VIRTUAL DELPHI: TWO CASE STUDIES

Arne R. Flaten[a], Alyson A. Gill[b]

[a]Dept. of Visual Arts, Coastal Carolina University, Conway, SC 29528, USA – arflaten@coastal.edu
[b]Dept. of Art, Arkansas State University, State University, AR 72467, USA – agill@astate.edu

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ABSTRACT:

From the 6th century BCE onwards, the Greek sanctuary at Delphi gained an unparalleled level of importance in Greek religious and political life. Excavations at Delphi were undertaken by the French School in 1892, and today the monuments at the site survive in varying states of preservation. In spring 2007 faculty and undergraduate students at Coastal Carolina University and Arkansas State University embarked on a collaborative project called *Ashes2Art* which focused on a three-dimensional virtual reconstruction of several features of the sanctuary including the tholos of Athena Pronaia and the loutron, or plunge bath, located to the southeast of the central sanctuary. The digital reconstructions of both buildings raise a number of significant questions about earlier reconstruction efforts and in the case of the loutron, suggests a new theory about the drainage system for the bath.

À partir du 6ème siècle BCE le sanctuaire grec à Delphes a gagné un niveau incomparable d'importance dans la vie religieuse et politique grecque. Les excavations à Delphes ont été commencées par l'École française en 1892 et aujourd'hui les monuments survivent dans l'états de préservation différents. En 2007 la faculté et les étudiants à Coastal Carolina University et à Arkansas State University ont entrepris un projet en collaboration appelé *Ashes2Art* qui s'est concentré sur une reconstruction en trois dimensions de plusieurs bâtiments dans le sanctuaire en incluant le Tholos d'Athéna Pronaia dans le Marmaria et le loutron, trouvé au sud-est du sanctuaire central. Les reconstructions des deux bâtiments proposent un certain nombre de questions importantes à propos de plus premières reconstructions et en cas du loutron, suggère une nouvelle théorie du système d'eau pour le bain.

1. INTRODUCTION

Delphi was inhabited from the Mycenaean period onwards, and from the 6th century BCE its famous sanctuary gained an unparalleled level of importance in Greek religious and political life. Today, the monuments at the site are in varying states of preservation with the restored Treasury of the Athenians, the theater, and the stadium being among the best preserved. Excavations at Delphi were undertaken by the French School in 1892, and in 1932 a 1:200 physical model of the site constructed of painted wood and pasteboard was made by Hans Schleif. One of the extraordinary aspects of that early model was the reconstruction of the theater which was the earliest scale model of a Greek theater. The 75 year old model which is housed in the Archaeological Museum at Delphi remains the most complete physical model of the site, and to date no three-dimensional virtual archaeometric reconstructions have been published for the sanctuary at Delphi.

2. DIGITAL MODELS

In his *Description of Greece* the 2nd century CE travel-writer Pausanias describes various monuments at Delphi and places the sanctuary within its topographic context, noting the buildings that were still preserved in the 2nd century and recording the mythical history of Delphi and votive offerings given to the oracular god Apollo. In his description of the entrance into the sanctuary and the path along which the ancient visitor would have traveled, Pausanias notes, "When you enter the city you see temples in a row. The first of them was in ruins, and the one next to it had neither images nor statues. The third had statues of a few Roman emperors; the fourth is called the temple of Athena Forethought. Of its two images the one in the fore-temple is a votive offering of the Massiliots, and is larger than the one inside the temple." (Paus.10.8.6)

Despite Pausanias' description of the physical monuments, it remains difficult to fully visualize the sanctuary as it once was, and even the best physical models have limitations since the viewer cannot "walk" through the site or engage the space with any sense of proportion or scale. One of the advantages of digitized three-dimensional models is that the modern visitor can do just that. Digital reconstructions allow us to move outside the traditional boundaries of art history, archaeology and other disciplines in the Humanities, considering sight lines (which buildings could be seen from certain areas within the sanctuary), the ways in which space would have functioned in antiquity, and how these buildings would have interacted with one another. Unlike small scale models, which are of tremendous value in their own right but ultimately are fixed and static, virtual reconstructions are dynamic and plastic, allowing for additions to the model as new information surfaces. One of the research outcomes of virtual reconstructions is that the built environment offers access to new types of information about ancient sites, allowing us to engage a diverse set of experimental architectural problems, including lighting and a wide variety of engineering issues.

The past decade has witnessed an exponential increase in the creation of three-dimensional models of ancient sites. These models have moved out of the academic realm and entered popular culture, with Hollywood movies (Troy, Gladiator, Alexander, etc.) and television programs (eg. The Discovery Channel and The History Channel) aimed at diverse audiences. While the reconstructions are often breathtaking, those types of models have not been without their problems or their detractors. The "reality" suggested by the models can overwhelm the accuracy of the reconstruction and compromise the underlying assumptions of the reconstructive effort (Favro, 2006). Basic problems of proportion, color, scale, and sculptural decoration also pervade many of these projects. The problems with accuracy are not limited to models meant for film and television. A vivid example of problems associated with digital reconstructions can be seen in the model of the Philippeion at

Olympia which was part of the "1000 Years of the Olympic Games: Treasures of Ancient Greece" developed by the Powerhouse Museum in Sydney. In this model the ionic columns and capitals on one side of the structure deviate from the temple's axis to such an extent that they could not possibly support an entablature of any kind. At the same time, there are problems with extreme realism in models. The more "realistic" the textures and lighting become, the more one takes for granted the veracity of the model.

Despite problems inherent in the modeling of ancient buildings, carefully rendered and archaeometric digital reconstructions of various ancient sites are growing in number and complexity, including the Digital Roman Forum realized through the Experiential Technology Center at UCLA and the Institute for Advanced Technologies in the Humanities at the University of Virginia, as well as the impressive archaeometric work on the Acropolis at Athens and the pyramids of Senwosret I and III by the Museum of Reconstructions in conjunction with the Metropolitan Museum of Art in New York. Surprisingly, however, virtual reconstruction models and the creation of digital databases for archaeological sites in Greece are relatively new. *Ashes2Art* is among the first projects of its kind to fully digitally reconstruct sites in Greece, and it is the only online project focusing on digital reconstructions for the sanctuary at Delphi.

3. ASHES2ART: DELPHI

Ashes2Art: Virtual Reconstructions of Ancient Monuments is an innovative, collaborative concept between Coastal Carolina University and Arkansas State University. In this project students and faculty at both institutions work together closely to create virtual reconstructions of Panhellenic sites, as well as other locations outside Greece, including Carthage and Ephesus. The primary focus of *Ashes2Art* is to create accurate digital restorations of various sites and to supplement those models with essays, QuickTime panoramas, active sitemaps, extended bibliographies, and a clear and transparent methodology. Project directors work with specialists in each field, including excavation directors, to ensure that the monuments are accurately restored. Eventually, viewers will be able to navigate through the virtual reconstructions in an FPS (First Person Shooter) platform using open-source software.

Ashes2Art started conceptually in 2003 under the co-direction of Arne Flaten and Paul Olsen at Coastal Carolina University, but the inter-university collaborative work on Delphi did not begin until spring 2007. In this initial phase, we focused on specific buildings in both the central sanctuary complex and in the Marmoria, including the Temple of Apollo, the Athenian Treasury, the temple of Athena Pronaia, the gymnasium, the plunge bath and xystos (or running track). Due to the constraints of the present publication, this brief discussion will take the form of two case studies focusing on the Tholos of Athena Pronaia and the plunge bath, outlining some of the problems, methodologies and discoveries that have formed our collective research. These two monuments were chosen because they represent different sets of questions and problems. The contexts of these buildings as well as the people they would have served are vastly different, with the Tholos of Athena Pronaia being located in the sacred context of the Marmaria and used for religious purposes, and the bath being located in the secular context of the gymnasium and used by athletes. These buildings also presented completely different challenges in rendering and offer different solutions to research questions.

3.1 The Tholos of Athena Pronaia

Among the best known monuments from Classical Greece, the Tholos of Athena Pronaia is a circular building, 14.76 m. in diameter, built between ca. 380 and 360 BCE with a Doric outer peristyle of twenty columns and an interior with ten Corinthian half-columns. It was probably designed by Theodorus of Phocaea, who Vitruvius cites as having written a treatise on the structure. (Vitr. *De arch.* 7.12) Herodotus records one of the more poignant episodes in the history of the site: ″The barbarians had just reached in their advance the chapel of Minerva Pronaia, when a storm of thunder burst suddenly over their heads- at the same time two crags split off from Mount Parnassus, and rolled down upon them with a loud noise, crushing vast numbers beneath their weight- while from the temple of Minerva there went up the war-cry and the shout of victory…The blocks of stone which fell from Parnassus might still be seen in my day; they lay in the precinct of Pronaia, where they stopped, after rolling through the host of the barbarians.″ (Hdt. 8.37-39)

Figure 1. Tholos of Athena Pronaia.
Photograph by Arne Flaten

The excavation reports of the French School provided the fundamental basis for our model of the Tholos. That information was then compared to various other publications, including the findings of the Japanese-American expedition in 1994-1996 which focused on documenting all of the surviving blocks associated with the Tholos, with extensive photographs, drawings, and measurements. Those measurements, while precise, were not always consistent with those published in the original excavation records, or in subsequent sources. In most cases the discrepancies between sources were minor and had a negligible impact on the digital models; a table containing metadata which we imbedded in the digital model was sufficient to allow online viewers to evaluate the differences.

In reviewing previous reconstructions of the Tholos, mention should be made of *Marmaria: Le Sanctuaire d'Athéna à Delphes*, a small volume published in 1997 which combined the efforts of the French School at Athens with the technology of the French national power company. The book includes stunning images of their digital reconstructions against backdrops of real sky and real terrain. The resulting images were particularly impressive considering that they were modeled in the mid 1990s. Unfortunately, the study provides little in the way of scholarly apparatus, nor does it explain their reconstruction decisions and methodologies, some of which are highly controversial. The later model of the Tholos by the French school does not place any of the metope sculptures in their respective places (nor do we), but does place figural sculpture on the roof above every sixth lion's head and at the apex of the conical roof. The exterior of the building is uniformly white, making it appear as though the entire structure was carved from a pristine slab of marble (a problem which may have been exacerbated by the reduction of the 3D model to static 2D reproductions).

For our reconstruction of the Tholos of Athena Pronaia, we placed textures taken from our high definition photographs of the actual blocks of the Tholos on a bumpmap to provide a relevant surface pattern, and texture and color variety. We also placed clear and accurate indications of all the seams between the drums, and between all of the individual blocks of the temple. The lion's head spouts were modeled based on the surviving examples at the Archaeological Museum at Delphi. While our reconstruction is not strictly archeaometric, it provides a high level of accuracy based on published archaeological reports, multiple reconstructions to address diverse scholarly opinions, and transparent methodological descriptions and imbedded metadata. It is also available online, free of charge in static form and in various QTVR formats.

In any reconstruction difficult decisions must be made beyond the basic wireframe construction. Whereas the basic dimensions and the placement of many architectural details are fairly straightforward based on the physical remains, various models of the Tholos have historically provided antithetical approaches to the construction of the roof. Some models suggest that it was a two-tiered structure with a circular drum of marble, following the diameter of the interior space, rising through the first sloping roof and capped by a second conical roof, similar to the tholos at Epidauros (Dinsmoor, 234; Lawrence, 184). Other models, including that of the French School, have a single conical roof, based on reconstructions of the late-6th century tholos of Sikyon at Delphi or the late-4th century Philippeion at Olympia (although the reconstruction of the roof for the latter monument is disputed).

The material used in the roof construction is also debated. Overlapping Laconian terracotta tiles (as in Figure 2) were used extensively throughout the region from the late Archaic through the Classical periods, but overlapping diamond shaped tiles, either of terracotta or marble, also may have been employed at Delphi as seems to have been the case for the tholos at Athens, which dates to ca. 470 BCE. The French School reconstruction evidently follows this latter theory. The center of the roof in either scenario was probably capped by a small cupola. The material remains at Delphi do little to answer the question definitively so the models reflect that uncertainty: two distinct models were built with switches to address not only questions related to elevation but also to accommodate disparate materials and patterns.

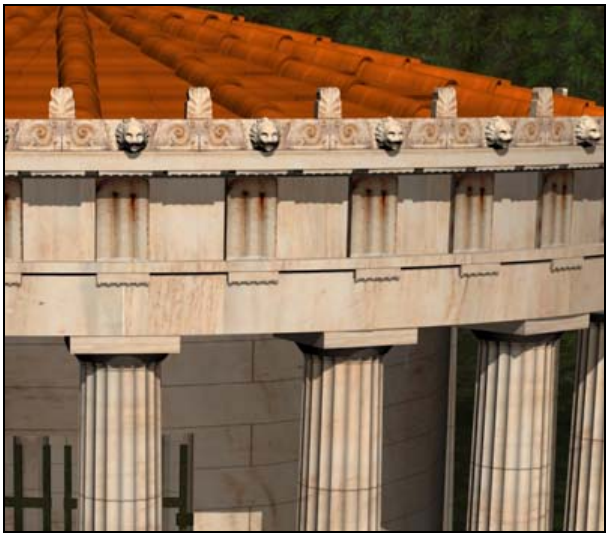

Figure 2. Detail of the exterior of the Tholos of Athena Pronaia showing partial view of the single tier roof construction. Greg Schultz, Coastal Carolina University.

Perhaps even more problematic is the interior of the tholos. Different marbles were used to dramatic effect: the light colored exterior columns rested on a stylobate built of wedge shaped slabs of black limestone or marble, and the pale orthostates, threshold, and walls contrasted with the dark floors and the facing of the ledge supporting the interior Corinthian columns. But what of the ceiling? Did it reflect the exterior shape (whatever that shape may have been)? Was it patterned in diamond-shaped coffers, as Dinsmoor (234) suggests, or was it plain? Apart from these aesthetic questions, did the construction of the temple, and specifically the roof and ceiling, somehow accommodate a natural light source? Although Lawrence has suggested that the interior may have been lit by openings in the upper areas of the walls, there is no physical evidence remaining to suggest that arrangement (Lawrence, 184-185). With no preserved openings in the walls, we have suggested in this reconstruction that lighting was provided by natural light from the doorway and from lamps. Even so, this raises additional questions since the form of the lamps is unclear. These questions become significant because they underscore the precarious nature of our understanding of precisely how the building was used and under what conditions.

In static models or digital reconstructions reproduced in two dimensions for hardcopy publication, questions concerning the interior illumination of the structure are rarely addressed visually since the viewer is not given access to that part of the model. However, when a fully interactive digital model is available online, the viewer can enter the building, and he or she will inevitably turn his or her gaze upwards once inside the structure—where he or she will often encounter speculative reconstructions. The easy way to sidestep this problem is to restrict the range or tilt of the viewer's vantage point within a QTVR model, but this is only an exercise in avoidance. One of the exciting opportunities afforded by digital models is that the creator/designer/archaeologist can evaluate how much light various physical options and alterations would have provided. We plan to post several of these theoretical lighting reconstructions online, but in the end they remain hypotheses; in the absence of compelling evidence otherwise, our Tholos reconstruction does not allow for natural light other than that from the entrance.

The doorway itself also is also problematic. The physical evidence makes it clear that the Tholos of Athena Pronaia had doors or gates, but what type of doors? Were they made of solid bronze or were they bronze (or iron) gates that allowed light to pass through when they were open? What sort of decoration did they have, if any? At what times of the day, month, or year were the doors open? What types of hinges were used? The digital reconstruction provided by the French School opted for a simple open lattice-type gate, as does ours, but only regional comparanda supports such a solution.

3.2 The plunge bath

Swimming was associated with athletics in antiquity and Herodotus, writing in the 5th century BCE even attributed the Greek victory at the Battle of Salamis to the swimming skills of the Greeks. (Hdt. 8.89) Plato, writing in the 4th century BCE, and Diogenianus Paroemiographus, writing two centuries later, both put swimming on the same level as reading. In *Laws* Plato notes, "These stupid people are called wise although, as the proverb goes, they do not know how to read or to swim." Diogenianus echoes this saying, "Not knowing how to swim or to write. For the Athenians they learn these skills from childhood." (Diogenian. 6.56) Pausanias mentions annual "swimming races" held by the Greeks and there are many literary references to Greeks swimming in the seas and rivers. (Paus. 2.35.1; Hdt. 8.89; Pl. *Resp*. 5.453d; Ar. *Plut*. 656ff; Hom. *Od*. 6.210ff) Given the value placed on swimming in antiquity, it is not surprising to find swimming pools and plunge baths intended for immersion in the Greek gymnasium.

The sites of the Panhellenic games all had significant swimming facilities. The rectangular swimming pool at Olympia dates to the mid-5th century and is the earliest known swimming pool associated with a gymnasium in Greece. The mid-4th century pool at Isthmia is the largest pool of this type in Greece. These large pools would have accommodated the swimming of laps by athletes. Delphi and Nemea had plunge or immersion baths in which athletes would have bathed. The bath could also have been incorporated into an exercise regime. The space constraints at Delphi might have played a role in determining the type of bath used in this context, since both types of baths are found in gymnasia.

Figure 3. Greek plunge bath at Delphi.
Photograph by Alyson Gill.

The Hellenistic circular plunge bath at Delphi dates to the last quarter of the 4th century BCE and is located in the central court of the gymnasium, to the northwest of the palaestra. (Figure 3) The limestone bath had an interior diameter of 9.7 m. and was ca. 1.9 m. deep. The bath, in its current state, is formed by three slightly irregular superimposed rings of limestone, but in its original state the bath included a fourth course. The courses descend at angles providing seats or steps for the bathers. While no floor for the bath was recovered during excavation, the floor was most probably paved and covered with layers of fine waterproof cement.

Ten marble basins of the *lenos* type (similar to those at Nemea) are aligned in a row under the retaining wall of the upper terrace of the gymnasium to the east of the pool, in an open-air washing area. The arrangement of the basins in close proximity to the bath is a popular Hellenistic configuration. The basins would have been filled with Castalian spring water from a channel running behind the wall. Water then flowed into each basin through a lion-headed spout placed in the wall above each chest-high basin. Cuttings in the ends of each adjoining basin allowed water to flow between the basins and eventually to pour out onto the ground. This arrangement would have allowed athletes to wash themselves in basins that would constantly be filled with clear running water. After emptying onto the ground, water would have been collected in a central water channel, traveling three meters to the pool and emptying into water channels running along the top course of the bath, some sections of which are still preserved. (Figure 4) This arrangement does not seem ideal since water used for basin washing would have been re-used in the pool. This water delivery system also has been problematic since it does not allow for an easy way to have water flow out of the pool.

Figure 4. Greek plunge bath at Delphi. Detail of water channel.
Photograph by Alyson Gill.

There is no evidence to suggest that the bath ever supported a roof of any kind. While covered bathing developed in Greece in the late 5th to early 4th centuries BCE, the Delphi bath is one of the latest examples of a bath in the open air. (Ginouvès, 129, n. 7) The uncovered bath is also consistent with other baths of this type in Greece associated with athletic contests, including the Greek baths at Isthmia and Olympia, both of which are unroofed.

The reconstruction of the plunge bath and wash basins was based on the excavation reports, and the bath was modeled as precisely as possible. (Figure 5) Of particular interest in the modeling of this building was the consideration of the water delivery system for the bath. Once the model was constructed, the water flow into the bath was clear. One of the most interesting aspects of the three-dimensional reconstruction of the bath was the clarification of the way that the pool would have been emptied—something that could not be seen from the physical evidence alone. Once the bath was constructed, a comparison of the bath to the plan of the bath from the

excavation record allowed us to align a drainage area to the retaining wall to the south of the bath. A small hole in the lowest course of the bath would have connected to a channel which would have carried water away from the bath, allowing the water to circulate through the bath. This arrangement would not only have allowed for a constant circulation of water, but it also would have kept the pool very cool for athletes wanting to bathe. This system, while simple in many ways, represented a technological advancement in immersion baths since in earlier periods bathers would have had to have basins filled and emptied by hand. It should be noted that the observation about the water delivery system associated with this bath could not have been done using traditional methods. Instead, it was only with the three-dimensional model that we were able to "see" how the bath functioned in its original state.

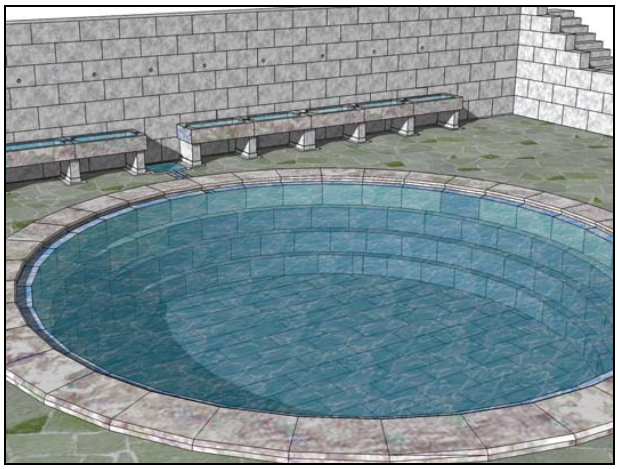

Figure 5. Detail of plunge bath at Delphi.
Richard Taylor, Arkansas State University.

4. CONCLUDING REMARKS

Although three-dimensional virtual models of ancient sites are becoming increasingly mainstream, very few archaeometric models of monuments in Greece have been constructed. In turning our attention to the Greek sanctuary of Apollo at Delphi, the *Ashes2Art* project was able to construct several three-dimensional digitized models of buildings within the sanctuary and use these models to explore a variety of research problems.

While there is still a great deal of uncertainty about the reconstruction of the roof of the Tholos as well as other architectural and structural details, the model that we have constructed offers something that to date has not been presented: the model is rendered as accurately as possible with the marble matched to colors captured in high definition photographs taken of the Tholos blocks at the site. With the incorporation of "switches," the viewer will now be able to see various proposed reconstructions of architectural details, including several types of roofs and doors. This aspect of the model allows an increased veracity in modeling as several suggested reconstructions can be incorporated into a single model with citations provided for the viewer.

Our three-dimensional digital reconstruction of the Greek bath at Delphi is the first time that the bath has been published in this format, and the modeling of the bath allowed us to make several observations about the water delivery system for the bath that could not otherwise have been seen using traditional methods of reconstruction. While the method of delivery of water to the bath has always been known, there has been a general sense of puzzlement over why the bath was filled in this way since it relies on the re-using of water from overflowing water basins to the north of the bath. The way that the pool was emptied also has never been demonstrated. Our reconstruction allowed us to see that the water delivery system while seemingly inefficient was actually technologically advanced—setting the plunge bath at Delphi apart from any other bath of this type. The filling of the bath in this way allowed for a constant circulation of water in the bath, which would have made the open-air pool very cool and kept the water clean. The model also allowed us to align the bottom of the pool to a water channel which then poured out at the base of the retaining wall to the south of the bath. These observations were only possible through the modeling of the bath, and would not have been possible through traditional methods of architectural reconstruction.

5. REFERENCES

Alexander, C. 1932. Models of Delphi and Olympia. *The Metropolitan Museum of Art Bulletin*, 27 (Jan.), pp. 12-13.

Barrett, J.C. 1987. Contextual Archaeology. *Antiquity,* 61, pp. 468-73.

Bommelaer, J., ed., 1997. *Marmaria: Le Sanctuaire d'Athéna à Delphes*. (Sites et Monuments, 16). École française d'Athènes/Électricité de France, Paris.

Dinsmoor, W. 1973.*The Architecture of Ancient Greece: An Account of its Historic Development.* Biblo and Tannen, New York.

Favro, D. 2006. In the eyes of the beholder: Virtual Reality re-creations and academia. *JRA*, Supplement 61: Imaging Ancient Rome: Documentation—Visualization—Imagination (Proceedings of the Third Williams Symposium on Classical Architecture, 2004), edited by Lothar Haselberger and John Humphrey, pp. 321-334.

Fingarette, A. 1970. The Marmaria Puzzles. *American Journal of Archaeology*, 74 (4), pp. 401-404.

Forte, M., and A. Siliotti, eds. 1997. *Virtual Archaeology: Recreating Ancient Worlds*. H. N. Abrams, New York.

Gillings, M. 1999. Engaging place: a framework for the integration and realization of Virtual-Reality approaches in archaeology. *British Archaeological Reports* (supplementary) 750, pp. 247-54.

Ginouvès, R. 1962. *Balaneutikè: Recherches sur le bain dans l'antiquité grecque*. Éditions E. de Boccard, Paris.

Ito, J. 1997. *Architectural Measurements of the Sanctuary of Athena Pronaia in Delphi 1994-1996*. Architectural Mission to Delphi, Kumamoto University.

Jannorary, J. 1953. *Fouilles de Delphes*, vol. 2, *Le Gymnase*. Éditions E. de Boccard, Paris.

Lawrence, A. W. 1957. *Greek Architecture*. Penguin Books, London.

Lock, G. 2003. *Using Computers in Archaeology: Towards Virtual Pasts*. Routledge, London and New York.

Marinatos, N., and R. Hägg, eds. 1995. *Greek Sanctuaries: New Approaches*. Routledge, London and New York.

Michaud, J-P. 1977. *Fouilles de Delphes*, 2, *Topographie et architecture. Le sanctuaire d'Athéna Pronaia, le temple en calcaire.* Éditions E. de Boccard, Paris.

Pedley, J. 2005. *Sanctuaries and the Sacred in the Ancient Greek World*. Cambridge University Press, New York.

Ryan, N. 1996. Computer Based Visualization of the Past: Technical "Realism" and Historical Credibility, in *Imaging the Past. Electronic Imaging and Computer Graphics in Museums and Archaeology*, eds. T. Higgins, P. Main, and J. Lang, British Museum Occasional Paper No. 114, London, pp. 95-108.

_____. 2001. Documenting and Validating Virtual Archaeology. *Archeologia e Calcolatori* 12, pp. 245-73.

Valavanis, P. 2004. *Games and Sanctuaries in Ancient Greece: Olympia, Delphi, Isthmia, Nemea, Athens*. Getty Publications, Los Angeles.

Yegül, F. 1992. *Baths and Bathing in Classical Antiquity*. MIT Press, Cambridge.

Zut, T., S. Carpendale and W.D. Glanzman. 2005. Visualizing Temporal Uncertainty in 3D Virtual Reconstuctions. In: *Proceedings from the 6th International Symposium on Virtual Reality, Archaeology and Cultural Heritage*. Edited by M. Mudge, N. Ryan, and R. Scopigno. Vast, Lausanne.

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