SOME OBSERVATIONS ON THE DORIC TEMPLES OF THE 5th CENTURY B.C.E.

In the 5th century B.C.E. the Doric Order is unified and its proportions are being stabilized to such an extent that they aid us in determining the date of the building. This order reaches its peak with the construction of the Parthenon in Athens, in which all the harmonious elements are integrated and unified.

Several scholars have already pointed out some existing discrepancies in the temples of South Italy and Sicily in the 5th century B.C.E., as compared with temples of the same century in the Greek mainland. In order to illustrate these differences we present here two tables of the measurements of the temples and the measurements of various parts and the ratios between them, as well as the material from which the temple was built. The temples are presented in chronological order, one table for each region.

These data are sporadically presented in the studies of various scholars, but each deals with these problems from a different angle.[1] From these tables we can distinguish a number of points which differentiate between the temples of Magna Graecia and of Greece in the 5th cent. B.C.E. (With the exception of the Temple of Zeus at Olympia which is built in a manner similar to the temples of Magna Graecia):

1. The column is more squat.
2. The intercolumniation is smaller.
3. The ratio between the height of the entablature and the height of the column is smaller (a relatively higher entablature).
4. The temples are longer in relation to their width.

[1] The tables were prepared according to the data presented in the works of Robertson and Dinsmoor with the exception of columns 6 and 12 which were prepared by us.

Table 1

Doric Temples of the 5th century B.C.E. in Greece*

Date	Material	Site	Dedication or Name	Dimensions of Stylobate	Ratio between Width and Length	Number of Pteron Columns	Lower Diameter of Column	Height of Column	Ratio between Diameter and Height of Column	Height of Entablature	Ratio between Height of Column and Height of Entablature	Ratio between Lower Diameter of Column and Inter-columniation
490	Limestone	Caulonia	?	18.20×41.20	2.2	6×14						
490	Marble	Athens (Acropolis)	Parthenos	23.51×66.88	2.8	6×16	1.905	?	?	?	?	1.29;1.32
490	Limestone	Aegina	Aphaia (later)	13.80×28.50	2	6×12	0.990	5.259	5.32	2.006	2.62	1.59;1.65
475–450	Marble	Delos	Great Temple of Apollo	13.72×29.78	2.1	6×13			5.5			
470–460	Limestone	Olympia	Zeus	27.68×64.12	2.3	6×13	2.210-2.248	10.426	4.64–4.72	4.165	2.4	1.32–1.36
447–438	Marble	Athens (Acropolis)	Parthenon	30.86×69.51	2.3	8×17	1.905	10.439	5.48	3.289	3.17	1.25
440	Marble	Athens	Hephaistos ('Theseum')	13.72×31.77	2.3	6×13	1.015	5.714	5.61	2.019	2.83	1.53
435	Marble	Rhamnus	Nemesis	10.10×21.30	2.1	6×12	0.620	4.101	5.74	1.384	2.96	1.66
430–425	Hard-Limestone	Bassae (Phigalea)	Apollo Epikourios	14.63×38.29	2.6	6×15	1.091	5.918	5.42	1.962	3	1.45;1.50
425	Marble	Sunium	Poseidon	13.48×31.15	2.3	6×13	1.051	6.026	5.77	2.013	3	1.41
420–400	Porous-Limestone	Argos	Hera (Heraeum): Second Temple	17.40×38	2.2	6×12	1.320	7.365	5.59	?	?	1.47

* The measurements are in metres

Table 2
Doric Temples of the 5th Century B.C.E. in Magna Craecia*

Date	Material	Site	Dedication or Name	Dimensions of Stylobate	Ratio between Width and Length	Number of Pteron Columns	Lower Diameter of Column	Height of Column	Ratio between Diameter and Height of Column	Height of Entablature	Ratio between Height of Column and Height of Entablature	Ratio between Lower Diameter of Column and Inter-columniation
490	Limestone	Selinus	'A,	16.23×40.24	2.4	6×14	1.320	7.162	5.43	2.768	2.59	1.27
490	Limestone	Selinus	'E, or 'R, (Hera?)	25.32×67.82	2.6	6×15	2.286	10.108	4.43	4.470	2.2	1.07
480	Limestone	Akragas	Zeus Olympios (Olympeion)	52.85×110	2.1	7×14 (engaged)	4.292	19.202	4.46	8.115	2.3	0.88–0.89
470	Limestone	Syracuse	Athena	22×55	2.5	6×14	1.918	8.559	4.46	?	?	1.17
460	Limestone	Paestum	Hera ('Poseidon')	24.29×60	2.4	6×14	2.070	8.889	4.29	3.785	2.3	1.16–1.17
460–440	Limestone	Akragas	'D, ('Juno Lacinia')	16.89×38.13	2.3	6×13	1.409	6.426	4.57	?	?	1.19
440	Limestone	Akragas	'F, ('Concord')	16.23–16.91 ×39.44–39.35	2.4	6×13	1.409	6.731	4.78	2.946	2.2	1.27
430	Limestone	Segesta	?	23.25×57.50	2.4	6×14	1.956	9.372	4.78	3.581	2.6	1.22

* The measurements are in metres.

5. The temples are larger in area.
6. All the temples are built of limestone.

As already mentioned, various scholars have already given sporadic attention to a number of these discrepancies, and many tend to explain this in terms of the building material. As the building material is limestone the architects of Magna Graecia did not rely on this building material, and hence, the changes in the proportions. In other words, in their opinion the beginning of the use of marble as building material instead of limestone in the Greek mainland (from the 2nd quarter of the 5th cent. B.C.E.) resulted in structural and proportional changes.

A careful examination of the data in the above mentioned tables shows that this explanation fails when put into practice. The temple of Aphaia in Aegina which was erected in 490 B.C.E. is built of limestone and its proportions approach those of the Parthenon. The proportions of the temples of Apollo Epikourios in Bassae (near Phigalea) and Hera in Argos (the second temple) which were also erected of either limestone or porous limestone in the last 3rd of the 5th cent. B.C.E. are close to those of the Parthenon. From here it seems that we cannot accept the conventional explanation that the building material (limestone) is what determined the existing differences in proportion between the temples of South Italy and Sicily and those of Greece in the 5th cent. B.C.E.[2]

The construction in limestone in Magna Graecia is due to the fact that the marble quarries in South Italy and Sicily yielded only small blocks

[2] J. Boardman et alii, *The Art and Architecture of Ancient Greece* (London 1967) 41: "So many of the peculiarities of plan and detail are repeated in the western temples that it is right to speak of individual schools, or indeed to look for the influence of individual though unnamed architects, who had both to meet the restrictions of the materials at their disposal and satisfy the aspirations of the rich tyrants for whom they worked."
E. Langlotz and M. Hirmer, *The Art of Magna Graecia* (London 1965) 23–24: "The reasons for these aberrations are many and various. In the first place, there are technical ones dictated by the available material. Southern Italy lacks marble which would be suitable for temple-building. But the limestone there is softer and, in general, less homogeneous than that of the mother-country. Consequently, the statics had to be worked out on a different basis and the structure differently proportioned. The porous limestone had to be specially protected from the effects of weathering by terracotta facings on the horizontal and sloping cornices of the roof (sima and geison)."
A.W. Lawrence, *Greek Architecture* (London 1962) 182: "This cannot be entirely explained as a precautionary measure, although the local stone of which they are built was not as trustworthy as marble."

not suitable for the building of the temples; limestone, on the other hand, is to be found in considerable quantities in this region.

It is difficult to know why in Magna Craecia the column is more squat (the average ratio between its lowermost diameter and its height is 1 : 4.65, while in Greece it is 1 : 5.5); the intercolumniation is smaller (the average ratio is 1 : 1.15, while in Greece it is 1 : 1.49); the entablature is higher in relation to the height of the column (the average ratio is 1 : 2.4, while in Greece it is 1 : 2.9). The overall result of this designing is a set of lower and denser columns, and a higher and heavier entablature.

As already pointed out by various scholars the temples of Magna Graecia are usually larger in area than those on the Greek mainland. This phenomenon is explained by the fact that the Greek colonies in Magna Graecia wanted to demonstrate greater architectural and technical ability, and to rise above the motherland in their grandeur in showing excess vainglory and exhibitionism.

From what has been said so far it seems, that we can assume the existence of a variation of the Doric Temple, which developed in Magna Graecia. If we accept the supposition that we have here a variation of the Doric Order, we must attribute to this variation the temple of Segesta. Its proportions are typical of those of the other temples of Magna Graecia. Hence, we cannot compare the proportions of the temple at Segesta with those of the temples on Greek mainland of the same period, as Lawrence did. Likewise, we cannot accept his conclusion that the temple was designed and planned to fit in with the scenery.[3] We may also attribute to this variation the Zeus temple at Olympia, whose proportions and building material fit in with the temples of Magna Graecia. The temple of Zeus is unlike the other Greek temples of the same period, even though according to Pausanias (5.10.3) it was designed by a local architect named Libon.

[3] Lawrence, *op. cit.* 180–182; see also: E. Ayrton, *The Doric Temple* (London 1961) 182.

Selected Bibliography:

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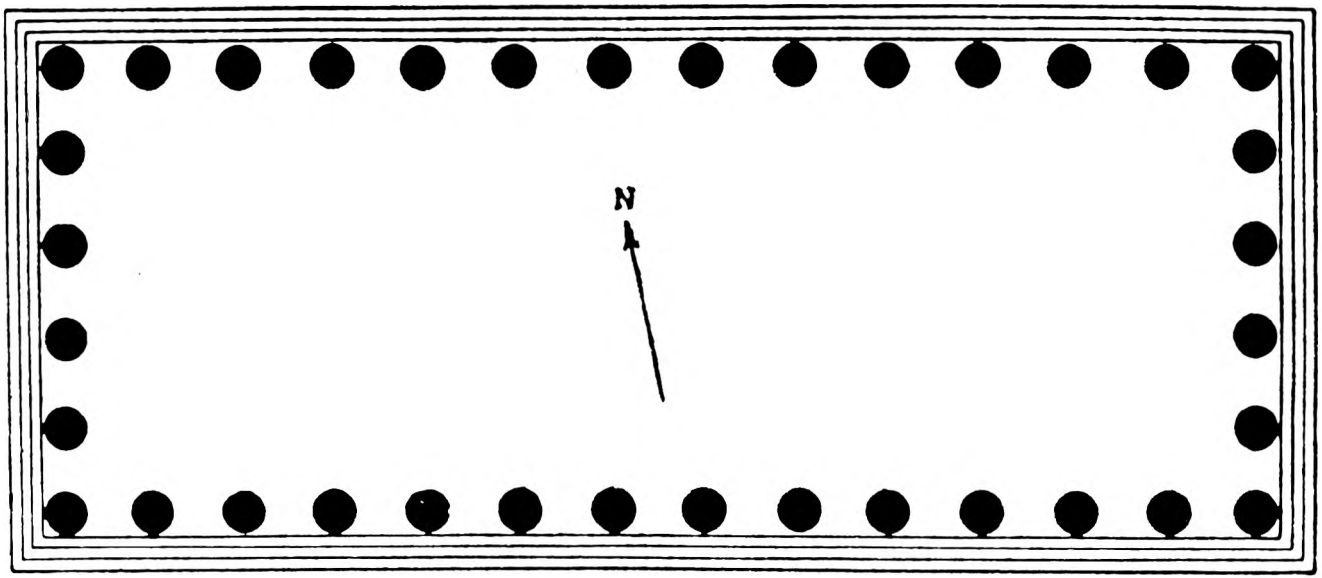
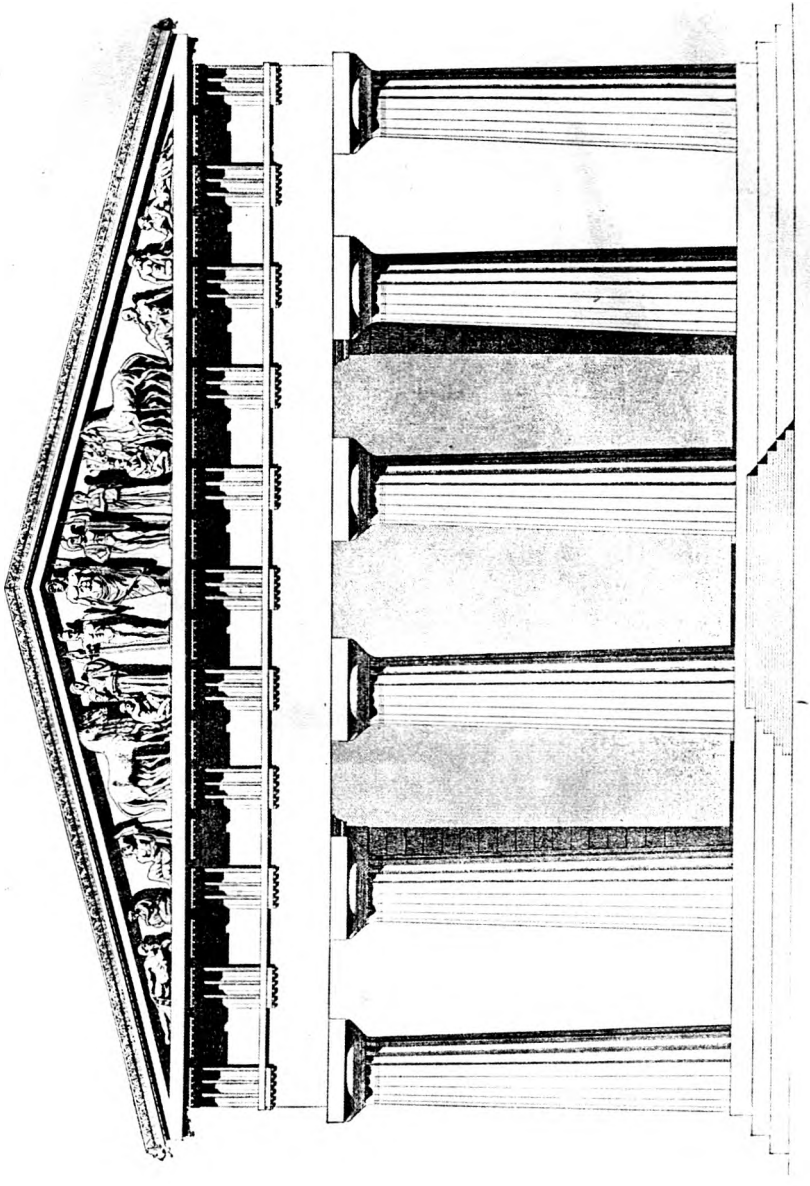


Segesta — Ground-plan of the Temple; 430 B.C.E.

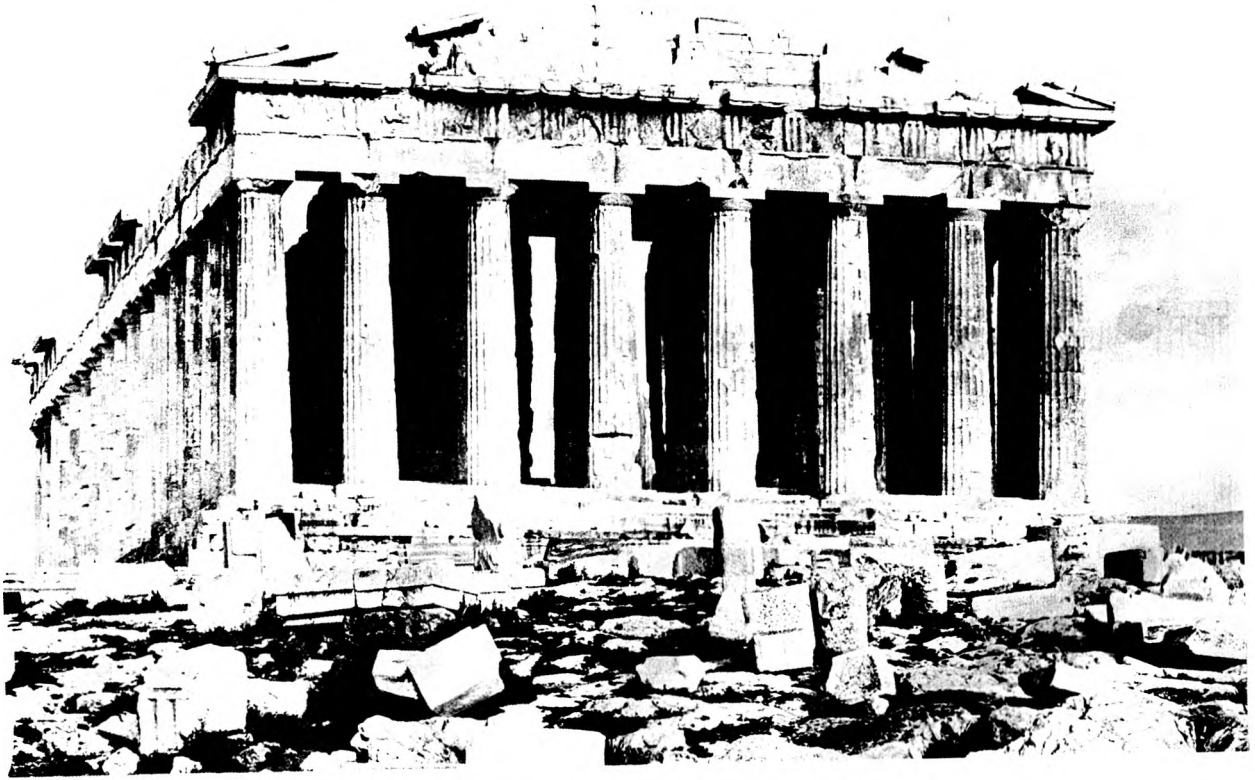
Athens — Hephaesteum (so-called Theseum) seen from the south-west; 440 B.C.E.

Paestum — Temple of Hera II, so-called Temple of Poseidon, seen from the south-east; 460 B.C.E.

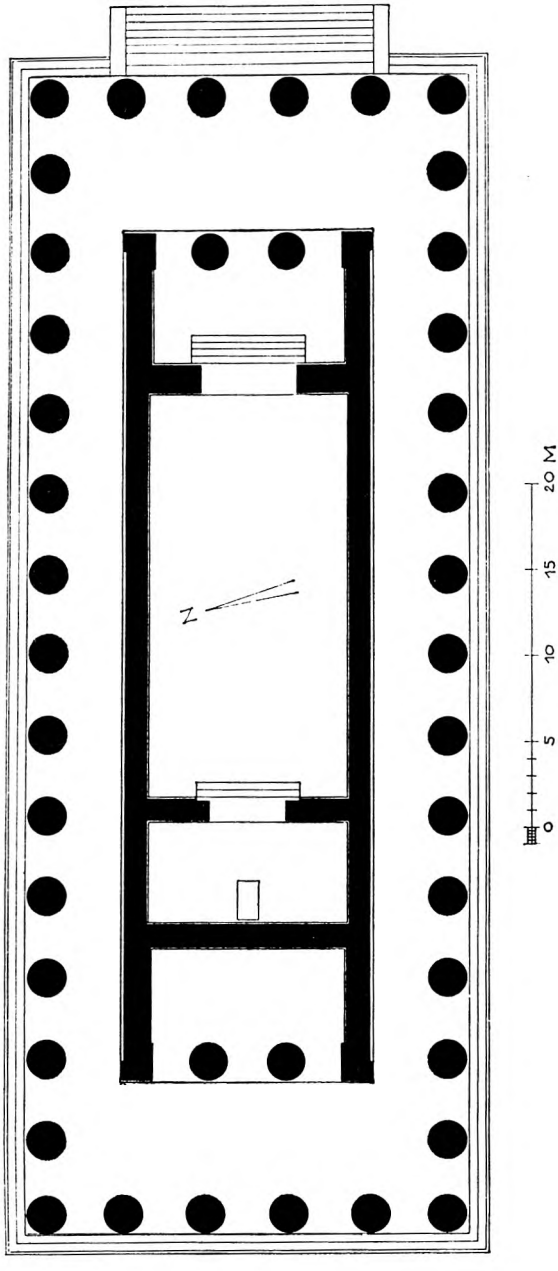
Segesta — Temple seen from the east; 430 B.C.E.



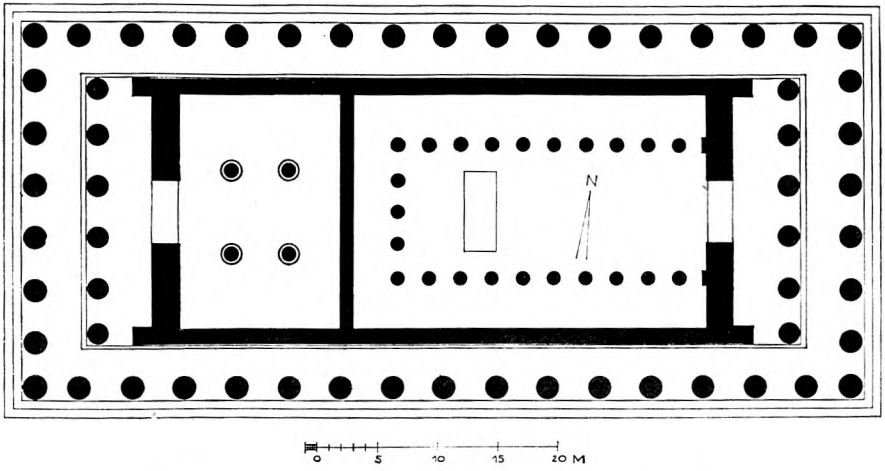
Olympia — Temple of Zeus; 470–460 B.C.E.



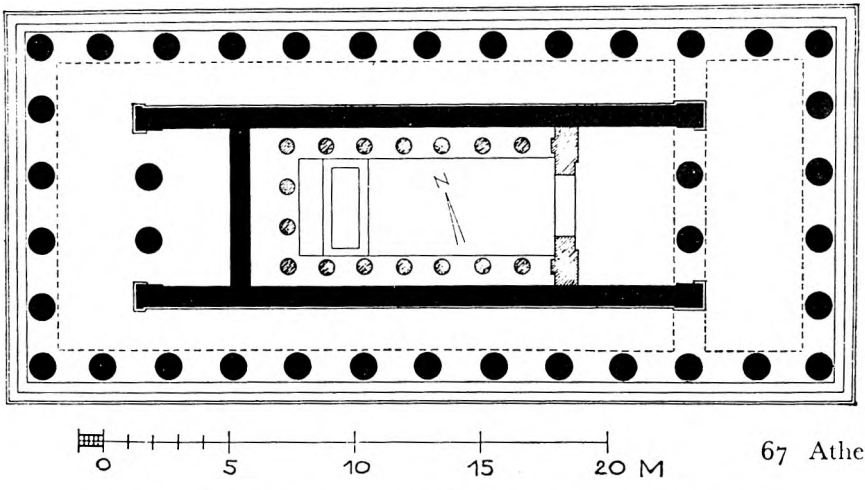
Athens, Acropolis — West front of Parthenon; 447–438 B.C.E.



Selinus — Temple of Hera; 490 B.C.E.



Athens, Acropolis — Parthenon. Plan; 447–438 B.C.E.



67 Athens.

Athens — Hephaesteum, so-called Theseum. Plan; 440 B.C.E.