difficulties in identifying clear stratigraphic levels.[41] By treating well deposits in their entirety, wells become more useful to the discussion of sanctuaries as they aid in the recreation of a more nuanced history of activities.

The first consideration for the study of a well is its use as a deposit. As a large volume of open space, wells are a convenient place for artifacts to accumulate. Well deposits have usually provided troves of material for archaeological studies, resulting in their treatment as typological or chronological studies of specific types of artifacts. While wells were common in the ancient world, many are not treated in contemporary studies and publications as a single context, taking the full life of the well into consideration.[42] Wells identified as closed deposits, where the fill represents a single deposition, have received the most attention in scholarship.[43] The result is that only wells with homogeneous fills "warrant the publication of the whole collection."[44] This approach marginalizes the impact of well assemblages with more diverse fills to typological studies. With this methodology, the Nemean wells would only be studied for the range of artifacts

[40] This approach was helpful for the reconstruction of vessels or the identification of possible whole vessels that were previously overlooked. I divided the ceramic contents into five fabric groups: fine ware, blisterware, kitchen/cooking ware (utilitarian ware), semi-coarse, and coarse. The much larger, more general term, domestic ware, was used to distinguish kitchen/cooking, semi-coarse, and coarse wares from fine and blister wares. Tiles were cataloged separately from the ceramic vessels. Following the study of the ceramics, any additional artifacts, such as lamps, kiln wedges, loom weights, glass shards, and metal objects, were studied individually (Kimmey 2017, 5–7).

[41] Kimmey 2017, 114. Determining the stratigraphy of a well is a difficult task, often only becoming clear during the study of the contents. In a study of 16 Agora wells, Shear noted that five "consisted of a single dump without stratigraphic subdivision" with pottery joins from varying depths. Of eleven wells with multiple fillings, in only six could they distinguish between upper and lower fills (Shear 1993, 384, n. 5, 387; cf. Camp 1977, 175–184).

[42] Wells at Corinth are more often referenced in publications of larger ceramic studies, rather than receiving an individualized focus. For example, Edwards (*Corinth* 7:3) relied on pottery from 49 well deposits for his discussion of Corinthian Hellenistic pottery, while Pemberton (*Corinth* 18:1) used ceramics from 41 wells as comparanda for her discussion of the Greek pottery from the Sanctuary of Demeter and Kore. The Anaploga Well (*Corinth* 7:2) was only half of the volume, sharing with the publication of Archaic ceramics. In the Kerameikos, Stroszeck notes that while the park has been excavated for more than 150 years with a water installation detected every year, they were "never analysed in context" (Stroszeck 2017, 43). Most recently, ten wells from the historical period at Lerna were fully published with each well treated as a single context (*Lerna* 8).

[43] Sixteen wells from the Agora were studied in depth by Shear (1993) to further establish the chronology of the Persian destruction of Athens. Although first discovered in 1938, the Agora Bone Well has only recently received a full publication, perhaps due to the unique nature of the fill (Liston *et al*. 2018). Another well from the Agora was fully studied and published to discuss the symposium's context within a house (Lynch 2011). At Corinth, only two wells have received individual treatment, the Anaploga Well (*Corinth* 7:2) and 5th-century well in the Agora (Pease 1937). A single well from the Rachi Settlement at Isthmia has been published as a *Hesperia* article (Anderson-Stojanović & Reese 1993).

[44] Pease 1937, 257. Anderson-Stojanović & Reese (1993, 257) begin the publication of the well from the Rachi Settlement at Isthmia in a similar fashion, stating, "The rarity of closed and stratified deposits of Hellenistic pottery in the Corinthia lends particular interest to the contexts of the well excavated in 1955 and 1956 in the Rachi settlement."

with little attention to the larger implications of the assemblage.

The second consideration is the reconstruction of the depositional processes through which artifacts ended up in wells. There are two main ways for this to happen: the artifact fell in accidentally or it was placed there intentionally. Either action can represent a primary or secondary deposition of the artifact. Wells were used in antiquity as today, as a source of water. Some artifacts found in wells are a direct result of use. A pot that breaks while one is fetching water or a cup sitting on the wellhead that was knocked in are examples of accidental and primary deposition.[45] In the case of a well, most accidental deposition will be primary. At times, sherds or other small objects dropped on the ground could be "kicked in" by accident, which is secondary deposition.

Primary and intentional deposition is placing an object directly into the well, such as a dedication. While no artifacts in the Nemean wells represent such an action, the possibility does exist. Throwing waste directly into a well, either refuse or an abandoned object, is also intentional and primary.[46] The clean-up of debris is intentional and secondary. Cleaning of the sanctuary could occur at any point in time, such as when a pot that broke near a well was immediately thrown in or a debris pile that had accumulated over time was later moved to a well. While pottery can enter a well through all types of depositional processes, the other types of artifacts are more often the result of intentional secondary deposition.

Use deposits in wells are different in character from well fills because of the difference in processes. The filling of a well corresponds to the abandonment of the water source.[47] Wells could be abandoned for several reasons, including changes in the water table, accidental collapse, pollution of the water source, or intentional disabling.[48] Once a well was abandoned as a water source, it could be a danger if left open. The deep shafts are convenient receptacles for disposing refuse and other debris. The character of the fill can determine how the well was filled. A homogenous deposit would indicate that the material was thrown in at one event. Any earlier material, often no more than a few sherds or a small part of an object, would suggest that the refuse for the fill contained a small portion of earlier material because the source of the fill was not homogeneous. Two chronologically distinct strata would represent two distinct types of deposits or two distinct deposit events.[49] Wells could also be filled gradually over time resulting in dissimilar contents.[50] While ceramics are the most common artifact found in the Nemean well fills, other materials include animal bones that represent disposal of organic garbage, architectural elements from damaged buildings, fragmentary inscriptions, coins, other metal objects, and by-products of industrial production.[51]

[45] Not every well will have a use deposit. If it does, it would only correspond with the lowest part of the shaft. The rarity of use deposits corresponds to the frequent cleaning needed to maintain the safety of the water supply. Cf. *Lerna* 8, 113.

[46] For example, the potters' dump in the Anaploga Well is an example of intentional and primary deposition of spoiled pots that were discarded. Cf *Corinth* 7:2, 69–70.

[47] Well fills are different in character from use fills because the deposit only occurs when the well is no longer usable, as the filling of a well would create a disruption for those relying upon it. Cf. Shear 1993, 384; *Lerna* 8, 113–117.

[48] Lynch (2011, 26–27) discussed the intentional disabling and filling up of wells in the Agora after Persian sabotage and pollution.

[49] This is seen in the Athenian Agora wells, where Lynch (2011, 22, 36, 34) notes both immediate clean-up of Persian destruction deposits and a secondary clean-up about a decade later.

[50] Lawrence (*Corinth* 7:2, 67) concludes that the Anaploga Well was filled in such a way.

[51] Shear 1993, 386; Lynch 2011, 23; *Lerna* 8, 114.

Internal disturbances to both use-deposits and dumped fills can obstruct the identification of different strata in a well. During the use of a well, the bottom levels would contain water, and smaller sherds would be abraded by water action. Additionally, fluctuations to the water table could mean that wells were found dry and abandoned, only to produce water in later years. The rise and fall of the water level within the well would disrupt its contents. While a well was active, it could be cleaned, either partially or completely, which would remove any accumulated material. These activities would not leave traces in the archaeological record, resulting in disturbance to the contents of a well deposit that cannot be clearly identified in the remains.

Examination of the condition of the artifacts, especially the pottery, is the best way to reconstruct the different deposition processes. Primary deposition, whether intentional or accidental, results in complete artifacts or at least reconstructible artifacts. Any complete vessel intentionally deposited into a well could remain intact, falling either into water or upon a softer stratum that cushioned its fall. Conversely, secondary deposition, most commonly intentional, is characterized by smaller non-joining fragments indicating that the artifact did not break in the well but came from mixed-refuse material accumulated elsewhere. Partial artifacts, such as half a loom weight or a fragment of a roof tile, which cannot be reconstructed from within the well assemblage are the strongest indicator that the artifact was deposited elsewhere first and later moved into the well. Taking into account the types of artifacts and their condition allows for a more comprehensive picture of the life of both the artifacts and the well.

Interpretation of fills: primary use, abandonment, and secondary use

The ten wells discussed were constructed between the 6th and 4th centuries BC. Since the rubble-lined construction is similar throughout, it cannot be used to date the wells. Studying the assemblages is therefore the only way to assign any dates to the wells' primary use, abandonment, and secondary use. Stratigraphy in wells is complex due to a number of factors, as established above. Generally, a well's basic stratigraphy consists of a use fill, a dumped fill, and a supplementary fill.[52] Only two wells in Nemea preserve use fills, while the majority contain material more indicative of dumped fills. Through the study of the contents, I assigned the fills to different deposition events. When there was no clear distinction in date between excavated layers or when the well was excavated as a single layer, the full contents were assigned to a single fill. In these cases, the contents of the well either represented a single depositional event or slow accumulation over time, without any clear difference in the material remains. Wells with multiple contexts represent filling through two to three events.[53]

Each well contained material from the full history of the Nemean Games, *c.* late 6th–early 3rd centuries BC, with some later materials (*Table 1*).[54] While 6th- and 5th-century BC artifacts were present in every well, their quantities and locations within the shaft vary; their sole presence cannot be taken as evidence of early use as often the materials were not localized in any one part of the shaft. Those wells with more complete 6th–5th-century BC material at the bottom are more likely to correspond to a use fill, but the fragmentary material found throughout the shaft mixed with later artifacts represent residuals from the sanctuary. Due to the presence of 4th- and 3rd-century BC artifacts in all ten wells, the conclusion must be

[52] Pease 1937, 257; Shear 1993, 384–387; Lynch 2011, 10–25; *Lerna* 8, 112–117.
[53] Kimmey 2017, 117.
[54] The date range given for each well represents the full chronological range of artifacts from the well rather than a depositional sequence.

that all wells were open to some extent during the second phase of the festival.

Well L17:1 had two filling contexts: the Upper Fill and the Lower Fill.[55] While both contexts have a similar artifact date range of the 6th–early 3rd centuries BC, the division into two contexts reflects the distribution of artifacts in the well, specifically four reconstructed vessels. Fragments of these vessels were found either in the upper part of the shaft or the lower part, rather than throughout, suggesting two separate depositional events. The high percentage of 6th- and 5th-century BC material in the Lower Fill, 80%, may indicate a use fill, but the majority of the ceramics were very fragmentary, suggesting dumped fill. The presence of fragmentary 4th- and 3rd-century BC material at the bottom of the well also supports secondary deposition. The continuation of this distribution in the Upper Fill supports this scenario. Well L17:1 was likely filled during the clean-up of the sanctuary at the beginning of the second phase, resulting in several depositions of earth and artifacts.[56]

Well L17:2 also had two filling contexts: the Upper Fill and the Lower Fill.[57] There appears to have been several small, depositional events within the well, but the only clear division between the artifacts is the later Early Christian disturbance that occurred among the upper layers of the wells. While earlier material was present, it was both fragmentary and dispersed throughout the depth of the fill, suggesting dump rather than use fill. The abundance of architectural members and kiln wedges, waste associated with ceramic production, also supports this conclusion. Despite the close proximity of Wells L17:1 and L17:2, the deposition of their fills was different, corresponding to different dates of filling or that the fill was gathered from different locations within the sanctuary. The final use of Well L17:2 would occur several centuries later when the gutter was deliberately added to facilitate the use of the baptismal pool for the Early Christian basilica. During this renovation, the well was subject to disturbance in the upper levels.

Well M17:2 preserved more evidence of primary use and deposition of materials. The 6th–5th-century BC artifacts were found throughout the depth of the fill but the distribution of later artifacts suggests three fill contexts. The Upper Fill contained post-Roman material; the Middle Fill ranged from 6th century BC to Hellenistic; the Lower Fill ranged from the 6th–4th centuries BC.[58] In the bottom of the well, nearly complete or complete 4th- and 3rd-century BC pitchers were found, preserving a rare example of a use fill at Nemea. It seems that most of the assemblage was deposited through primary use and activity around the well in the second phase of the festival, with a smaller amount of earlier, residual material entering through secondary depositional events. The well never seemed to function as a refuse pit during the festival periods, as a large number of nearly complete or mendable vessels were present. Likely after the festival left Nemea in the 3rd century BC, the well was deliberately closed to ground level, packed with several small stones, a moulding fragment, and an unfinished Ionic column.[59]

The distribution of vessel types and dates in Well K14:4 support at least two depositional events.[60] The Upper Fill ranges from 6th century BC to Roman, suggesting later disturbance

[55] Depth of Upper Fill = 1.52 m; depth of Lower Fill = 1.23 m.

[56] Through this section, my use of "cleaning" or "clean-up" refers to an event of cleaning the sanctuary space, not a cleaning of the well.

[57] Depth of Upper Fill = 3.40 m; depth of Lower Fill = 4.05 m.

[58] Depth of Upper Fill = 2.76 m; depth of Middle Fill = 3.57 m; depth of Lower Fill = 0.77 m.

[59] Excavation Notebook M17 (III), p. 431.

[60] Depth of Upper Fill = 3.58 m; depth of Lower Fill = 2.80 m.

or a possible later cleaning event, while the Lower Fill dates from the middle of the 5th–3rd centuries BC. Well K14:4 demonstrates a shift to more artifacts from the revival period but also represents a unique distribution of artifacts from the first phase due to its proximity to the temple. The Lower Fill is characterized by more 4th-century BC to Hellenistic artifacts, often complete or mended, perhaps suggesting a use fill. Mixed within this fill were fragments of 4th-century BC inscriptions and fragment of 6th–5th-century BC vessels, both ceramic and bronze, and architectural features that would only enter a well through secondary deposition, either from sanctuary clean-up or perhaps ritual disposal. The identification of a use fill here is problematic; thus it is more likely that the majority is secondary-dumped fill with some example of primary deposition rather than a clear use fill. Eventually, Well K14:4 was intentionally sealed with a large stone slab and several smaller stones, either in the Hellenistic or Roman period, perhaps even in conjunction with the construction and use of the neighboring well, K14:3, in the 3rd–4th centuries AD.[61]

Well E18, the only major earthen well, was dug in the end of the 4th century BC, used for several festival cycles, and then closed before the 3rd century BC or at the very beginning of it. The 4th-century BC material was found throughout the full depth of the well, corresponding to the use of the nearby Heroön, and the lack of stratigraphy suggests a single dumped fill. The ceramics, a large quantity of drinking vessels and open shapes, reflect the activities in or near the Heroön. Some of these vessels may have been deposited after they were no longer needed or could represent cleaning of dedications from the Heroön. The few 5th-century BC vessels are likely evidence of vessels dedicated during the first phase of the Heroön that were cleaned and dumped due to their more fragmentary nature. The miniature votives also strongly support a relationship between the well and the Heroön. Although some organic and faunal remains were recovered from the well, they were minimal, consisting of a few handfuls of very small fragments. None of the bone fragments were significant enough in size to suggest eating, which contrasts to the bones found in the Heroön itself.[62] When paired with the ceramic assemblage, it seems that ritual activity in the area revolved more around liquid rather than food consumption. By the early 3rd century BC, and after the construction of the stone reservoir, Well E18 was no longer used as a water source, but was fully closed off, probably as a safety precaution, since the top of the well corresponds with the Early Hellenistic surface level.[63]

The three other earthen-dug wells preserve fewer, and very fragmentary, artifacts making dating more difficult, but all appear to preserve intentional, secondary depositional events. The fill of Well O17:1 represents debris from the surrounding area more so than any use as a water source. At less than a meter in depth, Well O17:2 had the smallest quantity of artifacts, was quickly abandoned, and intentionally filled with soil, a half column, and large stones. No ceramic joins or associated finds were found between Wells O17:1 and O17:2, suggesting

[61] Miller 1979, 77–81; cf. Excavation Notebook K14 (III).

[62] Burnt bones from sacrifices, especially the left thigh of sheep and goat, were found in great quantity in the Heroön. While sacrifice occurred in or around the shrine, there is little evidence of feasting in the wider area around the Heroön, as attested by the very minimal faunal remains in the well and a lack of any food-preparation vessels. MacKinnon (2013, 139) notes that at the Heroön, there were no holocaust sacrifices, in which the whole animal is burnt at the altar, but rather the preference was for *thysia* sacrifice, in which parts of the animal were burnt at the altar.

[63] The well collapsed in the Hellenistic period, at which point it was probably used as a dump for items from the neighboring Heroön of Opheltes; this would explain the abundance of fine ware and votive-type items (Excavation Notebook E18 [I–III], p. 135).

that they were filled at different times or the fill originated from different locations. Due to the presence of 4th-century BC material, Wells O17:1 and O17:2 could have been dug and filled during a single festival. Well O16:1 had four early 3rd-century BC artifacts, suggesting it was filled later than those in O17. The 5th-century BC artifacts in these three wells are residuals of the first phase, gathered in the soil for the dumped fill. With little to no evidence that any of these fully functioned as water sources, their fills were deposited during a secondary event rather than from use.

The location of Well L19 within House 3 secures a construction date at the end of the 4th century BC.[64] While material from the late 5th–early 3rd centuries BC is found throughout the well, the majority of the finds date to the 4th century BC. The nearly complete 4th-century BC vessels were found in the bottom, unlined portion of the well, representing the use fill. The high number of complete vessels, either intact or reconstructed, suggests that they entered the well whole or were broken nearby (perhaps within the house itself) and then deposited into the well. Another factor to consider is the clay layer excavated at the top of the unlined portion of the well. If the clay layer accumulated when the well was unused, then material thrown in after the abandonment of the well would not pass through it.[65] This may explain the presence of fragmentary early 5th-century BC remains in the upper, lined part of the well, as they are evidence of secondary deposition after abandonment from another part of the sanctuary rather than the house. By the time the festival left the sanctuary in the early 3rd century BC, the well was out of use and was filled over time with soil and stones but also tiles, general sanctuary debris, and animal remains.

Well N17:2 was constructed and mainly used in the end of the 4th century and early 3rd century BC in connection with the industrial needs of the kiln. The substantial amount of tile fragments throughout the fill demonstrates a relationship between the well and the kiln.[66] The majority of these tile fragments were waste or surplus tiles produced in the kiln, deposited later in the well as refuse. The lower 3 m of the well contains a mix of artifacts in various states of preservation.[67] The nearly 30 vessels reconstructed from the fill at the bottom of the well suggest primary deposition, dating from the 5th–1st centuries BC.[68] These vessels were mixed together in the bottom of the well, rather than in a chronological stratification, and do not represent a preservation of a use fill. The exact situation that would have led to the deposition of a high number of complete, high-quality fine ware vessels into the well is unclear. Well N17:2 stands apart from the other nine wells in both construction and contents. During the 1st century BC or after, it was abandoned and intentionally filled with 7 m of soil, stones, and fragmentary ceramics.[69]

[64] Miller (2004, 91) notes that the houses, at least five but possibly seven in total, were built in the end of the 4th century BC, and all were out of use by the second quarter of the 3rd century BC, in the range of the second phase of the festival.

[65] Miller 1988, 13.

[66] Just over 1,800 fragments of tile found in the well during excavation, in various fabrics and sizes, were kept; this number does not include the tile that was discarded during excavation.

[67] Miller suggested that this lower part of the well had three distinct layers that "reflect the periods of inactivity at Nemea in the Hellenistic period when the games had been transferred to Argos" (Miller 1976a, 190). My study of the ceramics confirmed that there were three periods represented, but the well did not have clear stratigraphic layers as the vessels were mixed throughout the 3 m depth (Kimmey 2017, 224–231).

[68] Reconstruction ranged from a full profile to complete.

[69] In my study, nearly 200 tile fragments were collected from the 7 m fill, though not all tiles were kept during the excavation. The very small size and battered state of the ceramics did not allow for any precise dating.

Conclusions

The study of wells in sanctuaries involves several factors, including natural water sources, well management, and methodological approaches. The wells' primary function was to provide water for basic human needs, which should not be overlooked. But an easily accessible water source was important for cooking and craft production as well as rituals; all of which can be tied to the wells' placement and unique construction features. The evidence from Nemea demonstrates how wells can be used as discrete units of information to trace patterns of activity within the sanctuary. Since the well fills originated from within the sanctuary, either due to use or intentional filling from refuse, the contents are directly connected to the activities that took place there.

Each well has its own narrative of construction, use, and abandonment. Many of the Nemean wells were constructed taking advantage of an underground water source to aid in water management. Yet some were dug for specific purposes, such as Well N17:2 that provided water for ceramic production in the kiln complex, or Well L19 that was built into the floor of a house used by the custodians of the games. The majority of the wells were lined with rubble, ensuring their stability over several festivals as a source of water for the athletes and visitors. Over time, these wells were filled with sanctuary refuse, produced in large amounts during the festival and during the hiatus between them. Thus, the wells, after abandonment, were converted to disposal locations for the different sanctuary activities that would have occurred over time. Identifying the different depositional processes for the well fills provides more context for the objects than if they were studied separately from their original context.

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