The architecture of the Hera I temple of Paestum

An archaeological comparative study

Jolan van der Stelt

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Bachelor thesis

Classical Archaeology

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1. Introduction

1.1 Research question

In this thesis I will be exploring the architecture of the Hera I temple from an archaeological perspective. Although the temples of Paestum are among the best preserved Greek temples in the world, they lack sufficient architectural documentation. This is especially true for the two temples of Hera. The Hera I temple in particular stands out from the other two temples. Its features were seen as unusual by the eighteenth century discoverers based on empirical comparative studies; however explanations for its odd appearance are lacking. For that reason this thesis focuses on the main research question: was the architecture of the Hera I temple indeed unusual, as was assumed? And if so, what could be the reason for the interpretation of its unusual character? In order to answer my questions I will compare the architecture of the temple with a Roman Basilica, a temple of mainland Greece (Hellas) and a temple of Magna Graecia. After the comparisons I hope to provide a better understanding of the architecture of the Hera I temple in the context of Hellas and Magna Graecia. The research relies on dig reports, literature about architecture and archaeology of the Paestum area, the Hephaisteion and basilicas in general and on architectural plans. The thesis focusses on architectural details in order to provide a solid basis for future interpretations.

The first chapter consists of a basic introduction of Paestum and its context to provide background information. Chapter 2 provides the basics for the understanding of Greek architecture, the Doric order and the architecture of the Hera I temple of Paestum. Chapter 3 consists of a case study of three comparisons with the Hera I temple. It will be followed by a discussion and a conclusion.

1.2 Greek colonisation and Magna Graecia

Around 1200 BC Greece entered its Dark Ages, but around 800 BC city-states emerged again and started to expand. The new Greek societies became extensively urbanised. The Greek city-states renewed contacts with the Phoenicians and this contact provided them with new knowledge to transform their way of life. They even adopted the Phoenician alphabet and language. Greek poleis started copying Phoenician art, but slowly discovered their own ways to express themselves. These new developments mark the beginning of the Orientalizing period of Greek art (Astour 1985, 24-25).

Throughout Greece commercial city-states arose on geographically beneficial places. They were often founded at the start of trade roads and at natural harbours or naval communication routes. Among these commercial cities are Samos, Chalcis, Etruria, Corinth and Megara. In the first half of

the eighth century BC Greek city-states began to start colonies overseas, because of population growth and trading. The Greek colonies were situates around the west-coast line so they could maintain direct communications with the Tyrrhenian Sea. They formed independent political entities with their own individuality. The most extensive colonisation was that of Southern Italy and Sicily. The coast of Southern Italy shared similarities with the Greek homeland regarding to climate and soil. It was referred to by the Greeks as ἡ Μεγάλη Ἑλλάς, translated in Latin as Magna Graecia. The cities of Magna Graecia had their own specific traits, in particular devotion to mystic cults and secret fraternities (Antonaccio 2007, 202-206; Astour 1985, 25-30).

The first Greek colony was founded on the western coast of the fertile Campanian plain in 757 BC. The city was called Cyme. Rhegium was founded on the Italian coast of the Strait of Messina in 730 BC. Sybaris and Croton were founded in 720 and 708 on the eastern coast of Calabria. Taraes, in Latin Taranto, was founded in 706 BC between an inner and an outer natural harbour. The latter became the largest city in Magna Graecia. Eventually most of these Greek colonies started founding their own secondary colonies. Poseidonia (Paestum) was founded by Sybaris on the border of Campania. The end of the great Greek colonisation was marked by the establishment of Elea by the Phocaeans. Sybaris was destroyed in 510 BC (Antonaccio 2007, 206-208; Astour 1985, 27-30).

Figure 1: Map of Italy (Gates 2003, 310)

1.3 A historical overview of Poseidonia/Paestum

Poseidonia is one of the best known Greek cities on the Italian peninsula. The earliest found pottery from Greek graves to the north of the city dates around 625-600 BC. This indicates its foundation occurred around 600 BC (Pedley 2005, 167-169). It was founded by migrants from the Greek colony of Sybaris in Southern Italy. The city of Naples was located only fifty miles to the north. The city was located along the Tyrrhenian coast of South Italy and it was characterised by a low limestone ridge four hundred meters from the sea. The later fortification walls of the city followed the shape of this ridge. The city had access to fertile farm land for agriculture and fresh water for drinking and irrigation. There was plenty of timber and clay available. The geographical location was well situated for commerce; as the city was located at the end of the overland route from the south through the Vallo di Diano (Pedley 2005, 167-169). The city did not have its own anchorage, so ships had to be dragged to the beach. The city remained a Greek city for two centuries (Gates 2011, 311).

The city started to grow in the mid-sixth century BC. This growth is indicated by early sculptural decorations that were discovered outside the city walls at the extra-urban sanctuaries (Gualtieri 2013, 372-373). This growth only lasted until the fifth century BC and at the second half of the fifth century BC the city began to decline. The decline of the city is indicated by the material import and grave goods. At this time Lucanian warrior graves first appeared in the Paestum area (Skele 2002, 43).

The Lucanians were Samnites speaking the Oscan language. They took over Poseidonia around 400 BC. Their arrival seems to have happened gradually. Most of the architectural structure of the city plan stayed the same. When the Lucanians took over Poseidonia they named it Paestum[1] (Astour 1985, 34). The changes of their arrival are best visible in the rural context. The new settlers brought socio-cultural changes to the city. They can be seen in the wall paintings of chamber tombs found at urban cemeteries. These paintings show the ideology and the values of the Lucanian elite. The Lucanians also brought agricultural intensification to Poseidonia. Lucanian Poseidonia was characterised as a multicultural city that contained elements of Greek, Etruscan, Oscan and Phoenician/Punic origin (Gualtieri 2013, 376-382).

Poseidonia became a Roman colony in 273 BC when the Romans took over the city. With the Romanisation the decline of the city began. The Via Popilia was built in 133 BC. This major north-south road did not pass over Paestum and so the main trade centre shifted to the cities in the bay of

[1] The later name of Paestum is the one that will be used for the remainder of the thesis.

Naples. Further decline was caused by flooding and malarial swamps. Between the seventh and ninth centuries AD the entire population had moved inland (Gates 2011, 311).

1.4 The excavations of the Paestum area

Felice Nicolas directed the first investigation of Paestum in 1805. He was a superintendent of antiquities for the kingdom of Naples. During this investigation the temples of Ceres (Athena) and Neptune (Hera II) were restored. He also initiated excavations outside the city walls. These excavations were mainly focused on tombs and paintings. The general aim of the investigation was the collection of as many objects as possible. This resulted in poorly excavated tombs without detailed documentation. Paestum was never included among the main official excavation projects and so the excavations at Paestum were isolated and sporadic. Excavations inside and outside the walls directed by Canonico Giuseppe Bamonte were paid for with private funds. The publication described the finds without much detail and the excavations were dealing with vandalism, neglect and the loss of archaeological finds (Pontrandolfo 1986, 52-53).

The first science-based excavation began in the 1830s with the discovery of the temple of Peace. However, publications did not contain detailed scientific studies. The focus of excavations of the mid-nineteenth century was on cemeteries. Around 1930 the area around the temple of Ceres and a large part of the Forum were excavated under the direction of Amedeo Maiuri. The only remaining documentation of this excavation is a series of photographs. During the excavation stratigraphy was ignored, which led to poor conservation. In 1934 a different scientific discipline began detailed excavations outside the town. The publication of these extra-urban excavations showed more information about the history of Paestum than any of the earlier excavations inside the city walls. In 1948 Pellegrino Claudio Sestieri began a massive excavation project. The projects entailed the excavation of the town and the surrounding necropoli. His successor, Mario Napoli, started the exploration of the Forum in 1972 and combined this with stratigraphical explorations. These excavations were the first to provide a detailed documentation of the construction phases (Pontrandolfo 1986, 52-55).

1.5 Surroundings and site context

The city of Poseidonia was surrounded by cemeteries and sanctuaries. The ones close to the wall offered protection and the ones in the hinterland provided contact with neighbours. In the countryside of the Poseidonian territory the northern edge of the territory was marked by the sanctuary of Hera at Foce del Sele on the south side of the river Sele. The sanctuary flourished between the sixth and fifth century BC, until the arrival of the Lucanians at the end of the fifth century BC. The

sanctuary of Demeter at Albanella was located on the main route to the interior and the Vallo di Diano. It was founded in the early fifth century BC and continued under Lucanian control, starting a network of farming communities in the northeast tracts. The end of the sanctuary was around 300 BC. Close to the south wall of Poseidonia the suburban sanctuary of Santa Venera was founded in the sixth century BC (Pedley 2005, 175-182).

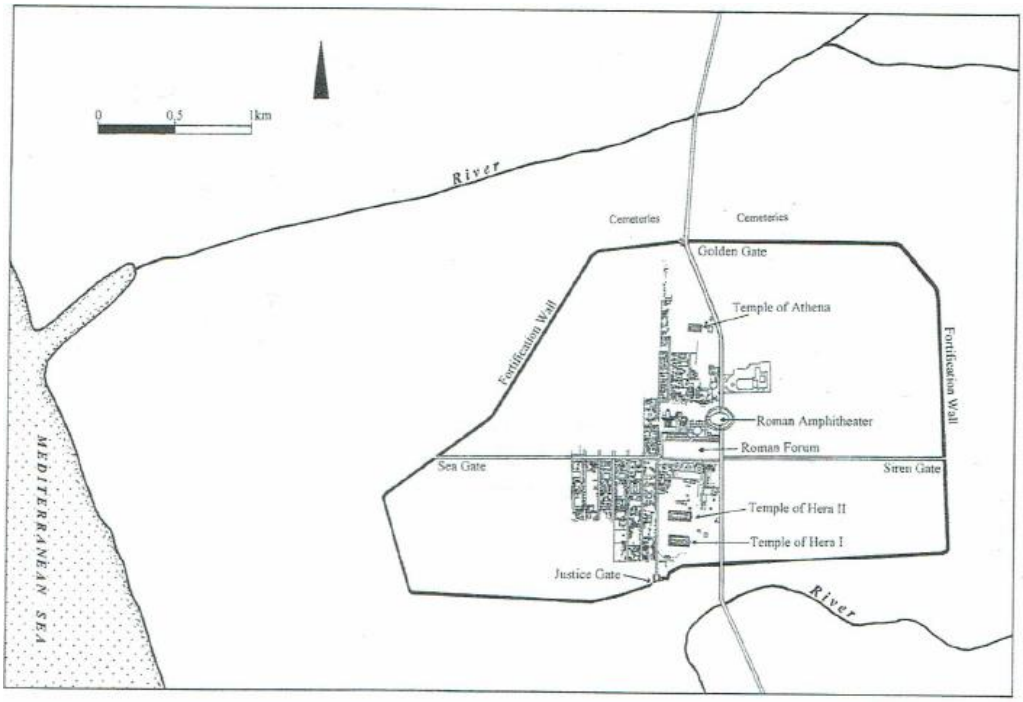


Figure 2: Map of Paestum (Gates 2003, 312)

Plans of the city of Poseidonia of the sixth century BC do not exist, because the Greek city structure was replaced by the Roman city structure. The Romans used the Hippodamian principles[2] to build the city. It has been assumed that Poseidonia was also built in a grid as surveys in the nearby Greek colonial city Metapontum show that this city was built with an organised grid in the sixth century BC. The Greek grid, however, could not have been the same as the Roman grid, because the three remaining Greek temples and the north and south city gates do not follow the line of the Roman grid (Gates 2011, 311).

[2] The term Hippodamian principle, named after Hippodamus of Miletus, is used to describe orthogonal grid patterns used to (re-)build cities in de Greek and Roman World from 479 BC onwards. The principle originated in the rebuilt of the city Miletus. The principle innovations of the Hippodamian grid replaced earlier grid patterns, and Hippodamus of Miletus was credited as the inventor of the grid pattern (Paden 2001, 26-39).

1.6 The temples of Paestum

The city of Paestum is well known for its three Greek temples: The temple of Hera I (Basilica), the temple of Athena (Ceres) and the temple of Hera II (Poseidon/Neptune). They are the best preserved Greek temples in Magna Graecia. In the eighteenth century people became fascinated by the ruins of Paestum, since the temples appeared to be so different from Roman classical architecture (De Jong 2010, 13-20). The reactions of the travellers visiting the city varied enormously. Some praised the simplicity of the architecture of the temples, while others described them as inelegant (De Jong, 37-41).

The temples were built in the Doric order. All three show certain features of construction and design that can be classified as regional West Greek practice. The temples stand in a north-south line in the middle of the city and they are all oriented to the east. The temples were made of local travertine and sandstone (Gates 2011, 311-312).

The oldest temple is the temple of Hera I or Basilica, built between 550 and 520 BC (Pedley 2005, 170-171). The second great temple was built around 520 BC. The temple is dedicated to the goddess Athena according to the terracotta figurines that were found. The last, largest, and best preserved of the three is the Temple of Hera II built around 470-460 BC, next to the temple of Hera I. The dedication to Hera was indicated by votives (De Jong 2010, 23-24; Gates 2011, 313-314).

Against this background the next chapter will focus on the Hera I temple and in specific on its architectural plan in the scope of Greek architecture.

2. The first Hera temple at Paestum

This chapter will provide the necessary background information for the understanding of the architecture of the Hera I temple. It starts with a brief overview of the history of Greek architecture and specifically the monumental temple architecture. The architectural background provided in this chapter is largely based on architectural textbooks of the mid-twentieth century, because more recent studies on Greek architecture lack comprehensive descriptions for basic understanding of all the architectural principles, as they focus on specialized topics of architecture. After the architectural overview of monumental temples, this chapter will zoom in on the Doric order, which is the building style for the Western Greek temples of Paestum. At the end of the chapter a detailed description of the architecture of the Hera I temple is provided. This description of the Hera I temple will form the basis for the comparisons that follow in the next chapter.

2.1 The history of Greek architecture

The history of Greek architecture that is described here follows the work of Coulton[3]. Only a few buildings of the Dark Ages (1200-800 BC) of Greece have survived. These buildings were built only from local materials and they were small and functional. From the middle of the eighth century BC onwards, the amount of buildings in Greece increased and the buildings became bigger in size. The focus on bigger buildings may have been stimulated by an interest in the remains of the past.

However, doing so was not easy. The ruins were difficult to understand due to lack of architectural interpretation. The tradition of building the architectural achievements of the Bronze Age had not been practised for over three centuries. Therefore, the remains could not supply helpful models for the eighth century BC architects in Greece. Trading settlements in North Syria and colonies in Italy did not have much effect on Greek architecture either. Neither featured all-stone buildings and therefore could not provide sufficient models for architecture.

The seventh century BC marks the beginning of Greek monumental architecture. Buildings were no longer made only for a specific function, but they were built with the intention to impress and endure. There has been close contact between Greece and Egypt from the beginning of this century.

[3] Although the work of Coulton is dated (1977) it is used as the main source for the history of architecture, because this work provides a detailed development of Greek architecture that is not described as comprehensively in more recent research, which focus on specialisations within architecture providing in-depth detailed studies.

The rapid change may have been influenced by the technical skill of Egyptian architecture. The Egyptians built massive architecture made for Pharaohs out of dressed stone. They also built smaller shrines with a walled inner hall that was surrounded by columns or pillars. The use of megalithic masonry, the use of proportion and the general effect of the Egyptian architecture was similar to that of the Greeks. Therefore, Egyptian architecture provided the best model for Greek architecture.

Greek monumental architecture began in the northeast of the Peloponnese, as is suggested by archaeology and literary tradition. Temples at Corinth and Isthmia from the seventh century BC had tiled roofs and (part of) the walls were made of dressed masonry. These temples might be used as evidence for the existence of stone working techniques in Greece before contact with the Egyptians. To build the temples they had to be able to quarry stones to a specific size and to work them to regular blocks. The techniques may have developed independently in Greece. The squared stone blocks used for building monumental architecture resemble the technique of the Egyptians. The use of tiles in temple building has no precedent, but the mass-producing techniques needed to make clay objects in moulds were introduced by the Levant. The Greeks probably (re-)invented the use of tiled roofs on their temples (Coulton 1977, 30-35).

Greek architecture between the sixth and fourth century BC can be divided into three phases: The Archaic period until 480 BC, the Classical period until 400 BC and the Late Classical period until about 330 BC. Starting from the sixth century BC, activities that justify and improve human life became more important. The domestic character of the temples changed with the arrival of the cult status and the peristyle. The naos, where the statues were situated and the offerings were made, became enclosed with walls to make it more private. After 600 BC almost all buildings were made of stone. The fifth century BC was one of development. It saw the writings of the first great historians and the invention of geometry and perspective. Practical sciences were flourishing and Greek sculpture and architecture were perfected. The fourth century BC was one of painters as is evident from architectural decoration (Plommer 1956, 111-118).

2.2 Monumental temple architecture

Stone carving for sculptures and architecture in Greece began at the end of the seventh century BC. Before the use of stone, Greeks built with timber and sun-dried brick. When building with the new material, the Greeks tried to reproduce the traditional shapes of earlier wooden buildings. Doric temples were the first type to be built with stone. They resembled the previous wooden ones. The resemblance was enhanced even more by deliberately copying essential functional details in wood as decorations, since they lost their function in the stone versions. Rows of pegs used in wooden temples to nail two pieces together were represented in the stone versions by guttae projecting from a mutule.

Beside the accurate reproductions of some functional wooden ornaments into stone decorations, the architects also used free adaptation of elements of innovation. The designs of temples varied widely. Some features may have been more suitable to transform into a stone version than others (Lawrence 1973, 99).

The nature of the materials used for the same style of building led to a different proportional balance. Early stone Doric temples were remarkably massive, which may have been a deliberate choice to impress. The original temple architecture had to be redesigned to provide better aesthetics and structural requirements. This was a slow process. Eventually the Greeks achieved efficiency in stone working. They needed a better understanding of functional requirements and various parts of the originally wooden structures were changed to fit a stone form (Lawrence 1973, 99-100)

Marble was not at first used for stone building in Greece. Roofs and ceilings were first made of wood, but they were later replaced with tiles. Builders would use softer limestone (poros) for the most delicately moulded courses and a hard white limestone for the plainer (Plommer 1956, 112-113).

2.3 The Doric order

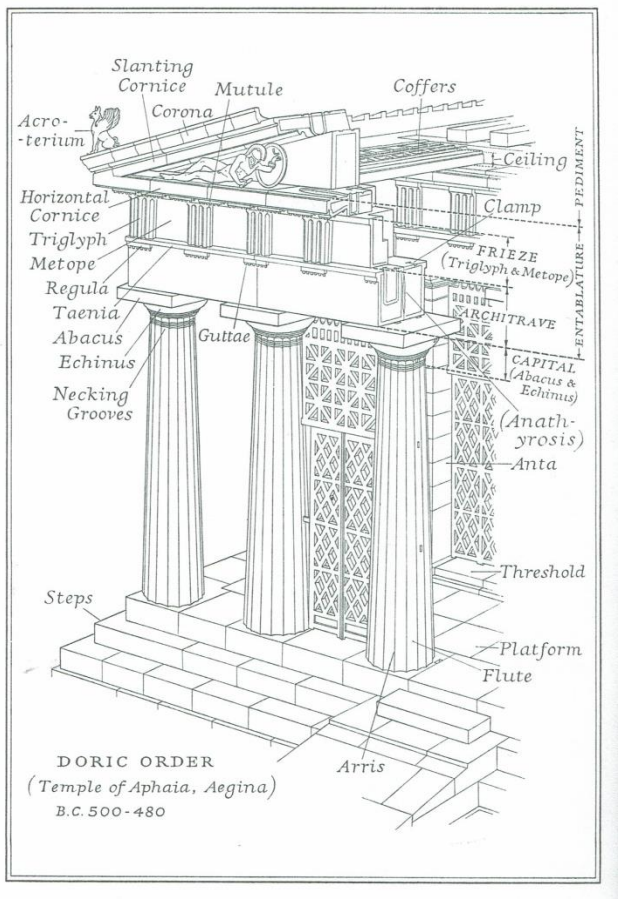


Figure 3: The Doric order (Lawrence 1973, xxx)

The Doric order is an invention of builders from the Peloponnese of the seventh century BC who were trying to create a monumental style in architecture (Coulton 1977, 39). According to Vitruvius (3.3.1) the Doric order was not designed for temples, because its laws of symmetry are likely to lead to differences and mistakes. Greek Doric temples were built on the post-and-lintel principle. Horizontal lintels, the entablatures or ceilings, were held in place by vertical posts, the columns or walls (Woodford 1982, 24).

The monumental temples of the Doric order were considerably bigger than the ones before. The interior of each temple consists of a rectangular room (naos/cella) with a porch in front (pronaos) and a matching false porch at the rear (the opisthodomos). The interior is surrounded by a portico of columns. In the Western Greek territories an inner room called the adyton was more common than the opisthodomos. The adyton was entered from the naos. This change from opisthodomos to adyton was probably influenced by the religious rituals that were performed inside temples. However, there are no records of existing remains of other materials to explain what the adyton and the opisthodomos were used for specifically (Plommer 1956, 120; Coulton 1977, 43-45).

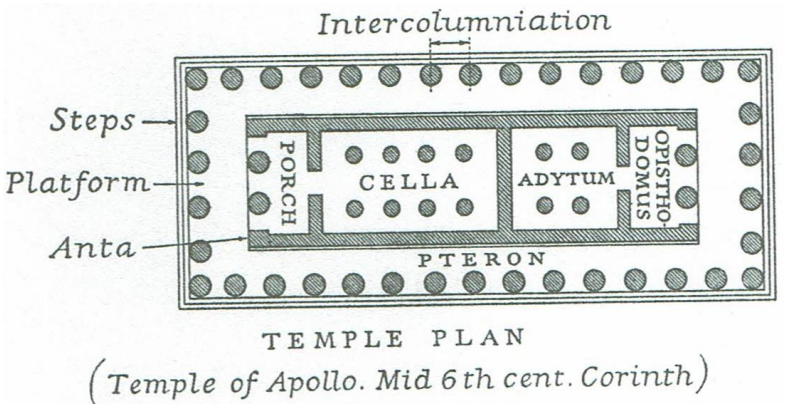


Figure 4: Plan of typical peripteral temple (Lawrence 1973, xxxi)

Typical Doric temple characteristics are fluted columns carrying Doric capitals, an architrave, a taenia with regulae and guttae, a frieze with hollow triglyphs and undecorated metopes and a projecting cornice decorated with the mutules and guttae. Steps of Doric temples were often steep and large. Sometimes intermediate steps are located in the central part of the main façade. The stylobate was the top step of the crepidoma and the direct bottom of the colonnade. Sometimes it is raised slightly above the level of the floor. The Doric column has no base and the lower diameter nearly equals the width of the stylobate stone it is placed on. Within the Doric order changes in the various proportions appear to produce a more harmonious effect (Plommer 1956, 130; Coulton 1977, 43).

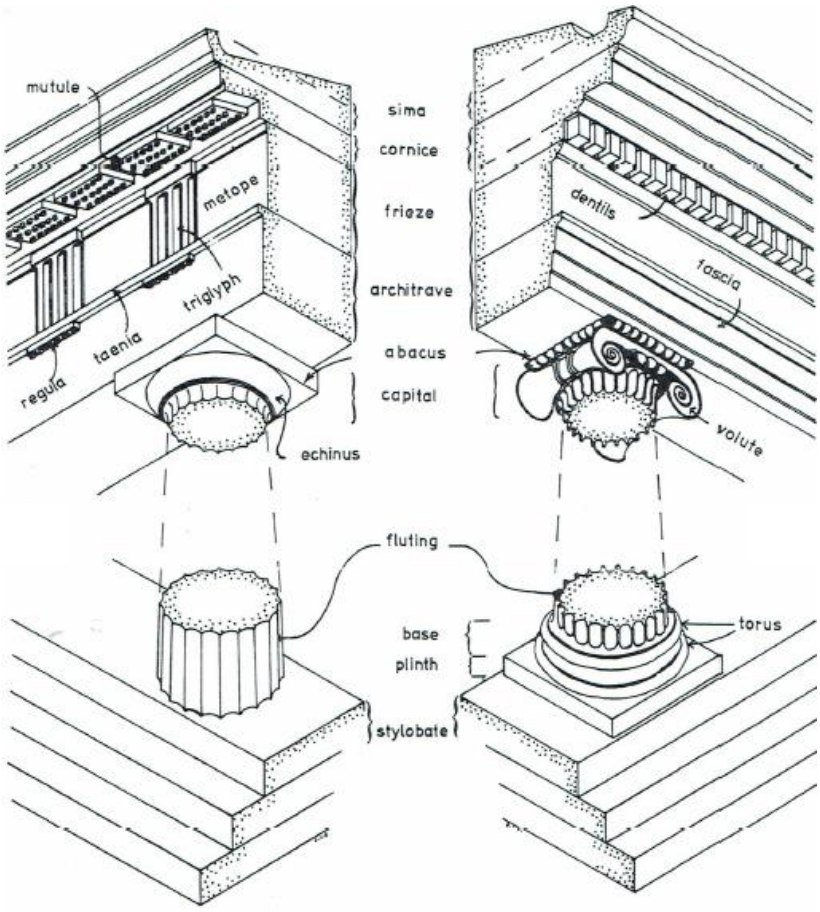


Figure 5: Doric and Ionic temple structures (Coulton 1977, 190)

The shaft of Doric temple columns stands directly upon the stylobate, without a base. It is composed of superimposed drums. The drums were held together by spikes of wood or sometimes bronze or iron. The metal spikes were enclosed in square blocks of the same material in which they could expand and contract without splitting the stone. The top and bottom of the drums contained a hole in the centre in which the spikes were secured. The flutes of columns are almost always concave, broad and shallow and where they meet they form sharp edges known as arrises. The earliest shafts were copies of the previous wooden shafts and they were very slim. The most common number of flutes for these earlier shafts was sixteen. Change to heavier shafts occurred before the middle of the sixth century BC and this may have been the main influence on the change to twenty flutes as the new preferred number of flutes. This number of flutes automatically resulted in a hollow on each front of the column and an arris near the corners of the abacus. The new preferred number did not change with scale or proportions. Concave flutes were previously used by Egyptians in stone and by the Minoans and Mycenaean in wood. The fluting functioned as an aesthetic effect to distinguish the shafts from the masonry in the background and it also emphasized the lifting function of the shafts (Lawrence 1973, 101; Plommer 1956, 130-131).

The capital might have developed from pre-Hellenic wooden forms. It is often carved from one single block of stone. The echinus, the circular cushion like lower part of the capital, goes outwards and forms a subtle hyperbolic profile to achieve the effect of a gradual transition to the overlying flat slab, the abacus. The neck junction with the top drum is normally decorated with necking-rings carved close to it. This is purely aesthetic and there are no strict rules about their number and form. The upper ends of the flutes curl outwards and end in a round moulding creating a form similar to scallops. The lowest part of the echinus is often flattened and the beginning of the curve is often marked by moulded necking rings, called annulets. The number of annulets at the echinus is usually three or four (Lawrence 1973, 101-102; Plommer 1956, 130-131).

While there was a lot of experimentation and innovation with the proportions of columns of Greek temples, the shapes that form the columns remained practically the same. The only exception is the profile of the echinus. During the sixth century BC, columns were made from several superimposed drums. The height of the columns was 4.5 to 5 times the diameter of the lowest drum. The shafts were approximately 8 times as high as the capitals. At the middle of the fifth century BC the ratio between the height of the columns and the diameter of the lowest drum had increased. The columns were 5.5 to 5.75 times as high as the diameter of the lowest drum. During this period, the shafts tapered less than before and were often even 11 or 12 times as high as the capital. The capital itself was narrower than before and it was also lower, although it remained the wides part of the shaft. The reduction of tapering at the top of the shaft in combination with a narrower capital resulted in a more gradual curve on the side of the echinus. Another experiment that was used to achieve a more gradual transition between the shaft and the abacus was the making of a capital with an echinus that was larger than the abacus. At the beginning of the fifth century BC already, the echinus is almost 0.5 time as high as the abacus. The ratio between the columns height and the lower diameter reached its aesthetical climax in the fifth century BC, but the buildings required a lot of expensive stone. Therefore the temples of fourth and third centuries BC continued to use slighter proportions. As a result the capital became very small and narrow in proportion and the curve of the echinus transformed into a strait slant (Lawrence 1973, 103).

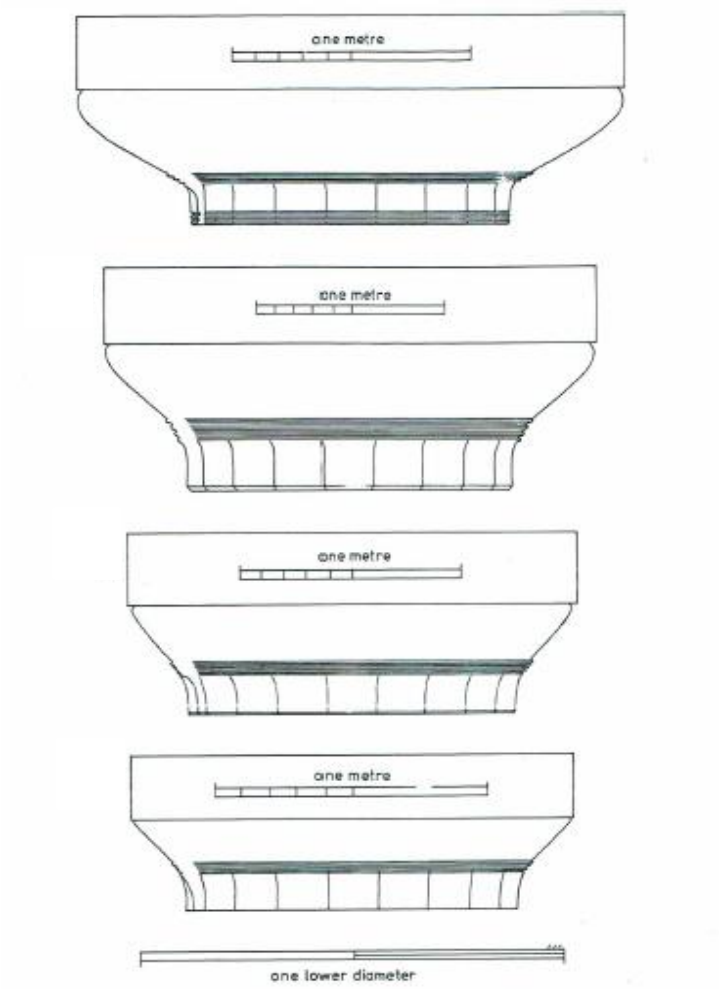


Figure 6: Changes in Doric capital profiles between the 6th and 4th century BC (Coulton 1977, 103)

According to the rules of proportions, columns have to be spaced at an axial distance of approximately half their height. However, this is hardly ever reached exactly. There is no easy ratio between the interaxial distance and the diameter of the lower part of the column. The entablature is often a little higher than one third of the column height. In the fifth century BC, the architrave has a height that is between the upper and lower diameter of the column, often four fifth of the latter diameter. The architrave is often one lower column diameter thick. Its face projects beyond the shaft. The junctions between architrave blocks are aligned with the centre of the columns (Plommer 1956, 131-132; Lawrence 1973, 104).

The frieze is about the same height as the lower architrave and it includes triglyphs and metopes. A triglyph contains three vertical upright fillets called glyphs, with flat front faces and side faces chamfered at 45 degrees. Two vertical hollows between the three glyphs end in a curve. The outer corners end with two half curves. The front face never projects beyond the plane of the architrave taenia and thus always sets back form the guttae. The triglyphs total height is one and a half times its width. At the bottom of each triglyph small bands, the regulae, are attached to the taenia and

small pegs, guttae, are attached to the regulae. The normal width of triglyphs is half one lower diameter of the columns. One cantered over each column and one (but sometimes more) over each interval. Metopes are nearly square, often undecorated planes. The Doric frieze is the most constant and distinctive feature of the order; its square metopes greatly enhance the serenity of the Doric temple (Lawrence 1973, 104-105; Plommer 1956, 133-134).

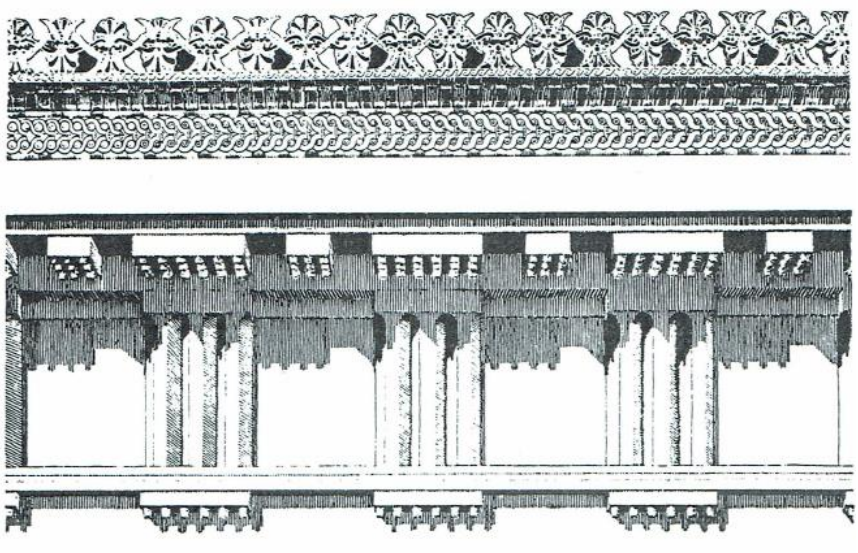


Figure 7: Doric frieze and cornice (Coulton 1977, 98)

The cornice, the upper part of entablature, has a height about half that of the frieze, but projects from the front plane of the triglyphs for a distance nearly five eighth of their height. Above it is the projecting face of the corona with mutules decorated with guttae projecting from its soffit above each triglyph and metope. Above the cornice on the two shorter façades of a normal temple came the pediment, consisting of a raking cornice and a horizontal cornice that form a triangle (Lawrence 1973, 107; Plommer 1956, 135-137).

The early Doric capital was probably a re-invention of the Greek architecture of the Bronze Age. Doric columns taper upwards like Egyptian columns and most early Doric columns have sixteen flutes, as was common in Egypt. The Doric architrave had parallels with Egypt in terms of the projecting band belonging to the cornice. However, the guttae on the Doric architrave have no precedents in Egypt or Bronze Age Greece. They may have derived from functional pegs in wooden construction. The frieze of triglyphs and metopes was not a literal copy of the wooden temples, because of the difference in weight between the materials (Coulton 1977, 39-41).

2.4 Architecture of Paestum

As mentioned above, the Archaic and Classical temples at Paestum are among the best preserved temples in the Greek world. They were built in the Doric order and all three temples contain construction and design features that are typical for Western Greek temples. The temples are orientated to the east and they stand in one line through the middle of the city from north to south. The temples were made of local travertine and sandstone (Gates 2011, 311-312).

` The three temples of Paestum were built in different periods and so they express different ideas on architecture in different periods of time. Comparison between the temples could provide an overview of the development of architecture of the early Greek Doric temples (De Jong 2010, 20). Architectural terracottas of the early sixth century BC suggest the preceding of another religious building before the three temples were built (Pedley 2005, 170).

The largest and best preserved temple of the three is the Temple of Hera II built around 470-460 BC, next to the temple of Hera I. Votives indicate the connection with Hera. Out of the three Doric temples, this is the most conventional one. However, the architecture still differs from the traditional Greek temples in some aspects. The temple of Athena was built around 520 BC. Terracotta figurines are an indication for the dedication to the goddess Athena. The oldest temple is the temple of Hera I. It was built between 570 and 520 BC (De Jong 2010, 20-24; Gates 2011, 312-314).

2.5 Hera I temple

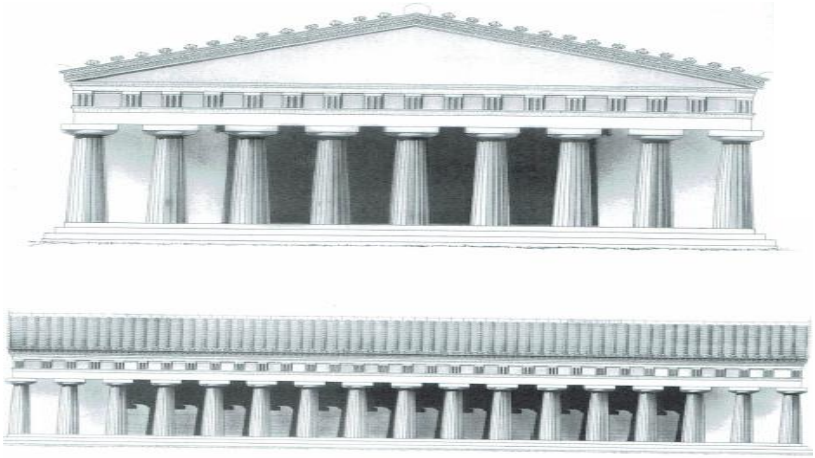


Figure 8: Front and side view of the temple of Hera I (Mertens 2006, 144)

The first temple of Hera was built in the Doric order around 530 BC. It is the oldest temple of Paestum, located in the southern temenos of Hera (Mussche 1968, 4). The name Basilica was given to the temple in the eighteenth century. Visitors of Paestum did not believe it was a temple, but thought the building was used for civil administration. The reason for not acknowledging Hera I as a temple was the unusual plan; the absence of the pediments, a colonnade in the middle of the temple, the use of a front and a back in the naos and an odd number of columns. The temple was later connected to the Goddess Hera, because her name was found on pottery connected to the temple. Hera was the city's protector and possessed a sanctuary within the walls (De Jong 2010, 21-22; Pedley 2005, 170-172).

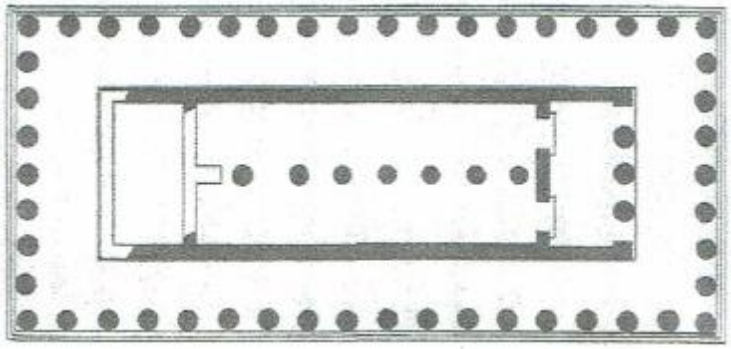


Figure 9: Plan of the Hera I temple (Napoli 1970, 5, in De Jong 2010, 21)

The temple is a Doric enneastyle peripteros. The crepidoma has three steps. The colonnade has nine columns on the short sides and eighteen on the long sides. This number and arrangement of the external columns is unusual. The temple might have been a part of an experimental structure of creative powers of Western Greek architects (De Jong 2010, 20-22; Dilla 1932, 347). The temple measures 24.51 by 54.27 meter. The columns measure 1.45 by 6.43 meters and have a ratio of 1:4.47. They have a pronounced entasis and they are strongly tapered. In total, the temple has fifty fluted columns. The flutes end in an apophyge and the necks of the columns are decorated. The echinus has a broad profile. The interaxial measurements are 2.87 meter on the short sides and 3.0 meter on the long sides. The entablature has largely disappeared and there are no pediments. The part of the entablature that is left is decorated with a Lesbian cymatium or cyma reversa, not with a taenia. The temple did not have regulae or guttae. The frieze does contain triglyphs and metopes. The inner structure is almost entirely gone, but it consisted of a pronaos with three columns in antis. There were two doors leading into the naos, which was divided into two aisles by one row of seven columns. These columns had the same base diameter as the columns on the peristalsis. Behind the naos was an adyton (Mussche 1968, 4).

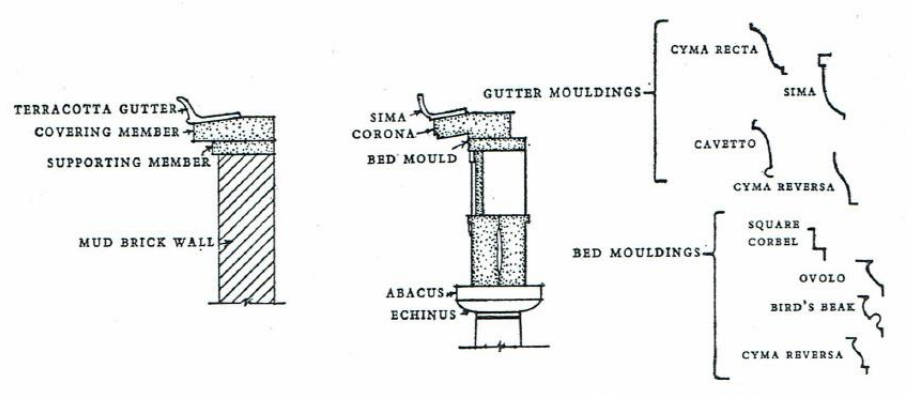


Figure 10: Temple mouldings (Lawrence 1973, 107)

The capitals are curved outwards and are bulging. They are ornamented with different decorative designs. The columns are built with the use of entasis. Entasis is a swelling of the vertical line. The entasis of the temple of Hera I is the most evident of the three temples a Paestum. The reason for this strong entasis can be an optical illusion, to make the temple look even bigger and stand out more. Other reasons could be the aesthetic effects of a stabilising function (Thompson *et al.* 2007, 540-541).

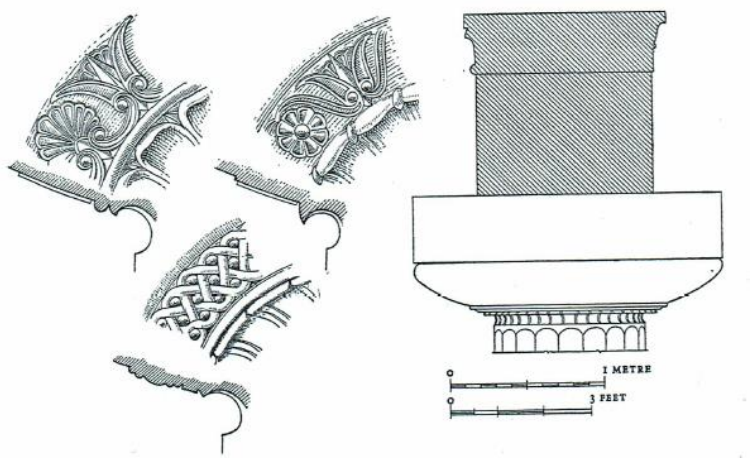


Figure 11: Ornamented capitals of the Hera I temple (Lawrence 1973, 128)

The floor of the naos is higher than that of the pronaos. The central row that bisects the temple from east to west could be an indicator for the division between different sacred spaces for cult practises. Hera and Zeus (Xenios, the Hospitable) are listed as possible deities. Another possibility is that Hera is worshiped in two different aspects (Kourotrophos and Hoplosmia). However, it could also be an indicator of an old building arrangement of the seventh century BC or a requirement for the architectural structure (De Jong 2010, 20-22; Gates 2011, 312; Pedley 2005: 170-172).

The entire pteron of the remains is still standing. Part of the architrave survived, but the walling is lost. The broad pteron is almost two intercolumniations wide. To make sure every corner contains a triglyph, the Sicilian principle describes a closer spacing of the columns. The intercolumniation at the temple of Hera I is twice as large as it should have been according to the principle. The intercolumniation is 23 cm on average and the proportional ratio is one fourteenth. The addition of an extra column would have made the ratio closer by one forty-fifth, which conforms to the Sicilian principle. For this reason, it seems as if the architect of the temple purposely chose to differ from the Sicilian principle to give the pteron exactly double the number of columns on the long sides than on the short sides. The interior naos has largely been demolished, which makes it difficult to judge the intentional aesthetics of the temple. The use of columns could be the reason for the solid look of the temple. The walls of the naos are almost two intercolumniations away from the pteron, the pronaos and the adyton on foundations for an opisthodomos. The junction of the pronaos and the naos is made apparent by a change in thickness of the side-wall. The floor levels of the naos are a little higher than that of the pronaos, which could be interpreted as a possible step (Lawrence 1973, 127).

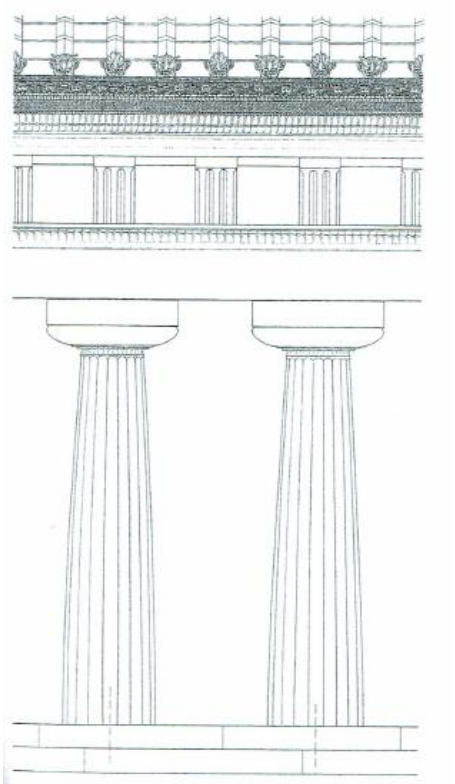


Figure 12: Reconstruction of the exterior of the Hera I temple (after Mertens 2006, 145)

3. Comparisons

In this chapter I will compare the architecture of the Hera I temple with that of the Roman Basilica, the Hephaisteion at Athens and the Hera II temple at Paestum. These comparisons provide a better understanding of the architecture of the Hera I temple. The first comparison is with the Roman Basilica. This comparison is necessary, because the eighteenth century rediscoverers of Paestum saw the temple as a basilica instead of a Greek temple. Little information can be found about the specific architectural reasons behind this interpretation. The second comparison is with the Hephaisteion in Athens. This comparison will provide information about the similarities and differences between the Western Greek temples and the temples of the Greek mainland (Hellas). The last comparison is with the Hera II temple at Paestum. This comparison will give information about the similarities and differences between temples of Magna Graecia. The comparison may also provide information about the similarities and differences of functionality of temple architecture within Paestum itself.

3.1 The Roman Basilica

Travelers of the eighteenth century named the temple of Hera I 'Basilica'. They did not believe the building could be a temple because it did not have pediments, it had an odd number of columns at the back and front and the colonnade in the interior divided the building. It looked more like a building for civil administration to them than a building dedicated to a deity (De Jong 2010, 24).

There has been a lot of debate on the origin of the Roman Basilica. The name is derived from the Greek word 'basilike' meaning 'kingly'. The first Roman Basilica must have been built in the third century BC, because it was already mentioned in the work of Plautus. The third century BC was a period of Hellenization in Rome. The earliest Roman Basilicas were located at the Forum Romanum. The basilica was closely connected with the diplomatic practices in the Forum Romanum (Welch 2003, 5). They were used for the judicial, political and economic activities of the Forum when it was not favourable to perform them in the open air (Coarelli *et al.* 2014, 49).

The Roman Basilica became common in the Roman world from the second century BC. Basilicas were built to meet the needs of Rome (Plommer 1956, 316). In the fourth century AD, the basilica plan was adapted as the standard design for Christian churches. In Roman times, the basilica provided physical space for offices and stands. It was always located alongside a forum or a similar open space (Gates 2011, 337-338).

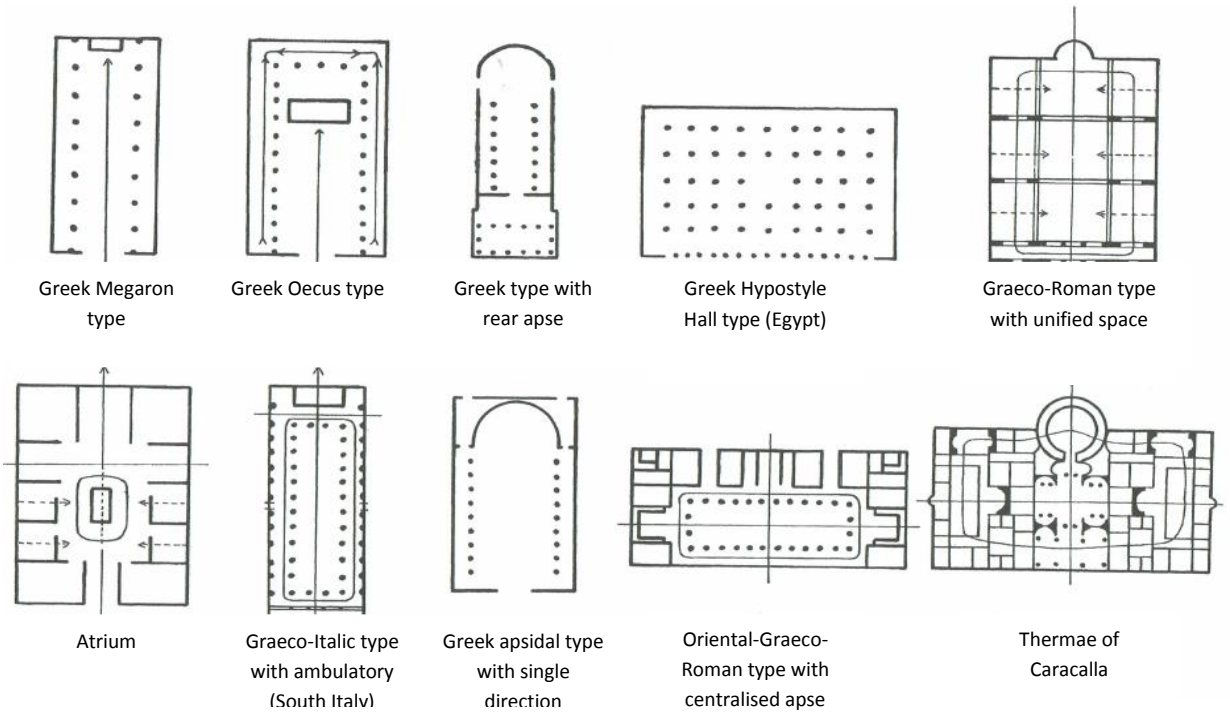


Figure 13: Plans of Basilicas and related buildings (after Müller 1937, 251)

Early basilicas were more connected to a Greek model and were often entered through the short side. Later basilicas were often entered through the long side. The Romans also added the apse to the Greek model and in some basilicas a place of worship was located (Müller 1937, 250-258). There were a lot of variations in the proportions and elevations of basilicas in the Republican period, but there were two basic trends in Italian basilica design by the end of the second century BC. An early broader version and a more elongated version often located in important cities. In form a basilica has a centralized hall, often used for congregation, aisles, upper walkways and columns (Welch 2003, 5-22). This central rectangle is roofed and surrounded by a peristyle that covered walkways on all four sides. The central roof rises higher than that over the side halls. This raised roofline allowed an arrangement known as a clerestory, a line of windows providing light (Gates 2011, 337-338; Coarelli *et al.* 2014, 49).

The Basilica Porcia built in 184 BC, the Basilica Sempronia and the Basilica Opima have disappeared. The Basilica Fulvia-Aemilia (also known as Basilica Fulvia and Basilica Aemilia) is the only surviving Republican Basilica. It was built in 179 BC and restored several times (Coarelli *et al.* 2014, 48). Part of the basilica burned down in Alaric's sack of Rome in 410 BC. The walls gradually collapsed inside the ruins, but around 1494 the west façade of the original arcade had still survived and was sketched in great detail by Giuliano Da Sangallo and his brother Antonio. In 1500 however, the ruins of the structure were demolished by Bramante to reuse the marble for the palace of Cardinal Adriano Castellesi da Corneto (Gorski 2015, 93-94). The remains were covered under a thick layer of

fill and not rediscovered until the nineteenth century. The first excavations of the basilica were directed by G. Boni and A. Bartoli and lasted from 1899 to 1912 (Gorski 2015, 94). The eighteenth century visitors that named the temple of Hera I 'Basilica' could therefore only have known the appearance of the basilicas of the Forum Romanum from the drawings of the Da Sangallo brothers. It is likely that they based their observation on other existing basilicas, for example the one at Pompeii. Their comparison with the Hera I temple would have been made based on the general features of the Roman Basilica. In contrast, my comparison will focus on specific architectural features.

3.1.1 Hera I and the Roman Basilica

Table 1: Similarities and differences between the Roman Basilica and Hera I

	Basilica	Hera I
Similarities	Inner rectangle	Naos
	Ambulatory	Wide space between peristyle and naos
Differences	Peristyle surrounding the inner rectangle	Walls surrounding the naos on 3 sides
	Inner rectangle accessible from all sides	Naos accessible from front side only
	Clerestory	-
	Apses (in some basilicas)	No apse
	Entrance on long side (in some basilicas)	Entrance on the short side
	No single row of columns	Row of columns in naos
	Used for civil administration	Used for worship and cult practices

As said before, the Roman Basilica is characterised by a central rectangle surrounded by columns with a roof that is higher on the centre than over the sides. This inner rectangle is surrounded by a peristyle with walkways. This feature is comparable with the naos of the Hera I temple, as it is a common feature of Greek temples. The naos, however, is not surrounded by a peristyle. Instead, it is surrounded by walls on three sides and three columns at the front side. The result is that the central space can only be entered from the front, whereas the central space of a basilica can be entered from all sides. This distinct division in the naos between a front and back is an unusual feature of the Hera I temple that does not compare to the basilica structure. The intercolumniation between the peripteral columns of the Hera I temple and the naos is very wide, providing a wide ambulatory. The profound use of ambulatories is a feature that is common in basilicas.

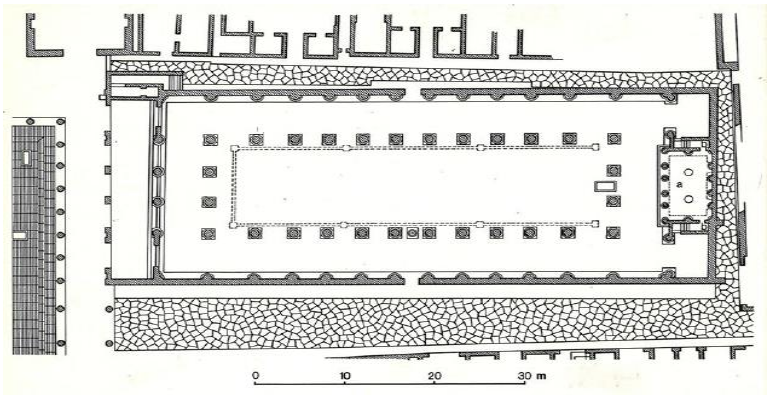


Figure 14: Plan of the Basilica of Pompeii (La Rocca et al. 1976, 110)

Another feature of a basilica is the roof that is higher in the centre and lowers at the sides, forming the clerestory. It is not possible to compare this with the roof of the Hera I temple, because the temple misses almost its entire entablature and therefore does not have pediments or roof. Reconstructions of the temple of Hera I, however, do not indicate windows. Other features of some types of basilicas are apses and an entrance on the long sides of the building, instead of on the short side. Both of these features are not to be seen in the Hera I temple. These features do not occur on all types of basilicas, but are more common in the Roman influenced basilicas. The typical middle colonnade of the Hera I temple on its turn, is not to be found in any type of basilica.

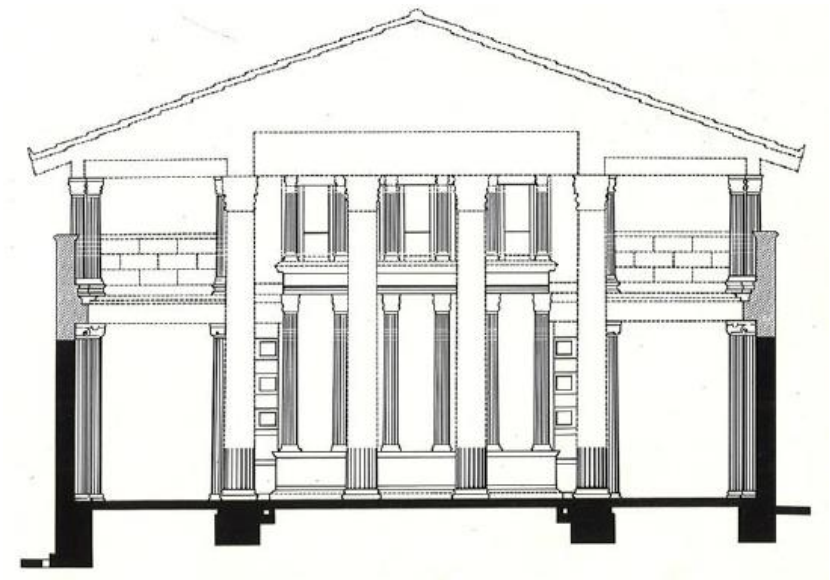


Figure 15: Transverse section of the Basilica of Pompeii (La Rocca et al. 1976, 111)

Besides the architectural features, a basilica and a temple are two completely different types of building according to their function. A basilica was used for diplomatic practices and sometimes judicial and economic activities, whereas a temple is a sacred place dedicated to one or more deities. A

temple is connected with religion and temples where built to make an impression on the Gods. The architectural plan of a basilica is likely to be different from the architectural plan of a temple. A temple often needs a private space for private cult-practices inside the naos or in an adyton. A basilica on the other hand needs to be easily accessible to accommodate groups of people to discuss matters of civil administration.

3.2 A temple of mainland Greece/Hellas: the Hephaisteion at Athens

Figure 16: The Hephaisteion (personal photograph)

The Temple of Hephaistos (Hephaisteion) was dedicated to the god Hephaistos and the goddess Athena. It is located on the Kolonos Agoraios, the western hill of Athens in mainland Greece. Its connection to the metal-working God Hephaistos is made by the metal-working finds in the area. The temple is a typical peripteral Doric temple with a naos with a pronaos and an opisthodomos, each with columns in antis. All the steps, apart from the lower one, are made from white marble. The outside appears older than the Parthenon, but the inside suggests that the architect was inspired by the designs of Iktinos for the Parthenon. The naos contained a statue for both deities (Lang and Eliot 1954, 46).

The temple is unusually well-preserved, because it was used as a Christian church, the Church of St George. This is the reason that the naos is covered with a great barrel vault (Lang and Eliot 1954, 47). The temple was visible from the agora and the focus was on the front of the temple, a typical feature of later Roman temples. It was built between 450 and 420 BC as a completely new building with no predecessor. Its plan and elevation are traditionally Doric with interesting sculptural remains. The temple's east and west pediments portray Herakles' deeds. The pediments on the north and south show the exploits of Theseus. Because of these sculptures the temple is often called Theseion. The friezes were decorated with battle scenes (Gates 2011, 267; Lang and Eliot 1954, 46-47).

Marble used for the temple was found locally and imported from other regions. Local sources were the mountains Pentelikon and Humetts. A fine-grained marble known as Pentelic was produced

by the former and a pale bluish-grey one known as Hymettian by the latter. Pentelic marble was used above the foundation level. A finer coarser-grained marble, imported from Paros, was used for the sculpted metopes (Gawlinski 2014, 30).

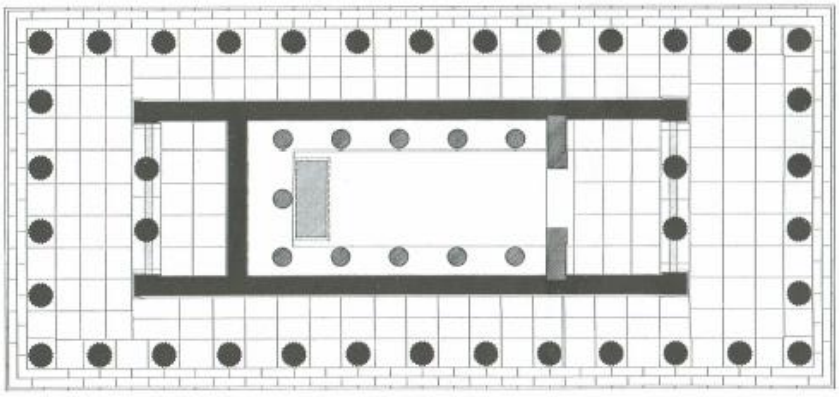


Figure 17: Plan of the Hephaisteion (Dinsmoor 1941, 86, after J. Travlos 1939)

Even though the temple of Hephaistos has been preserved very well, comprehensive architectural descriptions, especially after the nineteenth century, are lacking, as most studies describe specific details of the architecture. The observations made in this thesis are therefore mainly made with the use of the architectural plan of the actual temple. The Hephaisteion has a hexastyle peripteral plan of six by thirteen columns. The temple is 13.71 meter by 31.77 meter. The external columns are Doric and fluted with twenty flutes with sharp arris. The crepidoma has a three step base. The temple of Hephaistos still has its pediments. The interior consists of a pronaos with two columns in antis, a naos and an opisthodomos with two columns in antis. The pronaos is placed further inwards than the opisthodomos and it aligns with the third external column. Inside the naos were three rows op columns along the naos walls with superimposed columns. The side colonnades consisted of five columns and the colonnade towards the opisthodomos consisted of three columns. The upper columns were of the Ionic order (Lawrence 1973, 176; Dinsmoor 1941, 86-93).

3.2.1 Hera I and the Hephaisteion

Table 2: Similarities and differences between the Hephaisteion and Hera I

	Hephaisteion	Hera I
Similarities	Peristyle	Peristyle
	Crepidoma of 3 steps	Crepidoma of 3 steps
	Fluted external columns with 20 flutes	Fluted external columns with 20 flutes
	Pronaos and naos	Pronaos and naos
	A frieze with metopes and triglyphs	(Parts of) a frieze with metopes and triglyphs
	Function: temple	Function: temple
Differences	6 x 13 external columns	9 x 18 external columns
	Opisthodomos	Adyton
	Ionic features	No Ionic features
	2 rows of 5 columns and a rear row of 3 columns in the naos	1 row of 7 columns in the naos
	Superimposed internal columns	Internal columns not superimposed
	Function: worship of Hephaistos	Function: worship of Hera

The Hera I temple and the Hephaisteion both have a peripteral colonnade of Doric columns and a three step crepidoma. The number of columns is completely different. The external columns of both temples have the traditional fluting of twenty flutes. The temples have a pronaos and a naos, but the Hephaisteion has an opisthodomos, while the temple of Hera I has an adyton. The use of an opisthodomos instead of an adyton was the favourable choice in mainland Greece. The use of the adyton is a more Western Greek feature of the sixth century BC (Winter 1976, 140-143). Both temples have a frieze with metopes and triglyphs, which are traditional Doric features. The Hephaisteion does not only have Doric features, but it also has Ionic superimposed columns and an Ionic frieze.

The temple of Hera I is considerably larger than the temple of Hephaistos. The interior of the two temples differs a lot. The single row of seven columns in the temple of Hera I is not repeated in the Hephaisteion. Instead, the temple has two side rows of five columns and a rear colonnade of three columns in the naos, and all of them are superimposed by an Ionic column. The two buildings are

both temples that are accessible from the short side and the naos can be entered through a pronaos. Both the Hephaisteion as the temple of Hera I are dedicated to deities and there is a possibility for worship or cult practises present inside the naos.

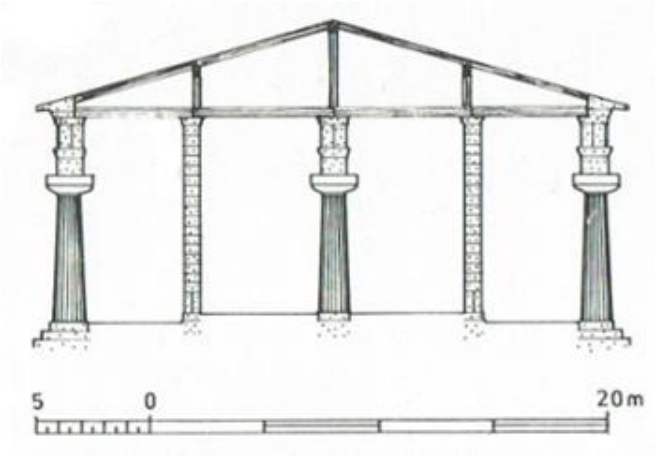


Figure 18: Transverse section of the temple of Hera I (after Coulton 1977, 78)

Figure 19: Transverse section of the Hephaisteion (Dinsmoor 1941, 87, after J. Travlos 1939)

3.3 Comparison to a Western Greek temple: Hera II at Paestum

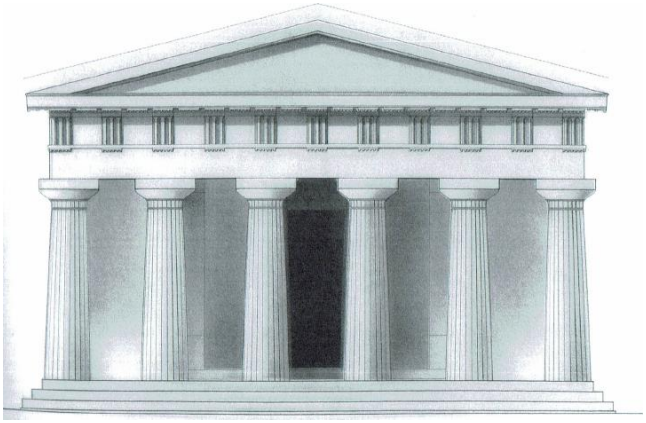


Figure 20: Front view of the Hera II temple (Mertens 2006, 293)

The architecture of the Greeks in South Italy is characterized by the freedom to discard or modify features of the Doric design. They were sometimes even replaced by Ionic elements. In the mainland, architects were bound to the study of proportions. They started the foundations for the later perfectionists of the fifth century BC. The work of the fifth century BC architects of Greece was seen as superior to the style of the Western Greeks and the western schools started to copy this style, abandoning their originality and crudity. This period marks the end of the distinctive Western Doric architecture as far as the Greeks were concerned. They could not have known the impact the Western Greek architecture would have on later Roman temples (Lawrence 1973, 129).

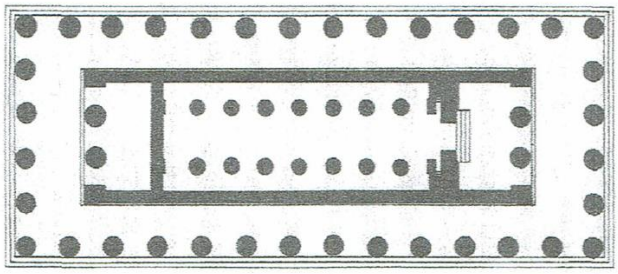


Figure 21: Plan of the Hera II temple (Napoli 1970, 11, in De Jong 2010, 21)

The temple of Hera II (Poseidon/Neptune) was built directly to the north of the Hera I temple around 460 BC. It was constructed to company the temple of Hera I. It was the most conventional Greek temple according to column arrangement and the pronaos with two columns in antis. The temple is the largest of the three Greek temples at Paestum. It is also the best preserved temple of them all (De Jong 2010, 23). It is a Doric hexastyle peripteros with six columns on the short sides and fourteen columns on the long sides. The temple measures 24.31 by 59.93 meter. The temple stands on a stylobate of 24.3 by 60 meter. Its crepidoma consists of three steps and it is curved. The columns are

8.88 meter high with a base diameter of 2.11 meter on the short side and 2.03 meter on the long side. They have a ratio of 1: 4:3. The interaxial measurements are smaller on the short sides (4.47 and 4.29 meter at the angles) than on the long side (4.50 and 4.36 and 4.22 meter at the angles) (De Jong 2010, 23-24).

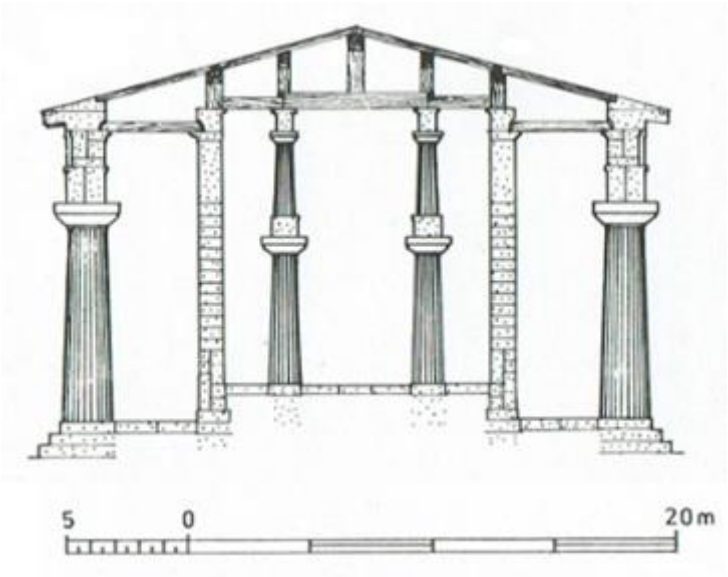


Figure 22: Transverse section of the temple of Hera II (after Coulton 1977, 78)

The columns are characterised the use of entasis, although not as profound as in the Hera I temple. They consist of twenty-four flutes opposed to the normal twenty. The inner structure comprises a pronaos with two columns in antis. The two columns are matched with the pronaos. The interior divided roof joists were supported by twin colonnades of two superimposed columns supporting the roof of the temple. The columns were plastered with stucco to imitate marble. The naos leads to an opisthodomos. Three steps lead to the naos which is raised 1.40 m above the pronaos. On both sides of the entrance, stairways lead the way to the roof. They gave access to a gallery to see the statue and were used for maintenance of the ceiling. The naos is divided into three aisles by two rows of seven columns. The lower columns are 6.06 m. high and have twenty flutes. The architrave of 0.86 meter is put on top of them. The architrave does not contain regulae or guttae. Instead it is decorated with a continuous moulding. The architrave ends are supported on small half-pilasters that are places in the east and west walls of the naos. A second row of columns surrounds the inner architrave. They are 3.41 m high with a base diameter less than the diameter of the neck of the lower columns. The columns in the upper row have sixteen flutes and are crowned by another architrave of 0.98 meter high. The total height of the naos is 11.32 m. Since there was no gallery, these inner columns served solely to support the ceiling and the roof. The entablature is 3.78 m. high and repeats the curvature of the stylobate. A single and a double contraction of the angle columns are used to solve the problem of

the triglyphs and metopes. The length of the frieze is slightly shifted. The temple does not contain decorated sculptures (Mussche 1968, 7; De Jong 2010, 23).

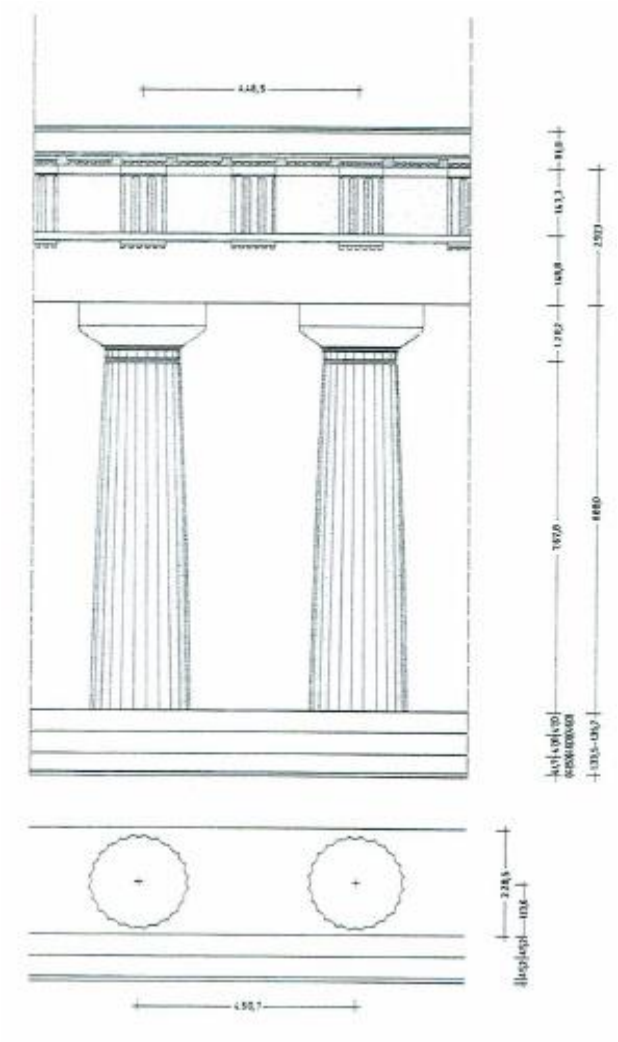


Figure 23: The exterior of the Hera II temple (after Mertens 2006, 286)

3.3.1 Hera I and Hera II at Paestum

Table 3: Similarities and differences between Hera II and Hera I

	Hera II	Hera I
Similarities	Peristyle	Peristyle
	Crepidoma of 3 steps	Crepidoma of 3 steps
	Use of entasis	Use of entasis
	Pronaos and naos	Pronaos and naos
	Columns in antis (2)	Columns in antis (3)
	Slightly bulging echinus	Bulging echinus
	No regulae and guttae	No regulae and guttae
	Steps towards the naos	Step towards the naos
	Lower internal columns with 20 flutes	Internal columns with 20 flutes
	Internal colonnades of 7 columns	Internal colonnade of 7 columns
	Function: temple for worship of Hera	Function: temple for worship of Hera
Differences	6 x 14 external columns	9 x 18 external columns
	2 columns in antis	3 columns in antis
	Stairways beside the naos entrance	No stairways
	36 external columns with 24 flutes	50 external columns with 20 flutes
	2 rows of superimposed internal columns	1 internal row of columns with external column proportions
	Higher internal columns with 16 flutes	Internal columns with 20 flutes
	Opisthodomos	Adyton

The Hera I and Hera II temple at Paestum were built next to each other within 100 years. Both temples were dedicated to the Goddess Hera, based on archaeological finds. Both temples have a crepidoma consisting of three steps. The columns of the temples are characterized by the use of entasis, which is more profound in the first temple of Hera. The temples both have a pronaos with columns leading to the naos. The temple of Hera I has three columns in antis, and the temple of Hera

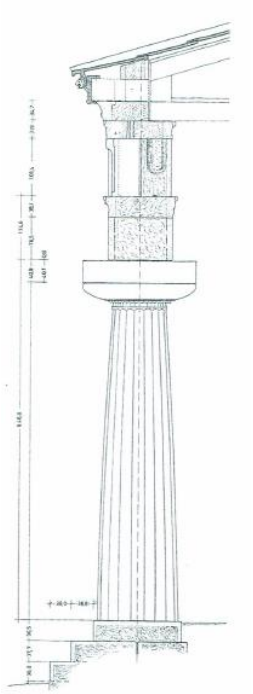
II has two columns in antis. The naos of the temples contain columns. The temple of Hera I has one row of seven columns and the temple of Hera II had two rows of seven superimposed twin columns. The number of columns in a row is the same, but the number of rows is different. Behind the naos in the temple of Hera I is an adyton and behind the naos in the temple of Hera II is an opisthodomos. The pronaos of the Hera II temple leads to the naos with three steps. The pronaos of the Hera I temple is a bit lower than the naos, indicating a step. The temple of Hera I has a broad echinus with a bulging capital. The temple of Hera II has a slightly bulging echinus. The temples do not have regulae and guttae.

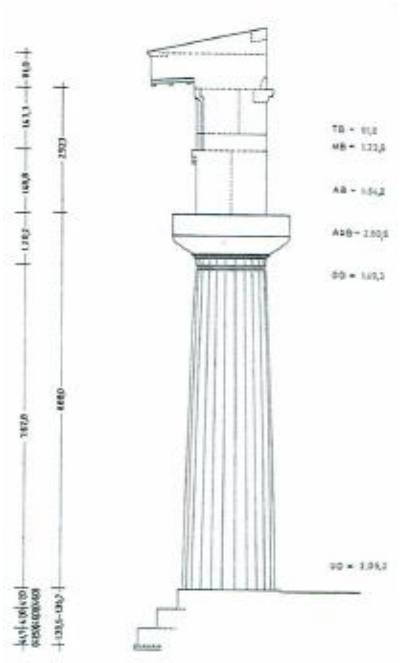
The main difference between the two temples is the number of peripteral columns. The temple of Hera I has nine by eighteen columns, a number not found in any other temple, and the temple of Hera II has six by fourteen columns. The temple of Hera II has stairways on the sides of the entrance of the naos. The temple of Hera II is longer on the long side than the temple of Hera I, but shorter on the short side. This makes the Hera I temple look wide. The temple of Hera I has fifty external columns with twenty flutes. The temple of Hera II has thirty-six external columns with twenty-four flutes. The external columns of the Hera I temple are of the same height and have the same diameter as the internal columns and the internal columns also have twenty flutes. The internal naos columns of the Hera II temple are smaller than the external columns. The first row of columns has twenty flutes and the upper row of columns has sixteen flutes. The differences between the structures of the two Hera temples might indicate differences in function. The sixth century BC Hera I temple was divided into two different spaces and had a closed, private adyton at the back. The fifth century BC Hera II temple on the other hand had a more open internal structure with two columns in the naos creating a large inner structure surrounded by a smaller ambulatory and an easily accessible opisthodomos. These differences might indicate that the Hera I temple focussed more on private cult practises, whereas the temple of Hera II focussed more on more general worship of Hera.

In the sixth century BC in Magna Graecia, originality and experimentation were highly used in architecture. The Western Greeks were more willing to combine ideas of other Greeks and non-Greeks in their temple structures. This led to new inventions to try to make the temples more attractive. Examples of these innovations are the interior consisting of pronaos, naos and adyton, the use of spacious colonnades and the use of entasis. The experimentation became less during the fifth century BC under influence of the mainland (Winter 1976, 139-143).

Both temples show features that belong to Western Greek temples. The temple of Hera I has an adyton and uses entasis. This temple seems to differ more from the traditional Greek temple than the temple of Hera II. The odd number of columns, the thickness of the internal columns, the presence of one row of columns in the naos, the three columns in antis and the broad intercolumniations

between the colonnade and the internal structure are all features that are uncommon. The Hera II temple shows experimentation in the use of entasis, the amount of flutes on the columns and the use of staircases between the pronaos and naos.





Left:

Figure 24: Architecture of temple of Hera I (after Mertens 2006, 145)

Right:

Figure 25: Architecture of the temple of Hera II (after Mertens 2006, 286)

4. Discussion

The results of the comparisons show that the temple of Hera I is more similar to the various Greek type basilicas than the Roman type basilicas with entrances on the long sides. The comparison between the Hera I temple and the Roman Basilica show that the two only have a central rectangular space and a wide ambulatory in common. Architectural studies from the nineteenth century and modern research no longer see the temple of Hera I as a basilica, but none of these studies feature an in-depth description of the architectural features of the Hera I temple and the basilica to support this change of view (Barletta, 2011; De Jong 2010). The comparison of the two building types described in the previous chapter provides the missing evidence that there is no empirical reason to interpret the temple of Hera I as a basilica. Therefore it seems more likely that the comparison of the eighteenth century rediscoverers of Paestum to a basilica was based merely on a presumed function and association than on architectural structure, even though a basilica and a temple are not used for the same activities.

The temple of Hera I does show some similarities with the Hephaisteion at Athens, a Greek mainland temple (Hellas). The temples both show features of the traditional Greek Doric order, in the general architectural plan. However, the Hephaisteion has an opisthodomos, the preferred Greek architectural feature, while the temple of Hera I has a typical Western Greek adyton. The temple of Hera one is also considerably larger than the temple of Hephaistos. Nonetheless, the comparison between the two temples shows that the temple of Magna Graecia and the temple of mainland Hellas shared distinct similarities that indicate they were built on a similar model.

The two Hera temples at Paestum are both very large with a similar width. Both temples show features of the traditional Doric order of the mainland, but they also show features of the typical Western Greek architecture of Magna Graecia. The temple of Hera II is more similar to the traditional Greek temple of the mainland than the temple of Hera I. This seems to be in line with the trend of the growing influence of mainland Greece on Magna Graecia in the fifth century BC, when this temple was built. The temple of Hera I was built in the sixth century BC, a period of experimentation, which might be an explanation for a number of unusual architectural features. The experimental number of columns of the temple of Hera I however, seems to have been invented especially for this temple, as it is not preceded nor succeeded in other temples and could easily have been adjusted to fit the more traditional rules of proportion. At the same time it is interesting that the temple of Hera I does not show Ionic features, even though it was built in a time of adaption and experimentation with Ionic features. Instead, the more traditional Greek temple of Hephaistos of mainland Greece does show some Ionic features. The temple of Hera I seems to share some similarities with both traditional Greek

Doric temples as well as with Western Greek temples of Magna Graecia, but the temple also shows some differences that are not to be found elsewhere.

These findings raise new interpretative questions concerning the Hera I temple that go beyond architectural analysis. Do the differences between the two Hera temples of Paestum indicate specific differences in function? The temple of Hera I might have been a temple for private cult practises, whereas the temple of Hera II might have been a temple for more general worship of Hera. Another question that is raised from the findings is: Why is the temple of Hera I so experimental? The experimentation on the architectural features of the temple of Hera I are linked to its early date and its location in Magna Graecia, but future research might be able to provide a better understanding the amount of experimental features. Another question raised by the result from this thesis is: What was the effect of the unique character of the Hera I temple? The unique appearance of the temple of Hera I resulted in various reactions in the eighteenth century. The temple might have had a similar effect in antiquity. The temple could have served as a model for other temples providing both aesthetically favourable and less successful features.

5. Conclusion

In this thesis I used in-depth architectural features of the temple of Hera I to support interpretations of archaeology. Literature on Classical archaeology does rarely feature detailed architectural descriptions of the site of Paestum, and especially the temple of Hera I. With this thesis I have provided a full description of the architecture of the Hera I temple of Paestum. With the use of comparison between the temple and the Roman Basilica I have explored architectural evidence for the comparison of the two. The results provided in this thesis lead to the conclusion that the temple of Hera I is not a Roman Basilica based on the architectural plan. The comparison of the temple of Hera I and the Hephaisteion in Athens provides information about the relationship between Hellas and Magna Graecia. The two temples show a similar origin. The comparison between the two Hera temples at Paestum provides information about the relationship of temples in Magna Graecia. Both temples show an experimental character.

In this thesis I have gathered architectural details of the temple of Hera I at Paestum and compared them with architectural details of the Roman Basilica, a temple of mainland Greece and another temple of Magna Graecia at Paestum. Based on these architectural details I can provide an empirical architectural conclusion to my research question: was the architecture of Hera I indeed unusual? And if so, what could be the reason for the interpretation of this unusual character?

With the architectural details gathered in this thesis I can conclude that the Hera I temple is in fact unusual, but not in the way archaeological studies previously deemed it to be. It is not a basilica, but the temple is built with a unique mixture of architectural styles. The temple shares some similarities with both the Greek Doric temples of Hellas and the Western Greek temples of Magna Graecia, but the temple has its own special features that are not found anywhere else. The unique features of the temple were already recognized by the early discoverers of the eighteenth century, but this thesis has shown that there is no empirical reason to interpret the temple of Hera I as a Roman Basilica. The temple was built in a time of experimentation and it seems that the builders of the temple of Hera I purposely tried to create a unique temple. The in-depth architectural basis provided in this thesis raises new questions, providing material for future research. Future studies can focus on differences in function, the amount of experimentation used in the architectural features of the temple and the effect of the unique character of the Hera I temple.

Terminology

(Based on Coulton 1977, 189-191 and Plommer 1956, 367-371)

Abacus – upper part of the capital of a column, supporting the architrave
Ambulatory – the part of a building intended to walk in
Annulet – a small (square) moulding around a column, often a projecting ring below the echinus
Anta – the wall-end terminating a colonnade at the naos
Apophyge – an outward curve at the ends of the shaft of a column where it is connected to the capital or base
Architrave – the lowest part of the entablature, resting on the columns
Arris – the sharp edge formed by the intersection of two flutes
Astragal – a small convex moulding band on a column
Base – the lower part of the shaft of a column, absent in the Doric order
Bed – the bottom part of a cornice, not projecting much
Capital – the upper part of a column, an abacus and an echinus
Cella – see naos
Clerestory – a wall with windows of a room that is higher than the surrounding roofs to light the interior space
Colonnade – a row of columns at regular intervals
Column – circular or polygonal feature of a building supporting the entablature and roof, often decorated and comprising the capital, shaft and base.
Cornice – the top projecting member of the entablature
Corona – upper part of the cornice
Crepidoma – the multilevel platform on which a temple is erected
Echinus – the lowest part of a capital, supporting the abacus and spreading outwards from the sides of the shaft
Entablature – sum of horizontal members of the upper temple (architrave, frieze and cornice), resting on the columns and supporting the roof
Entasis – slight convexity often present in the tapering of a column
Flute – vertical shallow groove along a surface
Frieze – middle member of the entablature, often containing carved reliefs
Glyphs – vertical grooves on triglyphs
Guttae – small peg-like projections from mutules and regulae
Intercolumniation – distance from column axis to the next column axis
Metope – plain or decorated rectangular member between two triglyphs

Mouldings – modelled surfaces used to frame the various architectural members or to emphasise their shape

Mutule – slab like projecting element under the cornice above metopes and triglyphs

Naos – a walled rectangular room in the centre of a Greek peristylar temple. The room contains the cult-image

Necking – a plain section beneath the capital and above the astragal of a column

Opisthodomos – false porch behind the naos

Pediment – gable of classical building, normally with a low pitch (15 degrees)

Peripteral – entirely surrounded by an outward-facing colonnade

Peripteros – a temple surrounded by a portico with columns

Peristyle (pteron) – a colonnade surrounding (a space within) a building or the space between a colonnade and a neighbouring wall

Portico – a colonnaded front or porch of a building or an extended colonnade with a roofed walkway supported by columns or enclosed by walls

Pronaos – porch in front of the naos of a temple

Regula – projecting bar below the taenia under each triglyph

Shaft – the column section between the base and the capital

Sima – upturned lower edge of the outer tiles of some Greek roofs forms a continuous gutter or sima

Soffit – the visible underside of an architectural member such as an arch or corona

Stereobate – the remaining steps of the crepidoma beneath the stylobate

Stylobate – the continuous step immediately supporting the columns

Taenia – a continuous band moulding at the top of the architrave

Triglyph – a grooved panel on a frieze alternating with metopes

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Summary

This thesis provides a comparative study of the architecture of the temple of Hera I at Paestum. The first chapter comprises the research question and general information about Greek Colonisation, Magna Graecia, the history of the Paestum area, the excavations and the temples of Paestum. The second chapter provides detailed background information about Greek architecture, monumental temple architecture, the Doric order, the architecture of Paestum and the temple of Hera I, as this is crucial information for the comparative studies.

The third chapter contains the case studies of the comparative study. The temple of Hera I is compared to a Roman Basilica, because early eighteenth century travellers thought the temple was a basilica. The comparison of the two building types provides the evidence that there is no empirical reason to interpret the temple of Hera I as a basilica. The comparison with the Hephaisteion in Athens, Hellas and the comparison with the temple of Hera II at the same site in Magna Graecia show that the temple of Hera I shares similarities with both traditional Greek Doric temples of Hellas and with typical West Greek temples of Magna Graecia. Besides these similarities, the temple of Hera I seems to differ from both type of temples a lot in the architectural plan. The combination of the traditional and Western Greek features as well as features that are not to be seen elsewhere makes the temple of Hera I unique. This thesis provides in-depth overview of the architectural structures of the temple of Hera I. With this information as a solid basis, future research can focus on functionality, the amount of experimentation used to build the temple and the effect of its unique character.

Samenvatting

In deze scriptie wordt een vergelijkend onderzoek gedaan van de architectuur van de eerste tempel van Hera in Paestum. Het eerste hoofdstuk bevat de onderzoeksvraag en geeft een algemene beschrijving van Griekse kolonisatie, Magna Graecia, de geschiedenis van het gebied rondom Paestum, de opgravingen en de tempels van Paestum. Hoofdstuk 2 geeft gedetailleerde achtergrond informatie over Griekse architectuur, monumentale tempel architectuur, de Dorische tempel orde, de architectuur van Paestum en een gedetailleerde beschrijving van de tempel van Hera I. Deze informatie is van groot belang als basis voor het vergelijkend onderzoek.

Hoofdstuk 3 bestaat uit het vergelijkend onderzoek. De tempel van Hera I wordt eerst vergeleken met een Romeinse Basilica, aangezien reizigers uit de achttiende eeuw de tempel zagen als een basilica. De vergelijking van de twee bouwtypes laat zien dat er geen enkel empirisch bewijs is voor de interpretatie van de tempel van Hera I als een basilica. De vergelijking van de tempel van Hera I met het Hephaisteion in Athene, Griekenland en de vergelijking met de tempel van Hera II in Paestum, Magna Graecia, tonen aan dat de tempel van Hera I vergelijkbare eigenschappen deelt met zowel de traditioneel Griekse Dorische tempel uit moederland Griekenland als met de typische West Griekse tempels van Magna Graecia. Naast de overeenkomsten, lijkt de tempel van Hera I gebaseerd op de architectuur ook erg veel te verschillen van beide tempels. De combinatie van traditionele en West Griekse eigenschappen samen met eigenschappen die uniek zijn voor de tempel van Hera I maken de tempel van Hera I uniek in haar soort.

Deze scriptie voorziet toekomstig onderzoek van een gedetailleerd overzicht van architecturale structuren van de tempel van Hera I. Met deze scriptie als basis kan toekomstig onderzoek zich gaan richten op de functionaliteit van de tempel, de hoeveelheid experimentele aspecten en het effect van het unieke karakter van de tempel van Hera I.