

Between External and Internal Space: an Urban Transition

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Master of Building Engineering and Architecture
Università degli Studi di Trento, 2009

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ABSTRACT

The aim of this dissertation is to explore the evolution of both architecture and urban space, in terms of mutual relationship between solids and voids, with particular attention to two transitional moments of ancient and modern history: the *Hellenistic* and *Baroque* periods. This study is the result of the consideration that in certain periods, at least in western history, there is a clear predominance of either interior or exterior space in relation to architecture. If on one hand external space seems to predominate in Greek and modern architecture, interior space is prevalent between the Roman and the Renaissance periods. The hypothesis is that both the *Hellenistic* and *Baroque* periods represent intermediate phases in the historical transition between interior and exterior space and that this transition is manifested, through the transformations of the urban fabric, in the enclosed civic spaces of forums and squares. The methodological approach can be more easily described defining what this analysis is not meant to be: this examination is neither intended to be an urban theory nor a historical study. The intention is to interrelate theory and history, remaining distant from the necessary abstraction of urban design theory and, at the same time, avoiding the indispensable specificity and attention to details required by architecture history.

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PREFACE

This thesis, even though it is chronologically organized, is not intended to be an organic and complete analysis of the issue of space throughout history. Some periods have been analysed more carefully, other more approximately. Furthermore different approaches have been used in some parts of the thesis to emphasize specific aspects. As an example the analysis of the *Chthonic* and *Tectonic* archetypes in the second chapter is based on a very general and theoretical approach. This chapter can be considered an independent examination of the clearest expressions of internal and external space in relation to architecture. The core of this thesis is formed by the chapters 3, 4 and 5 in which I have tried to illustrate the change in the space conception between the Greek and the Roman periods. In these chapters all the architectural and urban plans have been redrawn in the same way to allow an easier confrontation. The main assumption of this thesis is that these plans can illustrate the progressive transformation of the urban fabric and the transition from external to internal space more easily and more clearly than words can do. Chapter 6 is conceived as a short, mainly visual, historical analysis of the analogies between the Hellenistic-Roman periods and the Renaissance-Baroque ones. The final chapter deals with the predominance of exterior space in the time span between 1750 and the 20th century. Since this period is characterized by the development of theory and history in the architecture discipline, the issue of space is analyzed, in this chapter, primarily from a theoretical point of view.

The thesis period is always a delicate and sometimes tormented period. Therefore I am sincerely grateful to my thesis committee for having made this semester an enjoyable and enriching period. I want to thank the thesis advisor Michael Dennis first of all for the last two inspirational years at MIT. His book "*Court and Garden*" has been an important reference point, a solid methodological framework and a source of inspiration. It is in the description of the dissolution of the urban fabric explained in this book that I have perceived a sort of inverted or mirrored process of the articulation and formation of the urban fabric between the Greek and the Roman period. I would like to thank Julian Beinart for the constant stimulations and for the challenging talks about the role of history in contemporary practice. I wish to acknowledge David Friedman for the inspiring suggestion to analyze the development of mathematics during the Greek period and for having helped me to clarify the disciplinary boundaries of this work. I also want to acknowledge Arindam Dutta for his stimulating considerations on sustainability, Alexander D'Hooghe for his suggestion to look at Giedion's work and Mark Jarzombek for the few things I know about prehistoric architecture. I would like to thank Barbara Littenberg, Steven Peterson and Maria Alessandra Segantini for their skilled comments during the thesis presentation and my friends and classmates for their encouragement.

Certainly without the support of my family I would have never been able to spend two more years to study. Therefore I want to thank them, considering that this work would have been impossible without their help.

1

INTRODUCTION

Methodological approach

The aim of the following dissertation is to explore the evolution of both architecture and urban space, in terms of mutual relationship between solids and voids, with a particular attention to two distinct transitional moments of ancient and modern history: the Hellenistic and Baroque periods. The *Hellenistic* world and the historically parallel *Roman Republic* will be the focus of this dissertation, whereas - given the short time of this study - the late Renaissance and Baroque periods will be analyzed only briefly and in terms of analogy with the Roman and Hellenistic periods.

The methodological approach can be more easily described defining what this analysis is not meant to be. This examination is neither intended to be an urban theory nor a historical study: the intention is to interrelate theory and history, remaining distant from the necessary abstraction of urban design theory and, at the same time, avoiding the indispensable specificity and attention to details required by architecture history. Moving in this open field can be very hazardous and slippery: the risk is to produce a series of observations that are not universal enough to be theoretically meaningful and not precise enough to be considered historically valid. I am not saying this as a sort of *captatio benevolentiae*, intending to safeguard and cover myself by possible mistakes; I rather want to define the limits of this approach to clarify that the necessary accuracy required by a historic analysis and the conceptual abstraction of a theoretical work cannot be fully achieved in this kind of work, even though I think it is worth investigating such an undefined and intermediary field.

As a result of this intention, the scale of observation will also be halfway between the large scale of the city, necessary to read the entire urban morphology with its structure and patterns, and the architectural scale of the individual buildings, which is proper to a precise historical analysis. It is therefore difficult to accurately define the object that is going to be placed under the microscope without recurring to such generic and abused terms as “public building” or “public space”. The analyzed object might even shift during the examination: it could be an agora, a sanctuary or a forum as well as a square, a street or a palace. To narrow down the field, the primary focus will be on public buildings and public spaces. That is because they are generally the most relevant and representative built elements: the artifacts which more clearly manifest a political, cultural and artistic intentionality. Therefore what is considered crucial, in this dissertation, is the correlation between solids and voids in primary public spaces. My intention is to investigate how the most important religious and civic buildings relate between each other, what kind of space is generated around them and what this space might represent.

1.1 Between external and internal space

The intention to investigate such an intermediate and undefined disciplinary field is generated by the consideration that in certain periods, at least in western architecture history, there is clear predominance of either interior or exterior space. In a very synthetic and generalized way we can say, as an example, that Greek architecture is based on the disposition of isolated objects or volumes in an open space and that consequently exterior space generally predominates. On the contrary during the Roman period interior space is the most evident characteristic of the large monumental buildings such as the *Basilicas*, the *Baths* and even the theaters and the amphitheaters if we consider that for the first time they are completely enclosed. A strong predominance of the interior space is still recognizable during the Renaissance period, whereas the modern era, similarly to the Greek period, is again primarily based on the presence of isolated single volumes placed in an open space and in relation with the landscape. This highly schematic periodization is derived from the work of those historians and theoreticians who have considered the issue of space as a primary issue for architecture. The first one is probably the Austrian art historian Alois Riegl, who has conceived an aesthetic theory about space, in relation to both art and architecture, analyzing the end of the Roman imperial period in his *"Late Roman art industry"* in 1901. The most innovative aspect of this book, at least for the late nineteenth century, is the intention to investigate a non-classical period, commonly considered by his contemporaries an epoch of decline. On the contrary, according to Riegl there is no decline in art and cultural development, since every period and culture is based on a distinctive artistic intentionality, a specific "Kunstwollen" which is different throughout time. The perception of a decline in art is therefore related to the misunderstanding of that specific period and to an uncritical interpretation which is generated by the application of the same aesthetic categories, primarily those that are valid for classical art, to conceptually different periods and artifacts. The analysis of the Late roman art convinces Riegl that this specific period is based on a completely different "Kunstwollen" from the "ancient art" and specifically from Greek classical art.

According to the Austrian historian, during the earlier periods, such as in archaic and classical Greece, art is based on the visual perception of "external objects" surrounded by an open space, or using a more accurate term, by a "void". As he continues: *"Filled with the air of the atmosphere, space leading the eyes of the naïve beholder to see individual external objects as separate from one another, is for the very same reason not material but the negation of material and consequently a void. Therefore, because it cannot be individualized in a material shape, space was originally not able to become a subject for ancient artistic creation. Yet ancient art, by following strictly its responsibility, had to go even further: it had to negate and suppress the existence of space because it constituted an obstacle for the clarity*

of the absolute individuality of external objects in the work of art.”¹ Furthermore ancient and Greek art is based on the observation of “individual material phenomena” or entities, which are perceived not in space, but on a flat plane. The flatness of the perception is generated by the lack of the third dimension, the *depth*, which is perceivable only in interior spaces. According to Riegl’s psychology of perception, ancient art is primarily “tactile-visual” and based on two dimensions, the *height* and the *width*. In “*Late Roman art industry*” he explains that in ancient art the eye “shows us the objects only as colored planes and by no means as impenetrable material individuals; this optical perception especially makes the objects of the external world appear to us in a chaotic mixture.”² This description of a bi-dimensional or flat visual perception, not only clearly defines the essential principles of Greek art, but even anticipates by a few decades the modern art “Kunstwollen” and especially the aesthetic principles of the Dutch De Stijl movement (1917-1931). Therefore we can recognize a strong analogy between the Greek and the modern periods not only from the fact that architecture is generated in both cases by the disposition of autonomous objects in an open space, or *void*, but also from the abstract and depthless perception generated by a similar use of colors. If we keep in mind that Greek temples are colored with primary colors, mainly red and blue, and that they are conceived to be seen from a diagonal or angular point of view, we can recognize a striking analogy with the De Stijl artistic and architectonic principles. Greek polychromy is practiced mainly between the sixth and the fourth century, and the dissolution of its original colors has certainly altered the perception of the archeological remains - which now appear as naked white marble volumes - leading furthermore to altered aesthetic interpretations.



FIG. 1 The relation between colors and architecture in ancient and modern periods. The external angular vision and the use of artificial primary colors reduce the sense of depth emphasizing a flat perception. (On the left side), The Temple of Zeus at Olympia, after the color reconstruction of Curtius & Adler with metopes added. (ca. 468-456 BC), (In the middle) Contra-Construction, by Theo van Doesburg and Cornelis van Eesteren (1923), (On the right side) Schröder House, Rietveld (1924).

¹ Riegl, Alois, and Rolf Winkes. 1985. *Late roman art industry*. Archaeologica ; 36. Roma: G. Bretschneider: p. 21.

² Ibid., p. 22.

On the contrary, the sense of depth is characteristic of Roman architecture during a period in which interior space becomes progressively predominant. This acknowledgment is originated in “*Late Roman art industry*” from the analysis of the Pantheon. According to Riegl: “*A simple historical fact may be mentioned by way of preface: the interior of the Pantheon in Rome has niches cut into the surface of the arch of the interior walls while the exterior is still a completely uninterrupted cylinder. Hence, the composition of masses is already present here in the interior space, while it is still missing in the exterior. From such observations one immediately recognizes the creation of space as the motivating element in the development of Roman imperial architecture.*”³

However we can recognize an even earlier Roman prototype for the development of interior space in the *Basilica* type, which appears for the first time around the beginning of the second century B.C. and it’s arguably the first large indoor public building of Ancient history. The space enclosed by the internal peristyle of the basilica represents the earliest clear materialization of the sense of *depth* in space, a perception that couldn’t be achieved in the earlier Egyptian and Greek hypostyle halls in which the internal space is completely filled with columns. It’s probably not a coincidence if the sense of depth is developed, during the first century B.C., in all the artistic expressions and even in painting as it is evident from the so called *Roman Second Style Wall Painting*. Most of the frescos of this period represent ideal architectural constructions in a prototypical “convergence” perspective.⁴ Scholarship on this subject has debated the proper term for this kind of perspective for long time, since it is not scientifically and geometrically constructed. What is probably more relevant, using Riegl’s terminology, is to understand the artistic “intentionality” of this period and specifically the attempt to explore the third dimension to represent depth. In this sense these frescos are essentially analogous to the Renaissance perspective paintings, even though technically less sophisticated. Additionally during the Renaissance we can recognize a similar strict correlation between the geometrical perspective construction and the deep interior space of the Basilica typology, which is exemplarily manifested in Brunelleschi’s *Basilica of San Lorenzo* or *Santo Spirito* in Florence.

The Roman and the Renaissance periods arguably represent the two period of western history in which the sense of depth is more distinctly manifested in terms of architectural internal space and perspective paintings. In both cases the centrally planned spaces, quintessentially based on a circular plan, represent the culmination of the attempt to define an interior space, because in these cases the sense of depth virtually proliferates in every radial direction demanding an even higher degree of subjective consciousness on the observer.

³ Ibid., p. 20

⁴ For the use of perspective during the Roman period see: Stinson, Philip. 2011. Perspective systems in roman second style wall painting. *American Journal of Archaeology* 115 (3) (July): pp. 403-426.

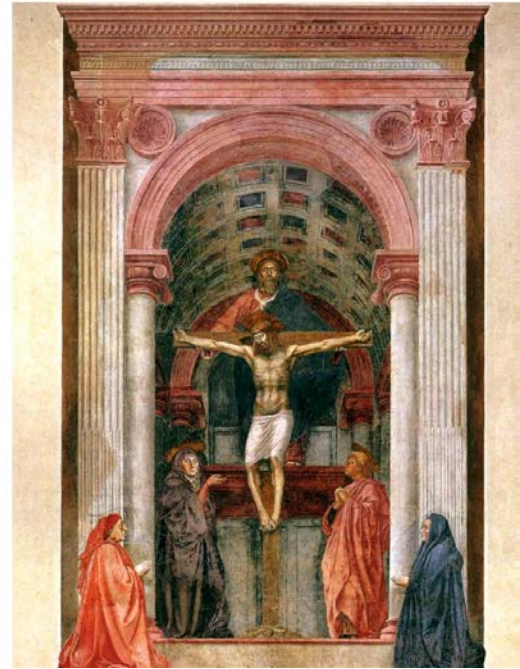
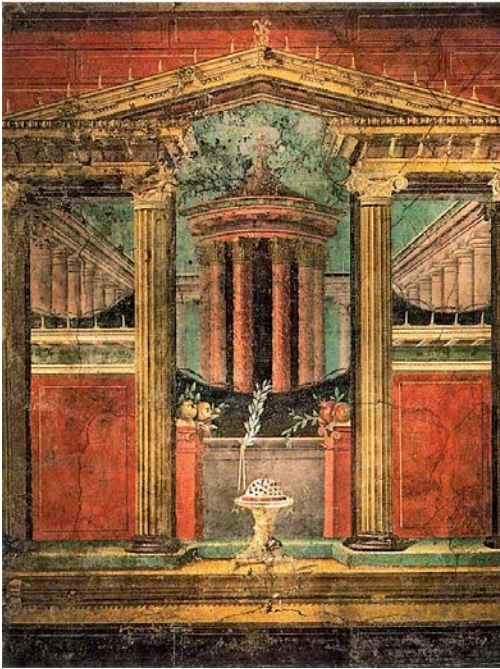


FIG. 2 The perception of depth in architecture and perspective paintings. On the left side: Roman period. (on the top) Reconstruction of the interior space of the Basilica of Pompeii (beginning of 2nd century B.C.), (On the bottom) Roman fresco from Boscoreale, near Pompeii (43-30 B.C.). On the right side: Renaissance. (on the top) Basilica of San Lorenzo, Brunelleschi, Firenze (1419-1480 A.D.), (on the bottom) Holy Trinity, Masaccio, Santa Maria Novella, Firenze (1427 A.D.).

In a synthetic way we can say that on one hand ancient and Greek artistic intentionality - and we might add also the modern one - is characterized by the presence of external objects in a “void”, by a bi-dimensional perception based on the eye and by a certain flatness emphasized by the use of primary colors, on the other hand during the Roman and Renaissance periods the “Kunstwollen” is based on internal space, sense of depth and curved planes. It must be clear that the identification of analogous artistic internationalities in different historical periods, in relation to primary and essential aspects such the issue of space and the perception of the viewer, does not mean that these periods are necessarily

“similar”, or that there is a pre-defined teleological development of art and culture. The first part of this dissertation is dedicated to a more theoretical definition of what internal and external space could mean in relation to architecture. From the analysis of the architectural archetypes which primarily express either interior and or exterior space, it will become evident that their prevalence is alternately recurring throughout history. This demonstrates that it does not make sense to define history in terms of an unavoidable linear development based on a Hegelian historic teleology. On the other hand it would be equally unreasonable to say that every architectural and artistic case is unrelated and independent from its historical period or that there is no predominance of either interior or exterior space throughout history. If it is possible to argue, as I will try to show more systematically in the following chapters, that during the Greek and the modern period there is a clear prevalence of autonomous objects conceived to be seen from an exterior space, as well as there is a predominance of deep interior space under the Roman Empire and the Renaissance, the next “consequent” step is to try to understand how and why there is a shift or a change between these periods.

Siegfried Giedion in his “Architecture and the Phenomena of Transition”, published in 1970, explains these systematic shifts in a pragmatic way and in terms of a change in materials and construction processes. Therefore the invention of Roman concrete is considered the event that allows the creation of large vaulted spaces, whereas the 19th century steel construction determines the shift between the baroque and the modern period. This deterministic approach is derived from the earlier “materialistic” theories of Gottfried Semper. As a matter of fact the large interior spaces of the Roman Bath complexes couldn’t be built without the invention of concrete and in the same way the modern “free-plan” couldn’t be realized without a steel or concrete frame structure. However if we oppose Semper and Riegl point of views we could wonder what comes first: is a new technique or an invented material that determines new architectural and artistic practices or is maybe the artistic intentionality and the need for something that leads to the development of new techniques? This is a typically circular cause-consequence dilemma with no definitive answer. In this case the most honest answer is that both these point of views are valid, they are only different interpretations of the same phenomenon. It is almost like looking at the same object from inside or outside: the Semperian interpretation is based on a materialistic analysis primarily focused on the object or the artifact, whereas Riegl tries to interpret any artistic expression within the larger cultural context and through its gradual changes. Furthermore these two opposed views are also related to another similarly irresolvable dilemma: does history evolve through sudden revolutionary shifts generated by the invention of new materials and technologies, or does history unfold incrementally through the constant cultural evolution and according to the changes in the artistic intentionality? The antithesis between “discreteness” and “continuity” represents the most recurrent issue of this dissertation and not only in terms of methodology or interpretation of history. We can recognize the same opposition between a *discrete* and a *continuous* model even in relationship between architecture and space. When exterior space predominates the urban environment is generally defined in terms of a discrete system formed by isolated volumes, whereas interior space is usually characteristic of a continuous and dense urban fabric.

Furthermore, the hypothesis of this analysis is that the “discreetness” and the “continuity” expressed through art and architecture in the urban environment are only the most evident manifestation of the larger cultural context and, in other terms, the expression of different ways of perceiving reality. Therefore the Greek composition of discrete architectural objects in the landscape will be associated with a “discrete” way of thinking that can be recognized in science and philosophy. The risk of this kind of interpretation, if defined in terms of an overarching structuralism, is to degenerate in a sort of totalizing theory. However “structuralism” is based on universal and a-historic principles, whereas the main hypothesis of the following study is that all the political and cultural conditions, which are expressed through art and architecture, are continuously shifting throughout history in a continuous incremental process. Therefore the intention of this analysis is to focus on progressive transitions and incremental changes between periods in which either internal or external space is predominant.

In Giedion’s “Architecture and the Phenomena of Transition” there is no analysis of the intermediate periods or any systematic attempt to identify an incremental progression, whereas Riegl suggest, in a short sentence, that during the Hellenistic period it might be possible to identify an incremental step in the transition from the Greek definition of floating objects in an external space to the Roman monumental interiors. According to Riegl “One can hardly deny that a decisive progress in the direction of formation of interior space took place under the diadochs but all criteria necessary for a detailed determination of this progress are missing.”⁵ The intention to investigate, in this dissertation, the intermediate and transitional periods is almost a response to this suggestion. After being considered for a long time a decadent period, similarly to the late Roman art studied by Riegl, the Hellenistic period has been more systematically investigated by archeologists and historians during the last decades, thus contributing to a better understanding of the field and lessening the lack of “criteria necessary for a detailed determination”, as Riegl would say. Both in the Hellenistic and the Baroque periods, we can recognize an intermediate spatial typology that architecturally materializes the progressive transition between internal and external space. This typology can be identified in the urban enclosure of the Hellenistic *agora* and the Roman *forum* as well as in the Renaissance *piazza* or the baroque *unified square*. The most striking similarity of the baroque and Hellenistic enclosures is represented by the fact that during these two periods design is extended from the architectural scale to the urban scale. If on one hand there is, in both these periods, less attention and invention at the architectural scale, which is manifested in a “mannerist” or “baroque” repetition and accumulation of already consolidated stylistic elements, on the other hand the main design focus is moved to the urban scale, extending the principles of order and composition to the larger urban fabric. During these two periods urban design reaches the largest scale and arguably the highest results. Furthermore in this intermediate phases exterior and interior become almost equivalent and solids and voids of the urban fabric seem to have equal value.

⁵ Riegl, Alois, and Rolf Winkes. 1985. *Late roman art industry*. Archaeologica ; 36. Roma: G. Bretschneider: p. 29.

1.2 A matter of scale

If the primary “medium” of representation for both architecture history and urban design theory is a drawing or a plan - even though in various ways and with different scales - the attempt to investigate an intermediate field necessarily requires a proper “intermediate” scale. In the wide spectrum of the different types of drawings we can consider its extremes in the small-scale of a highly detailed archeological survey and in the large-scale of a diagrammatic urban plan. If the former requires the accumulation of every detail and the overlapping of all historical layers because it is fundamentally a scientific documentation survey, the latter requires the minimum amount of signs and lines to underline and isolate the most important design features. In the following analysis we cannot achieve the level of detail of a proper historical analysis, both in terms of methodology and of drawn representation, and at the same time we cannot reach the theoretical abstraction of urban design theory and the clarity of a diagrammatic plan. Furthermore the main focus will be on the most important public buildings and spaces, therefore the proper scale will be an intermediate one in which it’s not possible to represent and evaluate the entire city. However this “middle scale” allows the representation of the most relevant buildings at an architectural scale since this is necessary to fully understand their position and role within the context and more generally the relation between solids and voids. A lighter brown “*poche*” will represent, in public buildings, the areas of transition between external and internal space such as a portico, whereas a darker brown will be used for internal rooms. Residential buildings are represented in gray and are not fully analyzed in this study. All the evaluated cases will be represented in the same way and through this intermediate scale to allow an easier confrontation. The main assumption of this work is that through an historic sequence of similar plans the architectural transition from exterior to interior space could become more evident and clearer than in a purely written examination.



FIG. 3 The different scales and levels of details. (From Left to Right): 1) Archeological survey, 2) Architecture drawing, 3) Intermediate urban-space drawing, 4) Urban drawing, 5) Urban plan

2

INTERIOR AND EXTERIOR SPACE Chthonic and Tectonic Archetypes

In this chapter I will try to give a more detailed definition of what internal and external spaces could mean in relation to architecture. In the attempt to show their most primitive and essential expression and with the intention to differentiate their main characteristics, internal space will be related to the *cave* or the *chthonic archetype*, while external space will be associated with the hut or the *tectonic archetype*. As few architecture historians have already pointed out, there are periods in which either internal or external space is clearly predominant over the other. If we accept their periodization, which I think is generally valid and in most of the cases fully evident, the next step is to understand what might have caused the shifts between the different periods. As I will try to suggest at the end of this chapter, it is not focusing on the architectural evolution of materials, techniques or styles that these changes can be completely explained. We have to shift our attention from the architectural object to the context to realize that there is a transition between interior and exterior space or vice versa, and that this transition is a progressive and incremental “urban transition”.

2.1 Two archetypes

Among all arts, architecture is certainly the most close to human life, not only because it materially constitutes the place where we live, but more substantially because it replicates the condition and the contradictions of any human being. All individuals are defined by the interaction between their subjective self consciousness, placed in the intimate space of their interiority, and their external projection into the real world, which Heidegger defined as *Dasein*: the condition of “*being out there*” in the world, as an entity between other entities in a specific time. Our body mediates between these two conditions in the same way as architecture mediates between its *interior space*, which is the essential and necessary condition for any habitation, and its *external presence* in space and time, as object between other objects. In essence architecture can be defined as the interface that mediates between internal and external space.

Domesticity, intimacy, and spirituality are usually related to an architectural *interior space*. The enclosed space, clearly separated from the external world, is the condition which allows us to freely express our intimate individual being. Generally the interior of our house is a direct manifestation of who we are and how we live, and therefore it is also the expression of our subjective self-consciousness. Spirituality, or more generally any relation that we have with the metaphysical world, is also usually related to an enclosed condition separated from the exterior mundane world: in fact an enclosed centralized interior can generate a metaphysical timeless space where natural light cannot fully penetrate and therefore cannot really manifest the passing of time and the presence of the exterior world.

In the world out there, the *exterior space*, our presence is expressed by the position and the interaction of our body with other objects-bodies gathered in the same space. The façade of a building, or more generally its external surface, should be intended as a communication tool exactly like our face or our body presence. Anthropomorphic analogies between human bodies and buildings are quite well known and don't need to be explained in detail. What is more important is that the external space is the arena for communications and interrelationships between individual entities. Position, articulation, orientation, distance and proximity are a few basic attributes of both individual bodies and buildings in the external space: all these attributes have a specific meaning and define specific social relationships. In essence the way in which individuals interact in a society is very similar to the way in which buildings are positioned and interrelated within the urban space. We could say that, if the interior of our house is the manifestation of our individual personality, the urban space is the materialization of the social and political system which inhabits it.

These are only simple and banal considerations, but the dialectical relationship between internal and external space in architecture is only a declination of a broader and deeper polarity that has dominated western culture throughout history in the recurring attempt to resolve it: the contraposition between subjective and objective, between particular and universal, between private and public and more concretely between individual freedom and

social structure. Throughout history we can identify the moments in which one of these spheres becomes predominant over the other. The evolution of western culture could be probably represented as a shifting position oscillating in the wide spectrum between the two antithetical poles of subjectivity and objectivity. In this oscillating movement pure subjectivity and pure objectivity represent the unreachable extreme limits of the spectrum.

Architecture, throughout history, has also been characterized by a similar alternating predominance of internal and external space. If architecture is the interface between interior and exterior space we can imagine it as a membrane that is being continuously deformed throughout history, according to the balance of internal and external forces. But even in this case one type of space cannot completely subvert the other: pure internal space and pure external space are extreme conditions that cannot be reached because they would negate the role of architecture as mediator between them.

The hypothetical case of a pure internal space would be possible only if we exclude the external world with its space and time. It would be a pure void, a metaphysical timeless space: maybe something closed to the condition of being in the womb before birth or in burial chamber after death: an unthinkable condition of pure subjectivity placed before the origin and after the end. It would be an eternal space that we can only imagine, maybe a "space of pure imagination".

On the other hand in the case of a pure external space there would be no internal space: architecture would be annihilated and reduced to the role of a sculpture in an open space, a solid form without function. In a pure external space architecture would be objectified and reduced to the condition of being a mere entity between entities. We might call it a purely "objective space".

But if the antipodes of this spectrum are unreachable or would make no sense, we can identify two archetypes, which are very close to these extreme ends: the **chthonic archetype**, which is exemplified by the interior space of the *cave*, and the **tectonic archetype**, which is traditionally associated to a *hut* placed in an open space. The ideal expression of the **chthonic archetype** is a pure hollow space carved out from the "*khthon*", the solid surface of the earth: it is a unified void excavated from a solid mass without joints. On the contrary the **tectonic archetype** is the expression of the artificial construction process, it's produced by a "*tecton*", a builder or a carpenter. The result of this process is an assemblage of elements, which are still recognizable in the final grouping through their joints.

If we go back to the late Neolithic period, when architecture was extremely simple and therefore also more pure in its expression, it's possible to identify clear examples of these two archetypes.

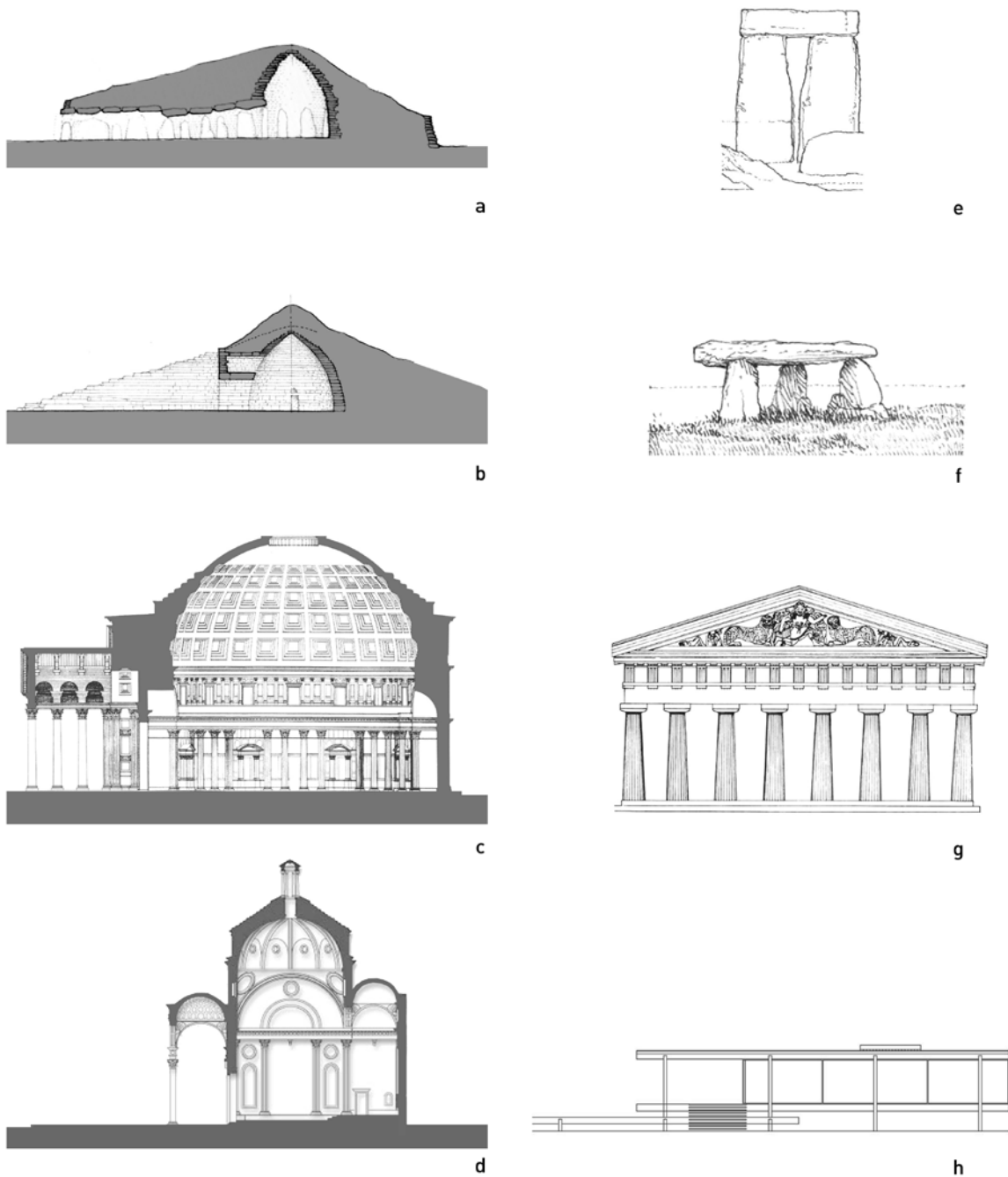


FIG. 4

LEFT SIDE Evolution of the "chthonic archetype". The interior space is visualized in section: a) The passage grave on Ile Longue, south Brittany, France, ca. 4100 BC b) Treasure of Atreus near Mycenae, Greece, ca. 1250 BC c) Pantheon in Rome, Italy, 126 AD d) Pazzi Chapel in Florence, Italy 1460 AD

RIGHT SIDE Evolution of the "tectonic archetype. It is better expressed frontally e) trilithon in Stonehenge 2500 BC, f) dolmen structure, g) Temple of Artemis in Corfu, Greece 580 BC. h) Farnsworth House, Plano, Illinois, 1951 AD

2.2 The chthonic archetype

The first example of the chthonic archetype can be found in the **megalithic chamber** tombs that have been built in Portugal, France, England, Norway and Sardinia around 3000 BC. They are formed by a circular chamber built with stone slabs and covered by an artificial mound of earth. The connection with the exterior world is limited to a narrow passageway. These megalithic chambers, the most primitive buildings found in Europe, can be considered the clearest architectural manifestation of an archetypal internal space. Essentially they represent a pure, almost spherical, chthonic void placed in the center of an earth mound. The corbel-vaulted chamber is emphatically disconnected from the external world, from its time and space, and seems to symbolize the unreachable center of the Earth, the origin of everything. The natural light can penetrate within this chamber only once a year and just for few minutes during the sunrise of the Winter solstice. The earth mound, which encloses the chamber emphasizing the separation between interior and exterior space, is organically connected to the terrain and thus emerges as a natural protuberance. The chamber is hidden within the earth, in this sense we could say that there is almost no exterior.

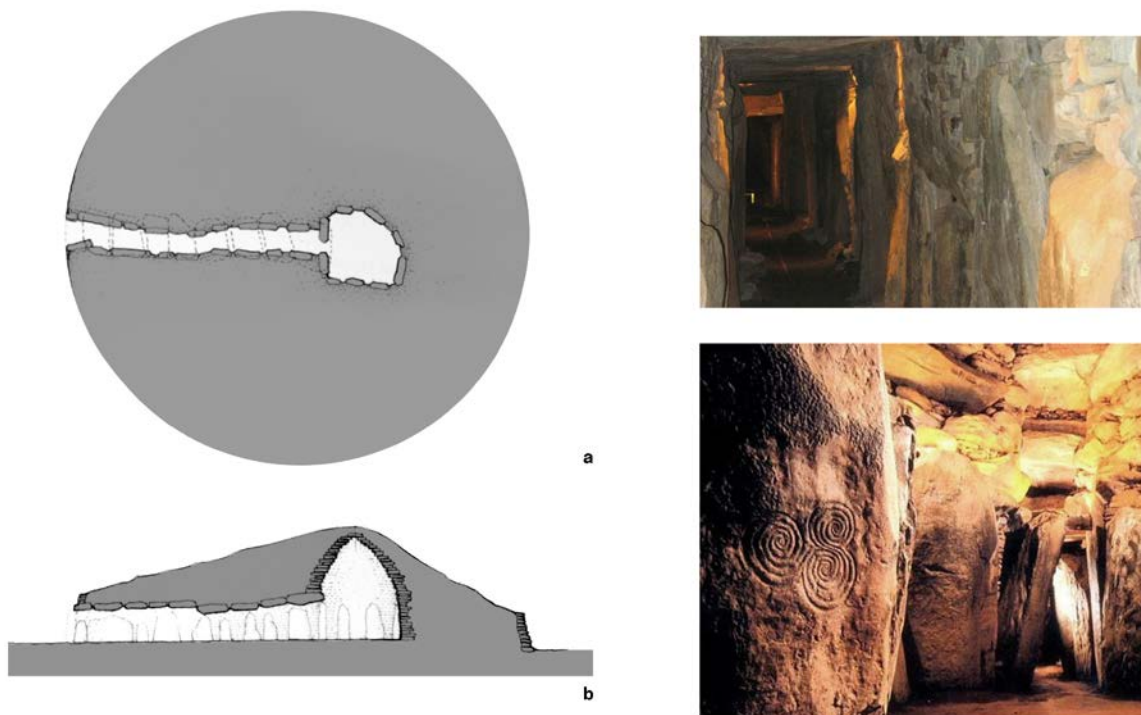


FIG. 5 Megalithic chamber tombs: a) plan of the passage grave on Ile Longue, south Brittany, France, ca. 4100 BC., b) section of the passage grave on Ile Longue. On the right side interior pictures of the megalithic chamber tomb of Newgrange, Ireland, ca 3200 BC.

A more articulated version of this megalithic chamber can be found in the chthonic temples built in Malta during the early Bronze Age⁶. In this case the interior lobed space is composed by interconnected oval chambers built with massive parietal stones. The stone benches found within the temples indicate that the interior chamber was probably used as ritual space and as gathering place for the community. The chambers are internally finished with plaster and covered with a thick layer of earth to form an artificial hill. Even in this case we can interpret the construction of the megalithic temple as an attempt to find a symbolic and spiritual connection with Earth Mother. The correlation between the architectural void in the Earth and the idea of a womb, symbol of fertility, is manifested in the rituals connected to these temples. According to Mark Jarzombek *“the nature of the rituals for which these structures were built has been lost to history. But statuettes of heavysset earth goddesses found in the site are evidence of a cult dedicated to fertility, death and renewal. The deities, some sitting upright, others lying asleep, look not unlike the temples themselves – a squat rounded figure harboring a mysterious inner world.”*⁷

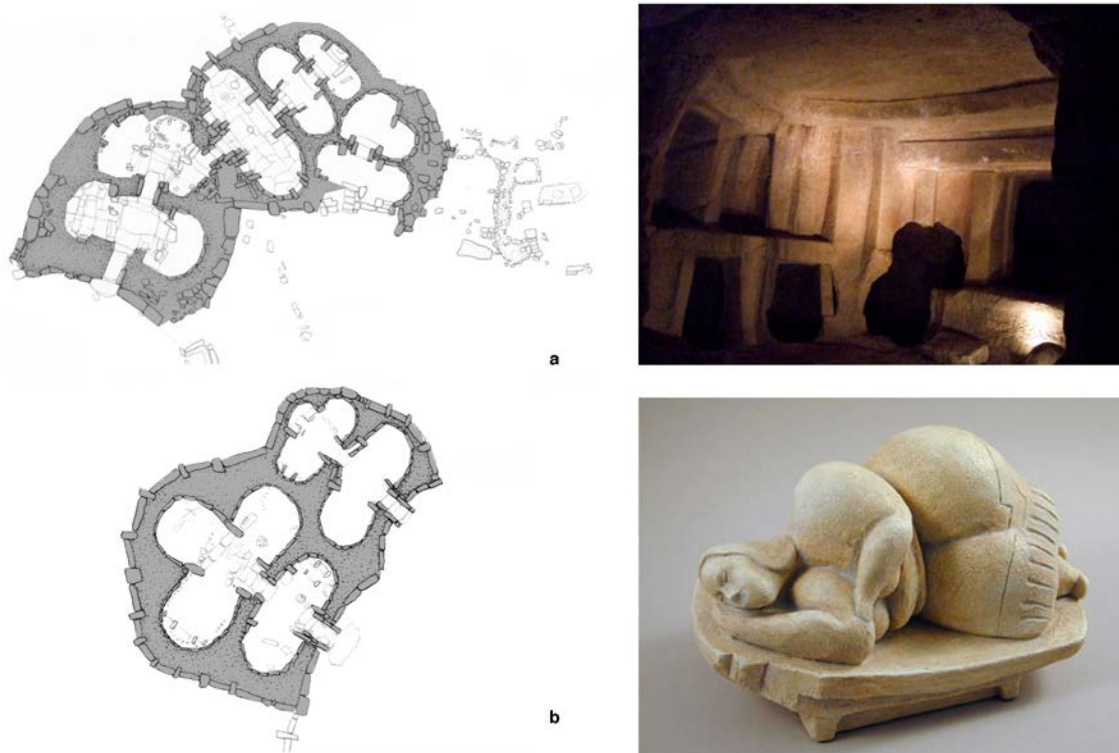


FIG. 6 Maltese temples: a) plan of the temple complex in Ġgantija, Malta ca. 3500 BC., b) plan of the temple complex in Tarxien, Malta ca. 2500 BC. On the upper right side interior picture of a Maltese temple, on the lower right side Maltese statuette of Earth goddess

⁶ Sigfried Giedion connects the development of interior space with Maltese temples. See: S. Giedion. 1971. Architecture and the phenomena of transition; the three space conceptions in architecture. Cambridge, Mass: Harvard University Press: pp. 21-29

⁷ Ching, Frank, Mark Jarzombek, and Vikramaditya Prakash. 2011. A global history of architecture. 2nd ed. Hoboken, N.J.: Wiley: p. 46.

We can summarize here the main attributes of the **chthonic archetype**, which can generally be defined as a primordial manifestation of interior space in architecture. The internal chamber is typically a centralized space, usually curved and lobed and ideally spherical to symbolize the equidistance from the center and the absence of interferences from the outside world. The isolation between internal and external space is emphasized by thick walls or by an earth layer: inside almost no natural light is allowed to manifest the passing time of the exterior world because the chamber symbolically represents an eternal time in which the “origin-birth” and the “end-death” are equivalent. The construction is based on a vaulted structure that organically and gradually connects horizontal and vertical elements. The external appearance is usually not relevant: the internal space has predominance over the exterior.

During the Bronze Age this archetype is repeatedly used in different contexts: we can find it in the Sardinian *nuraghes*, in the Mycenaean *tholos* of the *Treasury of Atreus* and in the Etruscan tombs. But this archetype has also evolved during history into a more formal and abstract prototype for an architectural interior space. The Pantheon in Rome can probably be considered the most refined example of the Chthonic archetype in ancient times. Vincent Scully gives a vivid description of its metaphysical interior space: *“Roman architecture came to enclose space completely, to develop the interior as a controlled universe of its own. In a very Roman way, by concentrating on the interior, you can make the world behave; you can make the world more perfect than it is outside. Therefore, the Pantheon is a great planetarium, with the planets standing around the side and the sun marking them out. It’s like the Roman Empire itself – a web of provinces around a central sea, with the sun above. But it’s more than that. It really is the whole of universal space shaped. When you get in it and walk into the shaft of sunlight, all the rest goes black; you are in the blackness of some vast space where the confines are unknown. Even though the coffers and the columns are heavy and classical, they disappear, and you are brought into a whole universe perfectly shaped by the imagination of Rome.”*⁸

After the Roman period the predominance of the interior space of the chthonic archetype is still evident throughout the entire middle age. Therefore we can recognize a continuous evolution between the Roman Pantheon, the Byzantine Hagia Sophia and the Renaissance centrally planned churches. The centralized plan, the predominance of the interior space over the exterior, the hemispherical dome, the filtered metaphysical light: in all these cases the characteristic elements of the primordial Chthonic archetype are still present, nonetheless sublimated into a more elaborated form and into a more dramatic scale.

NEXT PAGE - FIG. 7 *The Chthonic Space of the Pantheon, Rome*

⁸ Scully, Vincent. 1992. Architecture: The natural and the manmade. *Bulletin of the American Academy of Arts and Sciences* 46 (2) (Nov.): pp. 41-42.



2.3 The tectonic archetype

If the interior space is expressed by the **chthonic archetype**, in the open space of the exterior world we can identify the presence of the **tectonic archetype**. In the tectonic archetype the human activity and intervention is more evident. Architecture's role here is different: the tectonic structure is a more apparent device, it's a communicative tool that intends to express the artificiality of the construction process. The most primitive and basic example of this archetype is expressed by the **stone circles** of the late Neolithic period. This kind of human intervention is not yet architecture because it lacks of any kind of interior space, but it represents the beginning of a rational approach to the world: the stone circles could be defined in modern terms both as a landscape sculpture and as a tool to follow the movement of moon and stars. Stone circles are built positioning stones according to a specific pattern: usually circular, oval or formed by parallel lines. The basic principle of the tectonic archetype is to place and to assemble in an open space freestanding objects which establish a direct relationship with the landscape. The relative position of the objects is based on a rational pattern and communicates a specific human intentionality.

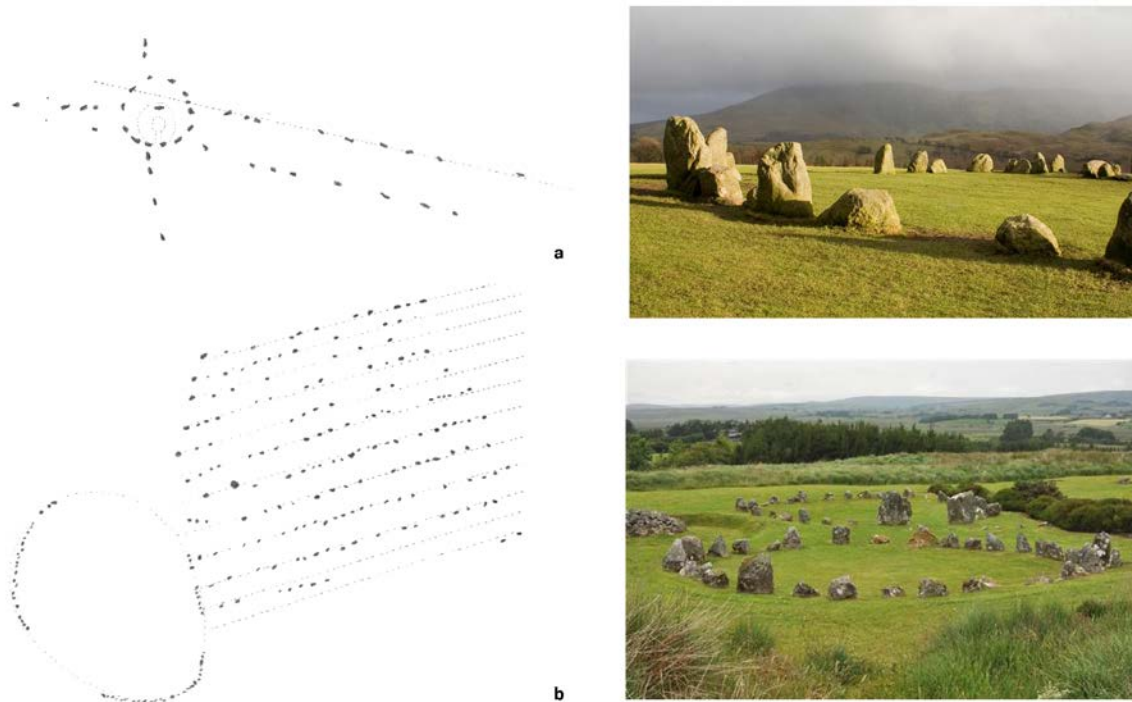


FIG. 8 Stone circles: a) Main circle in Callanish, Scotland 2900 BC, b) circle (cromlech) and alignments of standing stones in Carnac, France 2000 BC. On the upper right side interior picture of Castlerigg Stone Circle, on the lower right side Beaghmore Stone Circles

The artificiality of this act is essentially expressed by the free standing stones, placed vertically in an unnatural position: this act represents the most minimal but at the same time the most radical achievement of man's ability to transform his environment opposing the artificial to the natural. A more architectonic expression of the tectonic archetype can be identified in the *cove*, where three free standing massive monoliths are disposed in a U shape configuration which delimitates on three sides a space open to the sky. But the real fulfillment of the tectonic archetype is reached only with the construction of the *trilithon* and the *dolmen*. Here a horizontal monolith is positioned over the supporting vertical monoliths to cover a space that is partially enclosed but still in direct continuity with the external landscape. Evidently the primary intention here is not the formation of an interior space: the aim is to partially enclose the external space within a rationally constructed frame. The **trilith** can be considered the basic unit of the tectonic archetype: it is basically a post and lintel system whose origin can be arguably traced back to a simpler carpentry assemblage of wooden posts and beams. More abstractly the trilith celebrates men's ability to rationally use their hands, transforming a natural element like a piece of wood into a more articulated system: into a framework in which every piece has a specific formal and structural function.



FIG. 9 a) Cove stones Avebury henge, Wiltshire, U.K., 2600 BC b) Dolmen in Newport, Wales, U.K. c) Trilith in Stonehenge, U.K. 2300 BC

The correlation between the trilithic system and carpentry is evident in the first version of Stonehenge built around 3000 BC. Archeologists have found out that the first circle was built as a timber structure, enclosed by an inner ditch and possibly by an outer bank. The timber posts were up to a meter in diameter at least 10 feet high. The Stonehenge site was rebuilt many times, and this could explain the fact that the same architectural model was easily rebuilt with a different material like stone. But this reveals also an attitude which is

strictly related to the tectonic archetype: an attitude of a dynamic society that continuously challenges the old models, that rebuilds what's old and outdated in new ways, as opposed to the chthonic archetype whose massive structure instinctually expresses the idea of stability and immutable time. According to Mark Jarzombek: *“the Maltese temples only underwent a process of refinement and enlargement, as one might expect from a rather static society, whereas Stonehenge underwent several revisions that significantly and purposefully altered its use and meaning.”*⁹



FIG. 10 Stonehenge a) Plan of Stonehenge, U.K., 1800 BC. On the right side pictures of Stonehenge.

In the early Bronze Age, around 2300 BC, Stonehenge was transformed with the construction of the Sarsen Ring of trilithons, which is still visible today. According to Mark Jarzombek *“the Sarsen Ring was architecture of a particular type, for it was in reality something akin to carpentry in stone. The sanding of the surfaces, and the way in which the stones were fitted together, all seem to imply a direct application of the techniques of carpentry to stone. Possibly the designers were replicating in stone a wooden prototype, or perhaps they were seeking to enhance the power of stone structure by embodying in it the more familiar techniques of woodworking”*¹⁰.

The Greek peripteral temple with its external colonnade is the most refined and sophisticated version of the tectonic archetype. As we will see in the next chapter the origin of the Greek temple can be traced back to the 8th century BC, when a timber colonnade was built around a simple *cella* built with bricks. The transformation of this wooden *posts and*

⁹ Ching, Frank, Mark Jarzombek, and Vikramaditya Prakash. 2011. A global history of architecture. 2nd ed. Hoboken, N.J.: Wiley: p.47.

¹⁰ Ibid., p. 49.

lintel system into a more durable trabeated colonnade would happen one century later. The same clarity and expressivity of the tectonic structural system articulated in the Doric temples can be found again, afterwards, probably only in the modern period. Le Corbusier's Maison-Domino represents the most iconic example of the reiteration of the tectonic archetype, even though it is probably with Mies van der Rohe's projects that the a modern version of the tectonic framework system is expressed in the most essential and clearest way.

The trilithic-tectonic system has a magnetic presence within nature, it almost declares itself as artificial. The clearly unnatural static system, the evident opposition between vertical and horizontal elements, the artificiality of the right angle, the structural tension expressed by the lintel and the apparent instability of the space generated under the trilith: all these elements contribute to the perception of the trilithic system as a human artificial creation, a man-made framework through which nature is observed. In fact the trilithic framework is produced to be observed frontally and from a certain distance: it is one of the reasons for which it needs to have an exterior open space around. Another reason is that the tectonic archetype is meaningful and expressive only when is placed in contrast with the natural environment.

If on one hand the interior space of the **chthonic archetype** generates a magnetic concentrated space that leads towards the center, a space that must be observed from within and that completely surrounds the observer, the **tectonic archetype** generates a space that seems to be originated from the rhythm of its abstract grid, a space that emanates from its tectonic framework towards the open exterior space. To fully appreciate its influence and the contrast between its presence and the natural landscape, the observer must be in the open space looking at the building as an object in relationship with its surroundings. Furthermore, when the tectonic archetype is observed from outside it appears as an almost transparent object because nature behind it remains partially visible, filtered through its rational structure.

At this point we can fully realize the paradox of the relationship between the chthonic and tectonic archetype with nature. The *chthonic archetype* is in essence a void space completely detached from the external natural environment, from the sun, from the wind, from the rain. It's a space where no kind of vegetation could evidently grow. It is a space that negates nature. However, as we have previously seen, outside it appears in direct continuity with nature: externally it seems part of it. On the contrary the *tectonic archetype* is directly placed within nature and it's formed by objects placed by humans in a open landscape: stones placed on a grass field, between trees and under the sunlight. But the aim of these objects is to express their artificiality and extraneousness from nature: they are intended to be an evidently human artificial expression.

NEXT PAGE - FIG. 11 On the Left side: Evolution of the "chthonic archetype". On the Right Side: Evolution of the "tectonic archetype".



a



e



b



f



c



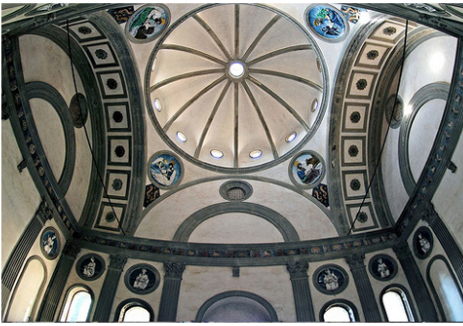
g



d



h



e



i

2.4 Chthonic vs. Tectonic archetypes, main differences

Up to this moment, I have tried to delineate the main characteristic of the two archetypes, both of which express in the best way the difference between interior and exterior space in relation with architecture. Needless to say, the buildings previously chosen to exemplify the two archetypes represent only their most clear and radical expression and are not intended to stand for the entire architecture production of their period. It is also evident that most built architecture is a composite and combined expression of both *chthonic archetype* and *tectonic* archetypes in various measures. However, as I will try to show later on, we can clearly individuate historical periods in which one type is predominant over the other. But before analyzing these periods, I would like to summarize the main difference between the two archetypes.

If we compare the chthonic and the tectonic archetypes we can delineate and oppose their main characteristics as a declination of the basic antithesis of *interior vs. exterior space*: heavy vs. light structure, dark vs. bright, vaulted vs. trabeated, masonry vs. free standing columns, round vs. straight line, organic vs. artificial, female vs. male, sphere vs. grid of points, continuous vs. discrete, unified vs. articulated, metaphysical vs. physical, eternal vs. instantaneous, conservative vs. progressive and so on...

One more noteworthy differentiation can be found in the realm of the relationship between architecture and the other artistic expressions. I have already emphasized the fact that the most primordial expression of the **tectonic archetype** is very close to what we might call a *landscape sculpture*. Of course we cannot know if behind the construction of stone circles there was an artistic intentionality. But at least we can say that the simplest versions of the tectonic principle, such as the freestanding *monolith* and *trilith*, have undoubtedly a strong sculptural quality. The relationship between the columns of the classical orders and human sculptural figures has already been analyzed in many architectural treatises: the use of *cariatrides* can be recalled here as the most evident manifestation of this connection. What is more interesting is that the act of producing a tectonic structure is strictly close to carpentry production, and more essentially to the instrumental direct use of hands, which is necessary also in sculpture.



FIG. 12 *The correlation between Tectonic Architecture and sculpture is evident in the combination of architecture and sculpture of the Doric Temple: Detail of the frieze of the Parthenon, Athens (438 BC)*

More generally we can say that the best location for sculpture is in the open exterior space, where the sunlight can emphasize the shadows, and where the sculpture can be free standing like in the case of the tectonic archetype. Façades are another typical location for sculptures because they can contribute to the communicative role of the building exterior. In this sense the Greek Doric temples, with their plastic pediments and friezes, might be considered the best example of the possible symbiosis between sculpture, external space and tectonic architecture.

On the other hand we can find a similar connection between the **chthonic archetype** and painting. The origin of painting dates back to more than 30.000 B.C. and thus probably much earlier than any architectural expression, but its first known expression can be found in the natural chthonic space of the *Grotte Chauvet* in France. The most practical explanation for this location is that painting, for the instability and vulnerability of all natural painting mediums, needs to be protected from the external effects of sun, wind and rain. A more suggestive explanation is that a possible source of inspiration for the paintings in the *Grotte Chauvet* could be found in the flickering shadows projected by a fire or by torches on the surfaces of the cavern, but this interpretation might be influenced by the classical idea, suggested by Pliny the Elder's in his *Natural History* (circa 77-79 AD), that painting originated in tracing lines around the human shadows. What is sure is that painting needs a support, a wide surface, protected from the direct sunlight, and that any kind of large

interior space seems to be an adequate place to meet these needs. Additionally, as I have earlier described, the essence of the chthonic archetype is to generate a metaphysical space disconnected from the external reality, a space of subjectivity and imagination: these qualities have many affinities with conditions required by the act of painting. If on one hand sculpture needs to be freestanding to be observed from multiple perspectives as in the case of the tectonic prototype, on the other hand painting requires a single point of view: therefore the centralized interior space of the chthonic archetype perfectly suits the needs. Moreover the chthonic interior void can be considered as a space of projection, a space that allows the representation of a metaphysical reality. The correlation between interior space and the invention of perspective has been debated for long time and it's difficult to state which one comes first, and which one has influenced the other. What is sure is that through the invention of perspective painting becomes a way to create imaginary spaces, which can contribute to modify the perception of the interior space. Fresco technique, especially in relation with the vaulted space or the domes of the chthonic archetype, can be considered the most explicit expression of the relationship between interior space and painting.

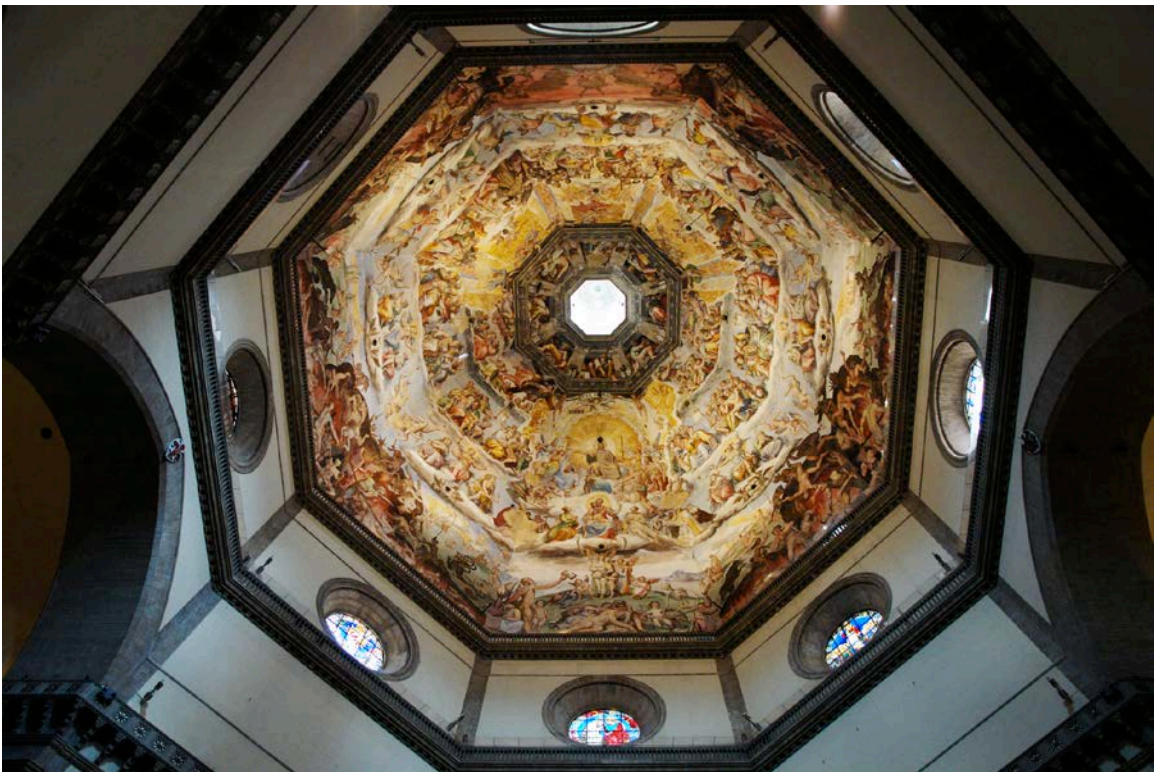


FIG. 13 The correlation between Chthonic Architecture and painting is evident in the frescoes and mosaics of Roman, Byzantine and Renaissance Architecture: "Last Judgment" fresco in the dome's interior of the Cathedral of Florence, painted between 1572 and 1579 by Giorgio Vasari and Frederico Zuccari.

The idea and maybe also the suspicion that the chthonic archetype is a space of imaginative projection and representation, as opposed to the external true reality, can be traced back to the notorious *allegory of the Cave* in Plato's *"The Republic"* (BOOK VII). Here the progression from the dark interior space of the cave to the brightness of the open-air external space symbolically represents the advancement of Knowledge as a sort of *enlightenment* process. In the chthonic space of cave the prisoners don't see the reality but only a projection of it, since reality can be experienced only outside, under the sunlight. The fire in the cave casts shadows that are perceived as real by the prisoners, whereas they're only a misleading representation. In Plato's analogy there are already all the main elements of the dialectical opposition between chthonic and tectonic archetypes such as: cave vs. open space, dark vs. light, appearance vs. reality, representation vs. truth. It's also evident that Plato's epistemological preference is for the allegorical external space outside the cave, which is considered as the only condition that allows the achievement of truth. Both Plato's philosophy and the evident predominance of exterior space and tectonic archetype in Greek architecture are therefore symbolically linked by this allegory, which is highly influential in western culture.

The metaphor of the cave is also strictly related to Plato's aesthetic principles: paintings and poems, exactly like the shadows in the cave, are considered by the Greek philosopher as fallacious imitations of objects that exist in the real exterior world and therefore they represent a dangerous illusion. In Plato's dialogue "Phaedrus" (275d) Socrates says: *"You know, Phaedrus, that is the strange thing about writing, which makes it truly correspond to painting. The painter's products stand before us as though they were alive, but if you question them, they maintain a most majestic silence. It is the same with written words; they seem to talk to you as if they were intelligent, but if you ask them anything about what they say, from a desire to be instructed, they go on telling you just the same thing forever"*. Plato, to exemplify the deceptiveness of painting, explains in "The Republic" that there are three kind of beds (BOOK X): the bed that exists in nature which is created by God, the bed which is the work of the carpenter, and the bed which is reproduced by the painter. In this sense the carpenter (an allusion to the tectonic principle?) is more close to God or to the Truth because he makes with his hands a real bed, whereas the painting of the bed made by the artist is *"removed from truth in the third degree"* because it imitates neither truth, which is represented by God, nor reality, which is related to the carpenter's work, but only a visual appearance. A painting is also misleading because it depends on the subjective point of view chosen by the artist: *"you may look at a bed from different points of view, obliquely or directly or from any other point of view, and the bed will appear different, but there is no difference in reality."* The perspective representation in painting is therefore considered by Plato as a limited representation of reality based on the subjectivity of the artist. A more definitive statement is expressed later: *"This was the conclusion at which I was seeking to arrive when I said that painting or drawing, and imitation in general, when doing their own proper work, are far removed from truth, and the companions and friends and associates of a principle"*

within us which is equally removed from reason, and that they have no true or healthy aim. Exactly. The imitative art is an inferior who marries an inferior, and has inferior offspring.”

We have seen before the connection between painting and *chthonic archetype* as well as the relationship between sculpture and *tectonic archetype*. It's noteworthy that in his critical aesthetic judgments Plato alludes less frequently to sculpture than to painting. We could suppose a preference of Plato for sculpture since in the dialogue "Meno" (91d) the sculptor Phidias is said to be "*so famous for the noble works he produced*": this is the warmest judgment given by Plato to any artist. In Plato's aesthetics, if on one hand painting is weakened by the distortion provoked by perspective, on the other hand sculpture maintains the true proportions based on the real measurements of the object. In the dialogue "Philebus" (56b) there is a clear distinction between arts that preserve actual measurements and mathematical principles such as architecture, shipbuilding and carpentry, as opposed to those arts that distort the measurements like painting. This is also the distinction between true "proportions" and the misleading "perspective". In this dialogue Socrates says: "*But the art of building, I believe, employs the greatest number of measures and instruments which give it great accuracy and make it more scientific than most arts...*" And answering then to Protarchus who asks "*In what way?*" he says: "*In shipbuilding and house-building, and many other branches of wood-working. For the artisan uses a rule, I imagine, a lathe, compasses, a chalk-line...*", and to conclude "*Let us, then, divide the arts, as they are called, into two kinds, those which resemble music, and have less accuracy in their works, and those which, like building, are more exact.*" Therefore in Socrates' words architecture is considered as a scientific and rational discipline because it is based on arithmetic principles and exact measurements. Moreover from these words we can understand how much architecture in Ancient Greece is an expression of the tectonic principles since it is directly related to shipbuilding, carpentry and "many other branches of wood-working". We can therefore consider the allegory of the Cave and the critique of painting as two interconnected aspects that are related to the Greek dismissal of the *chthonic archetype* and to the preference for the *tectonic* one.

Greek architecture can be considered a good starting point to analyze the evolution of space in Western architecture. If there can be little doubt that exterior space and "tectonic" archetype are predominant in the classical Greek architecture, we could wonder how and why interior space and "chthonic" architecture become again predominant from the Roman period probably until the late Renaissance. I think that it is reasonable to say that the *chthonic archetype* and the *tectonic archetype*, and thus the predominance of either interior or exterior space in architecture, are alternately recurrent throughout history. Therefore it does not make sense to express the unfolding of history as a linear evolution or in terms of unavoidable advancement from one archetype to the other. This dissertation is an attempt to define the different periods, in ancient and modern European architecture, in which one kind of space is predominant over the other. The aim is to propose a possible interpretation for the change from one model to the other.

2.5 Chthonic and the tectonic archetypes throughout history

Before trying to propose a possible interpretation of the paradigm shifts that might have determined the prevalence throughout history of either the interior or exterior space in relation to architecture, I would like to outline here a general periodization which seems to recur in the analysis of some architecture historians such as those of Sigfried Giedion, Christian Norberg-Schulz and Vincent Scully.

If classical Greek architecture represents one of the most evident and clear expressions of exterior space and tectonic archetype, in the Hellenistic period we can individuate the beginning of a paradigm shift that will be completed by Roman imperial architecture. With the new use of concrete and the development of long span vaulted spaces, both interior space and Chthonic archetype become predominant again. Buildings such as the Pantheon, the basilicas, the large thermal complexes represent the most vivid examples of this paradigm shift. This relevant transition will be carefully analyzed in the next chapters with an attempt to propose a possible interpretation. For now it's enough to consider that the predominance of interior space is still recognizable, even though in progressively shifting forms, during the Byzantine period, throughout the middle age and until the end of Renaissance. To have a glimpse of this continuity it's probably enough to keep in mind the uninterrupted process of development of the large interior space of the Roman civic basilica through the early Christian basilicas and the medieval Cathedrals, up to the Renaissance centrally planned churches. We can arguably say, without oversimplifying such a complex and long time span too much, that during this long period the effort of architects has been mainly directed towards the construction of churches, monasteries and huge basilica complexes, in which the interior centralized space must be considered in relation to the spiritual and political importance of Christian religion during this period. The emergence of the Palazzo typology during the renaissance and the progressive development of civic architecture could be considered the beginning of a new transition. But it's probably during the late baroque period that we can identify a process similar to the Hellenistic one, but inverse in its result, which determines a new paradigm shift and a change from the interior space of the *chthonic* archetype to the exterior space of the *tectonic* archetype. This new paradigm shift, that could be chronologically situated around 1750, marks the beginning of a new predominance of the *tectonic archetype* and ideally reconnects the Greek period with the beginning of what is traditionally called the modern era.

To recapitulate this periodization we can say that exterior space is predominant from the archaic Greek period until the Hellenistic period, Interior space becomes prevalent between the Roman and the Baroque period, whereas from the Neoclassical period to the 20th century exterior space seems to be again the main focus of architects. Therefore we can individuate three main phases and two main paradigm shifts, which corresponds approximately to the Hellenistic and the Baroque periods.

Giedion is the first historian who has clearly identified the importance of space in relation to architecture, recognizing the relevant historical shift from exterior to interior space between Greek and Roman Times, as well as the return to exterior space after the end of eighteenth century. In his canonical history of the modern movement, *"Space, time and architecture"*, he defines these three phases as "three space conceptions". According to him: *"It is easier to understand what is happening in architecture today when it is set into a wider frame of architectural reference. To summarize briefly: There are three stages of architectural development. During the first stage - the first space conception - space was brought into being by the interplay between volumes. This stage encompassed the architecture of Egypt, Sumer, and Greece. Interior space was disregarded. The second space conception began in the midst of the Roman period when interior space and with it vaulting problem started to become the highest aim of architecture. The Roman Pantheon with its forerunners marks its beginning. During the second space conception, the formation of interior space became synonymous with hollowed-out interior space. Alois Riegl was the first to recognize this. Despite several profound differentiations, this second space conception persisted throughout the period from the Roman Pantheon to the end of eighteenth century... The third space conception set in at the beginning of this century with the optical revolution that abolished the single viewpoint of perspective. This had fundamental consequences for man's conception of architecture and the urban scene. The space-emanating qualities of free-standing buildings could again be appreciated. We can recognize an affinity with the first space conception. Just as at the beginning, architecture is again approaching sculpture and sculpture is approaching architecture."*¹¹

If we accept this very general and diagrammatic subdivision, even acknowledging the fact that it cannot explain all the case-by-case variations and the possible contradictions, the most instinctive reaction is wondering why some periods are predominantly characterized by either interior or exterior space, and why the architectural sensibility changes so dramatically throughout history. And, furthermore, what do these changes mean in relation to social and political transformations or even cultural evolution?

These two paradigm shifts are specifically analyzed by Giedion in his last book *"Architecture and the Phenomena of Transition: The Three Space Conceptions in Architecture"* (1970), and explained, almost in a "semperian" way, as the result of the changes in materials and production processes. Therefore the transition from Greek exterior space to the Roman interior space is explained as the effect of the invention of "concrete" as construction material. According to Giedion *"The true greatness of the Romans lay elsewhere: in the creation of interior space. It was their inventions and new techniques of construction that brought about the differentiation of interior space, and it is the purpose of this book to describe how this occurred and how it developed."*¹² Similarly the transition from internal to

¹¹ Giedion, S. 1967. *Space, time and architecture; the growth of a new tradition*. Charles eliot norton lectures ; 1938-1939. 5 , rev a enl ed. Cambridge: Harvard University Press: p. lv.

¹² S. Giedion. 1971. *Architecture and the phenomena of transition; the three space conceptions in architecture*. Cambridge, Mass: Harvard University Press: p. 3.

external space during the industrial revolution is expressed as the result of the new iron constructions of the nineteenth century.

The hypothesis of this dissertation is that these paradigm shifts cannot be exhaustively explained within architecture discipline and considering only variations, transformations and technological innovations of individual architectural objects. I think we have to look, instead, to a more general context and to the larger scale transformations of the urban fabric. To do so we have to avoid the typical “object fixation” of modern architecture and modern history, trying to consider the evolution of architectural types into the wider and more complex urban context. Rowe's and Koetter's *Collage City*, published in 1978, is probably the first historical analysis that has fully acknowledged urban space, considering architecture history through an innovative examination of the transformation of the urban fabric. For the first time they have analyzed buildings as naked volumes, considering the relationship with each other in context of the combination of urban fabric and urban space, therefore giving the same value to solid and voids.

Using Rowe's approach, the evolution of architecture history appears in a different way: modernity represents not only the transition from the interior space of chthonic archetype to the exterior space of the tectonic archetype but, more importantly, the progressive dissolution, disaggregation, fragmentation and atomization of the “traditional” and dense urban fabric. Furthermore the two paradigm shifts of the Hellenistic and Baroque periods represent from this perspective the beginning and the end of the traditional dense urban fabric in Europe, its progressive processes of formation and dissolution.

If therefore modern architecture historically represents the progressive disaggregation of the traditional articulated urban fabric, it's exactly from the urban space of the Greek agora that I would like to start, in the attempt to narrate an inverse “history of modernity”: the process of formation of the traditional urban fabric which coincides with the transition from the external space of Greek architecture to the internal space of Roman vaulted monuments. This architectural transformation can be understood only if it is considered within the larger context of the progressive modification of the urban fabric, analyzing the change in the relationship between buildings, the increasing density and the variable proportion between solid and voids in the city. Because as Colin Rowe says in *Collage City*: “Ultimately, and in terms of figure-ground, the debate which is here postulated between solid and void is a debate between two models and, succinctly, these may be typified as acropolis and forum.”¹³

Gideon's chronological subdivision of the “three space conceptions” is considered here as a valid and meaningful categorization. However the intention of this study is to expand the analysis of the transitional phases between these periods, taking into account the urban fabric transformations. From this analysis it will emerge that the shift from Greek tectonic architecture and external space to Roman chthonic architecture and internal space is much more incremental and progressive. The same can be said for the inverse transition from

¹³ Rowe, Colin, and Fred Koetter. 1978. *Collage city*. Cambridge, Mass.: MIT Press: p. 83.

Renaissance internal space to neoclassic and modern preference for external space. Even if Giedion's interpretation of these changes, as the result of new material and technological innovation, cannot be confuted, through a larger scale analysis it is possible to show that the different architectural space conceptions evolve progressively and incrementally in relation to the urban fabric transformations. From this point of view architecture history doesn't appear anymore as the struggle between two antithetical archetypes, but, probably in a more complex way, as the progressive transformation from one another which happens through the urban fabric modifications. Thus the two intermediate periods, the Hellenistic (between Greek and Roman) and the Baroque (between Renaissance and Neoclassicism), have an important and relevant role in this incremental process. From an urban perspective it's possible to consider the urban enclosure of the Hellenistic agora and Roman forum, as well as the enclosures of the Renaissance and Baroque Squares, as a necessary transitional element in the shift between internal and external space.

More generally we might argue that it is through the urban progressive transformations that some apparently revolutionary innovations are possible in architecture and that it is in the interaction between different buildings in the urban space that typological evolutions happen. In abstract terms we can say that new ideas and discoveries happen through cultural evolution and that cultural evolution happens through the interaction of individuals. No idea, invention or advancement could happen in the isolation of an individual existence. The same can be said about architecture: new typologies, technologies and even styles emerge when an abstract prototype is adapted to the urban context, when it reacts to existing buildings, when it tries to innovate previous solutions and when ideas are combined to create a different solution. Thus urban space, exactly like the more abstract entity called "culture", is the medium in which architecture innovations happen as a result of the interaction between individual and singular buildings with other buildings and through the interaction of their architects. A history of "architectural objects" without the urban context is like a history of "singular ideas" which doesn't consider the role of cultural evolution with its multiple influences, or is like a history of "big events and big names" which does not acknowledge multiple factors and social interactions.

To have a glimpse of the possible implications of this different approach to architecture and urban design history, I would like the reader to ideally follow me in a quick "travel through time". We are going to start from Greece keeping in mind the indissoluble correlation between the tectonic classical system of "columns and entablature" and the external space that the building is facing. A correlation which becomes evident as soon as we have a look at a Doric temple standing in the middle of the landscape. Its massive and repetitive columns are undoubtedly facing the exterior space, and have a strong, almost magnetic, relationship with it. If we could imagine being one of these Doric columns, almost taking the role of a *caryatid* or a *telamon* (the male counterpart), we would face the external space in front of us, witnessing its change throughout history.



FIG. 14 The relation between the Doric temple and the exterior space: the temple faces the landscape and the outside space: Temple of Concordia, in the “Valle dei templi” (5th century BC.), Agrigento, Sicily.

In the 6th century B.C. we could be part of a temple colonnade in a sanctuary of Greece or Magna Grecia. From this position we would be probably facing a beautiful landscape: a hill covered with olive trees or a maybe a gulf of the Aegean sea. On the slight slope, placed under our feet, altars and small “Treasures” are increasingly built throughout history to commemorate victories, nonetheless maintaining the predominant natural aspect. One century later we might be part of a building in an agora. We would still see in front of us a large open space with trees and many roads intersecting, but around us the landscape would be more urban. The space in front of us would be really crowded: people are now selling all kinds of commodities and other people are assembled to discuss different kind of topics. We can hear from here the typical sounds of a crowded market and we can perceive the smell of the food that is sold there.

Later on, during the Hellenistic period, for the first time we would see in front of us some columns which are so similar to ourselves: that’s because they are part of the same building. Therefore we would realize being part of a larger and more complex building, probably a colonnaded “stoa” articulated in a “L shape” or “U shape”. It would be almost like staring at our arms for the first time, recognizing that they are part of our body. The space in front of us would be probably smaller, more crowded, and much more urban: indeed, for the first time, the ground in front of us is entirely paved. The merchants are now selling their products behind us, under the roof of the Stoa which we are supporting, because here they are partially separated from the agora and protected from the rain and the sun. In this same period, we might also be in Roman Italian peninsula, within a newly built Forum. In this case the colonnade of which we are part, would completely enclose the space in front of us. Thus we would perceive, probably for the first time, that the space in front of us is not completely external: it is part of the built complex of which we are also part. On one side of

the forum we would see a temple built on a high podium. The space of this forum is still very crowded: there are many people, statues, and rostra. Even if there are speakers addressing the crowd, the environment seems to be more quite and less noisy: we cannot see in front of us horse drawn carts because they are not allowed to enter in the Forum and the laud merchants are now moved to a separate building because blood-letting products, such as meat and fish, are not allowed and moreover mayhem is prohibited. Even if the market doesn't take place anymore in the forum there are still numerous people gathered here because the portico that we compose is connecting a lot of different buildings: the basilica, a new enclosed space for the market called *Macellum*, the *Comitium*, the civic buildings and the public offices.

Furthermore, a few centuries later we would recognize that the columns of the portico that we are facing are even more close to us, and that the space in front of us is even more intimate. The light is now more filtered, and if we looked above our Corinthian capitals, we would see that the space we are fronting is covered by a large span wooden ceiling. At this point we would recognize being in a Roman public basilica, and we would be probably shocked to realize that we are now placed within an interior space. Our original condition of being a column of a Doric temple facing the exterior landscape is now completely subverted: we are within a building. But it would be even more surprising realizing that without seeing the wooden ceiling above us, we would have never realized being part of an interior space: undeniably all the transformations that have changed the initial condition of being a Doric column of a Greek temple, have been so incremental and so progressive that they could only be perceived as part of a continuous uninterrupted progression: an unbroken process that has completely subverted the initial condition. It is almost as if we had walked on the continuous surface of a Möbius strip, realizing after a while that we have “incrementally” moved from the external surface to the internal surface, nonetheless remaining on the same strip surface and walking in the same direction.



FIG. 15 The “shifting” view from the colonnade throughout history: from exterior, through enclosure, to interior space. On the left side: View of the landscape from Segesta temple, Sicily (5th century B.C.) In the middle: View of the enclosures of the “Palestra” and View of the Forum in Pompeii (2nd century B.C.), On the right side: view of the Basilica of Saint Mary Major, Rome, (5th century A.D.)

Likewise if we continued walking on this historical “Möbius strip” we would recognize that during the middle age we would still be facing the internal central nave of a Basilica, a Cathedral or a Church, with their metaphysical light and their undisturbed silence. During the Renaissance and the Baroque period we could be facing the enclosed space of a courtyard in a ducal palace or maybe the wider enclosure of a unified square. Progressively during the neoclassical and modern period the urban fabric in front of us would start to fall apart into smaller autonomous buildings and it would finally dissolve into the landscape. On the contrary natural elements would appear again in front of us. At the beginning some trees planted in the open square that we are facing, later on an English romantic garden and finally we would be surrounded again by a wild nature. At this point we would realize being again on the external surface of the “Möbius strip”, probably on the same point in which we had started this ideal trip, taking the role of a Doric column which is facing the Mediterranean landscape. Here we are still fronting a completely external space and we are still surrounded by wild nature, exactly as it was almost 2500 years earlier.



FIG. 16 The “shifting” view from the colonnade throughout history: from interior, through enclosure, to exterior space. On the left side: view of the central nave of Trani Cathedral, Trani (1160s A.D) In the middle: View of the enclosures courtyard of the Palazzo ducale by Luciano Laurana (1460s B.C.) and Piazza ducale di Vigevano by Antonio Filarete (1490 A.D.) On the right side: view from the pilotis of Villa Savoye by Le Corbusier, Paris, (1931 A.D.)

In the next chapters I will try to unfold this historical “Möbius strip”, with the attempt to understand the progressive changes between exterior and interior space through the analysis of the evolution of urban fabric and urban space. This analysis might show that this process is much more linear and continuous than what it might apparently seem and that the *urban enclosure* should be necessarily considered as a third *space conception*, placed between exterior and interior space, an urban “intermediate archetype” that allows the transition from the tectonic to the chthonic one and vice versa. What is evident at the end of this “imaginary trip”, is that the tectonic system generated by Greek architecture, which is more generally called “classical order”, represents an indissoluble and uninterrupted founding principle of western architecture, even considering its various formal expressions

throughout history. And we might arguably say that this is true even when this “tectonic” system is less evident, like in the period in which interior space predominates. The real difference is that between the Roman and the late Renaissance periods the “classical order” is less apparent because it’s expressed within the buildings and directed towards the interior space. Thus we can say that the rational clarity of the classical order doesn’t disappear during the “dark” middle-age as it might apparently seem: it is only internalized and made more metaphysical.

Furthermore we can say that the most relevant function of the “classical order” in architecture is to express a precise character and directionality, similarly to our face. The tectonic system formed by columns and architrave is evidently and indissolubly related with the space in front of it. Thus if we follow its position throughout history we can read it almost as an arrow which indicates what is the predominant space in that specific period, allowing us to recognize if it’s facing an exterior space, an urban enclosed space or an interior space. The classical order is therefore like a “Möbius strip” that connects the entire western architecture history, facing alternatively interior, enclosed or exterior space through a nonetheless continuous and linear path.

3

GREEK ARCHITECTURE

The temple and the stoa as isolated objects in the landscape

If the intention of this dissertation is to describe the formation process of the urban fabric of the “traditional city”, Greek architecture represents a relevant and meaningful starting point. On one hand because the Hellenic space conception is in some way antithetical to it and paradoxically more close to the modern condition of isolated volumes in a open space, on the other hand because the autonomous buildings conceived by Greek architects around the 7th century BC, such as the Doric temple and the stoa, can be considered as basic units which are going to compose, during the following centuries, a more complex system through an incremental process of transformation, re-orientation, incorporation and densification. This process leads to the progressive enclosure of urban space and to the formation of the articulated urban fabric of the so-called “traditional city”. If we compare the “traditional city” to a language, with its complicated grammatical structure and its continuous evolution through time, we can think of the Greek *temples* and *stoas* as the basic units of that language: the words that will be incrementally transformed and assembled into more elaborated and articulated discourses. The intention of this chapter is to analyze the genesis of these basic “words” to be able to follow their evolution through time. But before doing this I would like to briefly analyze the significance and the relevance of the Greek Temple, and specifically of the classical “order” composed by columns and architrave, because this can help to explain the overall intention of this dissertation.

3.1 The Greek Temple and the Stoa

As we have previously seen, the Greek Doric temple represents the clearest manifestation of a tectonic archetype in ancient times, and its architectural conception is inseparable from its condition of being placed in an open space and in juxtaposition with the natural landscape. In this chapter the main focus will be on the exterior space that surrounds the Doric temple and the intention is to analyze its gradual transformation when multiple buildings are progressively assembled around it. I would like the reader to perceive the similarities between the modern and the Greek space conceptions, because from this perspective the transformations that happen from the Classical Greek period to the Roman Imperial period can be considered the inverse of the process that has dissolved the “traditional city” between 1750 and 20th century. Consequently, analyzing the Greek isolated buildings and following their evolution through the enclosed space of the Roman Forum up to the interiorized space of the early Christian Basilicas, is almost like to start from modern isolated buildings and, moving backwards in history, tracing their origin back to the neoclassical isolated pavilions and further backwards through the baroque enclosed squares to the interior space of Renaissance Churches.

The essence of the Doric Temple is to be a magnetic and sculptural object “mythically forged” by the hands of the architect to symbolize the characteristics of its cult deity and to be observed in the landscape. Its visual presence is amplified by its tectonic qualities, which are materialized in the rhythm of its external tridimensional framework composed by columns and architrave. The origin of this rational system, which is commonly called classical “order”, is the most striking innovation of Greek architecture.

All the canonical architectural treatises have insisted in the relationship between the classical column and the human figure. The column, similarly to the primordial monolith, is basically a vertical element opposed to the horizontal landscape. If we exclude the palm tree, which has had a direct and evident influence in the genesis of the Egyptian column, the human body represents the most diffused and accessible example that might have been found in nature and taken as a model for a column. The human body with its standing posture is in itself an abstract, almost unnatural, vertical element. Furthermore the human vertically standing position symbolically represents a revolutionary event in men’s evolution: the event that has substantially distinguished men from animals, marking a completely different, almost “un-natural”, evolutionary process.



FIG. 17 The human body represents a primordial model for the tectonic archetype. On the left: a prehistoric Stone circle. On the right: "Another Place", a contemporary sculpture installation by Antony Gormley

The increasing self-consciousness and the emergence of the human individual figure, considered as an autonomous entity abstracted from nature, is undoubtedly one of the founding principles of Greek art. The first expression of this radical event can be found in Greek epic poetry such as the Homeric poems, whose written version can be dated around the eighth century BC. The most remarkable aspect of Homeric poetic narration is the emergence of the human figure of the "Hero", a self-confident human being whose actions are memorable and mythical. Even though Greek gods are usually thought to mediate between natural and human events, the individual hero appears as an independent figure who speaks and acts autonomously. This is certainly innovative: it is like if a human being, with his firm presence and his potential acts, is being perceived for the first time from the outside and is being likewise idealized and represented in a myth. This can be considered the beginning of the emergence of the individual being in contraposition to nature: a self-conscious process, which is later on objectified and crystallized in the materialization of his body in sculpture. We can compare this process to the emergence of the self-conscious individual citizen in Greek society, which is a necessary step towards a democratic political system. The "hero cult", which is materially manifested in the practice of venerating bodies or body-parts supposed to "embody" epic and tragic heroes, is a seminal aspect of Greek culture and has a strong correlation with the rise of the Greek polytheistic religion, a religion in which gods are represented acting and behaving like humans.

It is noteworthy that Greek polytheistic religion emerges out of the contraposition between Chthonic and Olympian Gods: the "Chthonic gods" are supposed to come from the underworld and represent wild nature, fertility, darkness and irrationality whereas Olympian Gods represent clarity, order and rationality.¹⁴ This distinction is relevant

¹⁴ American scholar Camille Paglia argues that "Chthonic gods" represent femininity, whereas "Olympian Gods" represent masculinity. Moreover she argues that progress is based on the revolt of

because it can be compared, in architectural terms, to the difference between chthonic and tectonic archetypes, and, moreover, it can help to understand the predominance of the tectonic principles in classical Greece. Nietzsche in his influential book *"The birth of tragedy"* has interpreted the origin of Greek drama as the result of the dichotomy between the Dionysian and the Apollonian. Dionysus is the god of wine and represents chthonic forces, wild nature, unrestrained aesthetic and rhythmic music. On the contrary Apollo is the typical Olympian god and represents sunlight, sight, form and plastic arts. The Greek tragedy, according to the German philosopher, emerges from the antithesis between the Apollonian and the Dionysian artistic impulses, and is generated in the moment in which a balance between "dream" and "wine hallucination" is achieved. The protagonist of the drama, the tragic human "hero", usually struggles to make an "Apollonian" order appear in the "Dionysian" inexplicable chaos. This is the real essence of Greek tragedy. Therefore the emergence of the hero as a human figure is related to the appearance of the Apollonian rationality and to the reaction against the "Dionysian" wild nature.

In the Greek tragedy, the music of the "chorus", expressed by the rhythm of the "Dithyramb", is considered by Nietzsche as an archaic Dionysian element whose origin can be traced back to the satyr chorus and to the Bacchantes' rituals, whereas the apollonian dialogue between the main protagonists is considered the expression of the attempt to establish a rational order. Therefore, according to Nietzsche, Greek tragedy is archaically originated by the Dionysian satyr (goat-men) dances and rituals. To prove this he etymologically connects the word tragedy to "goat-song", the combination of *tragos* (goat) and *aeidein* (to sing). If the Dionysian impulse is predominating in archaic Greece and if in the "tragedy era" the two elements are in balance, after the fifth century B.C., and especially with Euripides' tragedies and the Socratic dialogue, Apollo starts to predominate the Greek world, determining the decline of tragedy and Myth, as well as the rise of plastic arts.

In "The birth of tragedy" Doric art is represented as a triumphant expression of the Apollonian spirit. Nevertheless, the German philosopher, who has always revealed a strong Dionysian disposition, critiques the plastic Apollonian art for being "too sober" and "too rational". To understand Nietzsche's interpretation we have to consider the influence of Schopenhauer's *"Die Welt als Wille und Vorstellung"* (The World as Will and Representation) that presents a similar contraposition between "will", which is similar to the Dionysian tendency to desire and strive, and "Representation", which can be compared to the Apollonian rationality and signifies the ability to create a mental idea of a object that is experienced as an external entity outside the mind. According to Schopenhauer the most immediate object that can be represented is the subject's own body. Therefore the advent of the Apollonian cult during the 8th century, around the same period in which also Homeric poems are transposed from oral to written version, is related to the emergence of the ability to clearly "represent" external reality, a process of progressive self-consciousness in which

masculinity against the Chthonic forces of nature. See: Paglia, Camille. 1991. *Sexual personae : Art and decadence from nefertiti to emily dickinson*. 1 Vintage Books ed. New York: Vintage Books.

the human figure emerges into the world, and can be, for the first time, represented and objectified.

This interpretation is relevant because the rise of Doric art is strictly related to the cult of Apollo, which has a Doric origin even in the name. The sensibility of Doric artists must have been attracted and inspired by the cult of Apollo, the god of light and sun, which represents also the progressive self-consciousness and the emergence of order into the real world. This is happening during the 7th century B.C., a period in which a new mercantile class is emerging throughout the Aegean Sea contending the power with the old aristocracy of the rising city-states. In every field, from the lyric poetry of Hesiod, through Doric art to the pre-Socratic philosophy, the most relevant common aspect is a strong self-confidence in the ability of man to establish a new rational order. This becomes evident as soon as we have a look to the firm standing position and to the apparent determination “to be in the word” of the “*kouros*”, which can be considered the first sculptural representation of Apollo, as a young male figure, in Archaic Greece. Its rigid and muscular posture can be interpreted as a primitive - but at the same time assertive - attempt to represent the emergence of the human physical body into the world, basically expressing the contraposition between the human artificial verticality and the horizon, we might say between the “Apollonian” order and the “Dionysian” nature.¹⁵



FIG. 18 On the left: columns of an archaic Doric temple in Assos (6th century BC). On the right side: archaic “Sounion Kouros”, Athens, National Museum. (6th century BC).

¹⁵ For the emergence of the physical body in Archaic Greece see: Holmes, Brooke. 2010. *The symptom and the subject : The emergence of the physical body in ancient greece*. Princeton, N.J.: Princeton University Press.

The *kouros* embodies a contracted figure, a firm and massive “*soma*” (body) that seems to emerge from a monolith and to resemble a standing column. The *kouros* is a relevant achievement in art history because it represents the origin of Greek sculpture and is furthermore interesting for this analysis because it’s coeval with the construction of the first Doric temple (around 600 BC). The most evident similarity between the Archaic Doric column and the Kouros, besides their similar massive proportions and their usual inspiration or dedication to Apollo, is the almost self-confident attitude that they both express, their unequivocal standing towards the horizon, their absolute determination that can be compared only to the Homeric description of a “hero” who is standing resolutely in front of his enemy.

In his “*The idea of space in Greek architecture*” Martiensen says that “*the anthropomorphic conception of the gods was a developing process which involved a change from the recognition of the mysterious and implacable forces of nature, to a belief in certain ‘definitive and personal’ gods.*”¹⁶ Using Nietzschean words we might say that this process is expressed by the change from a Dionysian condition of being subjugated to the natural chaos to an Apollonian attempt to establish a human order.

Martiensen connects the original belief in natural forces to the archaic Greek cults dedicated to Dionysus and to the architectonic condition of being in a natural enclosure from which the theater is derived: “*The early choric dances in honour of Dionysos for instance, would be held near his sacred precinct, and this fact in combination with a suitable topographical situation would in turn provide the basis for a formally shaped theater. The earliest chthonic ceremonies, then, were held in the open air, probably in some form of enclosure suggested by the natural conformation of its surroundings or by a clearing in a grove, and such rites as were performed in sacrifice or other demonstration took place before the symbol, external to it and only in an implied (not constructed) enclosure. The substitution of an anthropomorphic symbol for a purely natural or non-representational object may be assumed in principle to be the starting point for providing a constructed protection or “house” for the deity symbol. This change-over from a chthonic to an Olympian form of religion thus becomes closely associated with the deliberate creation of a formal architectural framework for the whole procedure of religious ceremony.*”¹⁷ This “formal architectural framework”, which represents the emergence of an Olympian or Apollonian Order, is the so-called “classical order”, a tectonic system formed by columns and architrave, fully applied for the first time in the Doric temple. Therefore we can consider the Greek tectonic archetype of the Doric temple and its assertive presence in the exterior space as the most direct expression of the new Apollonian order established in Greece during this period.

¹⁶ Martiensen, R. D. 1956. *The idea of space in greek architecture*, with special reference to the doric temple and its setting. Witwatersrand University Press: p. 62.

¹⁷ *Ibid.*, p. 63.

Thanks to the rhythmic repetition of the colonnade around the “*naos*” (cella), the appearance of the Doric temple as a whole is very emphatic: its several columns appear to the viewer almost like a group of aligned “heroes” in the front line of the Achaean army.

According to Vincent Scully “*The whole organization of the temple suggests that other great creation of the Archaic period, the phalanx, in which the hoplites are like columns in the sense that they are free-standing, self-sufficient geometric forms. They are trained, so the poet Tyrtaeus tells us, to march in step with each other; therefore, their power comes from the disciplined humanity of the phalanx group. Tyrtaeus’s words “Kai poda parpodi theis ep aspidos aspid ereisos” sounds like the march of those columns along their base; an image of humanity, of a divinity in human form, appears. It brings human wish, the projection of a special human cultural order, into the old order of natural things, and sets up a dialogue between nature’s will and the human wish - out of which the whole luminous structure of Greek classic tragic thought takes form.*”¹⁸ The anthropomorphic quality of the Doric column, and metonymically also of the Doric temple, must be related to the fact that even gods, to whom temples are dedicated, are conceived as anthropomorphic and don’t represent natural forces anymore.



FIG. 19 The frontal, almost facial, quality of the Doric Temple: On the left side: Statue of a young man in Motya, Sicily, (450 BC). On the right side Temple of Concord at Agrigento, Sicily (430 BC).

The Doric temple appears almost like a figure that is facing us, and, using Scully’s metaphor, its colonnade seems a phalanx group that is standing in front of us. This assertive and frontal appearance establishes a strong unidirectionality and determines the effect of a sculptural magnetic presence that emanates from the temple towards the outside. The temple emerges like a firm body that is facing the exterior space, a body whose face is apparently “staring” at us. Thus the temple itself can be considered as an elaborated transfiguration of a human being. An etymological correlation between the temple and the

¹⁸ Scully, Vincent. 1992. Architecture: The natural and the manmade. *Bulletin of the American Academy of Arts and Sciences* 46 (2) (Nov.): pp. 38

human body can be found in the word “fronon”, another term used for pediment which comes from the Latin *frons* or “forehead”.

The understanding of the anthropomorphic qualities of Doric temples is essential for the following analysis, because it means that the Greek temple is not a neutral object placed in an open field, as it probably would be without its magnetic peripteral columns and its pediment. We might say that it's precisely the repetition of the colonnade, and more abstractly the classical orders, that create an “inter-face” between the *cella* and the exterior space, a boundary which acts exactly like a “face”, expressing a frontal direction and a specific “character”. A flat solid wall would never have this “facial” quality, whereas it would probably appear like a flat mute face with no eyes, no nose and no mouth. It is in the rhythm between columns and voids, in the balance between reflected light and shadows and in the equilibrium between vertical and horizontal lines, that some inexplicable and enigmatic anthropomorphic characteristics appear. We might say, in a simple way, that the temple houses and represents a human-like god and therefore resembles a human-like figure. The evident sculptural quality of the Doric temple is strongly related to these anthropomorphic characteristics and it is also for this reason that the temple needs to be seen in the external space from different perspective, almost like a statue of a god.



FIG. 20 The Doric temple “faces” outside towards the landscape, the exterior space is predominant over the interior: Temple of Segesta temple, Sicily (5th century B.C.)

The role of the classical order is to create a framework or an interface that strongly emphasizes the difference between interior and exterior: even if the colonnade allows walking through it, it is not a neutral membrane like a wall with openings. In the case of a Greek Doric temple the exterior is predominant over the interior because the colonnade faces the outside in a very determined and firm way: almost like a *phalanx*, Scully would say. It is easier to understand the importance of the external space around them if we consider the fact that the columns - and more generally the Temple as a whole - are inspired by anthropomorphic apollonian gods who are reminiscent of the human figure, and that, for this reason, exactly like a body or a face, they express an unequivocal directionality,

We have to keep in mind that a Doric temple is not built to solve any practical problem or human need, nor to be a “public assembly place”: it is meant to be observed from the exterior space and to represent the individuality of the god. Thus the temple must appear as an isolated and autonomous entity recognizable in the landscape. The function of the temple is mainly to house the cult statue, therefore to house the god. According to Vincent Scully Doric temples “*housed the image of a god, immortal and therefore separate from men, and were themselves an image, in the landscape, of his qualities.*”¹⁹ The Doric temple is therefore a sculpture in the open landscape more than a building.

The predominance of exterior space is coherent with the religious function of the Doric temple because the public religious ritual is held outside the temple around the external altar on which sacrifice is offered. The role of the open-air altar in Greek religion is determinant and the space that surrounds it is inseparable from the temple even if it is physically detached from it. According to Martienssen, who has clearly recognized the predominance of exterior space in Greek architecture, “*The protective dwelling for the god afforded no space for the worshippers, and, from the point of view of the perceiving spectator, had an essentially external significance. Internally such special treatment as it may have received must have been of a limited type and of a degree considered to have been in accord with the statue - if such were the symbol - to be enshrined. Externally, however, the architectural envelope became in turn a symbol of the splendour and greatness of the deity, and in this process was established the particular form of treatment that was destined to play an integral part in temple design throughout the long history of its development. For the temple, unlike the dwelling constructed for human habitation, is primarily significant as seen from the outside.*”²⁰ This “particular form of treatment”, which has been invented and developed to express its splendor mainly only on the outside, where the ritual takes place, is the classical “order” composed by columns and architrave.

The origin of this “particular form of treatment” can be traced back to the 7th century B.C, when a peripteral colonnade of wooden columns or posts is built around a preexisting *naos* (cella), a typical long mud-brick construction based on the Mycenaean “Megaron” prototype.

¹⁹ Scully, Vincent. 1962. *The earth, the temple, and the gods; greek sacred architecture*. New Haven: Yale University Press: p. 59.

²⁰ *Ibid.*, p. 63.

But an even earlier prototype for the external colonnade can be recognized in the “Heroon” built in the island of **Lefkandi** (Eubea) probably built around 950 B.C at the beginning of the “Homeric age”. The Heroon, is usually a "hero's grave", a shrine or monument dedicated to the commemoration of a hero. A ritual which, as we have seen before, is essential for the origin and the development of the Hellenic art and culture. In the exceptional case of Lefkandi archeologists have found the cremated body of a man, the “hero” buried with his weapons, and the inhumed body of a woman, with her remarkable jewelry, both placed within a long “archetypical hut”. The most important feature of the building is the external wooden verandah, which follows the horseshoe shape of the building and prefigures the temple colonnade. This primordial building ideally connects the emergence of the Greek temple to a more primitive “hut archetype” and, at the same time, the relative cult of anthropomorphic gods to an archaic “hero cult”.

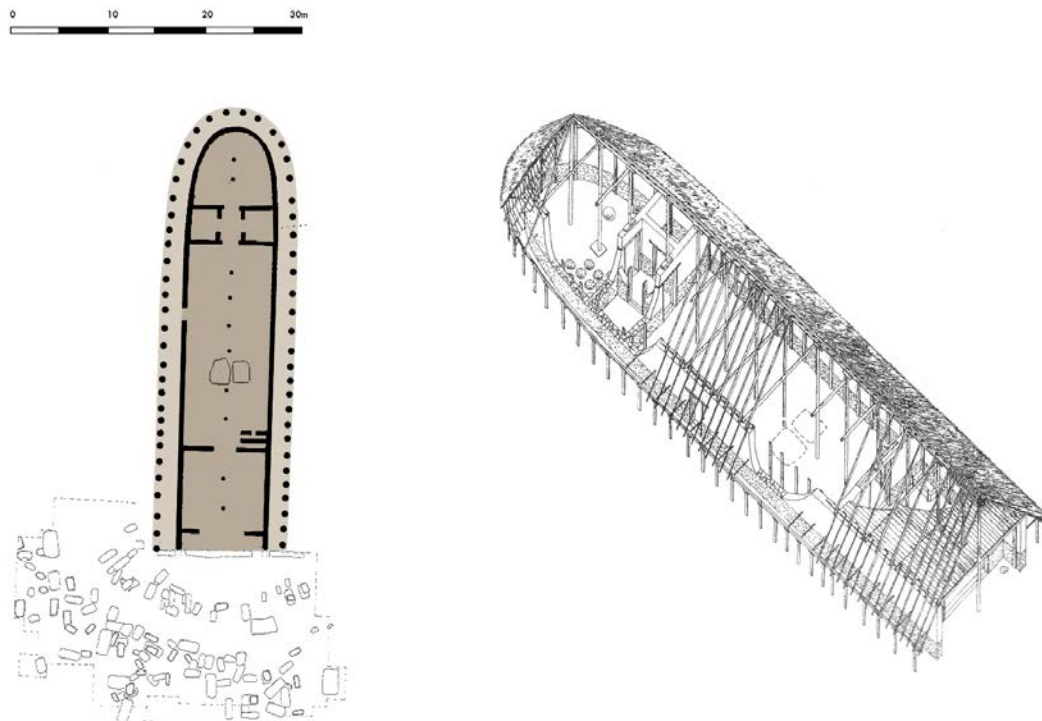


FIG. 21 The Heroon” of Lefkandi (Eubea) built in the 10th century B.C. On the left side: reconstruction of the plan. On the right side: Axonometric view (drawing by Coulton, 1993).

The temple of Apollo at **Thermon** can be considered the next step in the definition of the temple typology. The first attempt to build an external tectonic “framework” around the temple can be dated from the 8th century B.C., when a wooden colonnade is disposed as a horseshoe, similarly to the Lefkandi hut, around the walls of the Megaron. But it is only at the end of the 7th century B.C. that the temple is rebuilt in a more definitive version, with a

very long *naos* and a peripteral colonnade of wooden columns standing on a stone base. The posts are placed around the four sides, five on the front and fifteen on the side. This building represents an archaic wooden prototype of the Doric temple. The surrounding colonnade has evidently no structural value: its function is to create a portico, a tectonic wooden structure that faces the exterior space, protecting the brick walls of the *naos*.

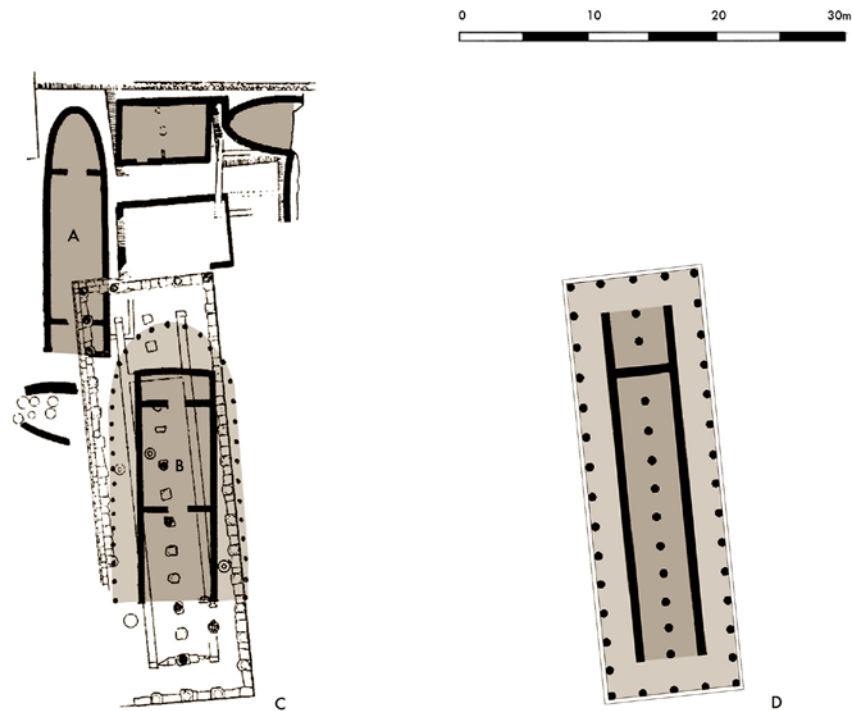


FIG. 22 plan with successive buildings of the Temple of Apollo, Thermon, Greece: A) “Megaron B” (9th century B.C.), B) First prototype of a temple with a horseshoe colonnade around the Megaron walls. (8th century B.C.) C) Temple of Apollo (end of 7th century B.C.) D) reconstruction of the Temple of Apollo

According to Scranton “This suggests that in its original conception the “peripteron” was not integrally part of the temple, but an addition – an attachment for the protection of an area in some sense separate from the essential building. As a *naos* – a living space – would not be provided for a “god” until such a being, integrated, localized, self-embodied, rather than a pervasive numinous power, was conceived by men, we would infer that the first appearance of the simple *naos* as a “temple” was the direct response to a new conception of deity beginning to take form after the collapse of Mycenaean culture. The addition of a protected volume external to the *naos* of the god would then in its turn derive from needs external to the god –

those of the people attending on his worship.”²¹ Therefore the external colonnade represents an attempt to relate the naos, the house of the god, with the external space and to create, at the same time, a rational framework that can be observed from outside and used by the worshipers.

A similar evolution can be seen in the successive constructions of the Heraeum, the temple of Hera, in the Greek island of **Samos**. The first building, dating approximately from the beginning of the 8th century B.C., is a long and narrow *megaron* with a central row of wooden columns, that supports the roof, and three wooden posts placed in the open front which faces east towards the altar.

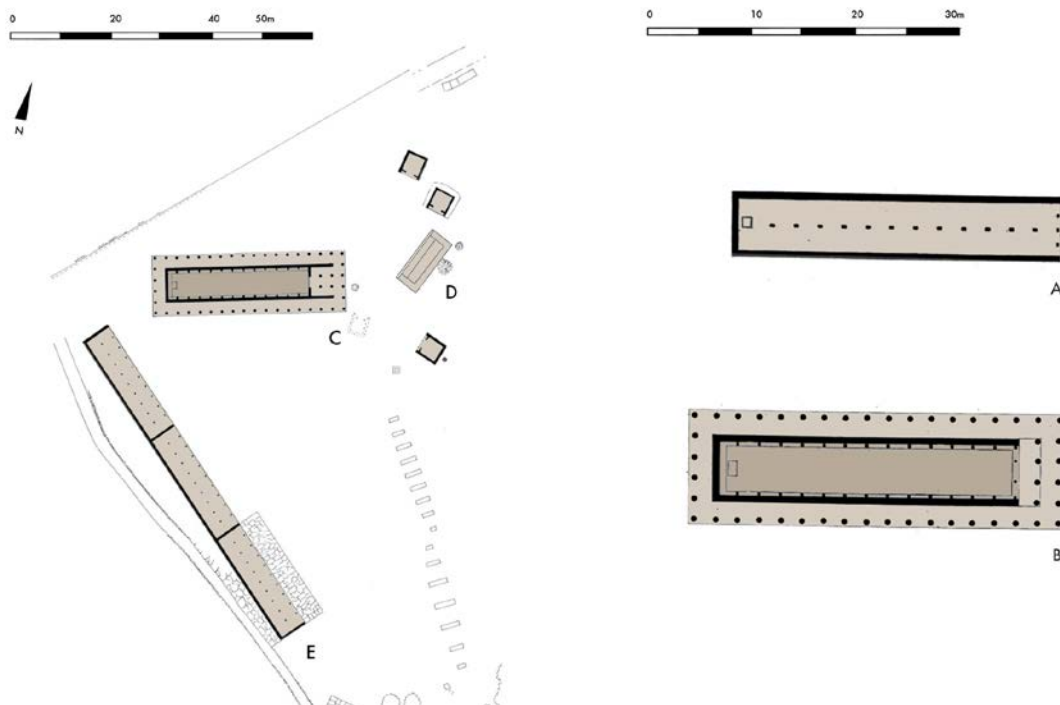


FIG. 23 plan with successive buildings of the Heraeum, Samos, Greece: A) First Heraeum Temple (8th century B.C.), B) Second Heraeum Temple (7th century B.C.) C) Second Heraeum Temple within the site: the altar (D) is in front of it. The south stoa (E) can be considered the earliest example of stoa in Greece.

During the seventh century, around 660 B.C., the axial row of column is removed and a wood colonnade of eighteen by six column is attached around the older cella. To understand this change we have to consider the progressive transition from the Mycenaean ritual,

²¹ Scranton, Robert. 1962. Greek architecture. Great ages of world architecture. New York, G: Braziller: p. 22.

which takes place within the intimate Megaron room around the central hearth, to the ritual of the Greek polis, which takes place outside the temple around an open-air altar. We can therefore recognize an evident shift from interior to exterior space, a shift in the religious ritual which is manifested and materialized by architecture. The new colonnade of the temple creates a surrounding portico which faces the external space, and this same function is echoed in the portico of the *south stoa* built near the temple in the same period. We can consider the elongated and colonnaded building of the south stoa one of the earliest examples of its kind. The *stoa* is basically a long portico, originally built in wood, which is used for the first time in sanctuaries to shelter the worshippers from bad weather.

In general we can say that during the 7th century B.C. the Sanctuary of Hera in Samos represents a really relevant case in Greek architecture history because we can find here one of the first prototypes of a wooden peripteral Temple, probably the first prototype of a stoa, which is also built in wood, and more generally a prototypical site disposition which already expresses all the main characteristics of Greek space sensibility. In this sanctuary the buildings are placed, apparently without a predetermined order, as isolated volumes in the open space, showing a stronger interest in establishing a relationship with the landscape, than in trying to define a legible space. The temple and the south stoa are independent objects and their autonomy is expressed by their different orientation and by the space that separates them.

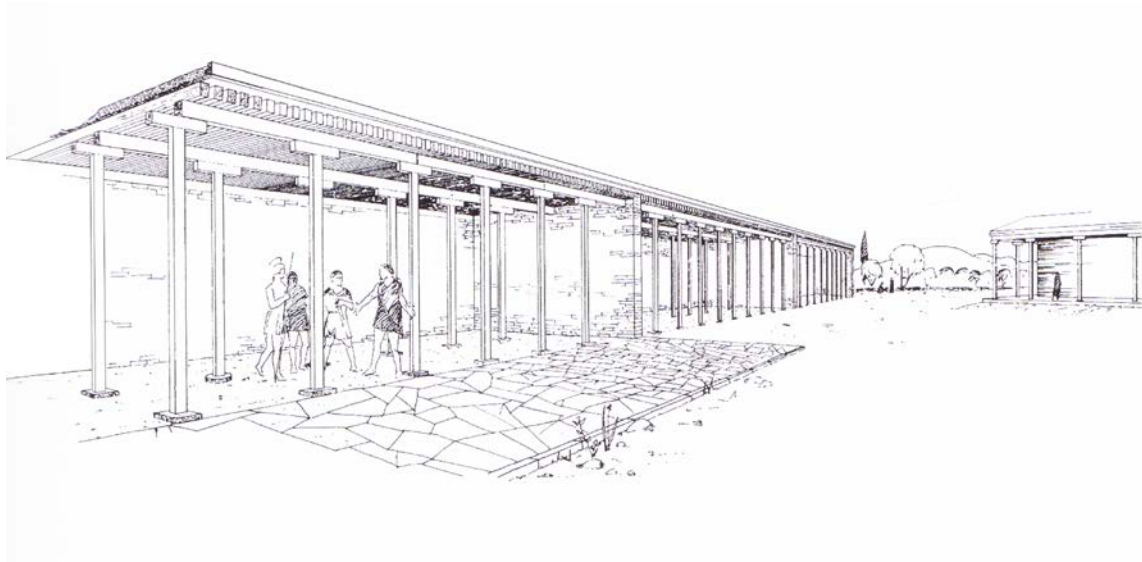


FIG. 24 Heraeum in Samos, Greece: Reconstructed view of the south stoa, on the left, and the temple, on the right side. In this early example we can already recognize the Greek space sensibility. Buildings are placed as isolated volumes in the landscape. (drawing by Gruben, 1957)

Furthermore in the island of Samos we can also find, few decades later, the first “prototypical architect” intended as a professional figure. The third version of the Heraeum, a much larger Ionic temple, is built by the Samian artists Rhoecus and Theodorus of Samos

probably between 570 and 550 BC. They are the first “architects” whose name is associated with a building. From their work we can understand the strict correlation of Greek “tectonic” architecture with sculpture and woodworking: in fact Rhoecus is a famous sculptor and his son Theodorus is an architect and sculptor reputed by Pliny the Elder as the inventor for certain tools for woodworking such as a carpenter’s square, the plumb line or level and the lathe. Theodorus is also renowned for having written the first architecture treatise in history, a dissertation about the temple of Hera in Samos. Pliny in his *Natural History* (XXXIV.83) references the Samian architect in the sentence “*Theodorus who made the labyrinth of Samos*”, combining his name with the “labyrinth” of the Temple of Hera. The enigmatic word “labyrinth” can be explained by the fact that the third version of the Heraeum is a gigantic dipteral temple surrounded by a labyrinthine columned framework composed by a double peristyle of over hundred columns.

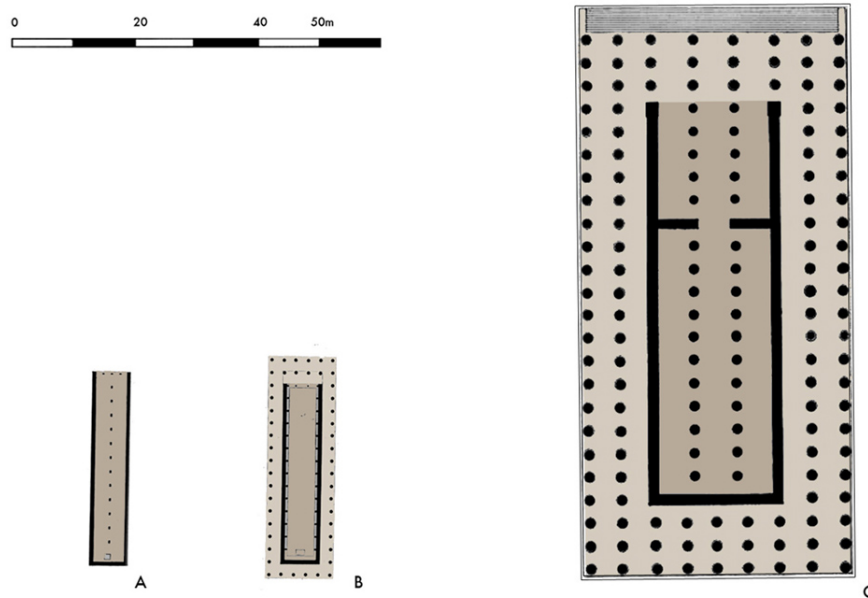


FIG. 25 Successive buildings of the Heraeum, Samos, Greece: A) First Heraeum Temple (8th century B.C.), B) Second Heraeum Temple (7th century B.C.) C) Third Heraeum Temple, built by Rhoecus and Theodorus (ca. 550 B.C)

But Pliny’s definition may have also been influenced by the Greek Historian Herodotus who had been exiled for some years in the island of Samos and has described the third Temple of Hera in his “*History*” in comparison with an Egyptian building called “labyrinth” (2.148-49): “*Yet the temple at Ephesus and that in Samos are surely remarkable. The pyramids, too, were greater than words can tell, and each of them is the equivalent of many of the great works of the Greeks; but the labyrinth surpasses the pyramids also. It has 12 roofed courts, with doors facing one another, 6 to the north and 6 to the south and in a continuous line...*” Besides the

historical confrontation between monuments, from these words we can realize how much Egyptian architecture is known and appreciated in Greece and how much the monumental endless repetition of stone columns, typical of the Egyptian Hypostyle Halls, might have influenced early Doric architecture in a period of transition from wood to stone constructions. Another characteristic, which can be found in the imposing Egyptian temples, and that is also present in the third version of the Heraeum, is the fact that the spacing of columns gradually widen towards the center, thus emphasizing the central entrance.

The strong links between Samos and Egypt are not only commercial: around 660 the Egyptian king is helped by the Ionians to gain control in his country and during the sixth century the enlightened tyrant of Samos, Polycrates is allied with Amasis II, the ruler of Egypt. If we look at the succession of the three versions of the Heraeum in Samos, we can realize that besides the change from wood to stone there is an evident jump in scale and a more monumental attitude that could be arguably attributed to a certain Egyptian influence.

However in this period the Egyptian influence on Greek culture is much wider and not only related to architecture. Pythagoras, the most important mathematician and philosopher of the 6th century, is also born in Samos around 570, in the same period in which Rhoecus and Theodorus are building the gigantic “labyrinth” of the Temple of Hera. The evolution of Pythagorean philosophy, based on the belief that in the entire cosmos “all is number”, is strictly influenced by Egyptian and even Babylonian mathematics. In fact in his early life he traveled for long time to Egypt and Mesopotamia to acquire firsthand information on mathematics and astronomy. Pythagoras derived from this long peregrination the idea that the entire universe is based on numbers, combining religious mysteries and mathematical notions. But besides the evidence of an intense and productive contact between Egyptian and Greek cultures during this period, I think that the evolution of the Pythagorean philosophical system is relevant to understand in a wider sense the advancement of Greek culture and even the development of Greek architecture. If we ideally follow Pythagoras’ life and the evolution of his ideas we can better interpret the changes in architecture practice and maybe also the shifts in the “meaning” of architecture.

The period in which Pythagoras is lived, the sixth century, is a period of incredible cultural transformations. Using Plato’s analogy of the cave, we could compare this period to the “enlightenment” after the passage from the darkness of the cave to the exterior space, and similarly, using Nietzschean terms, we can define this century as the moment in which the Apollonian clarity starts to predominate over the Dionysian natural “underworld”. An emblematic figure of this period is Thales of Miletus (624–546 B.C.). He is a mathematician and furthermore the philosopher who can be reputed to be the beginner of western philosophy. He studied in Egypt, where he learned mathematics, and he later brought this knowledge back to Greece. It is Thales himself who has advised Anaximander’s student, Pythagoras, to visit Egypt in order to continue his studies in mathematics and philosophy. Thales’ philosophical approach, based on the attempt to explain in a logical way every phenomenon, generally represents the end of Mythology and the beginning of the first

scientific and philosophical revolution. It is in this period of emerging apollonian rationality that Doric architecture is progressively generated and materialized.

The transformation of the wooden structure into stone architecture, and thus the origin of the Doric architecture, can be dated back to the beginning of the sixth century B.C. But if the Doric temple of Hera built in Olympia around 590 B.C. is only a literal translation of the previous wooden structure into stone, it is only around mid-sixth century in the new colonies in Sicily and Magna Graecia, that new temples are built directly in stone, demonstrating a stronger artistic, almost apollonian, self-confidence.



FIG. 26 Doric temple in Selinus, Sicily

In this period the influence of the new colonies is increasingly expanding along with the growth of commerce, and consequently the new colonial city-states start competing, politically and culturally, with each other and with the cities of mainland Greece. According to Martienssen *“The foundation of colonial towns in Sicily and Magna Graecia brought about an epoch of temple building in these new centers which, based on models in existence in Greece, transcended these in vigour and splendor, and marking a significant stage in the clarifying and consolidating of standards that so far had been indicated but not fully realized in plastic forms. The wooden columns of the Heraion at Olympia were replaced by stone as they rotted, but the process was one of reparation, a tentative move in the direction of permanence, rather than a*

fresh construction on a predetermined plan. We can see this fresh construction in its most vital form in a building such as the Temple "C" at Selinus, product of a fully established technique yet demonstrating a new confidence, a new-found strength in aesthetic expression."²² If the temple of Apollo built around 550 B.C. in Syracuse represents the earliest and roughest example of this new artistic self-confidence, more refined and sophisticated versions of the Doric temple can be found in Selinus, Paestum and Metapontum.

Even Pythagoras, after his trip to Egypt leaves Samos to escape from the "tyranny" of Polycrates, and moves to Croton, a Greek colony in southern Italy. The only few written references to his life can be found in the novel "Gallus" written by the satirist Lucian (2nd cent. A.D.). The Latin writer ironically transforms Pythagoras into a cock and makes him say: *"I even went to Egypt to study with the prophets, penetrated into their sanctuaries and learned the books of Horus and Isis by heart, and then I sailed to Italy and worked upon the Greeks in that quarter of the world to such an extent that they thought me a god"*.²³ Effectively there are many references in which Pythagoras is considered the son of Apollo or in which he is considered to have a golden thigh and to gleam with a supernatural brightness. In the Lucian novel "Gallus" Pythagoras himself says: *"my soul originally left Apollo, flew down to earth and entered a human body"*²⁴.

As a matter of fact in Croton Pythagoras sets up a religious sect that is going to have a strong influence throughout the entire Magna Graecia. The beliefs of Pythagorean sect, which has often been compared with Freemasonry for its political implications, are based on a combination of mathematical knowledge, philosophical principles and Orphic mystery cults. But besides these mysterious and disputed aspects, Pythagoras can be undoubtedly considered the most important mathematician and philosopher during the 6th century BC and his discoveries have been highly influential throughout the entire Greek world. Probably even the words Philosophy (love for wisdom) and Mathematics (what is learned) are coined by Pythagoras.

The best Doric temples of this period have been built in Magna Graecia during Pythagoras' life, in the colonial cities that might have been influenced by his thought, such as Paestum, Selinus or Metapontum where he will end his life. Even if the direct influence of Pythagorean thought on architecture cannot be proved, we shouldn't disregard the increasing role of mathematics in this period and the importance of arithmetic in the realm of an architectural practice that is mainly based on written descriptions, codified rules, and numerical parameters. To better grasp the role of mathematics in architecture we have to understand Greek architectural practice, without taking for granted tools and instruments that we now use. In ancient Greece the two phases of design and execution are not completely divided, as it is normal today. Therefore the role of Greek architects is slightly

²² Martiensen, R. D. 1956. The idea of space in greek architecture, with special reference to the doric temple and its setting. Witwatersrand University Press: p. 68.

²³ Lucian. Gall. 18

²⁴ Lucian. Gall. 16

different from the modern one: most probably they work as chief builders on the construction site and in many cases they materially execute the work as sculptors, as we have seen in the case of Rhoecus and Theodorus. We can deduce this from written documents because architects are paid little more than a skilled craftsman. These practical aspects are strictly related to the two main characteristics of the “Tectonic archetype” that I have previously outlined: the fact that it materially expresses the construction process, as an assemblage of finite elements, and that it has an evident sculptural appearance. But if Doric temple design is not generated by a drawn plan and is more the result of the material act of construction, we might wonder how the work is pre-organized.



FIG. 27 The Doric temple materially expresses the construction process and has an evident sculptural appearance. Temple of the Dioscuri in Agrigento (ancient Greek Akragas), Sicily (5th century BC)

Doric temples represent undoubtedly the emblem of Greek architecture, and from the contemporary perspective it seems difficult to think that they are not the result of a “design”. However their most striking aspect is that they represent a repetition throughout time of the same typology, altered only by the variations of some parameters. The plan of a Doric temple is very simple and basically the task of the architect is to refine proportions and details. According to Coulton, who has dedicated his book *“Ancient Greek architects at work”* to the issue of architectural practice, *“little help could therefore be derived from plans and elevations on a limited area with instruments of limited precision, and it appears that Greek architects developed a technique of design which did not involve scale drawing. Certainly no*

plans or elevations of Greek architecture have survived, and there is no clear mention of them in Greek literature or building inscriptions before the Hellenistic period; nor have any instruments for technical drawing been found."²⁵

Thus the project of a Doric temple is most probably not based on drawings, but on written specifications called *syngraphai*, which define the main characteristic of the building such as the number of columns on the four sides. All the other parameters are generated from these numbers. Temples are based on codified rules of proportions and their design is generated by the variations of mathematical parameters. This could explain why Doric temples seem to be extremely analogous and different at the same time: they are generated by the same "algorithm" modifying parameters and numeric proportions. Nowadays this approach would be called parametric design.

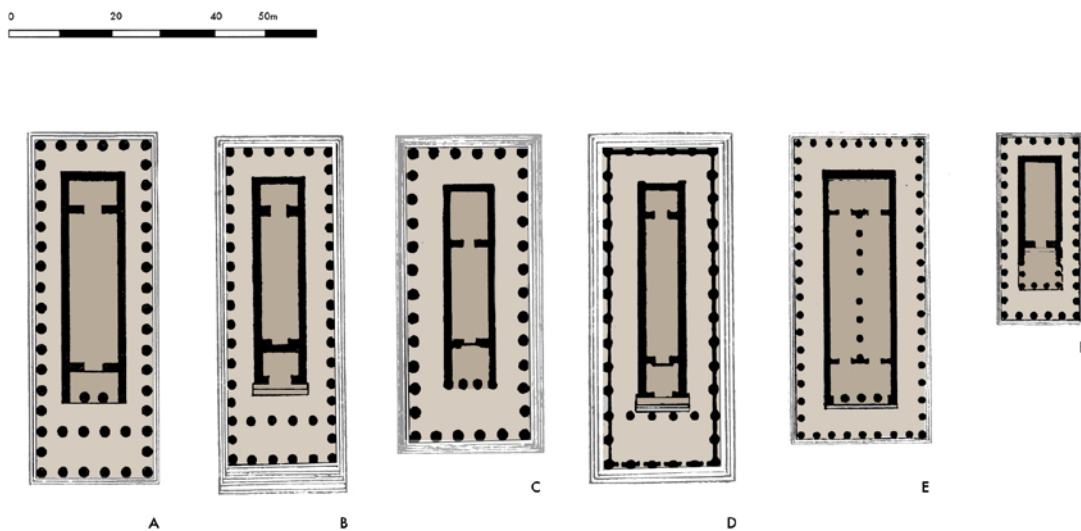


FIG. 28 Doric temples in Magna Graecia during the 6th century B.C.: A) Apollo, Syracuse (ca. 555 B.C.), B) Temple "C" Selinus (ca. 540 B.C.), C) Temple "D" Selinus (ca. 536 B.C.), D) Temple "F" Selinus (ca. 536 B.C.), E) Temple of Hera or "Basilica" Paestum (ca. 550 B.C.) F) Athena, Paestum (ca. 510 B.C.)

In Doric temples the repetition of columns of the peristyle, an element probably derived from Egyptian and Mycenaean architecture, can be considered a clear manifestation of the power of numbers in its simplest form and it would be inaccurate to ignore or diminish its meaning. The amount of columns in the frontal façade is the most effective design parameter to express the character of a temple and the simple shift from six to eight columns has a great impact in the final perception of the building. Even the canonical classification of Doric temples is based on to the number of columns of the facade: temples are called Tetrastyle, Hexastyle, Octastyle, Dekastyle if they have respectively 4, 6, 8 or 10

²⁵ Coulton, J. J. 1977. Ancient greek architects at work : Problems of structure and design. Ithaca, N.Y.: Cornell University Press: p.53

columns. It's difficult to disassociate these numbers from the cosmic and theoretical meaning that the first ten numbers have in Pythagorean philosophy.

In fact number mysticism is an essential part of the Pythagorean philosophy, which stems from an older numerological tradition that relates *odd numbers* with male attributes and *even number* to female characteristics. Pythagoras has carried numerology to the extreme. In his philosophical system all numbers from one to ten have a symbolic and universal meaning: *number one* is the generator of numbers, *number two* is the first even or female number, *number three* is the first male number and the expression of harmony as a combination of unity and diversity, *number four* represents justice, *number five* symbolizes the marriage as union of two and three and *number six* is considered the first perfect number because it is equal to the sum of its proper divisors (1 + 2 + 3). This number is relevant also for Doric Architecture. According to Vitruvius the canonical Doric temple has six columns (Hexastyle) and this is certainly the most diffuse Doric temple. Then, in Pythagorean numerology, Number *ten* is the holiest one because it's the sum of the first four numbers (1+2+3+4) and thus represents the entire universe. In another Lucian's satiric dialogue called "Philosophies for Sale", in which Zeus puts various philosophers up for sale in a slave market, Pythagoras asks one of his buyers to count. The buyer starts to count, "One, two, three, four." Pythagoras stops him and says "Stop, that's enough! You're to ten right now. You'll learn that four is ten. It's the perfect triangle, the oath we swear by." The buyer reacts to these words saying "Well, by ten! That's the headiest idea I ever heard of! Four is ten! What a platform for a Philosophy!" And then the Greek philosopher replies "Then you'll find out about earth, air, fire and water... You'll learn that God is Number, and intelligence and Harmony. And that you are not who you think you are." The Pythagorean "perfect triangle" is a particular triangle which has four for its side and is formed by the addition of the first four numbers whose sum is ten, the perfect number. This triangle represents also the four elements of the cosmos: earth, air, fire, and water.

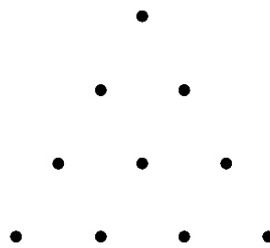


FIG. 29 The tetractys (τετρακτύς), or tetrad, A mystical Pythagoreans figure. It represents the sum of the first 4 whole numbers.

Pythagoras finds out that the first four numbers can also express musical consonances. According to Rudolf Wittkower "the extraordinary numerical relationship which he discovered led him to believe that the universe lay in certain ratios and proportions. He found out that the musical consonances known to the Greeks could be produced by dividing a string of the lyre in the following invariably fixed ratios: 1:2 (octave); 2:3 (fifth); 3:4 (fourth); 1:4 (double octave). The discovery that the musical consonances were arithmetically expressible

*by the ratios of the first four integers (1:2:3:4), the discovery of the close interrelationship of sound, space (length of string), and numbers, must have left Pythagoras and his associates amazed and fascinated, for they seemed to hold the key to the unexplored regions of universal harmony”.*²⁶

The belief in numbers of the Pythagorean school is well expressed statement of Philolaus, one of the philosophers of the school: *“All things which can be known have number; for it is not possible that without number anything can be either conceived or known”*. It’s evident that Pythagoras’ belief that in the entire *cosmos* “all is number” would be contradicted by the evidence that certain entities, such as the square root of two, cannot be measured and expressed by numbers. The square root of two is known in Mesopotamia (around 1800–1600 B.C.) in terms of the diagonal of a unit square and is approximated with sexagesimal fractions, (a numeral system with sixty as its base) to a value of 1.414222, which differs only about 0.000008 from the true value. But until the moment of a complete understanding, through a mathematical proof, that $\sqrt{2}$ can never be expressed as a ratio of integers, the diagonal of a unit square is probably considered as a measure that is difficult to express, and thus a good approximation is enough. It’s evident that at this stage the square root of two represents only a measurability problem and thus an unfavorable circumstance.

Pythagorean cosmology is based on the idea that numbers are the basic indivisible units of the entire cosmos. The number or “*arithmos*” in Pythagorean philosophy is a basic entity composed by units, a universal principle that resonated in the entire cosmos. All Pythagorean numbers are rational numbers, in the sense that they can be expressed as a relation or ratio of two integers. The Greek word for *ratio* or *fraction* is λόγος, the same word that means reason or rationality. Euclid in the fifth book of “*Elements*” defines *ratio* as “*a sort of relation in respect of size between two magnitudes of the same kind*”. Greeks think of rational numbers in terms of whole units: thus arguably the ratio that we now identify as $\frac{1}{2}$, in Greek mathematics doesn’t mean 0.5 or half, but means the relation between one and two. According to Hans Niels Jahnke “*The Greeks distinguished strictly between numerical magnitudes (natural numbers) and geometrical magnitudes (continuous quantities) on the ground that in Arithmetic the numerical unit (number 1) cannot be divided, but any geometrical magnitude including the corresponding unit can be divided indefinitely. It turns out that magnitudes of the same kind can be compared and arranged as well as composed (added and, in particular, multiplied)*.”²⁷ In Pythagorean numerology and philosophy a single unit cannot be divided, because the basic unit is “the one” or the monad: “the god and good”. Any entity in the cosmos can be expressed in numbers as an aggregation of multiple indivisible units. It is therefore evident that irrational numbers such as the square root of two are incompatible with this belief because they cannot be expressed as a ratio of whole numbers. We’ll consider the effect of the discovery of incommensurability later on. Now I

²⁶ Wittkower, Rudolf. 1960. The changing concept of proportion. *Daedalus* 89 (1, The Visual Arts Today) (Winter): p. 199.

²⁷ Jahnke, H. N. 2003. *A history of analysis*. History of mathematics ; v. 24. Providence, RI; London: American Mathematical Society; London Mathematical Society: p. 6.

would like to focus on the effect of this numerological and philosophical system on the physical understanding of the world and, as a possible consequence, on the way the world is shaped by architects.

Ancient atomism, the idea that the universe is composed of physical 'atoms' which are literally "uncuttables" and indivisible, is originated from Pythagorean belief that numbers, like atoms, are indivisible units which compose the universe. The germs of the idea could be found even earlier in Sumer and Egypt, but it's only with Pythagoras and more definitely with Democritus that they generate a certain philosophic understanding of the physics of the cosmos. The world is seen by ancient atomists as a whole composed by discrete autonomous parts separated by void: basic units which ideally can be observed and counted. Therefore even the sea is considered as an aggregation of a finite number of its basic units, the drops. This consideration can be extended to every other entity.

Atomists react against the paradox of infinity and multiplicity. This clearly emerges in the famous Zeno's paradox of "Achilles and the tortoise" which states that, even if Achilles is faster, he can never reach the tortoise. That's because in the case of a continuous space that can be infinitely divided, Achilles must reach the point where the tortoise has already been, but at this point the tortoise would be further ahead and therefore Achilles could never overtake the tortoise. Zeno argues that if magnitudes can be divided to infinity, it would be impossible for motion to occur and for time to progress.

Ancient Atomists believe to have solved this paradox by saying that every entity or distance in space is composed by basic units, a finite number of parts. But their theory is also supposed to resolve the analogous paradox of Parmenides about multiplicity, transformation and change. Parmenides claims that change is impossible because "nothing comes from nothing", form the void. The atomists on the contrary think that the atoms, the basic units that compose the universe, are unchangeable, but they also think that a change is possible when the "atoms" take a different disposition. Heinz Post in "The Problem of Atomism" explains Democritus atomism in this way "*we are looking for invariant units more or less hidden behind the world of change. The atomistic programme is to explain everything, but everything, in terms of denumerable of identical invariant units, or at least units of limited variety, i.e. of a small number of species. Ideally, we would want one species only. By the same token of simplicity we make units as large as possible (compared to experimental accuracy) so as to make the possible combinations as restricted as possible. At any rate, we make our units finite. If the variety of appearances in the universe is infinite, we would want in the material case an infinity of arrangements of individual units in space (relative location being the sole primary quality) to account for the infinity of appearances.*"²⁸ The issue at stake here is evidently the dispute between infinite and finite, between continuous and discrete, between a conception of the *cosmos* as continuous and infinitely divisible and an idea of the cosmos as composed by discrete finite elements. We might say that this is the difference between geometry and arithmetic. Ancient atomists and most part of the Greek classical world is

²⁸ Post, Heinz. 1975. The problem of atomism. *The British Journal for the Philosophy of Science* 26 (1) (Mar.): p. 20

generally based on the idea of a discrete physical cosmos, a cosmos whose basic units can be counted and therefore can be known. Atomism represents the attempt to reduce multiplicity to unity, and this challenge is achieved only if it is possible to define a basic unit. Furthermore this is possible only if there is a void, which separates these units. The invention of the “void” is therefore the necessary step that allows the atomists to separate and identify the basic units and to resolve Parmenides’ and Zeno’s paradoxes.

If the Greek atomistic cosmos is composed by visible bodies, atoms, and void we might argue that a similar conception is expressed by Greek architecture. The basic units of Greek architecture are the constituent element of the classical order: the column and the architrave. The different disposition of these basic units, or atoms, determines variations and changes in the body of the temple. The endless “parametric” variations of the Doric temples throughout history are based on different positions of the same basic units. I have earlier explained how the essence of the tectonic archetype is to be an assemblage of finite elements, which remain recognizable at the end of the construction process. The most remarkable characteristic of the Doric temple is exactly that its single parts appear as independent elements in a bigger whole. Even though, when seen from outside and from a certain distance, the Doric temple appears as an organic body, if we look close enough we can almost perceive the void between all the single parts. Its atoms are made visible by the separations between them.



FIG. 30 Detail of the Parthenon, if we look close enough we can distinguish all the single parts that compose the temple.

3.2 The Greek space composition

But the atomistic concept can be applied also to a larger scale. We can consider the body of the Greek city as being composed by isolated independent entities or “urban atoms”, such as the temple and the stoa, which are also divided by void. The different configurations of the urban space are therefore related to the different positions that these entities assume. I have already talked about the importance of the external space for the temple. The essence of the Greek urban space is undoubtedly expressed by the fragmentation and the “atomization” of the urban fabric: the discontinuity between buildings, the appearance of buildings as isolated basic entities and the presence of the empty space, the void, between them.

In the Greek sanctuaries the temple is usually a predominant isolated building that expresses the individuality of the god for whom it stands. In this case the most important aspect is the relationship with the landscape. The sensibility of the architect is expressed in the attempt to find the right position and orientation. We might even say that in this case the temple is a single “atom” in the open space of the landscape. But progressively different temples and stoas are being groped around the same space, creating a more complex articulation of space. The beginning of the process which leads towards the typical Greek space disposition of multiple isolated objects in an open space, can already be seen in the disposition of the Sanctuary of Samos in the seventh century. But the first attempt to organize the buildings according to a more complex disposition, juxtaposing the volumes of multiple temples and stoas in the open space can be found one century later in the new colonies of Magna Graecia. According to Roland Martin *“the western architects had a more developed taste for the monumental, a keener appreciation of the relations between masses and volumes, and a refined sense of architecture plasticity.”*²⁹ Selinus and Paestum represent the first case in which multiple temples are placed close together and juxtaposed.

But a glimpse of this new sensibility can be already recognized in the almost unique and precursory case of **Megara Hyblaea** in Sicily. The city is founded by Doric Greek colonists who come from the *metropolis* (the Greek word for “mother-city”) of Megara in Greece. The foundation can be dated from around 728 B.C. Here, much earlier than in any other cities, we can find a clearly defined civic agora, whose polygonal shape is defined by the intersection of two grid systems and whose space is delimited by two prototypical stoas and two little temples. This is the earliest known agora and even the urban plan can be considered the first known application of a grid system. Both these solutions, which have been developed in Megara Hyblaea around mid-seventh century, will become much more common around Magna Graecia and Greece a few centuries later.

²⁹ Lloyd, Seton, Roland Martin, and Hans Wolfgang Müller. 1974. *Ancient architecture: Mesopotamia, Egypt, Crete, Greece. History of world architecture.* New York: H. N. Abrams: p. 260.

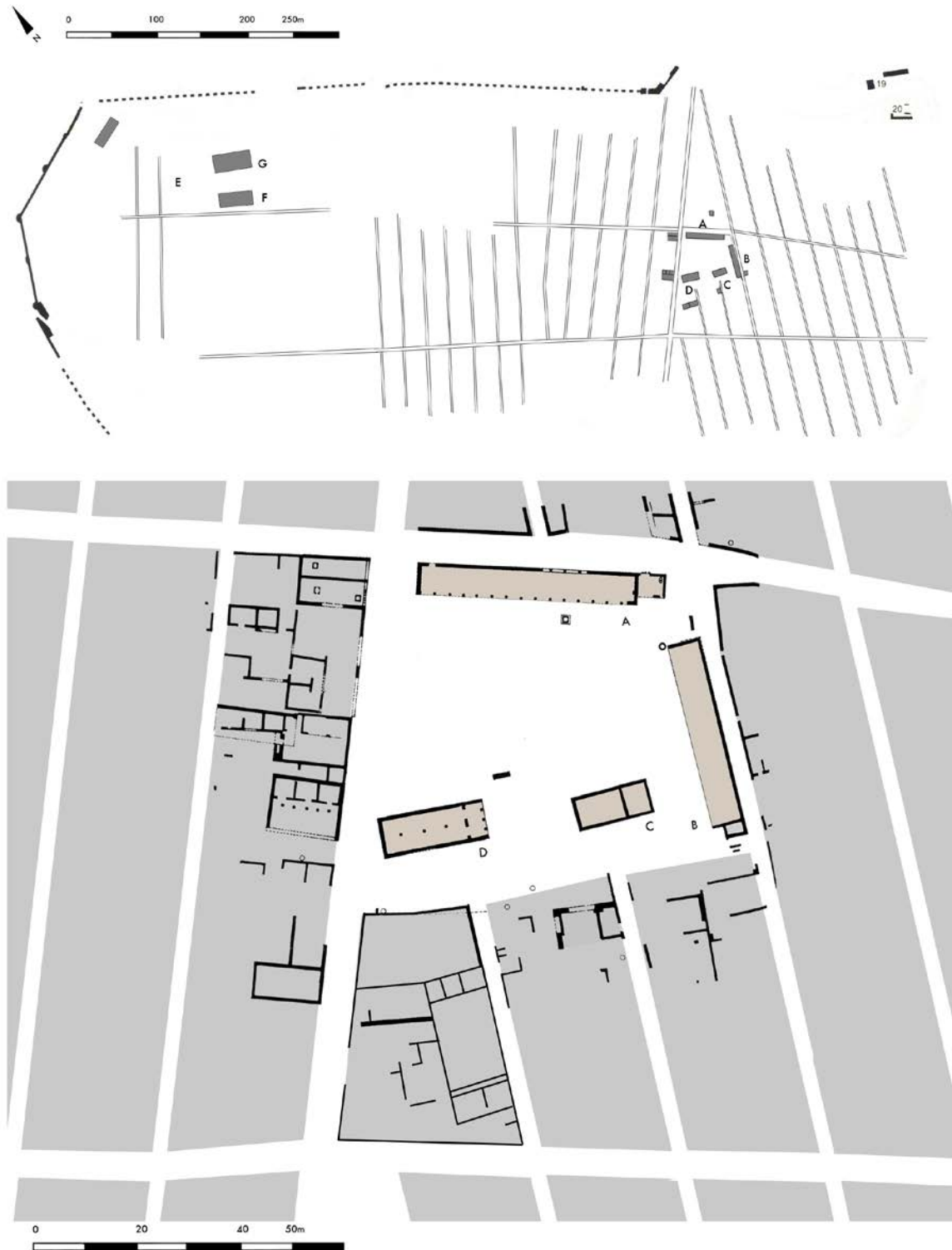


FIG. 31 Agora of Megara Hyblaea, Sicily, 650-600 B.C.: On the top page: General plan A) North Stoa, B) East Stoa, C) Temple "G", D) Temple "H", E) Northwest Sanctuary, F) Temple "A", G) Temple "B"

The two stoas of the agora are coeval with the first prototype of stoa in Samos. According to Coulton, who has dedicated a book to *“The architectural development of the Greek stoa”*, *“the Greek colonies in the west seem to have adopted the stoa habit as early as the mother-land. In Sicily two smaller, but still substantial stoas, both over 30m long, have been found along the north and east sides of the agora at Megara Hyblaea. They have not yet been published in any detail, but their general form is reasonably clear, and both were built in the second half of the seventh century. Both buildings presumably faced onto the agora, although the nature of their colonnades is uncertain.”*³⁰ Even the two temples placed on the southern side of the Agora can be considered some of the earliest examples of Greek religious architecture, and most probably the first one, the so-called temple “H”, is the earliest monumental sacred building of the western Greek world.

In the small Sicilian colony the combination of Stoas, temples and other public buildings around the same space, as elements that institutionally and physically define the space of the agora, represents undoubtedly an original solution that only in the Hellenistic period will be fully developed. Therefore we should consider the case of Megara Hyblaea as a real anticipation of how the Greek urban space is going to be composed and transformed through a long process of accumulation of different public functions, of densification of the urban fabric and of regularization of the public space. But the case of Megara Hyblaea is not replicated in other Greek cities in the same period and the process of formation of the public space is elsewhere much more slow and incremental. To understand the exceptionality of this case we can consider that even the space of agora of Athens, the capital of Classical Greece, during its flourishing period (5th century B.C.) is much less defined and clear. Therefore to follow the process of formation of the Greek space we have to start from more simple but diffuse tendencies.

One of these diffuse tendencies is the grid plan, which can be found in most of the Magna Graecia cities such as Megara Hyblaea, Naxos, Selinus, Acragas, Metapontum, Paestum. This rational town planning system, which is evident in these colonies since the seventh century B.C. and therefore predates the fifth century Hippodamian plan, must be considered as the result of practical and utilitarian reasons more than aesthetic ones. As it is common in any foundation of a colonial city, there is an urgent need to organize the city structure and to democratically divide the land in equal parcels. Therefore the grid pattern represents the most logical and practical solution. We can recognize an almost pre-functionalist zoning approach in Greek city planning, an approach which separates residential areas, and therefore private space, from the public space of the agora area and the temples. The blocks defined by the grid system are usually residential quarters, with almost no architectural emphasis. According to Scranton *“a Greek house, or rather a street of Greek houses, would have constituted a rather plain continuous wall broken by few doors and fewer windows, seldom more than two stories high. Thus as a building element it would have been plain and*

³⁰ Coulton, J. J. 1976. *The architectural development of the greek stoa*. Oxford monographs on classical archaeology. Oxford Eng.: Clarendon Press: p. 30.

simple, but rather uniform and clear-cut."³¹ If on one hand the residential blocks represent a simple repetition of introverted houses, which have usually no relation with the street, on the other hand the temples emerge as unique and distinctive elements of the city, catalyzing the open space around them. The primary role of the temples is confirmed by the fact that the temples and the sanctuaries are usually the first buildings being built in a new colony: the urban structure of the city usually develops around them.

This is evident in the case of **Selinus**, a colony founded in 628 BCE by the Sicilian Megara Hyblaea. The original nucleus can be recognized in the area of the acropolis, the hilltop in the southern part of the city which overlooks the sea. During the sixth century the grid organization is extended from this zone towards north, occupying the entire area between the two rivers. Even in this case, like in the mother colony Megara Hyblaea, the agora takes place in the intersection of two grid systems with different orientation. The two grids are formed by long blocks, which are 100 feet wide (*Hekatompedon*) and are based on the same division of the agricultural land. The urban plan is therefore the result of a precise system to subdivide the land, and considering the vastness of this area we might suppose that along these parallel roads the built density might have been quite low, especially in the more peripheral areas.

The southern acropolis represents the originating nucleus of the city. Here different temples are grouped in the same space in a "unified architectural ensemble". We can recognize in this monumental area a systematic and generalized process that is typical of most of the colonies of Magna Graecia: the accumulation of sacred buildings in the same place to achieve a sculptural juxtaposition of plastic volumes. This is the first step towards the articulation of a more complex urban space. According to Dieter Mertens the urban sanctuary of the Acropolis of Selinus, built around mid-sixth century B.C., represents the unsurpassed expression of western Greek architecture³².

The Temple "C", the most refined expression of new artistic confidence expressed by the architects of Magna Graecia, dominates the central space of the acropolis. According to Martiensen *"In comparison with later examples Temple "C" appears to have been almost casually situated, and bears an intimate relation with the surrounding city which is perhaps unique. From the east, however it must have appeared as a boldly silhouetted and dominating mass. On the north-east, too, a great open space lent a valuable horizontal foreground to the temple, and processions and ceremonies must have enacted in a splendid spaciousness"*.³³ Its external altar is placed 90 feet away from it and is an essential part of the temple.

³¹ Scranton, Robert. 1949. Group design in greek architecture. *The Art Bulletin* 31 (4) (Dec.): pp. 249.

³² See: Mertens, Dieter. 2006. *Città e monumenti dei greci d'Occidente*. L'Erma di Bretschneider. Rome: p. 186.

³³ Martiensen, R. D. 1956. *The idea of space in greek architecture, with special reference to the doric temple and its setting*. Witwatersrand University Press: p. 69.

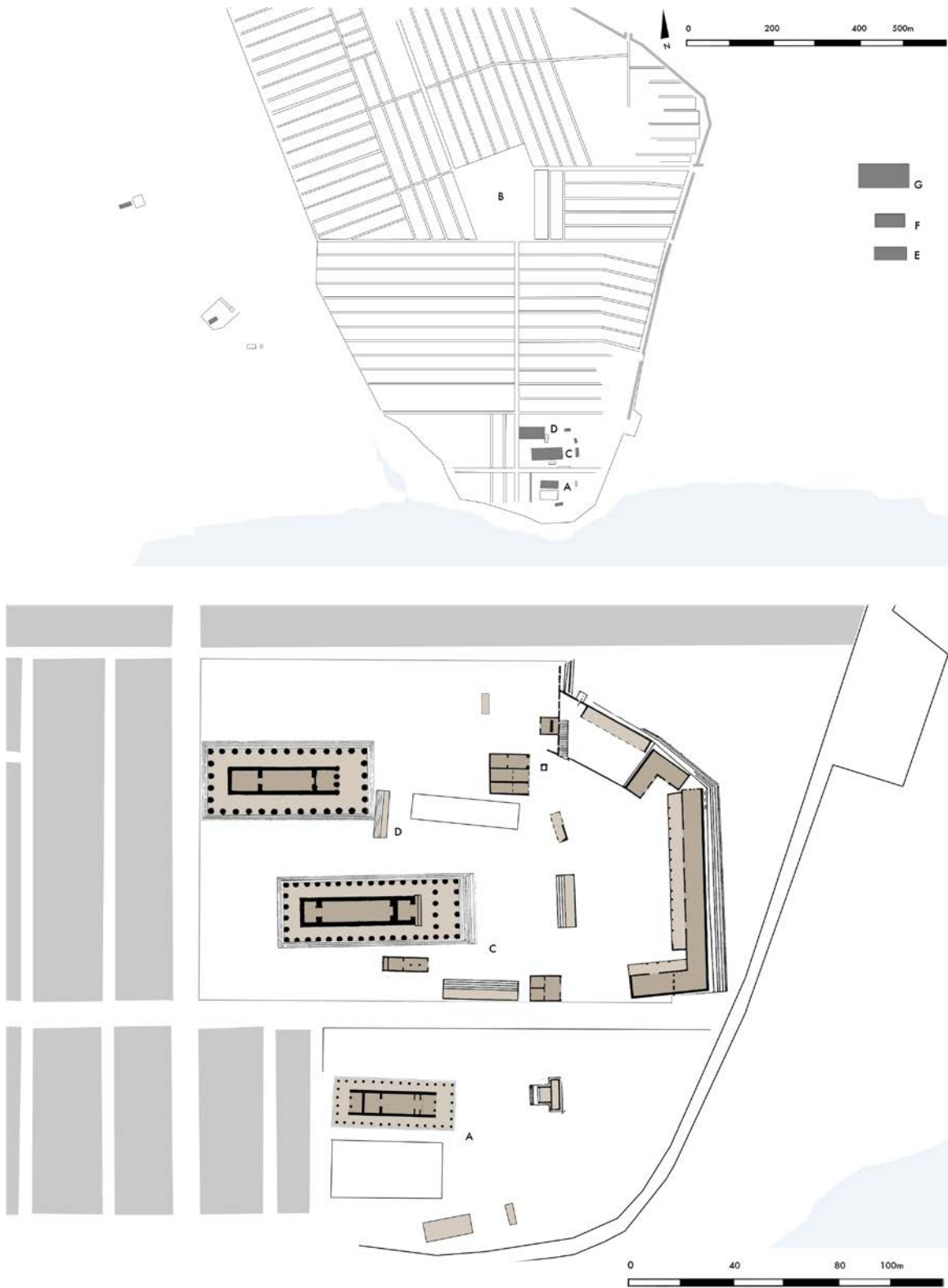


FIG. 32 Acropolis of Selinus, Sicily A) Temple "A", B) Agora, C) Temple "C", D) Temple "D", E) Temple "E", F) Temple "F", G) Temple "G", H) Temple "G"

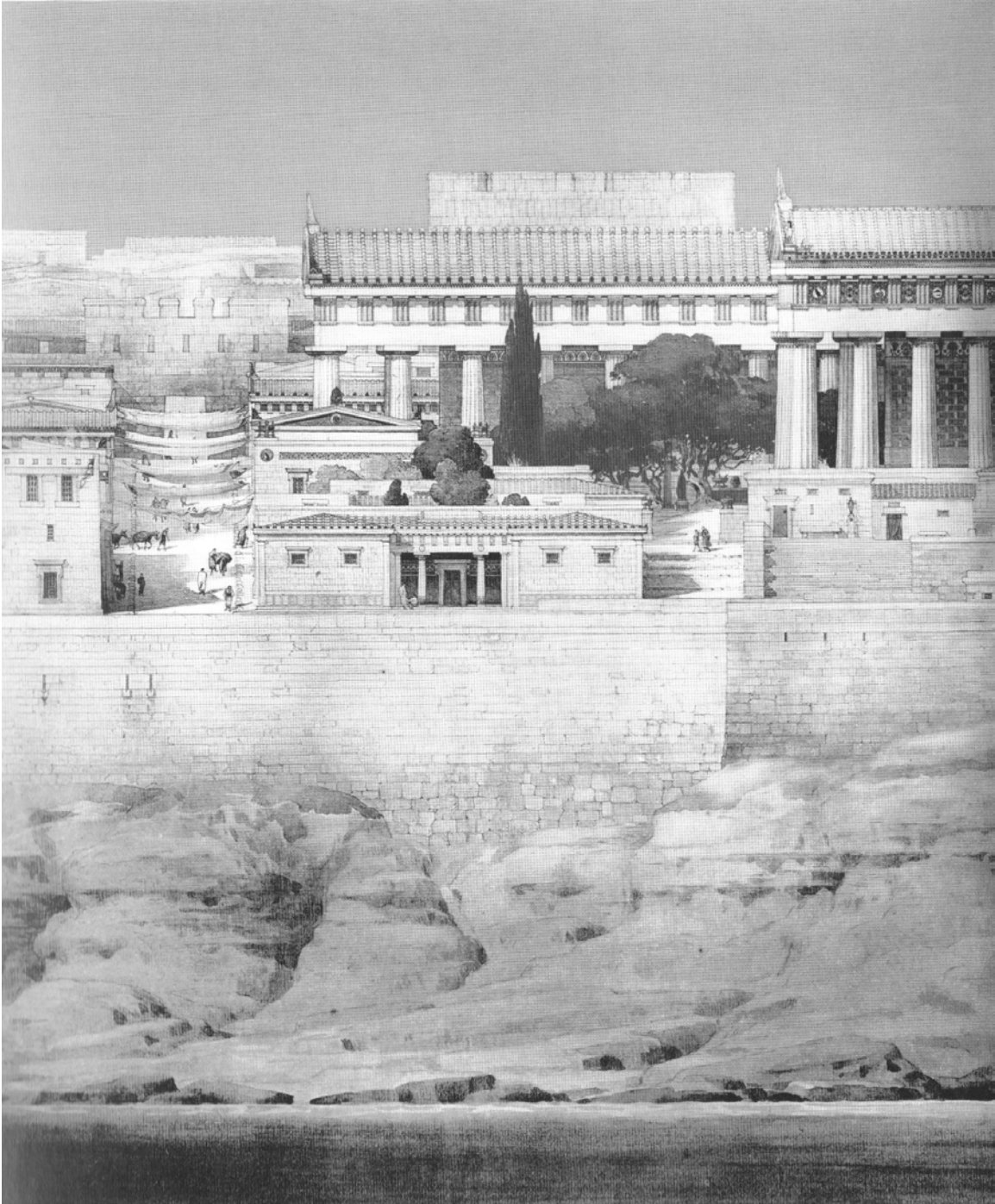


FIG. 33 Acropolis of Selinus, Sicily. Reconstruction drawing by Hulot (Fougeres, 1910), view from south of the Temple "C" on the right side and Temple "D" in the center.

The Acropolis of Selinus represents a clear composition of isolated objects that are conceived to appear as independent volumes and to be seen from the outside. In the case of Selinus the temples can be even seen from the sea by the approaching ships.



FIG. 34 *Acropolis of Selinus, Sicily. Reconstruction drawing by Hulot (Fougeres, 1910), view from the port. The temple "C" dominates the terrace of the Acropolis, between Temple "O" and "A" on the left side and Temple "D" on the right side.*

The reconstruction drawings by Jean Hulot visibly express the role of the temples in their evident attempt to stand out and to dominate the terrace of the acropolis of Selinus. Small buildings and altars have colonized the space around the temples increasing the effect of atomization and fragmentation of the urban fabric. The role of these little buildings in the ritual is not known, but spatially they reduce the vastness of the open terrace, generating a fluid dynamic space. Later on three more temples are built in a secondary independent sanctuary outside the city walls on the east side. These temples have also been placed as parallel volumes in the open landscape and, even in this case, are intended to be seen from the sea. We will consider the role of the largest temple later on.

A similar disposition of multiple temples can be found also in **Paestum** (Poseidonia), a colony founded around 600 B.C. Here a couple of temples are placed on the southern part of a wide strip of open public space that divides the grid plan in two parts. Both these two temples and a smaller temple built in the northern sanctuary are rigorously parallel although their orientation differs six degrees from the alignment of the grid. An explanation for this slight angle difference has not yet been formulated and the idea of a preexisting grid aligned with the temples has not been validated by archeologists. In the plan of Paestum, like in Selinus, there is a marked differentiation between the residential blocks and the open public space. This differentiation is a typical characteristic of Greek cities. The temples emerge here in a large open space, and the agora itself is a vast undefined space placed between the north and the south sanctuaries. In this context the temples clearly emerge as massive individual sculptures in a open space that allows them to be seen from any possible point of view.

The Temple of Hera (basilica), the first temple built in Paestum (550 BC), is a rare case of a *ennastyle temple* with nine columns in the front. Eighteenth-century archaeologists have erroneously called it "The Basilica" considering the Temple a Roman Basilica.

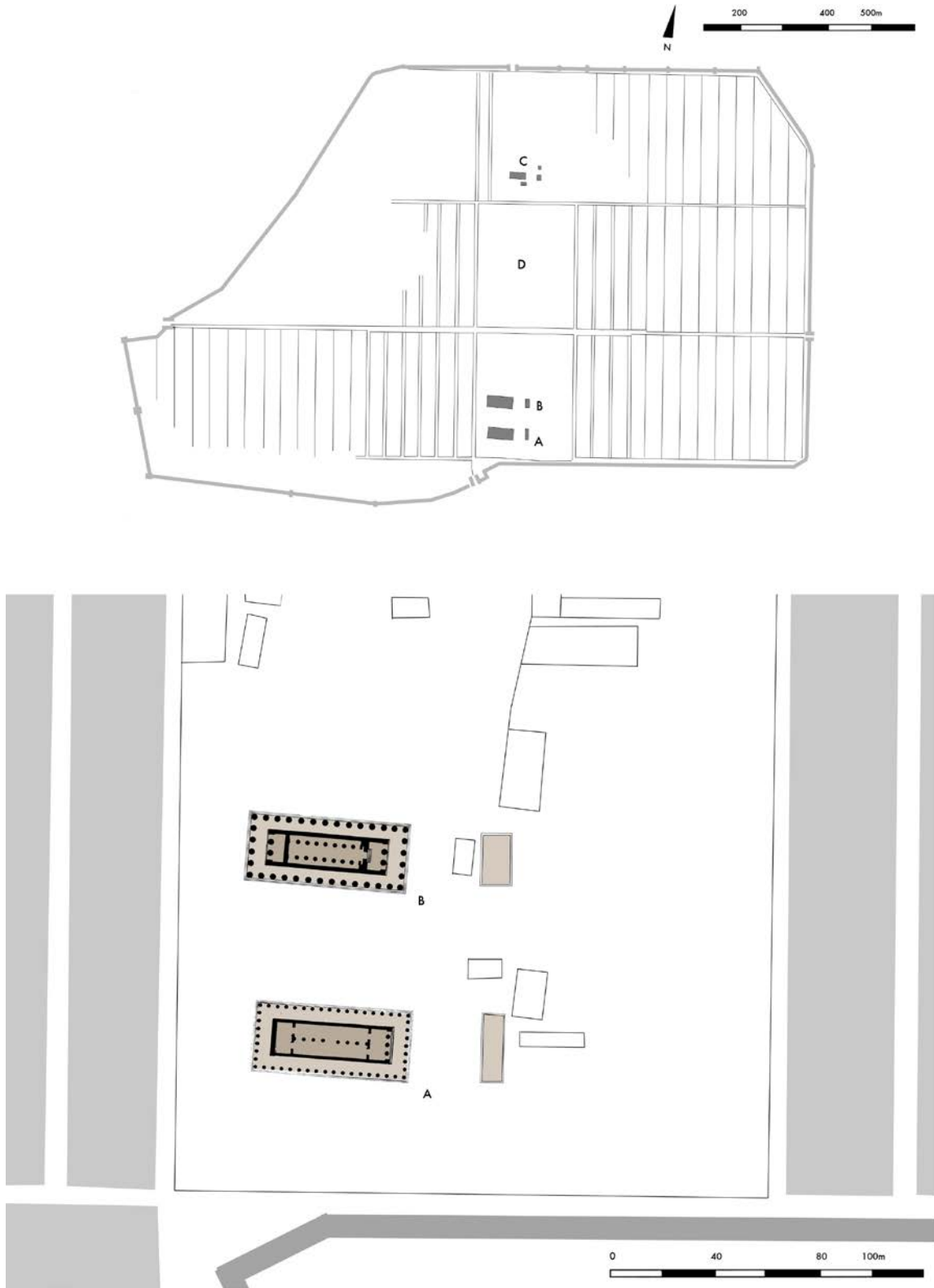


FIG. 35 Acropolis of Paestum in southern Italy. A) Temple of Hera (basilica), 550 B.C, B) The second Temple of Hera (Temple of Neptune), 450 B.C, C) The Temple of Athena, North Sancturay (Ceres), 500 B.C., D) Agora

According to Vincent Scully “its nine columns, with the central one expressive of the single row which runs through the center of a wide cella as a spine, can never be seen at once as a unit: they constantly demand to be counted and thus cannot unite their quality of an additive colonnade with the counter quality of seeming to be a single form.”³⁴ This building has puzzled the archeologists for long time, but the odd number of columns can be considered a quite typical archaic characteristic. The first Doric temples, as we have seen in the case of Thermon and Samos, are generated by the long building of the Megaron, which usually has a central row of columns that supports the roof. Later on the central row of columns, and therefore an odd number of frontal columns, has been kept in some of the earliest Doric temples. However the permanence of this archaic feature is destined to fade away.



FIG. 36 Acropolis of Paestum in southern Italy: the two temples are juxtaposed . In front: Temple of Hera (basilica), 550 B.C, Behind it Temple of Neptune, 450 B.C.

The central row of columns is evidently unpractical because it covers the entrance to the temple and obstructs the axis that leads to the internal chamber (naos). We can recognize, in the elimination of this central row, the beginning of a new interest for the development of interior space in the Greek temple. Even if the external space remains clearly predominant, architects are progressively trying to increase the internal space to allow a better axial view of the cult image. According to Robin Francis Rhodes the transition from an odd to an even number of columns in Doric temples marks the shift from an overwhelming emphasis on the exterior to a more equal treatment of the interior: “*The earliest evidence for a Doric*

³⁴ Scully, Vincent. 1962. *The earth, the temple, and the gods; greek sacred architecture*. New Haven: Yale University Press: p. 59

interest in interiors is very early indeed – as early as the early sixth century B.C. – and is found in the shift from an odd to an even number of columns on temple facades. This shift was accompanied by a change from a single axial row to a double row of interior roof support. The result was that the axis of the temple was opened, and the cult image could be placed on that axis and viewed without obstruction.”³⁵ The increasing interest for the interior space is at this stage only a hint, a trace which will become more evident and relevant only in the Hellenistic and Roman periods.

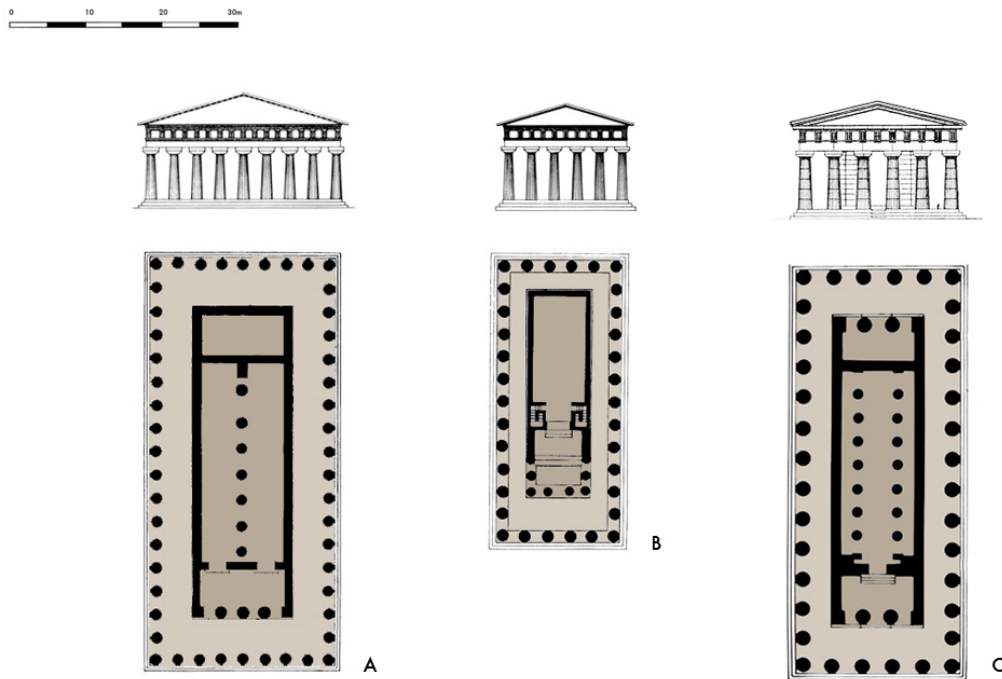


FIG. 37 Confrontation between the Temples in Paestum: (A) the Temple of Hera (basilica): it has an odd number of columns and a central row of columns in the naos (550 B.C.), (B) The Temple of Athena (Ceres)” which has an even number of columns (500 B.C.), (C) The second Temple of Hera (450 B.C.)

In any case the initial interest in interior space can already be seen in the “failed experiments” of two exceptional and gigantic temples: temple “G” in Selinus and temple of Zeus in Akragas (Agrigento). These two temples, most probably for their huge proportions, but also for the arrival of Hannibal’s army in 409 BC, have never been completed. They have similar dimensions, and in both cases the central naos is unroofed: it’s a “*sekos*”, an inner enclosure. We can consider the open air-cella as a practical solution since the normal span for timber is usually 6 or 7m and never more 12m and therefore the roof of such a large cella would represent an almost impossible challenge in this period. The general lack of

³⁵ Rhodes, Robin Francis. 1995. *Architecture and meaning on the athenian acropolis*. Cambridge ; New York: Cambridge University Press: p. 84

interest in internal space is strictly related to the fact that Greek architects always used a simple trilitic system without developing techniques for more advanced structural systems. According to Coulton surveys suggest that in terms of structure Greek architects are usually “conservative and unadventurous” because they generally base the roofing system on simple horizontal beams³⁶. But the open courtyards of the two gigantic temples represent also a completely new typology and probably also a change in the ritual. It can be argued that in such huge temples the internal space might have been conceived to contain numerous people. We can recognize in these two temples an attempt to develop new typologies and a preliminary sensibility for interior space.

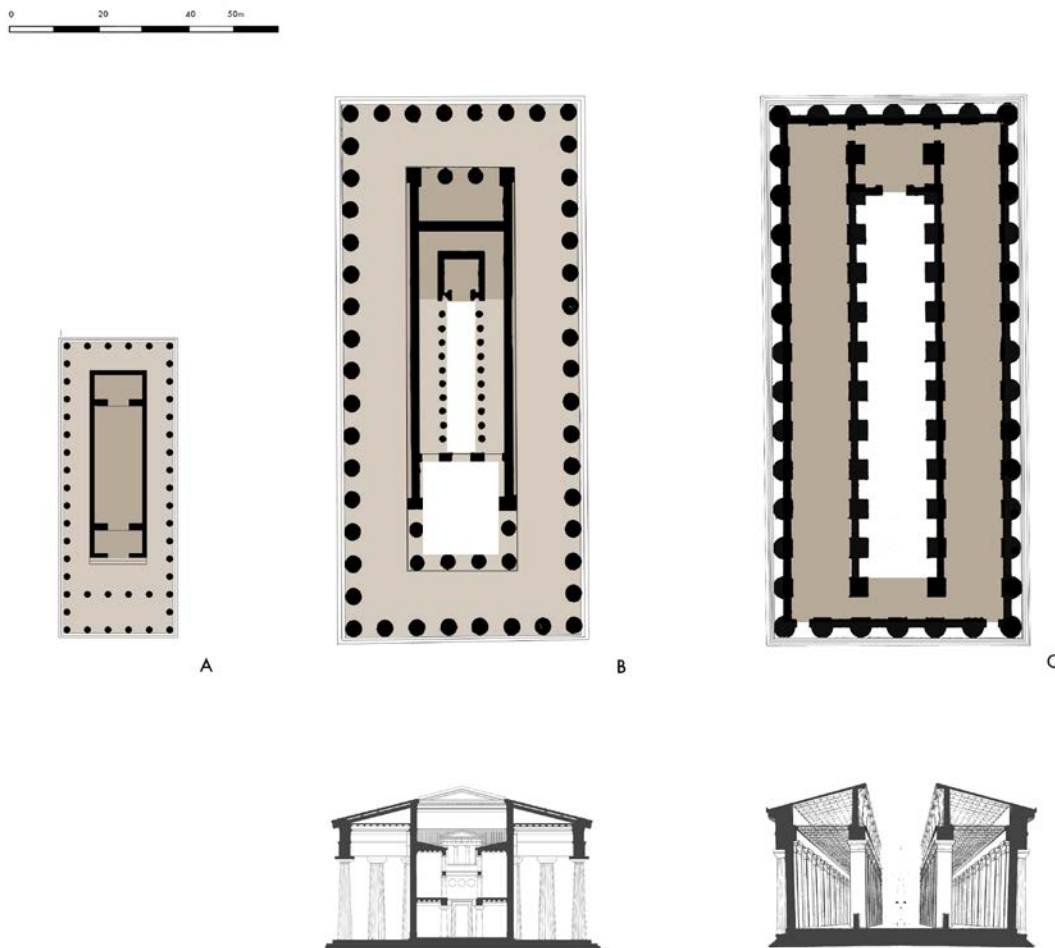


FIG. 38 Confrontation between the (A) Temple “C”, Selinus (540 B.C.), (B) Temple “G”, Selinus (520-450 B.C.), (C) Temple of Zeus, Akragas (510-409 B.C.)

³⁶ Coulton, J. J. 1977. Ancient greek architects at work : Problems of structure and design. Ithaca, N.Y.: Cornell University Press: p. 158-159.

The *temple "G"* in Selinus is 110 m long and 50m wide, with 17 x 8 columns. To have a glimpse of its huge dimensions we can consider that the columns are over 16 m high, with a base diameter of 3.4 m and a weight of approximately 100 tons each. At the end of the columned internal courtyard there is the *adyton*, the chapel with the cult image. The *temple of Zeus* in Akragas has similar dimensions and represents an even more evident deviation from the typical temple typology. The huge Telamon sculptures found on the site might have been placed externally to ideally support the entablature between the semi-columns positioned along the walls. In this case the colossal building is formed by three impressive naves. The central nave is conceived as an open courtyard which gives light to the lateral naves since there might have been no opening towards the outside besides the two main entrance doors. The plan seems almost an anticipation of the Roman Basilica typology, which is the prototype for later Christian churches. These two buildings express in the best way the experimental attitude of Magna Graecia even though they can be considered as an almost "premature" experiment on interior space. Furthermore they also represent a sort of "swan song" of Magna Graecia colonies since Selinus is razed to the ground in 409 B.C by the Carthaginian army of Hannibal, and Akragas is destroyed in 406 B.C by the same army, now led by Himilco.

In mainland Greece, between sixth and fifth century, we find more conventional typologies. According to Scranton *"In all this it may appear that the originality and curiosity of the sixth century was mostly in Asia Minor and even more in Magna Graecia, for the buildings of mainland Greece – the temple of "Apollo" at Corinth, the Old Athena Temple at Athens, the Doric and ionic treasuries at Delphi – are all, within a moderate range of variations, closer to the "conservative" main stream of design and proportions, as we are likely to think of it, which runs through the fifth century."*³⁷

However even in the more canonical Greek temples of the fifth century we can recognize an incremental process of transformation, especially in the internal *naos*: an evolution from the mere longitudinal narrow space of the archaic temples, to the interior cella of the Parthenon which marks the culmination of the Greek temple development.

The *temple of Aphaia* in Aegina represents the end of the Archaic period: the end of the archaic self-consciousness which is visually expressed by the massive Doric temples and concretely materialized in their isolation within the landscape. According to Martienssen: *"The gradual dissolution of that self-consciousness coupled with the increasing complexity of the temple surroundings (in which there was a tendency for the temple itself to become in turn a contributory unit and not an isolated self-contained structure) expedited the new plastic unity that we have seen demonstrated in the Temple of Aphaia."*³⁸

³⁷ Scranton, Robert. 1962. Greek architecture. Great ages of world architecture. New York, G: Braziller: p. 29.

³⁸ Martienssen, R. D. 1956. The idea of space in greek architecture, with special reference to the doric temple and its setting. Witwatersrand University Press: p. 80.

In this temple we can recognize a deliberate alignment of the cella with the peristyle columns, a feature which is going to be repeated in all the following temples. Even though the internal colonnaded hall maintains the longitudinal character of the archaic temples, the naos is now slightly wider and the internal columns contribute to give more emphasis to the interior space. We can imagine that the cult statue placed at the end of the hall is now flanked and framed by the two colonnades.

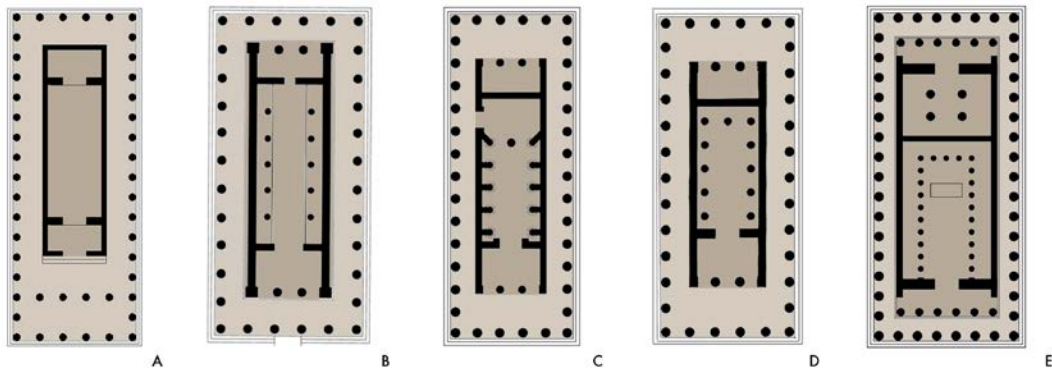


FIG. 39 Confrontation between temples (not at the same scale for a clearer confrontation) (A) Temple "C", Selinus (540 B.C.), (B) Temple of Aphaia, Aegina (500 B.C.), (C) Temple of Apollo, Bassae (450 B.C.), (D) Hephaisteion, Athens (449-415 B.C.), (E) Parthenon, Athens (447-432 B.C.)

A further step is visible in the *Temple of Apollo* at Bassae. This temple, credited to the architect of the Parthenon Iktinos, is known for having been described by Pausanias, the author of "Description of Greece", the first travel guide about Greece (8.41.7). According to the famous traveler of the second century A.D. : "On the mountain is a place called Bassae, and the temple of Apollo the Helper, which, including the roof, is of stone. Of the temples in the Peloponnesus, this might be placed first after the one at Tegea for the beauty of its stone and for its symmetry." But another renowned characteristic of this temple is related to its internal naos, in which, during a famous expedition in 1811, archeologists have found a column surmounted by the earliest known Corinthian capital. The column is placed at the end of the cella as an attempt to conclude the two rows of Ionic semi-columns, which are joined with pilasters to the walls of the cella. For its central position and for its uniqueness in the temple, the Corinthian column almost takes the place, and the role, of the cult statue. Moreover the single Corinthian column completes the Ionic semi-columns defining for the first time a simple peristyle enclosure which surrounds the interior room on three sides. If we include the external Doric columns we can find in this temple all the three classical

orders. It can be considered the first Greek temple in which different orders are combined within the same building.

In the *Hephaisteion*, the Temple of Hephaestus located in the north-west side of the Athenian Agora, on top of the Agoraios Kolonos hill, we find a similar solution, with the only difference that now all the internal columns are freestanding. In the essay "*Interior Design of Greek Temples*" Scranton notes that: "*it is perhaps worth while to observe that in the temple at Bassae and in the Hephaisteion the difference in effect from the feeling of a colonnaded corridor is produced by the insertion of only one extra column, on the axis of the building*".³⁹ Therefore in both the *Temple of Apollo* and the *Hephaisteion*, the central column has the role to reduce the "corridor effect" of the longitudinal space of the naos, defining a more enclosed internal space.

But it is probably only in the *Parthenon* that the internal peristyle of the naos is clearly defined on all three sides. Here the two levels of superimposed ionic columns surround and turn around the chryselephantine statue of Athena, placed in the middle, creating an emphatic background for it. The internal cella is also notably wider than in previous examples and, on the contrary, the external peripteral Doric colonnade is more close to the walls of the naos. During the fifth century we can therefore recognize an incremental process that leads towards a more important role of interior space in architecture. Both Temple of Apollo at Bassae and the Parthenon probably represent the first cases of distinguished interior design in Greek Architecture.

However we should not forget the undisputed predominance of the exterior space that is still dominating Greek architecture during this period, a predominance that is expressed both in temple design and in space disposition. The case of the Parthenon is emblematic because it can be considered the most refined and sophisticated expression of a "building-sculpture" which has been conceived to be observed from outside to the point of "deforming" its elements to have an optical correction that adapts the temple to the eye of the observer. According to Scranton "*the most significant differences are scarcely perceptible: the curvatures of steps and stylobate, architrave and frieze ; the intricate system of inclinations of the columns on front, sides and corners, in addition to the finer quality of the more common refinements of entasis and the extraordinary precision of carving, even in such minute details as the scarcely noticeable arrises between the flutes. The great superiority of the Parthenon, then lies in the sheer quality and sensitivity in the multitude of details, any of which belong in any buildings, but all of which are embodied in this building, to animate within its logically structured regularity more pervasively and more completely than any other building.*"⁴⁰ All these factors are symptomatic of an architectural practice that is strictly related to sculpture and is based on the quality of the multiple details which, altogether,

³⁹ Scranton, Robert L. 1946. Interior design of greek temples. American Journal of Archaeology 50 (1) (Jan. - Mar.): pp. 42.

⁴⁰ Scranton, Robert. 1962. Greek architecture. Great ages of world architecture. New York, G: Braziller: p. 30.

generate a final sculptural whole. Furthermore it is important to note that all these small variations would be imperceptible in any kind of scaled drawing. Therefore we might assume that the Parthenon is still the result of an architectural practice that operates without drawn plans, basing the composition of the main elements on mathematical rules of proportions: rules that might have determined also these incremental variations of curvatures and alignment corrections. If all these variations are generated to correct the visual perception it's evident that the essence of the Parthenon is related to its visual perception from the exterior space. The open surrounding space is therefore as much important as the building itself.

If the Parthenon represents the culmination of the Greek architectural development, the fifth century represents also the clearest expression of the Greek space conception, which has been previously explained in terms of fragmentation and "atomization". Furthermore if during the archaic period, and especially in magna Graecia, the system of parallel alignments predominates in the disposition of the temples and even in the organization of the long narrow blocks formed by parallel streets, during the fifth century the spatial system seems to be more fluid and less organized. The "urban atoms", represented by temples and stoas, during this period seem to be passing to a fluid state that disarticulates every crystalline grid, allowing the molecules to assume a free position and orientation. According to Roland Martin *"in all the instances one can discern the same principles linking the buildings in indefinite and fluid relationships. One volume is played off against the other, but not in the strict lines of geometric composition. Only in the following epoch did Hellenistic architects, under other influences, fall back upon axuality and symmetry for organizing their vast building projects."*⁴¹ Temples and stoas are being increasingly accumulated in the most important sanctuaries and agoras, without a geometric or rational disposition. According to Scranton, who has used the term "group design" to express Greek space sensibility: *"Accustomed to this kind of style in group design, when we view the apparently haphazard arrangement of buildings in many Greek sanctuaries and towns we naturally recoil with the rather astonished impression that there is no reason whatsoever behind them. It is worthwhile, however, to attain an open mind and try to see whether there may not be, after all, positive values in the Greek designs."*⁴²

The archaic system of organization based on parallel lines is still partially recognizable in the sanctuary of Hera in Argos called **Argive Heraion**. The oldest temple, placed in the northern terrace, has been destroyed by a fire in 423. After the fire a new temple is constructed in the middle terrace, by the architect Eupolemos, with the intention to host the famous Polykleitos' sculpture of Hera made with ivory and gold-plated bronze. The north stoa between the two temples, according to Coulton, is the earliest stoa constructed with

⁴¹ Lloyd, Seton, Roland Martin, and Hans Wolfgang Müller. 1974. Ancient architecture: Mesopotamia, egypt, crete, greece. History of world architecture. New York: H. N. Abrams: p. 334.

⁴² Scranton, Robert. 1949. Group design in greek architecture. The Art Bulletin 31 (4) (Dec.): pp. 248.

stone columns. It has probably been built around the early sixth century, a few decades after the first wooden stoa of the other important sanctuary of Hera: the Heraion in Samos. In the western part of the sanctuary we can also find the earliest example of a building with an open peristyle court, built in the late sixth century probably to serve as a *hestiatorion*, (dining hall). Altogether these buildings generate a typical Greek spatial composition of isolated objects apparently floating in a fluid space. A possible explanation for the parallel disposition of most of the buildings of the *Argive Heraion*, besides being an archaic feature, is that the sanctuary is placed on a sloped site, therefore all the terraces and the buildings are disposed along the terrain contour lines. Both the sloped site and the limited terraced space determine also an uncommon built density for a sanctuary and an unusual proximity between buildings which nonetheless might have generated a partial sense of enclosure and a richer spatial quality. The use of terraces and stairs is quite innovative for this period: we can consider this solution an anticipation of the monumental use of terraces and stairs of the Hellenistic period, an use which is quintessentially expressed in Pergamon.

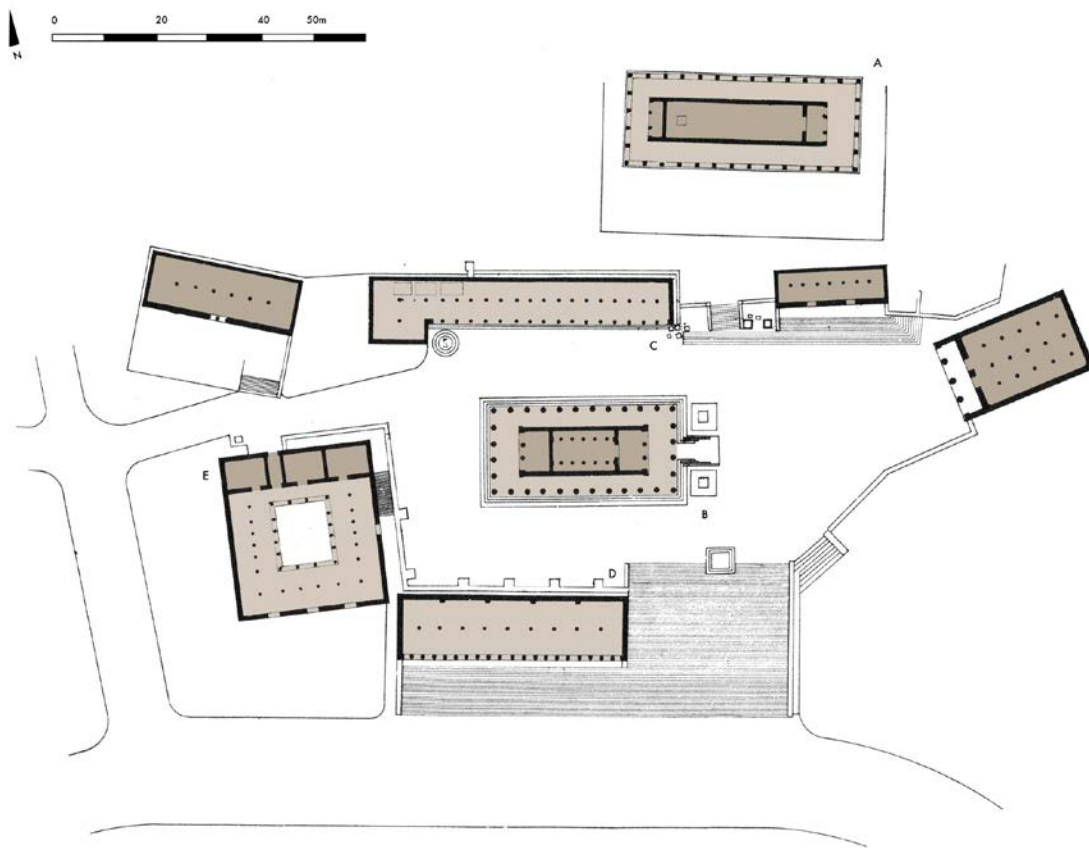


FIG. 40 Plan of the sanctuary of Argive Heraion during the fifth century. A) Old Temple of Hera (625–600 B.C), B) New temple (420 B.C), C) North Stoa (ca. 600 B.C), D) South Stoa (450-425 B.C) , E) West building, probably a dining hall (ca. 500 B.C)

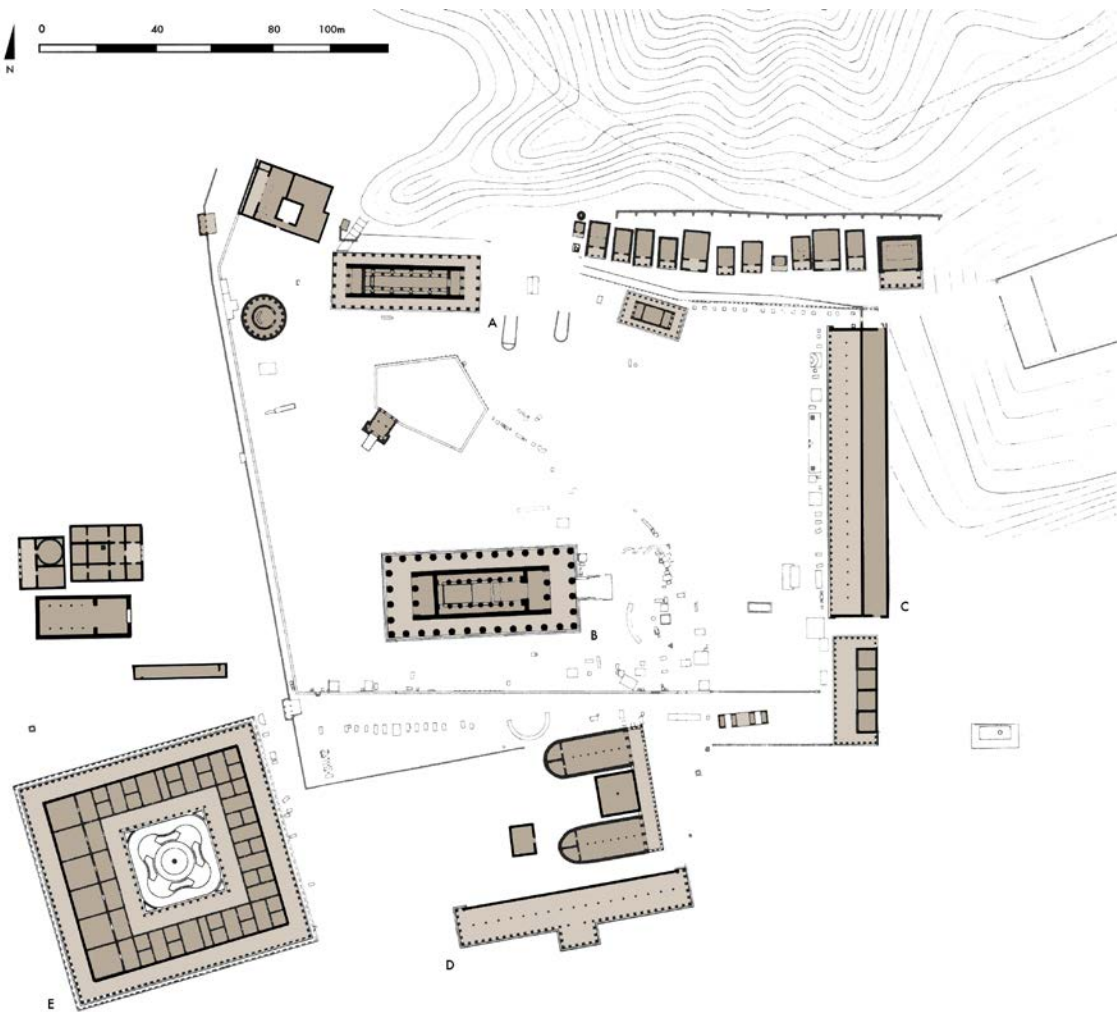


FIG. 41 Plan of the sanctuary of Olympia during the fifth century. A) Old Temple of Hera (ca. 600 B.C), B) Temple of Zeus (ca. 450 B.C), C) Echo Stoa (ca. 325 B.C), D) South Stoa (350 B.C) , E) Leonidaion, lodging place for athletes (ca. 330 B.C)

A more typical Greek space disposition can be found in the sanctuary of **Olympia**, the site of the Olympic Games in classical times. The first building activity dates from around 600 B.C. with the construction of the Heraion, the Temple of Hera. This temple, destroyed by an earthquake in the early 4th century AD, has never been rebuilt. A larger temple dedicated to Zeus is built in the middle of the 5th century BC. As noted by Doxiadis, the new Temple of Zeus is pushed westward far enough so as not to cover the view of the old Heraion from the main entrance, and southward far enough not to cover the same view from the southwest entrance⁴³. This is certainly one of the few recognizable principles which are characteristic of Greek space disposition: from the entrance point of the sanctuaries the main temples

⁴³ See: Doxiadis, Konstantinos Apostolou, and Konstantinos Apostolou Doxiades. 1972. Architectural space in ancient greece Cambridge, Mass., MIT Press

appear obliquely and can be usually perceived entirely without obstruction. On the contrary before approaching the site the temple is usually hidden whether by terrain, by a surrounding wall or by other buildings. But besides these principles and in terms of space organization the site apparently expresses no predefined plan.

As it is very common in most of the cities and sanctuaries of the classical period, the only element which partially defines and encloses the space is the freestanding stoa. The two stoas of Olympia, the Echo Stoa and the South Stoa, are built in the mid-fourth century to reorganize of the sanctuary. The unique feature of the south stoa, which defines the entrance to the site, is the hexastyle central protrusion treated like a temple façade. In the north-east side a of the sanctuary a series of treasuries buildings, intended to store votive offerings, defines an almost continuous front which separates the site from the hill behind. The large building with the peristyle court, placed in the southwestern portion outside the *temenos* of the sanctuary, is called "Leonidaion" and is the lodging place for athletes who take part to the Olympic Games. Its name comes from the its designer, Leonidas of Naxos, who has designed the building at the end of the classical period, around 330 B.C.

The general organization of the site expresses in the best way the effect of fragmentation and atomization of the Greek space conception. Temples and stoas emerge as units in the landscape, atoms that are completely independent of each other. According to Scranton *"In so large a sanctuary as those at Olympia and Delos, the space form is set by a great stoa on one side (at Olympia supplemented by the treasury terrace treated as a unit on another). Within the area so established is only one outstanding building; the many smaller ones are scattered about in general confusion. Now and then we may detect more or less formal effects among the subsidiary buildings, particularly when they are lined along roads or paths, but seldom do they achieve an organized collective form beyond the impression of a full, even crowded, volume. They are never all related to a dominant unifying structure."* This kind of disposition is arguably the result of a space organization which is not based on drawn plans.

If, during this period, scaled drawings are most probably not used for temples, it would be surprising to find out that they are used for larger and more complicated plans. Most probably new buildings are incrementally added to the same location, deciding the position and the orientation of every new building on site, according to the sensibility of the architects and in accordance with the landscape features and with the possible views from key points. What is evident is that in classical period temples are never placed within geometrically defined spaces. According to Richard Stillwell *"it is the definite, concise form of the building which is emphasized by the process of isolating it in space, a space to which no definitely recognizable geometric form is given. To be sure one may become conscious of an irregular space and hence, perhaps, made more aware of the perfect harmony of the building itself. Again a corollary may be taken from classical Greek sculpture where in reliefs there seldom if ever is any background save a wholly abstract one. The setting of figures in a scene, whether architectural or natural, belongs to a later age and goes along with the formalizing of*

the spaces that are a part of Hellenistic planning"⁴⁴. Doxiadis in his "Architectural Space in Ancient Greece" has tried to explain the "irrational" Greek disposition of volumes, from the seventh century B.C. onwards, as a precise system of radial subdivision of the arc of vision, from the point of view of a potential human observer standing at the entrance of the sanctuary. According to Doxiadis buildings are placed at specific intervals of this radial subdivision, employing either an Ionian ten-part or a Dorian twelve-part system. The thesis is certainly provocative and well documented with diagrams even though Doxiadis himself admits in the introduction that it is difficult to establish proof. I think that the starting premise, in other words the assumption that Greek architects employ a system of disposition of buildings based on "human cognition" and therefore on the view of the observer, is certainly valid. We have already seen that even temple design is strictly related to the visual perception of the building from the external space. Doxiadis has also shown that from the entrance of the sanctuary the temple is placed to be seen obliquely, showing two of its sides to the viewer, and to avoid an axial approach. This is certainly true in the classic period. The oblique view naturally emphasizes the three-dimensional quality of the isolated volume of the temple: this is a well-known principle in sculpture. I think it's also reasonable that the entry point to the site represents a privileged point of view. Furthermore it is realistic to think that the decisions about the position and the orientation of new buildings might have been taken from this point of view and primarily for this point of view. Therefore the real issue is whether these decisions are based on the sensibility of the architect or on codified rules. If temples are probably constructed according to mathematical rules of codified parameters, a similar system might have been used also for the positioning of buildings in space. A planning system based on polar coordinates would also be compatible with the assumption that Greek architects didn't use drawn plans. However all these hypothesis should be carefully analyzed, and confronted with recent archeological evidences. As Stillwell says in consideration of Doxiadis theory: *"if anywhere in the Greek world of the period under consideration we may expect to find the application of optical refinements with regard to the placing of buildings it should be on the Acropolis at Athens"*.⁴⁵

The **acropolis** of Athens, as we have seen in the case of Selinus, represents the original nucleus of the city. In most of the Greek cities the acropolis has been inhabited since Mycenaean times, a period in which cyclopean fortifications are built to protect the palace of the king with the Megaron. The acropolis is usually conceived as the stronghold which watches over the town: the "safe" place from which kings can dominate and maintain their power, especially during the so-called "Dark-ages" between the Mycenaean and the archaic period. Therefore the acropolis symbolically represents the possession of the control over the city. When the tyrants of the seventh and sixth century intended to come to power, they did so by forcefully occupying the acropolis.

⁴⁴ Stillwell, Richard. 1954. The siting of classical greek temples. *Journal of the Society of Architectural Historians* 13 (4) (Dec.): p.4.

⁴⁵ *Ibid.*, p. 5.

The role of the Tyrants is disputed. According to Wycherley: *“one must give the “tyrants” credit for the important part they played. “Tyrants” in the original Greek sense, that is unconstitutional (though not necessarily bad) rulers as opposed to hereditary kings, are constantly cropping up in the course of Greek history. In the seventh and sixth centuries they played a particularly important part. In some cities they held a key-point in political development, providing a necessary transition between aristocracy and democracy ; many of them wisely devoted much thought and money to public works and monuments.”*⁴⁶ Even the acropolis of Athens is taken over by Kylon, during the failed Kylonian revolt, and twice by Pisistratus, the tyrant who has started the Panathenaic Festival. In any case during the end of the sixth century the acropolis is transformed into a sanctuary with the construction of a temple dedicated to "Athena Polias". The acropolis, losing its role of stronghold, becomes a sacred place, and therefore a place that cannot be conquered, politically and physically, anymore. It is probably not a coincidence that democracy develops in Athens just after this event, in the last decades of the sixth century. But before analyzing the acropolis of the Periclean period, I'd like to examine its indissoluble relation with the city of Athens and more generally the issue of urban planning in the fifth century.

The transformation of the acropolis into a sanctuary marks a relevant transition: in this period the Athenian hill loses its “political” relevance and becomes part of the larger city. Its noteworthy that in the earlier Homeric Age it is possible to identify a strong distinction between the concept of “*polis*”, which indicates only the acropolis, the fortified town enclosed by walls, and the idea of “*astu*” the lower town, not enclosed by walls, inhabited by farmers. According to Jan Paul Crielaard *“In the poetry of Homer and Hesiod, “polis” evokes an image of the city as a whole, often in conjunction with its city wall; it refers to the city as seen from the exterior... “astu”, on the other hand, is the city viewed from within; the focus is on the inhabitants.”*⁴⁷ We might say that in the classical period the acropolis progressively loses its relevance and consequently the concept of polis is increasingly expanded to include both the city and the countryside. Therefore the distinction between “polis” and “astu” ceases to be meaningful after the sixth century. During this period the relationship with the landscape and the countryside becomes an essential urban aspect even in a city like Athens. It's noteworthy that *nomos*, the Greek word for “law” and the founding principle of the Greek poleis, is etymologically related to the root “-nem” (distribute, allot) and to the act of dividing the land. Greek poleis are intrinsically related to the land and to the relationship with nature. According to Wycherley: *“One should not get the idea that Greek culture was primarily and almost exclusively urban. The life of the Greek city-state was founded upon agriculture and remained dependent on it. The cultivation of its patch of fertile land, the growing corn, olives or vines, was important to each city, even the most highly developed, even to those which imported large part of their food from distant lands. Thucydides tells us that*

⁴⁶ Wycherley, R. E. 1976. How the greeks built cities. Norton library. 2d ed. New York: Norton: p. 8.

⁴⁷ See: Raaflaub, Kurt A., and Hans van Wees. 2009. A companion to archaic greece. Blackwell companions to the ancient world. ancient history. Chichester, U.K. ; Malden, MA: Wiley-Blackwell: p. 351.

the majority of the Athenians in the fifth century lived normally in the country (ii. 14.2), and Aristophanes in the Acharnians and elsewhere gives vivid glimpses of the deep attachment of a large section of the Athenians to the soil of Attica."⁴⁸ In 431 B.C., when Pericles becomes aware that Sparta intends to invade the Athenian territory, he has to convince the residents of Attica to move within the urban area of Athens. For most of them, the move means to abandon the land and ancestral relation with it. This strong relation with the countryside is physically expressed by the fact that Athens has not been enclosed by walls for a long period. The city has grown unregulated and through a slow process of agglomeration of autonomous villages. Therefore there is a substantial difference with the cities of Magna Graecia, in which walls and fortifications have been developed and built much earlier, probably for the higher risk of attacks, but also for the fact that these towns have been organized and planned before the construction. Even when the walls are finally built in Athens, they are placed at a relevant distance from the buildings, defining a quite loose structure which does not define a frame for the town.

The Greek polis appears therefore as an open system, strictly related to the exterior land: ideally it would be an immaterial and fluid entity, with no structures and no infrastructures, but only citizens. What constitutes and protects the city is not the built city and its walls, but its inhabitants. In the sixth century the lyric poet Alcaeus has clearly expressed the Greek idea of "polis" in a metaphor: *"Not houses finely roofed or the stones of walls well builded, nay nor canals and dockyards make the city, but men able to use their opportunity"* In another fragment he has claimed that *"men are a city's warlike wall"*. A similar vivid image has been used by Athenian politician Themistocles in his retort to Corinthian Adeimantus: *"Athenians have a far greater city than Corinthians: as long as they have two hundred ships full of men"*. The basic idea that *"men make the polis"* is largely diffuse in the classic Greek period.

Even the Hippodamian plan of the fifth century, should be considered, first of all, as a philosophical organization of citizens and only secondarily as a theoretical urban model which has been probably derived from the earlier examples that can be found in the colonies of Magna Graecia since the seventh century. In the second book of his *"Politics"*, Aristotle presents Hippodamus first of all as a philosopher concerned with the issue of the best form or government (Politics 2, 8): *"Hippodamus, the son of Euryphon, a native of Miletus, the same who invented the art of planning cities, and who also laid out the Piraeus- a strange man, whose fondness for distinction led him into a general eccentricity of life, which made some think him affected (for he would wear flowing hair and expensive ornaments; but these were worn on a cheap but warm garment both in winter and summer); he, besides aspiring to be an adept in the knowledge of nature, was the first person not a statesman who made inquiries about the best form of government."* The description of his eccentric way of life is not secondary, because is reminiscent of the description of Socrates in the same book: it can be interpreted as a way to characterize him as a philosopher. Aristotle goes on

⁴⁸ Wycherley, R. E. 1976. How the greeks built cities. Norton library. 2d ed. New York: Norton: pp. 12-13.

describing his philosophical system, which is based on the subdivision of land and citizens *"The city of Hippodamus was composed of 10,000 citizens divided into three parts- one of artisans, one of husbandmen, and a third of armed defenders of the state. He also divided the land into three parts, one sacred, one public, the third private: the first was set apart to maintain the customary worship of the Gods, the second was to support the warriors, the third was the property of the husbandmen. He also divided laws into three classes, and no more, for he maintained that there are three subjects of lawsuits- insult, injury, and homicide. He likewise instituted a single final court of appeal, to which all causes seeming to have been improperly decided might be referred; this court he formed of elders chosen for the purpose."* We can realize from these words that the essence of the Greek city is not the built city: the *polis* is mainly an immaterial system based on the law, the *nomos*, and the *nomos*, as we have seen before, is originated by the division of land. Therefore a *polis* is generated primarily by the division of land and by the consequent subdivision of citizens according to the law system.

The Hippodamian grid, in terms of built blocks and streets, is therefore only a secondary aspect, the practical materialization of an idea which is essentially political. However, in terms of urban planning, Hippodamus' subdivision in three parts is something which can be clearly recognized in Greek cities. The *private part* is primarily defined by residential blocks and is inhabited by the farmers. Both the *sacred part*, the acropolis inhabited by the Gods, and the *public part*, the agora inhabited by "warriors" –we might say the male citizens-, are placed in the open space and are clearly separated by the residential areas. Therefore the urban plan of Greek cities, intended as the network of streets and the form of the blocks, is mainly related to the private, residential area. The temples and the stoas are usually placed outside the residential blocks, as unregulated floating objects in the "open void" of sacred and public spaces. It's only in the Hellenistic period that temples and stoas start to be constituent and essential elements of the urban plan, articulating in a more complex way the clear distinction between private blocks and public open space.

This assumption can be also deduced by Aristotle, who speaks of the Hippodamian plan in terms of the form of streets and blocks, only in the book 7, where he discusses the best organization and disposition of private houses (Politics 7, 11): *"The arrangement of private houses is considered to be more agreeable and generally more convenient, if the streets are regularly laid out after the modern fashion which Hippodamus introduced, but for security in war the antiquated mode of building, which made it difficult for strangers to get out of a town and for assailants to find their way in, is preferable. A city should therefore adopt both plans of building: it is possible to arrange the houses irregularly, as husbandmen plant their vines in what are called 'clumps.' The whole town should not be laid out in straight lines, but only certain quarters and regions; thus security and beauty will be combined."* Besides the correlation between the form of the block and defensive issues, what is evident from these words is that the form of the urban plan is generated primarily by the shape the private housing blocks. The public space is to be considered the empty space left outside the blocks.

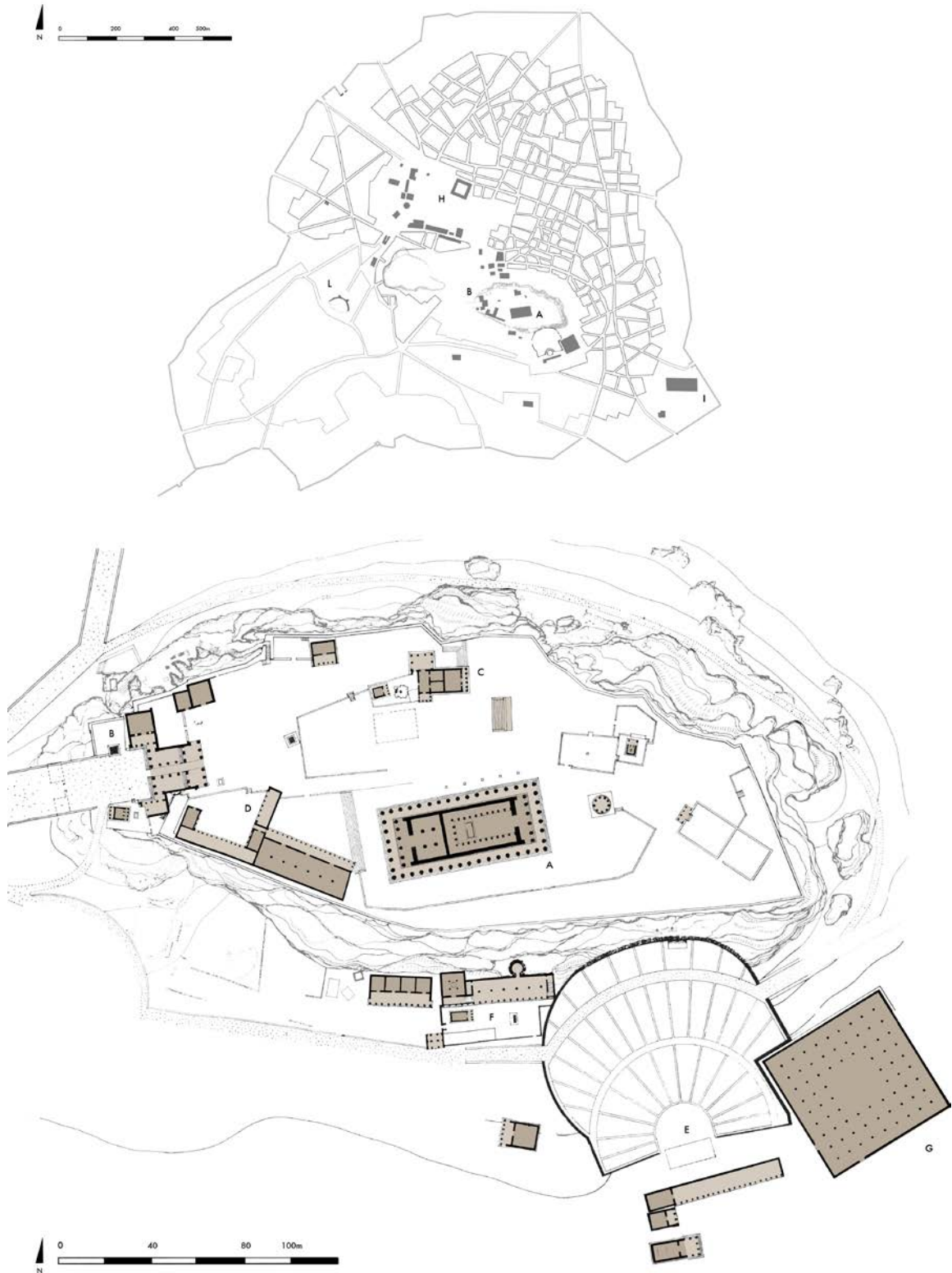


FIG. 42 Plan of the acropolis in Athens during the fifth century. A) Parthenon (447-432 B.C), B) Propylaea (432 B.C), C) Erechtheion (421-406 B.C), D) Sanctuary of Artemis Brauronia (430 B.C), E) Theatre of Dionysus (ca. 500 B.C as wooden construction), F) Sanctuary of Asclepius G) Odeon (435 B.C). In the general plan on top: H) Agora, I) Olympieion, L) Pnyx, meeting place of the Athenian assembly.

This is evident as soon as we have a look at the plan of Athens. The city emerges as system composed by the solid volumes of the private residential blocks, and the empty space of the public space with its floating objects. This evident distinction can be considered as the result of the clear separation between private and public life in Greece. Hannah Arendt in *"The human condition"* has described this contraposition in terms of the antithesis between "polis" and "oikos"⁴⁹. The "Polis" is the public realm, the space of politics represented by the agora in which the free male citizens emerge as individuals, as equals who have the right of acting and speaking. The "oikos", on the contrary, is the private and intimate space of the house, but also the place of "labor" for women and slaves: the space in which humans are together for necessity, for the urgency of life. We can visually recognize the private realm of the "oikos" in the solid residential blocks of the built city, and the public realm of the "polis" in the empty space in which individual entities such as citizens, temples, and stoas emerge as isolated bodies to express their "free position". Therefore we can argue that the *polis*, the Greek immaterial idea of a city, is fully represented by the empty space between the residential blocks, the void in which citizenship, freedom, and individuality are possible.



FIG. 43 The Temple of Athena Nike on the Acropolis of Athens.

⁴⁹ See: Arendt, Hannah. 1959. *The human condition*. Doubleday anchor books ; A182. Garden City, N: Y., Doubleday

It is in this empty and unregulated space that the buildings of the **Athenian acropolis** can freely emerge and stand out. Scranton has described this kind of spatial arrangement, generated by multiple little objects gathered around the same open space, in terms of "population": *"In this and many other examples it is clear that a spatial feeling exists, but that it is not organized systematically, and is very informal. In most developed cases numerous small monuments would create a sense of population within the space; that is, it would not be simply an empty area, but a place full of objects, various and interesting, providing life and variety. Although there would be no formal "view" or spectacle and little sense of organization, there would be an optimum of convenience and there would be a clear emphasis on the passage of the main objective"*⁵⁰

The Parthenon, the most important element of the acropolis, is built on the remains of the "older Parthenon", a building whose construction starts in 490 BC., after the Victory at Marathon, and ends prematurely when the Persians sack the city and raze the acropolis in 480 BC. The program of reconstruction of the acropolis is promoted, by Pericles during the second half of the fifth century, and realized by architects and sculptors such as Phidias, Ictinus and Mnesikles. Around 437 B.C. , when the Parthenon is almost complete, the architect Mnesikles starts working on the Propylaea, the new monumental entrance of the acropolis. Here, he rotates the disposition of the new building by 23 degrees, from the orientation of the previous structure, to have an axial entrance from the ramp. We can recognize in this incredibly sophisticated building some precursory characteristics such as the almost symmetrical distribution of volumes, an axial entrance, and a hint of a "U" disposition: all these elements will become founding principles of Hellenistic architecture at the end the following century. However the main difference is that in the Hellenistic period all these features are applied to an urban scale: here they seem reduced to the scale of an autonomous and small unified complex. Even in the sanctuary of Artemis Brauronia, never fully completed, we can find an anticipation of the "U" disposition of the Hellenistic agoras: here uniform colonnades are disposed around three sides, defining, for the first time, a small unified space.

It is noteworthy that the presence of this building on the acropolis would contradict Doxiadis' hypothesis that the Parthenon can be entirely seen from the entrance point of the Propylaea, as it is clearly shown in one of his evocative reconstruction drawings. According to Richard Stillwell: *"there was far more to be seen, however, than what is shown in Figure 8 (Doxiadis' view, Author's Note). There seems to have been a rather formidable terrace in front of the Peisistratid temple, or as much of it as was left after the Persians had sacked the Acropolis in 480. There was also a precinct wall for the Braurion and for the court of the Chalkotheke, and while the north wing of the building east of the Braurion probably is later, Gorham Stevens (The Periclean Entrance Court of the Acropolis of Athens, 1936) has traced, without question, a wall which extended along the north side of the Parthenon, formed a*

⁵⁰ Scranton, Robert. 1949. Group design in greek architecture. The Art Bulletin 31 (4) (Dec.): pp. 249.

*terrace, and bounded the Panathenaic way.*⁵¹ If Stevens' reconstruction is correct, the Parthenon wouldn't be entirely visible from the Propylaea, whereas it could be seen completely only after entering the smaller entrance which leads to the enclosure in front of the Parthenon, the so-called Chalkotheke court. As a matter of fact the space of the acropolis in the fifth century is much different from how it appears now. Certainly the walls that enclose of the sanctuaries, the statues and all the other small buildings create, in this period, the effect of a much more "crowded" space.

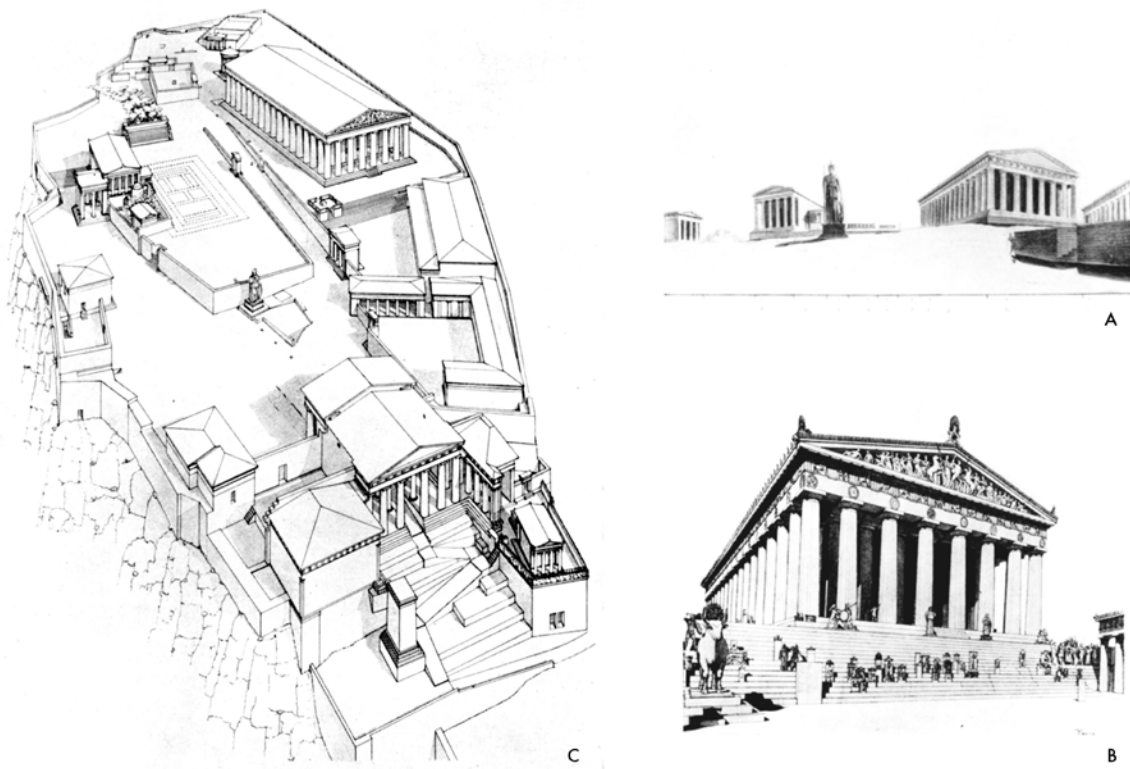


FIG. 44 View of the Parthenon: A) Restoration of the view from the Propylaea by Doxiadis, B) reconstruction of the first good view of the Parthenon from the smaller entrance of the Chalkotheke court, by Gorham P. Stevens. C) Bird's-Eye View of the Acropolis, from "Architectural Studies Concerning the Acropolis of Athens" by Gorham P. Stevens.

⁵¹ Stillwell, Richard. 1954. The siting of classical greek temples. Journal of the Society of Architectural Historians 13 (4) (Dec.): p.6.

Gorham Stevens has compared the space conception of Olympia or Delphi, with the disposition of buildings on the acropolis, recognizing in the latter a more evident attempt to organize the space: *"Today even the casual visitor in Greece finds those sites which have been occupied from a remote antiquity - Olympia and Delphi, for example - a jumble of buildings. The trained architect admires the beauty of the individual buildings of early date, but he calls the grouping of the buildings by its real name - a mess. And he wonders how the ancient Greeks, who were famous for their keen artistic appreciations of all kinds, tolerated such unsightly group planning... But, there is considerable evidence that even before Hellenistic times the analytic mind of the Greeks felt, that, if their rambling ensembles could be made more orderly, greater beauty would ensue."*⁵² One of these cases, in his opinion, is the acropolis of Athens.

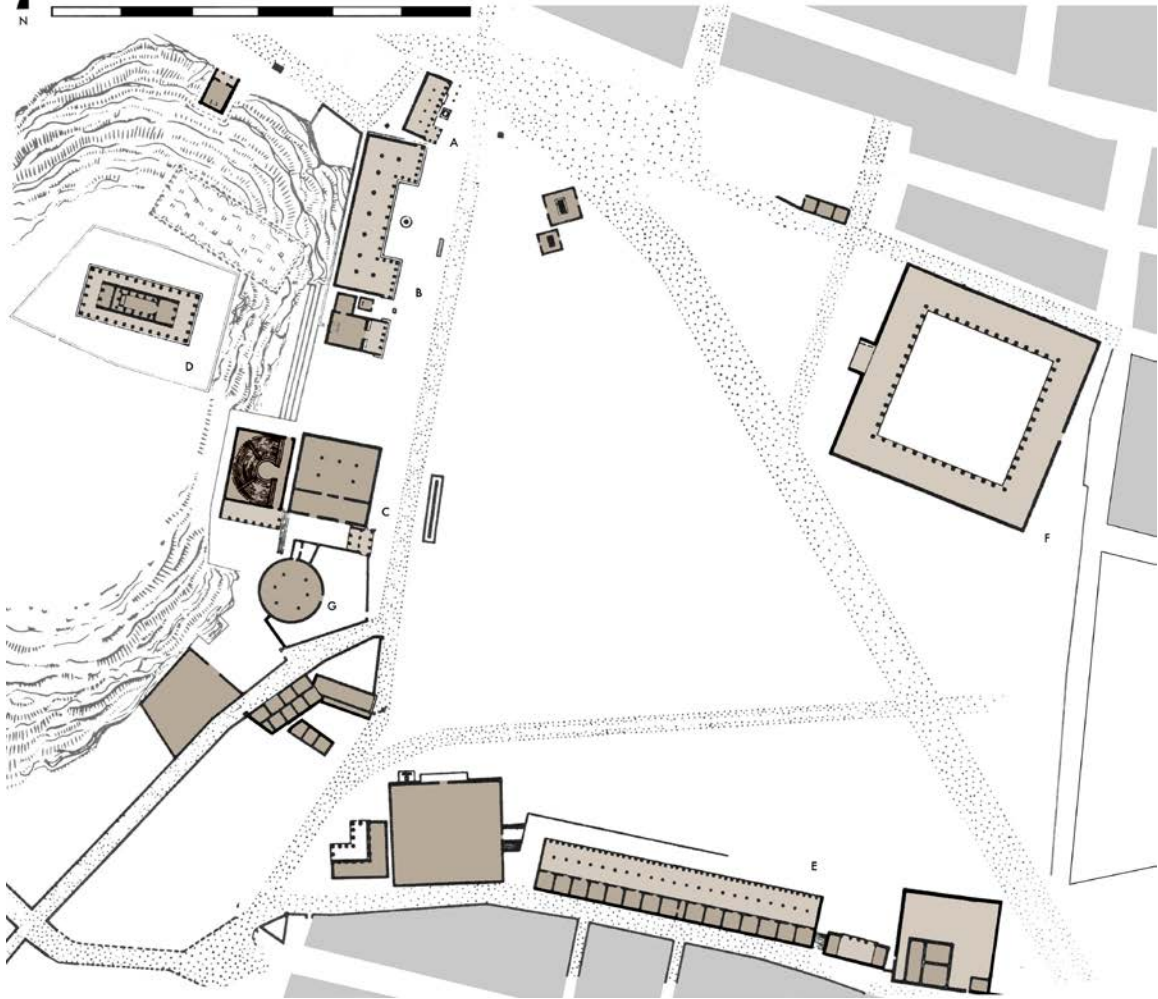
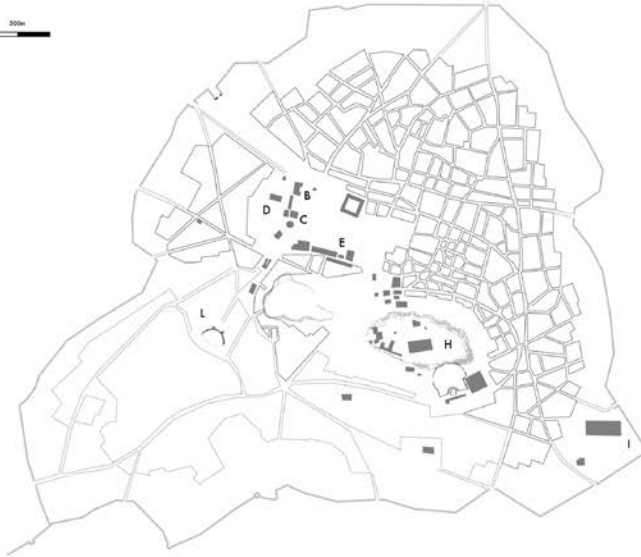
If according to Coulton the Parthenon marks the culmination of Greek architectural development, but also a change in direction⁵³, we might say the same thing for the space organization of the Acropolis. Even though we find here an almost "traditional" Greek space conception based on isolated volumes, we can recognize, in such buildings as the Propylaea, an attempt to relate different buildings within a more rationally ordered system. Another aspect which marks a change in direction is the modification of traditional typologies from the condition of being pure volumes to a more articulated composition of elements. This is evident in the Propylaea, the Erechtheion and the Sanctuary of Artemis Brauronia. They almost express the attempt to disarticulate the platonic volume and to alter the space around them incorporating part of it and defining some sort of enclosure. It is probably only the beginning a process which will be taken over by Hellenistic architects: the progressive enclosure of space.

In the case of the **Agora** of Athens, this process is evidently less clear. The agora is the gathering place of the free Athenian citizens. If, in the Homeric age, *agora* means simply "assembly of people", in the fifth century the agora becomes the political arena of the city, its public center. To understand the primary role of the agora we have to consider that in Greek cities all the public life is held in this central space, since streets cannot be fully considered part of the public space.

NEXT PAGE: FIG. 45 Plan of the Agora in Athens during classical period. A) Stoa Basileios (Sixth century B.C.), B) Stoa of Zeus (425-410 B.C), C) Old and new Bouleuterion (421-406 B.C), D) Hephaisteion, Temple of Hephaestus (449-415 B.C.), E) South Stoa I (ca. 425 B.C), F) Peristyle Building, Law Court (338-300 B.C.) G) Tholos, Prytaneion (470 B.C). In the general plan on top: H) Acropolis, I) Olympieion, L) Pnyx, meeting place of the Athenian assembly.

⁵² Stevens, Gorham Phillips. 1936. The periclean entrance court of the acropolis of athens. *Hesperia: The Journal of the American School of Classical Studies at Athens* 5 (4): p. 444.

⁵³ Coulton, J. J. 1977. *Ancient greek architects at work : Problems of structure and design.* Ithaca, N.Y.: Cornell University Press: pp. 112-113.



One reason for this is that streets, as we have previously seen, are primarily a residential space: streets with porticos and shops can be found only later in Roman times. Furthermore, streets at this time are usually unpaved, with usually inadequate drains and very rare sidewalks. Therefore in the archaic period all the public activities are mostly undifferentiated and are held in the wide, open space of the agora: the market, the religious rituals, the political meetings and the theater. Only later, and progressively, all these functions are differentiated and located in different areas. In the case of Athens, around 500 B.C. and with the reforms of Cleisthenes, the assembly is moved from the agora to the large open space of the *Pnyx*, and the theatrical activity is moved to the Theater of Dionysus, placed on the south slope of the Athenian Acropolis.



FIG. 46 The size of the Agora can be grasped even today. Its wide space corresponds to the green area between the Hephaisteion, the temple of Hephaestus, on the left side, and the Stoa of Attalos, built in Hellenistic times, on the right side. The area is cut diagonally by the Panathenaic Way which connects the city of Athens with the Acropolis.

To understand the space of the agora we have to consider its strong relation with the natural site: its wide space is not enclosed by buildings, but it's virtually enclosed by the hill of the acropolis. The numerous streets that intersect the area, the low density of buildings and the fact that the space of the agora in this period is mainly unpaved might have given the impression of a natural or apparently "rural-like" site more than an urban area. We have

already considered the strong relationship with the countryside of the Athenians, we can therefore suppose that even in the agora they might have tried to recreate a space which is not completely artificial and urban, an open space related to its natural surroundings. After all the relationship with the natural landscape is the most evident and persistent characteristic of Greek architecture.

As a matter of fact, trees are planted in the agora during the fifth century to give additional shade. According to Thompson the presence of vegetation is an important element that could have diminished the effect of an apparently unorganized and vast space: *"The result was an irregular and somewhat incoherent plan, at least as seen on paper. I have little doubt that these defects, if one should so describe them, were less apparent in actuality, among other reasons because of planting in the square. We are told that Kimon, the great statesman of the mid-fifth century, adorned the Agora with plane trees, and the ancient authors mention several other individual trees as well as groves around certain buildings and sanctuaries. I would urge that this be kept in mind as an exceedingly significant element in the setting of the ancient Agora, just as a single great tree or a row of trees may give much of its character to the square of a modern Greek town."*⁵⁴ However, to have a more realistic representation than the image of a bucolic and idyllic environment, we also have to consider that in the agora the quiet and "noble" activity of philosophers and politicians is mixed with the more active and noisy activity of a crowded market. The Greek verb "agorazein" means primarily to go to the market. In "the Acharnians", a comedy by Aristophanes, the love of the protagonists for their farms is opposed to the aversion for the Athenian agora which is ironically described as a place crowded with people that is better to avoid. According to Wycherley: *"marketing 'when the agora was full', i.e. in the morning, must have been a noisy and nerve-racking business, with much haggling ; according to the comic poets they used the Greek equivalent of 'Billingsgate', glared at their customers like Gorgons, asked exorbitant prices with a take-it-or-leave-it air, and faked rotten fish. Most of the cities had officials called 'agoranomoi' to exercise control and ensure fair dealing."*⁵⁵

It can be argued that the jumbled miscellaneous activities of the agora and the mishmash typical of any market are somehow mirrored in the incredibly vast and apparently disorganized plan of this central space. If Miletus, after being destroyed by the Persians in 494, is re-founded according to the grid system of Hippodamus, the Athenians, after a similar tabula rasa in 480 B.C., have rebuilt the city and the agora in the "old way", keeping the previous disposition of streets and buildings. Wycherley notes that *"the new buildings were bigger and architecturally finer, but they were still treated as self-contained units and most of them were strung out along the western side again. First came the Tholos, a small but elegant round building towards the southern end, which was a sort of annexe of the*

⁵⁴ Thompson, Homer A. 1954. The agora at Athens and the Greek market place. *Journal of the Society of Architectural Historians* 13 (4) (Dec.): pp. 9-14

⁵⁵ Wycherley, R. E. 1976. *How the Greeks built cities*. Norton library. 2d ed. New York: Norton: p. 66

Prytaneion and was used by the standing committee of Council. The old Bouleuterion was perhaps patched up and did duty for a time".⁵⁶

If we consider the fact that the Agora is the administrative and political center of Athens, it is quite surprising to find out that there are only few public buildings: the *Bouleuterion*, which is the "political" meeting place for the council of citizens called "*boule*" and the *Prytaneion*, the administrative "office" where officials meet to discuss the government of the city. The rest of the activities are held "open-air", or under the portico of the stoas. According to Coulton "*before the Hellenistic period few Greek cities had a wide range of specialized public buildings to accommodate the various functions of government. At first many of them took place in the open air like the meetings of the Areopagus and the Assembly at Athens during the fifth century; but there was an increasing demand for under-cover meeting-places and for a greater number of permanent state offices, a demand which could be conveniently met by the stoa. The archon basileus at Athens was to be found in the Stoa Basileios and it was there that the preliminary hearing of the case against Socrates was heard.*"⁵⁷ Another bigger stoa, the Stoa of Zeus, was built at the end of the fifth century in alignment with the Stoa Basileios. It is the stoa in which three Socratic dialogues take place, and we can argue that it's probably not used for public functions, but only for strolling and talking. It's possible to recognize in this building, like in the composite buildings of the acropolis, the intention to disarticulate the pure volume of the linear stoa with two small projecting wings treated as hexastyle temple facades. These slightly protruding arms represent an initial attempt to partially enclose the external space: it is another preliminary anticipation of Hellenistic features. The south stoa, built approximately in the same period of the Stoa of Zeus, with its 80 meters represents the longest stoa of its time. Its function is not sure, but it's probably the seat of the Thesmothetai, who are the assistants to the archons, and the Metronomoi, the market supervisors who inspect weights and measures. Another isolated building, the peristyle building in the northwestern part of the agora, is being built around 300 B.C., at the beginning of the Hellenistic period. However its construction never reaches the end. The unfinished built part has been probably used as a courthouse. During the mid-second century this building is demolished and its columns are used to build the new Stoa of Attalos, a building which is still visible today after the 1950s reconstruction.

Concluding this analysis on the Greek space conception from the archaic to the classical period, it is reasonable to say that the most characteristic and uninterrupted aspect is the isolation of the buildings as autonomous entities in the open landscape. The strong relationship with nature is therefore a corollary of the fact that the external space is never enclosed by buildings, but is left open towards the natural environment. If we exclude houses and residential blocks, which during this period are extremely simple and probably with no artistic intentionality, all built architecture is purely conceived in terms of

⁵⁶ Ibid., pp. 58-59.

⁵⁷ Coulton, J. J. 1976. The architectural development of the greek stoa. Oxford monographs on classical archaeology. Oxford Eng.: Clarendon Press: p. 11.

autonomous and unrelated volumes. The urban grid of archaic cities in Magna Graecia and the Hippodamian plan, represent during this period only practical systems for the division of land which have no visible effect on architecture, in terms of space.

The most striking aspect of Greek architecture emerges from the comparison between the “apollonian” rationality expressed by the classical order of temples and stoas and the apparent irrationality and the lack of order in their spatial arrangement. According to Scranton: *“Still, the typical composition of groups through the fifth century with its lack of formal order does demand an accounting. In fact this irregularity accomplishes two results, whether from conscious intent or not. First, it makes each building an independent reality existing in its own right, and second, it relieves the careful definition in the buildings themselves. On the one hand the order in the building is the more evident by contrast; on the other hand, the casual movement of the exterior space, the variety of natural and monumental elements around, create freedom and vividness of their own which strengthen the elements of vitality within the building. The totality, then, creates and embodies an awareness of objective reality, structurally ordered but alive; a part of the world, to be sure, but free and self-sufficient within it.”*⁵⁸ In general we can recognize in all the expressions of Greek culture a fundamental individuality and autonomy: in the Homeric hero of the archaic period, in the self-conscious attitude expressed by the figure of the Doric *kouros*, in the tectonic prototype of the isolated temple in the landscape, in the emergence of the individual citizen in Greek democracy, in the political autonomy of Greek city-state, the in the philosophical conception of the atom as the basic unit of the cosmos, in all these aspects we can recognize the manifestation of an independent and rational “apollonian spirit”, the spirit of a luminous *cosmos* composed by self-conscious discrete entities which are aware of their individuality for the recognition of the void space which separates them. It is the “emptiness” around them, which essentially allows these individual entities to be autonomous.

But with the end of the classical period objects and entities become increasingly more articulated and, as a consequence, the space around them is incrementally enclosed and interiorized. The progressive enclosure of space is the most evident aspect of the Hellenistic and Roman periods, a process that can happen only in the moment in which buildings are not conceived anymore as purely isolated volumes. This shift is related to the transformations that happen in Hellenistic times: in mathematics *geometry* becomes predominant over *arithmetic* and in architecture the use of drawings and plans become necessary tools to deal with larger and more complex buildings. A parametric approach to design, based on mathematical rules and conventions, is becoming inappropriate for large-scale composite buildings based on completely new typologies. But to properly understand this shift we should come back again to the history of mathematics and return, ideally, to the Pythagorean School in the south of Italy. It is around this School that a relevant paradigm shift might have happened during the end of the fifth century B.C., probably around 410 B.C.

⁵⁸ Scranton, Robert. 1962. Greek architecture. Great ages of world architecture. New York, G: Braziller: p. 22.

3.3 The paradigm shift: from numbers to geometry

*“Hippasus of Metapontum stood on the deck preparing to die. Around him stood the members of a cult, a secret brotherhood that he had betrayed. Hippasus had revealed a secret that was deadly to the Greek way of thinking, a secret that threatened to undermine the entire philosophy that the brotherhood had struggled to build. For revealing that secret, the great Pythagoras himself sentenced Hippasus to death by drowning. To protect their number-philosophy, the cult would kill...”*⁵⁹

The discovery of incommensurability can be considered almost like a crime scene without definitive proof or suspicion of any kind. Little is known about Hippasus of Metapontum, the Pythagorean philosopher who is credited for having discovered the existence of irrational numbers. We only know that he lives during the 5th century BC in Metapontum, not far from the Pythagorean school of Croton in Magna Graecia. We also know that he is a member of that school, from which he is later expelled, probably for the disclosure of a mathematical discovery that could contradict the Pythagorean belief that “all is number”: the understanding of the existence of incommensurable magnitudes. The circumstances around this event cannot not be rigorously verified for the lack of documents. However there are different accounts about the consequences of his apostasy: one reports that Pythagoreans erect a tombstone to him, as if he were dead, while another one claims that he is punished by death at sea. In both cases the distinction between historical evidences and legendary traditions appear to be, in this case, really confused and blurred. What is indisputable and historically proved is the effect of this event on the evolution of science and philosophy.

The discovery of incommensurability is probably generated by the geometrical analysis of the square root of two, in terms of the diagonal of a unit square, and not by the discovery of the “Golden ratio” as sometimes is reported. As we have seen previously, the diagonal of a unit square is already known before the discovery of incommensurability, even though, before this mathematical proof, it’s only considered as an anomaly that can be solved through approximations. According to Wilbur Knorr *“the fourth-century writers Plato and Aristotle always discuss incommensurability in the context of the side and diameter of the square. Aristotle’s uses of the example of the incommensurability of these latter lines show it to be a result familiar to his audience. It had, presumably, already entered the textbook tradition of geometry by this time. But he never credits its discovery to the Pythagoreans, despite his frequent discussions of Pythagorean doctrines. On the contrary, the central dogma which Aristotle ascribes to the Pythagoreans, “all things are (or partake of) numbers”, is incompatible with the acceptance of the irrational”*⁶⁰.

⁵⁹ Seife, Charles. 2000. *Zero : The biography of a dangerous idea*. New York: Viking: p.

⁶⁰ Knorr, Wilbur Richard. 1975. *The evolution of the euclidean elements : A study of the theory of incommensurable magnitudes and its significance for early greek geometry*. Synthese historical library ; v. 15. Dordrecht, Holland ; Boston: D. Reidel Pub. Co: p. 22

The only clear aspect of this intriguing and revolutionary event is that the discovery of incommensurability is inconceivable in Pythagorean philosophy and more generally in a time in which numbers have primacy over geometry. The discovery of irrational numbers marks a strong paradigm shift: continuous geometry takes the place of discrete arithmetic algebra. Knorr chronologically identifies the discovery of incommensurable numbers around 410 B.C., noting however that the discovery becomes an accepted theory only around 350 B.C.

According to the mathematician and historian Uta Merzbach the impact of this paradigm shift can be found in written documents: *“the dialogues of Plato show, however, that the Greek mathematical community had been stunned by a disclosure that virtually demolished the basis for the Pythagorean faith in whole numbers. This was the discovery that within geometry itself, the whole numbers and their ratios are inadequate to account for even simple fundamental properties. They do not suffice, for example, to compare the diagonal of a square or a cube or a pentagon with its side. The line segments are incommensurables, no matter how small a unit measure is chosen.”*⁶¹

After the discovery of the irrational numbers, Geometry, with its correlated worldly and primitive instruments such as the compass and the straightedge, appear to be, maybe for the first time, more accurate and truthful than numbers: indeed geometry can generate and represent segments, like the diagonal of a square, that cannot be measured or expressed with numbers. This recognition has a strong impact even in philosophy: on the entrance of Plato’s academy there is an inscription, visible to anyone entering the main door, on which it’s written: *“Let no one ignorant of geometry enter here.”* Geometry, a practical discipline generated by the need to survey objects and space, is progressively elevated to the same status of philosophy and becomes a primary source of knowledge.

According to Knorr’s chronology, incommensurability is widely accepted around 350 B.C., a period which coincides with the Aristotelian philosophy, but also with the advent of the Macedonian king Alexander the Great (356 – 323 BC) who has Aristotle himself as a teacher. The simultaneous deaths of Aristotle and Alexander, as well as Demosthenes, in 323 B.C mark the historical end of the Classical Greek period and the beginning of the Hellenistic period, a new epoch symbolically represented by the shift of the Hellenic cultural and political capital from Athens to Alexandria in Egypt. It’s not a coincidence, then, if Euclid, the author of the “Elements” and the “father of Geometry”, is living and practicing around 300 B.C. in Hellenistic Alexandria, the city famous for its Museum and the Library and universally considered the leading center of scholarship for generations.

Proclus a Neo-Platonist philosopher and the most important commentator of the Euclidian treatise, writes in the fifth century A.D. that the “Elements” are to mathematics what the letters of the alphabet are to language. The success of this book is millenary: translated in Latin by Boëthius in the 6th century, it survives the middle age because it is translated in

⁶¹ Merzbach, Uta C., and Carl B. Boyer. 2011. *A history of mathematics*. 3rd ed. Hoboken, N.J.: Wiley: p. 66.

Arabic and then retranslated back to Latin during the renaissance. The first printed version is edited in Venice in 1482.

In the “Elements” we can find a demonstration of the “Golden ratio” (BOOK II.11 – BOOK VI.30) and a systematic classification of incommensurable line segments (BOOK X). These demonstrations are based on “straight-edge and compass” geometric constructions and do not involve the ruler or, more generally, any measurement. According to Uta Merzbach “*line segments given by square roots, or by square roots of sums of square roots, are about as easily constructed by straightedge and compasses as are rational combinations. One reason that the Greeks turned to a geometric, rather than an arithmetic, algebra was that in view of the lack of real-number concept, the former appeared to be more general than the latter*”.⁶²

The scientific paradigm shift that happens between the Classical Greek age and the Hellenistic period, which generates the transition from Arithmetic to Geometry, ideally divides ancient history in two different *epistemes*. A compelling representation of this divide can be found in the “The School of Athens” a fresco painted by the renaissance artist and architect Raphael with the intention to visualize an allegorical representation of knowledge.



FIG. 47 The School Of Athens, Raphael (1483-1520)

⁶² Ibid.: p. 105

Within a geometrically constructed perspective space, that recalls the vaults of Roman Baths of Caracalla, Raphael displays, almost like classical statues, portraits of his contemporaries to represent the major figures of classical wisdom and science. The symmetrical axis of the allegoric composition ideally divides the scene in two parts, which correspond to the two *epistemes* of ancient history: idealism and arithmetic on the left side, realism and geometry on the right side. In the center Plato and Aristotle visually represent the demarcation line, or the paradigm shift: Plato, placed on the left side, holds his book “Timaeus” pointing at the metaphysical sky where the demiurge is producing ideas. Close to him, on the right side, Aristotle points his right hand towards the viewers and the real material world, holding his book “Ethics”. On the bottom left side, in the realm of idealism and arithmetic, we find Pythagoras in the attempt to write his famous theorem. One of his assistants is holding a slate with a numerological representation of the “perfect triangle” the symbol of the harmonic perfection of the cosmos: it shows that the simple sums of the successive integers 1, 2, 3 and 4 results in 10, the perfect number. Raphael intends to visually represent Pythagorean knowledge as a closed system: the Greek mathematician seems to hide what he is writing and the assistants around him are trying to capture some of his mystic interpretation of the *cosmos*.



FIG. 48 Detail of “The School Of Athens”, Pythagoras



FIG. 49 Detail of "The School Of Athens", Euclid and Raphael staring at us.

Symmetrically on the bottom right side we find the figure of Euclid who is demonstrating some geometric propositions with compass and straightedge. The demonstration of the Hellenistic mathematician can be seen and understood by all the students around him: geometry is allegorically represented as an open system of knowledge. Around Euclid we can identify the astronomer and geographer Ptolemy, holding his globe of the earth, the Persian astronomer and philosopher Zoroaster, and, behind them, a figure that is looking at us. It's a self-portrait of Raphael, who decides to place himself on the right side of the fresco: in the *episteme* of realism and geometry. We can consider this painting his architectural manifesto.

In the Hellenistic period the advent of geometry and the use of drawings, are interrelated phenomena that can explain the most important features of Hellenistic architecture: the importance of symmetry and axuality, the definition of more complex and articulated buildings that delimitate the external space and more generally the emergence of urban plans in which, for the first time, buildings give shape to the urban space becoming an integral part of the urban structure. Buildings, in other words, are not anymore autonomous and isolated entities.

4

HELLENISTIC ARCHITECTURE

The urban enclosure

The hypothesis of this chapter is that the Hellenistic period marks an important paradigm shift. The autonomous Greek city states, their free individual citizens, the isolated temples and stoas of agoras and sanctuaries, the discrete atoms and the indivisible numbers that theoretically compose the Greek *cosmos*, all these self-sufficient entities with the advent of the Hellenistic period are progressively merged and incorporated into a larger, continuous and more complex whole. Within the gigantic and almost limitless Hellenistic kingdoms free isolation makes no sense anymore, whereas aggregation, densification and articulation represent a sort of necessary reaction after the jump in scale and the sudden transition from *microcosm* to *macrocosm*. The Greek *poleis* are now part of a vast territory together with other new cities, the citizens become *cosmopolites* within a multifaceted and multicultural “melting-pot” society, temples and stoas are articulated into larger urban complexes, continuous geometry takes the place of discrete arithmetical numbers and in physics and philosophy the idea of a *cosmos* composed by indivisible everlasting atoms is substituted by the theorization of a world perceived as a continuous body infinitely divisible. The stoic philosophers claim that “*nothing incorporeal exists*”: if there is no void which “separates” the atoms, the atoms as discrete units are inconceivable. In stoicism everything that exists in the world is a body, and the world itself is a body whose soul is god.

The result of these transformations can also be recognized in the relationship between architecture and space. External space is progressively enclosed, negating its role of being a “void” which separates autonomous buildings. The Hellenistic urban enclosures, spatially and formally defined by stoas, represent an intermediate element in the architectural transition from external to internal space. However this process is incremental and progressive: it will be fully completed only during the Roman period.

4.1 A new vast empire

Polybius, the most important historian of the Hellenistic Period, explaining the decision to begin his history from the 140th Olympiad (220- 216 B.C.), claims that (book 1,3,3): *“Previously the doings of the world had been, so to say, dispersed, as they were held together by no unity of initiative, results, or locality; but ever since this date history has been an organic whole, and the affairs of Italy and Libya have been interlinked with those of Greece and Asia, all leading up to one end.”* Symptomatically, during the Hellenistic period, even history appears for the first time as an *“organic whole”*, which brings together local histories, different people, and diverse cultures. However this process has arguably started one century earlier, with the advent of Alexander the Great.

The most evident change at the end of his conquests is that the Greek “atomized” geography, formed by the aggregation of autonomous city-states, is incorporated within a bigger whole: an incredibly large and multicultural world that goes from the Mediterranean sea to the Indus river. Furthermore the Greek *poleis* lose their independence and are suddenly moved to the geographic “periphery” of a large empire. The Hellenistic period has often been considered as a decline period for Greek cities and classical culture. However Droysen’s studies in the nineteenth century, have confuted this idea, promoting the Hellenistic period as a relevant historical phase in which an enriching contamination of Greek and oriental cultures has generated the premises without which it would be impossible to understand the changes in Roman civilization and the evolution of European culture. Droysen’s thesis, in simple terms, is that the diffusion of Christianity can be understood only considering the transformations of Greek culture generated by the oriental artistic and religious influences during the Hellenistic period.

There is a recent tendency between Hellenistic historians to stress the vitality of the civic life during this period, dismissing the traditional idea of a demise of the *polis*. According to H. M. Jones: *“No one who reads Polybius can believe that the city state was dead or even dying in the third century. The internal political life of the cities was very much alive, and as in the preceding centuries bitter factional struggles were only too common.”*⁶³ Old Greek cities are expanded and architecturally enriched, and over seventy new cities are founded by Alexander throughout his empire, according to the model of the Hippodamian city. The idea of the decline of Greek culture can also be confuted by the fact that during the Hellenistic period Greek language becomes the common language of a vast geographical area becoming much more diffused than before. Therefore instead of describing the Hellenistic period as decadent, it’s probably more correct to define it in terms of a change in the perception of the world and of a different idea of the *cosmos*.

⁶³ Jones, A. H. M. 1964. The hellenistic age. Past & Present(27) (Apr.): p. 3.

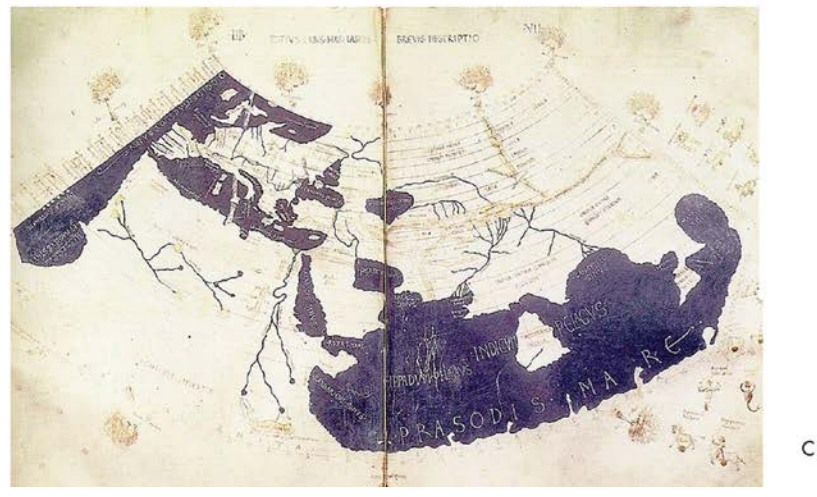
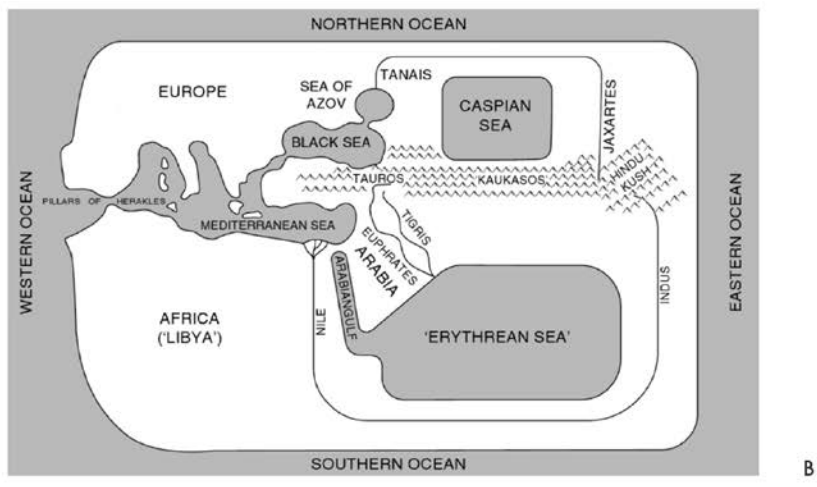
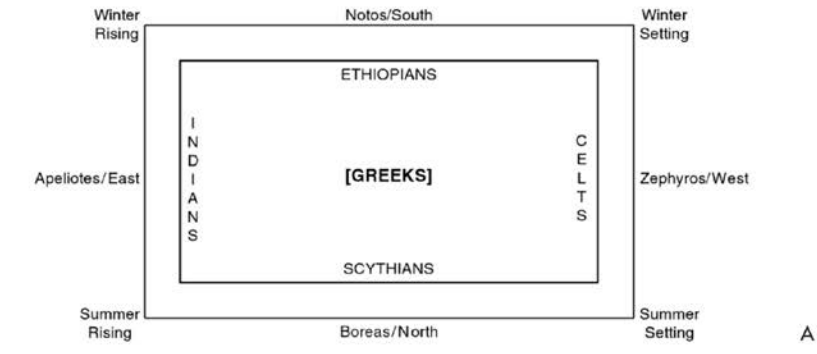


FIG. 50 The different perception of the "oikoumene" (the inhabited world) from an abstract model to Hellenistic geography. A) Ephorus' Parallelogram (4th century B.C.), diagram from the essay "Space and Geography" by Klaus Geus (Erskine, Andrew, ed. 2003. A companion to the hellenistic world.) B) The world before Alexander according to Aristotelian notions, diagram from the essay "Space and Geography" by Klaus Geus, C) The world after Alexander: Ptolemy world map based on the description contained in Ptolemy's book Geographia, written around 150 A.D.

But to properly understand this change in perspective, we have to consider the earlier conception of the world. The idea of a spherical earth is Pythagorean, and is based on the belief that the cosmos is a perfect and pure numerical expression: therefore the world can be anything but round. Plato, who has travelled to southern Italy to study Pythagorean mathematics, has derived from his school the idea that the universe is composed by four elements (fire, water, air and earth) and that the world is a globe. In his *Timeus* he describes the *demiurge* in the act of creating the world: "*Wherefore he made the world in the form of a globe, round as from a lathe, having its extremes in every direction equidistant from the center, the most perfect and the most like itself of all figures; for he considered that the like is infinitely fairer than the unlike*". Plato's description of the world is related to the fact that the sphere represents the most perfect ideal figure, the only one in which every point is equidistant from the center. But within this ideal and abstract conception, the Greeks distinguish the inhabited and known world as a separate entity, called "oikoumene" (from *oikos* or house), which is often represented as a rectangle superimposed over the perfect circle. The debate about the appearance of the known world is conceptually related to the definition of the proportion of this abstract "rectangle": Democritus, who has formulated the atomistic theory of the cosmos, proposes a 3:2 ratio for the relationship between the length (east-west) and the breadth (north-south), whereas Aristotle estimates a 5:3 proportion. In the ideal parallelogram of the "oikoumene" the Greeks are placed in the center, whereas distant countries define the edges: the Pillars of Hercules (Strait of Gibraltar) in the west, India in the east, Scythia (now Russia) and the Lake Maeotis (Sea of Azov) in the north, and Ethiopia in the south. The ocean is supposed to be all around this "known land".

This model, based on an abstract philosophical idea, has been progressively undermined by the expedition of Alexander the Great towards east, which besides being a military campaign, is also the first exploration of the "eastern" world. If the conquest of the Persian Empire is achieved within a quite well known territory, as soon as he proceeds eastward he starts moving in a completely unknown territory. During his advance to east, once he passes the Indus river, he realizes that he hasn't reached the eastern end of the "oikoumene", where there's supposed to be a great ocean that surrounds all the known land. After the Indus he finds another "unknown world". Therefore the eastern limit of the world seems now really remote and this acknowledgment generates an evident disappointment among Alexander's soldiers, who refuse to move eastwards any further. After this discovery Alexander changes his target: since the conquest of the entire Asia is impossible, he decides to move south. However when he reaches the delta of the Indus he realizes that the river Indus is not the upper course of the Nile, as it was believed before, and that India and Africa are not connected by land. Therefore he decides to modify his strategy, changing from terrestrial to maritime expedition. But his plan to circumnavigate the Arabian Peninsula to go from Babylon to Alexandria by ship, and, probably also the plan to circumnavigate the African coast to reach the Pillars of Hercules, remain unrealized because he dies in June 323.

This date marks the beginning of the Hellenistic period, but evidently also the advent of a completely new conception of the world. Alexander's discoveries, which can be probably

compared only to the age of discoveries in the 16th and 17th centuries for its effects, have completely changed the geography of the known world, generating also a different perception of existence. According to Klaus Geus *“the centrifugal forces released by the enlargement of the oikoumene catapulted Greece off its central position”* ⁶⁴. Furthermore, after being conquered by Alexander, Greek cities lose their political autonomy and become part of a large empire which is divided after his death in four kingdoms: the *Macedonian* in Greece, the *Ptolemaic* in Egypt with its capital in Alexandria, the *Seleucid* in Syria and Mesopotamia based in Antioch, and the *Attalid* in Anatolia with its political center in Pergamon. The ideal Hellenocentric conception of the *cosmos*, developed during the classical period, is progressively substituted by a more pragmatic and realistic description of the world. In the Hellenistic period Eratosthenes of Cyrene coins the word "geography", initiating the discipline of geography, as we understand it. He is a chief librarian of the Great Library of Alexandria, the city which becomes the center of science and learning of the Hellenistic world. In his researches he calculates the circumference of the earth and he even creates the first map of the world incorporating parallels and meridian. During this period academic research is widely developed in the new Hellenistic cultural centers, where Greek scientific knowledge is systematized and expanded in many disciplines such as astronomy, geometry, geography, medicine, and physics. It can be easily argued that the scientific and academic achievements of this period are comparable only to those of the age of enlightenment. In Eratosthenes' three books called *“Geographika”* the *oikoumene* appears for the first time as a multiracial and multicultural inhabited world. According to Pollitt, who has written the most thoughtful analysis of Hellenistic art, *“the world of Eratosthenes was becoming too big, too much subject to the influence of diverse and powerful cultural forces – Romans, Carthaginians, Persians, as well as Greeks – for an educated man to remain condescendingly provincial. As one came to know the character of non-Greek countries more thoroughly it was difficult not to conclude that other cultures had their virtues and strengths and that one’s own culture, however much at home one felt with it, was not intrinsically superior in all things.”*⁶⁵

As a matter of fact Alexander’s discoveries generate an increasing attraction for non-Greek cultures and a diffuse interest in travel literature and ethnographic accounts. During the Hellenistic period many Greeks leave their land and move to Egypt, Syria or Mesopotamia. In the new royal courts of the empire there is a high demand for Greek actors, poets, and philosophers and the new museum and libraries of Pergamon and Alexandria recruit numerous Greek scholars. In a parallel way many Syrians, Egyptians and Persians leave their cities and move to the newly founded cities of the empire. Greek language becomes the common language in this vast “globalized” world. The word cosmopolitan itself, used for the first time by Diogenes the Cynic, derives from the Greek word *kosmopolitês*, a commonly

⁶⁴ See the essay “Space and Geography” by Klaus Geus in: Erskine, Andrew, ed. 2003. A companion to the hellenistic world. Blackwell companions to the ancient world. Ancient history. Malden, MA: Blackwell Pub: p. 243.

⁶⁵ Pollitt, J. J. 1986. Art in the hellenistic age. Cambridge Cambridgeshire ; New York: Cambridge University Press: p. 11.

used term during the Hellenistic period which means “citizen of the world”. If in the archaic and classical period the citizenship of the polis is based on the “*genos*” and is inextricably related to the origin and the family, in the cosmopolitan Hellenistic world subjective qualities become more important than one’s ethnicity. In a fragment of a comedy of Menander (533, K) we can read that: *“If nature has given a man Good character by birth, then he’s well born even though he comes from Ethiopia.”*

The increasing primacy of subjective qualities over the ethnic origin is strictly related to the fact that an unseen number of people, with different culture and ethnicity, are becoming part of a large composite society and, for better or for better or for worse, have now to cohabit together. This is the most relevant effect of Alexander’s conquests. In his essay *“On the Fortune or the Virtue of Alexander the Great”* the historian Plutarch, describes Alexander's deeds in this way (329, c): *“he brought men from everywhere into a unified body, mixing together, as if in a loving-cup, their lives and characters and marriages and social customs. He commanded them all to think of the inhabited world as their fatherland, of the encamped army as their acropolis and guard, of good men as their kinsmen, and only of evil men as foreigner.”* Zeno of Citium, the founder of Stoicism, has derived from Alexander’s intention to unite a great variety of people into a single empire the notion of “brotherhood” and in general the idea that all persons live in the same condition and are therefore similar. Thus he claims that humans shouldn’t be divided in cities or nations. Stoicism represents the most important Hellenistic philosophy but also an anticipation of many ideas of early Christianity. Zeno’s philosophical ideas are influenced by the dissatisfactions expressed by Diogenes the Cynic, however, instead of seeking withdrawal and isolation, the stoic philosopher develops utopian ideas and promotes social changes. In his *“Politeia”* he even theorizes a society of people in which there is no need for money and law courts, because people join voluntarily under divine laws.

If the on one hand, during the Greek classical period, the cultural and philosophical system is based on the definition of an ideal model which, in platonic terms, is intended to be the most close to its “idea” –we can think of the Homeric “hero”, the democratic citizen, the most harmonic temple or the canonical statue-, on the other hand the Hellenistic system appears as a more inclusive system based on the acceptance of diversity and multiplicity: a system which incorporates differences in a bigger whole. This is evident in Hellenistic sculpture in which a statue is not conceived as the expression of an idea, but as a representation of reality. For the first time foreigners, neglected people, old men and woman are represented by sculptors. According to Pollitt *“The real world began to undermine the ideal world in Greek art of the Hellenistic period, and as it did so something was both lost and gained. What was lost was that almost magical ability to harmonize, as in the Parthenon sculptures, a sense of the eternal and the unchanging with one’s knowledge of the ephemeral. What was gained was a sympathetic feeling for the variety of the world of everyday experience and for the nobility which could be detected in seemingly ordinary things”*.⁶⁶ Therefore a sense of “nobility” can emerge, during the Hellenistic period, even

⁶⁶ Ibid., p. 13.

from the sculpture a dying Gaul, an “enemy” warrior who lies harmless on his fallen shield. Empathy for non-similar persons and non-ideal figures is probably the most characteristic aspect of Hellenistic culture. Furthermore the representation of non-canonical figures, very often in difficult or dramatic situation, is strictly related to another important aspect of Hellenistic sculpture: the emergence of realism as a consequence of the attempt to express subjective feelings and pathos.



FIG. 51 *The Dying Gaul*, Roman marble copy of a Hellenistic work of the late third century BC. Capitoline Museums, Rome.

This is evident if we analyse the evolution of facial expression in Greek sculpture from the archaic to the Hellenistic period. The Archaic *kouros* represents the clearest expression of an objective and plastic self-consciousness: the awareness of being in the world. We can say that he literally faces the external world. The kouros' god-like face reflects like a mirror an external order: the apollonian order of the cosmos. However nothing can be known about him, besides his exterior world. During the classical period the face is reproduced in a more realistic way, but facial lineaments are reduced to the minimum. The intention is to represent an ideal human face, a unifying model whose inscrutable appearance is well described by Winckelmann's expression "*noble simplicity and calm greatness*". However the achievement of such an ideal human visage generates a non-human perfection: a pure, but voiceless, plastic materialization of universal beauty. Hellenistic realism represents the moment in which a sculptured face embodies, for the first time, the head of a real man. The face appears as a transparent thin layer, which allows the subjective interiority to emerge.



FIG. 52 The evolution of facial expression in Greek sculpture from the archaic to the Hellenistic periods. From Left to Right: 1) Getty kouros, archaic Greek period, (ca. 530 B.C.), 2) The so-called "Blond Boy", from the Acropolis, classical period, (ca. 480 B.C.), 3) Statue of Diadoumenos, Roman copy of a Greek bronze statue by Polykleitos, classical period (ca. 430 B.C.), 4) Portrait bust of Attalus I, king of Pergamon, Hellenistic period (ca. 200 BC).

The invention of the portrait in painting and sculpture, as well as the new literary genre of biographies and memoirs, can be interpreted as the result of a new sensibility towards human interiority generated by the emergence of one's subjectivity. In the progression of Greek sculpture we can also recognize a change in the main topic: from the eternal youth of the archaic and classical period to the maturity and the senility of the Hellenistic period. Even though this assumption is generally valid, it has also been "forcefully" used, especially during the Nineteenth century, to prove a sort of connection between the artistic expression of a specific period and its "Zeitgeist", the spirit of its age. The Kantian idea of culture as a living organism has influenced many art historians who have seen in the classical Greek representation of youth a manifestation of a young dynamic culture, whereas, from this same perspective, they have considered the worn out bodies of Hellenistic sculpture as symbols of a regression to senility. The common idea of the Hellenistic period as a decadent age is related to this interpretation. However it is more correct to say that the preference for youth in classical art is related to the adolescence indisputably represents an ideal moment for life and beauty: therefore it's the only time of life which can be represented by an artistic practice which aims to define an ideal "model". On the contrary Hellenistic sculpture can be interpreted as the result of a more inclusive approach that is more close to reality and more willing to represent non-ideal figures. A proof against the "Zeitgeist" interpretation can be recognized in the fact that another common topic of Hellenistic sculpture, besides timeworn old figures, is the theme of infants and playful children: a theme often compared to the Baroque one.

To summarize we can say that Hellenistic sculpture is representative of the whole spectrum of variety: a spectrum which is probably related to the intention to reach the highest realism and to express, consequently, the entire spectrum of emotions. This phenomenon is arguably related to new subjective sensibility generated by the condition of living in a cosmopolitan society. Generally it can be said that the inclusiveness of differences is the most distinctive aspect of the Hellenistic period. If on one hand archaic and classical Greek art represents the "objective" emergence of the individual as a free autonomous person who, in the polis, is equal between equals; on the other hand during the Hellenistic period what emerges is the subjective personality of a human being who, in a multifaceted cosmopolitan society, is a unique and different person between different people.



FIG. 53 On the left side: Marble statue of an old market woman, Roman, Julio-Claudian copy of a Hellenistic work of the second century B.C., Metropolitan Museum of Art, New York. On the right side: Child and Goose, Hellenistic, mid-second century B.C, Louvre, Paris

The Hellenistic period has been often characterized, and maybe sometimes stereotyped, as individualistic. It is important, for the sake of clarity, however, to distinguish between the individual and individualism. If in the Greek polis, citizens emerge as free individuals, during the Hellenistic period they lose part of their autonomy and separateness, becoming part of a larger and more complex society. Thus, at least partially, they “turn inwards”. We may call this tendency individualism, but we can also consider this as the result of the emergence of one’s interiority: an interior world which was before negated or unexpressed. Hannah Arendt has clearly explained the clear division, in Greek society, between the public life of the *polis*, based on the political activity, and the private life of the *oikos*. The statue of the kouros, the Doric temple, and the democratic citizen are all expressions of the public life of the polis and bear no reference to the private aspects of life. This distinction progressively fades out and during the Hellenistic period subjective and intimate aspects start to become important, sometimes even public, features.

Michel Foucault, in his “Ethics, Subjectivity and Truth” distinguishes between the classical Greek relation with the self, expressed by the Delphic principle “*know yourself*”, and the Hellenistic “*care of the self*”, which is a principle derived from Socrates, accepted by Epicurus and the Cynics, and transformed into practice by Stoics as Seneca, Rufus, and Galen. The Greek “know yourself” can be considered the philosophical expression of archaic and

classical increasing “self-consciousness” of the individual. This principle is applied exclusively to the young citizen who wants to take part in the political life of the polis. In the Platonic dialogue “Alcibiades I” Socrates explains to the young Alcibiades that “knowing oneself” is the only way to better understand the needs of other citizens and the necessities of the polis. Therefore during the classical period the principle “know yourself” is linked with the political activity. According to Foucault: *“Plato gave priority to the Delphic maxim ‘Know yourself.’ The privileged position of ‘Know yourself’ is characteristic of all Platonists. Later, in the Hellenistic and Greco-Roman periods, this is reversed: the accent was not on the knowledge of self but on the concern with oneself. The latter was given an autonomy and even a preeminence as a philosophical issue.”*⁶⁷

We can recognize in the Hellenistic “care of the self” the emergence of a new concern for one’s inner state of mind. Subjective conscience progressively becomes more and more important. If on one hand the principle “*know yourself*” is typical of the classical Greek “oral culture”, in which rhetoric is necessary for the political life of a young citizen, on the other hand the Hellenistic “*care of the self*” is conceived as a material daily practice, usually based on intimate writing exercises. The Stoic examination of the self, which includes a conscientious examination of what one has done and what has not done, represents as instrument for the disclosure of the self. This written activity, defined by Foucault as a “technology of the self”, will become even more relevant and diffuse during the Roman period. But we can furthermore consider this activity also as a sort of anticipation of the Christian practices of confession and asceticism. According to Foucault: *“The Stoics say you must attend to the self, ‘retire into the self and stay there.’ Lucian parodied the notion. It was an extremely widespread activity, and it brought about competition between the rhetoricians and those who turned toward themselves, particularly over the question of the role of the master. There were charlatans, of course, but certain individuals took it seriously. It was generally acknowledged that it was good to be reflective, at least briefly. Pliny advises a friend to set aside a few moments a day, or several weeks or months, for a retreat into himself. This was an active leisure - to study, to read, to prepare for misfortune or death. It was a meditation and a preparation.”*⁶⁸ The letters of Seneca or Marcus Aurelius are exemplary: the small details of daily life are written to investigate the relation between the body and the soul. Memoires, personal diaries, and epistolary communication with friends are considered by stoics as a daily practice which should be done during the entire life, as meditation but in some cases also as a preparation to death. The happy proximity to death, and the idea of an after life, is one of the most recurrent issues of Hellenistic culture, a spiritual theme that has found expression in new religious practices.

The new *mystery cults* are widely diffuse during the Hellenistic period, and their essential feature is that they offer their devotees protection and personal salvation during their life

⁶⁷ Foucault, Michel, Paul Rabinow, and Robert Hurley, eds. 1997. *Ethics : Subjectivity and truth*. Foucault, Michel, 1926-1984. *Dits et écrits*. English. Selections ; v. 1. New York: New Press: p. 231.

⁶⁸ *Ibid.*, p. 232.

on earth and during the life to come. The term “mystery cult” comes from the Greek *mysterion*, meaning “secret rite or doctrine”, and is related to the fact that the people who join these closed communities are forced to go through an initiation. Some mystery cults anticipate aspects of early Christian cults such as the fact of dealing with life salvation, the initiation ceremony and the idea of a community. Luther H. Martin, in his essay “*The Anti-Individualistic Ideology of Hellenistic Culture*”, claims that: “*Like the mystery cults, the early Christian societies also based social inclusion upon distinctive claims of spiritual kinship. In a paradigm of social reorientation and inclusion more dramatic than anything suggested for membership in the Isis cult, Jesus is portrayed by some of these first Christians as requiring the rejection of one's natural family.*”⁶⁹ The presence of secret or closed religious communities, besides the mysterious and intriguing aspect of it, should be considered in the Hellenistic wider trend of growth of associations, clubs, and small communities. According to Owens “*To satisfy their needs for social intercourse they formed clubs. The Hellenistic age abounded in clubs of every kind, religious, professional, and ethnic.*”⁷⁰ The increasing subjectivity and the condition of being in a large cosmopolitan society are both aspects that might have contributed to the growth of small communities based on similar interests. Probably for the first time, even religion becomes a matter of personal choice. According to Jon D. Mikalson “*the thousands of Greek emigrees of the Hellenistic period were largely liberated from the all-encompassing religious traditions of their homelands, traditions that had dictated which gods they were to worship, where and on what days, for what purposes, and in which social and political contexts. But these gods were very much tied to local cults and practices in their homelands, and the emigrating Greek could not simply take them with him. He now faced choices in his religious life that neither he nor his ancestor had ever encountered.*”⁷¹ Between the most popular mystery cults we can recognize the healing god Asclepius, the Egyptian Isis and Serapis, but also the universal Dionysus. Orphism is another popular mystery religion dedicated to the cult of Orpheus who is also reputed for having invented the “mysteries of Dionysus”. A description of mystery rituals can be found in the book IX of the Apuleius’ *Metamorphoses*, known as “The Golden Ass”, in which the protagonist Lucius is initiated into the cult of Isis. We can recognize in all these cults similarities - even though based on different practices -with the stoic “*care of the self*” since all these *mysteries* promote health, safety, salvation and good life. More generally, during the Hellenistic period, the recurrent issue of death and rebirth, as well as the diffuse fertility rituals of the *mysteries*, can be interpreted as a return to the earth-based *chthonic* cults. The *apollonian* cult, which is architecturally expressed by the “tectonic” free-standing Doric temple, is

⁶⁹ Martin, Luther H. 1994. The anti-individualistic ideology of hellenistic culture. *Numen* 41 (2) (May): pp. 128.

⁷⁰ Jones, A. H. M. 1964. The hellenistic age. *Past & Present*(27) (Apr.): p. 21.

⁷¹ See the essay “Continuity and Change in the Hellenistic period” by Jon D. Mikalson. Bugh, Glenn Richard, ed. 2006. *The cambridge companion to the hellenistic world*. Cambridge ; New York: Cambridge University Press: p. 209.

progressively re-balanced by a return of the *Dionysian* rituals, which is manifested in architecture by an increasing interest for a “chthonic” internal space.

A glimpse of this new interest for internal space, in association with *mystery cults*, can be found in the unique **Samothrace temple complex** of the “Great Gods”. This sanctuary is known since the early archaic period for a Chthonic religious practice renowned as the *Eleusinian Mysteries*. The Pantheon of the “*Megaloi Theoi*”, the Great Gods of Samothrace, consists of numerous chthonic deities, primarily predating the arrival of Greek colonists on the island in the 7th century BC, and based around the central figure the “Great Mother”. However according to recent archeological evidences the building activity in this site has started only during the fourth century.⁷² During the Hellenistic period, after the investiture of Phillip II, the Samothrace temple complex becomes a Macedonian national sanctuary.

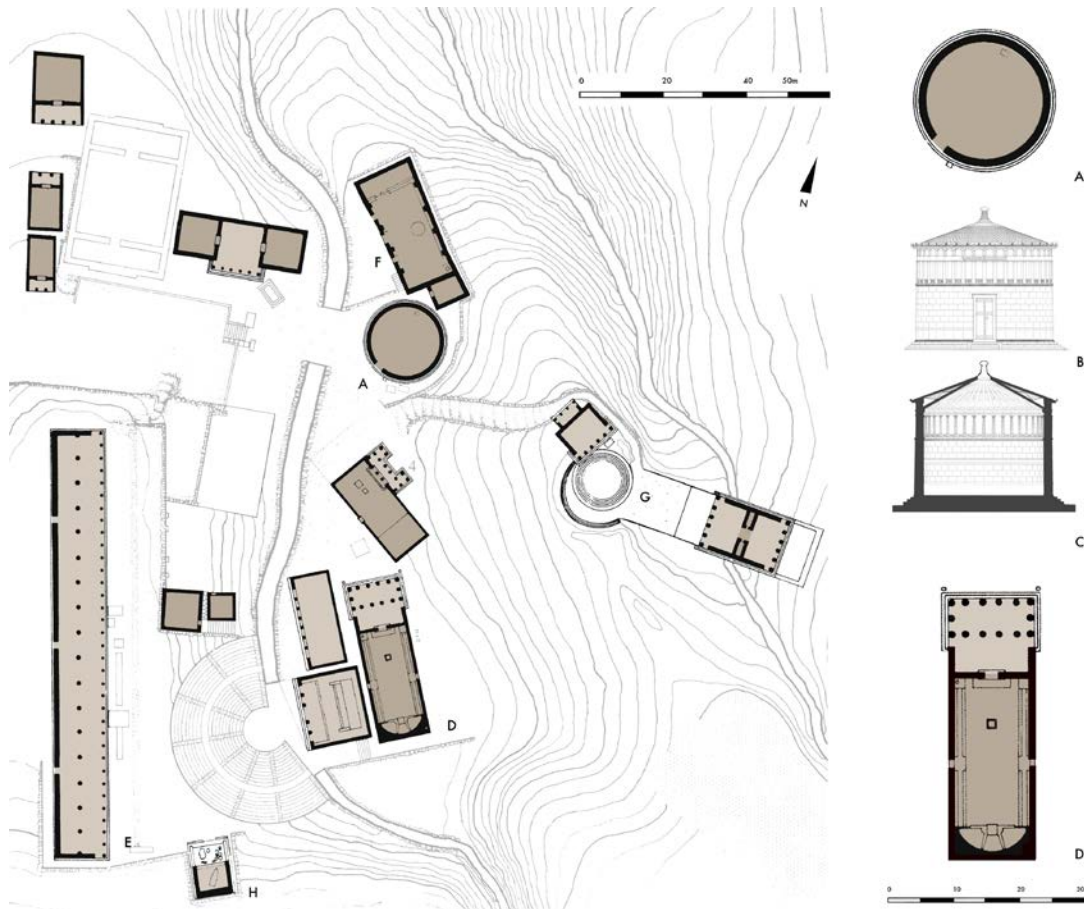


FIG. 54 Samothrace temple complex: A) Rotunda of Arsinoe II, dedicated by Arsinoe II of Egypt (288–270 BC), B) Façade of the Rotunda of Arsinoe II, C) Section of the Rotunda of Arsinoe II, D) Hieron, central Sanctuary (ca. 325 B.C.), E) Stoa”J” (250-150 B.C), F) Anaktoron, built in Early Imperial Period (1st century A.D.) on two preexisting structure (the Orthostate Structure and Proto-Anaktoron), G) Theatral Circle (4th century B.C) H), Niche of The Nike of Samothrace.

⁷² See: Theoi Megaloi: The Cult of the Great Gods at Samothrace, Volumes 96-97

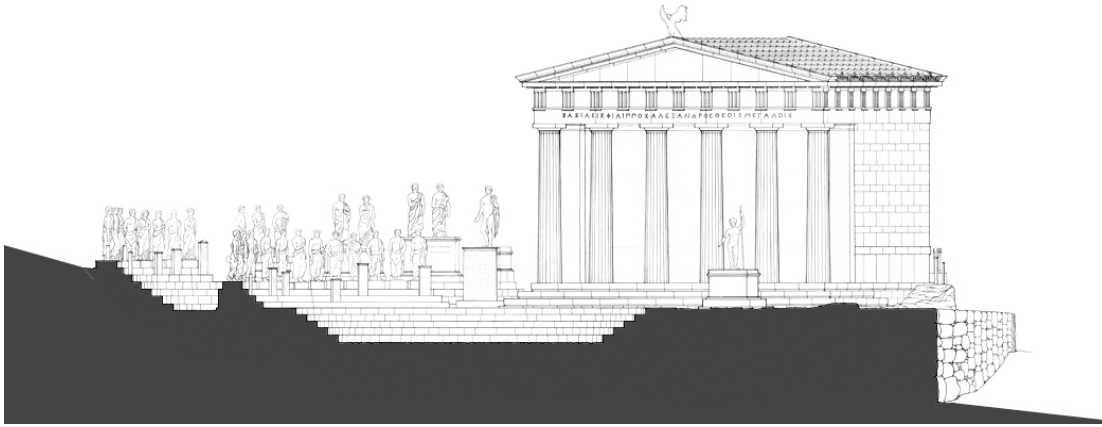


FIG. 55 Samothrace temple complex: Section through the Theatral Circle (4th century B.C.). Behind the Theatral Circle there is an hexastyle prostyle monument with a dedication: "Kings Philip [and] Alexander to the Great Gods". Drawing from www.samothrace.emory.edu

The importance of this site for the Hellenistic period is expressed by the fact that, according to a popular legend, the parents of Alexander the Great, Philip and Olympias, first met here. The *theatral Circle* is the earliest permanent gathering space for the celebrations of the Sanctuary. During the ritual the initiates would descend in this sunken open-air theater, which in itself, defines a sort of basic enclosed space.

The ceremony which takes place in this open theater, similarly to the "Dionysian" rituals, is based on songs, dances, theater and a judgment ceremony. Around 200 B.C. a Dionysian competition is added to the festival, after the construction of a new larger theatre. One of the finest Hellenistic sculptures, the *Nike of Samothrace* which stands on the prow of a ship and is now placed on the grand staircase landing of the Louvre Museum in Paris, has been originally created to overlook this new theater from a "chthonic" rock niche. Her well-refined transparent clothes moved by the wind and the expressive interplay between her body and the surrounding space are comparable only with the dynamism of Bernini's baroque sculptures, created nonetheless two thousand years later, during the 17th century.

The preparation for the initiation into the mysteries of the Samothrace sanctuary takes place in the smallest room of a building called "Anaktoron". Here the initiates usually dress in white, get a lamp, and then move to the larger room of the Anaktoron for the first stage of the initiation called "*myèsis*". In this large hall they attend the ceremony seating on benches positioned along the walls. The initiation ritual is based on the act of washing oneself in the basin situated in the southeast corner of the buildings, followed by a libation to the gods. The *Anaktoron* has been rebuilt three times. The oldest building is dated from the fourth century B.C., whereas the remains which are visible today are part of a more recent building constructed in the Roman imperial period.

Next Page: FIG. 56 *Nike of Samothrace*, Parian marble (220–190 BC) Louvre, Paris.



The second degree of the initiation is called the "*épopteia*," which means "contemplation", and takes place in the *Hieron*. This Hellenistic construction is the first building constructed on site, around 325 B.C, and it has probably been financed by Alexander's conquests in Persia. The *Hieron* is formed by a long cella whose main façade is a hexastyle temple-front decorated by sculpted figures of *Nike* placed in the corners. Its uncommon interior hall, eleven meters wide, is covered by the largest unsupported roof of the Greek world. But the most peculiar and unique aspect of this building is the terminal hidden apse of the cella. This is certainly an uncommon feature in Greek and Hellenistic architecture, and we could almost say that it anticipates, in smaller scale, the Roman and the early-Christian basilica typology. According to Ginouvès this apse is the most sacred portion, and its circular shape intends to recreate a grotto for conducting "chthonic" rituals. Therefore the attempt to reproduce a sort of "chthonic" space and the unusual interest for interior space, are strictly related to the mystery cult ritual which is held in the *Hieron*. Differently than in the case of a traditional Greek temple, here the ritual takes place within the building. The participants, during the *épopteia ceremony*, seat on the two long rows of marble benches placed along the sidewalls and supported by sculpted lion's legs. According to Karl Lehmann there is a preliminary ceremony that includes the confession of sins prior to the completion of the initiation rites. In both the "basilica-like" typology and the "confession" ceremony we can recognize unexpected precursory elements of the Christian rituals.

Another unusual building of the Samothrace temple complex is the Rotunda of Arsinoe II, which represents the largest covered round space in the ancient Greek world. The function of the Rotunda remains obscure, but we can assume that its large internal space, twenty meters wide, might have been used for rituals or important gatherings during the festival.

If we analyze the disposition of buildings in the Sanctuary of Samothrace, we can recognize a very traditional - almost classically Greek - distribution of isolated buildings in an open space. Even in this case the landscape features are more important than any space organization. In the *Hieron* and in the Rotunda of Arsinoe II we can also recognize an unusual interest for interior space, even though they represent isolated and unrepeated cases. Their unique anticipation, in smaller scale, of roman typologies such as the basilica and the Pantheon, must be considered in relation with the peculiarity of the ritual which takes place in this sanctuary. Large interior spaces are almost impossible to find until the Roman period, even during the Hellenistic age. However a different kind of enclosure of space, an open-air enclosure formed by stoas and colonnades, is becoming more and more common during this period. We can consider this kind of enclosure as a necessary intermediate step before the Roman development of large interior roofed spaces. Furthermore it can even be argued that without this diffuse Hellenistic tendency, the following architectural developments would be impossible.

To analyze the Hellenistic open-air enclosures we have to consider other sanctuaries and urban complexes. But before doing so, we have to evaluate the possible effects on the architectural practice of the scientific paradigm shift generated by the discovery of incommensurability. Within the mathematical discipline, the most direct consequence is

that Geometry appears, maybe for the first time, more accurate and truthful than arithmetic numbers because it can represent incommensurable magnitudes such as the diagonal of a square. But if geometry becomes predominant in scientific disciplines what are the effects on architecture? As Coulton has clearly shown, since no drawn plan has been found yet, it's possible to argue that during the classical Greek period the approach to architectural design might have not been based on drawings. According to current archaeological evidences it seems that archaic and classical architectural projects are defined only by written specifications, parametric rules of proportions and full sized models for special details.

Not surprisingly, the Hellenistic diffusion of geometry seems to coincide also with the introduction of drawings in architecture. According to Coulton *"the Hellenistic period must have seen a major change in techniques of design, however. The alphabetic numerals and the modular system of proportion would make it easier to plan accurately beforehand using the traditional procedures, but the change in the whole emphasis of architecture during the Hellenistic period required something more profound. A wider range of buildings was given a monumental treatment – gymnasia, council chambers, innumerable stoas, and even houses; and although these might be conventional in broad terms, they were more complex and less consistent in plan than temples, for they would often need to combine a variety of elements within a single building... There would therefore be much more to be gained by drawing preliminary plans, even imperfect ones, than there had been with the simpler and more strongly conventional buildings of earlier periods; and indeed there is evidence that this was done."*⁷³

In the Hellenistic temple of Apollo at **Didyma**, Lothar Haselberger has found traces of drawings and geometrical constructions on the lower parts of the walls of the *adytum*. These traces can be considered the first documented Greek architectural drawings.

The temple of Apollo at Didyma is built on a previous temple destroyed by Darius I of Persia in 494 BC, in the same year in which the nearby city of Miletus is also razed to the ground by the Persian army. Alexander the Great conquers Miletus in 334 BC and consequently the oracle of Apollo at Didyma is reconsecrated. In 313 BC the Milesians start to build a new Hellenistic temple on the site of the earlier shrine. The temple is comparable, in terms of size and typology, to the earlier "gigantic" experiments of 6th century Sicily: the temple of Zeus in Akragas and the Temple "G" in Selinus. Significantly even the Temple of Didyma has never been completed. In all these three cases the traditional temple typology is scaled up to a much larger monumental size. Arguably this augmentation might have generated the technological impossibility, at least for Greek standards, to roof the wide space of the proportionally large internal cella. However in the case of the Hellenistic Temple at Didyma we can recognize a sort of consciousness and intentionality in the definition of the internal open court. The *adyton*, or inner shrine, is an unpaved open court sunken in the temple platform to the ground level.

⁷³ Coulton, J. J. 1977. *Ancient greek architects at work : Problems of structure and design*. Ithaca, N.Y.: Cornell University Press: p.68

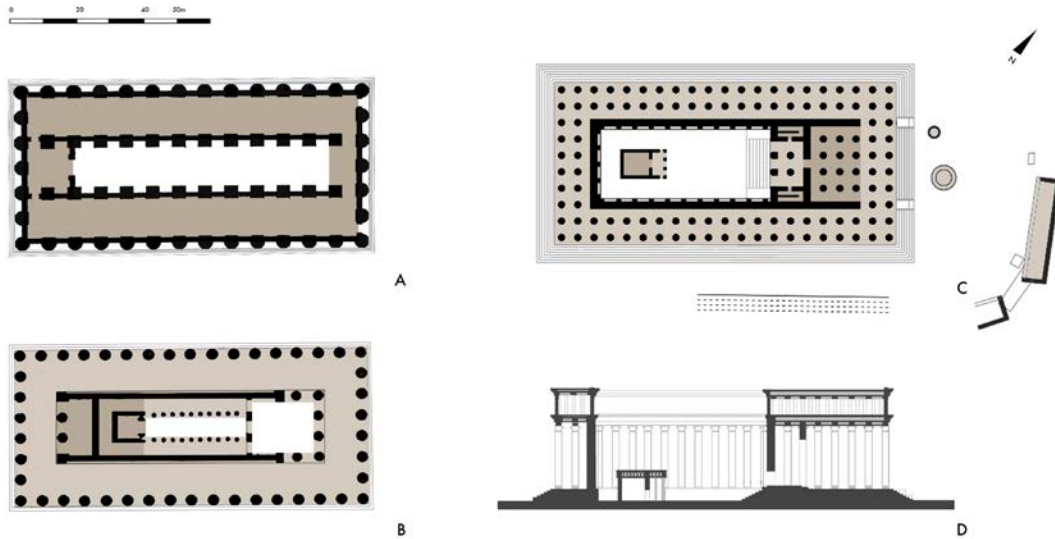


FIG. 57 Confrontation between the Magna Graecia "gigantic" temples (on the left side) and the temple of Apollo at Didyma (on the right side): A) Temple of Zeus, Akragas (510-409 B.C.), B) Temple "G", Selinus (520-450 B.C.), C) Temple of Apollo at Didyma (since 313 B.C.), D) Section through the internal open air court of Temple of Apollo at Didyma.

Here an ancient spring and a grove of laurels sacred to Apollo recreate a natural microcosm within the macrocosm: an enclosed reproduction of the external space dominated by a smaller temple which contains, in its own small cella, the bronze cult image of the god.

The presence of a little temple within the larger temple characterizes the inner courtyard as a sort of architectural womb, a place for origination and reproduction. Furthermore we can interpret this solution as an incredible compromise, which allows the conservancy of the correlation between the cult of Apollo and the external space - manifested by the presence of a smaller temple with a ritual space around it - even if this traditional "temple-external space" binomial is positioned within the internal space of a larger temple. The *adyton*, which literally means "inaccessible" because it's usually the place at the end of the *naos* in which the cult image is positioned, is transformed in the case of the larger temple into an open courtyard, becoming therefore publicly accessible. At the same time the cult image is positioned within the *adyton* of the smaller temple, maintaining its inaccessibility. Therefore this temple represents an incredibly intricate correlation of meanings: an interplay between open and closed, between exterior and interior space, between gigantic and miniature scales, between conventional rules and contradictions. Moreover this sophisticated interplay can be found also in the ritual.

It's possible to identify a sort of theatricality, which is another characteristic aspect of the Hellenistic period, in the ritual progression from the external to the internal space of the temple.

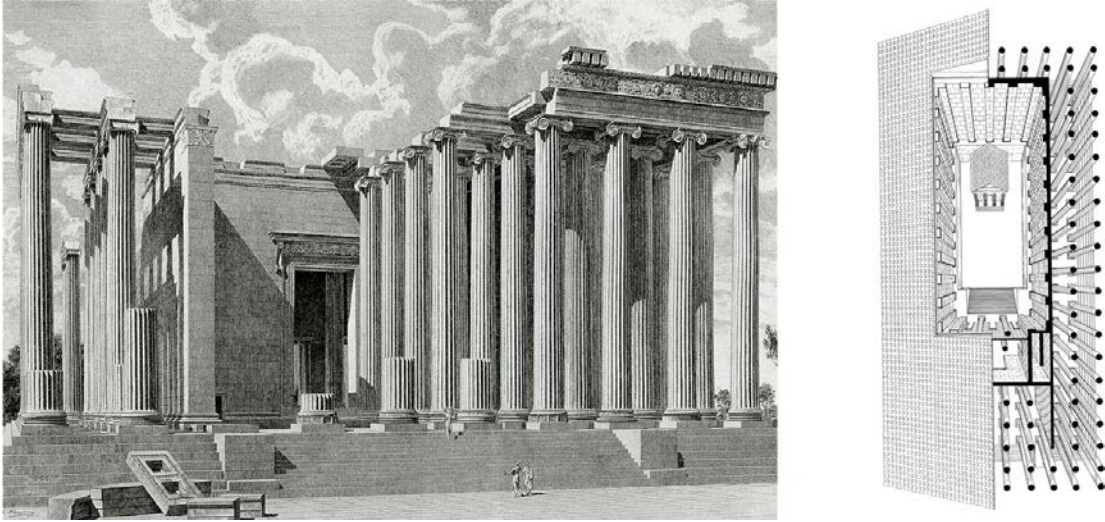


FIG. 58 On the left side, reconstruction drawing of the Temple of Apollo at Didyma, by George Niemann, 1912. On the right side, view of the temple from above.

The sequence to enter into the *adyton* starts from the external space of the larger temple. From here the worshippers walk up the stairs of the platform and access the labyrinthine forest of gigantic ionic columns of the *pronaos*. This semi-dark space is dominated by a huge central portal leading to a huge cella. Behind this gigantic door there is the oracle chamber which, however, is inaccessible. But almost like in a scene of “Alice in Wonderland” two miniature openings are visible from here on both sides of the cella. From these portals worshippers can access two sloping tunnels, connected to a tomblike antechamber, which finally lead to the inner courtyard. In the sudden shift from the darkness of the tunnel to the dazzling light of the open-air *adyton*, they would find themselves again in an external space surrounded by a high enclosure formed by stone walls. Here the grove of laurels, the spring and a little temple recreate an almost natural setting. With a 180 degree turn, the worshippers would see a monumental staircase, on the top of which there is another huge portal which corresponds with the other side of the oracular chamber. In this case the “manifestation portal” is open and framed by two gigantic columns: from this “theatrical stage” the oracle makes his pronouncements.

It is on the walls of this incredible open-air enclosure that Haselberger has found the first known Greek architectural drawings. They are carved over the marble surface of the walls with a half millimetre incision. The carved drawings represent in real dimensions a portion of the entablature and some individual parts of the building like the column base or the column profile with the geometric process for the calculation of the *entasis* curvature. All these drawing are rigorously geometrically constructed with compass and straightedge: they are a vivid representation of a design process that is getting more and more based on geometry. The floor plans are drawn directly on the stepping platform. The placement of the elements on this platform are based on a strict geometrical grid that is marked with short vertical lines.



FIG. 59 View through the sloping tunnel which connects the internal court and the external world.



FIG. 60 The unfinished open air court of the Temple of Apollo at Didyma.

But according Haselberger these full scale drawings, realized on site, represent only part of the planning process: *“before reaching this final stage, the plans for structures must have gone through several drafts. It seems likely that papyrus, parchment, whitewashed wood tablets or even flat stones served as the material on which these preliminary designs were drawn. The last option was confirmed recently by my colleague Wolf Koenigs, who, while investigating the Temple of Athena in the town of Priene, discovered a scaled-down sketch of its pediment; it had been incised in the bottom of a block that was later fitted into the building itself”*⁷⁴. Furthermore it’s possible to argue that the emergent use of plans and drawings in the Hellenistic period might have had repercussion even in the characteristics of the temple, altering the traditional design process. In a traditional Doric temple the external colonnade, with its irregular column spacing based on parametric rules, is built before the construction of the cella, which in many cases has no alignment with the columns.

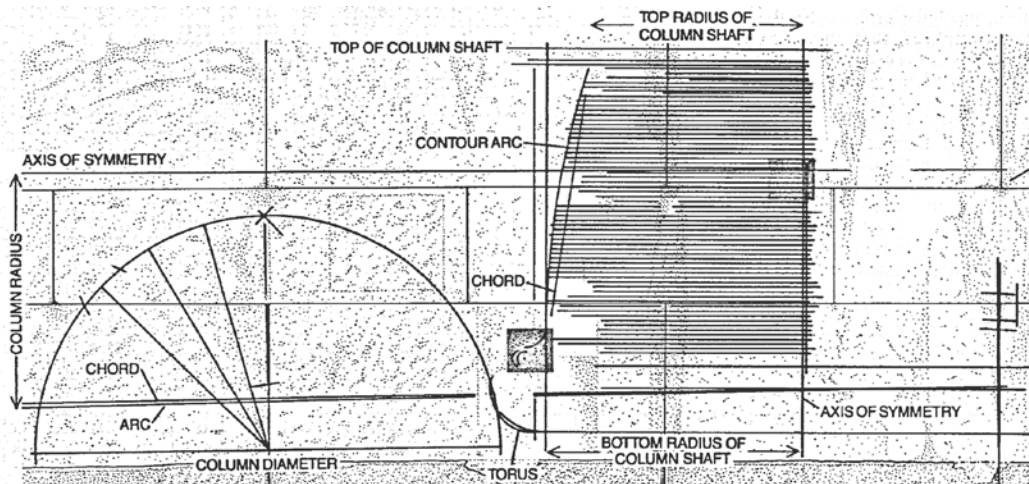


FIG. 61 Three overlapping drawings found by Haselberger, on the walls of the adyton.

⁷⁴ Haselberger, Lothar. 1985. *The Construction Plans for the Temple of Apollo at Didyma*. Scientific American, vol. 253, no. 6 (December 1985): pp. 126-132.

Only in the late classical period there is usually an alignment between the outer face of the cella and the centre of the penultimate column. The position of the columns on the platform cannot be defined by a drawn grid plan because the intercolumniation, the distance between the columns, is not consistent. This distance is determined only by parametrical rules. The most diffuse of these rules is the so-called “angle contraction”, a mathematical procedure that determines the reduction of the intercolumniation between the corner column and the penultimate one. This is done to maintain the same dimensions of *metopes* and *triglyphs*, and to have an entire corner *triglyph*. But in other cases, the rules are more complicated because, like in the Parthenon, the metopes have slightly decreasing dimensions. What is clearly evident is that all these variations cannot be easily perceived in a scaled drawing and are more easily defined by parametrical rules.

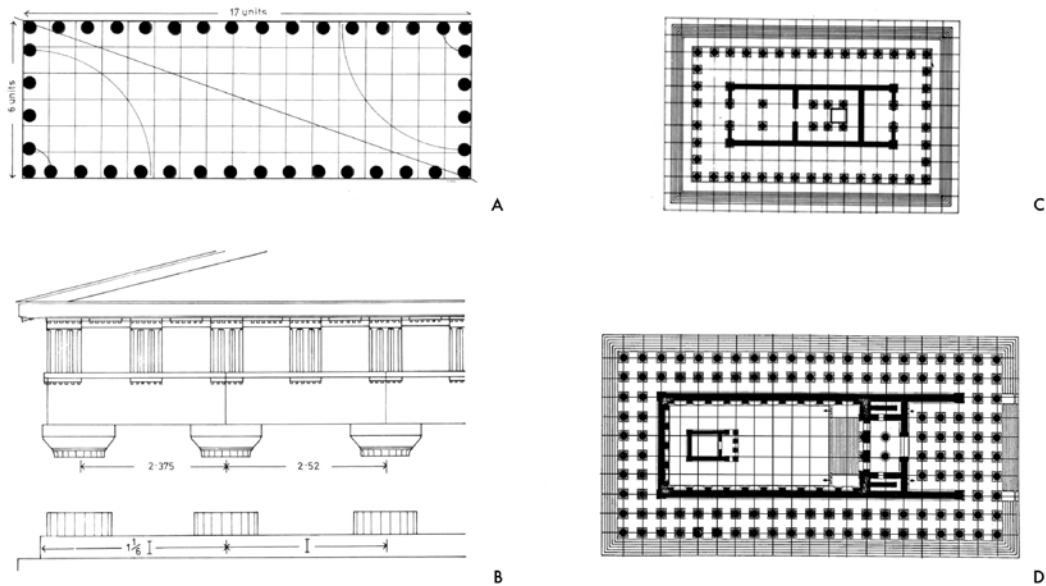


FIG. 62 Comparison between the archaic and classic temple design “parametric” approach (on the left side) and the Hellenistic geometric construction (on the right side): A) Hypothetical temple plan with 6x16 columns and with the angle contraction. Drawing by Coulton. B) Angle contraction of the Hephaisteion, Athens (449-415 B.C.). Drawing by Coulton. C) Temple of Artemis in Magnesia (130 B.C.) D) Temple of Apollo at Didyma (313 B.C.)

During the Hellenistic period, on the contrary, the cella is usually more complex than the Doric one, and it is built before the construction of the external regular colonnade. Columns are position according to a regular grid aligned to the axes of the walls of the Cella. This regular grid, which easily correlates all the elements in plan, suggests the fact that during the Hellenistic period the plan is worked out in a drawing. We could arguably say that in Doric temples the “sculptural” elevation, based on parametric rules, has precedence over the planimetric distribution of the elements, whereas in Hellenistic times design is based on the elevation of a drawn plan.

4.2 The Hellenistic space conception

Generally when we compare a Hellenistic temple with an earlier one, we can recognize another substantial difference. The quality of the archaic and classical temples is based on the sophisticated architectonic details and on a refined sculptural execution. The parametric variations in the position of the columns, the curvature of the platform and the inclination of the columns are all manifestations of an architectural practice which is focused on small essential details. During the Hellenistic time, all these differentiations are simplified, and there is also a less evident sophistication in the execution. This is because the attention of the architect is now focused on a larger scale. For the first time, and most probably for the use of drawn plans, architects can build larger scale urban complexes in which is possible to recognize the same rationality, the same symmetry and the same appearance of order that is evident in the Doric temple, but at an urban scale. Therefore architectural design evolves from an early Doric idea of a free-standing sculpture in the middle of the landscape, to a more articulated urban concatenation of temples, stoas, urban stairs and colonnades, usually disposed according to a grid plan or to a monumental axis. In architecture, similarly to the geographic shift from the small isolated *polis* to the vast Hellenistic empire, the bigger whole becomes progressively more important than the details. In this process of increasingly complex articulation of architectural volumes, the space “in between” is progressively enclosed and incorporated in the design composition. A similar process is noticeable in the evolution of the interplay between “body and space” in Greek sculpture.



FIG. 63 Evolution of the interplay between “body and space” in sculpture between the archaic and the Hellenistic period. Female figures (from left to right): 1) Peplos Kore, archaic period, Acropolis Museum, Athens (530 B.C.), 2) Aphrodite of Type Genetrix, Roman copy inspired by Greek statue by Callimachus, classical period, State Hermitage Museum, St Petersburg (420-410 B.C.), 3) Ludovisi Cnidian Aphrodite, Roman marble copy of the original by Praxiteles, classical period, (350 BC). 4) Group of Statues of Aphrodite, Pan and Eros, Hellenistic, National Archaeological Museum of Athens (100 B.C)



FIG. 64 Evolution of the interplay between “body and space” in sculpture between the archaic and the Hellenistic period. Male figures (from left to right): 1) Statue of a kouros (youth), archaic period, The Metropolitan Museum of Art, New York (ca. 590–580 B.C.), 2) Aristodikos Kouros, early classical period, National Archaeological Museum, Athens (510–500 B.C.), 3) Doryphoros, copy found in Pompeii of Polykleitos’ statue, classical period, Museo Archeologico, Naples (ca. 450 B.C.), 4) The Vatican Apoxyomenos by Lysippus, the court sculptor of Alexander the Great, Hellenistic period, Museo Pio-Clementino, Rome (ca. 330 B.C.)

In the archaic period the *kore* and the *kouros* appear as firm and rigid bodies that resolutely face the external space, almost like platonic volumes in an empty space. During the classical period the body is represented in a more realistic way - even though highly idealized - and is clearly more articulated. The arms remain close to the body but with a slight attempt to explore and occupy the external space. In the Hellenistic period the body is often represented with highly realistic details such as skin imperfections and veins. The posture is usually more dynamic and fluid and the body is articulated in such a way that the external space becomes part of the sculpture. The projecting arms are now virtually enclosing part of the space, which is progressively incorporated within the sculpture itself. It’s evident, that this kind of sculptural articulation is also the result of a more advanced expertise and probably also of a better quality marble. However it’s possible to recognize, besides the apparent “virtuosity”, an intentional investigation of the space and an attempt to consider solids and voids in the same way. Generally we can make the same consideration for Hellenistic architecture. The platonic volumes of the early temples and stoas become incrementally more articulated. Volumetric protrusions emerge from these perfect prisms, almost like architectural “arms” that start to investigate the external space. The beginning of this process, like in the case of classical sculpture, can be found in the articulated classical buildings of the acropolis, such as the *Propylaea* and the sanctuary of *Artemis Brauronia*. This tendency is continued and developed to a larger scale during the Hellenistic period. The colonnaded stoa is gradually developed into a more complex “L” and “U” disposition

which extends the stoa “arms” with a manifested intention to partially enclose the space that is fronting.

In the acropolis of **Lindos** on the island of Rhodes, it’s possible to identify a clear attempt to incorporate and enclose the space with the colonnades of Propylaea and stoa. The small Temple of *Athena Lindia*, dating from about 300 BC, is built on the highest point of the acropolis, on the remains of an earlier temple. The Propylaea complex is erected, probably in the same period, to define a monumental gateway placed between the monumental staircase and the upper temple terrace. Coulton describes it a sort of combination between the features of the *Stoa of Zeus*, for its protruding symmetrical tetrastyle wings, and the Mnesikles’ *Propylaea* of Athens⁷⁵, for its internal and external colonnade, which creates a sort of filtered passage.

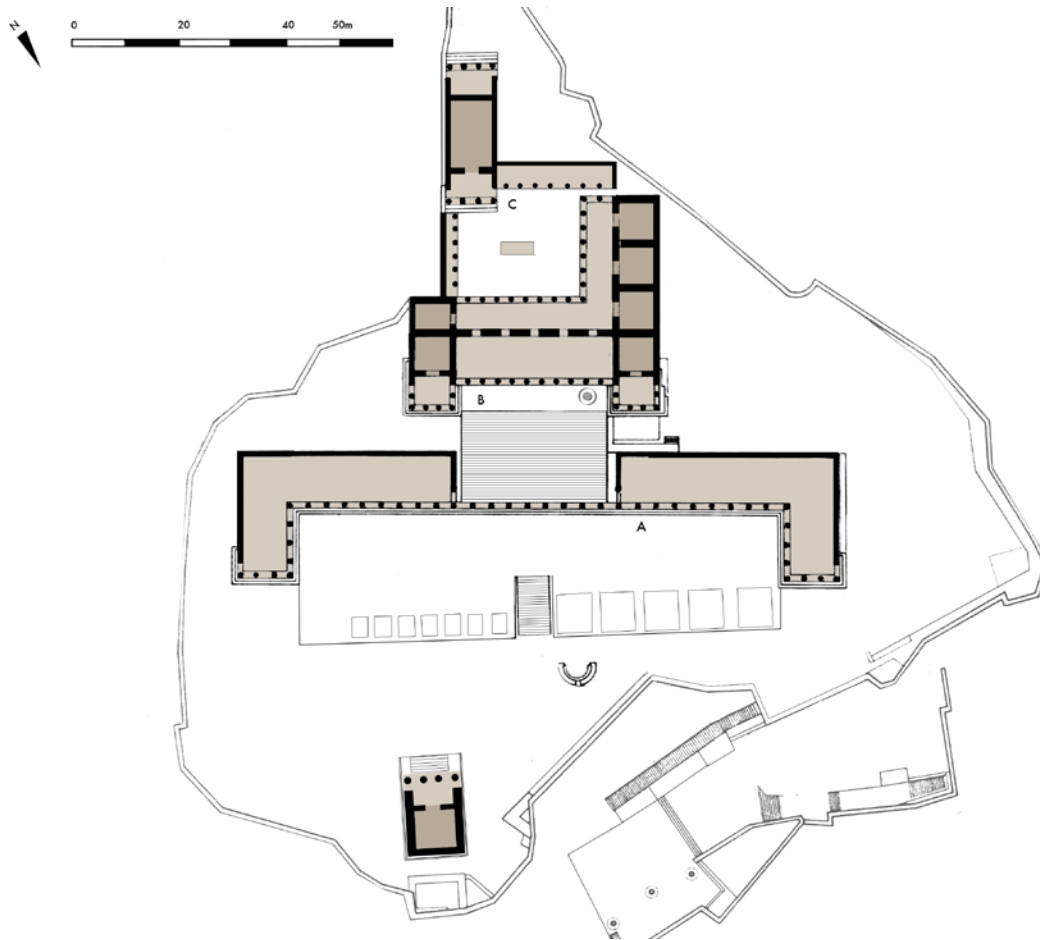


FIG. 65 Plan of the Lindos acropolis on the island of Rhodes. A) Stoa, late third century. B) Propylaea, (ca. 300 B.C.), C) Temple of Athena Lindia, (ca. 300 B.C.)

⁷⁵ Coulton, J. J. 1976. The architectural development of the greek stoa. Oxford monographs on classical archaeology. Oxford Eng.: Clarendon Press: p. 61.

After going through one of the five gateways, the temple of Athena appears, framed by the internal colonnade, from an angular perspective. On the internal side, the Propylaea building is shaped as a large “L” which defines two sides of an open court around the temple. The two colonnades that completely enclose this inner court are added at a later stage to increase the intimacy of the court. At the end of the third century a larger stoa is built on the lower terrace as a gateway for the monumental staircase. In this case the “arms” of the stoa project even more to partially enclose the space in front of it. Therefore the frontal appearance of the stoa is articulated in a sort of short “U” disposition, which is basically composed of two “L” shaped stoa, symmetrically placed on both sides of the staircase. These buildings compose, altogether, an innovative axial sequence which is intended to define a sort of theatrical entrance to the temple court.

The interest in symmetry and axuality is even more marked in the *Asklepieion*, the sanctuary of the “healing” god Asklepios, in **Kos**. The increasing popularity of the cult of Asclepius, starting from 350 B.C., has determined the development of this sanctuary where pilgrims arrive to be healed. The most evident aspect of this architectural complex is represented by its disposition on three degrading terraces and by the two “U” shaped stoas which enclose the space around the temples. In this case their function is related to the ritual: under the porticos of the stoas the patients can wait to be cured, during the day, and can sleep facing the temple, during the night (“*incubation*”), with the hope to be advised by Asclepius in dream. The lower stoa is the oldest one and can be dated from the third century B.C. It defines the entrance to the sanctuary, and is equipped with numerous rooms. The upper stoa is probably built, together with the Doric temple of the upper terrace, around 150 B.C. The temple is placed at the end of the monumental staircase and there is no external altar in front of it as was typical in a Doric temple: this is symptomatic of a change in the ritual but also of a transition from external space to enclosed space. In this sanctuary the conformation of the two stoas defines a sort of intimate and protected space, a mystic spatial enclosure which is almost a necessary condition for a sanctuary visited by sick and injured persons.

The most evident aspect in the planning organization of the Hellenistic sanctuaries is the overall symmetry and the strong axuality which defines the progression sequence from the exterior space, through the enclosed space, to the temple. According to Coulton: *“Another concept often, but not necessary, associated with the completely peristylar sanctuaries, is that of symmetry in the overall design. One of the functions of the surrounding porticoes was to give scale and importance to the temple by providing it with a formal frame. The hierarchical relationship of buildings and spaces thus created was made much clear by the use of an axial approach to a symmetrical sanctuary, for by this means the spectator was himself brought into the system. Such an approach is alien to the traditional planning of a Greek sanctuary. In early sanctuaries the various structures tend to be considered as separate entities without strict formal relationship.”*⁷⁶

⁷⁶ Ibid., p. 170.

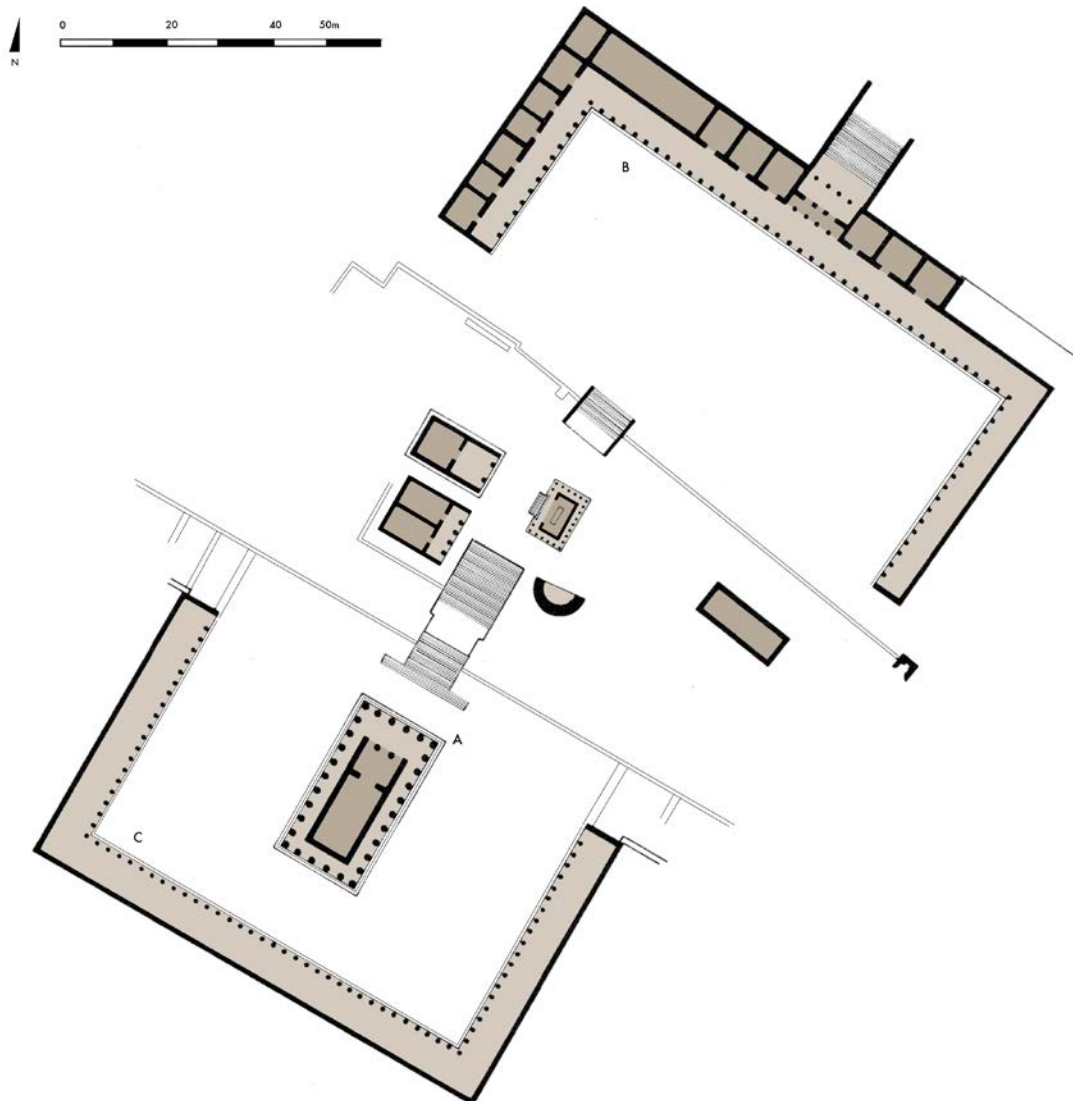


FIG. 66 Plan of the Asklepieion, sanctuary of the god Asclepius, in Kos: A) Doric temple, upper terrace (2nd century A.D.), B) Lower stoa (300-250 B.C.), C) Upper stoa (ca. 150 B.C)

As we have previously seen, during the classical period the axial approach is generally avoided because an angular vision of the temple can enhance its tridimensional qualities and its appearance as a separate volume. In Hellenistic architecture, on the contrary, buildings are not conceived anymore as separate entities, but as components of a bigger whole.

Phyllis Williams Lehmann, in the essay *"The Setting of Hellenistic Temples"* has compared this kind of composition to Baroque architecture: *"I should like to emphasize that in true Hellenistic fashion this composition is designed to be taken in at a glance, to be apprehended as a whole, for its single units only achieve their fullest value as parts of the whole. In this respect it differs radically from the classical predecessor like the Akropolis at Athens, where we*

are conscious first and foremost of individual buildings, however carefully contrasted and adjusted to each other they may be. If this essentially baroque tendency seems to architects and architectural historian accustomed to the full exploitation of baroque principles in later ages to be as yet embryonic in form, let us not forget that this is the first appearance in European architecture. But, like many other aspects of this rich age, it was destined to exert an immense influence on the later development of architecture.”⁷⁷

The colonnaded portico becomes, in this period, the most important architectural tool since it allows the connection of different buildings, to surround and to frame isolated volumes and to give formal and spatial unity to a larger group of buildings. The Hellenistic portico of the *Metreon* built at the end of the second century B.C. in the Athenian agora, is a clear example for the use of a colonnade to give order and unity to existing buildings. The portico is placed in front of different rooms connected with the new Bouleuterion to give them unity. Furthermore this portico creates an ideal continuation of the colonnade of the Stoa of Zeus, generating, between these two buildings, an axial entrance for the Temple of Hephaestus, placed on the hill behind. Even in this case symmetry and axiality, are used to give a clearer order to the built space.

The stoa, in all its declinations and in all its possible formal articulations, is the element which plays the most important role in the Hellenistic period. As I have tried to explain earlier, the colonnade establishes a clear frontal directionality which defines an indissoluble relationship between the building and the space that is facing. Therefore when columns are serially disposed all around a single building, like in the case of a peripteral Doric temple, the colonnade emphasizes the exterior presence of the building in the open space, indicating a strong relationship with the external space. But if the colonnade is internally “bent” in two or three parts, like in the cases of the “L” and “U” stoas, its frontal appearance is also folded and redirected towards the partially enclosed space. Therefore the articulation of the stoa in the Hellenistic period, is strictly correlated with the “folding of space” and to the architectural transition from external to enclosed space.

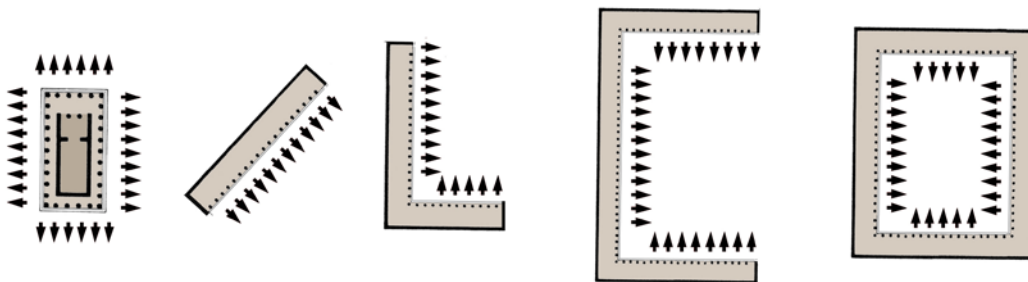


FIG. 67 The progression from external to enclosed space generated by the formal articulation of the stoa in “L” and “U” shapes. The complete enclosure is generally used only in the Roman period.

⁷⁷ Lehmann, Phyllis Williams. 1954. The setting of hellenistic temples. *Journal of the Society of Architectural Historians* 13 (4) (Dec.): p. 18.

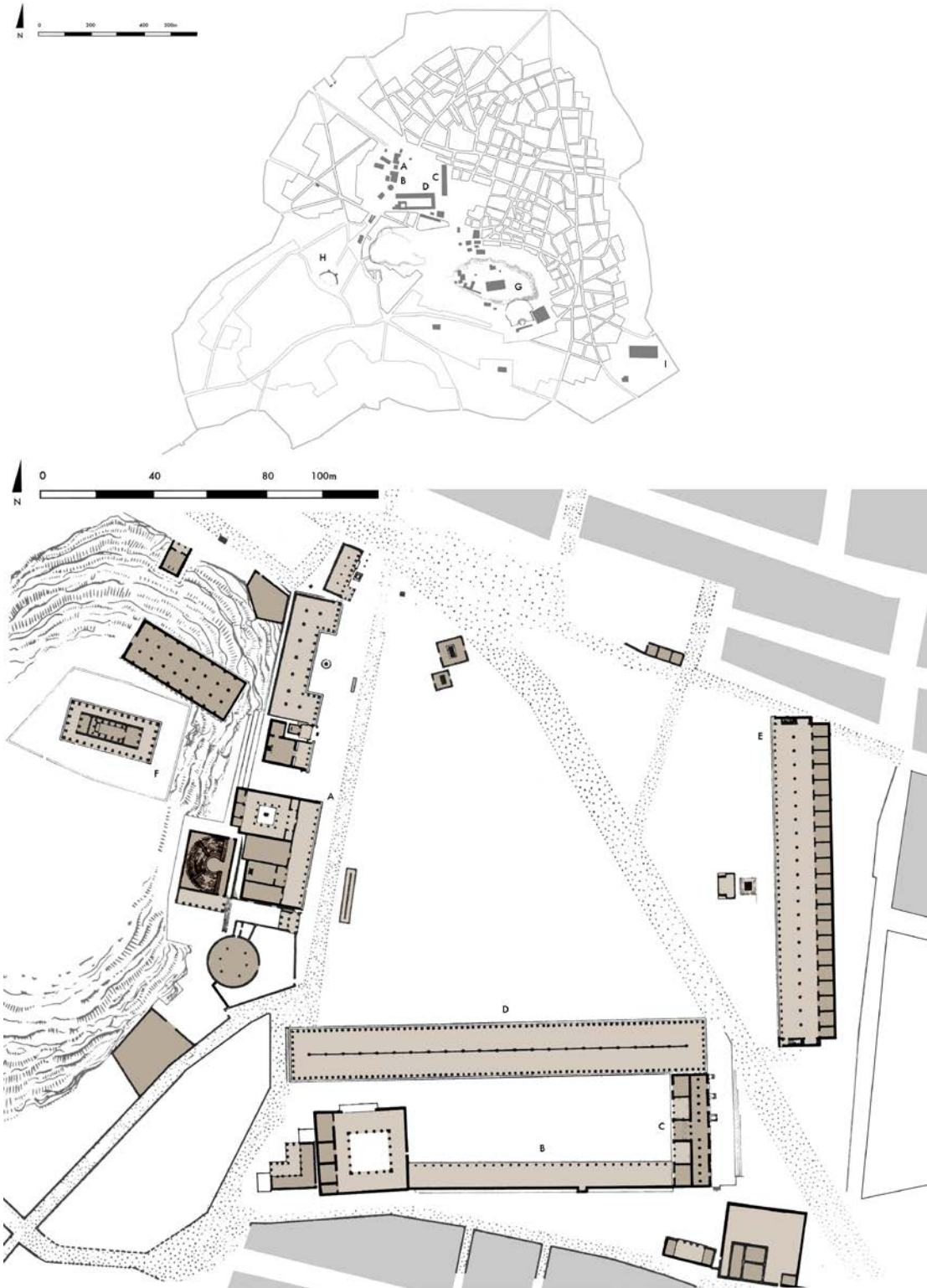


FIG. 68 Plan of the agora in Athens during the Hellenistic period: A) Portico of the Metroon (ca. 125 B.C) B) South stoa II (150 B.C.), C) East building, (ca. 150 B.C), D) Middle stoa, two aisled stoa with colonnades all around (180 B.C.), E) Stoa of Attalos, two storey stoa, (159-138 B.C.), F) Temple of Hephaestus, G) Acropolis, I) Olympieion, H) Pnyx

The most relevant aspect of the “U” shaped stoa is that the space which is partially enclosed between the protruding “arms”, becomes an integral part of the building itself and composes with the stoa a sort of architectural unit. An additional aspect of the stoa is that it allows the subdivision of space and the differentiation of its use. This feature can be recognized in the Hellenistic development of the Athenian agora. During the mid-second century the **Agora of Athens** is rearranged and transformed according to Hellenistic standards. After the construction of the portico of the Metroon the western side of the agora appears as a quite unified front. To give a sort of enclosure to the vast space of the agora, two large stoas are built on the other two sides. On the eastern side of the most important public space of Athens, the king of Pergamon, Attalos II, finances the construction of a large stoa dedicated to his name. This building, a two-storey arcade 115 meters long, is still visible today in the agora after having been reconstructed. Additionally the southern side the agora is enclosed by the long colonnade of the *middle stoa*, which is part of a larger complex formed also by the *east building* and the *south stoa*. Altogether these buildings define a smaller “U” shaped enclosure that is dedicated to the market activity. Therefore the *middle stoa* has the role to separate the agora in two areas: one dedicated to the political and public gatherings and the other reserved for the commercial activities.

The peculiarity of having colonnades on all four sides is related to the fact that this large building has to face both the agora space towards north, and the new market space towards south. The differentiation of the functions of the agora, initially in separate areas and later on - especially in the Roman period - in specific buildings, is one of the most relevant transformations of the ancient urban space. A separation between a market-free “*freemen’s agora*” and a “*commercial agora*” is suggested also by Aristotle in his *Politics* (VII, 12): “*Below this spot should be established an agora, such as that which the Thessalians call the 'freemen's agora'; from this all trade should be excluded, and no mechanic, husbandman, or any such person allowed to enter, unless he be summoned by the magistrates. It would be a charming use of the place, if the gymnastic exercises of the elder men were performed there. For in this noble practice different ages should be separated, and some of the magistrates should stay with the boys, while the grown-up men remain with the magistrates; for the presence of the magistrates is the best mode of inspiring true modesty and ingenuous fear. There should also be a traders' agora, distinct and apart from the other, in a situation which is convenient for the reception of goods both by sea and land.*” In the case of the agora of Athens, we can see the beginning of the process of functional differentiation, which will be fully completed only under the Roman empire.

However, to fully appreciate the Hellenistic innovations in architecture and urban design, we have to analyze other sanctuaries and agoras in which stoas, temples, and agoras are assembled in much larger compositions. The ability to design at an urban scale and the capacity of incorporating single buildings into a larger whole is undoubtedly the most innovative aspect of the Hellenistic period. To have a glimpse of this capacity we can think to the Hellenistic sculptural groups, in which for the first time, freestanding statues are grouped together to create a larger and more complex ensemble. The “Farnese bull” is a clear example of this ability.



FIG. 69 Farnese Bull, Museo Archeologico Nazionale , Naples. (end of 2nd century B.C.)

Here multiple bodies are intricately merged into a large-scale composition in which the interplay between solids and voids constitutes the most relevant aspect. In this bigger whole the single figures have a secondary role, whereas the general plastic appearance and the unity of the sculptural group are predominant.

Similar considerations can be applied to the Hellenistic cities. Their general plan is defined by a large-scale organization, usually but not always based on a grid system, in which single buildings contribute to define, as smaller components, a bigger and continuous unified order. According to Martienssen *“we may regard the architecturally unified city as being significant in providing a sustained pattern of environment which must inevitably have raised the index of visual satisfaction to a new and higher level. What was gained by the contemplation of single isolated objects now assumes a new order of continuity ; there is a fulfillment of the sensory faculties that accords with a collectively growing sensibility.”*⁷⁸

We have to consider that the possibility of designing larger architectural complexes and big sculptural groups is strictly related to the new patronage of the rich Hellenistic kingdoms. The development of “court art” can be traced back to Alexander’s court. Lysippos, the author of the most famous Hellenistic statues is chosen by Alexander the Great to make sculptural portraits of him. In the following centuries the Hellenistic monarchies found entirely new cities, each requiring temples and monuments, and enrich older cities with new monuments, gymnasia and market buildings. All these large-scale Hellenistic projects would not be possible without the regal patronage of the new kingdoms. According to Roland Martin *“This State-backed art, often designed to enhance the glory and prestige of princes, tends to enlarge volume and proportions in both sculpture and architecture, and encourages a splendid efflorescence of decorative mural painting, which seeks to broaden and enlarge both surfaces and masses by means of sensational architectural grouping. The result is an aim common to every field of artistic expression, a constant struggle to conquer space in all its dimensions”*⁷⁹ It’s noteworthy that the regal “court” and the architectural “court” or courtyard typology etymologically come from the same term. Throughout history it’s possible to identify an evident correlation between aristocratic regal-court systems and the enclosure of space typical of the courts.

However art-patronage is not the only aspect that has changed architecture practice during the Hellenistic period. If on one side the political power is held by the kings and their entourage, on the other side a parallel administrative system is developed to control their vast kingdoms. This highly systematic organization system, directed by professional bureaucrats, has influenced also architecture. According to Coulton, during the Hellenistic period, for the first time architects are hired as “city architects” to organize the defensive system of the city and probably also the civic buildings. Therefore the growth in scale of architecture design, is also supported by an increasingly articulated administration system.

The main difference between the “U” shaped stoa of the Hellenistic sanctuaries and its application in the larger urban compositions of the Ionian cities, is that in the agoras are usually symmetrically organized without a strong emphasis on axially. According to

⁷⁸ Martienssen, R. D. 1956. The idea of space in greek architecture, with special reference to the doric temple and its setting. Witwatersrand University Press: p. 38

⁷⁹ See Roland Martin’s preface in :Charbonneau, Jean, Roland Martin, and François Villard. 1973. Hellenistic art (330-50 B.C.). Arts of mankind ; v. 18. New York: G. Braziller.

Coulton: "In Ionia the space was often more important, and there the characteristic agora of the Hellenistic period was a rectangular space framed on three sides by L-shaped or Π-shaped stoas, with a straight stoa on the fourth side. The way these stoas flex round corners and merge into each other, as buildings never did in archaic or classical architecture, emphasizes the importance of the court rather than the mass of the buildings, or even the space beneath their roofs. In spite of its regularity there is normally no emphasis on the axis of symmetry of the Ionian agora. It is the space, not some building in or near it, that is the focus of attention."⁸⁰ We could explain this difference considering that the sanctuaries are usually approached frontally, therefore the axiality is related to processional sequence and to the way worshippers enter from the main entrance into the space enclosed by the stoas. On the contrary the U shaped agoras are usually aligned along the main urban street, which defines a non-axial entrance to the agora space. We can recognize this characteristic in Priene and Miletos.

The new city of **Priene** is founded, according to recent archeological researches, on the same site of the older city around the fourth quarter of the fourth century B.C⁸¹. The dispute around the founder of the city, whether a Hecatomnid or Alexander the Great, has not been solved yet, even though the strong influence of Alexander is clearly manifested in the Temple of Athena Polias. The dedication inscription "*King Alexander dedicated the temple to Athena Polias*" is a clear example of the art-patronage system initiated by Alexander and of the new "contamination" between civic affairs and religion. A dedication of a temple by a king would be unconceivable in a traditional Greek polis, and it's noteworthy that this temple is built by Alexander in Priene just after his offer to finance the new temple of Artemis in Ephesus is refused by the Ephesians for this reason. We know the architect of this temple from Vitruvius (I.1.12): "*Pythius, the celebrated builder of the temple of Minerva at Priene*". The construction of the *Athena Polias temple*, probably coeval with the foundation of the city, can be dated from 334 B.C. The city of Priene expresses in the best way the Hellenistic ability to integrate single architectures into a bigger whole: into an organic work of art based on a highly cohesive and sophisticated plan. Compared to the older Magna Graecia gridded towns, the blocks of Priene are not so long and almost square-like. The town plan is developed around the central terraced agora, superimposing a regular grid on the irregular steep slope of Mount Mycale. The houses of the residential blocks are therefore disposed on different terraced levels which give to most of the units a view over the landscape. The initial construction of the agora, built as a terrace on the sloping site, starts around the third quarter of the fourth century B.C, when the small *temple of Zeus* is also under construction. The north stoa is built on the remains of an older stoa, which matched the length of the U shaped portico, incorporating the rooms of the previous building and extending the portico eastwards to conceal the front of the *Prytaneion* and the *Bouleuterion* under a unified colonnade.

⁸⁰ Coulton, J. J. 1977. *Ancient greek architects at work : Problems of structure and design*. Ithaca, N.Y.: Cornell University Press: p.122.

⁸¹ Demand, Nancy. 1986. The relocation of Priene reconsidered. *Phoenix* 40 (1) (Spring): pp. 35-44.



FIG. 70 Plan of Priene, Hellenistic period: A) Sanctuary of Athena Polias (ca. 334 B.C.) B) "U" shaped stoa (ca. 300 B.C.), with the addition of the east wing (ca. 150 B.C.) C) Sanctuary of Zeus (ca. 330 B.C.) D) North stoa, two aisled stoa with colonnades all around (ca.300 B.C.), E) Gymnasium (ca. 130-100 B.C.)

The use of the portico as a unifying façade, with the intention to integrate different buildings, is a common Hellenistic feature as we have seen in the case of the portico of Metroon in Athens. The north and “U” stoa define altogether a unified urban ensemble that is spatially defined as a sort of great widening of the main east-west street, and is formally enclosed by a continuous portico. The market for meat and vegetables is separated from the main agora, and is held in the smaller open space placed near the eastern side of the “U” agora.

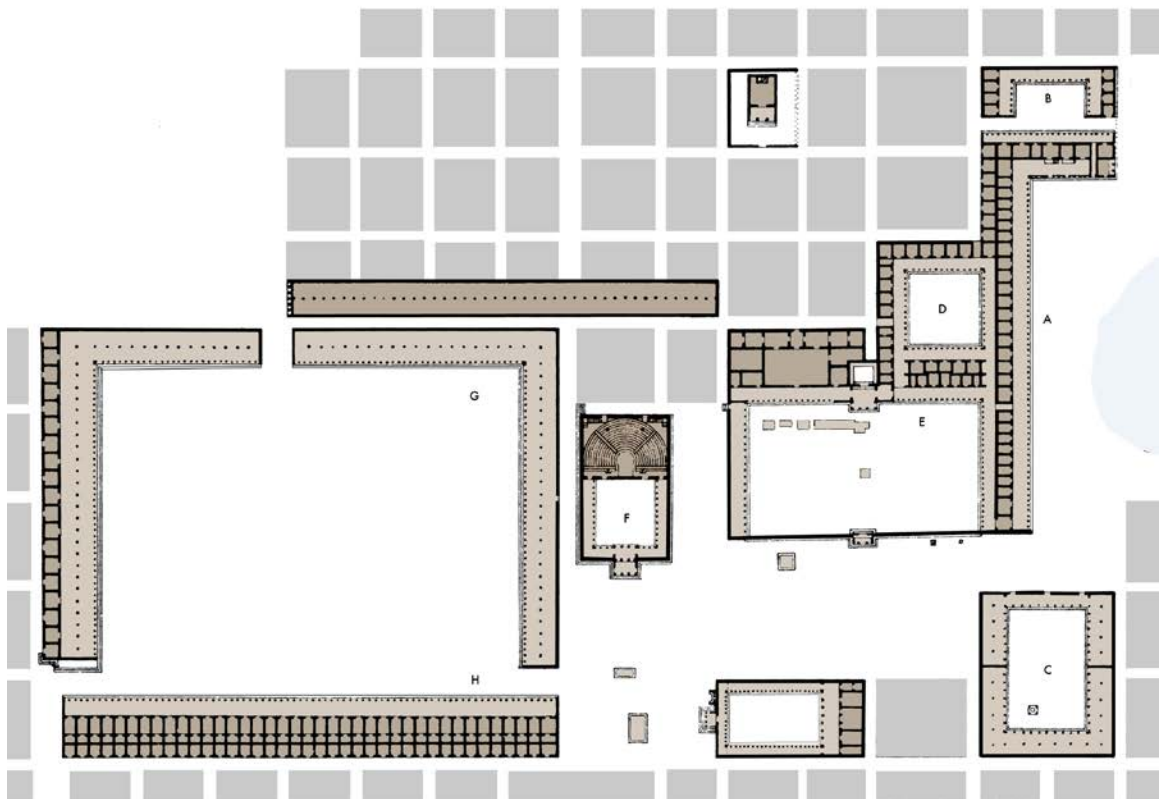
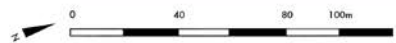
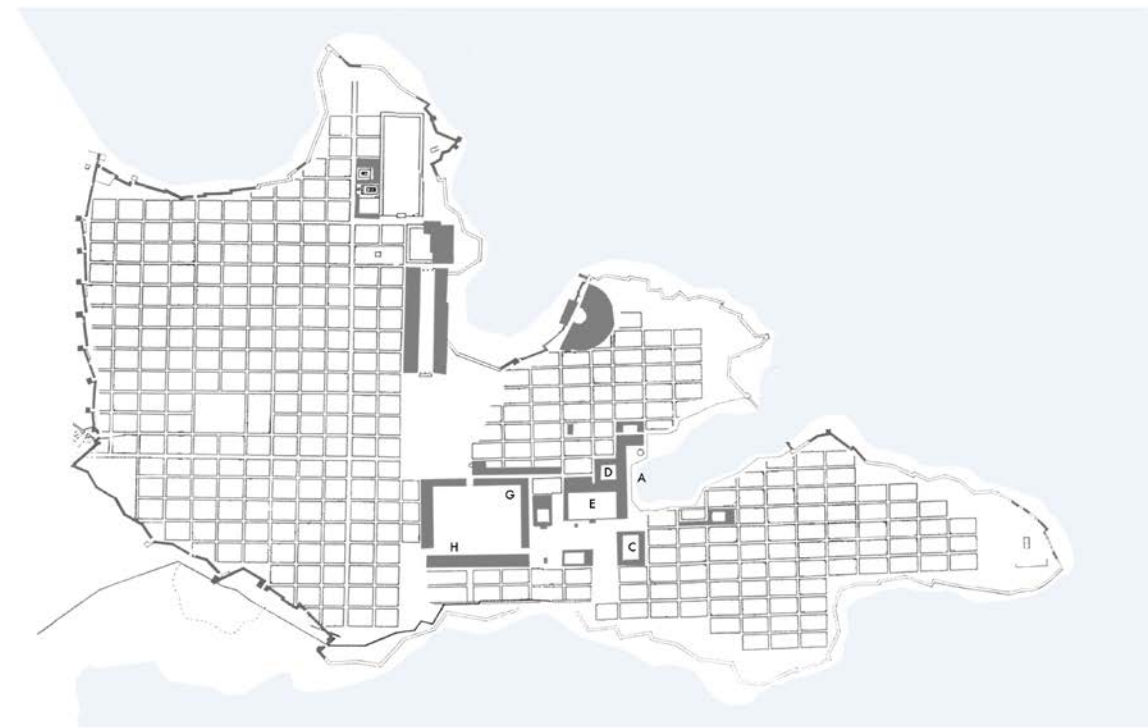
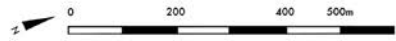
The importance of Priene, even though it is a small town with only 4-5000 inhabitants, is manifested by the fact that it becomes a member of the Ionian League. For its premature abandonment during the second century and for the correlated fact that it’s not expanded or transformed during the Roman imperial period, we can consider Priene a perfectly clear and untouched prototype of a Hellenistic city. According to Martienssen, “*when we say, therefore, that Priene is typical of the Hellenistic cities we merely imply that it demonstrates a unifying process in its constituent elements, and that the architectural expression of its institutions has finally crystallized into significant forms. The elements have no longer a specialized treatment ; there is only one medium – that of town-planning.*”⁸²

The development of **Miletos** is more progressive and the Hellenistic city is later on modified and expanded by the Romans. Its most extraordinary characteristic is the interplay between the rational gridded plan and the natural characteristic of the site, especially the coastline. The older part of the city is defined by the north Agora, which is placed in proximity to a protuberance of the sea which is used as a harbor. The complex of the *North agora*, formed by a long “L” shaped stoa, by a peristyle court and by a smaller “L” stoa facing towards the north market, is built as a unit in the late fourth century B.C. to delimitate the space of the north agora and the area of the harbor. The following step is the construction, financed by Antiochos I, of the long *East building* on the *south Market*. This stoa is composed by a portico, a row of shops facing east, and a row of double-room shops facing west. This typology is quite unusual for this period.

In the mid-second century the *north market* is enclosed with another “L” shape stoa which symmetrically reproduces the “L” disposition of the western part of the older North Stoa by the Harbor. A small temple is placed between the two “L” stoas marking the symmetry axis. In a similar way during the same period, the large space of the *south market* is also completed and enclosed by two more “L” shaped stoas. Therefore by the end of the second century the two market spaces of Miletos are almost completely enclosed by colonnades.

Next page: FIG. 71 Plan of Miletos, Hellenistic period: A) Stoa by Harbor (ca. 350-300 B.C.) B) Stoa west of the stoa by the Harbor (ca. 200 B.C), C) Delphinion (340-320 B.C), D) North Market, the north “L” stoa is part of the Stoa by Harbor (ca. 350-300 B.C.), the southern part “L” stoa is built later (ca. 150 B.C.), F) Bouleterion (ca. 175 B.C.), G) South Market (ca. 200 B.C.), H) East building on South Market, (ca. 275 B.C)

⁸² Martienssen, R. D. 1956. The idea of space in greek architecture, with special reference to the doric temple and its setting. Witwatersrand University Press: p. 38.



According to Coulton the popularity of “L” and “U” shaped stoas throughout all the Ionic Hellenistic cities means that the problem of turning a colonnade through a re-entrant angle is quite recurrent during this period.⁸³ If on one hand, during the classical period, the biggest architectural problem is related to the external corner of the Doric temples, a complication which is solved with the “angle contraction”, during the Hellenistic period this same problem is turned outside-in and is related to the internal angle of “L” and “U” stoas. This apparently small detail is in itself symptomatic of the progressive shift of focus from exterior to interior space. It’s noteworthy that a typical solution to the “re-entrant angle” problem, which is the heart-shaped pier, is probably originated in Miletos. Another typical characteristic of Miletos, related to the complicated articulation of the stoas, is the flat roof which is used for the first time in the stoa by the harbor.

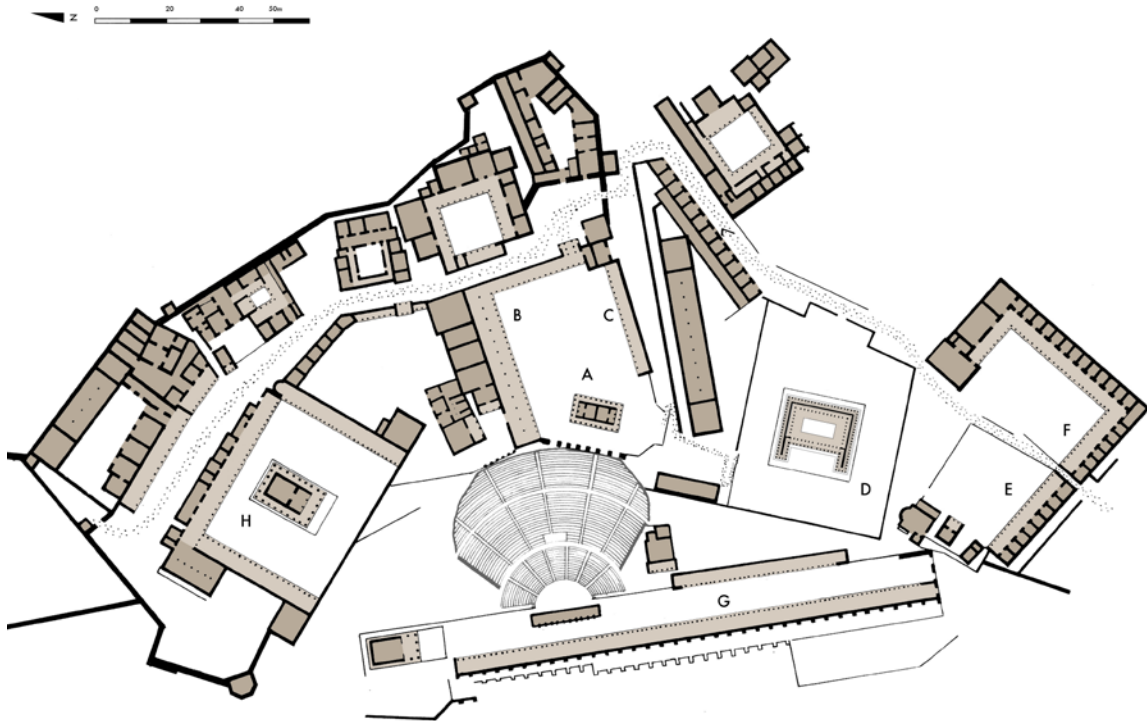


FIG. 72 Plan of acropolis of Pergamon, Hellenistic period: A) Sanctuary of Athena, temple of Athena (3rd century) B) Sanctuary of Athena, north-east stoa (190-180 B.C), C) Sanctuary of Athena, south stoa (160-140 B.C), D) Pergamon Altar of Zeus (ca. 175-150 B.C.), E) Upper agora, west stoa (170-125 B.C.), F) Upper agora, Pi-shaped stoa (170-125 B.C.), G) Theater terrace (ca. 125 B.C)

⁸³ Coulton, J. J. 1976. The architectural development of the greek stoa. Oxford monographs on classical archaeology. Oxford Eng.: Clarendon Press: pp. 63-64.

The city of **Pergamon**, defined by Pliny the Elder, in his *Natural History*, (V.31) “*the most illustrious of Asiatic cities*”, is the capital of the *Attalid Kingdom* in Asia minor. Its two greatest monarchs, *Attalos I* and his son *Eumenes II*, are patrons of science and the arts. Attalos I founded the *Great library* of Pergamon which competed with the one in Alexandria for being the leading cultural center of the Hellenistic period. Attalos gained admiration and popularity for stopping the threatening advance of the *Gauls*, who were defeated, but also celebrated, for the nobility they had shown in their dramatic end in numerous remarkable sculptures such as the “*Dying Gaul*” and the “*Suicide of Gaul and his wife*”. Even the celebrated *Pergamon altar*, dedicated to Zeus, is built in the first half of the second century to celebrate this victory. This altar dominates the Acropolis of Pergamon, a monumental ensemble of sanctuaries, agoras, and sophisticated peristyle houses which apparently seem to emerge as natural right-angled protuberances from the orographic conformation of a rocky hill, whereas they are the artificial result of an unseen planning capacity in combining the classical Greek sensibility towards the landscape with the Hellenistic tendency towards monumentality and space enclosure. The irregularity of the site evidently negates the possibility of a gridded plan: the acropolis of Pergamon is an agglomeration of different units. We have already seen how the “U” shaped stoa defines, with the enclosed space, a sort of architectural unit. In the case of Pergamon the plastic unity of architecture and space is even more evident because the stoa is placed on its own independent terrace and its “U” shaped disposition is left open towards the landscape view. All these platforms compose a sort of fragmented but at the same time organic monumental composition.

The sanctuary of Athena is the oldest cult center of Pergamon. The hexastyle Doric temple is built in the third century B.C., whereas the *north-east* “L” shaped stoa and the south stoas are built later to theatrically enclose the space around the temple as a sort of stage-set. The north east “L” stoa is a portico built on two levels in order to define a façade for the great library which is placed on a higher level, corresponding to the second floor of the stoa. The multi-storey stoa which takes advantage of the different levels between the platform and the surroundings is a typical Pergamene characteristic. In some cases shops, facing towards the outside, are built beneath the stoas which enclose the terrace space. The *upper agora* is enclosed by a regular colonnade formed by a U shaped stoa and continued by the *west stoa*. The two long stoas built on the theater terrace around 125 B.C. can be considered as a sort of anticipation of the colonnaded street that will be widely used during the Roman imperial period. The *west stoa* is 210m long and is certainly the longest built stoa.

At the end of the second century B.C. we can recognize two different and interrelated phenomena which architecturally mark the end of the Hellenistic development and the beginning of a new phase which will be fulfilled during the Roman imperial period. We have already seen that the colonnade of the stoa is a sort of articulated urban element which usually defines an enclosed and formally unified space. The increasing use of the colonnaded portico and its application in different contexts progressively transform this architectural element to a sort of independent system, detached from the Stoa typology. As a matter of fact, up to the end of the Hellenistic period the stoa has been used as a clearly identifiable autonomous typology. In the case of Priene, Miletos and Pergamon, even though

the stoa is articulated in complex forms, we can recognize the stoa as a singular building, usually composed by a colonnade and by a row of rooms, with a specific function, usually offices or shops. But later on the portico is used more often as an independent element: as a unifying façade connecting different buildings and different functions. The portico of *Metreon* in the Athenian agora is an early example of this use, which becomes more common and applied to a larger scale. Therefore the portico, a constituent element of the stoa, achieves a sort of autonomy during this period as the result of the shift from the architectural to the urban scale and for its new role of unifying frontage for different buildings. This tendency can be considered the fulfillment of the role of the *stoa*, which has always been used to define a space and to give formal unity, but it also marks the end of the stoa as an independent typology.

The second tendency which is recognizable at the end of the Hellenistic period is the achievement of the total enclosure of space. The agora of Priene and Miletos are clearly enclosed by the stoas on four sides, but this enclosure is never completed. A complete enclosure can be found during the Hellenistic period only in terms of single buildings, like in the case of the *Palaistra* and *Gymnasyon* typologies, which are usually developed around a *peristyle* court. It's noteworthy that the enclosed *peristyle* court is a typical domestic and intimate element. We can almost trace a development sequence of this typology from the small peristyle of simple Greek houses such as those in Olynthus, through the larger colonnaded courts of the Hellenistic palaces, to the *Gymnasyon* and *Palaistra* typologies. According to Frederick E. Winter the courtyard peristyle might have been influenced by oriental models, probably Egyptian and Persian.⁸⁴ The *court* type, both as a political system and as an architecture typology have clearly eastern origins. The Hellenistic idea of a "divine kingship", which is expressed by the cult of Alexander the Great and the later Hellenistic monarchs, is a notion deeply rooted in the older Egyptian and Persian monarchies. In architectural terms the typology of the royal palace developed around courts, together with the use of gardens, is also typically Persian and is exemplified by the palaces of Susa and Babylon. We know that Alexander lives for a long period in the Persian palaces during his campaigns. Therefore we can assume that during his conquest of the Eastern world Alexander the Great might have absorbed political and architectural models which are later on progressively incorporated in the new Hellenistic Kingdoms. Inge Nielsen has dedicated the book "*Hellenistic palaces : Tradition and renewal*" to the development of the palace typology during the Hellenistic period, claiming that the Persian influence has been underestimated on the account of a "PanHellenic" attitude and of a "bad reputation" of Persian culture.⁸⁵ The proof of an eastern influence would validate Droysen's interpretation of the Hellenistic period as the result of a Graeco-Oriental artistic and cultural fusion or "*Verschmelzung*". To have a glimpse of the influence of Persian typologies on Hellenistic architecture we can consider an example of a courtyard palace which is historically and

⁸⁴ See: Winter, Frederick E. 2006. Studies in hellenistic architecture. Phoenix. supplementary volume ; 42. Toronto: University of Toronto Press

⁸⁵ Nielsen, Inge. 1999. Hellenistic palaces : Tradition and renewal. Studies in hellenistic civilization ; 5. 2nd ed. Aarhus, DK ; Oakville, Conn.: Aarhus University Press: p. 36.

geographically closer to Greece. The Place of Vouni in Cyprus is built during the Persian occupation around 500 B.C. and is later on burnt down by a fire during 330 B.C. Its most innovative aspect is the central courtyard, which can be considered one of the first peristyle court in the eastern Mediterranean. This typology is further developed by the Macedonian kings. At the beginning of the Hellenistic period a Macedonian royal palace is built in Aigai, a small town in the northern part of Greece known today as Vergina. Even in this case the rooms of the royal apartment are disposed, to serve as dining rooms or androns, around a central courtyard which has now greater dimensions. The circular or "Tholos room" is probably the throne room of the palatial complex or the court of judgment. Close to the palace there is the theater where Philip II is assassinated in 336 BC and Alexander the Great is proclaimed king.

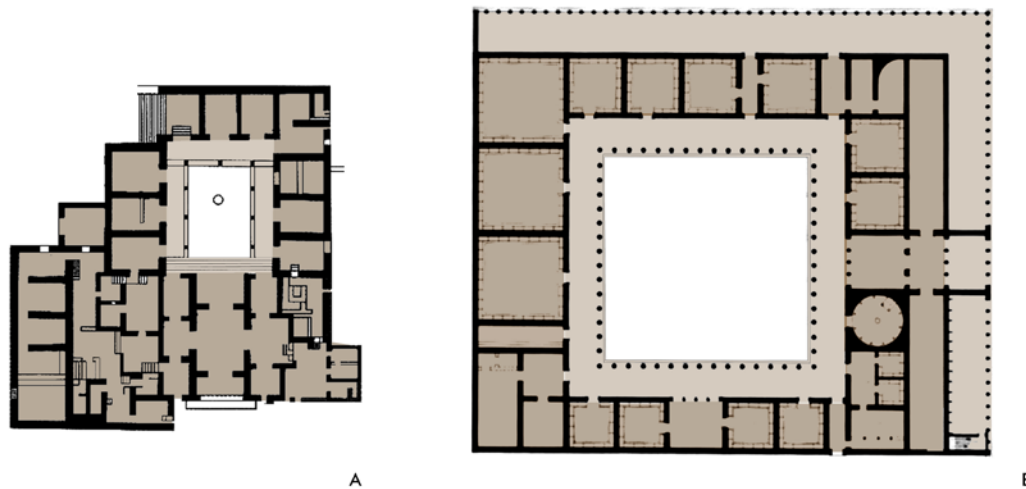


FIG. 73 The evolution of the peristyle court in the palace typology: A) Vouni Palace, North Cyprus (ca. 500 B.C.), B) Aigai Palace, Vergina, Greece, Hellenistic period

A similar typology, developed around a colonnaded court, is the Hellenistic *Gymnasion*. Its name means "gymnastic school" even if it's not meant to be a training space for competitive sport: it's more correct to consider the *Gymnasion* a place for the education of young citizens and in a later period also for scholarly and philosophical pursuits. The Greek educational model is based on the principle of *kalokagathia*, which is based on the combination between the "beautiful" (καλός), related to the body, with the "good" or "virtuous" (ἀγαθός), related to mind or spirit, and is applied for the first time in the gymnastic training for the young hoplites soldiers of the Greek poleis. Therefore, at least initially, physical and mental trainings are seen as inseparable aspects of the education. However, if the first *gymnasia* are open spaces enclosed by walls and primarily related to physical training, progressively the academic education becomes more important. This

change is architecturally manifested by the increasing need of covered interior spaces. The education becomes more sophisticated and later on the *Gymnasyon* is used by philosophers and sophists as gathering space for talks and lectures. The *peristyle* typology perfectly suits the needs for a large open space, dedicated to physical training, combined with covered rooms for lectures and pedagogy. Plato's *academy* in Athens is probably the most famous school or *Gymnasyon* in Athens, together with the *Lykeion* and the *Cynosarges*, from which the name Cynic derives. All these schools are not yet based on the courtyard peristyle typology since in the in the description of the *Lykeion* that we can read in the platonic dialogues there is no reference to the colonnades. The *peristyle Gymnasyon* typology can be dated from the begging of the Hellenistic period and one of the earliest example is the *Gymnasyon* built in Delphi around 330 B.C.

It is important to note that in all these cases, whether it is a small house, a Hellenistic *palace* or a *Gymnasyon*, the peristyle courtyard represents only an open space within a single building. However during the transition from the Hellenistic to the Roman period, we can almost recognize a point in which the architectural typology of the *Peristyle* court, which incrementally becomes larger and more public, and the urban typology of the agora, which progressively becomes more enclosed and more dense, finally almost merge together, generating the typology of the completely enclosed urban space exemplified by the Roman *forum*.

In the extraordinary case of the *Asklepieion* in **Messene** we can recognize both the two tendencies previously described: the transformation of the stoa in a unifying portico connecting different functions and the tendency towards a complete enclosure of space. Pausanias describes this sanctuary as a sort of museum for the numerous statues disposed around the portico (Description of Greece 4. 31. 10) : “ *The most numerous statues and the most worth seeing are to be found in the sanctuary of Asclepius. For besides statues of the god and his sons, and besides statues of Apollo, the Muses and Heracles, the city of Thebes is represented and Epaminondas the son of Cleommis, Fortune, and Artemis Bringer of Light.*” This sanctuary dedicated to healing god Asklepios, and therefore visited by sick people, is based on a square courtyard built around a Doric temple. Therefore, like in the similar case of Kos, we can suppose that the unusual enclosure of the space is related to the intention to define a protected and intimate space dedicated to sick persons, possibly isolating the sanctuary from the outside. In this case is not possible to use the terms *stoa*, because the colonnade is a sort of independent unifying element which connects different buildings and functions. If on one hand, for its scale, it's more closed to the *Peristyle palace* or the *Gymnasyon* than to a sanctuary formed by temples and stoas; on the other hand it's not a single building with a courtyard because it's formed by the aggregation of different buildings with different functions. One of the most interesting of these buildings is the *ekklesiasterion*, a small theatre-like construction enclosed within a rectangular structure and with a semicircular orchestra. The other big hall placed on the eastern part, close to the monumental entrance, is a *Bouleuterion*, the assembly room of the city of Messene. Its four internal columns support a hipped roof and along the three closed sides there is a continuous stone bench for the meetings.

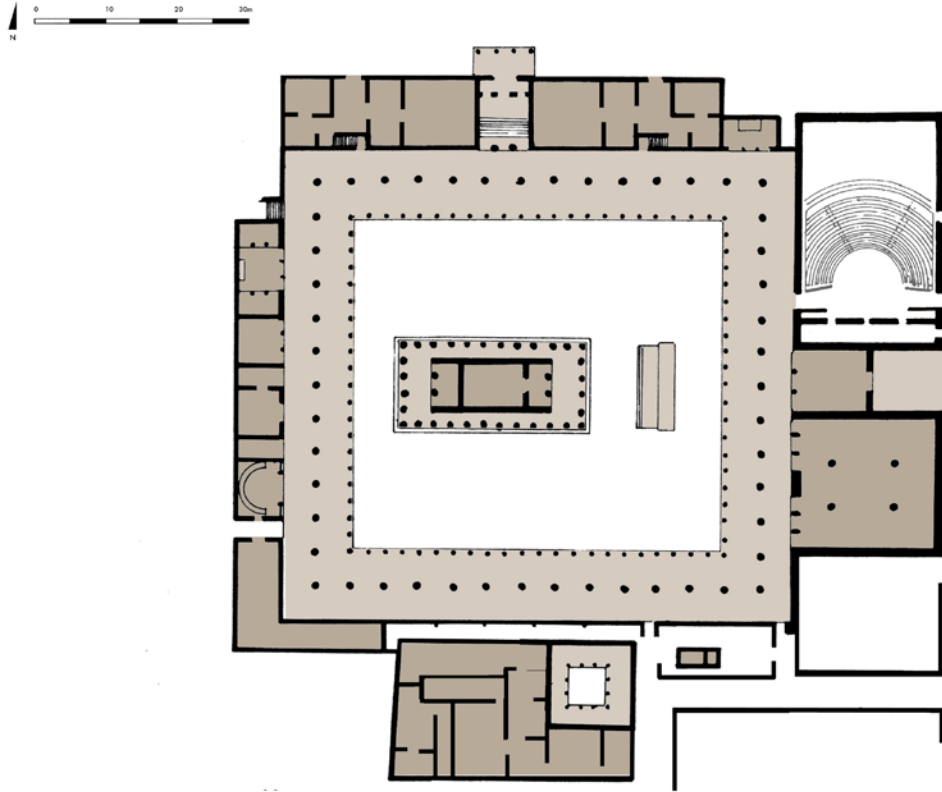


FIG. 74 Plan of the Asklepieion in Messene (second century B.C. or later)

The presence of the theater and the city assembly hall demonstrate that this sanctuary is partially conceived as sanctuary and partially as small enclosed agora composed by civic buildings. Therefore we could define the *Asklepieion* in Messene as a hybrid between civic and religious functions and as a transitional typology between the small scale architectural enclosure of *Gymnasia* or *palaces* and the larger urban enclosure of the Roman *forum*. According to Coulton *"The date of this complex is not firmly established, but the use of reeding in the lower flutes suggests a date not earlier than the second century B.C. At about this time the idea of porticoes as a unifying device in the city centre becomes apparent in Italy too; porticos serving this purpose were added to the forum at Pompeii in the second century B.C. The gradual extension of this device leads to fully enclosed agoras and under the Roman Empire this seems to have been considered by many the ideal form, in contrast to the more open arrangement which was usual in the Hellenistic period."*⁸⁶ To have a glimpse of the transition from the Hellenistic to the Roman period we can consider the case of Delos.

⁸⁶ Coulton, J. J. 1976. The architectural development of the greek stoa. Oxford monographs on classical archaeology. Oxford Eng.: Clarendon Press: p.173.



FIG. 75 Plan of Delos, Hellenistic period: A) L Shaped stoa (187-173 B.C.) B) Agora of the Italians (110-88 B.C.), C) Stoa of Antigonos (246-239 B.C.), D) Artemision, L shaped stoa (110 B.C.), E) Stoa of the Naxians (ca. 550 B.C.), F) Stoa of Philip (216-200 B.C.), G) South stoa (270-230 B.C.)

This site, a major trading center considered to be the sacred birthplace of Apollo, is furthermore interesting because it represents, during the Hellenistic period, an exemplary case of cultural and ethnic melting pot and a syncretic mixture of different cults: from the Greek Dionysos, Hermes, Pan and Asclepios to the Egyptian Sarapis and Isis or the Syrian Atargatis and Hadad. According to Mikalson *"By 100 there were additional cults of the Assyrian Ba'al of Babylon and of Astarte of Ascalon in Palestine. On Delos at this time, there was also a Jewish synagogue. Romans, too, were now living and trading on Delos and practiced their own traditional cults. This was truly an international community, and, unlike anything we find in the Classical period, Greeks of different cities, Egyptians, Palestinians, Romans, peoples of several other nationalities, and even freedmen and slaves worshiped, sometimes together, in a wide range of Greek and non-Greek cults."*⁸⁷

This site is furthermore interesting because we find here three evident space conceptions which correspond with the archaic and classical Greek disposition of isolated volumes, the Hellenistic partial enclosure formed by "L" stoas, and an anticipation of the complete enclosure of the Roman *forum* represented by the Agora of the Italians.

⁸⁷ See the essay "Continuity and Change in the Hellenistic period" by Jon D. Mikalson. Bugh, Glenn Richard, ed. 2006. *The cambridge companion to the hellenistic world*. Cambridge ; New York: Cambridge University Press: p. 209.

In the central area, dedicated to the Sanctuary of Apollo, we can recognize many classical temples disposed with different orientations. The oldest is the *Great Temple of Apollo*, built around 477 BC. During the Hellenistic period there is a clear attempt to delimitate this space with the long *Stoa of Antigonos* built between 246 and 239 B.C and other smaller "L" shaped stoas, like the one disposed around the *Temple of Artemis* in the *Artemision*. In the southern part of the Sanctuary we can recognize a more typical Hellenistic spatial disposition formed by the *South stoa*, the *Stoa of Philip*, and the "L" Shaped stoa: all built between the third and the second century. In the northern part, between the sanctuary and the sacred lake in which Leto is believed to have given birth to Apollo, there is a completely enclosed agora, called *Agora of the Italians*.

Wycherly has connected the emergence of the complete enclosure of an urban space to an Italic or Roman influence, which is exemplified by the "Agora of the Italians" at Delos. In the essay "The ionian agora" he writes: "Some of the more prominent foreign communities erected establishments of their own; the Italians' "agora," built towards the end of the second century, was a quadrilateral court completely enclosed by colonnades with rooms and exedrae behind, and was the largest building in Delos. It was not a public market, but a private meeting-place for the Italian colony's general uses. The central area of Delos was not a normal agora, but a cosmopolitan Hellenistic trading centre, irregularly built and hemming in the ancient shrine of Apollo. The form of the Italian building raises again the question of the part played by the fully enclosed peristyle court in agora planning. The idea that the peristyle was the ideal form of the agora, the culmination of a process in which the Priene type, not fully enclosed, was an intermediate stage, still seems plausible and attractive."⁸⁸ However Wycherly considers in a negative way the Roman tendency to plan the forum as a complete enclosure, in which the urban space is turned outside-in, because with the enclosed space "city life had lost something of its true quality, and the agora had a less vital part to play, a less intimate relation with all the varied activities of the community."⁸⁹ I will consider the effects of the complete enclosure of the urban public space of the Roman forum in the next chapter, however to properly analyze these spatial and functional effects it is important to understand the motivation behind this architectural tendency. According to Coulton "In the case of the of the agora, the adoption of an enclosed peristylar form is also the result of a changed concept of its purpose; it was felt that the agora should be a place set apart for developing civic virtues, untainted by commerce, so that all but the most respectable business was removed elsewhere. There was in fact quite a far-reaching reorganization of forms and functions in civic building during the late Hellenistic and early Imperial periods."⁹⁰ The roman forum typology marks the culmination of the process of differentiations of the functions of the agora which is evident during the Hellenistic period: the market is completely moved to a separate building, usually a small peristyle court surrounded by shops, and all the

⁸⁸ Wycherley, R. E. 1942. The ionian agora. The Journal of Hellenic Studies 62 : pp. 29.

⁸⁹ Ibid., p. 170.

⁹⁰ Coulton, J. J. 1976. The architectural development of the greek stoa. Oxford monographs on classical archaeology. Oxford Eng.: Clarendon Press: p. 168.

activities previously held in the agora and the stoas are placed during the Roman period in specific buildings placed around the forum. The Roman basilica, built around the forum space, progressively replaces the role of the stoas generating an interior space which is used for most of the functions that were previously held in the open air agora. However this doesn't mean that the Forum space is not alive and animated. Compared to a traditional agora it is certainly less open and more quiet because the market activity and the "vehicular" traffic are left outside. We should keep in mind that the confusion and the noisy activities of the traditional agora are criticized by Greek philosophers and writers. The idea that commerce is a demoralizing activity can be traced back to Hesiod or Plato, who forbids the citizen of the "ideal city" to practice trade. We have already seen Aristotle's suggestion to create an agora dedicated to the commercial activity, and one dedicated to the freemen. Furthermore in the comedies of Aristophanes people frequenting the agora are described as having a bad reputation. In *"the knights"* Demosthenes ironically tells one of the sellers: *"You are a cheeky rascal without shame, no better than a common Agora rogue!"*. Furthermore in *"the Clouds"* the shiny space of the *Gymnasion* is compared to the confusion generated by the chattering of the agora. It's noteworthy that during the Hellenistic period the enclosure of the *Gymnasion* and *Academy* typologies are generated by the need for a more intimate and protected space, a kind of space which cannot be achieved in the traditional open agora. If the philosophical discourses of Socrates are held in the classical agora of Athens, progressively the academic activity moves to specific buildings such as the enclosed space of the *Academy*.

To properly understand all these transformations we should consider the jump in scale from the classical Athens, which has around 100,000 inhabitants, to the Hellenistic Alexandria with over 1,000,000 residents. Therefore the differentiation of the activities of the agora is evidently the result of a more complex administrative system and similarly the need for more intimate public spaces can almost be considered a natural reaction to an increasingly stimulating, and sometimes disturbing, metropolitan life. The traditional Greek model of a unique and central public space, exemplified by the fifth century Athenian agora, cannot be practically applied to a large and multicultural metropolis and, in the same way, the ideal model of direct democracy, which works in the case of the 40,000 male citizens of an autonomous city like Athens, becomes unrealizable in such vast territories as the Hellenistic and the Roman empires. If on one hand the Hellenistic Agora and the *Forum* are progressively transformed into a monumental space, which is inevitably the expression of the new powerful system which is ruling the city, on the other hand public space, and in a parallel way also public life, is progressively distributed along the entire city. Streets become for the first time public spaces and are activated by shops and other commercial functions, progressively placed behind continuous street porticos. Additionally new buildings are constructed for public facilities and new institutions. Public space becomes therefore more continuous and more distributed throughout the city, and public life is redirected towards smaller communities, clubs and associations based on personal interests. If direct democracy is inevitably lost, public life becomes more disseminated and institutionalized, whereas citizenship becomes essentially less political and more civically driven.

5

ROMAN ARCHITECTURE

Towards an interior public space

The progressive process of enclosure of space, characteristic of the Hellenistic period, is continued and completed during the *Roman Republic*, which historically overlaps the Hellenistic period and officially ends in 27 B.C. when Octavian is named "Augustus" and becomes the first Roman Emperor. The complete enclosure typical of the Roman *forum* is the most evident manifestation of the fulfillment of this process.

The historical distinction between the *republican* and the *imperial* periods is relevant also in terms of architecture, because it marks the beginning of a completely new phase. We can identify this new phase in the transition from the complete *urban enclosure*, characteristic of late Hellenistic and Republican architecture, to the *internal space* of the vast Imperial public buildings. The misleading interpretation that Roman architecture is a deterioration of Greek architecture is generated by the lack of attention that characterizes Roman architecture and urban design at least until the most recent studies. Furthermore this canonical interpretation is usually extrapolated from the only ancient architecture treatise that we have, the "*De architectura*" by Vitruvius, which is published in 15 B.C. and it's therefore only representative of the Hellenistic-Republican approach, whereas sometimes it is erroneously considered as a complete theorization of Roman architecture. During the imperial period the Greek classical orders are progressively transformed into a decorative system: a pure representation very often reduced to a thin marble non-structural surface. But this thin surface usually covers a completely new structural system based on the combination of massive concrete walls and vaults. According to William MacDonald: "*Researchers must discard misleading assumptions such as the belief that all Roman design is based on Greek precedent, or that Vitruvius helps us to understand fully characterized Roman architecture. Roman architects and planners created the first coherent western urban system; in doing so, they formulated certain basic truths of architecture.*"⁹¹ This urban system together with the development of interior space, are innovative aspects which will have durable and relevant repercussions during the entire middle age until the end of the Renaissance period.

⁹¹ MacDonald, William L. 1988. Roman urbanism. *Journal of Architectural Education* (1984-) 41 (3, Urban History in the 1980s) (Spring): pp. 29.

5.1 The complete enclosure of space

The end of the Hellenistic period is marked by the incremental Roman conquest of the Hellenistic kingdoms. The canonical end-date is usually controversial and alternately identified in 146 B.C., which corresponds to the date of the complete control of the Romans over the Greek area and Asia Minor, or 31 B.C. with the Battle of Actium and the conquest of the last Hellenistic kingdom, the Ptolemaic in Egypt. In any case the most important aspect for this analysis is that we can identify a strong cultural and artistic continuity between the late Hellenistic period and the early *Roman Empire*, whereas cultural and political differences are more evident before the Battle of Actium and especially during the archaic period and the early Roman Republic. With the conquest of the Hellenistic kingdom the Roman political system substantially changes, embracing the imperial system originated by Alexander the Great and derived from the earlier Persian and Egyptian rulers. When Augustus defeats Marc Anthony and Cleopatra at Actium and subsequently conquers Alexandria in 30 B.C., he only visits a few places of the Ptolemaic capital and one of these is the tomb of Alexander the Great.⁹² This monument is described by the geographer Strabo in this way (17, 1, 8): “Also part of the royal palaces is the so-called “Soma” (body), which was an enclosure containing the tombs of the kings and that of Alexander.” Here, according to Dio Cassius, Augustus even dares to touch the embalmed body of the Macedonian emperor. This act is symptomatic of a period, at the end of the Hellenistic period, in which the idea of the soul deviates from the classical Greek conception of a rational and abstract entity, becoming more close to the Stoic consideration of the soul as a corporeal entity diffused throughout the body. Furthermore during the Hellenistic period there is a common belief that the *tyche* or fortune is strictly individual and related to the personal *daimon* or spirit. Therefore the act of touching the body of Alexander is, in Augustus’ intention, a way of marking a sort of political but also “spiritual” continuity between the two emperors and probably even an attempt to absorb or to be influenced by his *tyche*. As a matter of fact, once Augustus becomes the first Roman emperor he goes back to Rome where he starts a large program of urban transformation.⁹³ According to Suetonius “he found Rome a city of brick, and left it a city of marble.” It’s definitely in art and architecture that we can recognize the most evident and material continuity between the Hellenistic and the early Imperial period, a continuity that, under Augustus, is fully materialized in the monumental projects for Rome. Vitruvius’s “*De architectura*”, the architecture treatise dedicated to Augustus, is a written theorization but also a documentation of this specific period.

The Greek influence on Rome should be considered within the larger context of the political and cultural strategy of the Roman Empire, which is based on the acceptance of local

⁹² Erskine, Andrew. 2002. Life after death: Alexandria and the body of alexander. *Greece & Rome* 49 (2) (Oct.): pp. 163-179

⁹³ For the Augustan transformation see: Reggiani, Anna Maria, Filippo Coarelli, and Italy. Soprintendenza archeologica di Roma. 1987. Roma repubblicana dal 270 A.C. all'età augustea. Archeologia e storia a roma. Roma: Quasar

languages, rituals and cultures. However in the case of Greece this acceptance progressively fosters, becoming a deep and profound admiration. The widespread adoption of Greek philosophy, literature and theater is widely documented. During the Hellenistic period the well-educated children usually learn the Greek language and Greek literature, and the tradition of spending one year to study in Athens becomes progressively more common. A school of Greek declamation is open in Rome in 161 B.C. and the arrival of three Hellenistic Philosophers Carneades, Critolaus and Diogenes certainly testifies to the growing interest for Hellenistic rhetoric and philosophy.⁹⁴ In terms of artistic practice the Hellenic influence is the result of a systematic process of importation, imitation and adaptation of a great number of Greek Statues. In the work of the Roman artists it's possible to identify a clear continuity with the Hellenistic tendency towards realism and portraiture, both in painting and sculpture, reaching during the Roman empire the most realistic results. Even in the case of Roman art we can interpret the diffusion of portraits as a manifestation of the shift from the classic "objective" idealism to a diffuse "subjective" realism that emphasizes individual personal qualities. Furthermore, Roman portraiture is additionally influenced by Etruscan art in which the ability to represent a realistic facial expression is the result of the cult of the dead, a seminal and constitutive aspect of Etruscan society.



FIG. 76 Realism in Roman portraits (from left to right): 1) Head of a Roman, (80 BC.), 2) Portrait head a man, julio-claudian period (ca. 50 B.C.), 3) Portrait of a man (2nd century A.D.), 4) Portrait head of the Emperor Marcus Aurelius Antoninus (217 A.D.)

Furthermore, stoicism becomes the most important philosophy even in Rome and the introspective writing activity of Seneca and Marcus Aurelius testifies to the increasing importance of the Stoic practices of the disclosure of one's subjective conscience. The multicultural and cosmopolitan character of the Hellenistic empire is probably even more evident during the Roman period, and this might have influenced the understanding of individual differences and the emergence of subjective qualities. If the Greek citizenship of the *polites* is based on the *genos* and is rooted in a common ethnic origin, the roman *civitas* is a conceived as a social body of citizens, called *cives*, who have different origins and are unified by a common law. According to the historian Livius the first temple of Rome built by its founder Romulus is the *asylum*, the temple of the god Asylaeus on the Capitoline hill, which is conceived as a place of refuge for the inhabitants of other states.

⁹⁴ See "Hellenistic Influence on the Roman World" by Keith Branigan in : J. S., ed. 1987. The roman world. London ; Boston: Routledge & K. Paul

In terms of Architecture it's possible to argue that the changes in the architectural practice which are recognizable in the Hellenistic period are still evident, and probably in even more systematic way, in Roman architecture. If during the Hellenistic period, geometry becomes increasingly more important than arithmetic and drawing techniques are used by architects to design buildings that are progressively becoming more complex, from Vitruvius' treatise we have a written documentation of both the geometrical understanding of the incommensurable numbers and the use of drawings in architecture at the beginning of the Roman empire. Euclidian geometry seems to have a direct application in Roman architecture: Vitruvius is definitely aware of the incommensurability of the *square root of two* and he also knows that this magnitude couldn't be expressed arithmetically, but only geometrically. In his "De Architectura" he illustrates the problem of doubling the area of a square, which can be done only by drawing another square whose side is based on the diagonal of the smaller square, and it's therefore the square root of two of that side. According to Vitruvius (IX, Pref, 4-5). "A square plot of ground ten feet long by ten feet wide, contains an hundred feet; if we have to double this area, that is, to set out a plot also square, which shall contain two hundred feet, we must find the length of a side of this square, so that its area may be double, that is two hundred feet. Nobody can find this by means of arithmetic; for if the sides are made fourteen feet, these multiplied into each other give one hundred and ninety-six feet; if fifteen feet, they give a product of two hundred and twenty-five. Since, therefore, we cannot find them by the aid of numbers, in the square of ten feet a diagonal is to be drawn from angle to angle, so that the square may thereby be divided into two equal triangles of fifty feet area each. On this diagonal another square being described, it will be found, that whereas in the first square there were two triangles, each containing fifty feet, so in the larger square formed on the diagonal there will be four triangles of equal size and number of feet to those in the larger square." This "ad quadratum" progression, a design principle which will be widely used also in medieval architecture, can be found in many Roman plans, in floor texture patterns and in the canonical base of a Corinthian column.

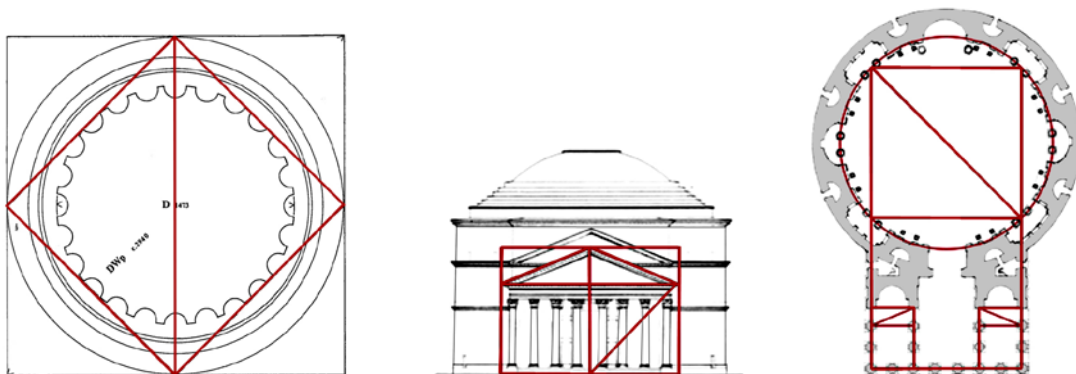


FIG. 77 Square root of two proportions in Roman architecture. On the left side: the side of base of the Corinthian column according to Vitruvius is equal to the diagonal of the square whose side is the diameter of the column. In the middle and on the right side: The pediment of the pantheon and the internal rotunda are base on a $\sqrt{2}$ proportion.

Therefore the “square root of two” proportion is widely used in Roman architecture: as an example, the principal rooms in the Baths of Caracalla are based on this proportion and the Portico of the Pantheon can be inscribed in a square, whose diagonal, replicated in an identical square inscribed in the rotunda, is equal to the diameter of the circle of the dome: thus the sphere that is contained under the huge concrete dome, is related proportionally to the width of the external Portico by $\sqrt{2}$. The second written documentation that can be found in the “De Architectura” is about the architectural drawing techniques, which are defined in terms of plans or “orthographia”, elevations or “ichnographia” and perspective or “scaenographia”. According to Vitruvius (I, 2, 2): *“Arrangement is the disposition in their just and proper places of all the parts of the building, and the pleasing effect of the same; keeping in view its appropriate character. It is divisible into three heads, which, considered together, constitute design: these, by the Greeks, are named ἰδέαι: they are called ichnography, orthography, and scenography. The first is the representation on a plane of the ground-plan of the work, drawn by rule and compasses. The second is the elevation of the front, slightly shadowed, and shewing the forms of the intended building. The last exhibits the front and a receding side properly shadowed, the lines being drawn to their proper vanishing points.”* The use of perspective, and therefore the ability to represent depth, is probably originated by the attempt to recreate a realistic stage scenography. According to Jesper Christensen, who analyses the first trace of perspective in some Vases painted in Apulia at the beginning of the Hellenistic period, *“Stage-painting and perspectival drawing were both designated by the term scenography (skeno-graphia, scaenographia) and this convention certainly acknowledged the priority of the stage in the invention of centralized perspective, but it probably also recognized the role of the theatre in the ensuing development of the technique. The importance of theatrical themes in many murals at Campanian/Roman sites is too well known to need elaboration here, though it bears repeating that bold and effective use of perspective-drastically plunging and zooming orthogonals-characterizes the most impressive 'theatrical' murals in the villas at Pompeii.”*⁹⁵ The same connection between architectural perspective and theater can be found, as Christensen notes, fifteen hundred years later during the Renaissance period. The correlation between the use of architectural drawings and the development of complex plans is even more evident in Roman architecture. According to Mark Wilson Jones *“in any event, by the late Hellenistic period scale drawings were used widely, and on the back of this experience (and contact with Egypt?), Roman architects came to depend on scale drawings and models. Indeed it is hard to see how else architects could have described the plans of centralized buildings such as amphitheatres or sections through interlocking arches and vaults.”*⁹⁶ However before analyzing the end of the Hellenistic period and the issue of continuity in Roman architecture, it’s important to outline the possible earlier Roman influences.

⁹⁵ Christensen, Jesper. 1999. Vindicating vitruvius on the subject of perspective. The Journal of Hellenic Studies 119 : p. 165.

⁹⁶ Wilson Jones, Mark. 2000. *Principles of roman architecture*. New Haven, Conn.: Yale University Press: p. 50.

5.2 The origins of Roman architecture

The origin of the Roman civilization during the eight century B.C. is better understood if considered within its favorable position in a central region of the Italian peninsula placed between the *Magna Graecia* colonies in south of Italy and Sicily, which between the eight and the sixth century -in terms of urban planning and architecture - produce some of the most advanced outcomes of the Hellenic world, and the Etruscan civilization in the northern area of Italy which corresponds to modern Tuscany. The direct artistic and cultural influence of these two areas on the Romans is not only possible, but almost unavoidable. We have already analyzed some of the *Magna Graecia* urban achievements. In the case of the Etruscan civilization, whose origin is still disputed, we have archeological evidence of many *necropolises* and tombs but very few cities have been excavated. This is the result of the fact the cult of the dead plays a primary role in Etruscan society, and this aspect is manifested in the monumental long-lasting treatment of their “chthonic” tombs as opposed to the short-lasting materials of the cities.

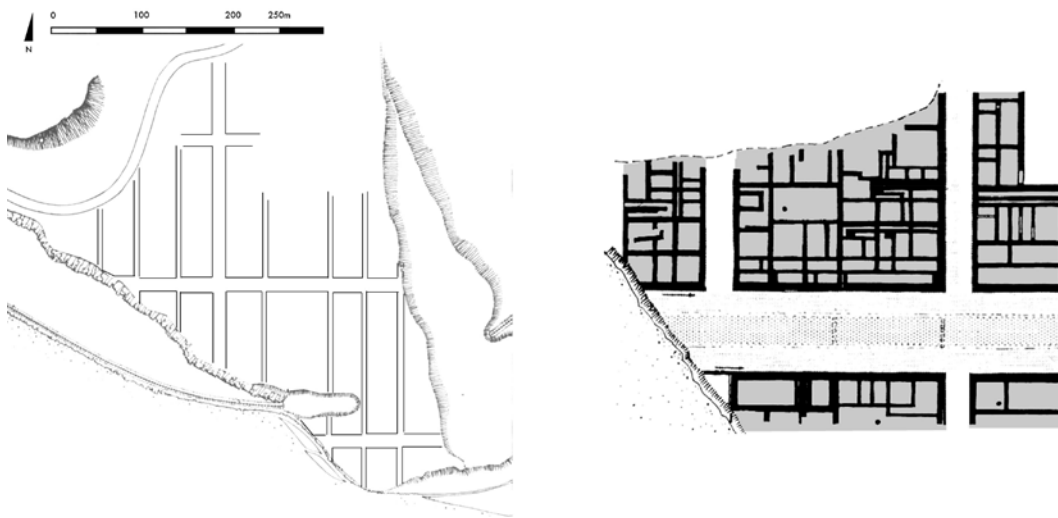


FIG. 78 The Etruscan city of Marzabotto, founded around 500 B.C. On the left side: general plan. On the right side detail of the broad streets with the paved sidewalks on both side.

However there is an exception, the city of **Marzabotto** founded around 500 B.C., in a moment in which the Etruscans intend to expand towards north, and destroyed almost a century later. Since it represents one of the few excavated cities, it's not possible to generalize and take it as a model of Etruscan urbanism. However from the archeological remains it's possible to outline, at least roughly, the Etruscan urban advancements of this period. The most evident aspect is the gridded plan. This solution is not used here for the first time since the first known application is in the Magna Graecia colonies more than one century earlier. However it's noteworthy that a similar outcome is the result of two

completely different societies: the Greek colonial city-states, which are essentially politically driven, and the Etruscan monarchic society, which is primarily religiously driven.⁹⁷ In any case the extraordinary aspects of Marzabotto can be grasped only by analyzing the archeological details of its plan. The streets are unusually broad (ca. 50 feet) with well-paved sidewalks on both sides, 15 feet wide, and with a well-planned drainage system. There is also a water supply system that distributes within the city the water that comes from a spring situated on the slope of the acropolis. Archeologists have found only the foundations of buildings below the floor level, but from these remains it's possible to recognize the topology of the houses, usually disposed around a paved courtyard with a well. Furthermore the small rooms positioned along the streets have been interpreted as shops, similarly to the Roman *taberna*. The paved large streets, the drainage system and the presence of street shops are all incredibly advanced elements for this period and furthermore an anticipation of typically Roman urban characteristic. According to Perkins, "*Even the most cautious observer cannot fail to be impressed by the evidence of systematic planning, coupled with a degree of civic organization in material matters (streets, cemeteries, water-supply, drainage) that is unsurpassed by anything that we know of from the contemporary Greek world.*"⁹⁸ A certainly innovative aspect is the hierarchy of the streets according to their importance, as well as the definition of a main north-south street (*cardo*) and main east-west street (*decumanus*).⁹⁹ This cross axial structure, later on applied also by the Romans, is related to the religious importance of the orientation of the city during the foundation ritual and to the subdivision of the city in four quadrants which supposedly reflect the division of the heaven. The Latin scholar Varro, during the first century B.C., explains that this Etruscan tradition is later on adopted by the Romans. According to Perkins "*In so far as the Roman tradition claims that certain ritual features, associated in historical times with the foundation of new towns, were derived from the Etruscans, there may be little reason to question its authority. Such features were the ploughing with oxen of the ' pomerium,' the city boundary, and (possibly) the formal quartering of the site of a new town, after the manner of the Roman augur, who divided a square plot of earth or sky into four quarters, in which to seek his signs.*"¹⁰⁰ The contacts between Romans and Etruscan are materially manifested by the foundation of **Cosa**, the first Latin colony in the Etruria, in 273 B.C. The name of Cosa, whose origin is probably Etruscan, appears in Virgil's Latin epic poem *Aeneid* (X. 168) and is defined by Pliny *Cosa Volcientium*, the colony or port of Vulci.

⁹⁷ For the dichotomy between Greek and Etruscan societies see: Mansuelli, Guido A. 1967. Problemi e prospettive di studio sull'urbanistica antica: La città etrusca. *Studi Storici* 8 (1) (Jan. - Mar.): pp. 5-36

⁹⁸ Perkins, J. B. Ward. 1955. Early roman towns in Italy. *The Town Planning Review* 26 (3) (Oct.): p. 136.

⁹⁹ See: Cavaglieri, Giorgio. 1949. Outline for a history of city planning. from prehistory to the fall of the Roman Empire: IV. Etruscan and Roman. *Journal of the Society of Architectural Historians* 8 (3/4) (Jul. - Dec.): pp. 27-42

¹⁰⁰ Perkins, J. B. Ward. 1955. Early roman towns in Italy. *The Town Planning Review* 26 (3) (Oct.): p. 143.

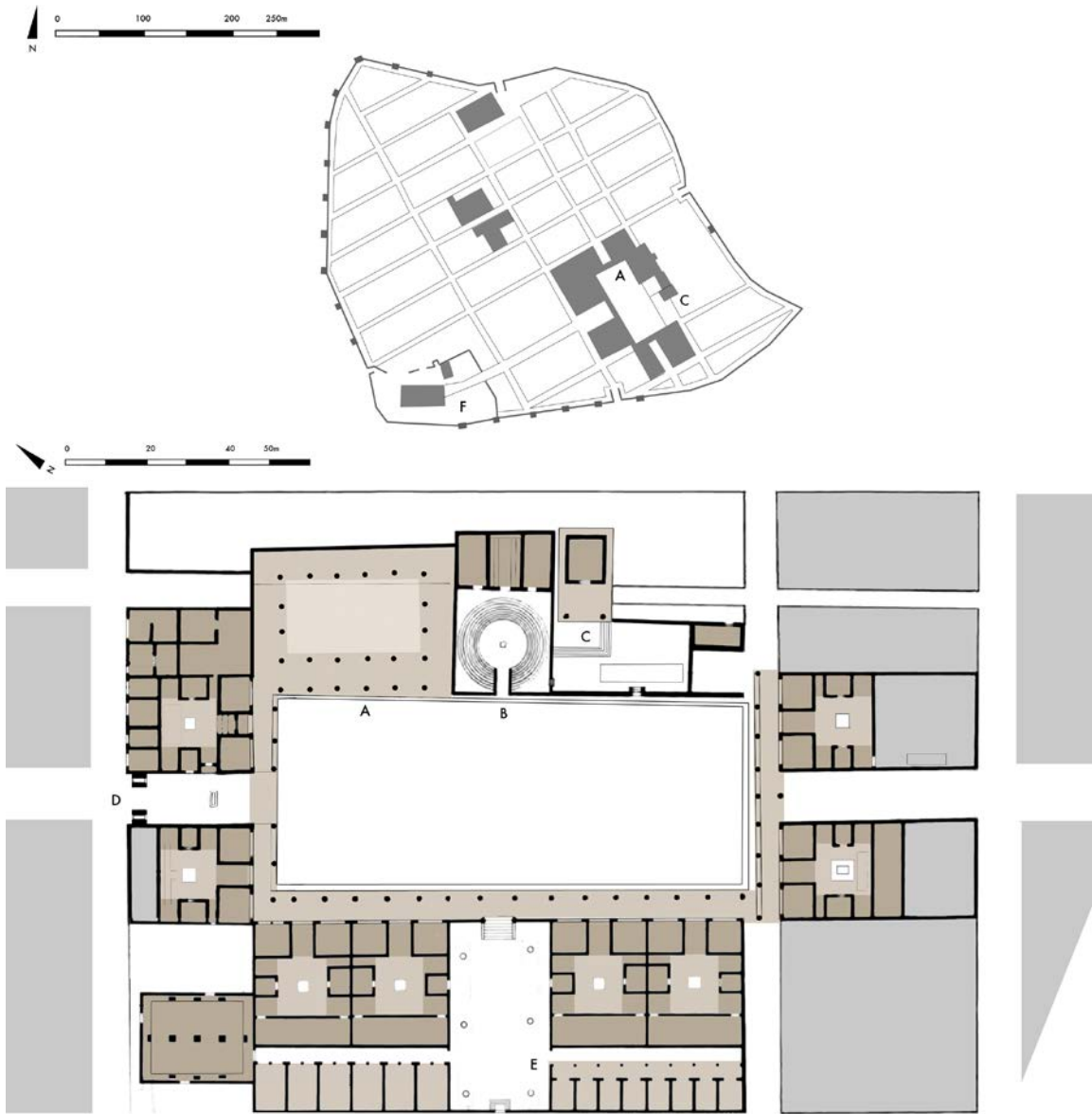


FIG. 79 On the top: Plan of Cosa, roman colony founded in Etruria in 273 B.C., Tuscany. On the bottom: Forum restored as 140 B.C. A) Basilica (150 B.C), B) Comitium and curia complex (ca. 270-240 B.C.), C) Temple B, (ca. 175-150), D) triple archway (ca. 175), E) Fish market, F) Capitolium (ca. 240 B.C.)

This new colony, for 7.500-10.000 settlers, is built in the proximity of a harbor which can serve as a naval base. The city plan, based on a grid system, represents one of the clearest examples of a Roman Republican city. Both in *Marzabotto* and *Cosa* we can recognize some typical Roman urban features. First of all the plan is dominated by cross-axial streets. More than a regular grid plan with homogenous blocks, which is typically Greek, the plan is formed by the intersection at right angle of primary and secondary streets, which usually form irregular blocks called *insulae*. Another characteristic is the so called “*pomerial street*” which circumscribes the inhabited area immediately inside the walls and is used to

assure rapid movement in a possibly crowded city. If the street network of the Hippiadamian cities such as *Miletos* or *Priene* emerges as the most functional way to guarantee accessibility to the homogenous residential blocks, in the case of the Etruscan *Marzabotto* and in the Republican *Cosa* the street space seems to have a more important urban role. The attention to the street is manifested not only by details like the paving and the sophisticated hydraulic systems, but also by the presence of multiple functions which activate its space, such as shops, *tabernae* and workshops. The typical cross-axial plan of roman cities, formed by the intersection of *cardo* and *decumanus*, is commonly considered as a civil use or a derivation of the layout of the military encampments or *castra*. As noted by Perkins it is truer the reverse¹⁰¹. An evidence of this is given by the fact that Polybius in his *Histories* describes the Roman military camp in terms of a city (VI, 41, 10): “So that, as everyone knows exactly in which street and in what part of the street his tent will be, since all invariably occupy the same place in the camp, the encamping somewhat resembles the return of an army to its native city.”

In *Cosa* an axial street directly connects the sacred area of the *Capitolium* with the civic space of the *forum*, paved with native stone, leading directly to the *comitium* and *curia* complex placed right in the middle of this rectangular area. This complex is the first monumental building which is constructed in the forum area. It is composed by the *comitium*, a circular theater-like assembly place enclosed by walls - whose function corresponds to the Greek *Bouleuterion* -, and the *curia*, a covered hall for the local senate, axially disposed at the end of the *comitium*. According to Frank E. Brown, who has started the excavation of *Cosa* with the American Academy in Rome, “the forum of *Cosa* is our purest example of a republican forum and shows clearly the sequence of planning and building, step by step, from the *comitium/curia* complex and reservoirs laid out and constructed at the time of the colony's foundation down to the conversion of its basilica into a festival hall in the time of Nero”¹⁰². A major transformation of the *forum* happens during the first quarter of the second century. A continuous portico is built around three sides of the forum area to enclose the space and to connect the offices and the shops disposed around the *forum*. All the buildings that surround the *forum* have the same typology: they have a tripartite front composed by a wide entrance, which leads to the interior *atrium*, flanked by two symmetric shops or *tabernae*. In this same period a monumental triple archway is built in the northwest entranceway. Vaulted constructions represent the most evident innovation, in terms of structure, of Roman architecture and the archway of *Cosa* is one of the earliest examples. Another transformation of this period is the enclosure of the rectangular space, placed along the same axis that connects the *curia* with the *Capitolium*, to serve as a fish market. In this way the commercial activity is moved away from the proper forum space.

¹⁰¹ Ibid., p. 146.

¹⁰² See: Brown, Frank Edward, Emeline Hill Richardson, and L. Richardson Jr. 1993. *Cosa III: The buildings of the forum: Colony, municipium, and village*. *Memoirs of the American Academy in Rome* 37 (, *Cosa III: The Buildings of the Forum: Colony, Municipium, and Village*).

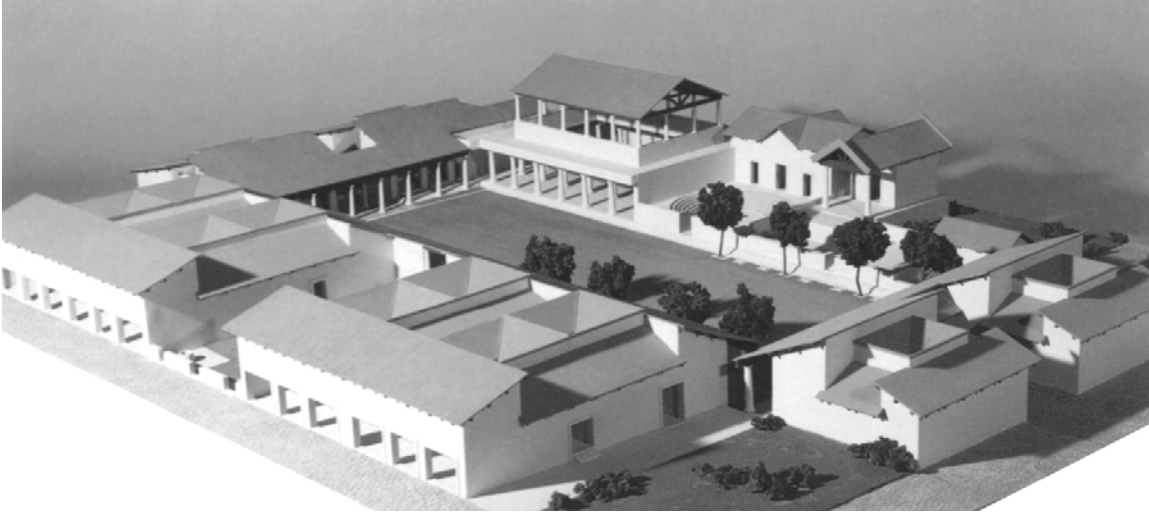


FIG. 80 Model of the forum of Cosa from the exhibition "La Romanizzazione dell'Etruria: Il Territorio di Vulci,"

The construction of the *basilica*, around 150 B.C., completes the enclosure of the forum space. This building is coeval with the first *basilicas* in Rome and it represents the first colonial or provincial *basilica* that we have found. Furthermore it corresponds, quite precisely, with the Vitruvian description of the *basilica* type. Vitruvius in the fifth book of "De Architectura" writes that (V, 1, 4): "the *basilica* should be situated adjoining the forum, on the warmest side, so that the merchants may assemble there in winter, without being inconvenienced by the cold. Its width must not be less than a third part, nor more than half its length, unless the nature of the site prevent it, and impose a different proportion; if, however, that be longer than necessary, a *chalcidicum* is placed at the extremity, as in the Julian *basilica* and the one at Aquileia." The *basilica* consists of a colonnaded hall, whose internal space is defined by an internal peristyle supporting a higher roof. An almost zenithal natural light illuminates this interior space through the windows of the *Clerestory* positioned over the internal peristyle. The *basilica* typology represents one of the most important innovations of Roman architecture and arguably the first type of completely public indoor-space. It is usually positioned alongside the *forum* space, and this aspect is incredibly relevant because it immediately suggests a direct transition, physical but also typological, from the complete enclosed public space of the forum to the interior space of the *basilica*.

In the case of *Cosa* this connection is even more evident because the *basilica* is conceived almost as a continuation and an expansion of the portico which surrounds the forum. It's important to note that the interior space of the Roman *basilica* typology is a functional evolution, or substitution, of the semi-open space of the Greek *stoa*. According to Coulton "while in the eastern Mediterranean the long portico continued to satisfy the need for non-specific public accommodation even in the Imperial period, in Rome and the Western Mediterranean the place of the *stoa* was in many respects taken by the civil *basilica*. For in the *basilica* magistrates could sit in judgment and the more refined forms of business could be

conducted. It offered greater protection from the elements and less annoyance from street vendors and casual crowds, whom it would attract less than a more open building like a stoa. These advantages were made possible by the clerestory lighting scheme which most civic basilicas had, together with improvements in roof constructions, so that the deeper, more secluded space of the basilica was neither too dark, nor encumbered by a forest of columns."¹⁰³ Vertical or zenithal lighting is another key feature of Roman architecture, a feature which is strictly connected to the increasing interest for interior space: we can find it the *atrium* of the domestic buildings, in the *Clerestory* of the basilicas and later on in the big high windows of the Baths or in the oculus of the *Pantheon*.

The role of the *basilica* is more evident if we place it at the end of the long process or transformation of public space which starts with the classical open agora: the public functions are progressively differentiated in separated buildings and space becomes incrementally more enclosed until it's finally incorporated within the interior space of the *basilica*. During this entire process the colonnade has a primary role. If in the archaic and classical isolated stoa the columns resolutely face the exterior space, during the Hellenistic period the portico of the stoa is articulated in more complex "L" and "U" shapes which partially enclose the space they are fronting. The complete enclosure is reached at the end of the Hellenistic period and during the Roman Republic, when the colonnades are disposed on the four sides of the forum, facing the urban enclosure. The *basilica* typology represents a further step, since it incorporates part of the public space of the forum within its interior space. The columns of the internal peristyle reproduce, in smaller scale, the urban enclosure of the forum, with the only difference that the central space is now roofed and vertically lighted from the *Clerestory*. The connection between the *basilica* type and the colonnaded *stoa* can be found even in the name. Even if the origin of the *basilica* is still uncertain, Coulton notes that the early *basilica* is sometimes called *stoa Basileike*, similarly to the Hellenistic royal stoas¹⁰⁴. The association with the *stoa* probably derives more from functional reason than from typological reasons, since the Hellenistic stoas are formally much different. However I think that the essential connection between the *stoa* and the *basilica*, besides the functional aspect, is deeply rooted in their basic unit: the colonnade. Etymologically the word *stoa* is related to the root *-sta* which is also present in the verb "to stand", in the idea of *statics*, and in *stylos*, the Greek word for column. The stoa is essentially a colonnade, a row of columns. In the *basilica* the columns are also a primary element, with the only difference that in this case they form an internal covered peristyle.

To conclude the analysis of Cosa, I think it's reasonable to say that it represents an extraordinary case for urban and architecture history. Its small dimensions and the fact that after the earthquake in 51 A.D. the city is almost abandoned, allow Cosa to be a clear and

¹⁰³ Coulton, J. J. 1976. *The architectural development of the greek stoa*. Oxford monographs on classical archaeology. Oxford Eng.: Clarendon Press, p. 180.

¹⁰⁴ For the use of the word Stoa and Basilica see: Downey, Glanville. 1937. The architectural significance of the use of the words stoa and basilike in classical literature. *American Journal of Archaeology* 41 (2) (Apr. - Jun.): pp. 194-211

unaltered example of an early roman city. Cosa represents for the Roman Republic what Priene is for Greek Hellenistic architecture. Furthermore these two cases are almost synchronic, since they are both primarily built between 300 and 150 B.C. From their direct confrontation it's easier to understand their chronological and dimensional similarities but also their apparent differences which are more a matter of details, even though absolutely meaningful details. The wide intercolumniation of the portico in the forum seems a direct application of the proportions of an Etruscan temple colonnade, and the temple B in the forum directly testifies this connection. This differentiation is expressed also by Vitruvius, and explained by the use of having gladiator games and spectacles (V, 1, 1-2): *"The Greeks make their forum square, with a spacious and double portico, ornamenting it with columns placed at narrow intervals, and stone or marble epistylia, and forming walks above on the timber framed work. In the cities of Italy, however, this practice is not followed, because the ancient custom prevails of exhibiting the shows of gladiators in the forum. Hence, for the convenience of the spectators, the intercolumniations must be wider; and the bankers' shops are situated in the surrounding porticos with apartments on the floors over them, which are constructed for the use of the parties, and as a depôt of the public revenue. The size of the forum is to be proportioned to the population of the place, so that it be not too small to contain the numbers it should hold, nor have the appearance of being too large, from a want of numbers to occupy it. The width is obtained by assigning to it two-thirds of its length, which gives it an oblong form, and makes it convenient for the purpose of the shows."*

In Cosa the typology of the buildings around the forum is also completely unusual for the Greek world, and this is even truer for the *basilica* type. From these details we can assume that Cosa is more the result of Etruscan influences than the replica of a Greek model. According to Perkins *"leaving on one side, however, these questions of the remoter sources of the tradition, and limiting ourselves to the question of the immediate influences that shaped Roman town planning during its early, formative stages, the balance (on the evidence at present available) would certainly seem to lie with Etruria."*¹⁰⁵ As a matter of fact Etruscan contacts and influences are predominant at least during the early stage of Roman urban planning and during the foundation of the earlier colonies between the fifth and fourth century B.C. However the year of the foundation of Cosa, 273 B.C., marks also the beginning of a more direct Greek influence, since in this same year the Roman city Paestum is founded as a continuation of the Greek *Poseidonia*. It's undisputable that from this moment the Greek Hellenistic world, even though initially limited to the Magna Graecia area, will progressively become the primary source of influence for Roman art and culture.

¹⁰⁵ Perkins, J. B. Ward. 1955. Early roman towns in Italy. *The Town Planning Review* 26 (3) (Oct.): p. 144-145.

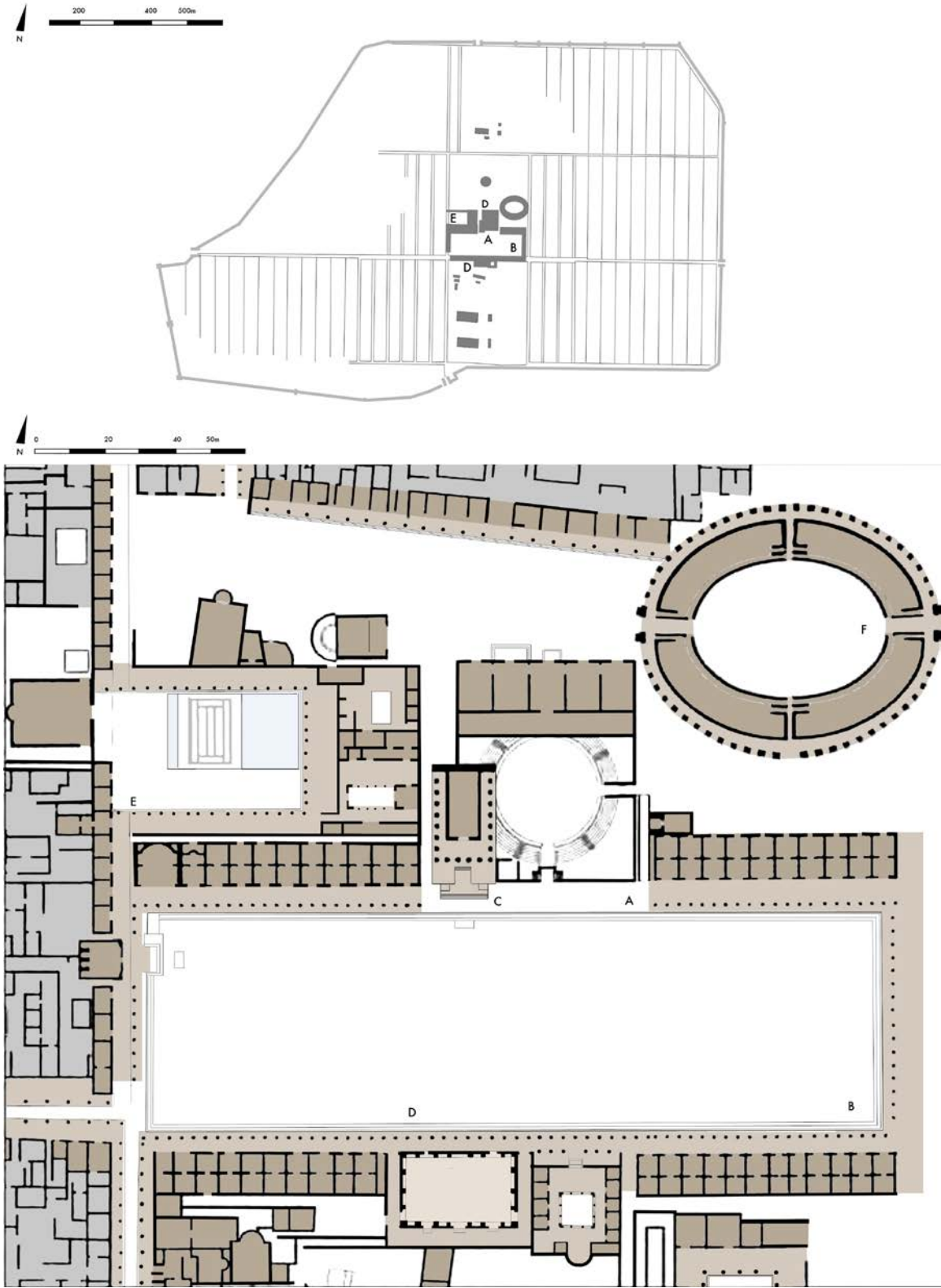


FIG. 81 Plan of the Forum of Paestum in the roman period. A) Comitium (ca. 250 B.C.), B) forum (ca. 250 B.C), C) Temple of Peace (second century B.C.)

The city of **Paestum** is referenced in Virgil's famous sentence "*Biferique rosaria Paesti*", for being the place of the roses that bloom twice a season. The Roman phase of Paestum follows an intermediate period, during the fourth century, in which the city is controlled by the local Lucanians and named Paiston. After becoming a Latin colony and being allied with Rome Paestum obtains a privileged status within the Roman system: it's the only colony, together with Cosa, which is allowed to issue coins. According to Richard E. Mitchell "*Moreover, Latin status carried with it the privilege of inter marriage and of doing business with Romans, and it was possible for Latins to immigrate to Rome and take up Roman citizenship or, when they were just visiting the city, to vote in the Roman assemblies. It also appears that local magistrates, like those at Paestum, were entitled to Roman citizenship by virtue of their local position. The aforementioned rights and privileges meant that Latin colonies like Paestum were the "real instrument in the Romanization of Italy."*¹⁰⁶

During the republican period a large construction program transforms the old Greek colony into a Roman city. The most relevant urban innovation is represented by the construction of an elongated forum, probably around 250 B.C., in the vast area of the older agora placed between the south and the north sanctuaries. The complete enclosure of the forum is formed by a surrounding portico, which is constructed with reused Doric columns during the following century. The forum is connected in the western part with the smaller enclosure of the *gymnasium* that surrounds a swimming pool with a central stepped platform used by the supporters during swimming matches. The continuous colonnade of the forum creates a unifying façade that connects different civic buildings, shops and *tabernae* and incorporates the second century Temple of Peace. In the central area of the forum there is a semicircular stepped *Comitium* with the *Curia*, a complex built after the foundation and very similar to the one in Cosa. The presence of these two buildings is relevant because it's typical of all Latin colonies and it explains their important role in the Republic and the relevance of local civic institutions. All these colonial institutions are based on an earlier model that can be found in Rome.

The first archaic *curia-comitium* complex is built in the Roman forum around 580 B.C. by Tullius Hostilius, the third king of Rome, and is composed by a rectangular *comitium* connected to a building called *Curia Hostilia*, the house of the senate. The *comitium* is originally conceived as a *templum*. This term, even though literarily means temple, can be very misleading because its original meaning in Latin is "sacred enclosure" and it's not referred to the building which in Latin is called *aedes* or *aedicula* in the case of a small shrine. Even Vitruvius uses the word *templum* in terms of a sacred enclosed area and in this sense the concept of *templum* is closer, probably even etymologically, to the Greek *temenos* which is the sacred precinct that surrounds the temple and the altar. Both these words derive from the root *-tem*, a linguistic unit expressing the act of dividing and separating which is the first necessary act to define an enclosure. More practically the Latin *templum* derives from the Etruscan ritual of orientation and subdivision in four quadrants that

¹⁰⁶ Mitchell, Richard E. 1985. Paestum in a roman context. *Journal of Aesthetic Education* 19 (1, Special Issue: Paestum and Classical Culture: Past and Present) (Spring): p. 46.

precedes the foundation of a city. In general a *templum* is a piece of ground which is chosen, delineated and consecrated by official diviners, the *augurs*, as an appropriate location for drawing *auguries*, or *omens*, from the flight of birds. The term *contemplation*, composed by the words *com* and *templum*, originally means to mark out a space for observation, and is related to the ceremony of the *augurs*. Varro, in “*De lingua latina*” explains that there are three different kinds of *templum*: the *templum* marked in the sky, a delimited area of the sky where the flight of birds can be *con-templated*, the *templum* on earth, which is an enclosed sacred space used for divination, and thirdly the resemblance between the earth and the *templum* in the underground. The concept of the roman *templum* is relevant for our analysis because it’s strictly related to the Roman space sensibility and to the preference for enclosures and interiors. We can therefore argue that the enclosure of space, which is typical of Roman architecture, has a strong ritual and spiritual correlation.¹⁰⁷ It’s arguably relevant and symptomatic that if in Greek architecture the temple is conceived as a building in the landscape, as a house of a god, in the Roman period the *templum* represents a rectangular enclosure and therefore space is, even linguistically, more important than the architectural object. The Roman space enclosure is intrinsically related to the ritual of the *augurs* and consequently to the act of taking important decisions such as, for example, the foundation of a city or the position of a military camp. The Romans generally base every important political or military decision on the divination of the *augurs* based on the observation of the flight of birds over a *templum*. If we keep this in mind the correlation between the first *comitium* and the *templum* is more comprehensible. The archaic *comitium* in Rome is, in essence, an assembly place where decisions are taken, and it’s for this reason that it’s original structure is a *templum*, a rectangular enclosure. Between 300 B.C. and 250 B.C. the *Comitium* is completely restructured, and it’s transformed in circular stepped enclosure. It is noteworthy that this is the same period in which the similar circular *curia-comitium* complexes are built in proximity to the forums, in the colonies of Cosa, Paestum, Alba Fucens and Fregellae. This testifies the primary importance of these colonies, and we can furthermore assume that the model for the circular *comitium* is derived from the *ekklesiastéria* of Paestum.

According to Filippo Coarelli the typical enclosed *forum* that can be found in all these colonies, always in proximity to the *comitium*, can be explained by the fact that the *forum* space is used as a voting space for the *comitia tributa*, a contemporaneous vote of all the electoral districts. We can assume that with the growth of the city the space of the *comitium* is not big enough. It’s evident that in this case and the space of the *forum* is the only one that can contain all the voters. The assumption of the use of *forum* as a voting space is based on the interpretation of the post-holes, or *pozzetti*, that have been found in all the Latin colonies in proximity to the colonnade that encloses the *forum* space. These pits have generated a recent debate between Mouritsen and Coarelli. Henrik Mouritsen claims that the larger pits could contain plants, whereas the smaller pits are intended to hold poles to

¹⁰⁷ For the correlation between roman cities and the rituals of the *augurs* see: Rykwert, Joseph. 1976. *The idea of a town : The anthropology of urban form in rome, italy and the ancient world*. Princeton, N.J.: Princeton University Press

support, perhaps, a superstructure like a stage or a tribune.¹⁰⁸ Filippo Coarelli is working on the recent excavations of *Fregellae*, which represents an ideal case since its traumatic end has preserved its initial condition and it's therefore more legible than Alba Fucens, Paestum and Cosa. From the excavation it is emerging a rectangular forum enclosed by a colonnade, very similar to the other three Latin colonies, placed in proximity to a similarly analogous circular *comitium*. Even here two parallel rows of pits have been found along part of the perimeter. According to Coarelli these pits are used to subdivide the *forum* space during the *comitia tributa* to divide the voters according to the electoral districts or tribes. These temporary subdivisions could be formed by ropes strung between the two ends of the forum. According to Coarelli: "*The presence on each side of two interconnecting pits could be explained by the presence of a system of winches, which would have been indispensable for stretching the heavy ropes along the whole length of the forum.*"¹⁰⁹ The existing pits in *Fregellae* would subdivide the area in five lanes with a slightly larger central corridor which could be explained by the presence of the aqueduct which crosses the forum area. Both Mouritsen and Coarelli claim that these are only preliminary interpretations. What is sure is that the role of Italic colonial forums is still mostly unclear and that a better understanding of their origin could generate incredibly relevant advancements in Roman urban history and, perhaps, also unexpected discoveries. If Coarelli's interpretation is correct it can be argued that the role of the colonies is much more relevant than what is generally assumed, and that the political activity of the citizens is higher than expected. According to Filippo Coarelli "*Everything that we know about Roman *libertas* (understood citizenship) shows that, on the contrary, the right to vote was usually exercised by the whole citizen body, and the situation in the colonies could not have been any different.*"¹¹⁰ Furthermore if the space of the forum is used for votes and public decisions, we could interpret the complete enclosure of the Roman republican forum as a *templum*: an enclosed space in which decisions can be taken in accordance with the gods. This interpretation is validated by the fact that the *Saepta Julia*, a gigantic construction built in the *Campus Martius* by Julius Caesar in 28 B.C., is a gathering and voting place for the *comitia tributa* and is based on the same typology of the earlier colonial *forums*. This urban enclosure, placed in proximity to the Pantheon, is a 300m-long and 95m-wide enclosure surrounded on four sides by a marble colonnade. Its huge dimensions are the result of the attempt to create a space in which all the Roman voters can be gathered. This site is also called "Ovile" or the "Sheep-pen," because internal subdivisions are formed within the enclosure to subdivide the voters exactly like in a sheep-pen. These subdivisions, probably formed by ropes or planks, need to be temporary because for the rest of the time the large space of the *Saepta* is used for gladiatorial games and strolling similarly to use of the forum explained by Vitruvius.

¹⁰⁸ Mouritsen, Henrik. 2004. Pits and politics: Interpreting colonial fora in republican Italy. *Papers of the British School at Rome* 72 : pp. 37-67

¹⁰⁹ Coarelli, Filippo. 2005. Pits and fora: A reply to Henrik Mouritsen. *Papers of the British School at Rome* 73 : p. 29.

¹¹⁰ *Ibid.*, pp. 26-27.

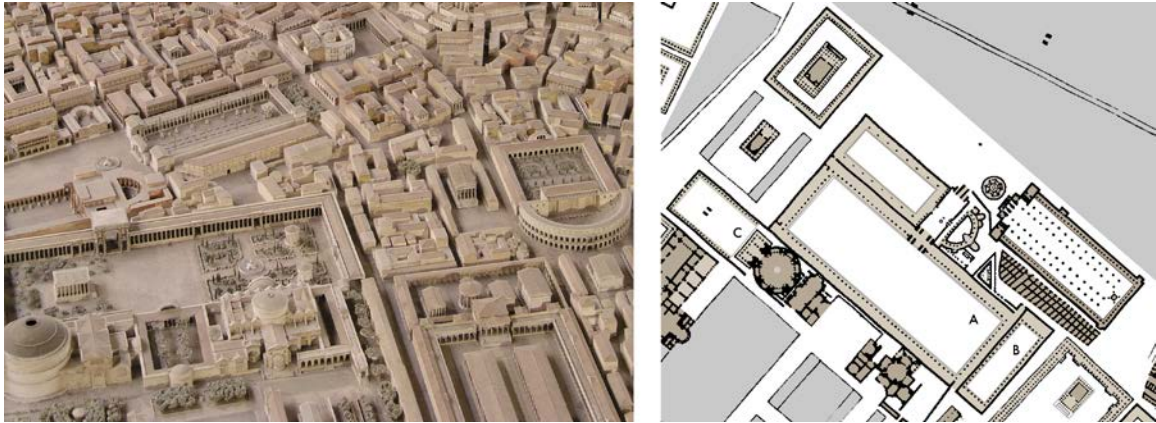


FIG. 82 On the left side model of the Campus Martius. The Pantheon and the Saepta are on bottom-left corner. On the right side plan of part of the Campus Martius. A) Saepta (28 B.C.), B) Diribitorium, the place where votes are counted (7 B.C.), C) Pantheon, the first version is built by Marcus Agrippa during his third consulship (27 B.C.)

We can argue that the complete architectural enclosure and the temporary subdivisions - based on the electoral districts or the tribes - are therefore necessary and practical aspects that guarantee the legitimacy of a vote for such a large number of people which is estimated between 30,000 and 70,000. We can imagine that to avoid double votes, or fake votes, in a period in which there are not yet valid identity or electoral documents, the only way is to gather all the people in a strictly enclosed space, defining physical divisions between the groups, and most probably creating an univocal circulation system that allows each person to vote only once. All the votes are counted by election officials called “*diribitores*” in the *Diribitorium*, a smaller enclosed court placed south of the *Saepta Julia*. Its court is covered by a famous roof, burned down during the fire of A.D. 80, which has 100-foot-long beams: it’s the largest ever constructed until this moment. The Saepta are described by Cicero in a letter to Atticus (IV, 16, 8): “*And so, I must confess, we “friends of Caesar” (I refer to myself and Oppius, even if that causes you to explode) have spent without any qualms sixty million sesterces towards that monumental work you used to praise so highly—the expansion of the over-crowded Forum, and its extension all the way to the Atrium of Liberty. The private owners of the land would not have sold for a lesser sum. But the results of our efforts will be magnificent, since we also have in mind to reconstruct the Voting Pens [Saepta] for the tribal assemblies in the Campus Martius, this one made of marble and roofed over, and we will surround it with a lofty colonnade a mile long. The Villa Publica will be attached to it as part of the same project.*”

This early imperial building is evidently based on the model of the earlier colonial forums. Even though the role of Italic or Republican forums is still not clear enough, it is possible to argue that cases such as Cosa, Alba Fucens, Fregellae and Paestum, are the result of the application of a similar urban model, a model that will have a strong repercussion during the following Roman imperial period. We can synthetically define two phases in the evolution of the Italic or colonial forums. In all these cases the general elongated shape of the Forum is usually defined during the first half of the third century B.C., when the comitium-curia complex is also built along one side of this space. This complex is certainly

the focal point of the forum and furthermore the small circular enclosure of the *comitium* represents the civic center and the place, or the *templum*, where decisions taken. In this early stage we can suppose that the space of the *forum* is generally used as a market place and surrounded by shops and *tabernae*, probably arranged with a non-completely regular form. The second phase corresponds to the first half of the second century, when - at the end of the second Punic war and after the defeat of the Carthaginians - a widespread building activity transforms Rome and the colonial cities. During this phase a unified colonnade is built in many of the colonial forums to give uniformity and clarity to the enclosed space. This monumental enclosure transforms the forum into a spatial unit, which is separated from the rest of the city but at the same time intrinsically tied to the most important civic buildings and connected with the most important streets. This is the moment in which the market is also moved to an independent building placed in proximity to the forum. According to James Russell *"The trend in Roman cities, by contrast, was to enclose the forum completely within its own precinct and divorce it from the traffic of the surrounding streets so that it became, in a sense, an element somewhat withdrawn from the city around. In this way the complex acquired a tightly integrated unity, its relationship with the rest of the city now concealed by the surrounding enceinte. This feature presents a marked contrast to public squares in which individual buildings bounded the area with streets intervening. The same trend towards shutting the agora in upon itself became popular in the Greek cities of the eastern Empire, to be sure, but most authorities are agreed that this process began later than in the west, probably as a result of Roman influence."*¹¹¹ If Coarelli's interpretation is correct, this new phase exemplified by the complete enclosure of forum can be interpreted as the result of the shift of civic and decisional center from the small circular *comitium* to the larger enclosed forum. This interpretation is supported by the fact that in the case of Fregellae and Cosa, the *comitia* are demolished at an early stage, when the colonnaded enclosure of the forum is also built. If votes and important decisions cannot be taken anymore in the *comitium*, probably for its small dimensions, the *forum* might have been transformed into a larger *templum*. The construction of the continuous surrounding colonnade around the forum could be considered the necessary step to define the enclosure of a *templum* and to *"inn-augurate"*, according to the rituals of the *augurs*, a place where public decisions can be taken.

Furthermore during this second phase, the enclosure of the forum space is usually combined with the construction of the basilica, almost as a supplementary articulation of the *forum* colonnade. If on one hand the role of the *comitium* is arguably extended to the entire forum, once this has been enclosed by a continuous colonnade, on the other hand the public space of the forum is partially incorporated within the interior space of the Basilica. The earliest known basilica is the basilica of Pompeii, built, during this phase, in the early second century.

¹¹¹ Russell, James. 1968. The origin and development of republican forums. *Phoenix* 22 (4) (Winter): pp. 321-322.

The origin of **Pompeii** dates back to the archaic period, when, probably around the eighth century, the city is founded on a high lava plateau by the Oscans, an Italic people of Campania. Later on the city is conquered by the Etruscans, as the 6th-century inscriptions of a necropolis testify, and from the fifth century it's occupied by the Samnites who progressively expand the town. The original nucleus, called by Haverfield *Altstadt*, is formed by the portion of the city which surrounds the forum and is characterized by a more irregular pattern. The *Altstadt* is formed in the pre-Samnite period, probably during the sixth century, and we can therefore assume that its cross-axial original layout might be the result of the Etruscan influence. Even though the plan is not based on a strictly rational grid, it is possible to recognize the archaic cross-axial system that formally defines this older part. The *cardo* and the *decumanus* of the Altstadt intersect in the area of the forum and are expanded in a second phase to the rest of the city. The more regular grid outside the older nucleus, defined by Haverfield as *Neustadt*, is usually dated from the third century B.C., and can therefore be attributed to the Samnites. However recent excavation have found more than twenty cases of sixth-century remains of structures perfectly aligned with the grid in the *Neustadt*. We can therefore suppose that the older nucleus is expanded before the third century, even though not systematically and probably with a kind of suburban character. After the 4th-century Samnite Wars, Pompeii is forced to accept the status of *socium* of Rome, even though maintaining an administrative autonomy, and remains faithful to Rome until the war in which it takes part together with the towns of Campania against Rome. These cities are forced to surrender by Sulla, and consequently, in 80 B.C. Pompeii becomes a Roman colony. The forum is the result of a long process of transformation. We can assume that the archaic forum was characterized by a more irregular trapezoidal shape, determined by the disposition of the blocks, and that was probably surrounded by houses and shops. According to James Russell: *"Consequently, far from a gradual expansion of its area southwards this particular forum always extended over an area roughly equivalent to that which it covers today, but displayed a slightly different orientation and an elongated trapezoidal shape probably conditioned by the street plan of the early community."*¹¹² The construction of the earlier colonnaded enclosure and the basilica is commonly dated from the same period of the previous examples, that is to say around 150 B.C. The colonnaded enclosure, originally built in tufa, is evidently conceived as a regular oblong enclosure that redefines the previous trapezoidal shape of the forum, giving an unified façade to all the public buildings. This is evident by the fact that the public buildings placed around the forum, even though some of them are reconstructed in the early imperial period, maintain the orientation of the previous blocks and have a slightly different orientation. The space of the forum is closed to wheeled traffic and the pedestrian access is limited to three main entrances.

The most predominant building of the forum is the temple of Jupiter or *Capitolium*. It is constructed around 150 B.C, approximately in the same period in which the first colonnaded enclosure is also built. We can therefore assume that it is part of a larger monumental plan for the reconstruction of the forum. Its strongly axial position at the end

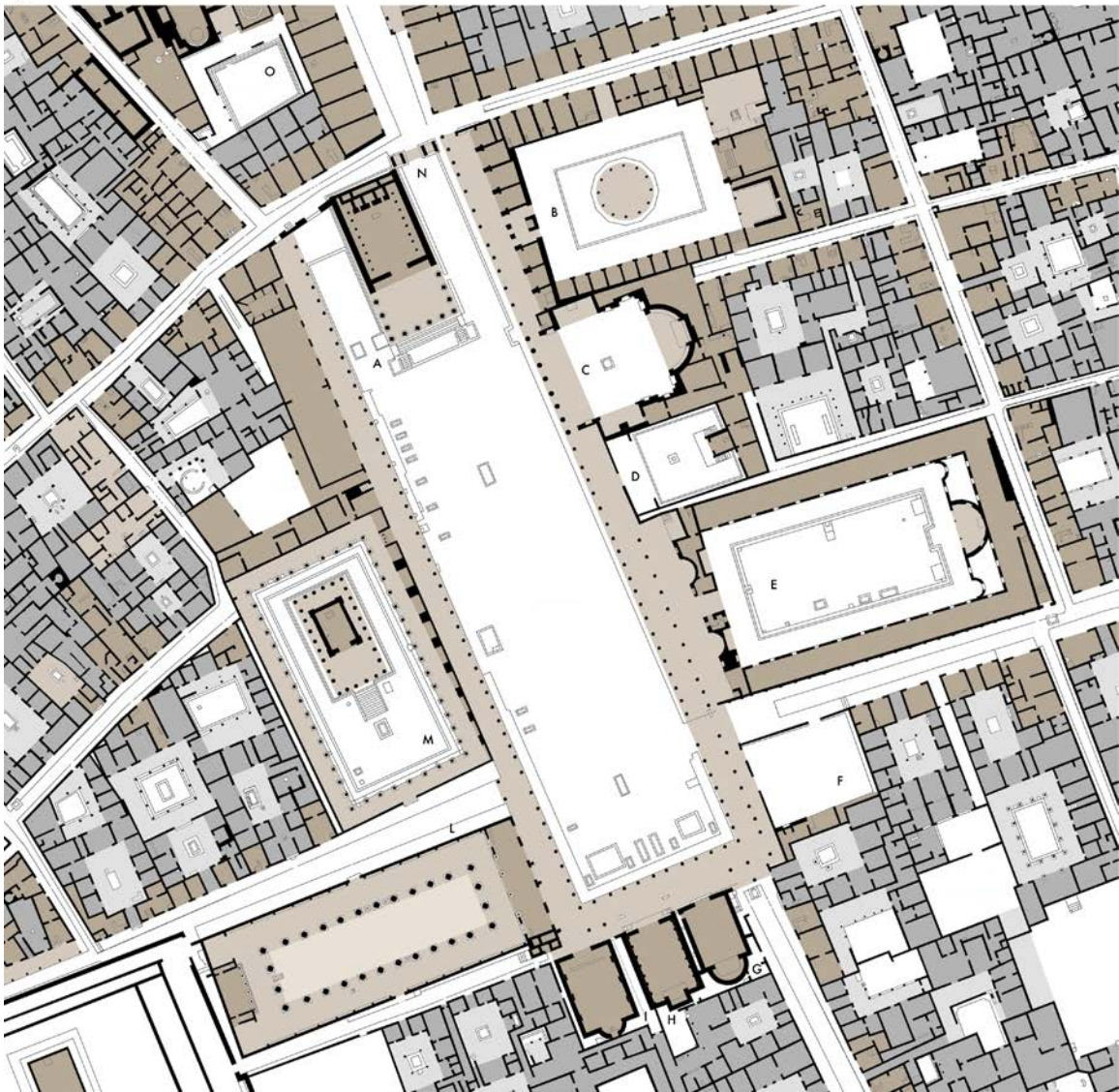
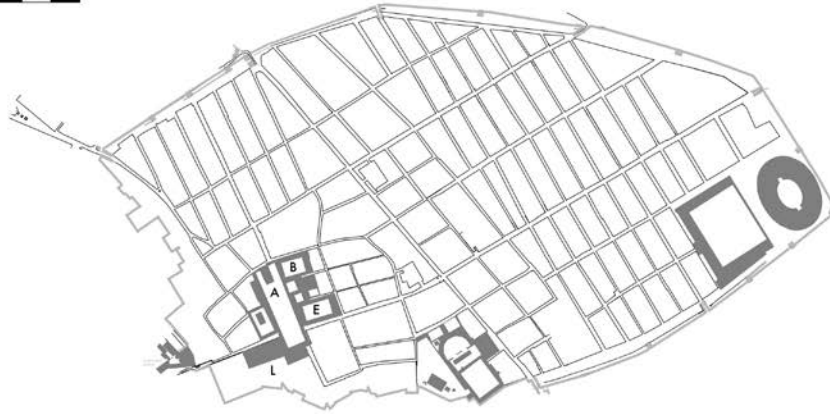
¹¹² Ibid., p. 310.

of the long enclosure of the portico is a characteristic Roman urban feature. The forum creates a monumental stage-set for the temple, which is placed on a typically Etruscan - as well as Roman - high podium. If the Greek peripteral temple has columns all around and it's conceived to be observed from all directions in a wide open space, the Roman temple is usually part of a larger urban ensemble in which it defines a predominant monumental façade. Therefore the frontal portico is more important than the lateral sides. The Greek Doric temple usually appears as an entire body: almost like a sphinx in which the frontal façade emerges like a face and the building behind forms the rest of the body. On the contrary an Italic or Roman temple appears like a head in which the rest of the body is formed by the enclosure of the forum. The surrounding porticos extend almost like projecting arms from the temple. This analogy is linguistically expressed by the word *Capitolium* which comes from the Latin *caput*, or head.



FIG. 83 The entrance to the Pompeii forum is only pedestrian. Traffic is kept outside by the presence of three stone blocks. Entrance from Via dell'Abbondanza.

Next page: FIG. 09 Plan of Pompeii: A) The Temple of Jupiter, Capitolium (ca.150 B.C.), B) Macellum, built in the Samnite period and later rebuilt (ca. 150 B.C.), C) Sanctuary of the Lares, built after the earthquake (62 A.D.), D) Temple of Vespasian, built after the earthquake (62 A.D.), E) Eumachia Building (ca. 10 A.D.), F) Comitium (second century B.C.), G) Office of the Duumvirs, built after the earthquake (62 A.D.), H) The City Council, built after the earthquake (62 A.D.), I) Office of the Aediles, built after the earthquake (62 A.D.), L) Basilica (2nd century B.C.), M) Sanctuary of Apollo (2nd century B.C.), N) Arch of Tiberius (16 A.D.), O) Forum baths (ca. 80 B.C.)



However a precise date for the forum complex has not yet been established. According to the *Pompeii Forum* Project directed by John Dobbins, the entire system composed by the colonnade enclosure, the basilica, the *comitium*, the eastern part of Sanctuary of Apollo and the Temple of Jupiter, are all part of a unified design whose construction follows the Roman conquest in 89 B.C and can attributed to Popidius. Besides the difficult attempts to find a precise date to this complex, the most interesting aspect is that this assumption is based on the recognition of a coherent urban strategy for all these buildings in terms of a designed urban ensemble. This interpretation is coherent with the tendency of both Hellenistic and Roman architecture to large-scale designs and urban compositions. According to Dobbins "since the pilasters are integral part to the building fabric in both the sanctuary of Apollo and the basilica, they, and the Popidian colonnade that defines their form, all appear to be part of one coherent design. The use of the same profile on the sanctuary and Basilica capitals support the link. Furthermore, the east wall of the Sanctuary of Apollo aligns with the façade of the Basilica and continues the ensemble."¹¹³ Additionally a unified construction phase would support the hypothesis of a strict connection between the enclosure of the forum and the basilica typology. Similarly to Cosa we can recognize a substantial continuity between the colonnade of the forum and the internal peristyle of the Basilica, which defines a smaller enclosure covered by a wooden roof. In a general analysis of the Basilica typology the Austrian historian Riegl explains that "the origin of the forum Basilica lies in the open court, which was covered out of necessity and utilitarian considerations. There is indeed no doubt that this particular preparation of a utilitarian building was a symptomatic and preliminary step for future developments."¹¹⁴ According to Riegl the wooden roof above the central nave represents a first step towards the definition of an interior space, a step which is completely achieved only later on with the use of large vaulted ceilings. We can therefore trace a genealogy of the development of the interior space in the sequence that starts with the enclosure of the forum, through the smaller covered enclosure of the Basilica to the monumental interior spaces of the larger Roman monuments such as the Baths. It is important to note that the large interior space of the basilica typology is developed before the use of concrete vaults, therefore it is not possible to say that it is the use of concrete that has generated the development of interior space. The reverse is probably more correct.

The buildings in the eastern part of the forum are probably built during the Augustan period. The new buildings are the *Eumachia Building*, the *Sanctuary of Augustus* also called *Temple of Vespasian* and the *Macellum*.¹¹⁵ The monumental archways connected with the Temple of Jupiter are also built during this period, even though most of these buildings are reconstructed after the earthquake that strikes the city in 62 A.D.

¹¹³ Dobbins, John Joseph, and Pedar William Foss. 2007. *The world of pompeii*. The routledge worlds. London ; New York: Routledge: p. 171.

¹¹⁴ Riegl, Alois, and Rolf Winkes. 1985. Late roman art industry. *Archaeologica* ; 36. Roma: G. Bretschneider: p. 35.

¹¹⁵ Dobbins, John J. 1994. Problems of chronology, decoration, and urban design in the forum at pompeii. *American Journal of Archaeology* 98 (4) (Oct.): pp. 629-694



FIG. 84 View from the colonnaded enclosure of the forum in Pompeii.

The destructive eruption of Mt. Vesuvius, which covers the entire city with volcanic ash in 79 A.D., crystallizes the city of Pompeii in a post-disaster state, when the repair works after the earthquake are still going on. Therefore the archeological remains of the forum represent a work-in-progress state as a result of the reconstruction phase after the earthquake: in 79 A.D. the portico is being rebuilt, the forum is being repaved with limestone blocks and all the buildings around are also being reconstructed or partially finished. The *macellum*, also damaged by the earthquake, is a typical Roman market building. This specialized architecture typology, usually defined by a small colonnaded court with shops placed around the enclosure, marks the culmination of the process of differentiation of the functions of the *agora* started in the Hellenistic period. The *macellum* is usually the place where fish and meat are sold and its construction in proximity to the forum is the result of the prohibition on selling blood-letting products, such as meat and fish, in the forum. In the Roman cities the rest of the commerce is redistributed along the streets which progressively become a more active and attractive public space. In the case of Pompeii shops and *tabernae* surround most part of the residential urban blocks, creating a sort of public interface between the street and the enclosed private space of the *domus*. This is more evident in the areas around the forum and in the theater district. In this way the urban fabric of Pompeii is characterized by a high functional and typological mixing: in a typical block we can find workshops, commercial activities and *tabernae* -usually connected with a living unit for the owner- all placed around the perimeter of the urban block, whereas, in the middle of it, there is generally an articulated composition and concatenation of one or two story party-wall houses of every kind of social class and scale. The urban block of Pompeii materially represents the Latin differentiation and interrelation between the concepts of *otium* and *negotium*. If on one hand *Otium*, meaning “repose”, represents the retirement from the public activity and is characteristic of the more intimate space of the house where time is dedicated to leisure, contemplation or to the stoic “care of the self”, on the other hand *Neg-otium*, is the negation of *otium* and is the Latin word for “shop”: it represents every business activity that can be held in shops, *tabernae*, workshops and public buildings. In the Roman culture *otium* and *negotium* are considered different - but at the same time - integral parts of one’s life, and, in a similar way, private and public buildings are completely integrated within the urban fabric.

If in a Greek city there is clear distinction between public and private space, in the case of Pompeii the combination and amalgamation of public and private is highly pervasive. In general the urban fabric of Pompeii is dense and highly articulated: solids and voids have equal value and in its intricate texture composed by streets, courtyards, peristyle gardens and enclosed public spaces it’s almost impossible to understand whether the voids are part of the interior or the exterior space. All the residential buildings are traditionally developed around the internal space of the *atrium*, and in the case of a large villa there are usually one or two courtyards or peristyle gardens. Even the house is not conceived as a strictly private space. Most of the houses are connected with shops and workshops and the business activity of the rich *dominus*, the owner of the *domus*, is usually held in the *Tablinum* room placed in the middle of the house between the *atrium* and the *peristylium* with the garden.

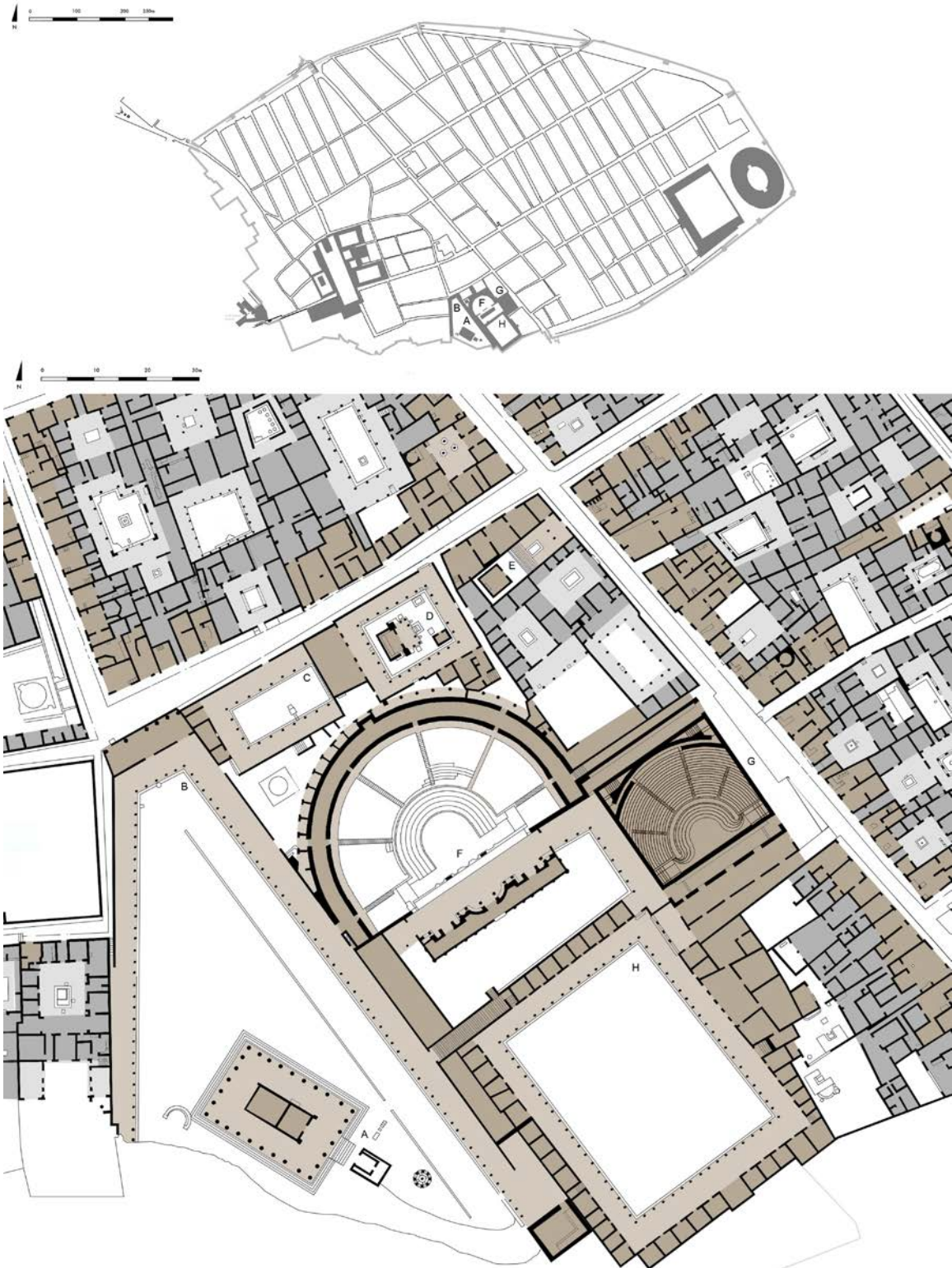


FIG. 85 Plan of Pompeii, Theater District: A) Doric Temple (6th century B.C.), B) Triangular forum (2nd century B.C.), C) Samnite Palestra (2nd century B.C.), Temple of Isis (ca. 100 B.C.), Temple of Zeus Meilichios (ca. 80 B.C.), F) Large theater (2nd century B.C.), G) Odeion, covered theater (ca. 80 B.C.), H) The Court of the Gladiators, (1st century B.C.)



FIG. 86 In a Pompeian domus the tablinum room is placed between the atrium and the peristylum with the garden: "A Pompeian Interior" by Luigi Bazzani, Danish museum of art (1882)

Therefore throughout the highly axial sequence that connects, in the roman domus, the entrance with the atrium, the *tablinum* and the garden, there is a general progression from more public to more private rooms. A similar mixture between private and public activities in residential buildings, can be probably found, in more recent periods, only in some Renaissance palaces and Baroque French Hôtels.

But if on one hand public and business activities are introduced into the realm of the domestic life, on the other hand private and intimate activities are progressively shared and held into the public realm. The most emblematic example is probably the introduction of urban public latrines in connection with the construction of the aqueducts and the sewage system, which are both technologies inherited by the Etruscans. Furthermore public baths and *Thermae*, become a constituent element of every city. The Stabian Baths in Pompeii can be considered one of the earliest examples of Public baths. If in the fourth century B.C. the complex is defined by a simple *Palestra* surrounded by colonnades, the definitive layout is completed during the first century B.C., with the introduction of the proper bathing rooms and with the construction of the earliest example of the hypocaust heating system.

Public buildings represent the civic infrastructure of a roman city. If on one hand the Greek concept of the *polis* is highly political and immaterial -usually based on its citizens more than on its material buildings- the Roman *urbs* is "the city of stone" formed by the civic infrastructure of the public buildings. In the "The Golden Ass" (*Asinus aureus*) by Apuleius, we can read a description of the city of Hypata in Thessaly, in which the urban life of the city is described in terms of its public buildings: *"In our opinion we easily excel all other cities in Temples, Baths, and other Public Works. Moreover the necessities of life are produced in super-abundance. There is freedom for the man who likes quiet, while there is the hustle of Rome for the commercial visitor and the retirement of a country manor for the peaceable tourist."* Between the public buildings of Pompeii we can list nine temples, the forum, the basilica, the curia, the comitium, the municipal offices, a theater district with an open-air theater, a covered theater and the Triangular Forum, an amphitheater, the gymnasium, a large and a small *Palestra*, three public baths and the *Macellum*. This vast number of public buildings is an evident indicator of the importance of public life in Roman society. The idea of society is, in itself, a Roman concept derived from the Latin word *societas*, which essentially means an alliance between people with a specific propose. According to Hannah Arendt, the public space in the archaic and classical Greek period is strictly separated from the private realm and is reserved for individuality: it's the space in which the individual citizen can act and speak. On the contrary in the Roman culture "to live" means to be among other men, whereas "to die" means to cease to be among other men. According to Hannah Arendt: *"It is not that Plato or Aristotle was ignorant of, or unconcerned with, the fact that man cannot live outside the company of men, but they did not count this condition among the specifically human characteristics; on the contrary, it was something human life had in common with animal life, and for this reason alone it could not be fundamentally human."*¹¹⁶

¹¹⁶ Arendt, Hannah. 1998; 1958. *The human condition*. 2nd ed. Chicago, Ill.: University of Chicago Press: p. 24.

Public latrines and baths represent only the most emblematic example of the shift of one of the most intimate activity from the private to the public realm. We should not underestimate the importance of this aspect because even the more simple condition of being with unknown people of different social class under the same roof, is -in certain periods of history and probably even nowadays- considered uncomfortable and in some cases even unacceptable. If the most intimate activity is held in the public realm, as in the Roman period, we should assume, at least, that this indicates a very strong social cohesion.

An actual visual representation of this social cohesion can be found in the urban plan of **Ostia**, the harbor city of Rome. The most evident aspect is the extraordinary density of the urban fabric, which is nonetheless defined by a highly organized layout. Here the combination between private and public realm is indisputable. If we analyze all the public functions and the morphology of the urban fabric around the forum it's almost possible to interpret its structure as a domestic typology enlarged to an urban scale: we could consider the intimately enclosed space of the *forum* with its *basilica* as a living-room connected with a more quiet room, the two bath complexes around the forum and the latrines as the bathrooms, the *tabernae* as numerous public kitchens, and the connecting streets as corridors like in the case of Via Tecta, a narrow street parallel to the *Cardo*, which is one of the first covered streets. This kind of analogy can arguably be applied to any urban center, but in the case of Ostia -probably for the proximity of these functions, the high density and the systematic organization- this metaphor seems to be directly materialized in the urban plan.

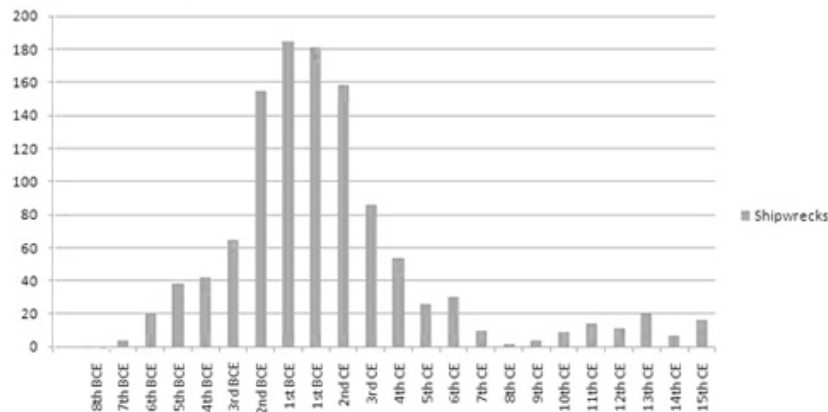
Ostia is often considered the first colony of Rome. According to ancient historians and writers such as Ennius, Livius, Cicero and Dionysius of Halicarnassus, it's founded by the fourth king of Rome, Ancus Marcius, in the late seventh century B.C. From the archeological remains we can deduce that the plan of Ostia is based on the earlier layout of the military *castrum* which has been variously dated between 380 and 275 B.C. Like in the case of the Roman phase of Pompeii, the first urban development and a more definitive urban plan is achieved under Sulla at the beginning of the first century B.C., following the cross-axial division of the *castrum* in *Cardo Maximus* and *Decumanus Maximus*. The forum is placed at the intersection of the two most important streets. In this case it is evident that to keep the feeling of an enclosed space the *Cardo Maximus*, a monumental street with shops behind continuous porticoes on both sides, does not lead directly to the forum. The *Capitolium* is placed in axis with the *Cardo*, and the entrance to the forum is possible through two lateral pedestrian entrances. We can be sure that this solution increases the perception of passing a threshold during the passage from the street to the forum space. Therefore the feeling of entering into an enclosed room, or maybe into an urban "living room", is architecturally emphasized. Even in the case of Ostia we can perceive the strict typological and physical connection between the *forum* and the *basilica*, in the sense that the *basilica* represents a miniature-roofed version of the forum enclosure and because it is evident that there is a continuity of space and functions between these two enclosed spaces. In any case the clear definition and demarcation of the forum around the four sides doesn't mean that its space is isolated from the rest of the city.



FIG. 87 Plan of Ostia, the harbor city of ancient Rome. A) Forum, the definitive layout is achieved during the reign of Hadrian (117-138 A.D.), B) *Cardo Maximus* is flanked by shops behind porticoes. C) *Decumanus Maximus*, D) *Capitolium* (120 A.D.), E) *Basilica* (81-117 A.D.), F) Round temple with forecourt (222-235 A.D.), G) *Forum of the Heroic Statue* (350 A.D.), H) *Baths of the Forum* (ca. 175 A.D.), I) *Byzantine Baths* (390-425 A.D.), L) *Latrines*, M) *Basilica Hall* (238-244 AD), N) *Nymphaeum* or fountains, O) *Curia* (81-117 AD), P) *Via Tecta*, one of the first covered streets (120 A.D.)

The forum space is connected with numerous public buildings besides the basilica: the forum baths are directly accessible from the porticos of the forum and a secondary forum placed behind the public baths is also physically connected with the main forum. Additionally the *curia*, placed in front of the *basilica* entrance, is also placed in proximity to the forum whereas the forecourt of the Round temple can be accessed through the *basilica*. Therefore the voids of the urban fabric are highly articulated and interconnected. Later on a real urban transformation happens under the emperors Trajan and Hadrian, a radical change which can be compared to Nero's urban renovation of Rome after the great fire in 64 A.D. In the case of Ostia the reasons for the change can be understood only by looking at the economical transformation of this period. It's possible to have a visual glimpse of the economic boom of this period from the diagram of the number of shipwrecks throughout history, which indicates the development of maritime commerce.¹¹⁷

Mediterranean shipwrecks



World Lead Production

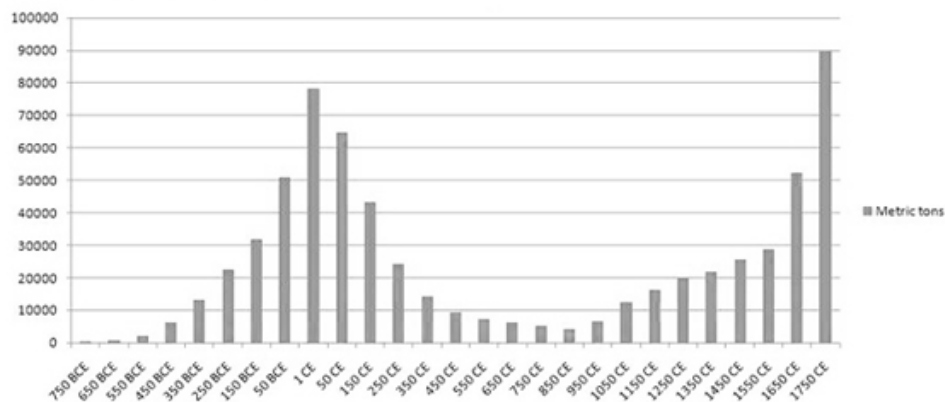


FIG. 88 On the top: Commercial expansion and economic growth according to the number of shipwrecks. The highest growth is between the end of the Hellenistic period and the beginning of the Roman Empire. From A. J. Parker. On the Bottom economic growth according to the lead production.

¹¹⁷ See: Parker, A. J. *Ancient Shipwrecks of the Mediterranean and the Roman Provinces*. Oxford UK, Tempus Reparatum / B.A.R. IS 580. 1992.

The histogram of the number of shipwrecks in the Mediterranean sea is a good index of economic growth in a preindustrial economy primarily based on agriculture and commerce. From the diagram it is possible to individuate a strong economic acceleration between the end of the Hellenistic period and the beginning of the Roman Empire. Furthermore the output of this diagram coincides with the result of another important economical index: the production of lead measured according to the pollution of the air throughout history. This diagram also shows a peak during the first century A.D which is surpassed in modern times only around 1750. The explosive economic growth of the first century A.D. means for a city like Ostia, which is the harbor of the capital of the Empire, a huge increment of the population and an unseen wealth diffusion. The growth of maritime commerce is directly exemplified and materialized in the works for the new harbor of Ostia which start under Trajan and end in 113 A.D. The hexagonal layout, conceived to protect the harbor from the wave action, may have been designed by Apollodorus of Damascus, the architect of Trajan's forum and Market in Rome. Its perfectly geometrical form is almost an anticipation of the Renaissance centrally planned ideal cities. Interestingly enough, in written literature utopian cities are always connected to the idea of maritime travels towards unknown places.

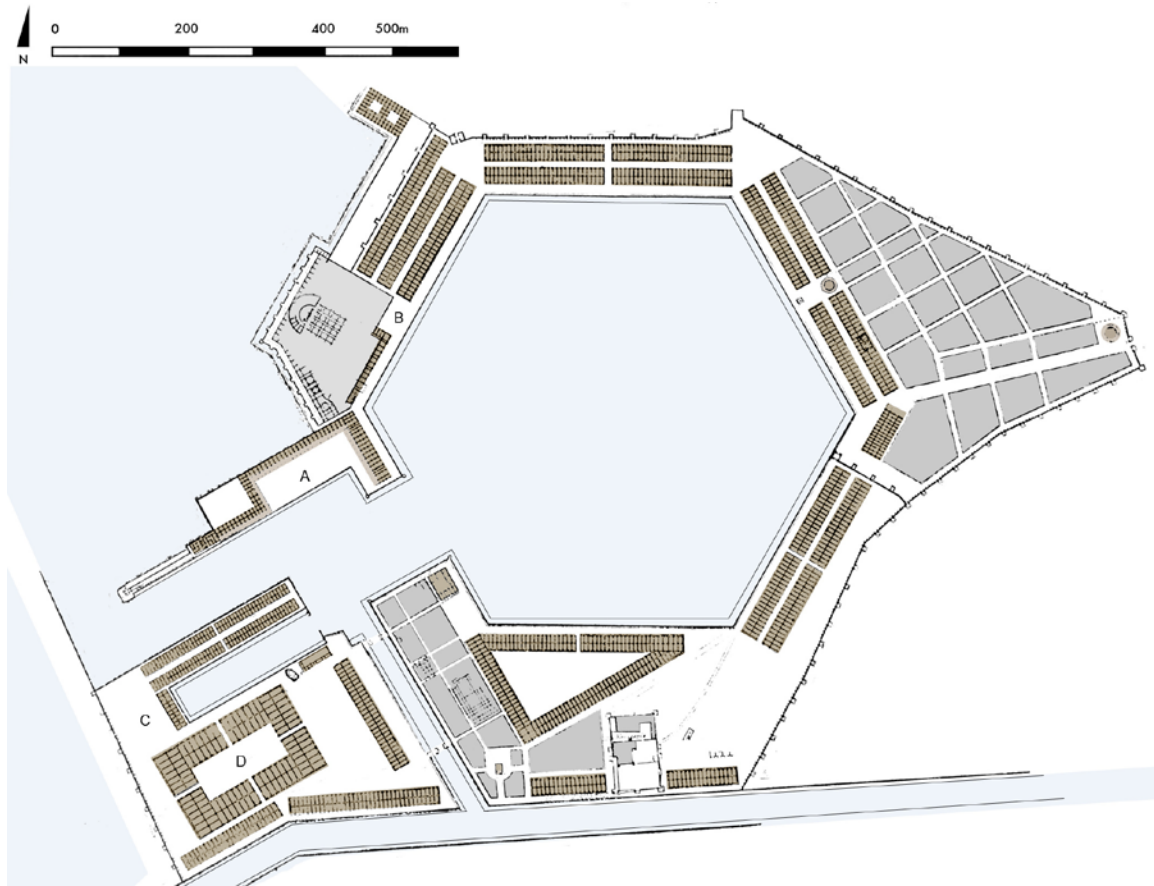


FIG. 89 Plan port town of Ostia built by Trajan (100-112 AD), A) forum, B) Imperial palace, C) Darsena, D) Forum Holitorium, the market for vegetables.

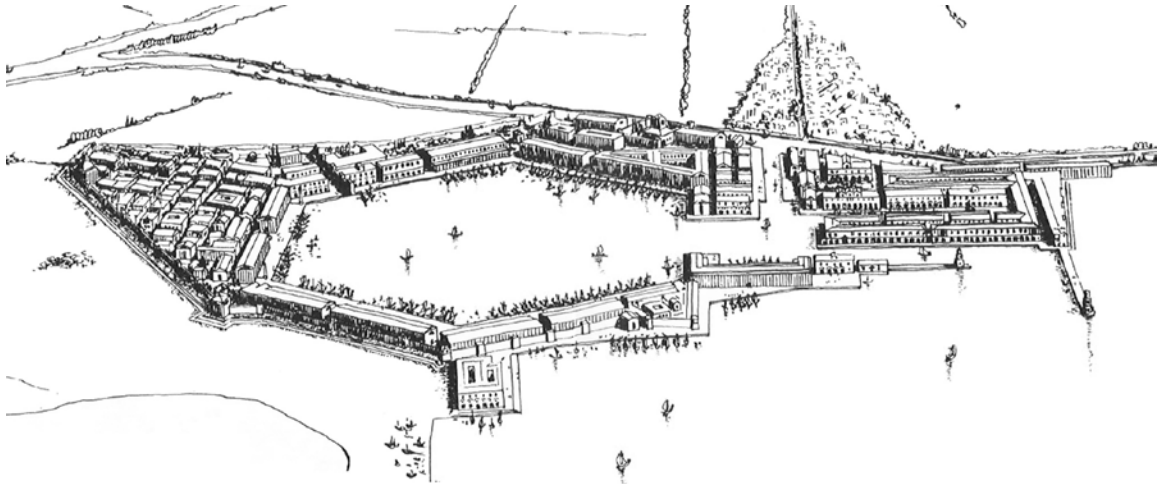


FIG. 90 reconstruction drawing of the port town of Ostia built by Trajan.

Its huge scale – every side measures 358 meters or 1200 Roman feet – is proportioned to the scale of the increasing commercial activity of the Empire. In the city of Ostia the growth of the population generated by these works and by the commercial flourishing requires the construction of new building units but also new techniques and materials which can allow a higher built density. Perkins, talking about the outburst of building activity during the first half of the second century, explains that *“of the factors that shaped it, unquestionably the most important was the availability of the new building techniques and materials which had been developed during the first century A.D., and which were now becoming available at increasingly advantageous prices as a result of the reorganization of the brickyards undertaken by Trajan and Hadrian.”*¹¹⁸ These new building techniques and materials are the use of concrete as well as the diffusion of bricks which are produced in the capital at an industrialized scale. These two techniques certainly increase the rapidity and the efficiency of the construction process. However the innovations required to achieve a higher built density are also typological. The Roman *insula* is a new apartment building typology with shops at the ground floor, which, with its maximum height of six or seven stories, achieves a built density unseen before. We can arguably consider the Palazzo type of the Renaissance period a reiteration of this new housing typology developed around a central courtyard.

The process of public activation of the private residential space and the “domesticization” of the public urban space are both complementary aspects of the increasing integration between public and private realms in the Roman cities. This process is well expressed in the *insulae* of Ostia. In the urban complex composed by the Insula of Serapis, the Baths of Seven Sages and Insula of the Charioteers, shops occupy the ground floor and are arranged around the two high arched porticos of the courtyards. The living units in the upper floor have small dimensions and the minimum amount of services. It’s possible to argue that the services of the *insula* which are not present in the units, are nonetheless integrated at an

¹¹⁸ Ward-Perkins, J. B. 1994. Roman imperial architecture. Yale university press pelican history of art. New Haven: Yale University Press: p. 146.

urban scale: thus the living units offer a place where to sleep whereas the rest of the daily life activities are primarily public. A large thermal bath complex, placed between the two apartment buildings and directly accessible from the courtyards, provides high quality bathing facilities whereas the numerous tabernae and shops provide a great variety of food.

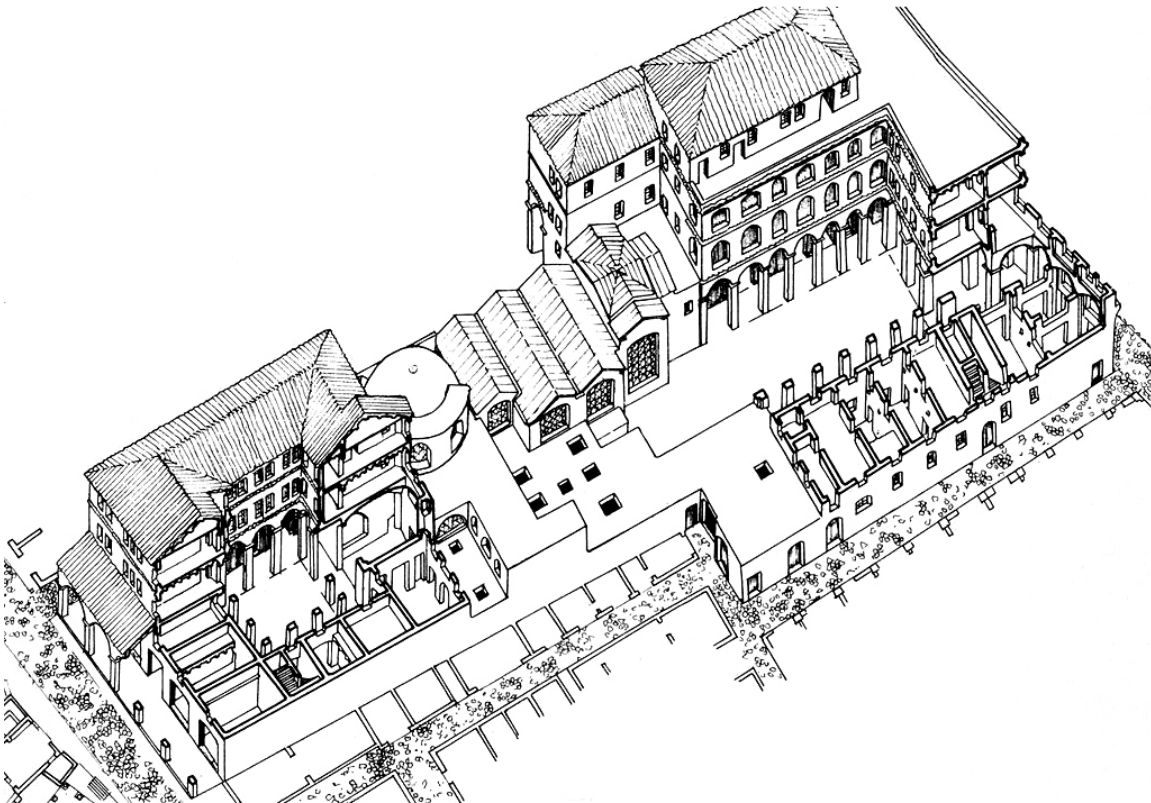
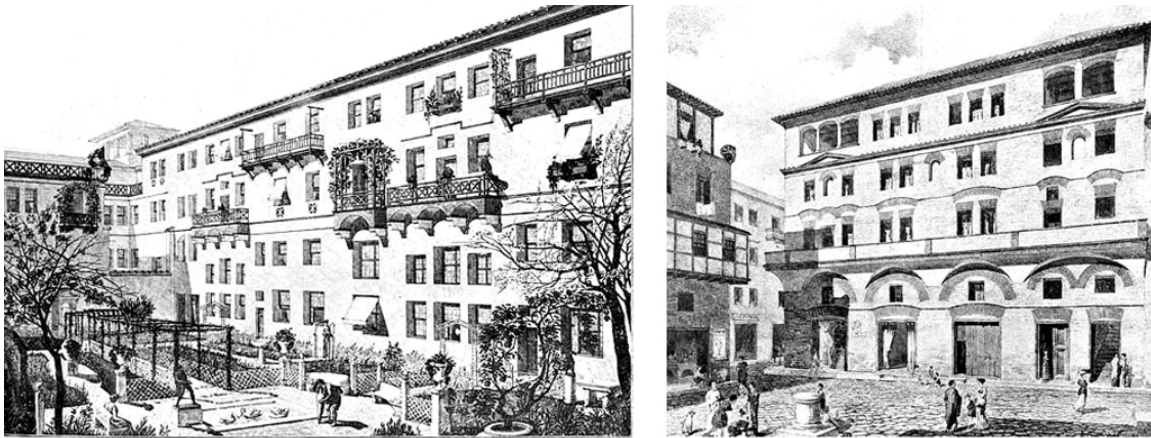


FIG. 91 The insula typology, or apartment building, in Ostia. On the Top left: Reconstruction drawing of the “casa dei dipinti”, seen from the north-east, by I. Gismondi 1923, On the Top right: Reconstruction drawing of the “Caseggiato di Diana”, seen from the south, by I. Gismondi. On the Bottom side: axonometric reconstruction of Insula of Serapis, the Baths of Seven Sages and Insula of the Charioteers, by I. Gismondi.



FIG. 92 A taberna, or restaurant, in Ostia. Tabernae are part of Roman daily life and are typologically strictly related to the street space. Vaults and exposed bricks clearly express the new esthetic principles.

This urban complex composed by *insulae* represents a good example of a direct integration between private and public space. I think that it can be arguably said –and this consideration may be valid even today in terms of sustainability- that in a highly dense urban environment the possibility to have integrated communal services can offer better living standards, even to low-income people, with lower costs and consumptions.

The diffusion of the new insula typology generates also new esthetic issues. One of these could be called “the façade problem” since for the first time architects have to deal with multi-storey buildings which cannot be conceived in terms of the classical orders. This problem is solved for the first time with a systematic use of windows and with the use of the exposed bricks in which the color, the texture, and design of bricks become simple but innovative esthetic features. According to Perkins “*In positive terms this meant a steady drift away from the use of the columnar orders and towards an architecture which could be viewed from without principally as an orderly alternation of solids and voids. In this context the introduction and widespread adoption of window glass proved to be an event of the first importance. In urban architecture it was increasingly the patterns constituted by the wall-surfaces, the doors and the windows which were left to tell the architectural story*”¹¹⁹.

¹¹⁹ Ibid., p. 151.

Another characteristic aspect of Ostia related to the issue of facades and to the activation of the streets by commercial activities, can be found in the widespread use of street front porticos, which are added to existing buildings and commercial activities during the early imperial period. The use of porticos in the western part of the Empire can be compared to the almost contemporary use of colonnaded streets in the eastern part of the empire, whose origin can be related to the Hellenistic monumental streets of Alexandria, probably inspired by the earlier avenues of sphinxes built by the Egyptian pharaohs. According to Coulton *"The addition of porticoes to improve what was already a monumental avenue may be another idea which was influenced by the example of Roman Italy, for from the first century B.C. onwards, some of the shops opening onto streets in Rome, Ostia and other towns had porticos built in front of them. The pre-Imperial examples of such porticos in Italy differ from the later colonnaded streets of the Eastern Mediterranean, however, in being treated very much as part of the individual buildings behind, not part of the street itself. The uniform facades characteristic of the colonnades street tend, therefore, to be lacking."* According to Coulton the first colonnaded street is built in Antioch between 40 and 4 B.C. by Herod the Great, whereas according to W. L. MacDonald the roofed colonnades along this street are built only later in the time of Tiberius¹²⁰. However it's reasonable to say that by the end of the first century commercial *colonnaded streets* become widely diffuse with porticos predominating in the west and colonnades in the east. In the Roman empire - and this aspect is valid even for non-architectural issues - the peripheral provinces often develop localized and individual tendencies without systematically repeating the model of the capital. Furthermore the influence between Rome and the other provinces is often reciprocal. The endless *colonnaded street* is one of the examples in which it's possible to distinguish a typically eastern character.

One of the earliest examples of a colonnaded monumental street is the *Lechaion* Road, or *cardo maximum*, in Corinth. The Greek city, after being sacked by the consul Lucius Mummius in 146 B.C, is transformed into a Roman colony by Julius Caesar in 44 B.C. and reconstructed with a grid plan layout. This represents a quite unusual case because the cities conquered by the Romans are generally preserved and expanded. In Corinth the earlier Temple of Apollo and the South stoa are integrated into the new forum complex and the *Lechaion* Road is transformed into the *cardo maximum* of the new cross-axial plan. If initially this street is still unpaved, during the first century A.D. it becomes a monumental axis and in the time of the emperor Vespasian it's closed to traffic, paved with hard limestone slabs, and flanked by sidewalks and colonnades with shops. The colonnaded *cardo* leads directly to forum space like in Ostia, but in this case it culminates into a monumental Arch built by Augustus and modified at the end of the first century A.D.¹²¹ We can suppose that the general effect of the urban ensemble composed by the colonnaded street with the

¹²⁰ MacDonald, William L. 1986. The architecture of the roman empire. Vol. II An urban appraisal. Yale publications in the history of art ; 35. New Haven: Yale University Press: p. 44

¹²¹ See: Edwards, Charles M. 1994. The arch over the lechaion road at corinth and its sculpture. *Hesperia: The Journal of the American School of Classical Studies at Athens* 63 (3) (Jul. - Sep.): pp. 263-308.

enclosure of the monumental arch might have been quite similar to the Uffizi gallery built by Vasari in the Renaissance, even though the archway in this case is placed between the main “piazza” and the monumental street whereas in the case of Firenze the archway-gallery is placed in the opposite side. In the forum the original south stoa built during the first quarter of the third century B.C is transformed during the reign of Augustus (31 B.C. to A.D. 14) when shops are changed into administrative offices. Later on a fountain house is built as an entrance court for the South Basilica, built in proximity to the south stoa, together with an elliptical room, a bath complex and the latrine.

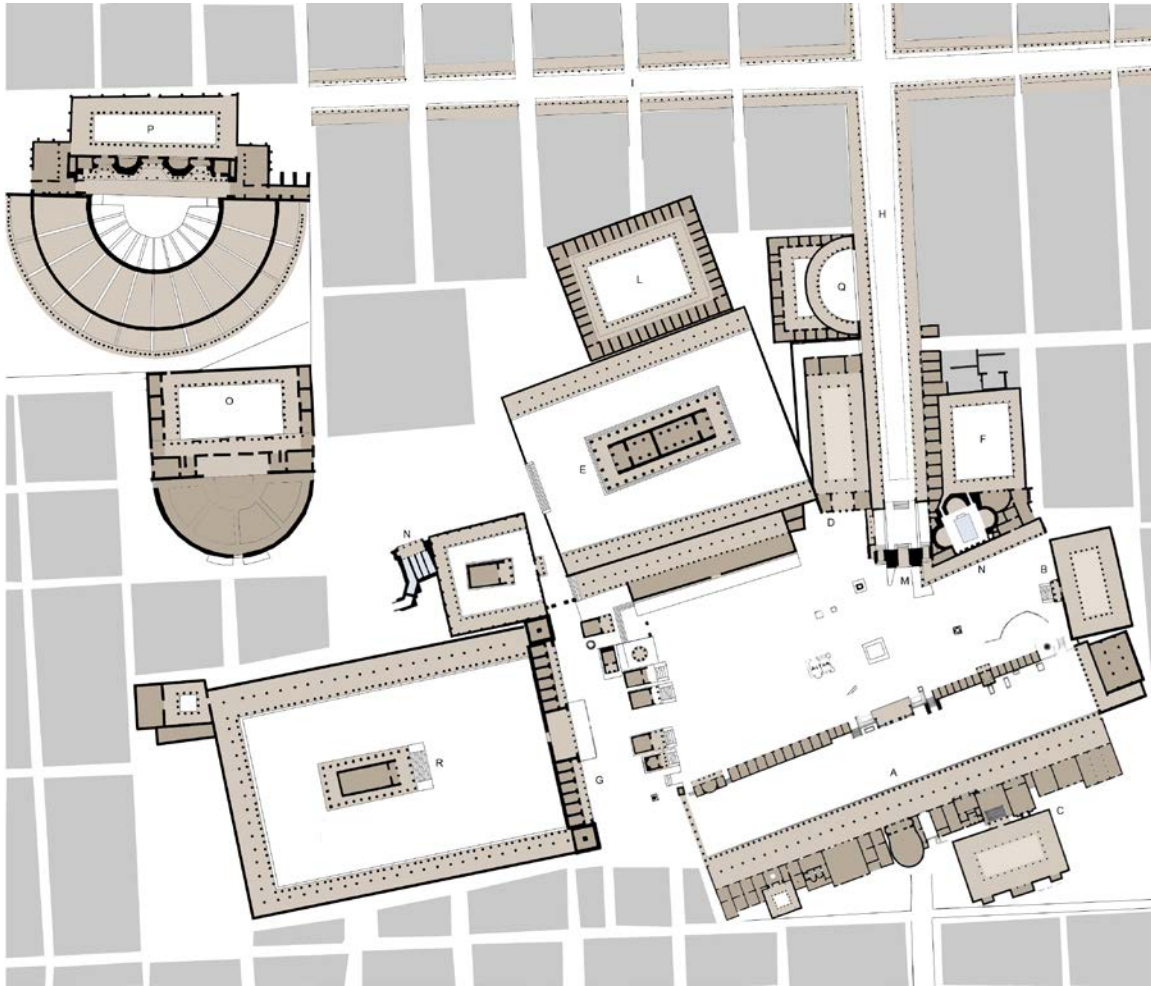


FIG. 93 Plan of Corinth during the Roman period. A) South Stoa (early third century B.C.) later on modified with the irregular shaped rooms, B) Basilica Iulia (ca. 10 A.D.), C) South Basilica (ca. 40-50 A.D.), D) Lechaion Road Basilica, rebuilt on an earlier basilica of the Augustan period (150 A.D.), E) Temple of Apollo, built to replace an archaic temple from the 7th century (540 B.C.), In the roman period the temple is enclosed by two stoas, F) Peribolos of Apollo, built over the old macellum, (ca. 75 A.D.), G) West shops (ca. 70 A.D.), H) Lechaion Road, the *cardo maximus* of the Caesarean colony in 44 B.C., is paved, closed to traffic and surrounded by porticos under Vespasian. I) *Decumanus maximus*, L) North Market (ca. 25 A.D.), M) Monumental Arch (ca. 75 B.C.) N) Nymphaeum and fountains, O) Odeum, covered theater (ca. 75 A.D.), P) Theater, originally built in the late fifth century and modified during the Hellenistic period. The three-story *scaenae frons*, decorated with sculpture, is added in the second century A.D., Q) Semicircular market (70 A.D.), R) Temple E, rebuilt after the earthquake in 70 A.D.

Like in Ostia a distinctive feature of Roman urban design is characterized by the presence of public fountains and *nymphaea*, which are built both for functional and esthetic reason. The biggest nymphaeum in Corinth is placed in proximity to the monumental arch. Numerous buildings, shops, and basilicas are progressively built around the forum space to enclose its space. The older temple of Apollo is enclosed by walls and by two stoas in the attempt to define the enclosure of a *templum*. Other public buildings include, like in any Roman city, a large theater, a covered theater, a macellum and other market buildings.

To have a glimpse of the effect of a colonnaded street it is enough to visit the archeological sites of the eastern cities of the empire, such as Gerasa, Apamea or Palmira, even though as MacDonald has noted, colonnaded streets can be found even in the western towns such as Herculaneum, Lepcis, Timgad or Djemila to quote few of them. The systematic use of colonnaded streets can be found in Roman cities founded or constructed after the first century A.D., whereas in the older Greek and Roman towns -with the exception of Corinth which is reconstructed after becoming a colony- porticos and colonnades are applied to smaller street portions and to existing buildings. The most impressive aspect of the eastern colonnaded streets is their scale and their length which in some cases must be measured in terms of kilometers. The endless repetition of columns in unified colonnaded streets is almost the result of a Hellenistic aesthetic principle which, in some provinces of the empire, continues to evolve even during the Roman period. It must be noted that in the eastern and north African regions the architectural innovations that are being developed in the Italian peninsula during this same period, such as the use of concrete and the vaulted constructions, are usually not applied and the materials which are primarily used, as well as the aesthetic principles, are directly derived from those of the Hellenistic period.



FIG. 94 Colonnaded street in Palmyra. The construction starts after the foundation as Roman colony in the mid 1st century A.D.

This demonstrates on one hand a certain cultural and artistic independency of the provinces and, on the other hand, the tendency of the Romans to accept local traditions and, in the case of architecture, the intention to use local materials and local techniques probably for practical and logistic reasons.

In the case of **Palmyra**, a city of central Syria and a caravan stop for travellers crossing the Syrian desert, the monumental effect of a colonnaded avenue can be grasped even today. Its endless repetition of columns emerges from the sand of the desert as the dried backbone of a gigantic animal, whereas what remains is in reality the spinal column of what once was a flourishing city placed along the caravan routes which link Persia with the Mediterranean ports of Roman Syria. Furthermore the remains of the Roman Palmyra visually represent what MacDonald has called, in relation to the Roman empire, “*urban armatures*”. According to MacDonald: “*Armatures consist of main streets, squares, and essential public buildings linked together across cities and towns from gate to gate, with junctions and entranceways prominently articulated. They are the setting for the familiar Roman civic building typology, the framework for the unmistakable imagery of imperial urbanism. As the central arenas of public activity they are integrated functional and symbolic wholes. Their dominant characteristic on the ground is directional and spatial unity, an indivisibility underwritten by fluid, unimpeded connections.*”¹²²



FIG. 95 The “urban armature of Palmyra”

¹²² MacDonald, William L. 1986. The architecture of the roman empire. Vol. II An urban appraisal. Yale publications in the history of art ; 35. New Haven: Yale University Press: p. 5

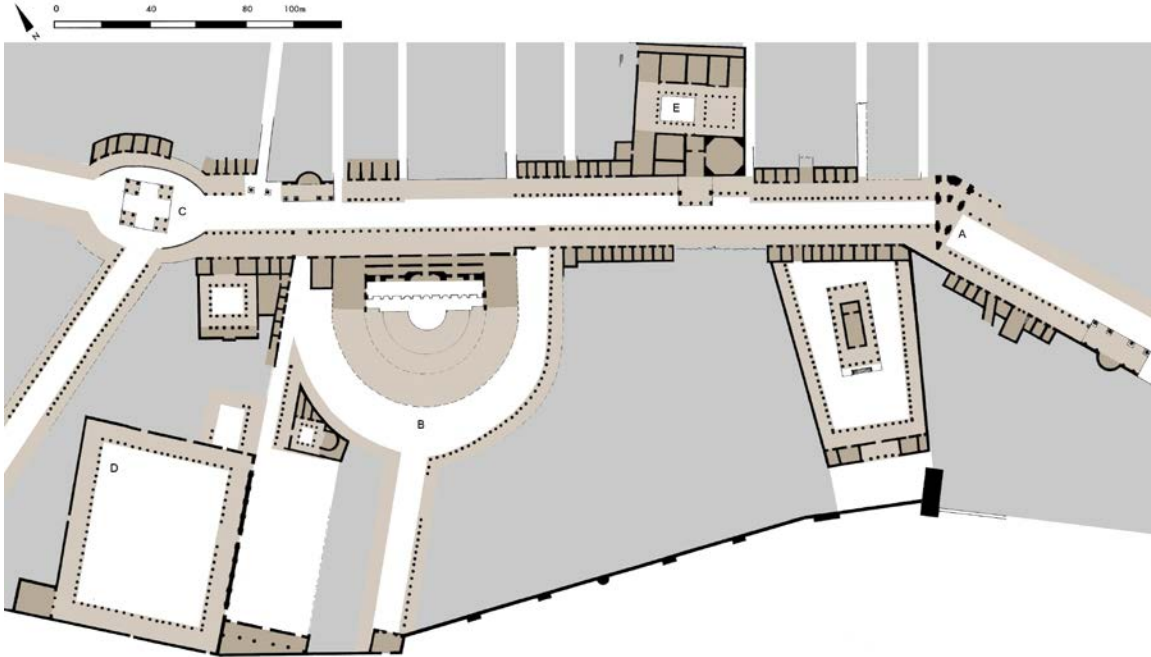


FIG. 96 reconstruction plan of the “urban armature of Palmyra”. A) Arch of Septimius Severus (193 - 211 A.D.), B) Theater (ca. 200 A.D.), C) Tetracylon (ca. 200 A.D.), D) Forum (50 A.D.), E) Baths of Diocletian.

Before the Roman foundation in the mid first century A.D., Palmyra was a nomadic settlement placed in proximity to an oasis. The first construction of the city is the enclosed forum, built around 50 A.D. A primary 1,100 m. long colonnaded street, forms the monumental axis of the city, which, together with secondary colonnaded streets, connects all the major public monuments including the Diocletian's baths, the forum, the theatre, the triumphal arch, the *tetracylon* and the Temple of Ba'al which is the greatest temple of the Roman east. The colonnaded street is divided into smaller segments with slightly different orientations, therefore the triumphal arch and the *tetracylon*, which are both built around 200 A.D., are conceived as urban nodes which mark the change in direction and the intersection of other streets.

By the end of the first century A.D. the “urban armature” system becomes more important and more effective than the city plan itself. The city of Timgad, the colony built by Trajan in 100 A.D. represents one of the last applications of the grid-system. Regular grid-planning, a theoretical and abstract way to organize and subdivide the space of the city before its foundation and according to an external and global understanding of its structure, is progressively substituted by the diffusion of the “urban armature”, an organizing system that seems to be incrementally generated from within the city and that physically materializes all the spatial connections between the main public spaces and monuments. The “urban armature” represents the systematic solidification of the public-space structure, organized according to a hierarchic articulation of the main and the secondary streets. Once a visitor enters a Roman city through the main Gate he can unconsciously “navigate”

throughout the city, even without knowing it, just following the urban armature. Colonnaded avenues clearly indicate the way and monumental archways, which can be seen from far away, immediately show the most important urban nodes. Nothing could be more different from a homogenous bi-dimensional grid plan system.

According to MacDonald *“Contrasts between city plans and armatures are revealing. Planning places things, whereas armatures, with their architecture of connection and passage, identify them and tell where they are. Planning is applied all at once; armatures are the products of the passage of time, of a process energized not by the work of a corps of professionals but by the imperial synthesis. The contrast throws the heavy concentration of planning studies on orthogonal patterns of Republican and Augustan times into sharp relief and emphasizes the fairly rapid disintegration of the orderly principles of early times. True orthogonal planning dwindled as erratic street patterns appeared ever more frequently. New or rebuilt quarters were often deliberately laid out with more or less parallel streets that met their cross streets at odd angles, and besides long-established towns of orthogonal plan, new districts sprang up willy-nilly, entirely unplanned. The taste for precise reticulation almost disappeared in the high imperial age, and the elaborated armature, flexible and adaptable and with no set plan, flourished.”*¹²³

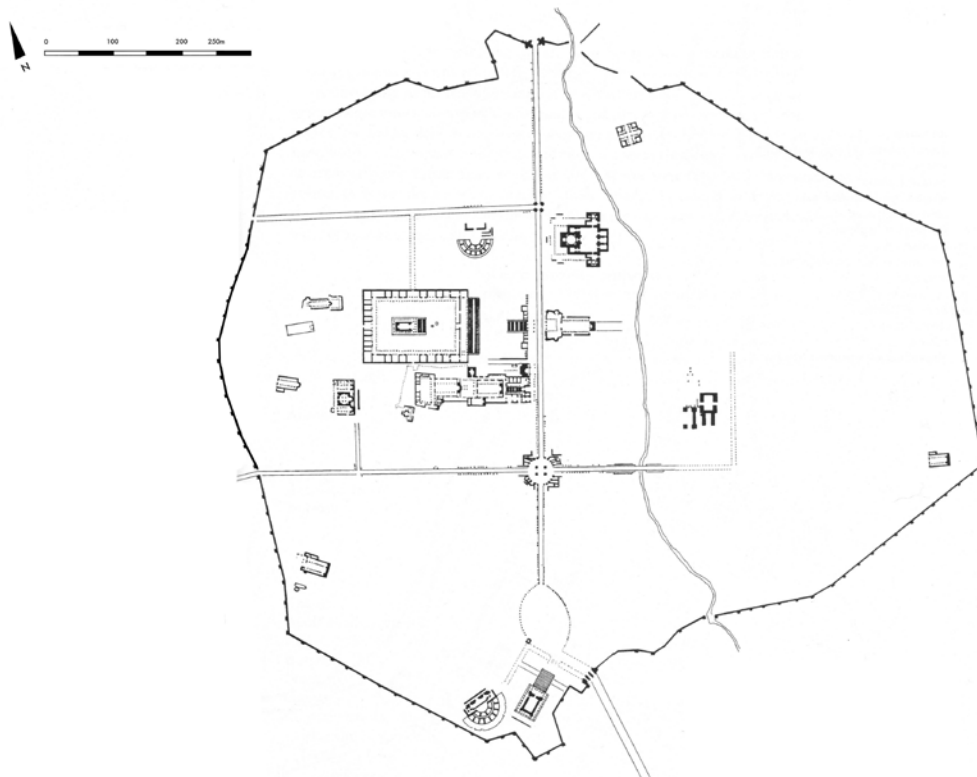


FIG. 97 The Urban armature of Gerasa

¹²³ Ibid., p. 25.



FIG. 98 The Urban armature of Gerasa

The expansion of the Roman empire culminates in 117 A.D., when the emperor Trajan dies. If we keep in mind the diagram representing the economic growth, we can notice, not surprisingly, that this period coincides with the peak in the expansion of maritime commerce. In terms of architecture and urban design, this same diagram could represent the expansion of the design scale throughout ancient history. From the attention to the sculptural details and the focus on the smaller constituent elements of the archaic Greek temple, through the large-scale sanctuaries and urban ensembles of the Hellenistic period, to the urban “total design” of the imperial period, the first century A.D. marks the maximum expansion of design scale. The urban grid layout, as we have seen from its first known application in the Magna Graecia colony of Megara Hyblaea, is primarily the most rational system to subdivide land and an urban planning system commonly used in a period of colonial expansion. Therefore it is not a coincidence if the culmination of the Roman Empire and the intention to maintain peace throughout the empire avoiding expansionism, coincides with the progressive abandonment of the grid-plan system.

Even in sculpture the Hellenistic tendency towards complex compositions and large-scale sculptural groups reaches the apex during the first century A.D. as the Laocoön and the Sperlonga Group demonstrate.



FIG. 99 *Laocoön and His Sons*, monumental sculpture in marble, Vatican Museums, Rome. (ca. 25 B.C.)

Pliny the Elder in his *"The Natural History"* describes the Laocoön group in this way (XXXVI, 37): *"the Laocoon, which stands in the palace of the Emperor Titus, is a work to be preferred to all that the arts of painting and sculpture have produced."* The Laocoön sculpture will have a strong influence in the late renaissance period. After being discovered in 1506 and placed at the Vatican Museums, Pope Julius II asks the architect Giuliano da Sangallo and his colleague Michelangelo Buonarroti to come and see it. The extreme torsion of Michelangelo's figures, both in sculpture and painting, are clearly inspired by this sculpture and by its incredibly complex and almost "baroque" composition. The date of this sculptural group has been disputed for long time and a definitive answer whether this sculpture is an original Roman creation or a modified copy of an earlier Hellenistic model has not been found yet. Pliny the Elder attributes it to three sculptors who come from the island of Rhodes: Agesander,

Athenodoros and Polydorus. They probably lived between the late first century B.C. and the first century A.D. This interpretation has been confirmed by another, more recent, astonishing discovery: the Sperlonga group found in the “grotto of Tiberius” in 1957 on the coast of Latium south of Rome. The name of the town Sperlonga probably comes from its famous natural cave since *spelunca* in Latin means cavern. In the “grotto of Tiberius” there is an inscription with the signatures of the Agesander, Athenodoros and Polydorus, and a large sculptural group, for many aspects similar to the Laocoön, which represents the adventures of Odysseus. In the case of the Sperlonga group it can be more easily argued that the sculptural group seems specifically designed for this location. According to Sorcha Carey, who considers the case of Sperlonga within a larger imperial tradition of grottoes and nymphaea decorated with Polyphemus groups, : *“The display was designed to emphasize the sculptures’ illusionistic qualities, so the blinding of Polyphemus was set in a dark recess to the back of the cave, while the Scylla group rose out of the pool at the grotto’s centre, transforming its calm waters into a spectacular struggle between monster and hero. The local area surrounding the villa complex and its grotto only enhanced this sculptured theatre, for it was here that Odysseus was said to have experienced many of his adventures. Across the bay, in plain view of the villa complex, rises Monte Circeo, called after the island in which Circe was said to have imprisoned Odysseus and his companions. The cave and its sculptures presented a vivid theatrical tableau to the diners on the island triclinium built into the pool outside, and indeed, like a theatre, came complete with seats for spectators, on either side as you entered the cave.”*¹²⁴



FIG. 100 Sperlonga, Cyclops group, blinding of Polyphemus, Sperlonga archeological Museum. (Installation of the sculptures ca. 4-26 A.D.)

¹²⁴ Carey, Sorcha. 2002. A tradition of adventures in the imperial grotto. *Greece & Rome* 49 (1) (Apr.): pp. 47-48.

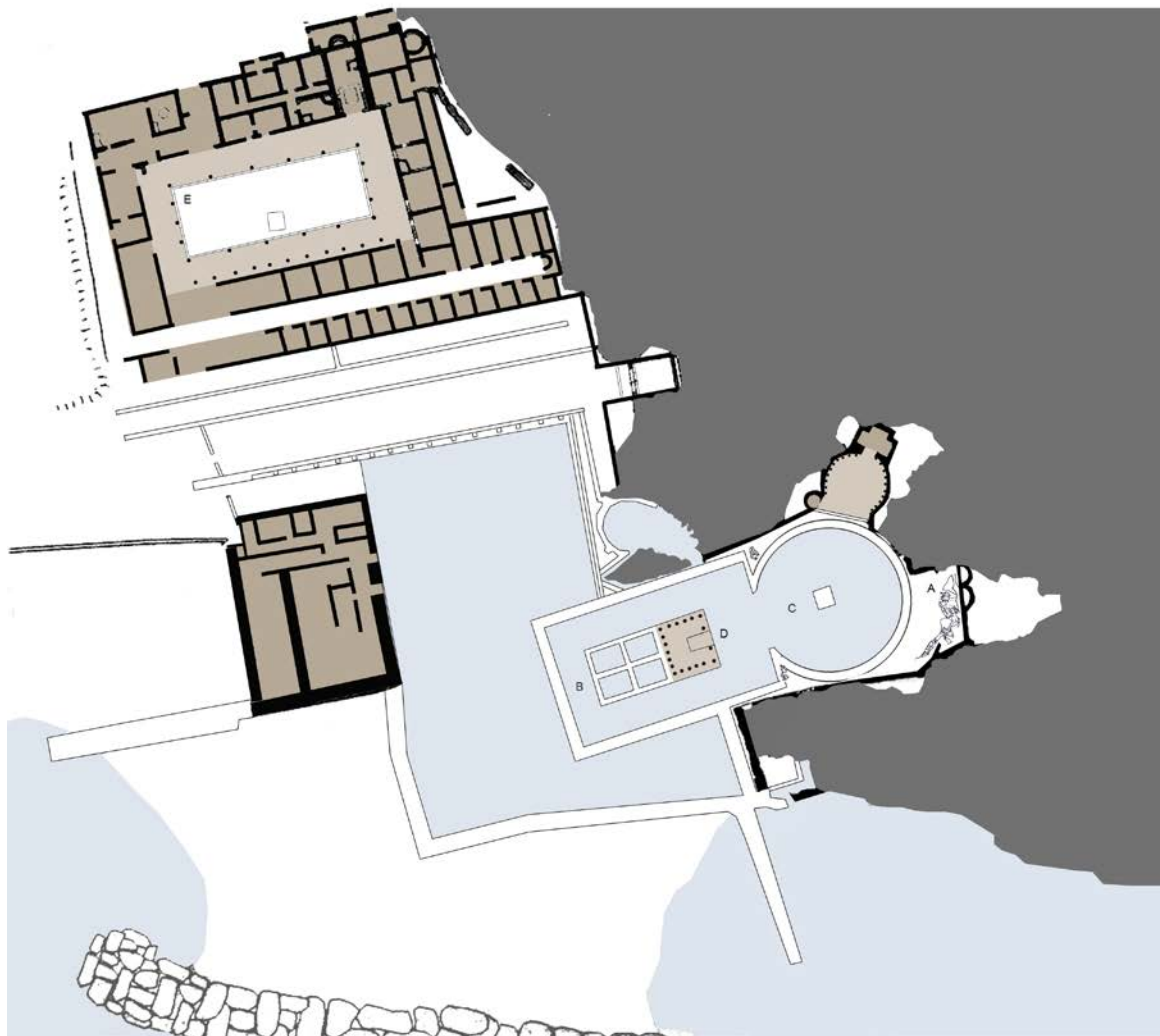
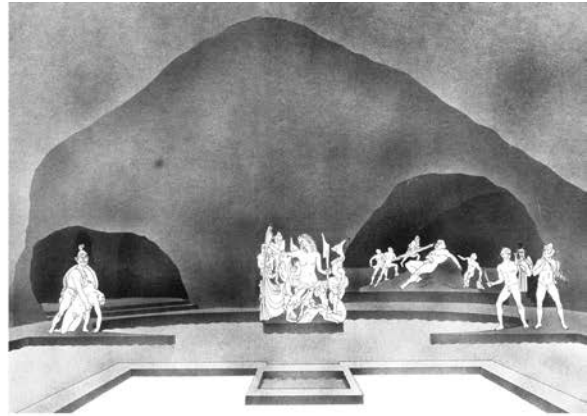
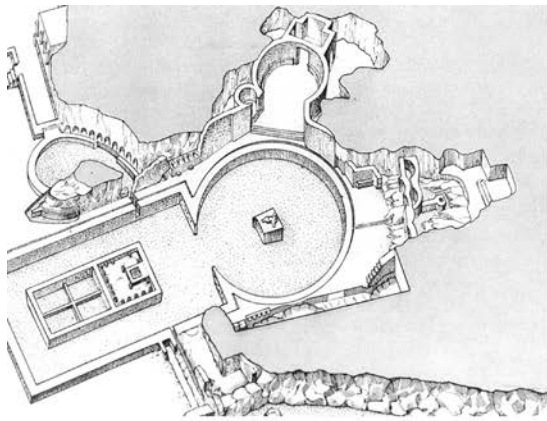


FIG. 101 Plan of the Grotto of Tiberius (14-37 A.D.), Sperlonga: A) Cyclops group, B) Rectangular pool, C) Circular pool with the Scylla group in the middle, D) Triclinium, E) Villa of Tiberius

The natural *grotto* is part of the complex of the Villa of Tiberius, and its internal space has been architecturally arranged with pools, a central triclinium and an oval artificial grotto. All the sculptures seem to be part of a larger architectural program and are carved in the same marble by the same workshop: most probably the same of the Laocoön. Besides the issue of the date of the Sperlonga group, the “Grotto of Tiberius” is highly emblematic because it shows a growing interest for cave-like chthonic spaces very often associated with water. The increasing number of monumental public fountains, *nymphaea* and monumental baths throughout the empire documents the progressive shift of focus of architects towards the development of an interior space, usually defined by curved massive walls and covered with domes or semi-domes, which is clearly inspired by natural *grottos*.

If the first century A.D. represents the moment in which design reaches its maximum scale, both in architecture and sculpture, the inevitable process of reduction of scale that will follow is marked by the transition from a primary focus on enclosed urban spaces, typical of the Hellenistic *agora* and the early imperial *forum*, to a progressive development of interior space. To follow the beginning of this development we have to move to Rome, because it is there that a new kind of architecture -primarily generated around an interior space- is produced with the use of concrete and vaulting techniques. According to MacDonald “*In the whole body of architecture in Roman lands, the most striking and fundamental change in stylistic direction took place during the latter half of the first century and the early decades of the second. It was then that the sculptured, linear forms of the classical past were first firmly challenged by the canopied volumes of the future. The vital significance of this shift for the history of architecture has been generally recognized, but the principles and meaning of the new style have not been explored in detail.*”¹²⁵ According to many scholars the first building in which the beginning of this new kind of architecture becomes evident is Nero’s *Domus Aurea*, built between 64 and 68 A.D. on one side of the Oppian Hill. This villa is part of a larger landscape project composed of a park with a large artificial lake. The *Domus Aurea* basically defines a sort of architectural front for the Oppian Hill in which it’s partly recessed. Its spaces are not yet completely excavated and scholars have given different interpretations regarding its topography. According to Gregory Warden “*The general picture provided by what is admittedly rather fragmentary evidence is that the Domus Aurea centered on the artificial lake and hugged the slopes of the surrounding hills, using these slopes as a kind of backdrop for buildings which were hardly more than theatrical facades for elaborate landscape effects. There seems to have been little concern for the crests of the hills.*”¹²⁶ Boethius considers the *Domus Aurea* a portico villa, since its major feature is the long front portico, which faces the landscape. But it is probably the backside, and its physically strict relationship with the hill which is more relevant, because the villa appears in plan as a sort of artificial and architectural version of a group of natural *grottos* or *caves*.

¹²⁵ MacDonald, William L.. 1965. The architecture of the roman empire. Yale publications in the history of art ; 17. New Haven: Yale University Press: Preface p. IX.

¹²⁶ Warden, P. Gregory. 1981. The domus aurea reconsidered. Journal of the Society of Architectural Historians 40 (4) (Dec.): pp. 274.

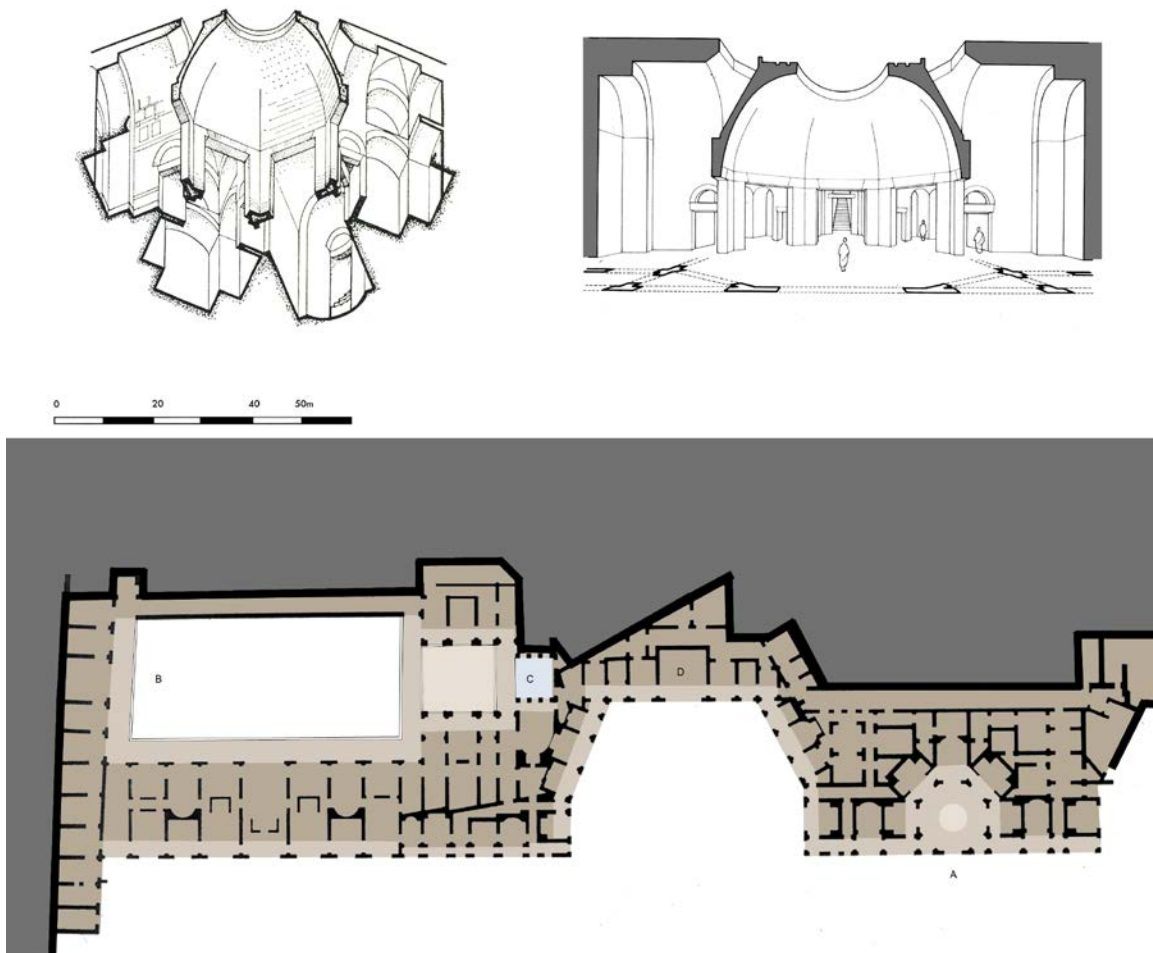


FIG. 102 Domus Aurea (64-68 A.D.), Rome. On the top: Axonometric view and section of the Octagonal room. On the bottom: Plan of the Domus Aurea: A) Octagonal Room, B) Courtyard, C) Nymphaeum, artificial grotto with fountain D) Barrel vaulted room.

The *octagonal room*, an incredibly sophisticated space in which the development of interior space is for the first time fully evident, represents a sort of rationalized *grotto* sunken into the hill. In its centralized space we can find all the characteristics of the later imperial architecture: the interior centrally planned space, the use of concrete and massive walls, the zenithal light, the use of niches and the development of domes and curved surfaces. In the octagonal room according to Perkins, all these aspects converge upon a single building: “already, for example, in the Roman architecture of the Late Republic one can detect a growing awareness of properties of interior space. This is the essential difference between the Greek stoa and the Roman Basilica and it is none the less significant for being in other respects contained within the rigidly rectilinear framework of a conventional classicism. Seen from this point of view the Basilica Ulpia and the central hall of Trajan’s Market are the collateral

branches of a single Roman tradition. Hardly less significant was the growing taste, already evident in Augustan times, for curvilinear or polygonal forms, a taste for which the wealthy seaside villas, with their spreading porticos, their fountains, and their tempietti, afforded such ample scope."¹²⁷ The octagonal room also represents the first time in which concrete is used to explore spatial forms in architecture. The high resistance of Roman concrete, testified by the fact that many Roman constructions are still standing today, is generated by the addition of *pozzolana*, a volcanic substance which makes the concrete more resistant and waterproof. This new material is used since the second century B.C. for engineering works such as the underground structure of maritime ports and utilitarian constructions.

The *Domus aurea* will be discovered during the renaissance when a young Roman inadvertently falls down from the upper surface of the hill into one of his *chthonic* rooms completely painted with *fourth style frescos*. The name *grotesque* attributed to this kind of style comes from the same word *grotto*, and is related to the fact that the discovered rooms of the *Domus Aurea* are initially interpreted as *caves*. Even Pinturicchio, Raphael and Michelangelo penetrate into these underground hollow rooms to see the frescos, remaining deeply influenced by them. The connection between the *Domus Aurea* and the "Grotto of Tiberius" is documented by the fact that the "Oval grotto" of Sperlonga, placed in proximity to the circular pool, is built during Nero's time. We can arguably suppose that Nero might have used the villa of his predecessor. This assumption is supported by the fact that in the *Domus Aurea* there is a mosaic representing Odysseus and Polyphemus similarly to the Sperlonga sculptural group. Furthermore the presence of the water is an essential feature also in Nero's villa in Rome, as we can suppose from the presence of the artificial lake built by Nero in front of it - on the site where the Coliseum will be built - and from the Nymphaeum placed in axis with the courtyard of the villa.

If we ideally follow the origin of the water of Rome to its natural sources we can also better understand the origin of the new "chthonic" architecture generated by the use of concrete and vaulted structures. Besides the water of the Tiber and some springs most of the water is drawn from the hills to the south of Rome and especially from the area east of the city near Tivoli. Here the water of the river *Aniene* is captured and transferred to Rome since 133 B.C. when Praetor Quinto Marcio builds the 90-km-long *Aqua Marcia* aqueduct. Christian Norberg-Schulz has described the peculiar landscape dug by the water in this area around Rome in his "Genius Loci", claiming with valid arguments that this natural environment might have had an *imprinting* effect on the Etruscan and Romans space sensibilities. According to Norberg-Schulz: "*The Roman region is of volcanic origin. To the west and on both sides of the Tiber, the land is covered by a thick crust of old lava and ash which is known as Tufa. During the millennia water courses have dug deep valleys and ravines in the volcanic crust, in Italian called forre. The forre appear as surprising interruptions of the flat or rolling campagna, and as they are ramified and interconnected, they constitute a kind of "urban"*

¹²⁷ Ward-Perkins, J. B. 1994. Roman imperial architecture. Yale university press pelican history of art. New Haven: Yale University Press: p. 101.

network of paths, a kind of “underworld” profoundly different from the everyday surface above”¹²⁸.



FIG. 103 Tivoli and the water throughout history. On the top: The waterfall of Tivoli, On the left side: “Waterfall at Tivoli Sun” by Teerlink Abraham, On the right side: “The waterfalls of Tivoli” by Giovanni Battista Piranesi. In the middle: Villa Adriana, Roman period (118-134 A.D.). On the left: Canopo. On the right: Maritime Theater. On the bottom: late Renaissance period, Villa d’Este, Tivoli (1550-1600)

¹²⁸ Norberg-Schulz, Christian. 1980. Genius loci : Towards a phenomenology of architecture. New York: Rizzoli: p. 144.

The natural “underworld” of the *forre* is not only a prototypical enclosed interior space but also a clear spatial prototype for the traditional Roman urban fabric in which the voids of streets and enclosed spaces seem to be dug from a solid block like in the *forre*.

The town of Tivoli dominates this kind of “Dionysian” subterranean landscape which has been dug by the river *Aniene* throughout the centuries before being partially deviated towards Rome by the Roman aqueducts. The relation between Tivoli, its landscape and the presence of water is a dominant “*topos*” of architecture and art history. We can find it in Roman literature and architecture, as Villa Adriana demonstrates, during the entire Renaissance, like in the case of Villa d'Este, and even in the Baroque period because Tivoli is a canonical stop during the “grand tour”. The most recent famous representation of Tivoli's waterfall is probably the emblematic watercolor of the Romantic artist William Turner.

It is in this location, between the second and the first century B.C., that a great sanctuary dedicated to *Hercules Victor* is built along the *Via Tiburtina*, the road which connects Rome with *Tibur*, the Etruscan and Roman name for Tivoli. This Republican sanctuary, similarly to the *Sanctuary of Fortuna Primigenia* in Praeneste, is built on a high platform which dominates the landscape not far from the Tivoli waterfall, whose presence is constantly indicated by the roar of the water. The platform of the temple is accessible through a theater-like staircase which is very similar to the *curia-comitium* complexes of the early Roman Colonies like Cosa, Paestum, Alba Fucens and Fregellae. The “U” shape disposition of the portico which surrounds the central temple is clearly derived from the Hellenistic sanctuaries. What's really innovative in this sanctuary is, paradoxically, what is less visible. Its platform is a completely artificial construction and in its underground chthonic spaces we can recognize the origin of the development of an interior space formed by concrete vaulted structures. The *Tiburtina* road crosses the platform at this underground level, through a sort of artificial barrel-vaulted hall naturally lighted by a series of zenithal openings. The vaulted chambers, which open onto the main hall at right angles are used as *shops* and *tabernae*, because this underground space is at the same time a circulation tunnel and a market. The location of a market in this underground place may seem unusual but if we think of the way in which airports and stations are conceived even nowadays, the reasons for this solution are more evident: what better place for a market than along an obliged passageway? The *Tiburtina* road is highly trafficked and is furthermore used by shepherds when they move their sheep during transhumance since this is a very pastoral region. The sanctuary itself is built over an older *forum pecuarium* (sheep market) because Hercules Victor is considered a protector of the shepherds travelling along the road. The flanks of the terrace are supported by arched structures separated by massive engaged buttresses, whereas the upper building is formed by vaulted porticos with engaged semi-columns made of the same concrete as the walls. This solution marks a clear differentiation from the classical and Hellenistic tectonic use of the classical orders. Furthermore the purely decorative system formed by vaulted porticos and semi-columns will become a distinctive Roman architecture feature.

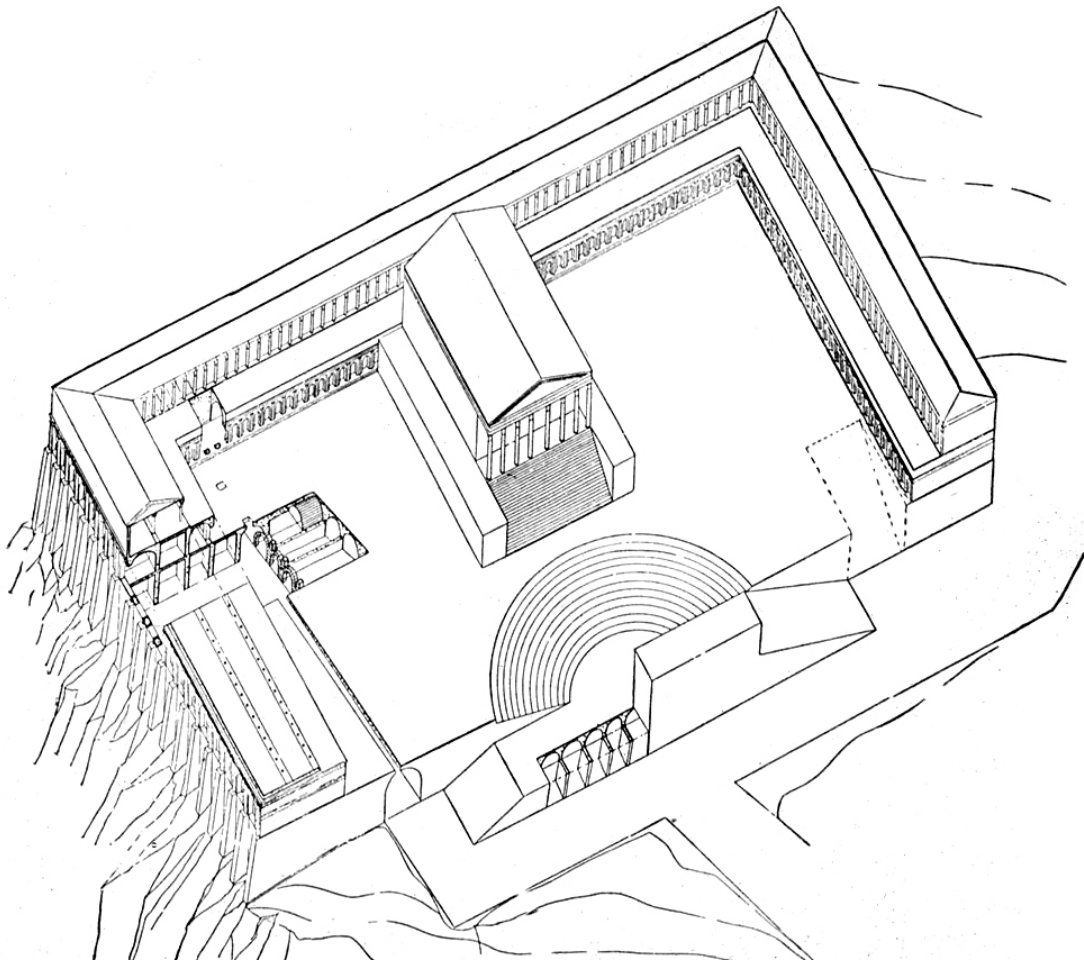
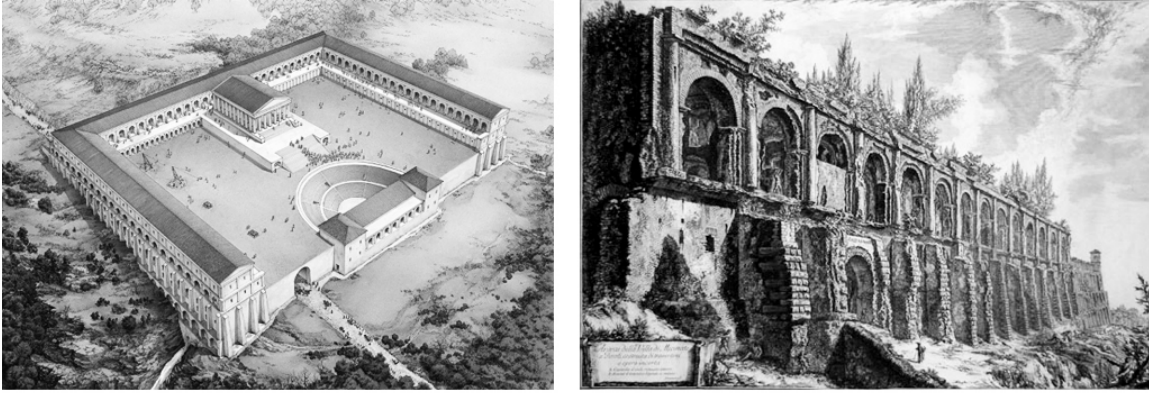


FIG. 104 Sanctuary of Hercules Victor in Tivoli. On the top, left side: reconstruction drawing of the Sanctuary, On the top, right side: "Avanzi della Villa di Mecenate a Tivoli." Exterior view of the so-called Villa di Mecenate at Tivoli, which is identified as the Sanctuary of Hercules Victor, By Piranesi. On the bottom: axonometric view with a section through the underground passage-market along Via Tiburtina.

This same façade system is later on used in the Basilicas of the Roman forum and in the Tabularium, as well as in the Coliseum and the Theater of Marcellus.

The *Forum Romanum* in **Rome** is the result of a long process of incremental transformation and modification of the original layout which dates from the archaic period. The archaic buildings such as the first temple of *Vesta*, the *regia* and the *curia-comitium* complex are built around the seventh century B.C. by Rome's kings Numa Pompilius and Tullus Hostilius. A major transformation happens with Julius Caesar (100-44 B.C.) who starts the works for the new *curia*, the *Basilica Julia*, the reconstruction of the *basilica Aemilia* and the *Rostra* in the Roman forum, as well as the Theater of Marcellus and the *Saepta* in the *Campus Martius*, which is conceived as an expansion of the public space of the Roman forum. It's during this period that we can recognize the first consistent use of concrete with *pozzolana* for architectural constructions. The *Basilica Julia*, built by Caesar is typologically very similar to its predecessor in the Roman forum and to the earlier basilicas of the Roman Republic such as those in Cosa and Pompeii. The most relevant difference is in terms of construction techniques and style. The trabeated columnar system, which is based on the classic "tectonic" structure used since the Greek archaic period, is substituted by a system formed by arched massive pillars and concrete barrel vaults. Like in the case of the sanctuary of Hercules Victor in Tivoli, the engaged semi-columns are only part of the decorative "apparatus".

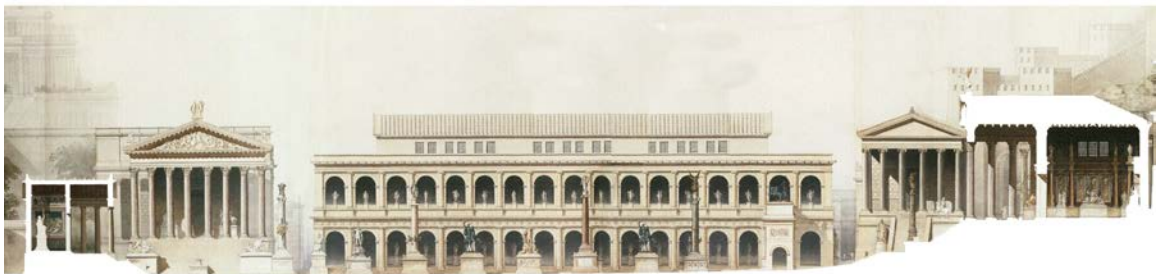
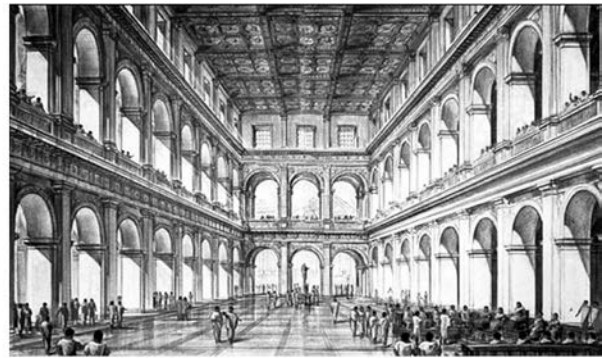


FIG. 105 Roman Forum. On the top, left side: Reconstruction drawing. The Tabularium behind the forum creates a backdrop enclosing its space. On the top, right side: Reconstruction drawing of the interior

space of the Basilica Julia. On the Bottom Reconstruction drawing with the façade of the Basilica Julia in the middle, section through the Roman Forum, by Ferdinand Dutert, 1874.



FIG. 106 Plan of the Roman forum in Rome. A) Curia Iulia (44 B.C.), B) Basilica Aemilia (179 B.C.), C) Temple of Antoninus and Faustina (141 A.D.), D) Temple of Caesar (29 B.C.), E) Temple of Vesta (first century B.C.), F) House of the Vestals, G) Temple of Castor and Pollux, originally built in 495 B.C. and

rebuilt (6 A.D.), H) Temple of Divus Augustus (37 A.D.), I) Temple of Saturn built in 498 B.C. and rebuilt (42 B.C.), L) Basilica Julia (46 B.C.), M) Temple of Vespasian and Titus (79 A.D.), N) Temple of Concord, built in 367 B.C. and rebuilt (121 B.C.), O) Arch of Septimius Severus (203 A.D.), P) Rostra (44 B.C.).

The *Basilica Aemilia* is more conservative in this regard, even though a two-storeyed portico façade with piers and arches is built along the southern side facing the forum to create an urban ensemble with the fronting façade of the Basilica Julia. It is in this period that the Carrara marble quarries start to be exploited for columns, pavements and wall-veneers together with other colored marbles coming from the empire. It is important to note that its general use is mainly decorative: this precious material is often applied onto cheaper and more practical structures made with concrete and bricks, defining a sort of thin decorative layer. This use is substantially different from the Greek “tectonic” use of stone and marble.

The lack of a clear plan in the development of the *roman forum* is quite evident from the plan. Rome, similarly to Athens during the classical and Hellenistic period, is a city incrementally accumulated throughout a long history in which the new principles of urban planning are applied with more difficulty. In this sense, we might consider both Athens and Rome as more conservative than the colonies in terms of urban planning, even though this is quite reasonable since in newly founded cities innovative urban design principles can be more easily applied. It is only in the new areas of the *Imperial Fora* and of the *Campus Martius* that a more rational planning approach can be found. However even in the older *Roman forum* it's possible to perceive, besides the lack of a regular layout, the attempt to define a clearly enclosed space. Its buildings, compared to those of the agora of *Athens*, define a much more dense space in which the two major *basilicae* flank a trapezoidal square enclosed on the other two sides by the temples. The construction of the *Tabularium* on the front slope of the Capitoline Hill clearly emphasizes the enclosure of the *Roman forum* creating a theatrical backdrop behind the major temples. The porticos of the two basilicas and the trapezoidal square of the forum represent altogether a sort of disarticulated version of the *Campidoglio* Square which will be designed by Michelangelo during the late renaissance in continuation with the same axis and in proximity to the Roman forum on the remains of the *Tabularium*. We may wonder if in Michelangelo's plan there is any intentional attempt to define a sort of regularized mirror image of the Roman forum, even though the setting of the *Campidoglio* on the Capitol hill is quite different from the orographic depression in which the *forum* is built.

The tendency towards a more regularized forum space in Rome is started by Caesar who decides to build a new *forum*, the first one in the area the **Imperial Fora**. Its plan, defined by an enclosed space framed on three sides by colonnades and dominated to the north by the Temple of *Venus Genetrix*, is clearly based on the model of the earlier Italic forums built during the Roman Republic. Its strict relation with the *Curia Julia*, also built by Cesar in 44 B.C., is typical of the earlier examples. Cesar's *forum* defines a clear pattern that will be followed, in terms of orientation and typology by the *forums* of following Emperors. Augustus completes the forum of Caesar after his death and since he promises a temple to *Mars "the Avenger"* during the battle at Philippi in 42 B.C., he builds another forum, in the same area, with a temple dedicated to Mars. In this case the orientation is perpendicular to

the axis of the previous forum. A 33 m high rear wall is placed behind the temple, probably as a fire wall, defining nonetheless a backdrop for the temple.

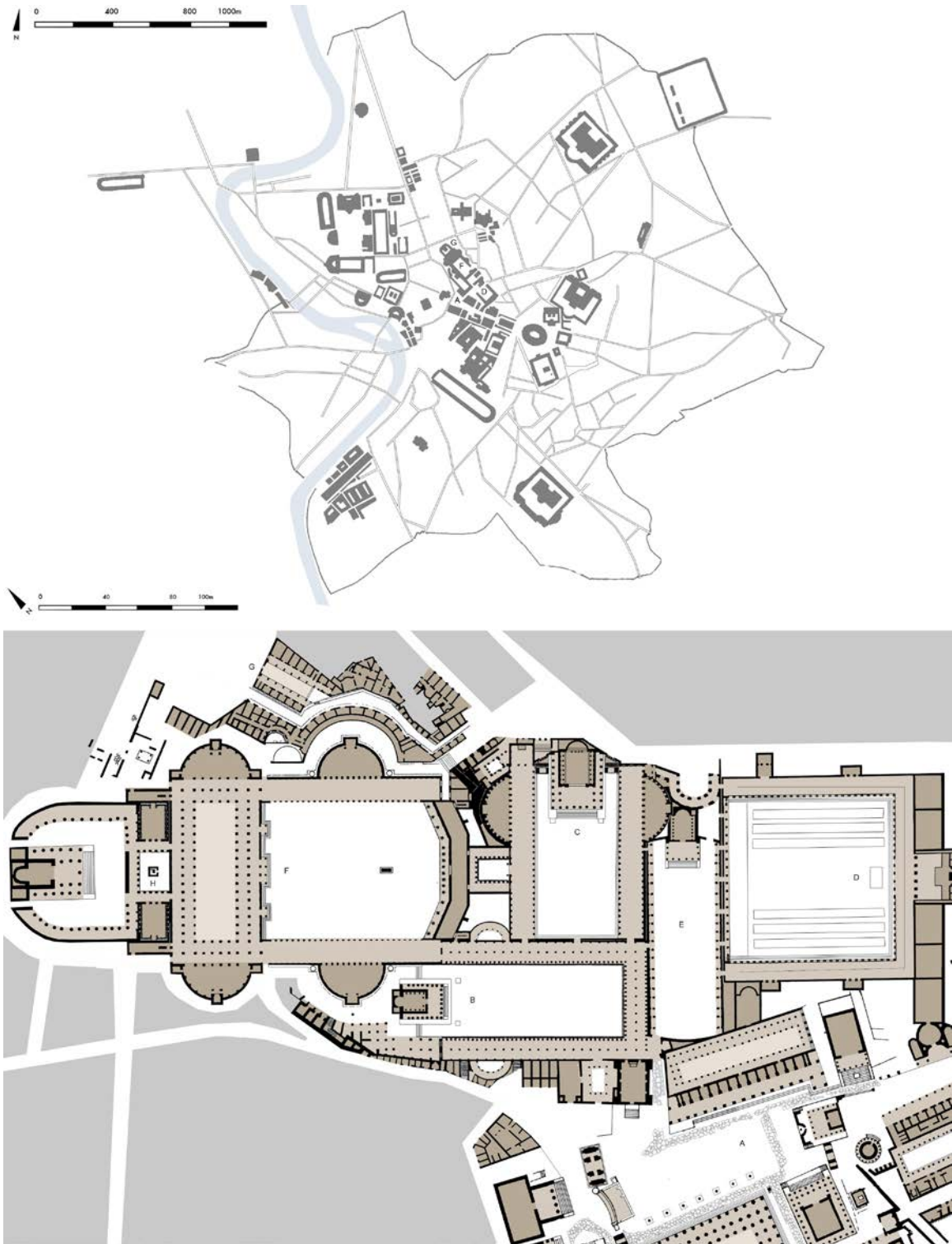


FIG. 107 Plan of the Imperial Fora in Rome. A) Roman Forum, B) Forum of Caesar (46 B.C.), C) Forum of Augustus (14 A.D.), D) Templum Pacis, Precinct of Peace (75 A.D.), E) Forum Transitorium, or Forum

Nerva (97 A.D.), F) Forum of Trajan and Basilica Ulpia (106-112 A.D.), G) Trajan's Market (113 A.D.), H Trajan's Column (113 A.D.)

Two roofed symmetric hemicycles, with statue-niches placed along its curved walls and a central recess for a colossal statue, are located on both sides of the forum. The *Templum Pacis*, dedicated to Peace and built by Vespasian to serve as a museum and library, has no *temple* and is formed by a portico built on three sides. Between the *Templum Pacis* and the *Forum of Augustus*, Nerva builds the *Forum Transitorium*, which is a sort of transitional area and a monumental thoroughfare along the *Argiletum*, a street which connects the artisan and merchant quarter of Rome called *Subura* with the Roman passing between the *Curia Julia* and the *Basilica Aemilia*. The narrow space of the forum doesn't allow a full portico colonnade, therefore the architect of the forum has designed pilasters with an entablature connected with detached paired columns.

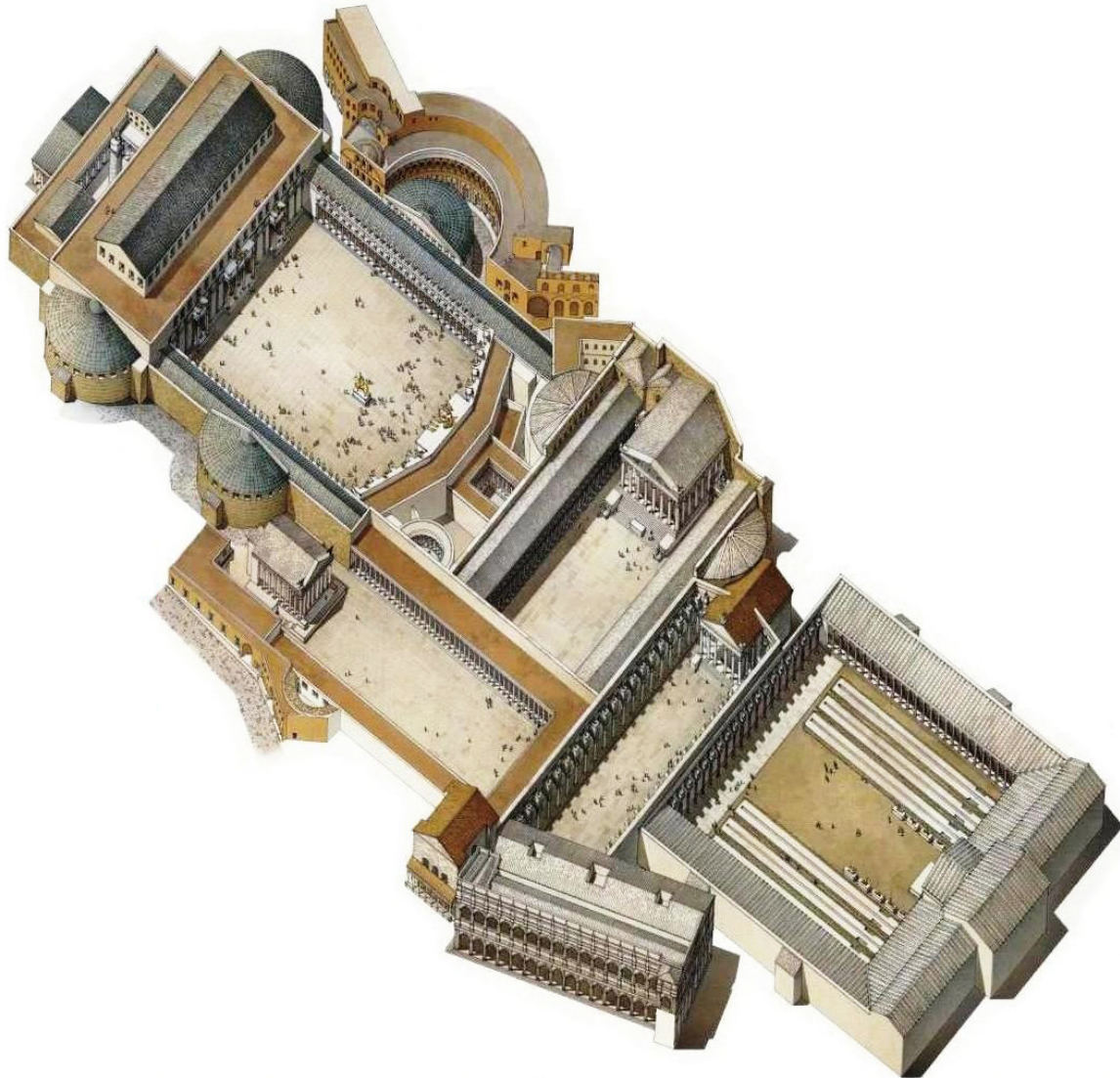


FIG. 108 Reconstruction drawing of the Imperial Fora in Rome.



FIG. 109 Section through the axis that connects the Templum Pacis, through the forum of Trajan and the Basilica Ulpia, to the Trajan's column. Reconstruction drawing by Julien Guadet, 1867.

The *Forum of Trajan*, the *Basilica Ulpia*, the *Trajan's column* and the *Trajan's market* represent altogether a unified complex designed by the architect Apollodorus of Damascus. Furthermore this *forum* seems to give unity to the entire *Imperial Fora*, because, as Blanckenhagen has noted, there are numerous alignments between the last and the previous *Fora*, the most remarkable of which is the axis that runs through the *Templum Pacis*, through the forum of Trajan and the *Basilica Ulpia*, to the *Trajan's column*. According to Blanckenhagen: "For me there can be no doubt that Apollodorus, the architect of the *Forum of Trajan*, conceived of his *Forum* as the final unifying element of the entire complex. At the ends of this axis were the *Temple of Peace* and the temple of the deified Trajan who had established peace for almost a full century. Museums and libraries were close to these two temples, establishing the symbols of the Roman Empire as that force which had pacified the world and spread civilization. The hills which surrounded the *Forum of Trajan* provided a monumental backdrop of lofty civic buildings. Every Roman walking through the five *fora* could enjoy each of them separately, could be reminded of his great past and great present in all aspects, and upon reflection could finally recognize a regularity which gave the old elements of axiality and symmetry a new significance and a deeper meaning."¹²⁹

Furthermore in Trajan's forum we can clearly perceive the typological transition from the enclosed space of the *forum* to the interior space of the *basilica*. In the analysis of the earlier *Fora* of Pompeii and Cosa I have already tried to show the analogies between the colonnaded enclosure of the *forum* and the internal peristyle of the *basilica* typology. In the case of the Trajan's forum and the *Basilica Ulpia* this same analogy seems to be almost intentionally expressed by its designer, because the two spaces have the same width and alignments. Furthermore they both have the two similar lateral hemicycles. It's almost as if Apollodorus of Damascus wants to show that these two spaces, an enclosed urban space and an architectural interior, are analogous.

¹²⁹ Peter H. von Blanckenhagen. 1954. The imperial fora. *Journal of the Society of Architectural Historians* 13 (4) (Dec.): p.26.



FIG. 110 Model of Rome as it appeared at the time of Constantine (AD 306-337), when the city had reached its greatest size. Constructed by Italo Gismondi from 1933-1937, later extended, and restored in 1990-1991



FIG. 111 View along the main symmetry axis through the remaining internal columns of the Basilica Ulpia to the Trajan's column.

According to James E. Packer “Where space permitted in the later fora, hemicycles or rectangular recesses augmented the flanking colonnades. The resulting architectural ensembles resembled simplified basilicas.”¹³⁰

The end of the first century A.D. represents the moment in which the progressive enclosure of urban space, which generally starts during the Hellenistic period and terminates in the denser enclosure of the Roman forum, and the parallel growing architectural interest for internal space almost merge together. If in the earlier cases the *Basilica* represented a sort auxiliary roofed space for the *forum*, in the case of the *forum* designed by Apollodorus of Damascus the relationship between the urban space and the architectural interior space is perfectly balanced. Interior and exterior spaces seem to have equal value and this is generally valid, during this period, also for the larger urban fabric in which solids and voids are highly amalgamated and interconnected and where it's difficult to decipher if voids are truly interior or exterior. However this sort of internal-external balance is historically “unstable”: the tendency in the following centuries is towards an even stronger predominance of interior space. The external colonnaded portico, like in the case of the Pantheon, will be progressively reduced to the role of a forecourt placed as an entrance courtyard in front of the main monument.

¹³⁰ Packer, James E. 1997. Report from rome: The imperial fora, a retrospective. *American Journal of Archaeology* 101 (2) (Apr.): p. 328.

What does this process mean? Is the urban space becoming more “interiorized” and “domesticized” or is the “interior architectural space” trying to achieve an urban role? Probably these two interpretations are both valid and somehow coincide. Certainly the *imperial fora* represent an unusual aggregation of spatial units in which the urban prototype of the forum has been interiorized within a single architectural construction. However at the same time the perception of space within the Basilica Ulpia and more generally within the interior space of the new large monumental buildings, might have been not so different from the feeling that one would have in a colonnaded street or in an enclosed urban space: the only difference is the presence of the roof. What seems to emerge from this period is a particular condition in which there is an extreme continuity and almost no difference between exterior and interior space, and it is possible to argue that the dense urban fabric is the medium that allows this continuity.

If the Basilica Ulpia represents a sort of roofed version of the space of the forum, in the Trajan’s market built in proximity to the forum we can see a literary “roofed street” which serves as a shopping gallery. This main *market hall* is part of a larger commercial quarter with more than 170 individual shops which are built on different levels and linked by an elevated street called *Via Biberatica* as well as by stairs and internal porticos. According to Perkins the whole complex “is a remarkable example of the vaulted cellular system construction of which the Roman architects of the capital had already shown themselves masters, the unit throughout being the *taberna*, the single-roomed, wide-doored, barrel-vaulted shop of standard Roman commercial practice.”¹³¹



FIG. 112 Section through the commercial gallery of the Trajan's market complex.

¹³¹ Ward-Perkins, J. B. 1994. Roman imperial architecture. Yale university press pelican history of art. New Haven: Yale University Press: p. 89.

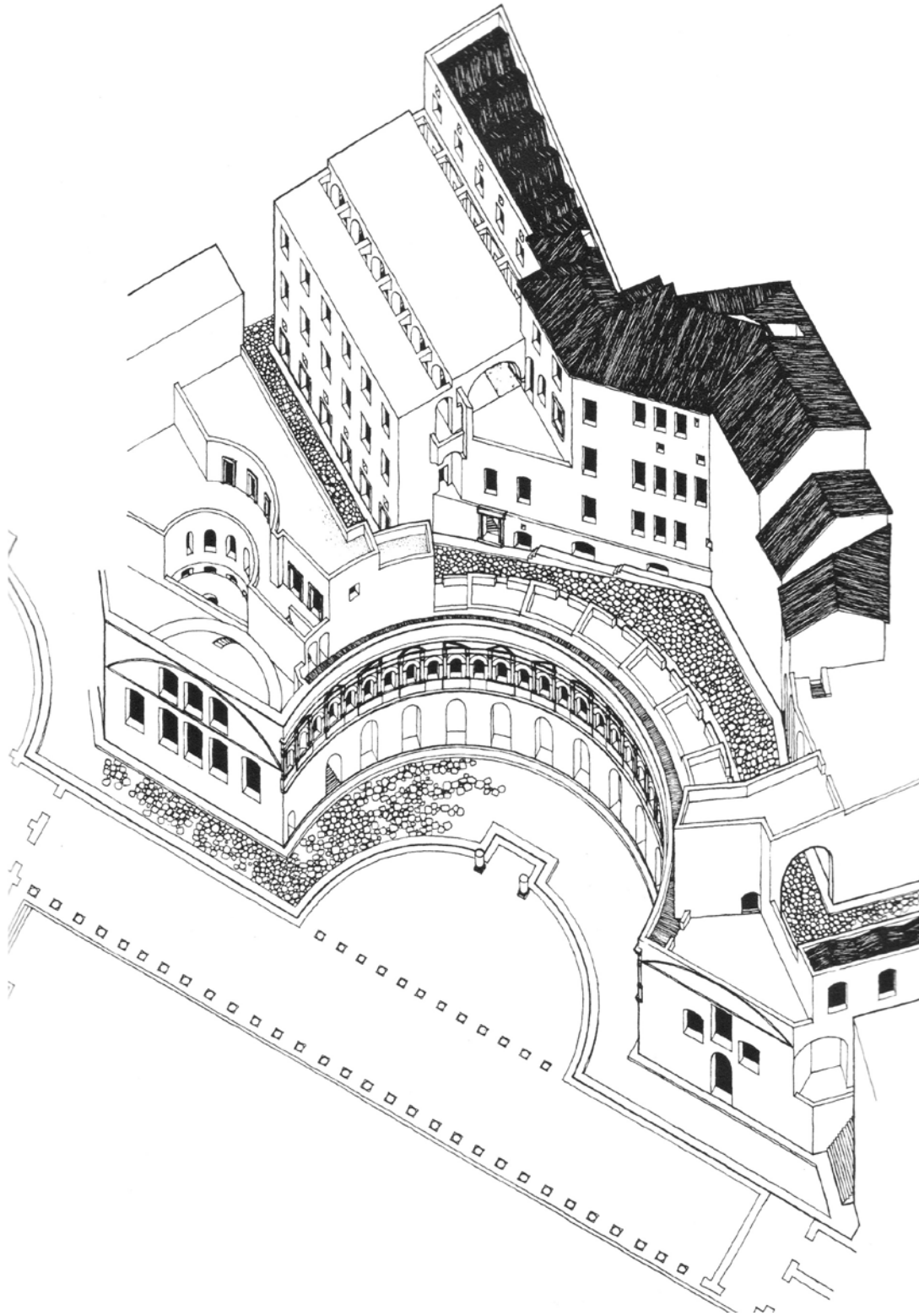


FIG. 113 Axonometric reconstruction drawing of the Trajan's market complex. From William MacDonald, "The architecture of the Roman Empire."



FIG. 114 Detail of the remains of Trajan's market: the whole complex is built of brick-faced concrete with travertine details. Similarly to Ostia, this new and simple use of the bricks, together with a façade system based on the rhythm of windows, determines the general appearance of Rome after the fire of 64.

The main hall is covered by six transverse barrel vaults which form a long canopy of concrete supported by fourteen piers. The complexity of this structure can only be compared with the central bath halls of the large thermal complexes.

The external appearance of the complex is determined by an unpretentious use of exposed bricks with few travertine details. The intention of using modest materials for the exterior and more precious materials like marble for the interior is in itself indicative of the progressive shift of focus of Roman architects. However, even with the simple use of bricks, Apollodorus manages to articulate the façade in a really elegant way. The system of pilasters and entablature that delicately emerges between the arched windows is clearly only a decorative apparatus: what really matters is the massive presence of the curved brick-wall and the vibration effect produced by the bricks pattern and by the rhythm of the openings. In general it's possible to say that Roman façades, similarly to the Roman urban fabric, are primarily determined by the alternation of solids and voids.

As Perkins has correctly noted, the way we perceive this façade today can be misleading because the high walls of the Trajan forum have disappeared and curved façade has now a wide open space in front of it. Originally its brick curved wall, which forms a series of shops at the ground floor, would be perceived from a narrow curved street placed behind the forum and shaped by its large hemicycle. From the bottom of this street space, which can be compared to a small canyon or a natural "*forra*" using Christian Norberg-Schulz's analogy,

the high curved wall would probably be much more dominant and the texture produced by the bricks pattern and by the “low relief” decorations would be certainly more emphasized. However even considering the Market complex in the contemporary context, we can realize how much its mass is mimetically integrated within the urban fabric. This is the result of the fact that the Roman façade system, basically defined by solids and voids and essentially expressed by the rhythmic use of windows, is the same façade method which is used in the more recent palaces that surround the complex and, even though it may seem a banal and obvious system, it’s fundamentally the same system which is still used nowadays.



FIG. 115 View of the Trajan's market in its current location.

The death of Trajan in 117 A.D. marks the end of an era. He leaves the empire in a period of peace at its maximum expansion. As we have seen before, this period corresponds to the peak in economic growth and -for what concerns this analysis- the maximum expansion in design scale. His follower Hadrian, a humanist interested in architecture, intentionally promotes the consolidation of the Empire borders dedicating his efforts to maintain peace and to a “civic” administration.

The end of Trajan marks also the end - a cruel end according to the senator Dio Cassius - of his favorite architect, Apollodorus of Damascus. As it is usual in the analysis of the ancient sources, it’s difficult to distinguish between history and legend or between real facts and “gossip” or minor conspiracy theories, however Dio Cassius says that Apollodorus of Damascus is sentenced to death by Hadrian for this reason (Book 69): *“But [Hadrian] first banished and later put to death Apollodorus, the architect who had built the various creations of Trajan in Rome – the forum, the concert hall, and the baths. The reason assigned was that he had been guilty of some misdemeanor; but the true reason was that once when Trajan was consulting him on some point about the buildings he said to Hadrian, who had interrupted with some remark: “Be off, and draw your pumpkins. You don’t understand any of these matters”- it chanced that Hadrian at the time was pluming himself upon such drawing”*. The reference to the “pumpkins” must be related to the umbrella-like dome of the *serapeum* in Villa Adriana designed by Hadrian himself. According to Dio Cassius *“When he became emperor, therefore, he remembered this slight and would not endure the man’s freedom of speech. He sent him the design of the Temple of Venus in Rome by way of showing him that a great work could be accomplished without his aid, and asked Apollodoros whether the*

proposed structure was satisfactory". Apollodorus' critique is based on the fact that the podium is reputed to be too low and that the two statues are considered too high for the internal cella. As Dio Cassius continues: "When he wrote this so bluntly to Hadrian, the emperor was both vexed and exceedingly grieved because he had fallen into a mistake that could not be righted, and he restrained neither his anger nor his grief, but slew the man. Indeed his nature was such that he was jealous not only of the living, but also of the dead..." As MacDonald has remarked, referencing Paribeni's interpretation, Apollodorus' murder should be dismissed because it's probable that Dio Cassius has intended to reduce Hadrian's reputation by claiming that he has murdered prominent persons¹³². However, besides the intriguing aspect of Dio Cassius's explanation, Apollodorus' criticism towards Hadrian seems to be authentic. Even though the traditional temple typology of Temple of "Venus and Rome" reflects Hadrian's Hellenism, in this almost canonical temple we can recognize the enclosure of space of the external colonnade, which defines a sort of enclosed *templum*, and the articulation of the interior *cellae* with their central apse, the lateral niches and the vaulted ceiling which contribute altogether to define a chthonic-like interior space. The two *cellae* are opposed symmetrically to represent Venus, the goddess of love or *Amor* in Latin, and the city of *Rome* which in Latin is "ROMA", that is to say "AMOR" spelled backwards. This is in itself indicative of Roman general attraction, or maybe obsession, for symmetry.

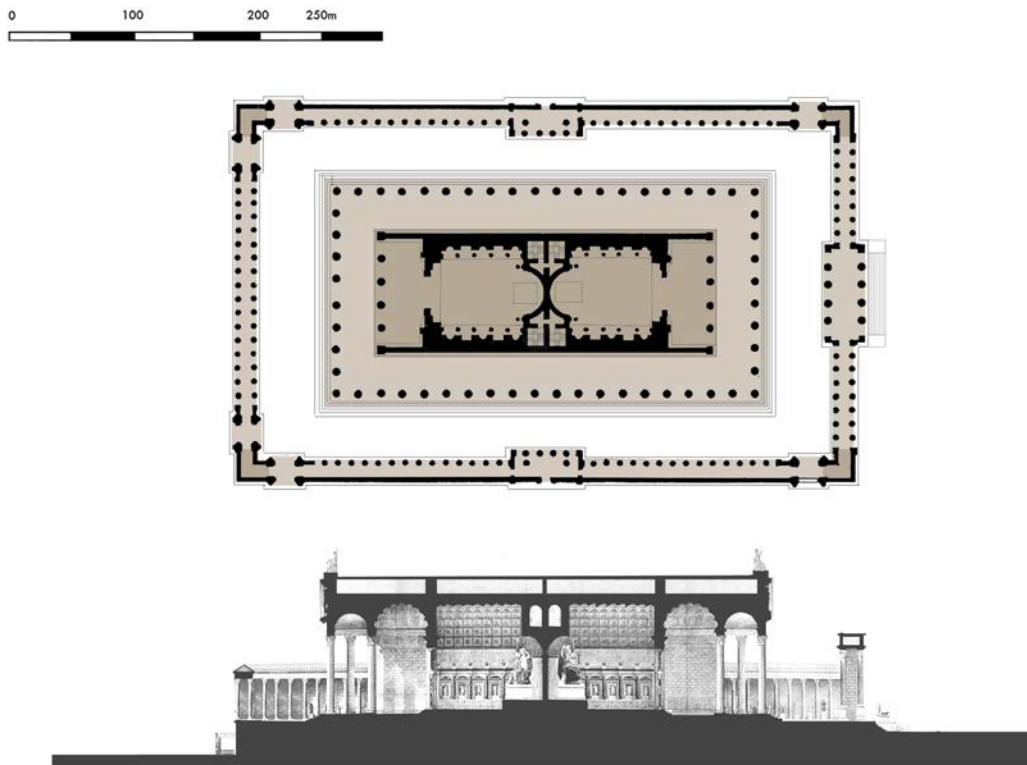


FIG. 116 Temple of "Venus and Rome" designed by Hadrian (121-135), section based on a drawing by Hector d'Espouy

¹³² MacDonald, William L.. 1965. The architecture of the roman empire. Yale publications in the history of art ; 17. New Haven: Yale University Press: Preface p. 133.

5.3 The predominance of interior space

The most interesting aspect that we can deduce from the intriguing “conflict” between Hadrian and Apollodorus of Damascus is the interest of the Roman emperor for architecture, an interest which seems to be confirmed by the fact the Pantheon, the monument which is canonically associated to Roman architecture, is generally considered to be the result of Hadrian’s design. Hadrian is often described as a humanist in the Renaissance sense: he has been a good soldier and a general, but also a poet, a painter, a sculptor and a capable administrator. His role as an architect is difficult to decipher not only for the lack of precise documents but also for the unusual fact he is, at the same time, the patron and the architect. What is sure is that in both roles Hadrian has highly influenced Roman architecture, transforming the concrete-vaulted system from a mere experiment –the “pumpkin” experiment using Dio Cassius’ ironic definition- to a standard of Roman constructions.

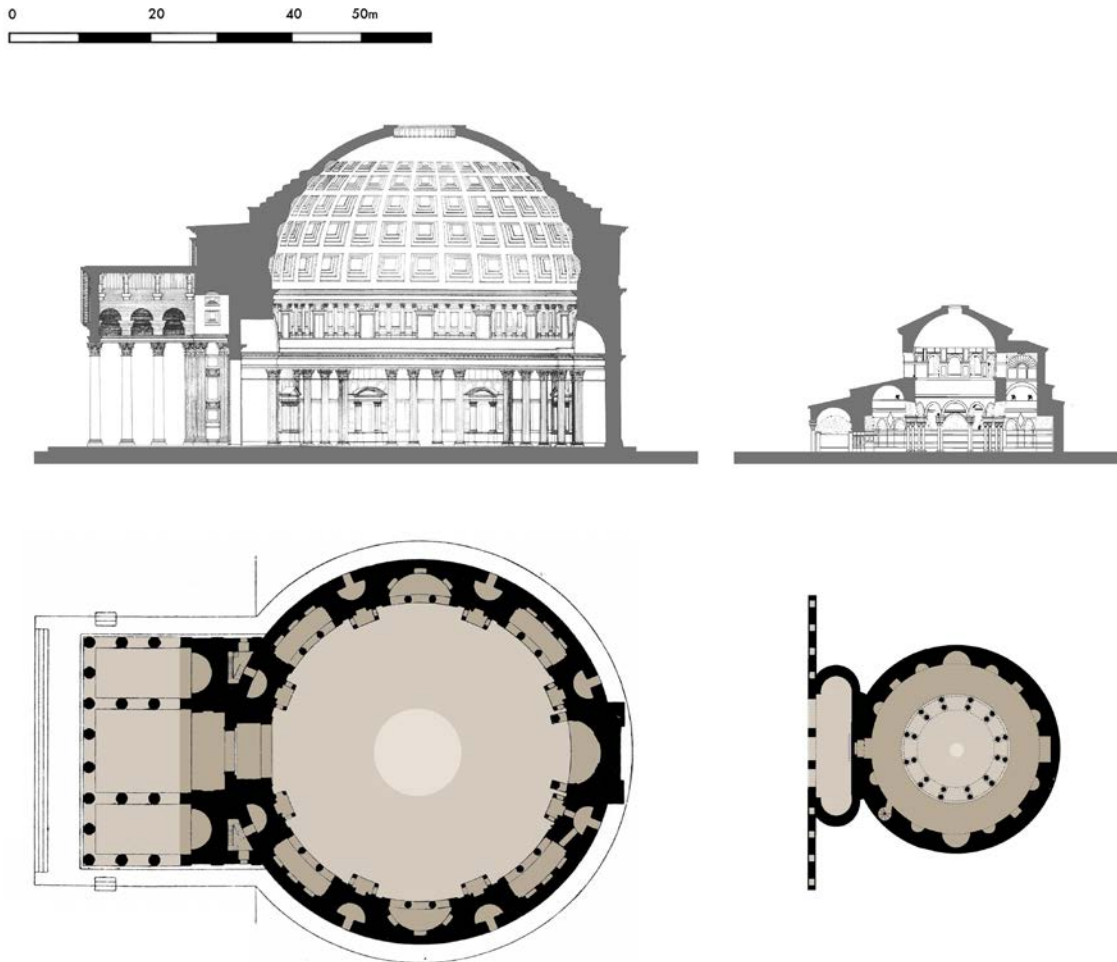


FIG. 117 Interior centralized space in Roman architecture: On the left side the Pantheon, (125-128 A.D.), On the right side: Santa Costanza (337-350 A.D.), the portico is substituted by a narthex.

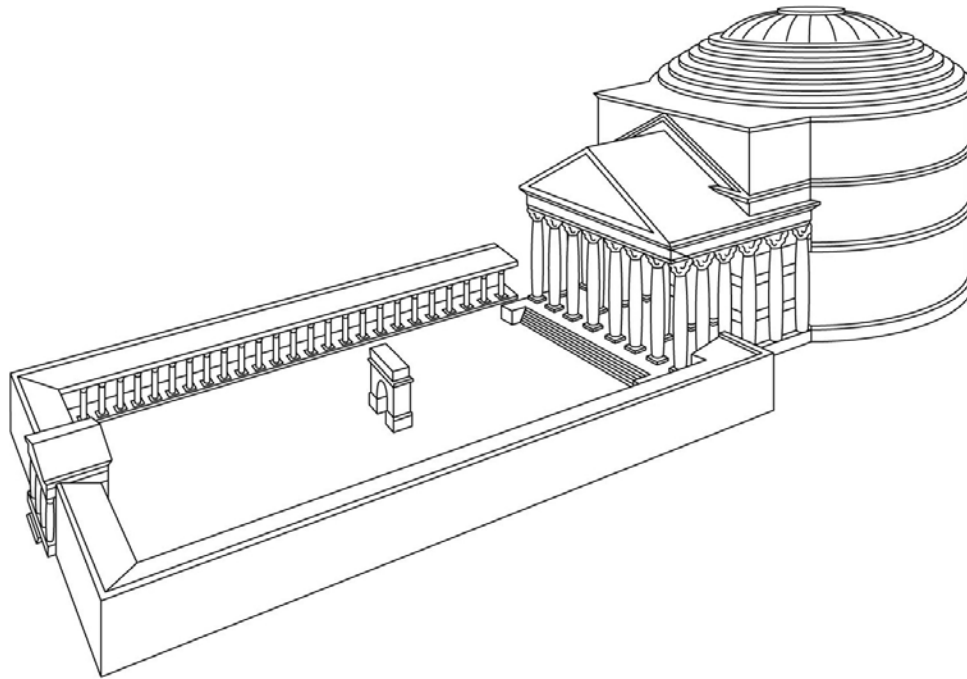


FIG. 118 Reconstruction of the Pantheon with the forecourt (125-128 A.D.), from MacDonald, William L. 1965. *The architecture of the roman empire.*

The fact that the gigantic rotunda of the Pantheon represents an evident fulfillment of the growing interest for interior space doesn't need to be explained. According to Perkins "with the building of the Pantheon the revolution was an accomplished fact. Architectural thinking had been turned inside out; and henceforth the concept of interior space as a dominating factor in architectural design was to be an accepted part of the artistic establishment of the capital."¹³³ According to Riegl: "Entering, and upon a first glance at the floor, one realizes the circular shape of the confining wall and concludes that the dimensions of depth and width ought to be equal; hence, there is evoked in the beholder a tactile feeling of unity through the dimensions of the bordering planes. More than any other interior space in the world the Pantheon preserved that pure ancient clarity which does not need mediation and that enclosed unity which, strictly speaking, belongs only to unperforated solid material shape. The early Roman Empire has thus found a solution for the problem of interior space to the end that it treated space as cubic material and captured it in absolutely equal and, therefore, clear dimensions. What seemed impossible, was now reality: free space was individualized."¹³⁴

Even though the Pantheon has always had a great influence and a high reputation -also for its incredible conservation state- there are certainly two aspects which have always created misunderstandings and generated disputes. One of these, primarily external, is related to the "peculiar" combination between the porch and the rotunda. What is indisputable is that

¹³³ Ibid., p. 111.

¹³⁴ Riegl, Alois, and Rolf Winkes. 1985. *Late roman art industry.* Archaeologica ; 36. Roma: G. Bretschneider: p. 31.

these two elements are completely different: not only structurally but also typologically. Certainly the portico represents a canonical temple-like type, a tribute to tradition which can be probably interpreted as an unavoidable choice for a religious building. The Rotunda is certainly more innovative: it is one of the largest covered public spaces in architecture history and it represents the most extreme use of concrete-vaulted structures in Roman architecture. The essential difference between these two components has generated the hypothesis that the two parts might have been built in different times. However the analysis of the brick stamps has confirmed that the entire Pantheon has been built during Hadrian's reign, between 125 and 128 A.D. If we accept the interpretation of the portico as a tribute to tradition, and maybe also as an attempt to combine the Greek and the Roman architectural traditions -considering Hadrian's admiration for Greek culture- we can also better understand the role of the forecourt. The colonnaded forecourt and the portico constitute altogether a very "traditional" typology, a typology very similar to the enclosed forum with a *Capitolium* or a temple placed at its end, as in all the earlier Roman republic forums. Furthermore if we consider that during this period the ground level is much lower than how it is now, the view of the dome might have been hidden by the high portico, remaining invisible from the forecourt. Thus we can suppose that the effect of entering into the expanded space of the rotunda might have generated an even stronger effect on the visitor: an architectural "*coup de théâtre*" that might have been consciously conceived. The forum-like space of the forecourt should be considered, in any case, an auxiliary secondary space compared to the interior of the Pantheon. Generally speaking, from this moment on, the colonnaded enclosure will loose its primary role of "space-generator" in architecture.



FIG. 119 Interior of the the Pantheon, (125-128 A.D.)

The second disputed issue is about the interior space and is related to the lack of coordination between the ribs and the coffers of the concrete dome and the Corinthian order of the rotunda. In many interior views of the *Pantheon* drawn during the Renaissance this “incongruence” has been corrected. One possible interpretation for this differentiation is related to the purely decorative role of the classical order in a Roman interior space. Clearly in the case of the *Pantheon*, besides the “real” columns of the niches, all the other interior elements are part of a decorative apparatus, a thin layer of polychromous marble that covers the brick-and-concrete structure. Besides the issue of the “incongruence”, in the *Pantheon*, which is the only existing well-preserved Roman interior, we can perceive the importance of this this layer of marble in the reflection of light and in the tactile feeling that generates. This is the reason for which the ruins of the numerous interior domed structures which have lost their superficial material, whether it is stucco, plaster or bronze, can hardly recreate the feeling of their original interior spaces.

But even if we consider the interior Corinthian order as purely decorative, we could wonder why it doesn't match the ribs and coffers of the dome, especially in a building that shows a high degree of constructive precision. One possible explanation is purely symbolic: the dome might have been conceived -and therefore architectural expressed- as something essentially disconnected from the earthly walls of the rotunda. The concrete dome, for its perfect geometry and its huge size, can be arguably considered a symbolic representation of a sky-dome. William C. Loerke has associated the division of the dome in 28 ribs, a number which doesn't match the other Pantheon numbers, as a possible representation of the lunar cycle since the moon orbits around the earth approximately every 28 days¹³⁵. In the original Etruscan and Roman concept of *templum*, that is to say the “in-augurated” enclosure which is a necessary condition of any sacred place, there is also, according to the ancient Roman scholar Varro (116 B.C. – 27 B.C.), a differentiation between the “*templum in caelo*” a visual field defined against the sky and the “*templum in terra*” the enclosure on earth. Therefore the disconnection between the attic of the rotunda and the ribs of the dome could represent the difference between the *templum* in the sky and the *templum* on earth. Furthermore Varro, in his “*De lingua Latina*”, claims also that the Latin word for sky “*caelum*” comes from the words “*chaos*” and “*cavum*” which means “hollow” (V, 19): “*On the whole I rather think that from ‘chaos’ came ‘choum’ and then ‘cavum’ (hollow), and from this ‘caelum’ (sky), since, as I have said, ‘this around and above, which holds in its embrace the earth,’ is the ‘cavum caelum’ (hollow sky). And so Andromeda says to Night*”. This linguistic interpretation written during the first century B.C., clearly shows a possible connection between the “hollow space” of Roman interior architecture, quintessentially expressed by the pantheon, and the idea of a sky-dome. If we also consider the other etymological connection between “hollow”, “sky” and “chaos” we could maybe interpret the incongruence between the dome ribs and the Corinthian order as an exhibited lack of order or an intentional “celestial chaos”. Certainly the internal chthonic space of the *Pantheon*, with its Dionysian semi-dark light and its possible allegoric association with the moon phases, is antithetical to the apollonian

¹³⁵ Loerke, William C. 1990. A rereading of the interior elevation of hadrian's rotunda. *Journal of the Society of Architectural Historians* 49 (1) (Mar.): pp. 22-43

clarity of a Doric temple placed in the external space and exposed to the sunlight. Therefore the chaotic incongruence of the dome could be considered an intentional disconnection from the apollonian classical order. Another clear expression of a monumental interior space in Roman architecture can be found in the public Baths. Since the first bath in Rome built by Agrippa, all the baths are public and the entrance is free: the thermal complexes have arguably a great role in Roman public life. The model for the imperial Baths, which are usually placed in a surrounding enclosure, is defined by Trajan's Baths designed by *Apollodorus of Damascus*. The larger *Baths of Caracalla*, inaugurated in 216 A.D. are the biggest ever known until then. What's more impressive about this colossal building is probably related to the aspects that cannot be seen and that can be more easily expressed by numbers. There are three underground levels for services and for the sewer system, an aqueduct which brings between 16,000 and 20,000 cubic meters of water per day (enough for a city of 70,000 inhabitants), there are 3,500 meters of lead pipes (from which we better understand the economic graph connected to lead production) and 49 heating chambers which consume 10 tons of firewood per day.

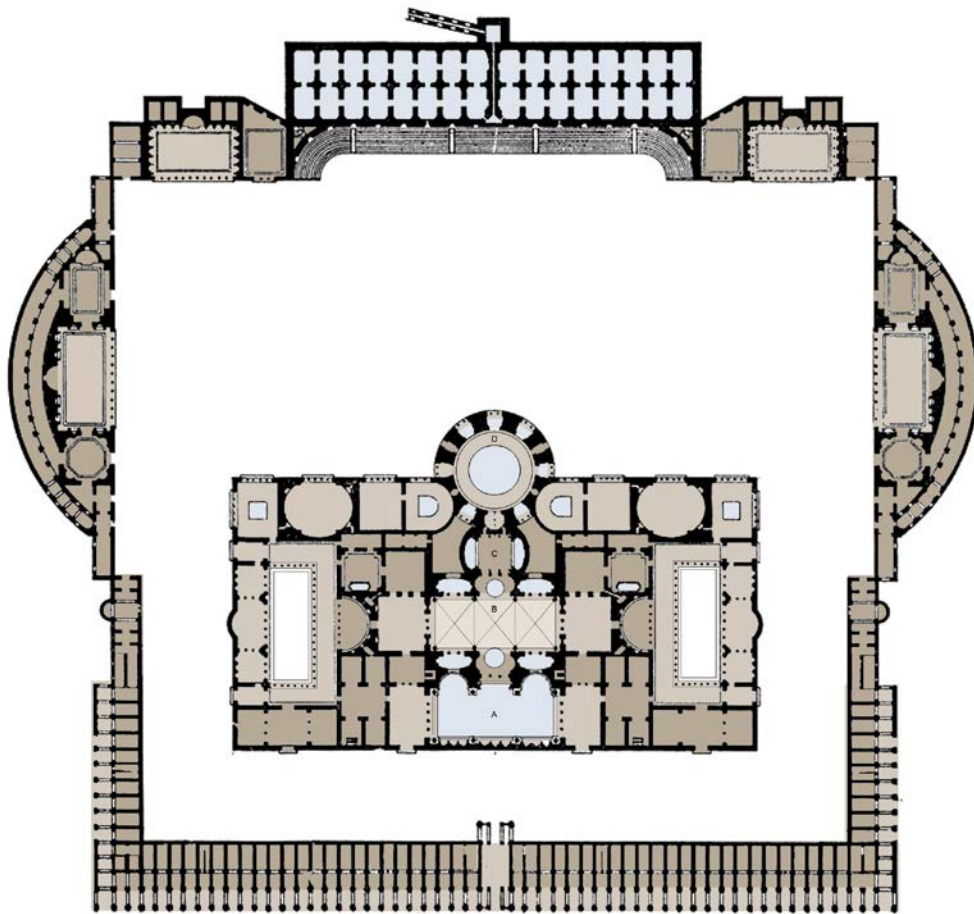


FIG. 120 Baths of Caracalla (212-216 A.D.): A) Natatio, open air swimming pool, B) Frigidarium, cold bath, C) Tepidarium, warm bath, D) Calidarium, hot bath.

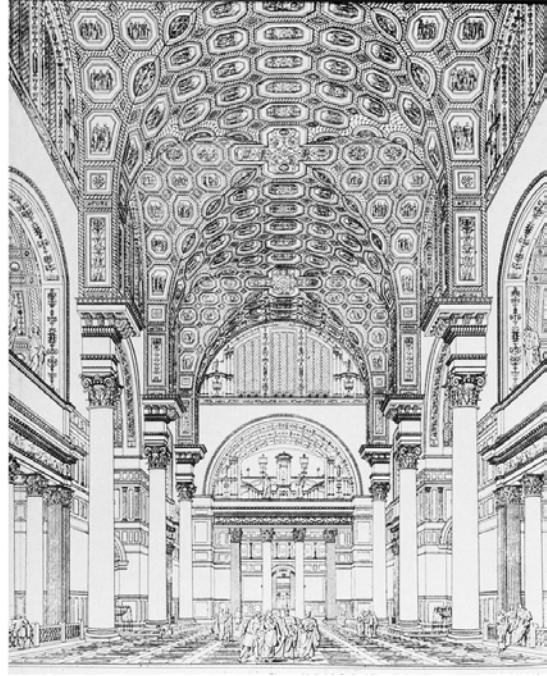
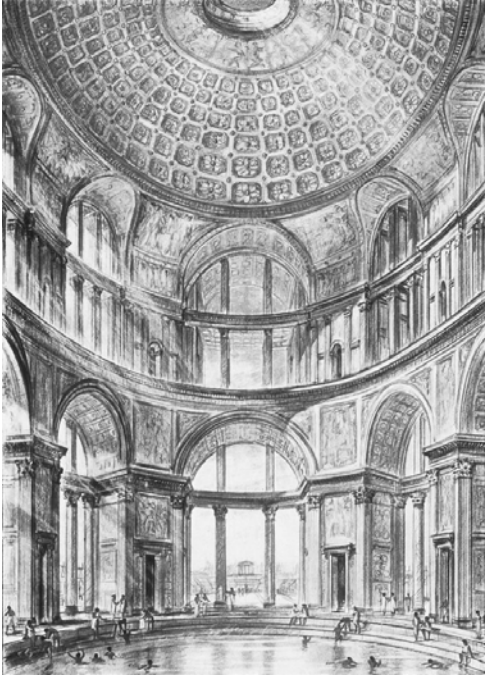


FIG. 121 Baths of Caracalla (212-216 A.D.): On the left side: reconstruction drawing of the Calidarium, On the right side, reconstruction drawing of the Frigidarium .

The number of daily users can be estimated around 10,000 persons because an ancient source indicates that there can be 1,600 users at the same time within the baths.¹³⁶ Therefore the Baths of Caracalla should be considered, first of all, as a structural and hydraulic engineering masterpiece.

In architectural terms the most evident aspect is the concatenation of large internal spaces and the formal complexity of the plan. The internal space of the Baths is highly articulated and the rich decoration of the interior contrasts with the simplicity of the exterior. The Plan is based on a cross-axial layout, similar to the plan of the earlier colonies, and is highly symmetrical. Through the longitudinal axis, which connects the entrance with the *Calidarium*, there is a progressive sequence from an exterior, through an enclosed, to an interior space. The main entrance leads to the large open courtyard of the Baths. The *Natatio*, the largest swimming pool, is placed in an enclosed open-air courtyard and represents the first space in the axial sequence. The *Frigidarium* or cold bath is placed in a vast central Hall covered by three transverse barrel vaults which mark the intersection between the longitudinal and transversal axes. The *Tepidarium*, the warm bath, is positioned in an intermediate smaller room, whereas the *Calidarium*, the hot bath which terminates the axial sequence is placed in a massive rotunda covered by a dome. Therefore the three progressive levels of space enclosure, the open-air enclosure, the longitudinal

¹³⁶ Data taken from: Lombardi, Leonardo, and Angelo Corazza. 1995. Le terme di caracalla. Roma: F.lli Palombi

roofed hall and the massive rotunda with the dome, are associated with an increasing temperature probably for the increasing need of thermal insulation associated with these rooms. Furthermore we can read in this sequence the same steps of the process that has transformed architecture during the Hellenistic period and the Roman Empire.



FIG. 122 Baths of Diocletian (298-306 A.D.). The internal space has been adapted by Michelangelo between 1563-1564 and transformed into the Basilica of St. Mary of the Angels and the Martyrs.

To have a glimpse of the internal space it is enough to visit the Baths of Diocletian, the largest thermal complex ever built, which is partially still standing today mainly for its reuse as an ecclesiastical space. Michelangelo between 1563-1564 has adapted the internal space of the *Frigidarium*, a central hall with three transept vaults, into a Christian basilica.

Diocletian at the end of the third century promotes the last important construction phase in Rome, a city which during this period appears as a highly dense and articulated urban fabric. Here the monuments built during almost ten centuries have been accumulated in an endless concatenation of solids and voids: an incredibly complex urban structure in which public and private spaces are indissolubly interconnected. The Roman urban fabric is the material *medium* in which the transition from external to internal space has been accomplished.



FIG. 123 Reconstruction of the plan of Rome at the end of the third century A.D.

However, the development of a purely internal space inevitably means the progressive disconnection and isolation from the urban fabric. The large imperial Baths already appear as independent cities within the city and their constructed surrounding enclosure is not conceived to generate space, but to define an edge. Generally speaking any architectural construction, primarily based on its interior space, essentially becomes a self-sufficient entity. The increasing predominance of interior space is related to the progressive reduction of scale in design and planning and to the transition from the urban to the architectural scale.

An example of this reduction of scale can be found in *Diocletian's Palace* in **Spalato**, which is built by the emperor for his retirement. More than a Palace, this architectural complex could be considered a small-scale urban unit. Its plan is based on a cross-axial layout, defined by a *Cardo* and a *Decumanus*, even though the most evident aspect is the defensive system formed by high walls and octagonal towers. Its use as a retirement place and as a fortified miniature city directly manifest the progressive disengagement of the imperial power and the increasing insecurity that characterizes the fourth century.

In the typology of the fortified miniature city we can recognize a type which will be predominant during the entire middle ages. The medieval *castles* in the profane realm, and the *monasteries* in the sacred realm, can be both considered typological reiterations of the Diocletian's Palace: they all represent self-sufficient architectural units, in which all the basic urban functions are concentrated. With the disaggregation of the Empire, and the rapid fall of the western part, these typologies will represent a necessary "local" substitution of the civic and defensive system previously provided by the Empire.

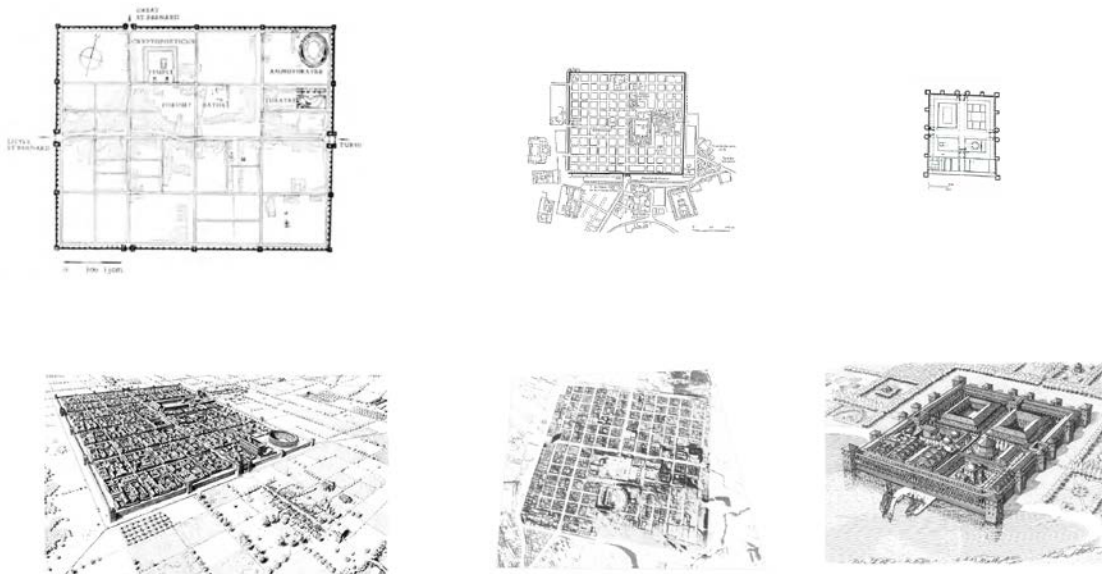


FIG. 124 The decreasing scale of planning: On the left side: City of Aosta, the last city founded in Italy in 25 B.C. In the middle: Timgad, the last colony founded in 100 A.D. On the right side: Diocletian's Palace in Spalato (Split), 305 A.D.

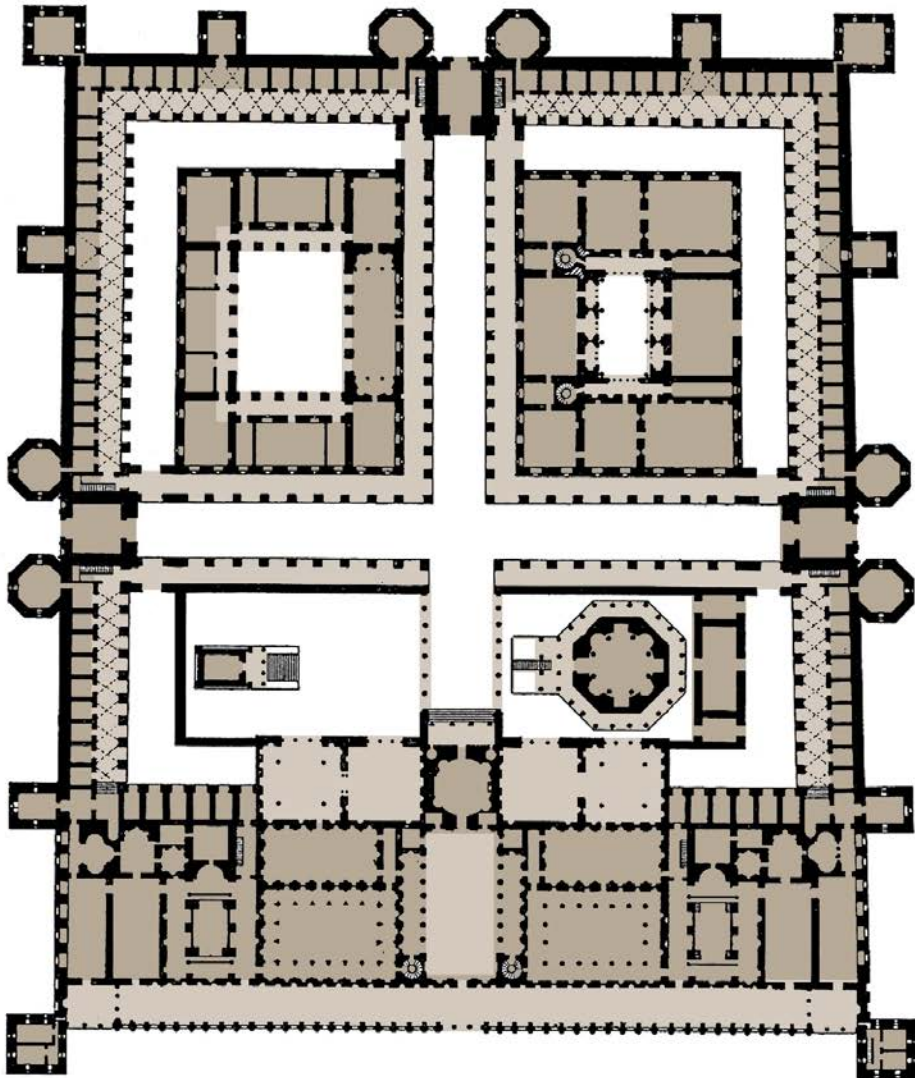


FIG. 125 Diocletian's Palace in Spalato (Split), 305 A.D. On the top view of the palace from the sea.

In terms of architecture the most important *typology*, considering its influence during the middle Age, remains the *basilica*, which is adopted by Constantine as the primary type for Christian architecture. Constantine's Edict of Milan issued in 313 A.D. proclaims religious freedom in the Empire and furthermore Christianity, under his reign, becomes the dominant religion of the Empire. This event will have a determinant cultural influence in European history. Additionally in 330 Constantine decides to move the capital from Rome to the newly founded Constantinople -where most of the commerce now concentrates- determining the definitive shift in the center of gravity from the western to the eastern empire. When his son Constantine II visits Rome in 357 for the first and only time, the monument he most admires is the *Basilica Ulpia* in the Trajan forum. The typological influence of the *Basilica Ulpia* on the medieval Christian architecture is indisputable. According to Perkins "it was still standing in Constantine's day, venerable and universally admired; and whatever may have been the reasons that led him and his advisors to select the *basilica* as the preferred architectural type for the places of worship of the newly enfranchised Christian religion, Trajan's building was one that must inevitably have been in every mind. The *Basilica Ulpia* may not have been a building of any profound architectural originality. But there are few monuments in antiquity that enjoyed a greater and more enduring prestige, or that did more to shape the subsequent course of architectural history."¹³⁷

The direct influence of the Basilica Ulpia on the early-Christian Basilicas of the fourth and fifth century is quite evident if we compare their plans. The typological continuity is marked by the persistent presence of an elongated building with a larger hall, or *central nave*, flanked by two or four lateral naves.

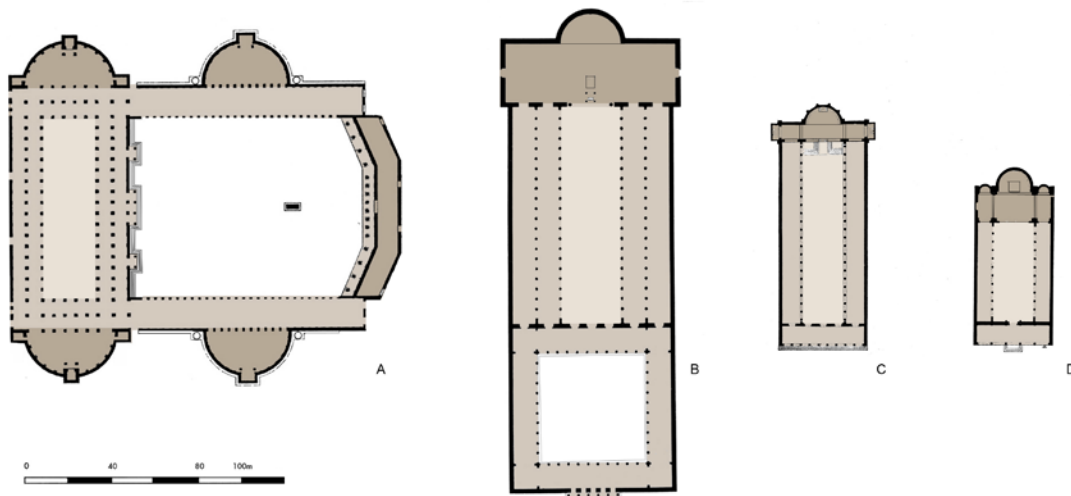


FIG. 126 The Basilica type during the Roman Empire and its influence in Early Christian architecture: A) Basilica Ulpia in the Trajan's forum, Rome (106-112 A.D.), B) Papal Basilica of St Paul Outside the Walls, Rome (ca. 370 A.D.), Papal Basilica of Saint Mary Major, Rome (ca. 430-440 A.D.), San Pietro in Vincoli, Rome (432-440 A.D.)

¹³⁷ Ward-Perkins, J. B. 1994. Roman imperial architecture. Yale university press pelican history of art. New Haven: Yale University Press: p. 95.

The central nave is usually lighted, like in the Roman type, by the windows of the *Clerestory* of the central hall. The most evident difference in the plan is the transformation from a traversal to a longitudinal layout: the entrance of the early Christian basilicas is placed in one of the shorter sides, similarly to the earlier Basilica of Pompeii. One of the two hemicycles of the Basilica Ulpia remains in the following buildings forming the terminal apse. If we consider the importance of the enclosure of the *forum* in connection with the earlier Roman basilicas, it's quite evident that its role becomes secondary in the later centuries. Often we can find a small peristyle forecourt which precedes the entrance, but even this type is progressively "absorbed" into the *Narthex* or the porch which constitutes the antechamber in many of early Christian basilicas. What is really astonishing, if we consider the entire European architectural history, is the permanence of this type throughout the Middle Age until the Modern period. The internal space of any *basilica*, church or cathedral, besides the different stylistic variations that will be elaborated in the following centuries, remains a longitudinal interior space, flanked by two major colonnades, which inevitably gives to any visitor the feeling of being in an interiorized urban space. The central nave might appear, according to its proportions, as a covered peristyle forum or as a roofed colonnaded street, but in any case we can always perceive that this kind of interior space is not a purely architectural typology. Its origin is the result of the architectural and urban transformations that have happened since the early Hellenistic period. The *Basilica* is primarily an urban space turned outside-in: an urban space crystallized in the interior of this persistent architectural typology and almost preserved, throughout the turbulent "dark ages", ready to reemerge again, as a real urban space, when the conditions will allow it.



FIG. 127 View of the interior of the Papal Basilica of St Paul Outside the Walls (4th century). Engravings by Piranesi. Piranesi seems to emphasize the role of the interior of the basilica as a roofed urban space.



FIG. 128 Interior of the Papal Basilica of Saint Mary Major, Rome (ca. 430-440 A.D.)

6

AFTER THE MIDDLE AGES

From the interior of the basilica to the enclosed square

In this chapter I will briefly outline the general tendency, in terms of predominance of either interior or exterior space, after the Middle Ages. The main hypothesis is that throughout the Middle Ages the interior space, and particularly the interior space of the ecclesiastical building, remains the predominant architectural feature. After the fall of the Roman Empire, the design scale is gradually reduced, again, to an architectural level and the primary focus is moved towards details. Therefore, both in terms of architecture and urban planning, the transformations of this period are mainly generated by incremental internal changes within already predefined urban and architectural typologies. If we consider the medieval *cathedral* type we can argue that its longitudinal typology, which is derived from the *basilica* and is based on a large central nave flanked by lateral naves, has basically no significant variations throughout this period: the main innovations and transformations are structural and stylistic.

However, during the Renaissance, the internal “façade system” of the *basilica*, which is composed of a lower colonnade and an upper clerestory, is progressively “externalized” and applied to the enclosing walls of *palazzo* courtyards and, later on, to external facades. We can consider this development as the inverse process that has happened in the transition from the enclosed space of the Roman *forum* to the interior of the *Basilica* type. The *Ospedale degli Innocenti* designed by Brunelleschi is something more than a classical portico fronting a square: it marks the intention of the architect to deal again with urban space. Its colonnade, as we have seen in the earlier chapters, marks a precise directionality and a strict relationship with the external space that it is fronting.

The unified Renaissance squares represent the next step in the process. In these cases, similarly to the Roman forums, the portico is extended and applied to three sides of a regular square to define a completely enclosed space. During the late renaissance and the Baroque period architects start designing bigger portions of the urban fabric again. In these large-scale projects symmetry and axiality are the most evident and characteristic features exactly as it was in the Hellenistic and early imperial period. But if during the Hellenistic period the general tendency was towards the enclosure of space, in the Baroque period we can recognize a process of progressive dilatation and fragmentation of the urban fabric. The sequence defined by the construction of the different Baroque squares in Paris is symptomatic of this process: the last one, Place Louis XV, marks the end of the attempt to enclose the urban space and the beginning of the modern tendency towards open space and

as well as the increasing emphasis on circulation. Between the early Renaissance to the end of the Baroque period we can recognize an incremental process, similar to the transition from external to internal space between the Greek and the Roman periods, even though with inverted direction and results: that is to say the transition from interior space, through enclosed space to external space, which corresponds with the progressive dissolution of the urban fabric.

If the main hypothesis of the following chapter is that we can recognize in the Renaissance, in the Baroque, and in the modern periods a reiteration –correspondingly- of the Roman interior space, of the Hellenistic space enclosure, and of the Greek space conception of isolated volumes in the external space, then the main issue is whether this reiteration is the result of the influence of history or of a similar architectonic intentionality.

As a matter of fact during the Renaissance period the rediscovery of ancient art and architecture has played a decisive role. Furthermore, for practical and geographical reasons, the Roman monuments have represented, for this period, the closest and more accessible source of inspiration since the rediscovery of Greek art would happen much later, probably for the fact that Greece has been part of the Ottoman Empire until 1821. Generally it's possible to argue that the historical models cannot fully explain the analogies between the space conceptions of these periods. If we analyze the early Renaissance period we can recognize that there is something more than an appreciation for a historical period or the attempt to replicate its artistic models: in both the Renaissance and the Roman periods there is a similar intention to explore “depth” through the internal space of the basilica or through perspective paintings. Thus the similarities are not only stylistic or typological: using Riegl' s terminology it's possible to say that what emerges, in both cases, is a similar “*Kunstwollen*” or artistic intentionality, probably related to an analogous way of perceiving space and, more generally, reality.

Therefore the issue about the influence of history is even more complicated: are the archeological discoveries that deterministically generate the inspiration and the reiteration of a specific historical model, or are the “elective affinities” between the artistic intentionality of different periods that generate the interest for a specific historic period, consequently promoting the archeological investigation of it? This is again a sort of circular question with no easy answer. What is sure is that some historical models have clearly a greater influence in determined periods. Furthermore the presence of archeological remains doesn't always imply a direct artistic influence: some of the Roman and Greek ruins have remained exposed and visible throughout the middle-age without generating the attempt to replicate those models. In most cases ruins have represented only a “quarry” for construction materials. Historical artifacts and monuments can continuously be in front of our eyes, even nowadays, but if we are not able to look at them in a specific way, probably similar to the same gaze of the artist and -more generally- of the society that has generated them, they will appear as a meaningless and mute accumulation of old objects.

6.1 The middle ages and the incremental variations

During the Middle Ages all the Roman cities were incrementally transformed, through an unconscious and unplanned process of internal modification. Apart from the *basilica* typology, which is altered only by stylistic transformations and essentially maintains its basic characteristics, all the other constituent urban elements -whether it is the urban layout, the streets, the forum or the other monuments- are organically incorporated and transformed within the medieval city. At the urban scale their form remains as a persistent structural element even though their ruins are generally reused and transformed into completely different buildings with different functions. In many cities the structure of the Roman *amphitheater* is incrementally adapted and transformed into a new residential urban block. In the case of Nimes, the amphitheater is transformed into a fortified Palace after the fall of the Empire and is afterwards readapted with the construction of smaller living units for seven hundred inhabitants. During the nineteenth century this Roman monument is transformed again and restored to its original condition and function. In many other cases, such as the amphitheater of Firenze, the alterations are so profound that the original structure is barely visible. In Lucca the original enclosed space of the amphitheater has been preserved and incrementally transformed into a picturesque square. In all these cases the influence of history is indirect and unintentional: the presence of older monuments constitutes persistent element which physically influences the urban and architectural transformations.

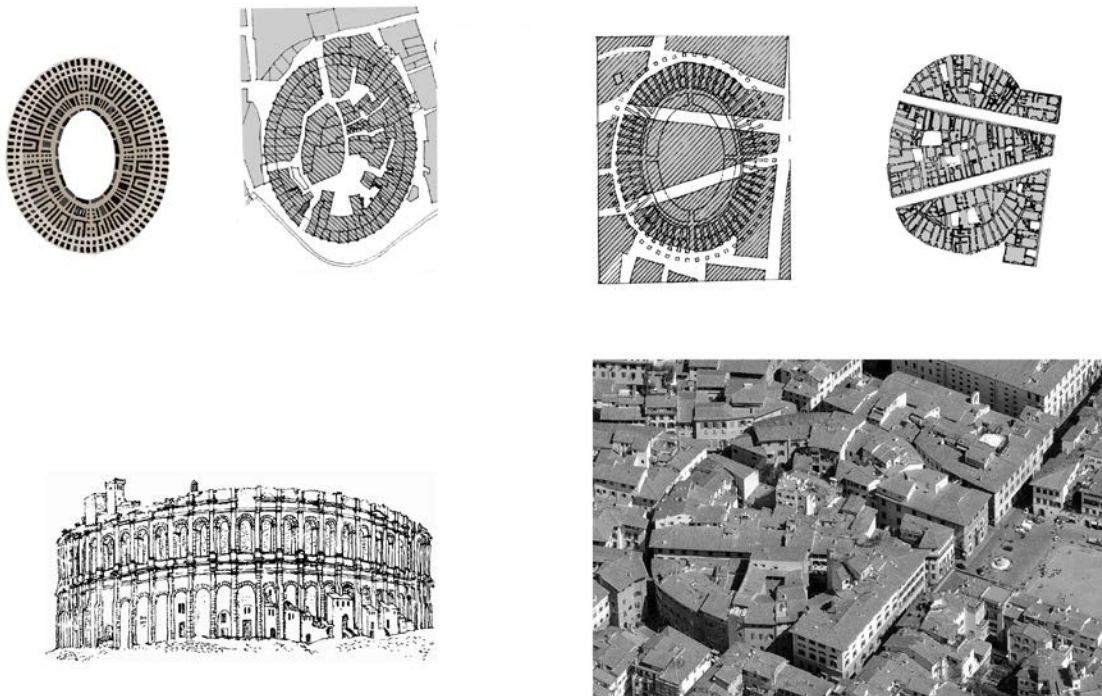


FIG. 129 The reuse of the Roman amphitheaters through incremental urban changes. Drawings from "Urban transformations" by Rodrigo Perez De Arce, in A.D. n.48. On the left side "Les Arenes" in Nimes, converted into a town plan, On the right side: Roman Amphitheater in Firenze.



FIG. 130 Reuse of the site of the Roman amphitheater in Lucca, Piazza dell'Anfiteatro

Many of the medieval squares are the result of the adaptation of previous Roman structures. The regular geometric forms typical of Roman planning, combined with the variety in the texture and the multiplicity of details generated by slow incremental variations, have produced unexpected architectural and urban results as it's possible to see in numerous medieval buildings and urban spaces. According to Wolfgang Lotz, many of the Italian squares are built on the remains of the older Roman *forum*: *"they date back to antiquity and have remained in use ever since, but were given a new form in the sixteenth century. Two examples may bring into focus the questions that challenge the architectural historian: the Piazza Erbe in Verona, which is surrounded by medieval buildings, and Piazza del Popolo in Fermo, which acquired its present shape in the sixteenth century. In both cases the square occupies the site of the antique forum. The Roman forum of Verona undoubtedly had straight facades, and most probably was surrounded by the two-storied colonnaded building that were characteristic of the Greek agora and the Italic forum."*¹³⁸ The irregularity of the layout of Piazza Erbe in Verona is determined by the fact that the ancient forum has been incrementally transformed during the middle ages, whereas Piazza del Popolo in Fermo has been rearranged during the *sixteenth century*, when two porticos have been built on the longest sides of the square according to a regular and unified design.

To have a glimpse of how a Roman forum might have appeared during the early middle age, it is enough to have a look at the so-called *"peristyle"* in Diocletian's Palace in Spalato.

¹³⁸ Lotz, Wolfgang, ed. 1981. *Studies in Italian Renaissance Architecture*. 1 MIT Press paperback ed. Cambridge, Mass.: MIT Press: p. 75.

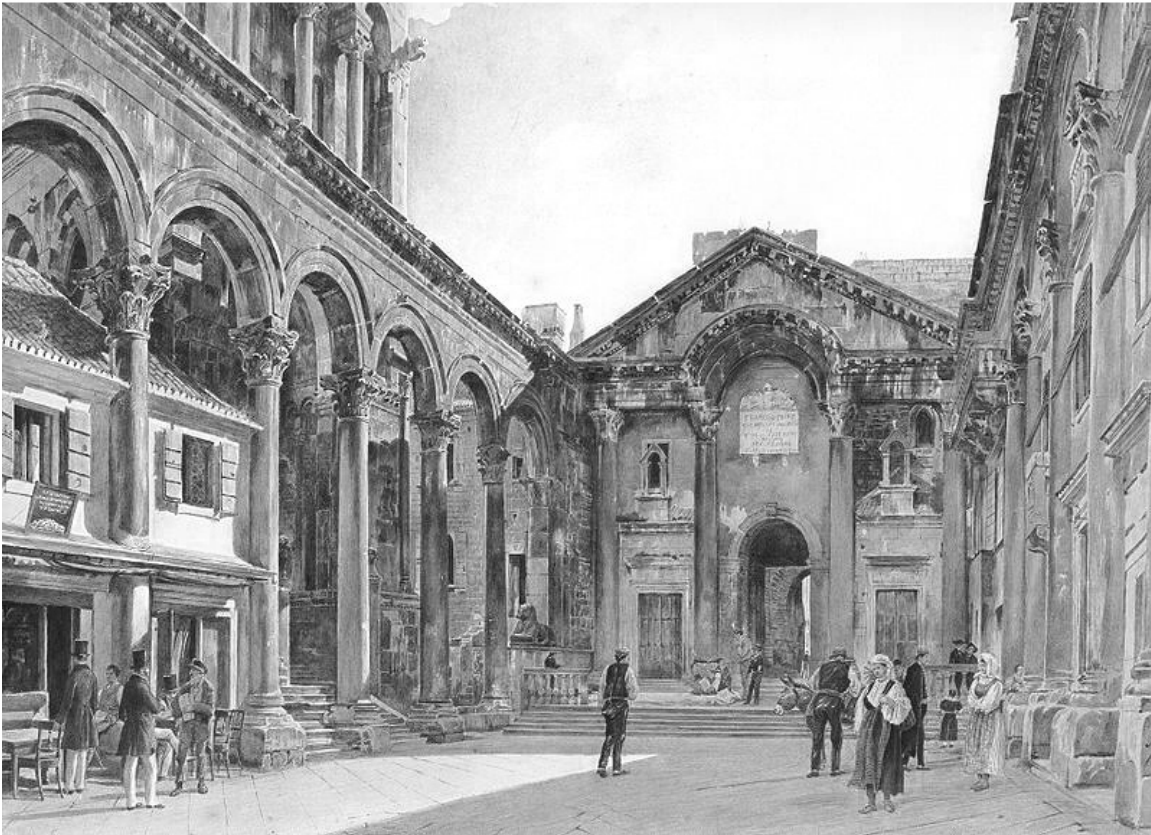


FIG. 131 The incremental transformations of the Diocletian's Palace in Spalato (Split). On the top: Roman plan compared to the medieval development, drawing from "Urban transformations" by Rodrigo Perez De Arce, in A.D. n.48. On the bottom: "Der Domplatz in Spalato", Painting by Rudolf von Alt (1841).

The "peristyle" represents a sort of miniature version of a *forum* in the miniature city of the Diocletian's Palace. For its small scale it is a good example of the typological relation between the enclosed space of the *forum* and the internal peristyle of a *basilica*: the "peristyle" in Spalato can be considered as a hybrid version of both. After the fall of the Empire, the porticos, which surround this enclosed space, have been progressively incorporated into the facades of new residential buildings.

FIG. 132 View of the incremental transformation of the so called "Peristyle" in the Diocletian's Palace in Spalato (Split): the portico on one side has been transformed into a façade for residential buildings.

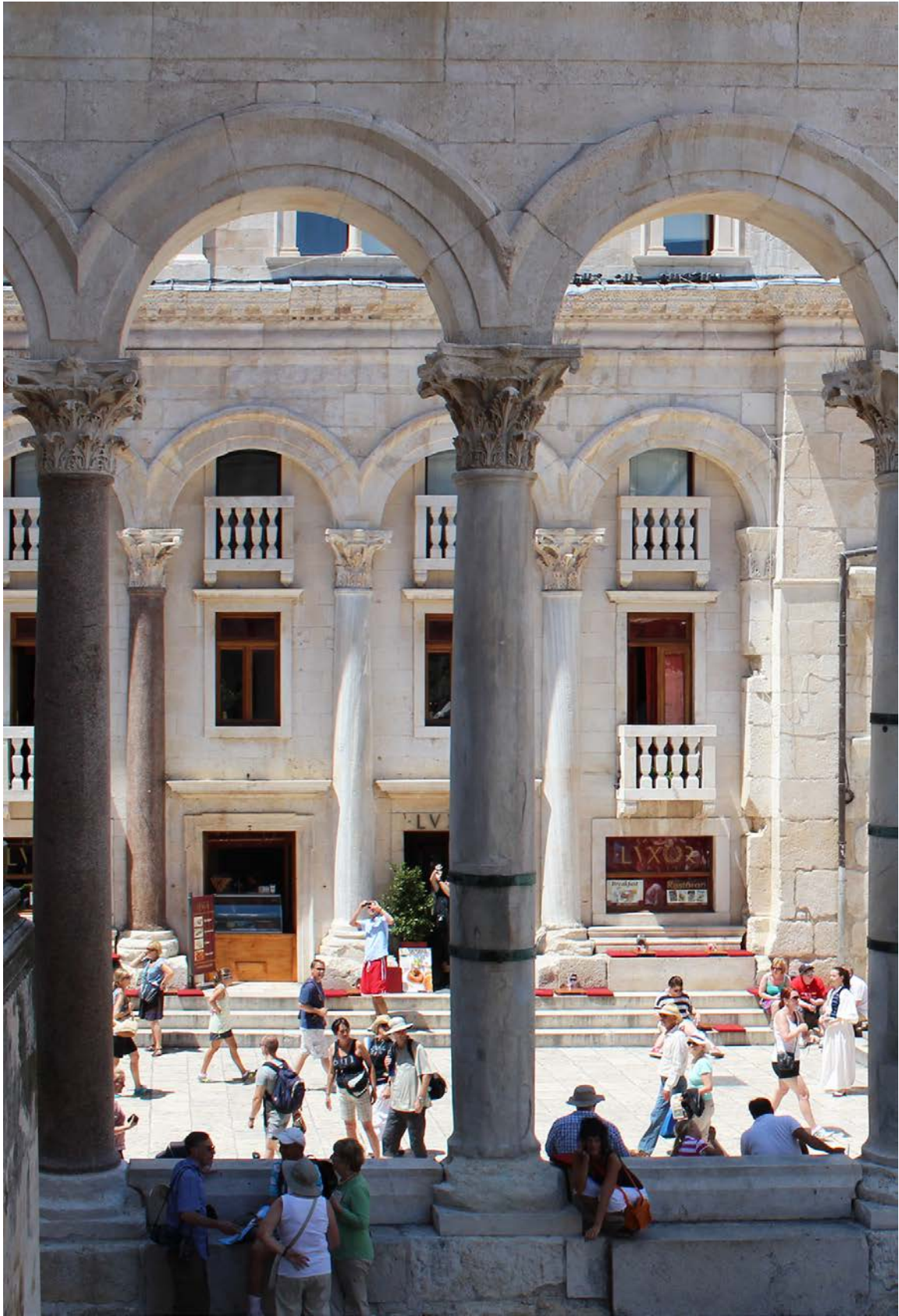




FIG. 133 *The typology of the fortified “miniature” city throughout the Middle Ages: On the left side: Diocletian’s Palace in Spalato (Split), (305 A.D.), In the middle: Saint Catherine’s Monastery, built by Emperor Justinian I, Mount Sinai, (527-565 A.D.), Bodiam Castle, Robertsbridge in East Sussex, England, (1385 A.D.)*

The same adaptation and accumulation of older and newer structures has probably happened in the forum of many other cities of the Roman Empire before being progressively rebuilt and rearranged.

The typology of the fortified “miniature” city of Diocletian’s Palace is replicated in numerous monasteries and castles throughout the Middle Ages. All these autonomous small-scale urban units directly manifest the disaggregation of the empire, and the progressive reduction of scale in planning related to the economical and political difficulties which characterize this period. But in the internal layout of the medieval monasteries we can also recognize an analogy with the Roman typology of the Basilica-forum complex. The 9th century Plan of St. Gall is an example of this and an extraordinary document since it is one of the few drawings that we have from the Middle Ages.

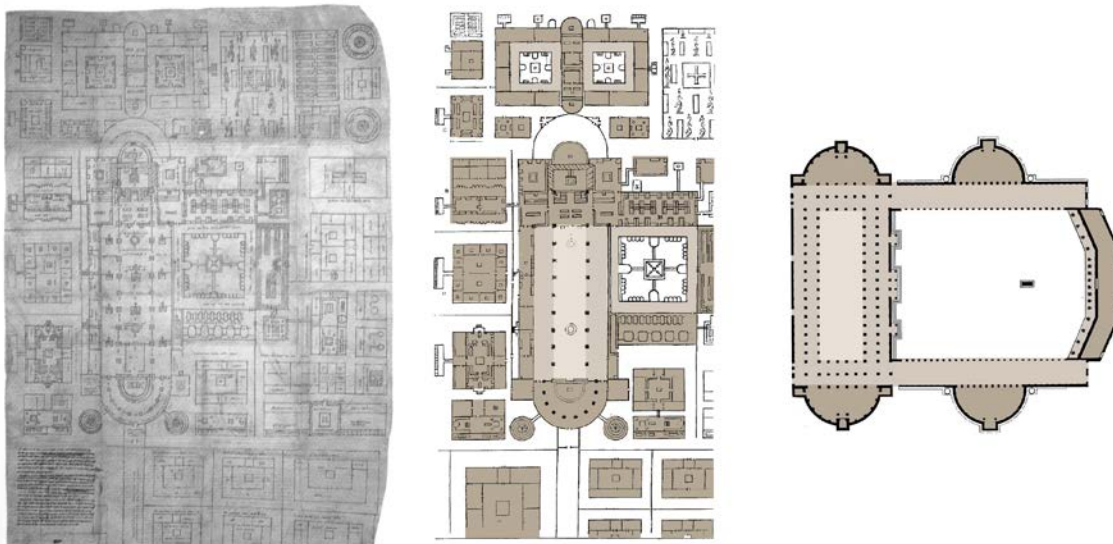


FIG. 134 *The Plan of St. Gall, diagrammatic plan for a monastery complex, (816-837 A.D.). On the left side: Original drawing on parchment, In the middle: reconstructed drawing, On the right side: the Basilica Ulpia in the Trajan’s forum (106-112 A.D.)*

It represents a monastic compound and it can be interpreted as a diagrammatic model for the construction of new monasteries. The layout of the church is reminiscent of the basilica Ulpia because it is similarly formed by a longitudinal central nave which terminates in two hemicycles. One of these is probably a sort of *narthex* or entrance called *paradisus*, whereas the other one represents perhaps an open garden placed behind the apse. The *cloister* adjacent to the church is significantly positioned at the center of the composition. Its enclosed peristyle is analogous, even though in a smaller scale, to the colonnaded enclosure of the *forum* placed in proximity to the *Basilica Ulpia*. All the communal life of the monastery gravitates around the *cloister*, almost like in the case of the *forum* of a Roman city. The communal refectory is placed on the south side of the cloister, the *calefactoria*, which is a heated room placed under the dormitory, is situated on the eastern side whereas the cellar for wines is positioned on the west side. The *cloister* of a monastery is essentially a "*Hortus conclusus*", an enclosed garden. In general terms *Hortus* means "garden" and has the same root as the word 'yard'. It can be imagined as an enclosed space, usually connected with a house or a building, and characterized by an abstract and geometrical natural environment. The use of enclosed gardens during the Middle ages can be considered a continuation of a Roman tradition, which is well documented by the Pompeian peristyle gardens, and is probably the result of a Persian influence. The very word "paradise" comes from the Persian "*pairidaeza*" which means "walled-in garden" or "enclosure".

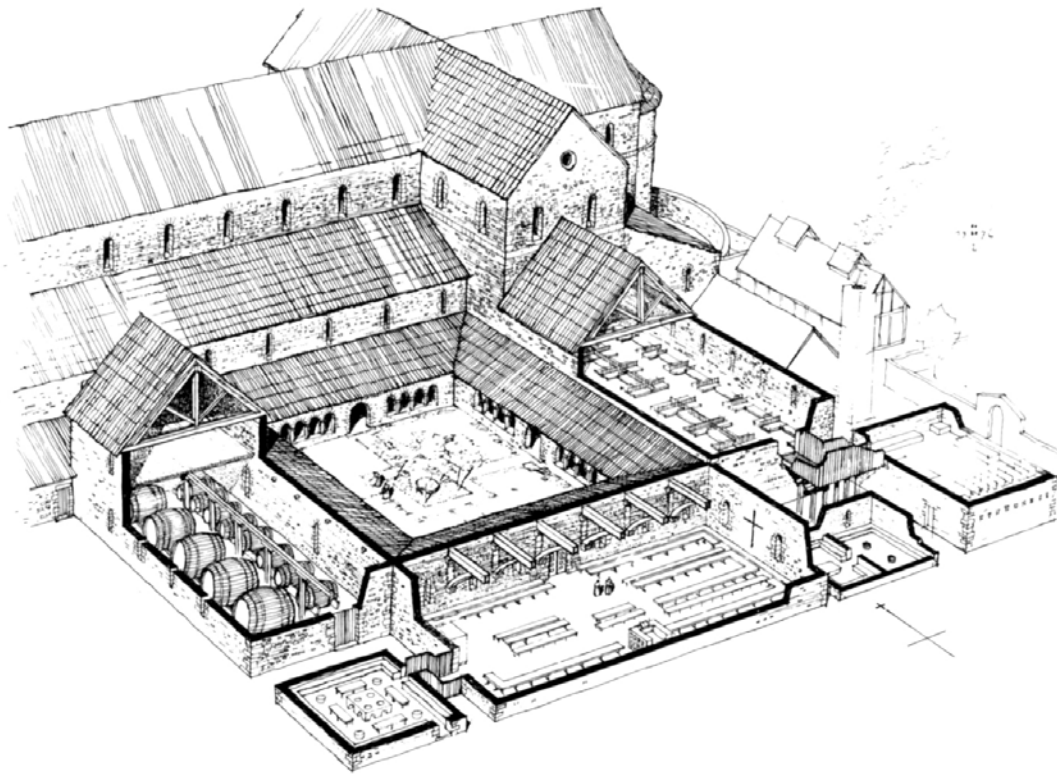


FIG. 135 Reconstruction of the monastery of Saint Gall, from "Heaven on earth: The plan of St. gall. 1980" *The Wilson Quarterly* (1976-)

6.2 The transition from an interior to an enclosed urban space

The *Basilica* type, since its earliest Roman examples, is basically a large roofed public space -originally conceived as a *civic* buildings and later on used for *religious* gatherings- whose origin is strictly related to the colonnaded enclosure of the *forum*. The urban character of its internal space is emphasized by the vastness of the main hall -or central nave- and by the presence of the surrounding colonnades or porticos which are facing, as urban facades, towards the interior space. The presence of the roof, for practical and logistical reasons, is the only element which clearly distinguishes the interior of a *Basilica* from a colonnaded street or an enclosed forum. The *Basilica* is like a Greek *Doric temple* turned outside in: the surrounding columns here are interiorized and the internal space has predominance over the exterior.



FIG. 136 The interior space of the Basilica as an “interiorized” urban space. On the left side: Papal Basilica of Saint Mary Major, Rome (ca. 430-440 A.D.), On the right side: The interior of the basilica as an urban space, drawing based on a sketch of Leo Krier, from “Urban transformations” by Rodrigo Perez De Arce, in A.D. n.48.

The predominance of the interior space is evident throughout the entire Middle Ages. The construction of a Medieval cathedral, which in some cases takes a few centuries to be completed, usually starts from the elements which primarily characterize the interior space such as the apse and the interior colonnades, whereas the external façade is generally the last part to be completed. This is in itself symptomatic of the higher importance of the interior during this period. In many cases the façade is even left incomplete and without decoration if there is no more funding. If, generally, the typology of the *basilica* remains unaltered throughout the Middle Ages, what changes, according to the different periods and the different geographical areas, is the style and the construction system. In the case of a Gothic cathedral the vaulted ceiling and the pillars usually form an organic whole, both in terms of form and structure, which emphasizes the vertical axis more than the longitudinal one. Therefore in a Gothic cathedral the reminiscence of an urban space is certainly diminished and its internal space seems to be sublimated into something else, certainly a more unified and metaphysical space.



A



B



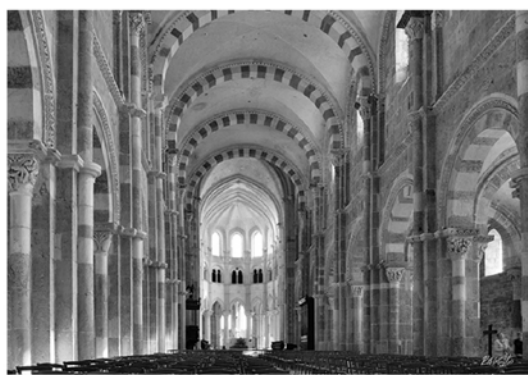
C



D



E



F

FIG. 137 The predominance of the interior space of the basilica type throughout the Middle Ages. A) Baths of Diocletian, Rome (298-306 A.D.), transformed by Michelangelo into the Basilica of St. Mary of the Angels and the Martyrs., B) Papal Basilica of St Paul Outside the Walls, Rome (4th century), C) Santa Sabina, Rome (432 A.D.), D) Basilica of Sant'Ambrogio, Milan (379 A.D.) the current appearance is the result of the works in the 12th Century, E) Abbey of Saint-Remi, Reims (1049 A.D.), F) Basilique Sainte-Marie-Madeleine, Vézelay, France. (1104 A.D.)

However at the end of the Middle Ages the original features of the Roman and the early Christian basilicas are applied again in the Romanesque churches, and even more clearly in the Renaissance basilicas. Colonnades and porticos become again the constituent elements of the internal space which is consequently expressed, again, in terms of an interiorized urban space.



FIG. 138 The permanence of the Basilica typology in the Roman and renaissance periods. On the left side: Papal Basilica of St Paul Outside the Walls, Rome (386 A.D.), On the right side: Basilica di San Lorenzo, by Brunelleschi, Firenze (1419-1480s)

The *Basilica di San Lorenzo* designed by Brunelleschi in Firenze is clearly a reiteration of the type of the early Christian basilicas. Even though the general layout is the same, in the case of the Florentine basilica the slender proportion of the columns, the wide intercolumniation and the height of the portico certainly give a less static impression, compared to the Roman basilicas. The lighter proportions might be interpreted as the result of a certain gothic influence which still characterizes the early works of Brunelleschi. In any case the internal space of the Basilica di San Lorenzo is clearly reminiscent of an urban interior, and if we could ideally remove the wooden ceiling, its interior space would appear as a perfectly proportioned renaissance street flanked by two porticos. The *Ospedale degli Innocenti* designed by Brunelleschi in this same period is essentially a replica of the interior space of a *Basilica* in which the roof is substituted with the open-air enclosure of an urban square.

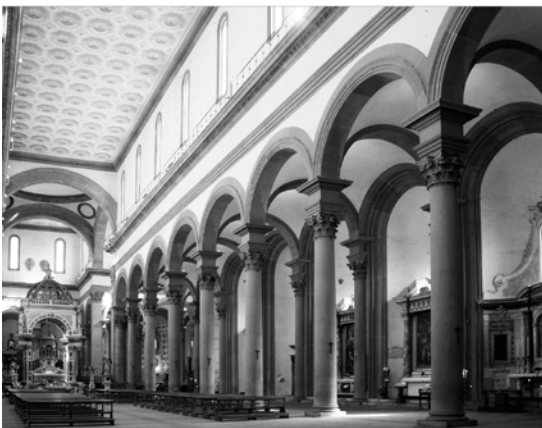


FIG. 139 The transition from the internal space to the urban space. On the left side: Basilica of Santa Maria del Santo Spirito, Brunelleschi, Firenze (1428), On the right side: Ospedale degli Innocenti, Brunelleschi, Firenze (1419-1427)



FIG. 140 Stylistic similarities between the Roman and the Renaissance periods. On the left side: Portico of the "peristyle" in the Diocletian's Palace in Spalato (Split), (305 A.D.) , On the right side: Ospedale degli Innocenti, Brunelleschi, Firenze (1419–1427)

Therefore it is possible to argue that the first designed façade of the Renaissance period marks the historic transition from the internal space of the *basilica* to the enclosed space of an urban square. This means that during the Renaissance the intentions and the ambitions of both the architects and their patrons are not limited anymore to internal ecclesiastical spaces: the order expressed by the rational layout of the basilica is exported outside its walls and progressively applied to the urban scale. This transition is marked by the concurrent rediscovery of ancient art, and particularly of Roman architecture. We can recognize many stylistic analogies between the details of the *Ospedale degli Innocenti* and the late imperial monuments. The arched portico is not used for the first time in the Renaissance: we can find a similar portico in the Peristyle of the Diocletian's Palace. Furthermore a similar use of decorated roundels between the arches can be seen in second century portico of the forum of Leptis Magna, a city of the Roman Empire situated in Libya.



FIG. 141 Stylistic similarities between the Roman and the Renaissance periods. On the left side: Detail of Portico in the forum of Leptis Magna, Libya, (second century A.D.) , On the right side: Detail of the portico of the Ospedale degli Innocenti, Brunelleschi, Firenze (1419–1427)



FIG. 142 Stylistic similarities between the Roman and in the Renaissance periods. On the left side: Arch of Hadrian, Gerasa, Jordan (129-130 A.D.), On the right side: Basilica di Sant'Andrea di Mantova, Leon Battista Alberti, Mantova (1472)

In many cases it's difficult to distinguish whether these analogies are the result of the direct inspiration from an existing historical models or the consequence of the application of similar design principles. It's probably unreasonable to think that the monuments of the Roman sites of *Leptis Magna* (modern Libya) or *Gerasa* (modern Jordan) are directly known by Renaissance artists and architects. Therefore the similarity between the Roman *Arch of Hadrian* in Gerasa and the Albertian façade of the *Basilica di Sant'Andrea* in Mantova should be interpreted as the result of the application of similar aesthetic principles and of a similar artistic intentionality. The giant order which characterizes both buildings directly manifest a similar decorative use of the classical order which would be essentially incompatible with Greek architectural models. However in other cases, such as the *Temple of Vesta* in Tivoli and the *Tempietto* designed by Bramante in San Pietro in Vincoli, we can be sure about the direct inspiration -at least for the circular colonnade- from the ancient model.



FIG. 143 Stylistic similarities between the Roman and the Renaissance periods. On the left side: Temple of Vesta, Tivoli, Italy (first century B.C.), On the right side: San Pietro in Vincoli, Tempietto by Bramante, Roma (1502)

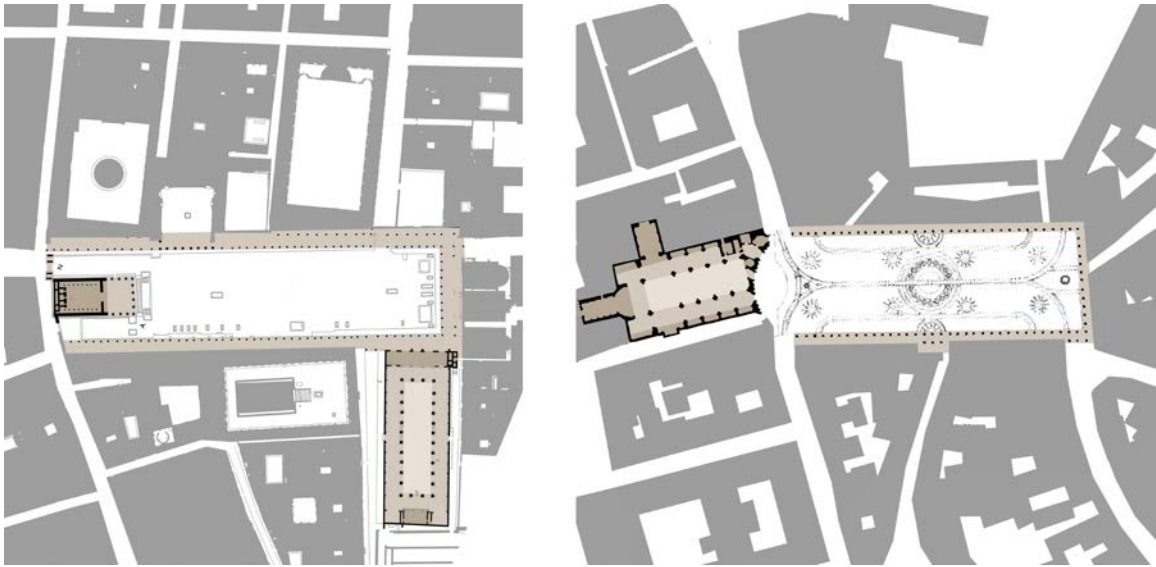


FIG. 144 Analogy between the Roman forum and the Renaissance unified square. On the left side: Forum of Pompeii (first century B.C.), On the right side: Piazza Ducale in Vigevano, probably designed by Bramante, Vigevano, Italy (1492-1496)

But besides the stylistic analogies, what is really relevant for this analysis is the similarity between the enclosed space of Roman *forum* and the enclosure of the unified Renaissance squares. If we compare the *forum* of Pompeii and the *Piazza Ducale* in Vigevano we can recognize in both case an elongated space, surrounded on three sides by a colonnade or portico and enclosed on the fourth side by a temple or church which axially dominates the square. The portico of Vigevano, a reiteration of the same façade system used in the *Ospedale degli Innocenti*, is conceived, like in the case of Pompeii, as a unified façade that connects different buildings and functions, facing towards the enclosed space of the square. It is important to note that during the Renaissance architects did not have any direct evidence of how a Roman *forum* might have appeared.



FIG. 145 Analogy between the Roman forum and the Renaissance unified square. On the left side: reconstruction of the view in the Forum of Pompeii (first century B.C.), On the right side: view of Piazza Ducale in Vigevano, probably designed by Bramante, Vigevano, Italy (1492-1496)

The forum of Pompeii was discovered only in 1749, and all the other *forums* had been completely buried or transformed into medieval squares. The only possible indication about the layout of a Roman Forum can be found during this period only in the written text of the “De architectura” by Vitruvius. In the case of the *Piazza del Campidoglio* designed by Michelangelo on the Capitoline Hill the physical proximity to the **Roman Forum** -and therefore the possibility of a direct influence- is a matter of fact. The new trapezoidal *piazza*, flanked by the porticos of two *palazzi*, is remarkably similar to the trapezoidal space of the *Roman Forum* and is furthermore aligned with the same axis. Even though in the case of the *Roman Forum* the position of the two basilicas is not perfectly symmetrical we know that a new portico was added to the *Basilica Aemilia* to imitate the façade of the fronting *Basilica Julia* exactly as in the case of the unified facades of *Palazzo dei Conservatori* and *Palazzo Nuovo* designed by Michelangelo. Since during the renaissance the ruins of the *Roman forum* are still partially buried, it is quite difficult to evaluate how much of the layout of the Roman Forum was known by Michelangelo. However the plan of the *Piazza del Campidoglio* seems to be the result of a conscious attempt to establish a typological and historical continuity with the ancient urban model. As Giulio Carlo Argan has noted in “Michelangelo Architetto”, there is a relationship between the interior of the Laurentian Library in Firenze designed by Michelangelo a few decades earlier and the project for the *Piazza del Campidoglio*. The interior sequence emphasized by the monumental staircase in the Florentine project is replicated at an urban scale on the Capitoline Hill. The *Piazza del Campidoglio* is therefore a sort of urban room accessible from a monumental staircase, an urban room which is physically and symbolically founded on the Roman forum and which faces, on the opposite direction, towards the Vatican.

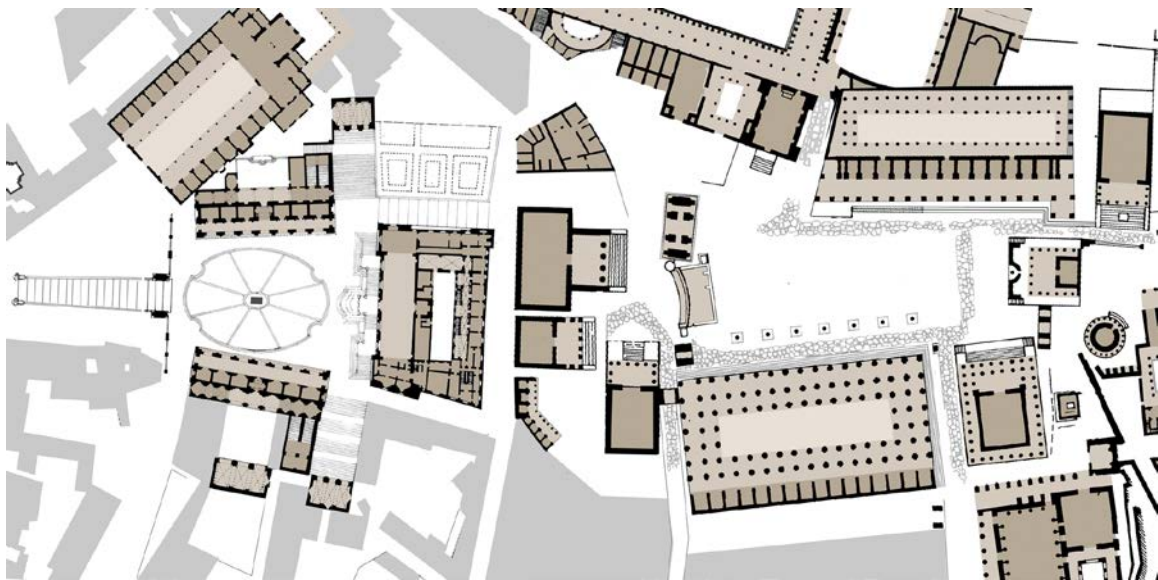


FIG. 146 The analogy, emphasized by the physical proximity, between the Roman forum and the Campidoglio Square designed by Michelangelo during the High Renaissance, reconstructed drawing. On the left side: Plan of the Piazza del Campidoglio (1536-1546 A.D.), On the right side: reconstruction of the Roman Forum (1492-1496)



FIG. 147 The decorative use of the giant order for the articulation of an architectural interior. On the left side: *Temple of Bacchus, Baalbeck* (138-161 A.D.) On the right side: *The Laurentian Library*, by Michelangelo, Firenze (1523-1525 A.D.)

From a stylistic point of view the analogy between the use of the orders in Michelangelo's projects and in Roman imperial architecture is remarkable. In the case of the *Temple of Bacchus* in Baalbeck and the *Laurentian Library* we can probably exclude a direct influence, but the use of the giant order, the *proto-baroque* accumulation of ornamental elements and the emphasis on the plastic qualities of the decorative apparatus are characteristic of both these interiors. We can recognize a sort of artistic analogy between Michelangelo's work and the Roman period even in sculpture and painting. We know that Michelangelo saw the *Laocoön* just after its discovery in 1506. The influence of this sculpture on Michelangelo's paintings and sculptures is evident especially in the emphasized torsion and movement of the human body.

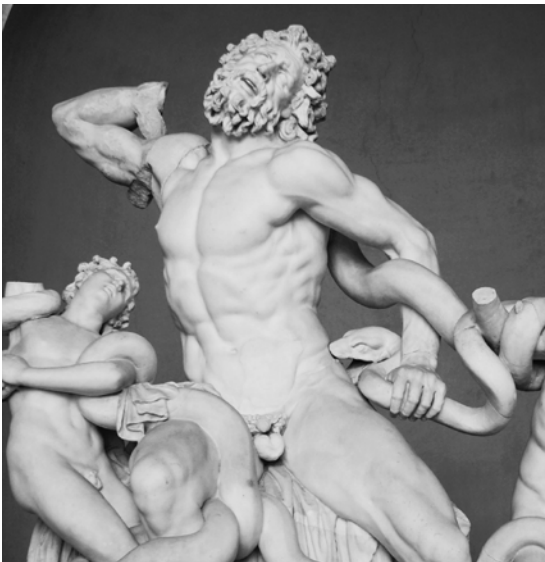


FIG. 148 Analogy in the interplay between "body and space": Roman period and High Renaissance. On the left side: *Laocoön* (ca. 20 B.C.), On the right side: *frescos in the Sistine Chapel*, Michelangelo (1508)



FIG. 149 The civic basilica in the Roman and Renaissance periods. On the left side: Basilica Julia (46 B.C.), On the right side: Basilica Palladiana, Vicenza (1548)

Even in the case of Palladio we can recognize many analogies between his work and the Roman period. We know from his treatise that he directly studied and drew Roman ruins, and his *Basilica* in Vicenza can be considered as a literal reiteration of the model of the Basilica Julia in the Roman Forum. However Palladio's work, generally considered the expression of *Mannerism* and of the end of the Renaissance, progressively marks a transition towards a more "classical" architecture in which the orders are not used as a mere decorative system. We can generally say that at the end of the Renaissance period and in the early baroque period the center of gravity of the historical influence slowly moves backwards towards the pre-imperial and the Hellenistic period. In the colonnaded *loggia* of Villa Pisani we can recognize a structural use of freestanding columns and a façade composition which is reminiscent of the Hellenistic *Propylon of Athena* in Pergamon.



FIG. 150 The Palladian use of the classical order: On the left side: Propylon of Athena, Pergamon (197-150 B.C.), On the right side Villa Pisani by Palladio, Montagnana (1552 A.D.)

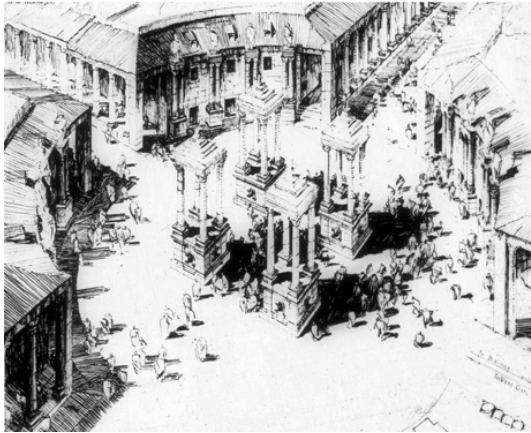
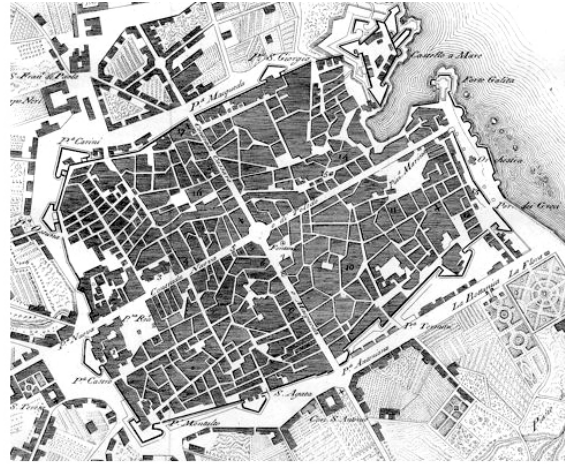


FIG. 151 Cross axial planning in Early imperial and Baroque periods: On the left side: Intersection between *Cardo* and *Decumanus* marked by the *Tetrapylon* in the plan of *Gerasa* (63 B.C.), On the right side: Cross axial plan of *Palermo* marked by the "*Quattro canti*" (1608- 1609 A.D.)

In the baroque period we can identify a general tendency towards larger scale projects which is comparable with the complexity of the urban projects during the Hellenistic and early imperial periods. In baroque planning the cross-axial layout, typical of early roman cities based on *Cardo* and *Decumanus*, becomes again a common feature. The baroque transformation of Palermo is defined by the construction of two perpendicular axes which intersect in the circular *Piazza Vigliena*. The concave facades of the four buildings that surround this square form the so-called "*Quattro canti*" or four corners. A strikingly similar solution can be found in the Roman plan for *Gerasa*, where intersection of the *Cardo* and *Decumanus* is marked by a central square dominated by the *Tetrapylon*. The *Quattro canti* in Palermo is directly inspired by the earlier "*Quattro Fontane*" or four fountains in Rome, which part of the larger urban plan of Sixtus V. The baroque church of *San Carlo alle Quattro Fontane* designed by Francesco Borromini is located near one of the four fountains.

A comparative analysis of both the *Hellenistic-Early Roman* and the *Baroque* periods could improve the critical understanding of these two intermediate historical phases which are often considered secondary or decadent phases. Wölfflin's *"Renaissance and Baroque"* can be considered the first "rehabilitation" of the Baroque period. His analysis is based on the contraposition of antithetical concepts such as *tectonic-atectonic*, *unity-multiplicity* or *painterly-linear*. In the introduction of this book Wölfflin claims that he would have liked to include "ancient baroque" in this analysis and that he intended to include it in another book¹³⁹. Unluckily he did not do it. Margaret Lyttelton's *"Baroque architecture in classical antiquity"* represents the first attempt to analyze the "baroque" characteristics of the late Hellenistic and early imperial Roman architecture, even though her analysis is limited to the Eastern part of the empire.¹⁴⁰ In both the ancient and the modern baroque we can recognize, using Wölfflin's terminology, an "a-tectonic" union of parts subordinated to a dominant element which is essentially different from the tectonic unity of classical architecture which is achieved by the composition of free-parts. Furthermore both these two periods are characterized by large scale urban compositions and can be both considered periods of transition between external and internal space in architecture. In the typically baroque equivalence between exterior and interior "forces" the development of space is played within the plane of the façade through the bas-relief effect produced by the accumulation of decorative elements.



FIG. 152 Analogy between early imperial and baroque architecture. On the left side: *The Treasury at Petra* (100 B.C. - 200 A.D.) On the right side: *Sant'Agnese in Agone, by Borromini* (1652 A.D.)

¹³⁹ Wölfflin, Heinrich. 1966. *Renaissance and baroque*. Ithaca, N.Y.: Cornell University Press

¹⁴⁰ Lyttelton, Margaret. 1974. *Baroque architecture in classical antiquity*. *Studies in ancient art and archaeology*. London: Thames and Hudson. See the review by Perkins and MacDonald: Ward-Perkins. 1976. [Untitled]. *American Journal of Archaeology* 80 (3) (Summer): pp. 322-324 and: MacDonald, William 1976. [Untitled]. *Journal of the Society of Architectural Historians* 35 (3) (Oct.): pp. 231-233

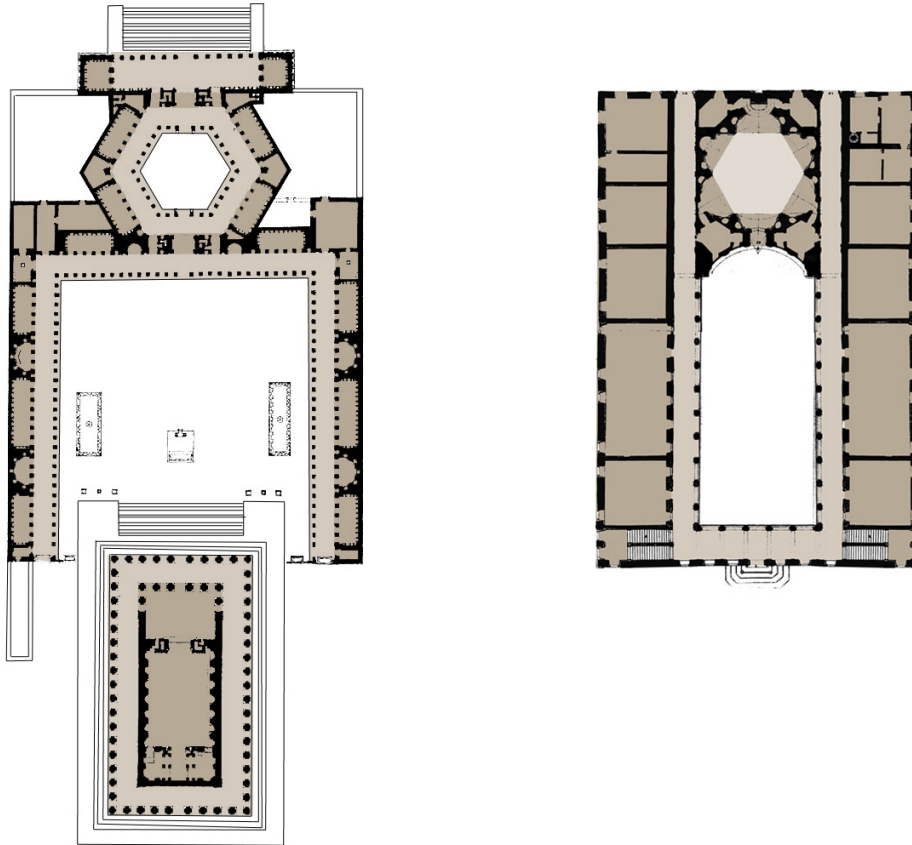


FIG. 153 Analogy between early imperial and baroque architecture. On the left side: Temple of Jupiter in Baalbek (15 B.C. - 135 A.D.) On the right side: Chiesa di Sant'Ivo alla Sapienza, by Borromini (1660 A.D.)

The analogy between these two periods is well expressed by confrontation between Borromini's projects and the Roman monuments in Baalbek. Even in this case it's difficult to prove a direct influence even though Baalbek starts to be explored around the 17th century.



FIG. 154 Stylistic analogy between early imperial and baroque architecture. On the left side: Temple of Venus in Baalbek. On the right side: Lantern of Sant'Ivo alla Sapienza, by Borromini (1660 A.D.)



FIG. 155 Analogy between early imperial and baroque architecture. On the left side Miletus gate (ca. 120 A.D.) On the right side: Noto cathedral (1776 A.D.)

Anthony Blunt even suggests that in Italy or in the Western provinces of the Empire there might have been similar buildings to those of Baalbek, which are known in the sixteenth and seventeenth centuries but have since disappeared.¹⁴¹ In any case, using Riegl's terminology, we can say that these two periods express a similar "Kunstwollen", or artistic intentionality, based on a similar perception of space. If we consider the work of Bernini, we would realize that this analogy is not limited only to architecture, but can be found also in sculpture.



FIG. 156 Analogy between early imperial and baroque architecture. On the left side: Oval forum in Gerasa (ca. 100 A.D.) On the right side: Saint Peter's Square, by Bernini (1656 A.D.)

¹⁴¹ Blunt, Anthony. 1976. [Untitled]. *The Burlington Magazine* 118 (878) (May): p. 324.



FIG. 157 Playfulness in Hellenistic and baroque sculpture. On the left side: *Boy with a goose* (ca. 160 B.C.) On the right side: *Fountain in Piazza Navona*, by Bernini (1651 A.D.)



FIG. 158 Dynamism in Hellenistic and baroque sculpture. On the left side: *Satyr and Hermaphrodite*, (2nd cent. B.C.) On the right side: *Apollo and Daphne*, by Bernini (1622-1625 A.D.)

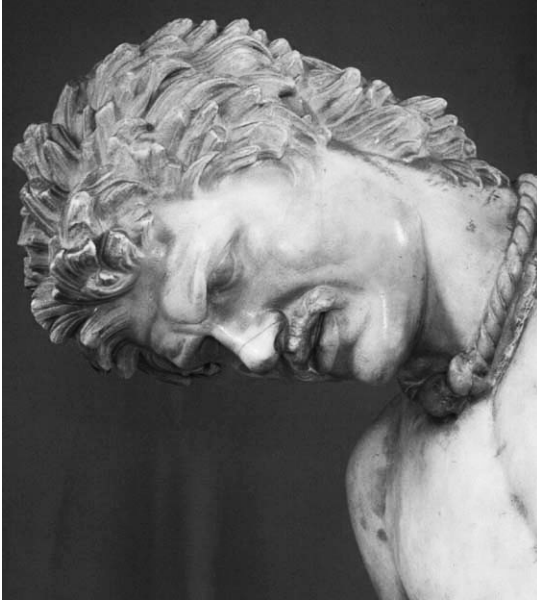


FIG. 159 Pathos in Hellenistic and Baroque sculpture. On the left side: *Dying Gaul*, (230-220 B.C.) On the right side: *Damned soul*, by Bernini (1619 A.D.)



FIG. 160 Pathos in Hellenistic and Rococo-French Revolution period. On the left side: *Ludovisi Gaul Killing Himself and His Wife* (ca. 200 B.C.) On the right side: *The Death of Marat*, by Jacques-Louis David (1793 A.D.)

Bernini's sculptures are characterized by complex group compositions, emphasis on dynamism and realism, as well as by the attempt to represent a wide variety of themes: from the playfulness of a babies playing with animals, to the pathos of a damned "soul". These are all aspects that can be similarly found in the sculpture of the Hellenistic period.



FIG. 161 On the left side: rejected project for the Palais du Louvre, by Bernini (1664) On the right side: built project for the Palais du Louvre, by Perrault (1665-1680)

Bernini's rejected project for the *Palais du Louvre* symbolically marks the end of the baroque period. In his designed façade there is an emphasized interplay between internal and external forces which is materialized in the combination of concave and convex surfaces, whereas Perrault's project is certainly more classical. His flat façade marked by the repetition of the free-standing paired columns clearly dominates the external space that is fronting almost like a Greek stoa. Furthermore Bernini's intention to go to Paris is symptomatic of the shift of the cultural and political center of gravity from Italy to France or northern Europe, which is characteristic of this period. If the geographical discoveries of Alexander the Great had pushed Greece from the center to the periphery of a newly conceived world, anticipating the emergence of the Roman Empire, the geographic discoveries of the Age of Exploration in the 16th and 17th century have also redefined a new world geography, generally promoting the Atlantic countries and transoceanic commerce and reducing the Mediterranean sea and the countries which are central to it to a secondary role.

Even the conception of the world in relation with the universe completely changes during this same period. The Ptolemaic system and the geocentric model supported by Christian theologians has remained widely accepted from the Hellenistic period basically until the end of the 16th century when it is subverted by the discoveries of Copernicus, Galileo and Kepler. Therefore the Hellenistic period and the 17th century mark the beginning and the end of an episteme, certainly characterized by Christian religion, which is architecturally dominated by the interior-centralized space and philosophically based on the idea that man is at the center of the universe. Even the Earth, which during these two millennia of European history has been conceived at the center of the universe, or we might say in the interior of the concentric spheres of the universe, is suddenly pushed in vast exterior space of the infinite universe, becoming a small entity between other entities. This probably represents the most emblematic expression of the perceptive and philosophical transition from interior to exterior space at the end of the baroque period. Furthermore if the Hellenistic period marks the beginning of the process of densification and articulation of the urban fabric, the neoclassical period marks the beginning of its dissolution which is manifested in its fragmentation into isolated free-standing objects. It's precisely in 18th century France that the shift from the old to the new episteme is more evident.

Michael Dennis, in *"Court and Garden From the French Hôtel to the City of Modern Architecture"*, has systematically explained and documented the beginning of the dissolution

of the urban fabric and the transition from the enclosed space of both the *Baroque squares* and the baroque *French Hôtels*, to the neoclassical and modern disposition of isolated volumes in the external space. As Michael Dennis writes in the introduction: “For centuries, space was the principle medium of urbanism - the matrix that united public and private interests in the city, guaranteeing a balance between the two. But in the eighteenth century, a process of change – social, intellectual, and formal – began to altar the balance in favor of the private realm. Free-standing object buildings began to replace enclosed public space as the focus of architectural thought, and despite some resistance during the nineteenth century, this formal transformation – from public space to private icon – was finally completed in the early twentieth century. The demise of the public realm was then assured.”¹⁴²

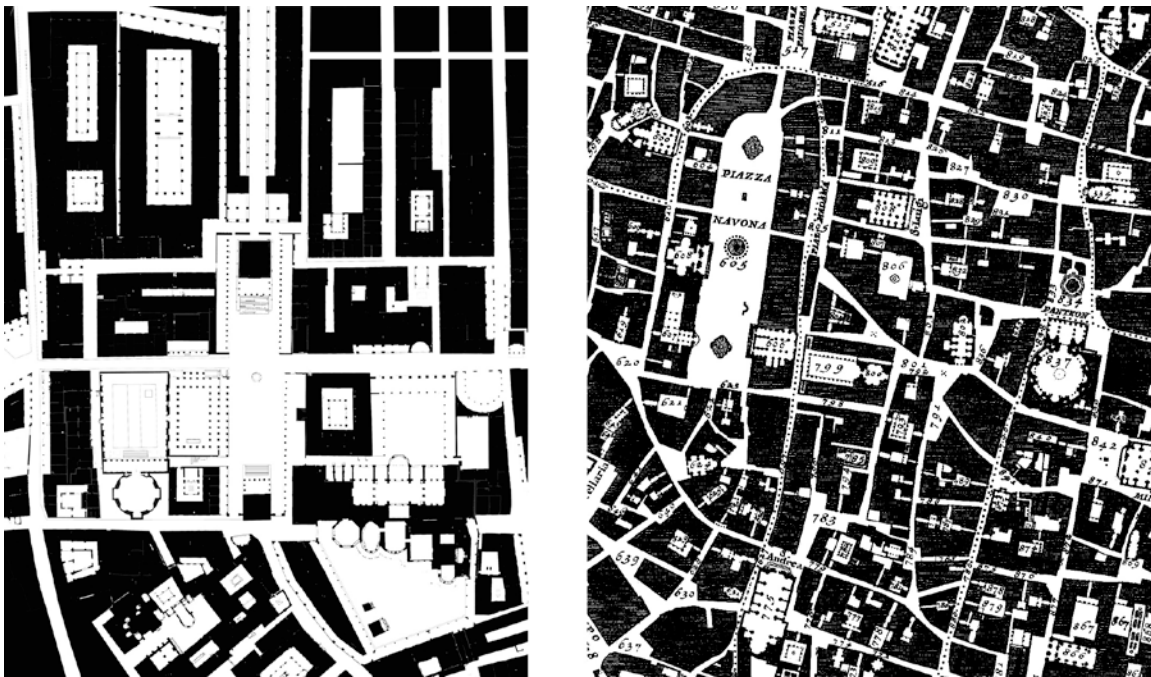


FIG. 162 The dense urban fabric of the “traditional” city in which solids and voids have the same value. On the left side: Plan of Ostia in the Roman imperial period. On the right side: Plan of Rome by Nolli (1748 A.D.)

In 1678 King Louis XIV leaves the *Palais du Louvre* and moves to Versailles. This event is symptomatic of the shift from the public realm of the urban fabric to a new territorial realm based on a new relationship with nature. It is in this non-urban environment that an architecture formed by isolated volumes can emerge, similarly to the Greek period. It is for this reason that in Versailles the gardens are even more important than the Palace itself. The gardens represent something more than a symbol of power: they embody a new self-confident approach to large-scale territory. The natural realm is not anymore an unknown an uncontrolled space.

¹⁴² Dennis, Michael. 1986. *Court & garden : From the french hôtel to the city of modern architecture*. Cambridge, Mass.: MIT Press: p. 1.

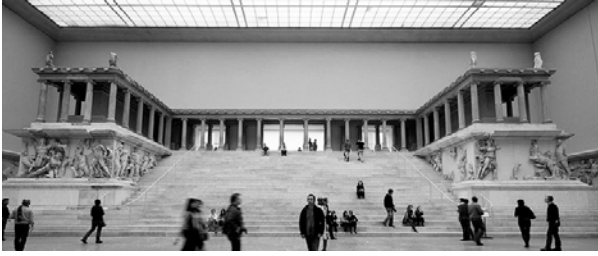


FIG. 163 Axiality, monumentality and “U” layout in Hellenistic and Baroque periods. On the left side: Pergamon altar (ca. ca. 150 B.C.) On the right side: Versailles palace (1664–1710 A.D.)

In architectural terms the Palace of Versailles is marked by a strong axiality and symmetry. Its “U” shape disposition and the partial attempt to enclose space between its two wings is comparable with the Hellenistic space conception. However, if the Hellenistic period is characterized by an increasing space enclosure, during the 18th century the tendency is antithetical. The tendency is towards open space and isolated volumes. The *Petit Trianon*, built one century later, already demonstrates a neo-classical and proto-modern space sensibility. The protruding wings are almost reabsorbed within the pure volume of the small building: a perfectly cubic pavilion which seems to declare itself as a self-sufficiency entity in the vast external space of the natural environment.

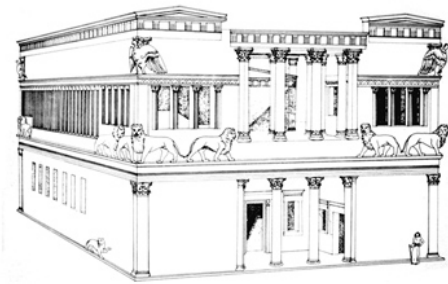


FIG. 164 Isolated Palace type in Hellenistic and Neoclassic period period. On the left side: Qasr al Abd, Hellenistic palace, Jordan (ca. 200 B.C.) On the right side: Petit Trianon, by Ange-Jacques Gabriel, Versailles (1762-1768 A.D.)

7

CONCLUSION

The predominance of external space in the modern period

In this chapter I will try to analyze the predominance of a space conception based on isolated autonomous objects, a conception which starts to emerge around 1750 and becomes widely diffused during the modern period. It is inevitable to connect this kind of spatial conception to the Greek one, which is similarly based on autonomous buildings in relationship with the landscape. Certainly this period is characterized by the rediscovery of Greek art and architecture and by the reevaluation of the tectonic archetype.

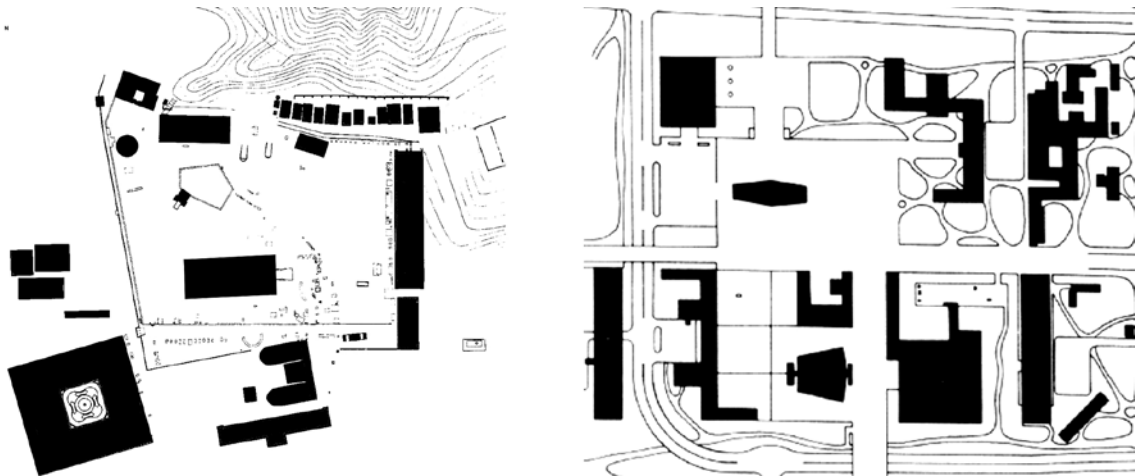


FIG. 165 The Greek and the modern space conception. On the left side: Olympia in the classical period (500-350 B.C.) On the right side: The plan for the town of St-Dié, Le Corbusier (1946 A.D.)

Since this period is characterized by the beginning of art history and architecture theory, I will analyze the issue of space primarily from a theoretical point of view. If we analyze the architectural treatises from Laugier to Le Corbusier we can recognize a consistent tendency for abstraction, the attempt to define an origin, the emphasis on progress, the preference for the tectonic archetype, and the “reconciliation” with a primordial nature. Certainly the issue of the relationship with nature emerges as the most important aspect of modernity, an unsolved issue even nowadays. If in the modern period this issue is defined in terms of air circulation, sunlight and hygiene, today it is expressed in terms of sustainability, landscape urbanism, or ecology.

7.1 Modernity and the preference for the tectonic archetype

We have seen in the first chapter how in Plato's "Allegory of the Cave" knowledge is symbolically achieved during the progression from the darkness of the cave to the sunlight of the outside world, through a process of literal "enlightenment". It is therefore not surprising to find out that this myth has a strong impact in what is called the "Age of Enlightenment" at the beginning of modernity. Laugier in 1753 publishes "An essay on architecture". In the preface he describes his research almost as a mystic journey from darkness to light, a journey not only similar to Plato's allegory of the cave but also vaguely reminiscent of Dante's peregrination from hell to paradise. This is how he describes it: "*at first, this search led only to obscurity and uncertainty. Yet I was not discouraged; I sounded the abyss until I thought I had discovered the bottom and did not cease to ask my soul until it had given me a satisfying answer. Suddenly a bright light appeared before my eyes. I saw objects distinctly where before I had only caught a glimpse of haze and clouds. I took hold of these objects eagerly and saw by their lights my uncertainties gradually disappear and my difficulties vanish.*"¹⁴³ Laugier, in his preface, seems to proclaim the advent of a new enlightenment, the return to a mystically rational "sunlight" which, as it is evident from the continuation of his essay, is missing since the end of classical Greek civilization. But it is in the incipit of the first chapter that this epistemological journey is translated into architectural theory and similarly explained as a progression from darkness to light, from interior to exterior space, from the chthonic archetype of the cave to the tectonic archetype of the hut. The incipit, in the attempt to explain an origin of architecture which is clearly influenced by Laugier's mentor Jean-Jacques Rousseau, narrates the story of a primitive man who is in a forest in harmony with nature, "*but suddenly mists are rising, swirling round and growing denser, until thick clouds cover the sky; soon torrential rains pours down on this delightful forest. The savage, in his leafy shelter, does not protect himself from the uncomfortable damp that penetrates everywhere: he creeps into a nearby cave and, finding it dry, he praises himself for the discovery. But soon the darkness and foul air surrounding him make his stay unbearable again. He leaves and is resolved to make good by his ingenuity the careless neglect of nature*". In few lines Laugier tells us that the cave represents the first architectural space found by a primitive man as soon as he leaves the "state of nature" represented by the forest. Meaningfully the discovery of the chthonic space of the cave is represented as the first moment in which a primitive man disconnects himself from nature: the cave is the space where nature is left outside, where there is no rain and wind. But this disconnection is defined by Laugier as an "ingenuity" because nature is the real source for architecture as he claims in the first sentence of the first chapter: "*It is the same in architecture as in all arts: its principles are founded on simple nature, and nature's process clearly indicates its rules*"¹⁴⁴.

¹⁴³ Laugier, Marc-Antoine. 1977. An essay on architecture. Documents and sources in architecture ; v. 1. Los Angeles: Hennessey & Ingalls: p. 11.

¹⁴⁴ Ibid., p. 11.



FIG. 166 Frontispiece of Marc-Antoine Laugier: Essai sur l'Architecture 2nd ed. 1755 by Charles Eisen

Thus the space of the cave is seen in opposition to nature and is described as a dark place lacking of air circulation. Already in these words we can identify Laugier's proto-modern approach: from the "enlightenment" to our time one of the most recurrent and almost dogmatic necessity expressed by architects is the research for sunlight, air circulation, open space. In modern times almost everything must move and circulate, everything should be fluid and flowing. Modern architects recognize in the old traditional city the same

characteristic of Laugier's cave: dark narrow streets where it's difficult to move and there is no sunlight and air circulation. Therefore the old city represents the faulty disconnection from nature, a true "ingenuity" exactly like the primitive habitation of the cave. In a modern perspective it is only in nature that the true principles of architecture can be found. According to Laugier as soon as the primitive man gets out of the cave, "*he wants to make himself a dwelling that protects but does not bury him. Some fallen branches in the forest are the right material for his purpose; he chooses four of the strongest, raises them upright and arranges them in a square; across their top he lays four other branches; on these he hoists from two sides yet another row of branches which, inclining towards each other, meet at their highest point... Such is the course of simple nature; by imitating the natural process, art was born. All the splendors of architecture have been modeled on the little rustic hut that I have just described.*"¹⁴⁵

The true origin of architecture is thus expressed by the construction of the *tectonic* hut, which has to imitate, using Laugier's words, the "*natural process*". The use of this term is relevant because the idea of architecture as a "process" is going to be one of the founding principles of modern architecture theory. The first act that exemplifies this attitude is the act of taking with the hands four strong branches, raising them upright exactly like in the case of the primitive standing monoliths. This is the first step in the construction of the trilithon and consequently of the temple. It is evident that the little rustic hut is only a model for the real original prototype of architecture which is identified, during the enlightenment, in the Greek temple: as Laugier clearly says in the introduction: "*Architecture owes all that is perfect to the Greeks, a nation privileged to have known everything regarding science and to have invented everything connected with the arts. The Romans, able to admire and capable of copying the excellent models which the Greeks had left them, wished to add something of their own and thereby only taught the world that when the stage of perfection is reached there is no other way than to imitate or decline*"¹⁴⁶. It is evident that this statement represents not so much an opposition to Roman architecture per se, but more profoundly a preference for the pure Greek tectonic architecture over the Roman reiteration of the chthonic archetype expressed by the predominance of interior space, arches and vaulted structures. To fully understand the relevance of this contraposition we have to consider Laugier's ideas in the wider context of the Greco-Roman controversy (1760s) arisen after the publication of Winckelmann's work on the supremacy of Greek art "*Gedanken über die Nachahmung der griechischen Werke in der Malerei und Bildhauerkunst*" (Reflections on the Painting and Sculpture of the Greeks) in 1755 and supported by Julien David Le Roy's "*Les Ruines des plus beaux monuments de la Grèce*" (Ruins of the Most Beautiful Monuments of Greece) printed in 1758. On the other side of the "battlefield" we find Piranesi who defends the originality of Roman architecture with his "*Della magnificenza ed architettura dei Romani*" (On the Magnificence of Roman Architecture) published in 1761.

¹⁴⁵ Ibid., pp. 11-12.

¹⁴⁶ Ibid., p. 8.

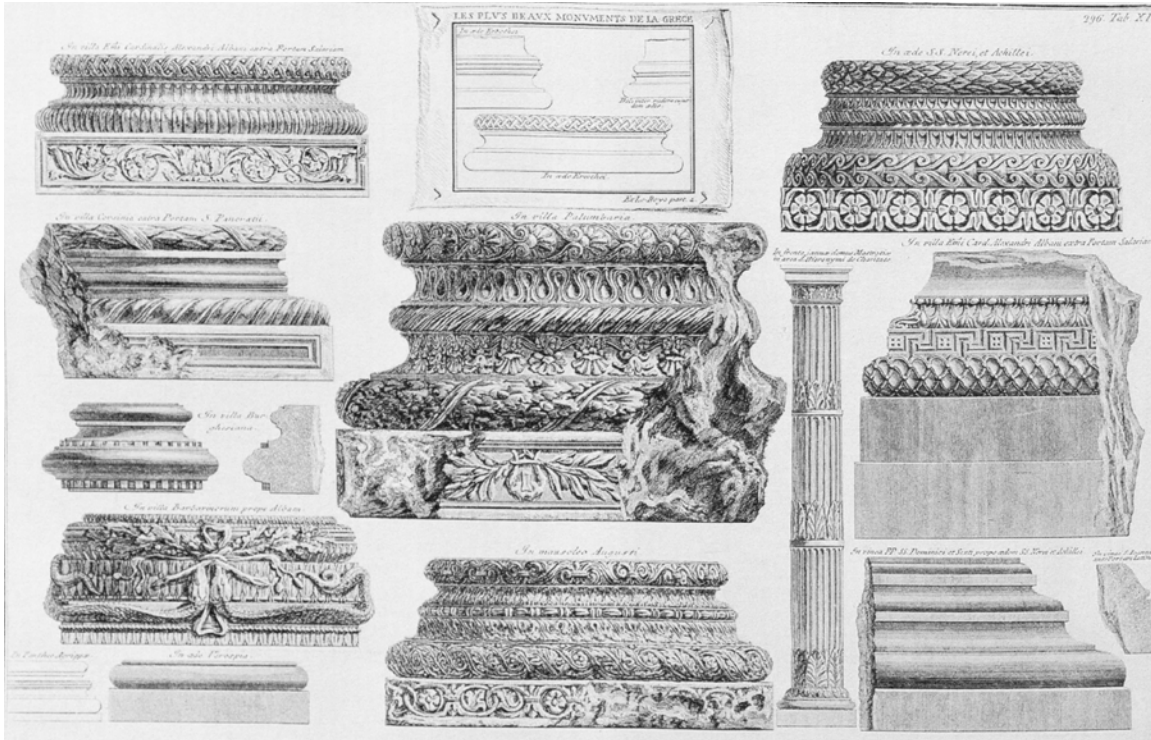


FIG. 167 Piranesi, "Della magnificenza ed architettura dei Romani" (On the Magnificence of Roman Architecture). On the top of the engraving Piranesi introduces an illusionistic replica of a Greek column base from Julien David Le Roy's "Les Ruines des plus beaux monuments de la Grèce". Piansesi represents it as a simple contour line drawing in opposition to the massive and rich decoration of Roman architecture details. The opposition is, again, between solidity and abstraction.

Piranesi's essentially chthonic attitude couldn't be expressed more explicitly than in his dark and visionary engravings: the drawings of hypothetical massive foundations of roman constructions and bridges, of cave-like ruins and invented Roman interiors. But if in the earlier engravings the unity of the Roman interior space is in a state of ruin, in Piranesi's *prisons* the chthonic archetype seems to reach a sort of paroxysm: the interior space seems to explode in chaotic fragments almost as if it's broken by the intrusion of bridges and tectonic structures. Piranesi's Prisons represent a hallucinated representation of the violent contraposition between the chthonic and the tectonic principles, between interior and exterior spaces: the prisons engravings seem to prefigure the imminent dissolution of the chthonic interior space and its transfiguration into an external tectonic space. Thus Piranesi seems to be conscious of the inevitable result of the contemporary Greco-Roman controversy, which can be seen as the contraposition, on a theoretical level, between the Greek tectonic purity and the roman chthonic symbolism.

In the Greco-Roman controversy, which is so relevant in the 18th century theoretical debate, we should first of all identify some practical reasons.

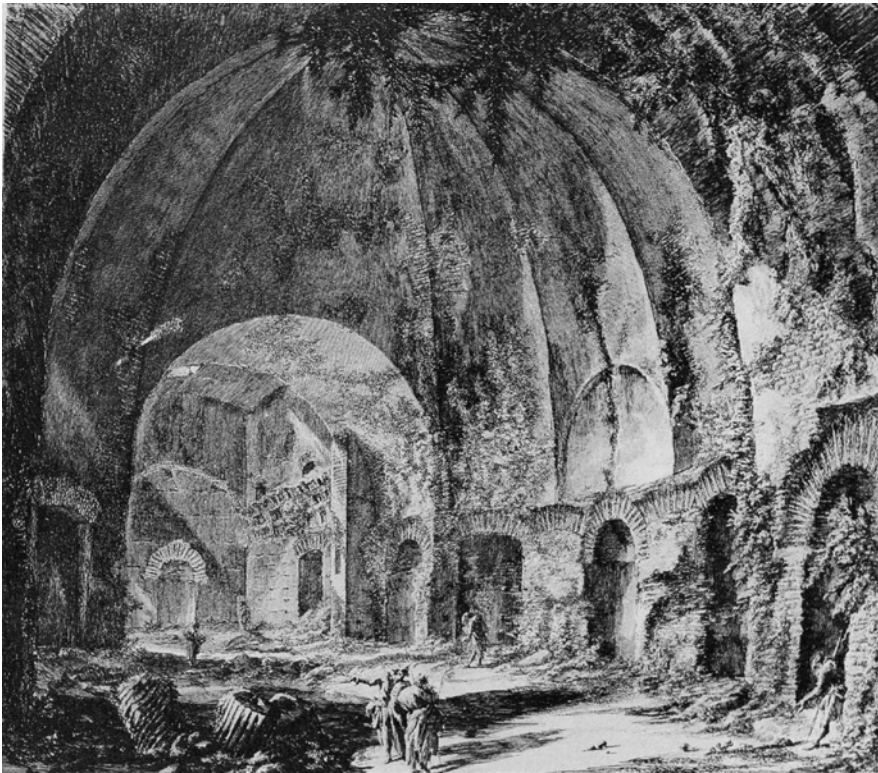


FIG. 168 Piranesi chthonic spaces. On top: "Prospettiva dello stesso delubro", etching on two joined sheets. On the bottom : "Interiora Balnearum Sallustianarum". (Interior of the Baths of Sallust)

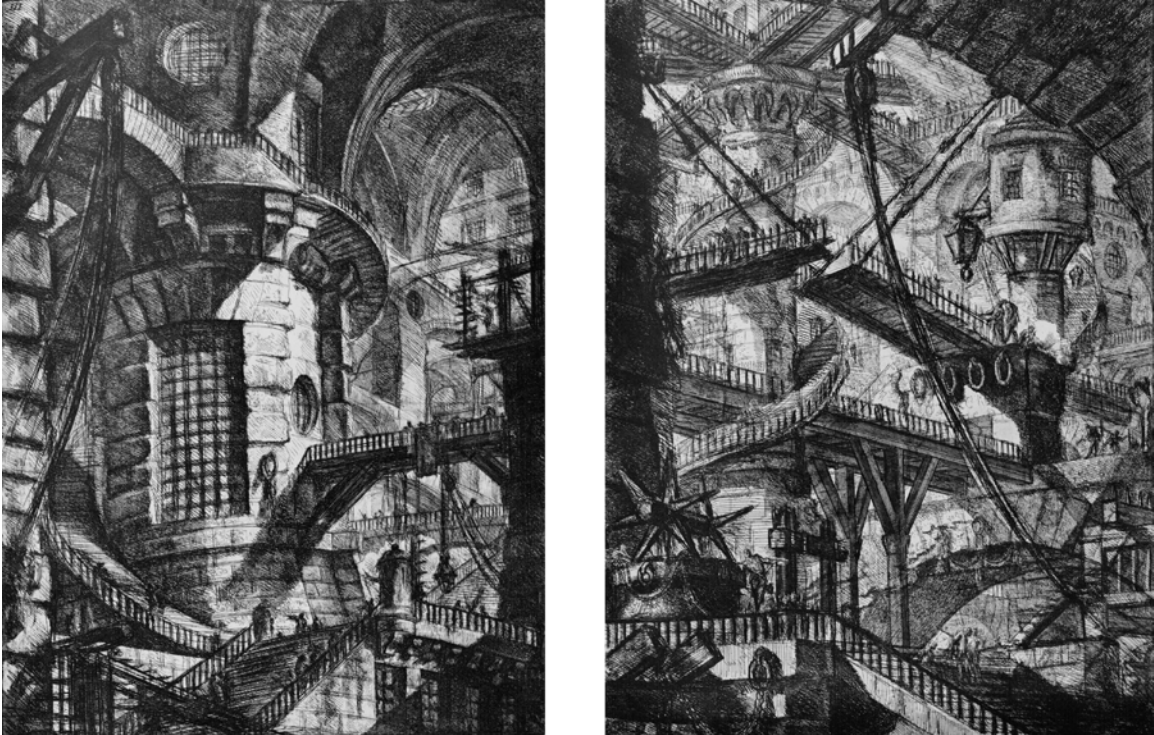


FIG. 169 Piranesi's Prisons: the interior chthonic space seems to explode in chaotic fragments almost as if it's broken by the intrusion of bridges and tectonic structures.

For all architects since the middle age and generally until mid 18th century, the undisputed model is represented by Vitruvius and by the remaining Roman ruins mainly because they practically represent the closest and most accessible source of inspiration whereas not much is known about Greek architecture: as a matter of fact from 15th century until its independence in 1821 Greece is part of the Turkish Ottoman Empire and therefore it is almost inaccessible. Significantly it is only after the independence war that the "Grand Prix de Rome" winners of the Beaux-arts are allowed to travel for the first time to Greece. In these years the barycenter of architectural interest is progressively moving from Rome towards the south east, through Paestum and Sicily, where architects have the first contact with Greek architecture even though mediated by Hellenistic and Italic influences, and then to Greece where they can finally appreciate the "noble simplicity and quiet proportions" of Greek art, as Winckelmann would say. It is almost as if the origin of architecture, which seems to represent one of the most relevant issues of this period, is slowly being moved geographically southeastward, from Rome to Athens, and historically backwards to 5th century BC.

But if these are some of the practical reasons for the Greco-Roman controversy we should also consider the debate in a wider historical perspective that takes into account the rise of Nation-States in Europe: not only because in this perspective the democratic Greek city-states emerge as a political model to be opposed to roman imperialism, but more relevantly

because the Nation-States are being formed under the pressure of a growing nationalism inspired by the search for a true national identity. All this is going to be one of the driving forces of 19th century Romantic nationalism but also the source of 20th century degenerations. Therefore if we consider the Greco-Roman controversy in the perspective of a growing nationalism, Piranesi's defense represents a helpless attempt to maintain the role of Roman and renaissance architecture, while Winckelmann's and Julien David Le Roy's publications intend to manifest the disengagement and independence from that tradition and the promotion of their countries as possible re-founders of Greek art.

A positive aspect of the rise of national identities is the beginning of a new interest for non-European cultures and therefore for a non-classical history, even though the understanding of foreign cultures is very approximate at this stage and is primarily based on the accounts of missionaries in the European colonies and on the rapidly expanding genre of travel literature. The first expression of this new aperture to a more global history of architecture can be recognized in Quatremire de Quincy who develops a theory of architecture for the *Encyclopédie méthodique* (1788-1815) in which he includes also Chinese architecture. Therefore in his theory he recognizes the chthonic *cave archetype*, which is associated with the massive and chthonic space of Egyptian and Etruscan architecture, the tectonic *hut archetype*, which is represented by the Greek temple, and a third archetype, the *tent*, related by Quatremire de Quincy to Chinese architecture, even though it is not conceptually and structurally so different from the *hut*.¹⁴⁷ In his theory the three archetypes directly represent human evolution since the *cave* is habituated by primordial hunters, the *tent* by nomadic herdsmen and finally the *hut* agricultural people. Despite the fact that Quatremere's theory continues to favor the superiority of the *hut prototype* and the Greek model we can recognize in his approach the beginning of a plural history, a history that is based on the different "characters" of buildings, and therefore a "history of styles". As Quatremere writes in the *Encyclopédie*, the "character" of a building is directly related to notions such as psychology and physiognomy, which are increasingly relevant disciplines in the 19th century ¹⁴⁸. On one hand the aperture to new cultures is an innovative tendency of this century, on the other hand in the same period we can identify a complementary hazardous tendency to scientifically associate differences in culture to language, ethnic groups and physiognomy and therefore to strictly categorize and "characterize" national identities.

Very illuminating, in this sense, is Viollet-le-Duc's "*The habitations of man in all ages*" published in 1876. Here again, more than one century after Laugier's essay, the search for the origin of architecture is still the most important issue.

¹⁴⁷ See Sola-Morales, Ignasi de. 1987. The origins of modern eclecticism: The theories of architecture in early nineteenth century france. *Perspecta* 23 : pp. 120-133.

¹⁴⁸ The importance of the notion "character" is explained in Colin Rowe, *Character and Composition or Some Vicissitudes of the Architectural Vocabulary of the Nineteenth Century*, in *Oppositions*, No. 2, 1974

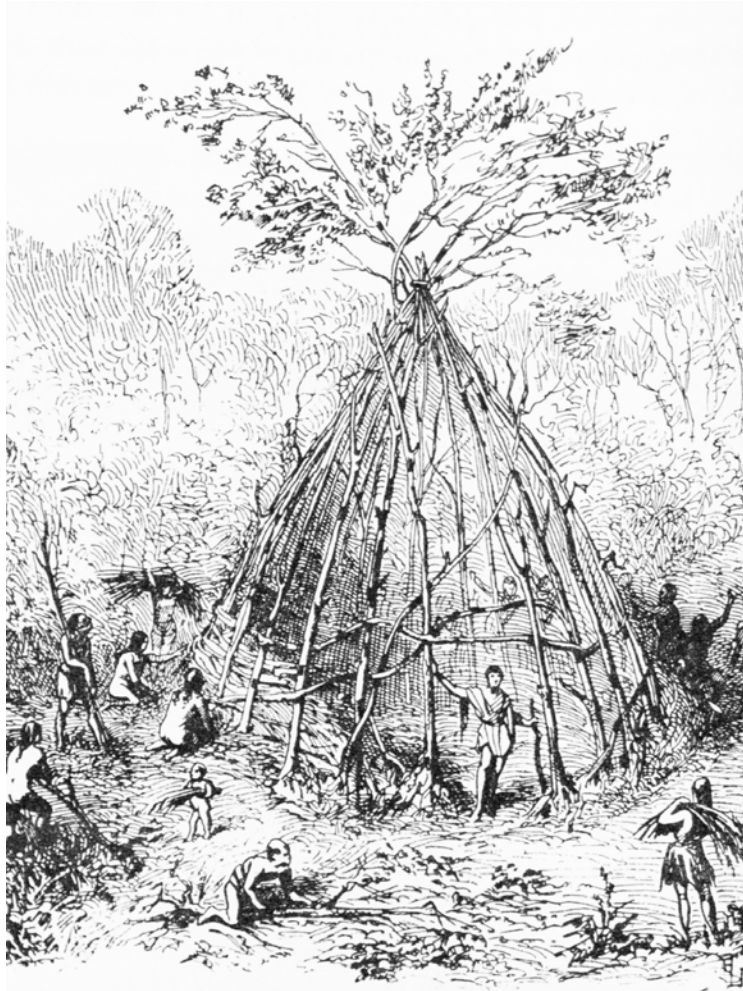


FIG. 170 Viollet-le-Duc's, Habitation of Man in All Ages, Drawing of "The first hut". On the bottom a profile of its inhabitants. These two drawings express the correlation of two typical 19th century ideas: The "character" of a building and the "physiognomy" of a person.

But if Laugier's interpretation is based on the typical 18th century sentimentalism and romanticism of the "noble savage", in the 19th century the issue of the "origin" becomes a more serious, almost scientific, investigation on the origin of cultural differences and "races". It's during this period that scientific researches, such as Darwin's evolutionary theories and 19th century anthropology inquiries, begin to be dangerously mixed with nationalistic ideas

and attempts to show the predominance of certain ideas, ethnicities or genders for the sake of progress. And it's in this eclectic and vicious cultural combination that the chthonic and tectonic archetypes appear again in the attempt to prove a kind of Darwinian evolutionistic theory of architecture.

In the incipit of Viollet-le-Duc's book we find again a primordial nature: *"In an age very remote from the present, seated upon a mountain brow, two beings are pensively contemplating the vast landscape which stretches before them. Lakes of irregular shape, connected by stagnant shallows, enclose level expanses covered with scrubby vegetation, varied here and there by low rocks which show like long upright faults. The horizon is broken by a mountain chain of fantastic outline"*¹⁴⁹. Two angelic beings are witnessing the creation of the world from the top of a mountain. Their task is to travel effortlessly through the different periods of human history helping men in the advancement of architecture. These two mythical invented figures already represent a dialectical opposition: *Epergos* wants to help human beings to advance in their progress, while *Doxius* intends to maintain the immutable tradition.¹⁵⁰ Therefore *Epergos* helps the primitive man to build the first hut. If Laugier's hut is evidently idealized and romanticized, the one described by Viollet-le-Duc intends to be a more realistic representation of a primitive hut, probably inspired by the discoveries of anthropology during his time. The attempt to give an anthropologic, almost "scientific", framework to the treatise is evident in the small engravings of human heads at the end of every chapter to illustrate the ethnic group associated with every architectural style. The engraving of the primitive hut is accompanied with the profile of a Neanderthal-like creature and therefore the character of the building is associated to the physiognomy of its inhabitants. The discipline of Physiognomy, which is so relevant during this period, is based on the idea that the facial expression reveals ethnic, psychological and even criminal types. This is only one aspect of an increasing dangerous mixture, which is typical of 19th century, between scientific notions, attempts to define a pure "origin" and nationalistic ideologies. In this sense to fully understand Viollet-le-Duc's research we have to place it in the context of the "Essay on the Inequality of the Human Races" published in 1853 by Arthur Comte de Gobineau, with whom Viollet-le-Duc has an active correspondence. The discovery of a common origin between Indo-European languages promotes the idea that the common "language" is a proof of a common "ethnicity": the speakers of the Indo-European

¹⁴⁹ Viollet-le-Duc, Eugène Emmanuel. 1971. *The habitations of man in all ages*. New York, B: Blom: p. 1.

¹⁵⁰ In his essay *"Notes on Viollet-le-Duc's Philosophy of History: Dialectics and Technology"* Martin Bressani considers Viollet-le-Duc's philosophy of history as an ideology of freedom: *"it attempts to demonstrate humanity's progressive transformation of nature-in its origin, hostile to man-into a new world in harmony with him. Inherent in this transformation of nature by man is a process of destruction and renovation. This dual action defines the terms of a dialectic: an opposition-man against nature-is resolved in the man-made object, thanks to the power of reason. Technique is the realm of human activity which best speaks of man's dialectical engagement with the world"*: see Bressani, Martin. 1989. *Notes on viollet-le-duc's philosophy of history: Dialectics and technology*. *Journal of the Society of Architectural Historians* 48 (4) (Dec.): p. 328.

languages according to Gobineau are expression of the "Aryan race", which has to be differentiated from the "yellow race" and "Semitic race".

These ideas are expressed in *"The habitations of man in all ages"* by Epergos, which represents not only the progress of architecture in opposition to Doxius' traditionalism, but evidently embodies Viollet-le-Duc's opinion. In the conclusion there is a dialogue between the two protagonists: Doxius exclaims: "Ah! There is again with his "races"!" And Epergos: "It happened that these races adopted methods of construction, - methods whose original elements are handed down from age to age, and make their appearance at the present day as manifestly as do the roots of the languages spoken by those primitive races. To illustrate this by example ; the Aryas, whose original abode was a mountainous and wooded region extending from the Upper Indus to the Brahmapootra, and stretching northwards into Upper Thibet, and as far as the Altai chain, towards its western extremity, evidently made use of the timber which those mountains afforded them in abundance, to erect their dwelling. When they quitted those elevated regions and descended first into Hindostan, then towards Ancient Media and Persia, then towards the Euxine; subsequently, in a westerly direction towards our own continent, Europe..."¹⁵¹ According to Viollet-le-Duc European timber architecture is originated in India. Therefore the wooden tectonic archetype of the Himalayan dwelling represents the true original prototype of western architecture and the architectural expression of a common Indo-European origin and language. The proof of this connection, according to Epergos, can be found in the Swiss chalet: "This is never the case with the unmixed or nearly unmixed productions of the Aryan race; they are not obscured by a confused mass of adventitious elements ; they maintain their identity through successive ages. Perhaps you will be surprised if I tell you that the chalets of the Swiss mountains are exactly like the dwellings that are to be seen on the slopes of the Himalayas, and in the valleys of Cashmere."¹⁵² If in Laugier's book the origin of architecture is identified in the hut as a primitive expression of the tectonic prototype of the Greek temple, Viollet-le-Duc pushes the origin of western architecture even more eastwards and identifies the original tectonic prototype in the Himalayan hut.

It's evident that the search for a pure "original prototype" is now extended to a global level and through a more hazardous combination of scientific knowledge, ethnographic notions, linguistic theories and attempts to define an even "purer" and more ideal origin. The theorization now is not limited anymore to architectonic and cultural issues: there is an attempt to define a totalizing "theory of origin" that merges architecture with languages, physiognomy, and ethnic groups. From this distorted perspective the "purity of style" is considered an expression of the "purity of race".

¹⁵¹ Viollet-le-Duc, Eugène Emmanuel. 1971. *The habitations of man in all ages*. New York, B: Blom: p. 382.

¹⁵² *Ibid.*, pp. 384-384.

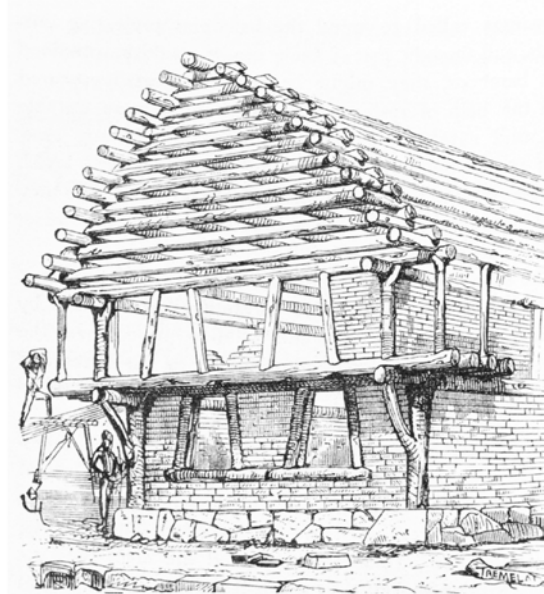


FIG. 171 Viollet-le-Duc's, *Habitation of Man in All Ages*, On the left side "The Primitive House of the Arya". On the right side "Building of Overhanging Unwrought Timber Framing"

The divergence between the *tectonic* and the *chthonic* archetypes are now expressed as ethnic and linguistic differences between the so-called "Aryan race" and "Semitic races". In the conclusion of the book *Epergos* continues to explain his theory "Left to the guidance of their own instincts the Aryas always built in the same manner, and have such a marked predilection for timber constructions, that they seek by preference countries that are wooded, and have a veneration for trees. All nations of Aryan origin are attached to forests, delight in them, live among them, and have certain woods which they regard as consecrated... The Semites either live, as a matter of necessity, in tents or in natural grottos; or they make themselves grottos with clay, that is, they erect concrete masses of mud or clay – hollow tumuli in which they are sheltered from the heat and from insects: for their settlements are in hot regions, thinly wooded, and where streams are infrequent. It was they who first supplied unconsciously the rudiments of vaulting."¹⁵³ We find here a very clear contraposition between the *tectonic archetype*, exemplified by "Aryan" timber constructions, and the *chthonic archetype*, which is associated with "Semitic" buildings: grottos, massive constructions built with masonry and vaulted spaces in which the interior is isolated from natural afflictions such as heat and insects.

¹⁵³ Ibid., p. 387.

It's probably instinctive, at his point, wondering what is the sense of this almost delirious explanation for the origin of architecture. First of all it should be clarified that, even though this "racial" contraposition will be adopted and transformed into the most nefarious ideology of the 20th century, neither Gobineau nor Viollet-le-Duc openly express anti-Semitic ideas.

What is most surprising about the ideas expressed in this book - and this is a consideration that can be extended to all modern ideologies - is that such theories stem from an approach that, pretending to be "scientific", ideally starts from "nature" in the attempt to find a pure "origin" and finally degenerates into a bizarre totalizing theory. In *"The Origins of Totalitarianism"* Hannah Arendt explains that "*an ideology differs from a simple opinion in that it claims either to possess either the key to history, or the solution for all the "riddles of the universe," or the intimate knowledge of the hidden universal laws which are supposed to rule nature and man.*" I don't want to claim here that the scientific approach to nature during the "enlightenment" and the obsessive investigation of the "origin" are necessarily related to the rise of modern ideologies, but, using Plato's allegory, the progression from the darkness of the cave to the "enlightenment" produced by the external sunlight might have heavily "dazzled" the observers. We might wonder if ideology is the result of the fact that a scientific method, typical of the Age of Enlightenment, is extended and applied, maybe too roughly and ingenuously, to humanistic disciplines and life-related issues such as: habitation, ethnicity, cultural differences. In Viollet-le-Duc's *"The habitations of man in all ages"* the intention is to "scientifically" express an almost anthropological history of human habitation, but the attempt to move historically backwards and geographically eastwards to find the true origin of western architecture degenerates into a purely ideal, maybe ideological, supposed origin.

What is most surprising about Laugier and Viollet-le-Duc's books is that here maybe for the first time theory is disconnected from history: their analyses are based on ideas and ideal types of architecture without combining text with drawings of existing buildings as it was typical in earlier treatises. During the 19th century, in the attempt to have a scientific approach to architecture theory, on one hand buildings are idealized and abstracted into "types", on the other hand art and architecture history is idealized and classified according to the abstract category of "style". Therefore the modern general tendency for a diagrammatic approach and abstraction is recognizable even in architecture history. As Quatremère de Quincy writes in the *"Dictionnaire historique d'architecture"* "*type' presents less the image of a thing to copy or imitate completely than the idea of an element which ought itself to serve as a rule for the model.*"¹⁵⁴ The introduction of "Type" in architecture theory marks the end of the traditional approach of architecture as *mimesis* and the beginning of an abstract and conceptual theory not related to any specific building. During the 19th century there is also, for the first time, a diffuse idea that *style* exists in its own as an autonomous entity, exactly like language, and that behind it there is an Hegelian "spirit of age", which

¹⁵⁴ See Quatremère de Quincy, "Type" in *Encyclopédie Méthodique*, vol. 3, trans. Samir Younés, reprinted in *The Historical Dictionary of Architecture of Quatremère de Quincy* (London: Papadakis Publisher, 2000).

almost like Viollet-le-Duc's *Epergos* and *Doxius*, inspires human actions and expresses a *will to form*. We can furthermore assume that in "*The habitations of man in all ages*" the two mythical figures of Epergos and Doxius represent a kind of Hegelian spiritual expression of the "tectonic and chthonic" dualism: Epergos represents progress, rationality but also all the qualities expressed by the tectonic timber constructions, whereas Doxius, with his preference for stability and for tradition, is the expression of massive vaulted constructions and hollow spaces. Therefore the tectonic-chthonic dualism is not anymore an expression of the two different relationships between architecture and space: this antithesis is now disconnected from real buildings and idealized into a representation of two "spiritual forces" in opposition: rationality vs. sensibility, technology vs. memory and progress vs. origin. It's also evident that one of these two forces predominates over the other.

The idea of "progress" is certainly one of the most characteristic aspects of modernity since Voltaire's ideas, in which for the first time the idea of *progress* is combined with scientific knowledge and rationalism. We can interpret the "enlightenment" fixation for a true "origin" as complementary to the obsession for "progress". The research for a true "origin" is a way to move before and therefore also beyond history: the past is reduced to a point placed at the beginning of everything. The modern dialectical dualism between origin and progress is very specific of a deterministic approach used since the enlightenment: if we define two points there can only be a determined line passing through. In historical terms the establishment of two points, the origin and the present, allows to define a linear evolution and a specific direction for progress. Modernity could not exist without this specific idea of progress. The use of the term "modernity" since early 19th century is in itself the expression of the attempt to define this straight line with the intention to identify a specific "punctual" past to be opposed to the present. And it is this straight line that indicates a direction for progress and consequently the necessity to overcome the past together with everything which is not aligned with this line. Therefore the risk of a deterministic idea of progress is to generate the presumption that some theories, languages, cultures, persons and therefore even ethnic groups should predominate over the others for the sake of progress.

Clarity, hygiene and purity are all typical modern terms that express, for better or for worse, the way in which the straight line of progress can be pursued. The modern obsession for sunlight, air circulation, traffic flows, lightness and dynamism are all expressions of the need for purity and consequently for progress. On the contrary, from this same perspective everything which is dark, massive, static and stable represents the past and a obstacle to progress. This opposition represents again a tectonic-chthonic dualism, and modernity is evidently trying to express tectonic principles.

But what are the effects of the ideology of progress in architecture? Since during the modern period buildings are conceived as isolated and autonomous objects in a open space, the rejection of the past does not imply the annihilation of the existing old buildings: it means only the refusal of the decorative apparatus and the purification from the old styles. But in urban projects the refusal of the past has more dramatic implications because urban interventions necessarily involve the old traditional city: for modern architects the *tabula*

rasa seems to be the only solution for a “purification” of the city, because there can be no synthesis between origin and progress.

We can identify two complementary tendencies in 19th century architecture theory. One, as we have seen, is related to the idea of **progress**: in this case the tendency to investigate the true origin is necessary to define a precise direction for progress. However as we have seen in the case of Viollet-le-Duc’s this kind of general, almost universal, scheme can degenerate into an idealized or even an ideological theory. The other tendency is related to the idea of **process**: here modern determinism is applied to a smaller and more manageable scale and to a much shorter time span. The result is a materialistic approach that tends to focus on the relationship between materials and construction process as in the case of Gottfried Semper’s “*The Four Elements of Architecture*” published in 1851. Therefore, even though both Viollet-le-Duc and Semper try to recognize the ideal types of architecture in the organic principles of nature, the former tries to identify some large scale universal principles based on the ethnographic evolution of the “race” types, whereas the latter is more interested in the small scale of the “construction process” and in the evolution of buildings as a biological organisms. Therefore for Semper history is based on a linear *process* of development from simple to complex forms.

Inspired by the constituting elements of a Caribbean hut seen at the Great Exhibition of 1851, Semper somehow expands the three types of Quatremire de Quincy- the *cave*, the *tent* and the *hut*- with a fourth element, which is the hearth, expressing them in terms of production process: the *hearth* is produced by ceramic art, the *enclosure* as tent or light-weight membrane is the result of textile production, the *mound* or thick *masonry* is the result of earthwork-stereotomy, and the *roof* as well the light frame system is produced by tectonics-carpentry. Furthermore according to Semper any architectural production process can be reduced to two basic procedures: the heavy construction of a “*stereotomic*” mass which is related to the earth and the assemblage of light-weight, linear elements into a “tectonic” spatial matrix which is related to the sky. The only difference with the *chthonic* and *tectonic* archetypes is that Semper consider these two categories not as unified building types but as components and expressions of the construction process.

According to Kenneth Frampton, Semper has derived his thesis from the ideas of August Schmarsow, the first modern theorist who has considered space in relation to building types, whereas all previous analyses were focused on the mere architectural object. As Frampton writes in the introduction of “*Studies in Tectonic Culture*” “*the great French architectural theorist Eugène-Emmanuel-Viollet-le-Duc would compile his magnum opus of 1872, his Entretiens sur l’architecture, without once using the term space in a modern sense. Twenty years later nothing could be further from the structuralism of Viollet-le-Duc’s thought than the primacy given to space as an end itself in August Schmarsow’s “Das Wesen der architektonischen Schöpfung” (The Essence of Architectural Creation), first published in 1894. Like many other theorists before him, Schmarsow would advance the primitive hut as the*

primordial shelter, only this time he would see it as a spatial matrix, or what he would call the Raumgestalterin, the creatress of space."¹⁵⁵

Before Schmarsow, space was only conceived as a void in relation to interior space, whereas external space was not acknowledged. The discovery of the relevance of exterior space for tectonic architecture is generated, in Schmarsow's case, by the confrontation between Egyptian and Greek architecture: *"The whole of the Egyptian temple is a spatial composition for a long temporal sequence of impressions, which can only be compared with music or epic and dramatic compositions. Perception of the temple is a series of acts, especially if the performance of the experience here proceeds from no other viewing place than that of the human breast. Completely different is the Greek temple with its column rows around the oblong built form of the cella. Here the exterior is the main point. It is as though a courtyard of the Egyptian temple, with its columns on the inner side of the wall enclosure, was turned from inside to outside. Here (in the Greek temple) is truly a building of surveyable bodily volumes, but likewise determined through the preponderance of the length over the depth dimension."*¹⁵⁶

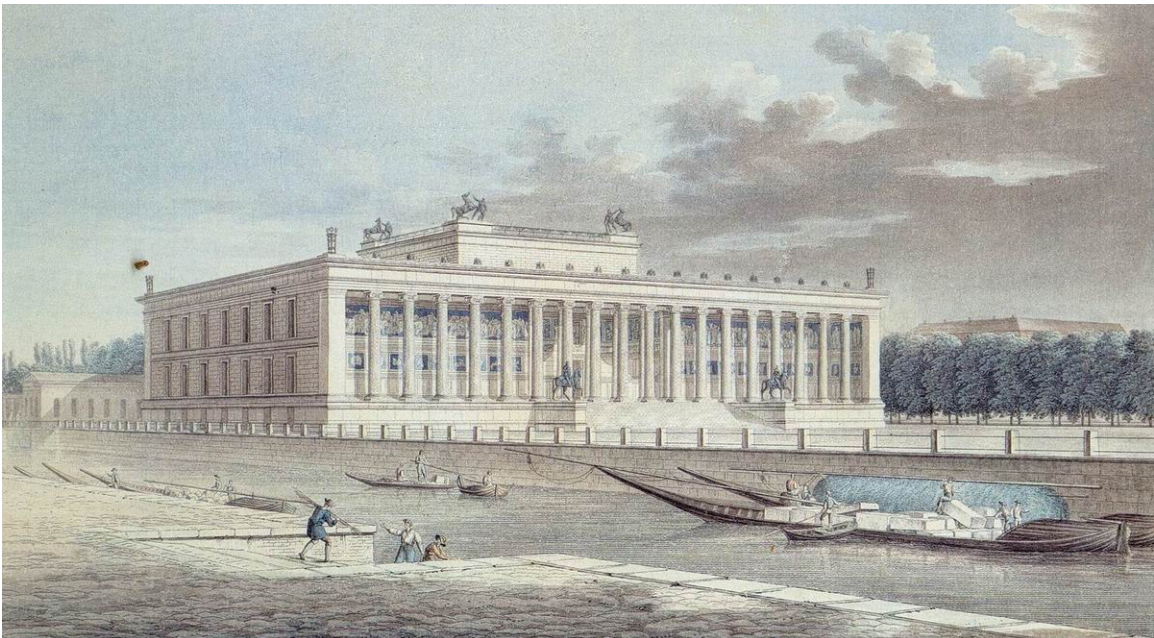


FIG. 172 Altes Museum, Berlin (1825-28) Karl Friedrich Schinkel

¹⁵⁵ Frampton, Kenneth, John Cava, and Graham Foundation for Advanced Studies in the Fine Arts, eds. 1995. Studies in tectonic culture : The poetics of construction in nineteenth and twentieth century architecture. Cambridge, Mass.: MIT Press: p. 1.

¹⁵⁶ From: Schmarsow, Grundbegriffe der Kunstwissenschaft, 192. See also: Schwarzer, Mitchell W., and August Schmarsow. 1991. The emergence of architectural space: August schmarsow's theory of "raumgestaltung". Assemblage(15) (Aug.): pp. 48-61

Schmarsow understands, probably for the first time, the relation between the tectonic archetype and the external space: a kind of open space which is based on the relationship between isolated objects and bodies, a “space of flows” influenced by the strong emanating presence of the external colonnade; furthermore a space antithetically different from the interior *chthonic space* which Schmarsow defines as “static”.

Schmarsow’s acknowledgment of the exterior space in relation to tectonic building types is not the result of a purely “historical” discovery and can be understood only if it’s considered within the architectural developments of his own time: by the end of 19th century a new way of designing urban space as a composition of isolated objects - very similar to the Greek disposition of temples in the open landscape - is already being widely accepted and used with the result of a progressive dissolution of the urban fabric. To remain in Schmarsow’s German area we can recall the *Altes Museum* built by Karl Friedrich Schinkel between 1825 and 1828: even though “internally” it can be considered as one of the last attempt to find a synthesis between the roman chthonic archetype, represented by a pantheon-like structure placed in the middle of the museum, and the Greek tectonic stoa of the main façade, it’s in Schinkel’s *masterplan* for the museum island that we find the clearest expression of a “Greek spirit”, to use a 19th century expression. The master plan is evidently composed by isolated objects in a wide open space and is a clear reiteration of the exterior space of the acropolis. As a matter of fact the Prussian intention to transform Berlin in the “new Athens” is already evident in the earlier Brandenburg Gate, built between 1788 and 1791 to be the *Propylaea* of the capital city.

With the beginning of the 20th century and the advent of the official modern architecture movement this tendency is strengthened: the need for open space, sunlight and air circulation becomes one of guiding principles of every urban intervention and in the progressive dilatation of the open space the “floating architectural objects” increasingly emerge as “rationalised icebergs” floating on a fluid field. Buildings are now primarily characterized by their “objective presence” and by their external visibility. The reiteration of the tectonic archetype is completely fulfilled: both in the rationality of the building structural frame and in their relation with external space and nature.

This new sensibility has been completely grasped, understood and enthusiastically promoted by Sigfried Giedion. In his “Space, Time and Architecture” the Swiss historian masterfully combines Semper’s attention to materials and production processes with Schmarsow’s acknowledgement of the external space, merging these ideas within the new approach of “modern art history” initiated at the University of Basel by his predecessors Jakob Burckhardt and Heinrich Wölfflin. In the three generations of Swiss art historians represented by Burckhardt (1818–1897), Wölfflin (1864–1945) and Giedion (1888–1968) and in their works we can trace the progressive shift of interests from Burckhardt’s “*The Civilization of the Renaissance in Italy*” (1860), through Wölfflin’s “*Renaissance und Barock*” (1888), to Giedion’s thesis “*Late Baroque and classicism*” (1922) followed, after two decades, by his canonical history of the modern movement “*Space, Time and Architecture*” (1940).

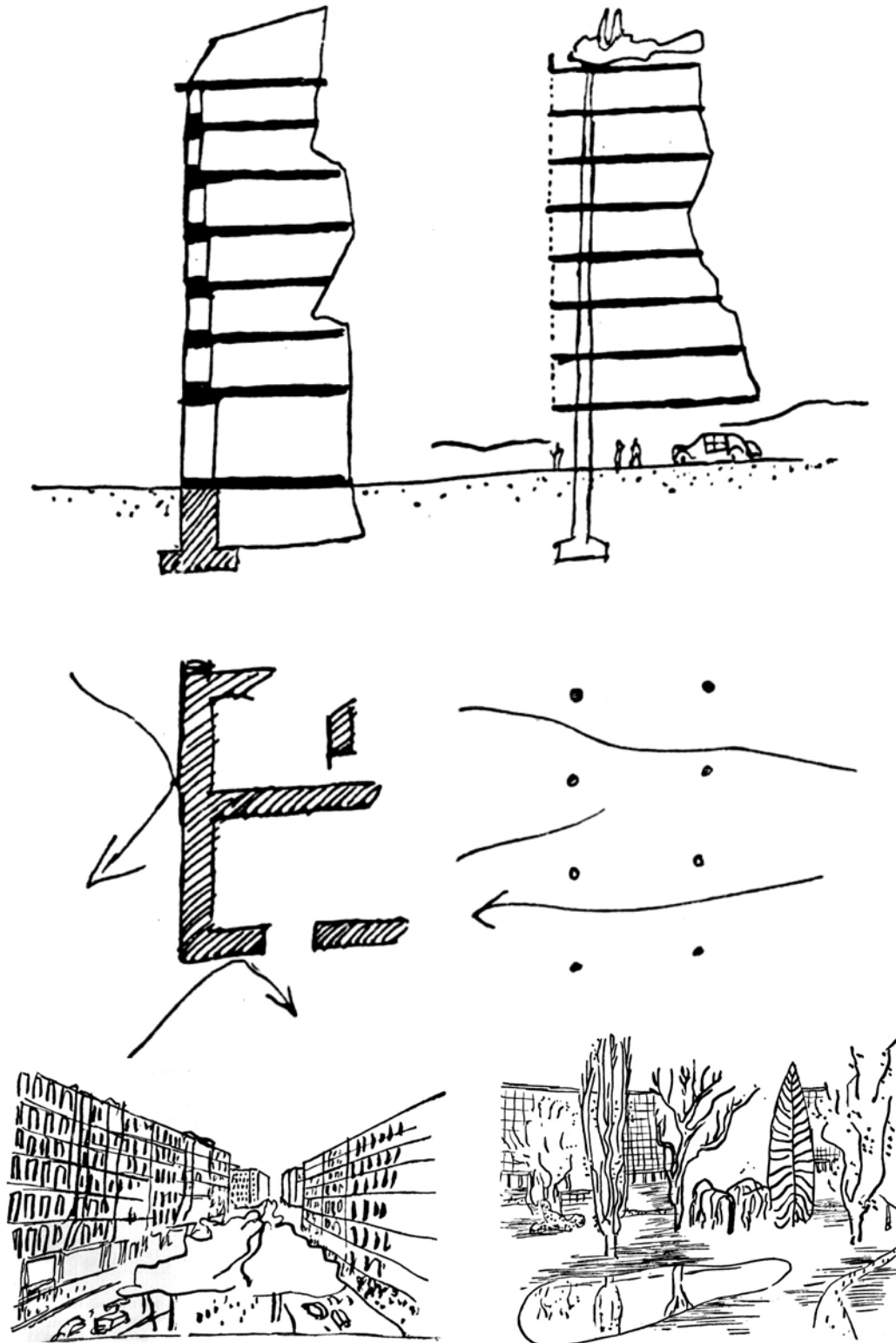


FIG. 173 The traditional vs. the modern city according to Le Corbusier. The modern city is based on a discrete system of isolated elements which allow circulation as opposed to the continuous urban fabric. On the left side: traditional urban fabric, massive walls, enclosure of space. On the right side: the modern city: light structures, air circulation, open space. From "La maison des hommes", Le Corbusier, 1942

This progression, which demonstrates the propensity of art historians to focus on periods that are more and more close to their time, can be explained by an incremental shift from history to "operative criticism" as Tafuri would call it. But paradoxically, even if modern history tends to focus on more contemporary events, without this precise sequence of earlier studies and without the inheritance of Burckhardt's and Wölfflin's understanding of Renaissance and Baroque periods, probably Giedion would have never had such a clear consciousness of the transformations generated by the modern movement and, more interestingly for us, he would have hardly comprehended in such a lucid way the shift from interior space to exterior space which happened between the Renaissance and the 20th century. It is Sigfried Giedion himself who in the introduction of "Space, Time and Architecture" attributes to his "precursors" a relevant role in his study.

We can understand Giedion's new approach already from the title. Time is considered, maybe for the first time, a relevant issue for architecture. As we have previously seen, it can be arguably said that the internal space of the *chthonic* archetype negates time because it expresses a disconnection from the external world and from its time: the *chthonic* interior space is metaphysical and symbolizes eternity. Therefore Giedion's reference to time can be interpreted as the expression of a strong interest for the world "out there", for the presence of architecture in the external space with its progressing time. It is important to consider that the conception of time is different throughout history. Only since the age of Enlightenment, time is considered objective and measurable: it is through its measurement that time appears as a dynamic entity, an entity in motion almost like a fluid. Even in this case Greek and Modern periods show a kind of "elective affinity": in the famous expression "*Panta rei*" (everything flows) the pre-Socratic Philosopher Heraclitus expresses a similar dynamic idea of a fluid time in a dynamic *cosmos*. Antithetically between the late Roman period and the middle age time is conceived as static and eternal: the perception of the progression of time is considered as a purely subjective phenomenon. For Saint Augustine (354–430), the most influential philosopher of the Middle Ages, time doesn't exist in reality but is a creation of the human mind: we could call this a "chthonic" and internal conception of time. In his "Confessiones" (lib xi, cap xiv) he says "*What, then, is time? If no one ask of me, I know; if I wish to explain to him who asks, I know not.*" According to Augustine we individually perceive time but we cannot explain it and objectify it, which means that we cannot bring our conception of time outside ourselves, because time is subjective. Every human being has his own perception of time, which is subjective and based on his memory. Therefore without memory time wouldn't exist.

We could never understand the importance of the activity of preservation and transcription of manuscripts in all monasteries during the entire middle age, without this subjective and eternal idea of time that considers individual and collective memory as its source. In the same way we cannot comprehend the refusal of the past of modern avant-gardes as well as the "tabula rasa" of 20th century urban design, without the modern dynamic idea of time and the consequent idea of progress.

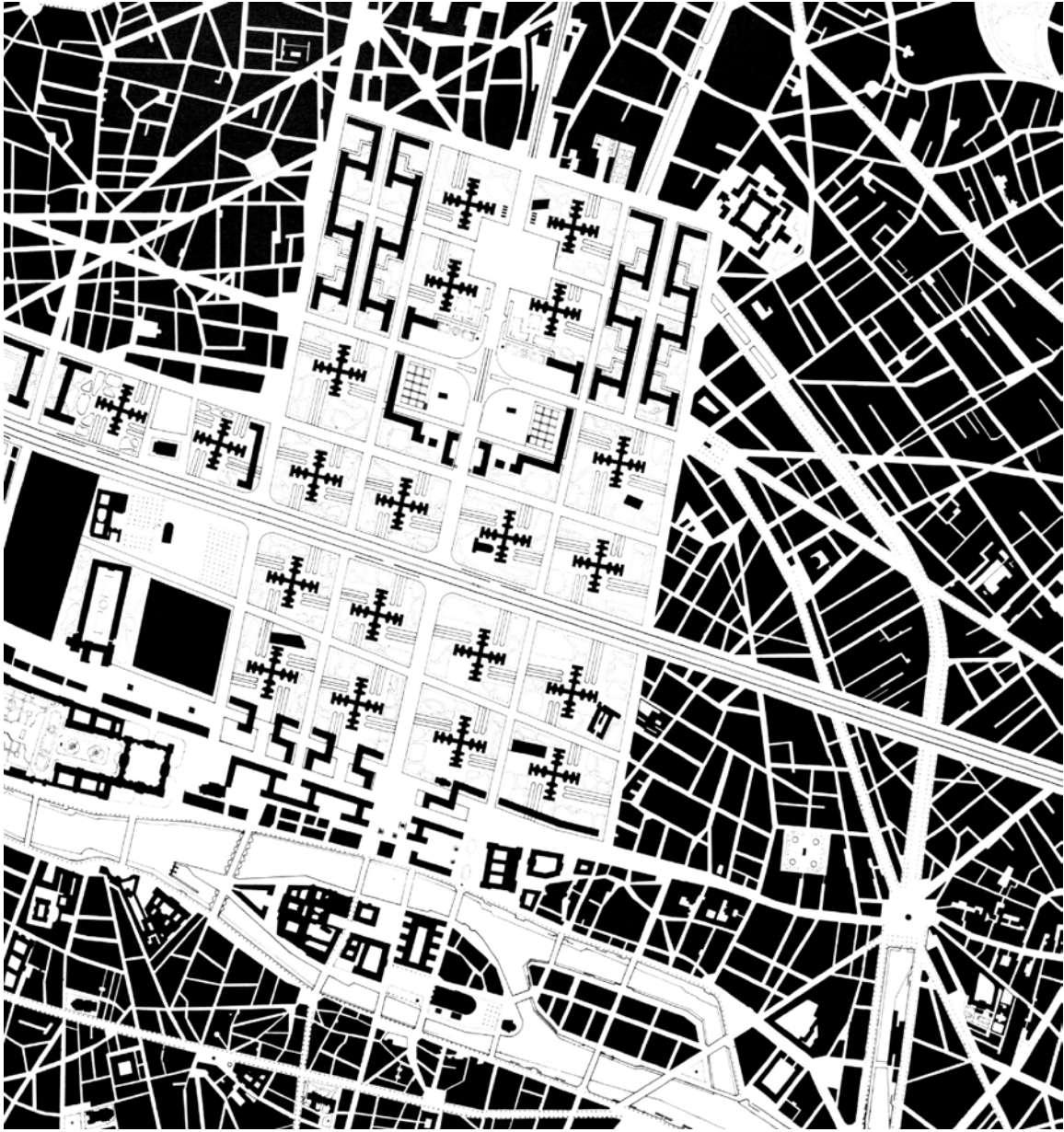


FIG. 174 Modern urban design and the “tabula rasa” relationship with the past. “Plan Voisin” by Le Corbusier (1925). Drawing from Rowe’s and Koetter’s “Collage City”.

It can be said that Giedion’s awareness of external space emerges almost dialectically as a reaction to the idea of space as mere internal void, which is dominant from Roman to Baroque period. This is evident in the introduction: “It may be advisable to project the present happenings against the large screen of historical developments. We see them in the light of the prejudices we were born with. Among these is a belief that architectural space is synonymous with hollowed-out space, with interior space. This belief is based on the development of the last two thousand years. Since the day of Imperial Rome, the formation of

*interior space has been the major problem of the art of building... But another space conception exists which has an equal right to recognition. This persisted throughout the first high civilizations – Egypt, Sumer, and even Greece. In all of these the shaping of the interior space was not regarded as of great importance. From the point of view of later times it could even be said that their builders neglected or disregarded it. They remained beginner in finding solutions to the vaulting problem because they never gave it the high symbolic importance it acquired in later periods.”*¹⁵⁷ Therefore Giedion programmatically rejects the interior vaulted space of the *Chthonic archetype* which, using his words, received little light and “*signified darkness, the motherly womb of the earth*”¹⁵⁸ He instead fosters the external space of the *tectonic archetype* where “*Forms are not bounded by their physical limits. Forms emanate and model space.*”¹⁵⁹ Giedion, following the tradition initiated by Laugier, ideally reconnects the Greek tectonic architecture and the preference for external space, which he defines as “*first space conception*”, to the modern times and to a similar “*third space conception*”. As he continues in his analysis: “*Today we are again becoming aware that shapes, surfaces and planes do not merely model interior space. They operate just as strongly, far beyond the confines of their actual measured dimensions, as constituent elements of volumes standing freely in the open. It is not just the size of the pyramids or the never-surpassed perfection of the Parthenon that is significant. It is the interaction between volumes which gives orchestration to the first architectural space conception. Today we have again become sensitive to space-emanating powers of volumes, thus awakening to an emotional affinity with the earliest origins of architecture. We again realize that volumes affect space just as an enclosure gives shape to an interior space. We can turn to the work of a sculptor for an expression of this contemporary awareness of the relation between volumes of different form, height, and position.*”¹⁶⁰ Giedion, similarly to Laugier and Viollet-le-Duc, connects his present with the “*earliest origins of architecture*” and this “*origin*” is expressed by the sculptural disposition of tectonic elements in the open space.

If his “*Space, Time and Architecture*” is an enthusiastic and “*operative*” history of modern architecture and a “*manifesto*” for its external space conception, in this late work Gideon is, at least partially, reconsidering the role of interior space. More than half of the book is dedicated to a well-documented analysis of the development of the large monumental vaulted spaces in Roman architecture. This could never be the case in the 40’s. How can we interpret this change? If we consider the moment in which it is published (1970), we can arguably say that Gideon’s position might have been influenced by the crisis of the modern movement followed by the rise of the so-called “*Brutalism*”. Louis Kahn’s work and late Le Corbusier’s projects clearly manifest a deviation from canonical modern architecture and a

¹⁵⁷ Giedion, S. 1967. *Space, time and architecture; the growth of a new tradition*. Charles eliot norton lectures ; 1938-1939. 5 , rev a enl ed. Cambridge: Harvard University Press: p. xlv

¹⁵⁸ *Ibid.*, p. xlvii

¹⁵⁹ *Ibid.*, p. xlvii.

¹⁶⁰ *Ibid.*, p. xlvii.

stronger interest in massive structures and interior space: surely a less “tectonic” kind of architecture.

Therefore in this later book the ‘third space conception’ is reconsidered, invoking the necessity for a synthesis between external and internal space: “*in twentieth century we are experiencing an interweaving of architectural conception of all periods. Attention is again directed to the play of volumes in space without losing the tradition of forming interior space*”¹⁶¹. What is this, if not the expectation, or maybe the hope, to find a possible synthesis between the *tectonic* and the *chthonic* archetypes, between exterior and interior space, and therefore ultimately between the present and the past, between progress and history? But if the modern paradigm is evidently based on the refusal of history and on the rejection of “hollowed-out” internal space, is this synthesis possible? To say this in a more direct way, is it possible a synthesis between a *hut* and a *cave*, a building that is both expressing external and internal space or an architecture that express both modernity and tradition? And even if we find such synthesis, would it solve the modern architecture crisis? Or would it be only a hybrid and composite object? The risk is to repeat what postmodernity has done: a reaction to modernity within modernity, the attempt to introduce history within progress, imagination within reality and complexity within order.

The problem is that the ultimate result of postmodernity is merely a hybrid modernity, which in any case reiterates modernity and its inescapable dialectical loop. The postmodern *Hyperreality* is the effect of the strive to reduce the distance between internal subjective imagination and external objective reality: the result is a *simulacrum*, an “imaginary world” like Disneyland that is both simulation and reality, a world in which the role of architecture as interface between interior and exterior is reduced to an ephemeral layer. Consequently postmodernity has achieved only a hybrid synthesis which is neither true nor false, neither subjective nor objective.



FIG. 14 An abandoned “Disney World” park in China, removing the surface of the “simulacra” we find again the tectonic-modern paradigm.

¹⁶¹ Ibid., p. 2.

7.2 From isolated objects to meta-objects

If we then reconsider the antithesis of the *chthonic* and *tectonic* archetypes we realize that a synthesis between them is impossible. There cannot be another “type” that blends these two archetypes without being a mere hybrid composition. If we analyze more carefully this binary opposition during the enlightenment we realize that the modern architecture’s programmatic intention is not to find a synthesis between the “cave” and the “hut” archetypes, but to show that the “hut” is the only possible synthesis. If we consider the typical Hegelian dialectic system “thesis, antithesis and synthesis” we have to invert the terms recognizing that during the enlightenment the *hut* represents the synthesis between the primordial nature and its negation, the *cave*. In Laugier’s explanation of the origin of architecture, the *thesis* is that architecture principles are “founded on simple nature”. This thesis is expressed in the incipit of the book and is represented by the initial description of a primordial nature. The cave exemplifies the *antithesis*, the negation of the thesis, because it is the expression of a disconnection between men and nature: the *cave* is antithetical to nature. The *hut* emerges as the only possible *synthesis*, the reconciliation between men and nature, therefore the invention of a new proposition. During the entire modern history it is possible to recognize the attempt to find a reconciliation with a primordial nature, an intention that can be probably traced back utopian thinking. Modern architecture’s insistence on trees, sunlight, and air circulation is the most direct expression of this desire.

Therefore the real binary opposition is between *original nature* and *cave*, whereas the *hut* is conceived as a possible synthesis. That’s why theoretically there cannot be synthesis between the *hut* and the *cave*, and that’s why the *hut* is the only solution for progress in this dialectical system. In the same way the modern insistence on the true “origin”, usually expressed in terms of a primordial state of nature, is necessary to show its absolute difference from actual history and to demonstrate that progress is the only solution, its dynamic synthesis. The modern idea of progress comes from the Hegelian idea that history unfolds or progresses as a dialectical process. According to Hegel (Logic, Section 81, (1)) “*It is of the highest importance to ascertain and understand rightly the nature of Dialectic. Wherever there is movement, wherever there is life, wherever anything is carried into effect in the actual world, there Dialectic is at work. It is also the soul of all knowledge which is truly scientific.*” Hegel’s dialectic system is not based on a triad, it is the result of a binary opposition between the “abstract”(thesis), and the “negative” (antithesis), which is resolved into the “concrete” (synthesis), which is a second step in the process, a new reality. In Hegel’s dialectic of existence “pure Being” and its negative “Nothing” generate the “Becoming”, the dynamic progression of reality that can be called progress. Here again we can individuate a strong analogy with the Greek philosopher Heraclitus, not only because his “*panta rei*” represents a similar idea in which everything is in constant change, but also because his dynamic conception of time and existence is conceived, for the first time in history, as the result of a dialectic process. In essence the Hegelian system reduces any condition to a bi-dimensional binary opposition, which is resolved into a synthesis that can

become a new proposition to be opposed to another antithesis, thus reiterating the binary opposition. This endless sequence is what defines progress and the dynamic perception of time. However it also generates a binary uninterrupted loop. Deleuze has probably been the first to criticize Hegel's binary logic in which only identity and its negative are opposed to be resolved in a synthesis without considering difference and multiplicity. In "difference and repetition" Deleuze considers Hegelian dialectic system as the *"ground for the demonstration of the identical. Hegel's circle is not the eternal return, only the infinite circulation of the identical by means of negativity."*¹⁶²

Therefore we might say that the only way to overcome the modern paradigm is to escape from the "modern binary loop" and this is possible only if we acknowledge multiplicity. In architectural terms this means that if the essence of modernity is represented by the production of isolated objects within an open space is not by changing these floating objects that the essence of this space can be transformed. Most of postmodern architects have transformed, fragmented and even deconstructed architectural objects without altering their condition of being an isolated, autonomous entity. Therefore postmodern architecture has largely operated within the modern paradigm.

But if we could ideally change the relationship between objects, giving them a new order, gathering them closer and closer until they partially merge into something, which is larger and more complex, that is to say a "metaobject", then those initial objects wouldn't be anymore autonomous and recognizable as individual objects. Furthermore the nature of the space around them would change accordingly and would be partially internalized. Therefore if we stop the modern tendency to think about singular ideal types, and we acknowledge multiplicity, then we can think of a "metaobject" that can express at the same time chthonic and tectonic characteristics. To do so we almost have to think of architecture in a "secondary order" that extends the first-order logic of the individual archetypes. It's almost like passing from the bi-dimensional system of isolated objects and autonomous archetypes, to a tridimensional system that can acknowledge the assemblage, the combination and the articulation of individual elements into a more complex "metaobject".

What I'm trying to describe is not an abstract and unthinkable entity: this kind of "metaobject" already existed in the past and an effectual example of it can be found in the articulated urban fabric of the pre-modern city. The European "traditional city", formed in different stages between the Hellenistic and the Baroque period, is essentially formed by a dense urban fabric, incrementally accumulated throughout history, in which individual buildings are merged without being completely recognizable as autonomous. The traditional city is a "metaobject" in this sense that it is an open project in which individual buildings and architectures are subordinated to a higher system. This kind of dense urban fabric, with its complementary voids, is the only condition in which internal and external space exist at the same time without being mutually exclusive. Moreover it is a place where representation and reality are mixed, where private and public are both present and where

¹⁶² Deleuze, Gilles. 1994. *Difference and repetition*. New York: Columbia University Press: p. 61.

memory and progress can coexist. We might say that in this “secondary level” a synthesis, or more precisely, a coexistence of the opposites is possible.

This kind of “metaobject” should be substantially distinguished by the idea of a “megaobject” which is instead only an isolated object, enlarged to a bigger, almost impossible, scale. The megastructures that have been conceived by architects during the late 60’s and 70’s are mere “megaobjects” that reiterate the modern “object fixation”. However, post war megastructures represent also a relevant and symptomatic event in architecture history because they can be interpreted as a first reaction to the fragmentation and the dissolution of the urban fabric in the modern city.

The first theoretical recognition of the dissolution of the urban fabric can be found in Rowe and Koetter’s *Collage City*, published in 1978 almost at the end of the “megastructures” phenomenon. The intention of the book is clearly expressed in the introduction: “*A proposal for constructive dis-illusion, it is simultaneously an appeal for order and disorder, for the simple and the complex, for the joint existence of permanent reference and random happening, of the private and the public, of innovation and tradition, of both the retrospective and the prophetic gesture. To us the occasional virtues of the modern city seems to be patent and the problem remains how, while allowing for the need of a modern “declamation”, to render these virtues responsive to circumstance.*”¹⁶³ This innovative book represents probably the first moment in which the “metaobject” of the urban fabric is fully considered within architecture theory and recognized as the only condition in which the opposites can coexist. The original approach of *Collage City* is to consider architecture within the articulated context of the urban fabric, giving the same value to solid and voids.

Using Rowe’s approach architecture history appears in a different way: modernity represents not only the transition from the interior space of chthonic archetype to the exterior space of the tectonic archetype but, more importantly, the progressive dissolution, disaggregation, fragmentation and atomization of the “traditional” and dense urban fabric. From this perspective we might say that a “post-modernity” or a paradigm shift has not yet come. Today we are still designing autonomous architectural objects and icons in which the external formal appearance is even more emphasized, we are still celebrating the city as a pure space of flows and circulation, we are still celebrating newness for the sake of progress. In some way, and probably even more dramatically, we are still hoping for a possible reconciliation with nature. Nature is not anymore represented by the idea of the “garden city” and by the optimization of air circulation and sunlight for hygienic reasons, today nature is expressed by the idea of “city as landscape” and by the implementation of technological systems to increase sustainability. Nonetheless the relationship with nature is essentially the same. Therefore like in the case of Laugier’s hut we are still trying to find a dialectical synthesis, an archetype that might allow a new living condition in harmony with nature.

¹⁶³ Rowe, Colin, and Fred Koetter. 1978. *Collage city*. Cambridge, Mass.: MIT Press: p. 8.

After all the modern process of dissolution of the urban fabric is only a mirror of the complementary process of reintroduction of nature within the city. In the dilatation of the modern city, the empty space left around the newly isolated buildings is intended to be filled up by nature. According to Colin Rowe *"In intention the modern city was to be a fitting home for the noble savage. A being so aboriginally pure necessitated a domicile of equivalent purity ; and, if way back the noble savage had emerged from the trees, then if his will-transcending innocence was to be preserved, his virtues maintained intact, it was back into the trees that he must returned. One might imagine that such an argument was the ultimate psychological rationale of the Ville Radieuse or Zeilenbau city, a city which, in its complete projection, was almost literally imagined as becoming non-existent."*¹⁶⁴ And later, quoting Le Corbusier from *The Home of Man*, *"Sun, space, verdure: essential joys, through the four seasons stand the trees, friends of man. Great blocks of dwellings run through the town. What does it matter? They are behind the screen of trees. Nature is entered into the lease."*

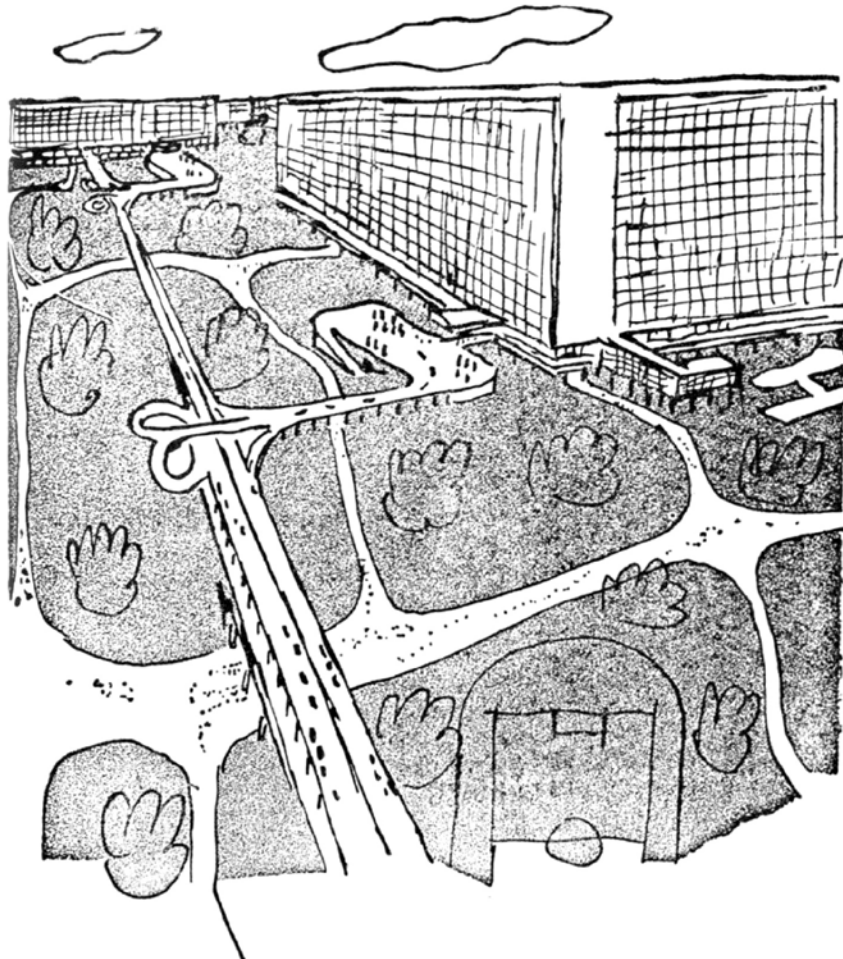


FIG. 14 The modern city according to Le Corbusier. Is the open space left between the buildings a space for the reconciliation with the "primordial" nature, or a space for car circulation and infrastructures? Can these two modern aspirations coexist? From *"La maison des hommes"*, Le Corbusier, 1942

¹⁶⁴ Ibid., p. 50.

This is undeniably the real expression of the modern dream. However if we look at the results and at what has been built in the 20th century we realize that the open space generated by the progressive fragmentation and dilatation of the urban fabric has been generally occupied by a mixture of hybrid nature and infrastructures: the modernist utopia of the city in a park, has been largely materialized in the dystopia of the city in a car-park.

On the contrary in the “traditional city” and basically from Hellenistic to Baroque times nature was left outside the city walls, and within the urban fabric nature was manifested only within abstract and geometrical enclosed gardens. In any case no tree was visible in the public space formed by streets and squares, as it is common today and as it was usual in the Greek agora. We can find here another strong connection between Greek and the modern periods: ancient Greek architecture was characterized by a strong relationship with the landscape, which can be compared to contemporary design tendencies. In the wide space of the agora there were usually plane trees and groves and in the sanctuaries the presence of nature, expressed by a tree or a springs, was an essential condition for the religious ritual.

Certainly the conflicting relationship with nature is the ongoing theme of the modern era, and furthermore, a problematic issue that has never been solved. To have a more objective and critical view of this issue in relation to architecture it is important to distinguish between real problems and ideologies. In the case of the modern city the solution to real problems such as lack of hygiene, contagious diseases and bad living conditions has been often represented in terms of lack of air circulation, sunlight, and open space between buildings. Now we can easily argue that there is no evident correlation between the actual problem and the proposed solution. Better hygiene and the reduction of contagious diseases have been achieved in the modern city with more “invisible” technical solutions such as sewerage and water supply systems. John Snow had dismissed, already in the nineteenth century, the so-called “*miasma theory*” which correlates the contagion of diseases with the lack of air circulation, demonstrating the diffusion of Cholera was caused by polluted water. However, for modern architects, even later, the combination of sunlight, air-circulation, and open spaces has remained as a sort of dogmatic solution to most urban problems. It is evident that besides the proclaimed “functionalist” approach of modernism, the insistence on air circulation and sunlight is the expression of something different than a solution to health problems: it is more probably based on aesthetic and maybe ideological principles which can be traced back to utopian thinking and to the attempt to have reconciliation with nature. The real *utopia* of modernism, the place that by definition cannot be reached, is primordial nature.

In dealing with the “sustainability” issue we are now facing a similar dilemma. Nowadays it is very difficult to distinguish whether the solutions proposed by contemporary architects are effective attempts to reduce energy consumption or, even in this case, the result of aesthetic and ideological convictions. Are we sure that in few decades the words “green-roofs” and “green-buildings” in relation to sustainability will not appear as outdated and ineffective as the words “air-circulation” and “sunlight” in relation to the hygienic problems

of the modern city? Are “more Nature”, and the escape from the city, the solution for the reduction of pollution and energy consumption, exactly as it was for modern architects, or is it maybe more dense cities and improved public transport systems, as it was sewerage and water supply systems for the problem of the modern city? It is certainly hard to have an objective perspective on this current issue. What is important, in any case, is to avoid confusing real problems with utopian thinking, technical issues with aesthetical preferences, as well as concrete solutions with ideological positions.

If, since the enlightenment, the relationship with nature has remained an unresolved issue, another critical aspect, strictly related to it, is the relationship with history. It is evident that for modern architects the reconciliation with nature, and therefore the low-density city characterized by air circulation and sunlight, is incompatible with the traditional dense city and more generally with the past. History appears in the modern period as a heavy and unmovable obstacle placed between the origin, with its primordial nature, and the future in which it hopes, through progress, to reestablish a similar uncontaminated relationship with nature.

Are *nature* and *history*, in relationship with the city, mutually exclusive? Maybe not completely, however, what needs to be clarified is the role of the city. Do we want to continue the dilatation of the urban fabric in the attempt to dissolve the city in an “almost” natural environment, or do we want to increase its historical, human, cultural, and built density? Do we prefer the discreteness and discontinuity of the modern city in the attempt to let nature, or a hybrid version of it, permeate within it, or do we prefer to increase the physical and historical continuity of the urban fabric through space and time?

The previous analysis, and in particular the examination of the role of *external* and *internal* space in relation to architecture, represents a partial examination of this dilemma. In general we can say that when architecture is conceived in terms of isolated “tectonic” buildings, placed in the open external space, the relationship with nature predominates, whereas when architecture is developed around an internal “*chtonic*” space -which is usually conceived as metaphysical and ideally eternal space- the disconnection from nature and the continuity of history are physically manifested. As I have tried to suggest in this dissertation it is important, however, to go beyond these archetypes, analyzing also what is between the single buildings. What physically connects the single buildings is the *urban fabric*, which is the medium in which architecture evolves. Even though architecture may appear revolutionary, it is through the slow, and apparently unchangeable, transformations of the urban fabric that new architecture typologies and technologies are developed. The urban fabric is for the development of architecture what culture is for the development of new ideas. Furthermore, what seems to emerge from this historical examination, is that the best urban environment is achieved, in the transition between exterior to interior space, in two intermediate phases: that is to say the *Hellenistic-Roman* and the *Renaissance-Baroque* periods. It is in these two periods that a sort of balance is achieved between *external* and *internal* space, but we could say also between *objectivity* and *subjectivity*, between *discreteness* and *continuity*, and, ideally, between *nature* and *history*.

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