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ANTIQUITY IN USE IN URBAN CONTEXTS

predictive analysis for urban archaeology*

Alexandra Teodor

“The (...) landscape itself, to those who know how to read it aright, is the richest historical record we possess.”¹

Abstract

What do modern cities developed upon ancient urban structures owe to the latter in terms of physical configuration? – This is the question my study begins with. It surely does not end with a straight answer, but it provides a preliminary methodology useful for deepening the study. In order to pave the way for the proper investigation of this vast subject, my project sets out to provide a preliminary classification and selection of case studies, creating the framework for a monograph on the integration and use of antique structures in modern urban settings. This type of synthesis is lacking yet. A secondary objective is to offer the methodological instruments to discover (and document) ancient structures hidden within modern cities – *i.e.*, where indeed they are most likely to be found.

Keywords: urban morphology, antique urban structures, adaptive reuse, predictive archaeology, heritage conservation

1. Introduction

This is an exploratory study set between urban archaeology and historical urbanism, broadly in the area of urban morphology.² The purpose is to collect data, experience and understanding from better documented contexts, and to transfer this cumulated knowledge to contexts that have received less attention. It developed as an alternative approach of

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investigation for a case where the two domains seem to fail each other, instead of collaborating (see section 2, *Constanța*).

Although any historical city in Europe is the object of countless archaeological reports and publications, and historical urbanism started its career with the ancient cities,³ and while the object of study is apparently the same for both disciplines – the city –, in reality (or in the actual practice) there are considerable gaps between the two domains and common flaws, as follows.

(1) It was considered for a long time that the archaeological layers of an ancient city occupied by modern settlements are seriously, or definitively compromised. This preconceived idea still seems to be vigorous in some places,⁴ and the same is implied indirectly when considering by default structurally distinct phases for any historical city (see section 3, *approach*).

(2) While various archaeological discoveries were recorded in cities whenever they were recognized as such, in various forms (more or less professional), **urban archaeology** developed as a field of study only since the 1980s, for the purpose of documenting and, where applicable, preserving the valuable structures of the past, in the context of urban investments and development.⁵ The dedicated European charters actually stress the paramount importance of integrating cultural heritage with the spatial planning process.⁶ **Historical urbanism** (seen as a branch of urban history, and of urban planning as well)⁷ covers a wide palette, developing knowledge on the span between the prehistoric and contemporary periods; it is also the instrumental discipline grounding the regulations for future urban development, which are specifically related to heritage.

Most commonly, urban archaeology is merely a puzzle of random discoveries; thus, rarely a city has benefitted from a systematic approach in its archaeological documentation.⁸ In this case, even a city plan documenting all excavations up to a recent date in a detailed representation is frequently too much to ask – it simply doesn't exist, nor does the man for the job, or the job itself. The documentation specific to urban planning, on the other hand, integrates all types of sources for the history of the city, including the archaeological evidence, but mainly on a general level of detail (e.g., sites mapped by chronology and/or archaeological cultures, areas which need to be protected, investigated etc.). Thus, there are at least two levels where these disciplines barely meet or are even in an apparent conflict: the scale of the approach, as previously mentioned, but also the main purpose – since the first is to enrich our knowledge of the cultural

past by highlighting previous structures of the city, while the second is to allow the city to grow over its existing structures.⁹

(3) Theoretically, any intervention in a determined historical urban area is likely to reveal archaeological evidence, including built structures which may require conservation and protection. But the city is not made only of bits of land, be they streets or unbuilt areas (parks, gardens, or simply empty parcels); a good part of the urban fabric consists of buildings.¹⁰ These are protected due to a set of values based on various criteria, the age of the built structures playing usually a prominent role besides architectural qualities and style, but they don't include by default the archaeological ones. In urban history, the age assigned to buildings is normally determined on the basis of cartographic evidence and stylistic elements, sometimes on archival data, but rarely on detailed on-site investigation, historical research and archaeological excavations.¹¹ And this is where another gap can appear, because the actual age of the buildings is not necessarily a uniform, or a simple parameter; in fact, the older the building is, the more complicated it gets to correlate dates with its multiple parts.

(4) While the specific data management tends as a rule to be overwhelming, as it is in the case of large historical cities, focusing exclusively on what is already known implies ignoring what is yet unknown – and this carries the potential of involuntarily destroying valuable remains.

Hence, the strategy for protecting what the urban fabric *may* contain (the yet uncovered archaeological/architectural remains of the past) must have another starting point: **predictive urban archaeology**, preceding the preventive one¹². And it should be applied to the entire urban fabric, both to the unbuilt, and especially to the built one.

*Predictive urban archaeology*¹³ is obviously nothing but the consecrated *predictive archaeology*¹⁴ (much more often dedicated to non-urban sites, for which it was developed in fact), only applied to urban environments, moreover integrated with urban morphology.¹⁵ I do not intend to theorize it more than I already did, of necessity, but rather to contribute towards developing this interdisciplinary field, by starting from a very specific (though wide) topic: the modern cities developed upon ancient cities, or the other way around, ancient cities contained within modern cities; simply put, *living ancient cities* (see section 2).

At the end of the introduction, I need to add my concern whether this topic has ever been tackled before in a dedicated form. Although finding similar or convergent approaches would surely have been useful to start

with, it was not the case until delivery of this manuscript. Regardless of the already existing contributions I may have not been aware of, the method proposed here can only be to the benefit of this fascinating field of study.

2. The questions and the premises

The main question which initially fueled this investigation, and then spread into multiple and entangled threads, was the following: Is it worth studying, in search for corresponding ancient structures, the present-day urban fabric of cities like Constanța?¹⁶ Urban continuity since Antiquity has been questioned there, and the city is generally considered having been built anew – on top of the ancient one. Presuming it is worth identifying and exploring common elements between the ancient and the present urban structures, what can we expect to find, or what should we be looking for, and where? Obviously, the direct answers to these questions won't be found by looking at other cities, but each experience can only improve our understanding of the larger phenomena, at least regarding the “what” and “where” (see sections 5-6). This, in fact, is not only about Constanța, but about any historical city. After framing the background case-study, the main concepts upon which the investigation method was built will be presented (section 3).

Constanța

The area known as “The Peninsula” preserves the oldest ancient city overlaid by a modern city on the territory of Romania – *Tomis*, today Constanța.¹⁷ Some archaeologists and historians claim there was no urban continuity in Constanța from Antiquity to the Modern Period; in fact, there is no clear-cut evidence, but only an absence of one.¹⁸ Nevertheless, as recently as ten years ago (in the early 2010s), bulldozers excavated Piața Ovidiu (the modern square presumed to have been the *agora* and later the *forum*, in Antiquity) and some major streets in this historical area, tearing through archaeological deposits of Greek, Roman, and Ottoman eras, *without any* previous and proper archaeological investigations; thick layers of reinforced concrete were eventually poured on top. This could have been a unique opportunity to collect essential data regarding the evolution of the city on a wider scale than the usual ongoing preventive

archaeology or the very limited systematic excavations could offer; it did not have to entail a ban on the development of the Peninsula, but simply a different planning of the modernization project. For this to occur, the decision-makers would have had to acknowledge the city's potential for buried evidence of the past – and they did not. Unfortunately, for most of the population, including the administration, the ancient city under their feet is not worth much except when some colorful mosaic or sophisticated marble capital accidentally resurfaces, but never as a whole. In their perspective, the modern city is a completely different city than the ancient city, with an entirely different name and life;¹⁹ most of the visible landscape in the Peninsula consists of nothing but modern architecture, not older than a mere century – so why bother thinking about, let alone spending resources on preservation? This glib approach to the urban heritage, both archaeological and architectural, is, I argue, fully unwarranted.

physical continuity

One of the main premises of this study is that, theoretically, **the physical continuity of urban structures** is possible despite the probable, or evident urban discontinuity. This does not imply that the structures were continuously used,²⁰ but only that they were, at some point, reused *in situ*.²¹ Anyone could come across some examples of coherent and functional structures (urban or rural) built in different sequences of time – a simple house, a palace, or a fortress; similarly, it does not necessarily imply that they were always/permanently occupied, it only means that they were reusable for as long as they preserved some structural qualities. It is precisely how fragments of some initial structures survive, over long timespans, integrated in subsequent structures, and therefore in use – even if there were any intermediary phases of abandonment. When this phenomenon occurs in urban environments, and continues to our days, they can be seen as historical “living cities”.²² From the perspective of this investigation, a **living ancient city** implies that the ancient urban fabric is in direct structural connection (thus, in physical continuity) with the present urban fabric: streets having largely the same imprint, even if the ground level is considerably higher, and buildings integrating structures from the ancient to the contemporary phases.²³ Conversely, when the archaeological remains of a historical city are discontinued (or separated) from the contemporary structures, regardless of the cause (natural, or artificial),²⁴ the corresponding areas are no longer parts of the “historical

living city,” but rather of the “contemporary living city” overlapping the extinct area of the historical city. It is perhaps necessary to point out that the “historical living cities” are rarely, within the course of history, the result of deliberate planning, but rather of vernacular, or organic evolution, influenced by multiple factors.

(urban) adaptive reuse

I initially used in the subtitle of my project the concept of “**adaptive reuse**”, quite fashionable today for replacing consecrated terms like “conversion”, and being for this reason rejected by some.²⁵ I intuitively stuck to it because it bonds these two essential (though partially overlapping) terms for *in situ* preservation: “reuse” and “adaptive”.²⁶ The consecrated expression (see below) uses “adaptive” for the functional aspect of the physical reuse, but obviously any reuse implies a certain amount of adaptation (not only functional, but possibly technical, maybe also esthetic, and so on). My interest is on the ***in-situ reuse*** of ancient structures within present-day structures, implicitly with all the intermediary phases. Nevertheless, “**adaptive**” better highlights the phenomena that determine a pragmatic reuse of built structures: it is the nature, or rather the culture, of the people who choose to do so (regardless of the source of their motivation), as will also be pointed out further. Although it is basic and normal at the scale of wider history,²⁷ the adaptive component is precisely what I (or we) see today as fascinating,²⁸ simply because it has been obscured by recent history – sometimes completely.

There is a European declaration from 2018, titled *Adaptive re-use of the built heritage: preserving and enhancing the values of our built heritage for future generations*. It claims **adaptive reuse as a strategy aimed at preserving heritage** buildings that had lost their initial function, but which are seen as having cultural, historical, spatial and economic values, while at the same time adapting the place for new uses.²⁹ This document tells us, basically, to stop demolishing older buildings in order to build new ones – an obvious and chronic disease of the 20th century, running well into the 21st. Perhaps it is not useless to say that our European historical cities preserved most of their urban fabric well into the late 19th century (or in some fortunate cases into the present day), as a result of unplanned, not strategic, adaptive reuse (or however we want to name this process). We are now actually struggling to retrieve a secular way of evolving built landscapes, be they urban or rural.

The concept of adaptive reuse, usually associated with buildings and building ensembles, can also be used for the urban ensemble, *i.e.*: the urban (scale) adaptive reuse.³⁰ Obviously, it is reduced or reducible to multiple architectural instances of adaptive reuse, but not only – there are also streets, squares, property limits etc. In this paper, I will explore how urban structures get to be preserved in time, and how easy it is to erase centuries of urban evolution in just a few years, simply by ignorance. What once used to be practiced naturally, today turns out to be required as a strategy, with serious issues of implementation, let alone success. Hence, this study is also a contribution to the **urban strategy of adaptive reuse**; and it perfectly fits urban archaeology – like two neighboring pieces of puzzle.

patterns of reuse

The pattern of reuse refers to the most common way(s) by which a type of structure is normally being reused from different criteria, such as functional, structural, or esthetical – in various combinations. Although patterns of reuse were initially the main focus of this project, they gradually became secondary – as explained in section 3, approach. Nevertheless, the relevance of this topic is crucial for both the scientific purpose (understanding the transformation of the urban fabric), and the predictive direction towards cultural management. Therefore, without aiming at a systematic approach, some observations could be made that I believe to be useful for further analyses and classifications of reuse patterns (see section 6). References to various types of reuse have been present in the scientific literature for long, but merely as collateral observations; dedicated studies are rare. Furthermore, most authors usually approach the reuse in terms of function (this is frequently the most accessible information),³¹ rather than look for the physical transformation of the built structures in time – which is not always immediately perceptible, except for the evident narrowing and partitioning in some cases. I am less interested in the functional aspect, instead my focus is on how a building structure (or street, square etc.) was physically occupied at different times, reduced, expanded, modelled, integrated, etc. – thus unintentionally preserved to our days. Moreover, the project is set to establish to what extent the ancient structures determined the subsequent configurations, for any situation between the architectural and the urban scale.³²

3. The method

delimitation

There is an immense literature on the cities in Europe that developed from ancient urban settlements; it mainly consists of historical and archaeological sources, but also of architectural and urbanistic ones, documenting or simply mentioning numerous instances of (adaptive) reuse of ancient built structures during history.³³ There are also numerous studies which hint, by resorting to intuition rather than mentioning archaeological data, to a multitude of former Roman living cities, especially in Italy.³⁴ However, these impressive conservation case studies are not sufficient for my purpose to highlight the potential of those cities that have a less clear evolution. There is no Atlas,³⁵ nor is there a database³⁶ collecting relevant information for generating various hierarchies of the cities, depending on numerous criteria: size in area or population, economy, amenities and so on, all correlated to a historical timeline, or even more, relevant data for urban morphology³⁷. In fact, such a project would be huge and probably very difficult to handle; it might be seen as utopian.³⁸ But then it's true that for documenting and/or analyzing anything at all about cities in history we can only fish in a very wide and turbid sea. Therefore, my approach is rather exploratory and deliberately random: whatever I would start with would be good, as long as it's a modern city with ancient roots.

The only limitation I began with was defined by two conditions: one is cultural, as I am mainly interested in former Roman urban centers,³⁹ and the other is geographical (or maybe also cultural), as I chose to focus on **European cities**. The latter is not because I ignore the importance of the North African or the oriental parts of the former Roman empire, but mainly because of my personal language limitations (Europe is already too much, and impossible to cover in this short space and time). I also let myself be guided by the intuition that the more varied the examples are, the better – regardless of their number. Hence, I will analyze cities regardless of their apparent historical continuity or discontinuity, sheer prominence, aspect, monumentality, recent interventions and their political backgrounds etc.

instrument(s)

Intuitively, the most relevant instruments for this subject are **city plans**, or more precisely the spatial data. Regardless of how rich a source can be in information about a city, in the absence of spatial representation

and correlation of the given information, it remains quasi-irrelevant for our purpose. Therefore, the existence of general archaeological city plans (representing all the known ancient remains) became the main criterion for selecting potential case studies. Archaeological plans for the different investigated areas in the city obviously exist (or they should) everywhere urban archaeology is practiced, but their accessibility is a different aspect. Hence, in order not to transform the project into one of collecting and assembling plans, I simply used whatever useful plans I encountered in some important synthesis works (see section 5). Note that these plans are not always (or rarely) updated with the most recent archaeological discoveries⁴⁰ – nor did it become my purpose to update them.

The minimum data for the proposed analysis is, thus, the plans of the archaeological structures known/discovered in the city, and the present-day configuration. While for the first category the data is, simply put, extremely heterogeneous, for the second category there is a perfect source to ensure not only a uniform scale of representation (a bigger problem than it would seem at first glance),⁴¹ but also a fairly updated situation of any city: the Google Maps imagery.⁴² These two main data sets are combined in a CAD or GIS environment,⁴³ useful for the most basic evaluation: the overlapping representations of the ancient and the modern structures – as precise as possible in terms of measurements, depending on the accuracy of the archaeological plans.

approach: process, or strategy?

As already mentioned, this project was initially all about the transformation of the urban fabric (even if, admittedly, heritage preservation has been one of my active concerns for many years now). Hence, I have drafted – among various lists and possible classifications – a short template for the case study analysis, as well as a correlated table for a centralized evaluation of the case study corpus. Based on the published material, and using the instruments mentioned above, the plan was to collect relevant data, with the purpose of identifying the transformations of the urban fabric, and if possible, their large-scale patterns – hence, **the process**. There are at least three major drawbacks in this approach – only partially foreseen at the beginning. One, the difficulty in finding comprehensive archaeological plans for the cities. Second, and most important, it largely relies on what is known *via* archaeological excavations – many times not much, or apparently so where the excavation plans are not updated. There are cities

where based on their documented history, the ancient urban fabric must have been continuously reused and transformed, but the archaeological evidence, at least at a first glance, seems very scarce (e.g., Palermo⁴⁴). The third aspect is that this method works fine for smaller areas of the ancient cities (e.g., Sofia and Barcelona), but not so for the larger ones (e.g., Thessaloniki and Rome).

I applied this method only for two cities (see section 4): for Sofia it revealed random, maybe curious, but limited correspondences, rather difficult to explain initially (before learning about the urban transformations from the 20th c.); instead, Barcelona displayed a beautiful preservation story, at least at first sight (without documenting details about the interventions of modernization in the pre-modern and modern periods). – Two contrasting evolutions, difficult to articulate one to another in a comparative approach, strictly on the ancient-present correspondences. – Then the path changed direction quite rapidly, with the case study of Thessaloniki. There was a great discrepancy between the apparent potential the city had to preserve ancient structures, based on its acknowledged continuity and the general aspect of the street network, and what I was learning about its modernization. Until proven wrong, I was quite certain that the modern transformations were localized rather than general, and that by no means would all be lost regarding ancient built structures discretely preserved in the historical urban fabric; unfortunately, for what I've called "the living city" (see section 2, *physical continuity*), it is lost almost entirely. The disappointment in realizing this (packed with the acknowledgement of how destructive a couple of decades can be, compared to fifteen centuries) was balanced with an important discovery.

Briefly put here, but broadly explained in the dedicated study on Thessaloniki,⁴⁵ the discovery was on the extraordinary spatial relation between the **traditional urban fabric**⁴⁶ and the ancient structures it contains, revealed by the analysis made on the area of the Palace of Galerius. Notably, this revelatory image, similar to a radiography, was obtained in the case of an urban fabric that was intensively modernized (meaning almost completely replaced); perhaps a good parallel is the ruined building which thus reveals its ingenious constructive system, otherwise hidden. The simple overlapping of an historical cadastral plan (made before the urban intervention) and an archaeological plan (resulted due and during the urban intervention) revealed how the so-called "medieval", or "oriental" urban structures encapsulated (quite properly) the ancient ones. Not everywhere, not entirely, but in a significant

proportion. This is not a complete breakthrough, but it is probably the first demonstration of this intuition on a larger scale of urban fabric, based on archaeological data (except for Rome, which is a particular case – see section 5). It is true, though, that in the absence of such a brutal dissection in the traditional urban fabric – as it was in the case of Thessaloniki – this clear understanding would have probably long remained obscured.

Returning from Thessaloniki to the main project, I then realized that I had found a very relevant criterion to differentiate within the present urban fabric of all those countless cities. While the project remained largely the same, it gained a different emphasis (since the initial purpose was, basically and symbolically, already answered to: Yes, it makes perfect sense to search for ancient structures in the traditional urban fabric of a living ancient city.) In this new approach, the ancient area of the city was visually inspected for its potential to preserve ancient structures, with the new key of the “traditional” aspect as a reference (see section 5). According to some definitions, this is named predictive analysis. The consequence that this could also contribute to cultural heritage management, and implicitly to the more effective and wider **strategy** of urban adaptive reuse was also a strong motivation to change the direction of the project.⁴⁷

This would by no means imply that the two methods exclude one another, or that the initial one had no potential. In fact, they are complementary, and probably there is more to be added to each of them, or besides them. The following would be a preliminary approach that includes both:

1. Identifying the areas with a *potential to preserve ancient structures* (**the strategy**) (see section 5);
2. Overlaying the available archaeological plans and identifying the correspondences between the present and the ancient structures (enabling the understanding of **the process**);
3. Where they have good correspondence, the architectural level of detail may be approached (deepening the understanding of **the process**);
4. Where there are no correspondences, further investigation towards a possible interpretation would be necessary (damage produced by recent interventions, “natural causes” – such as, perhaps, longer intervals of abandonment, see again section 5) (also deepening the understanding of **the process**).

In this paper I could only cover a demonstrative application of the first two points, for a limited number of cities. The material collected and processed is however wider than what could be presented in this limited space, not to mention the great potential of the subject to expand anytime in the future, even with very limited resources – published literature, Google Satellite, and some adequate software; the outcome could be priceless. I am also aware that any advance in research will change, refine, and amplify this preliminary approach, depending on the author(s) and the cities investigated; certainly, I would do so, as the actual route of this project already indicates.

4. *The Good, the Bad and the Worse*:⁴⁸ some answers from Barcelona, Thessaloniki, and Sofia

This section is meant to briefly present the case studies for which more attention was paid along this project. The limited space does not allow a full presentation of the results, but only some highlights. Other cities, mentioned in section 6, were also briefly evaluated based on the identified archaeological plans and their present configuration.

Barcelona

A huge city today, Barcelona⁴⁹ (ancient *Barcino*) excellently preserved its historical center – the area of the former Roman fortification (ca. 11 ha), and apparently the medieval area as well.⁵⁰ The brief presentation below is based on the case study analysis made on the plan published by Francesca Pallarés in the 1970s (Fig. 1, right), for it already contained enough elements for the approach on the ancient-present day correspondences.

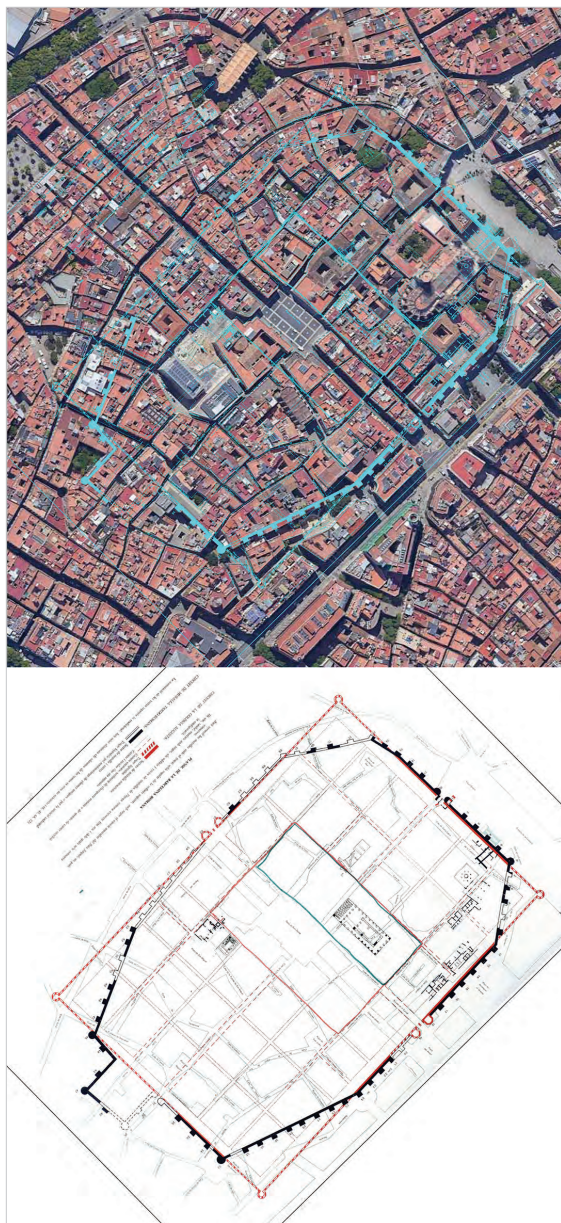


Fig. 1

The ancient perimeter is very well camouflaged into the medieval one; it's not easy to spot its position while looking at the historical area of the city from above (Fig. 1, left). It would also be difficult to say it is more regular than the medieval extension because it simply isn't. Perhaps the same trouble to distinguish them would be by walking on the streets.

The archaeological plan (Fig. 1, right; Fig. 2) reveals the slightly irregular plan of the Late Roman fortification – a rectangle (as it appears to have been initially) with the corners cut – as well as the street network restitution for the Early Roman phase of the city, and the main areas where built ancient structures were excavated by that time. Notably, the ancient fortification walls are coincidental or parallel to the actual outer streets, on almost the entire length; that means either a direct determination of the actual configuration (if the streets are ancient), or indirect determination (if the streets were cut later, but obviously constrained by the fortification). It is as if the Late Roman fortification was doubled outside by an offset of streets, thus creating an outer ring. This offset was only respected in a limited way inside the fortification – perhaps contributing to the difficulty to identify it at a rapid glance on the aerial view.

Besides the general observation that most of the ancient buildings have the same orientation with the ones subsequently built over them, the main outcome of this case study is on the reading of the street network. While analyzing the relation between the street network proposed by Pallarés (Fig. 2, the red axes) and the actual streets (having very good correspondence, *i.e.*, the same pathways), I noticed that they would not correspond along their entire length – obviously, since parts of them silted in time. Then I also noticed that other short street segments (including ones which were not included in that red grid) corresponded to some axes (thus, their extensions coincide) also parallel to the previously proposed grid. Since I stopped believing long ago in the perfectly equal interaxes, or other various “golden rules” of Roman urbanism (without attempting to prove them wrong),⁵¹ I systematically checked all the other possible correspondences – see the blue axes in Fig. 2. The most convincing of them, based on the archaeological evidence presented by this plan, is the

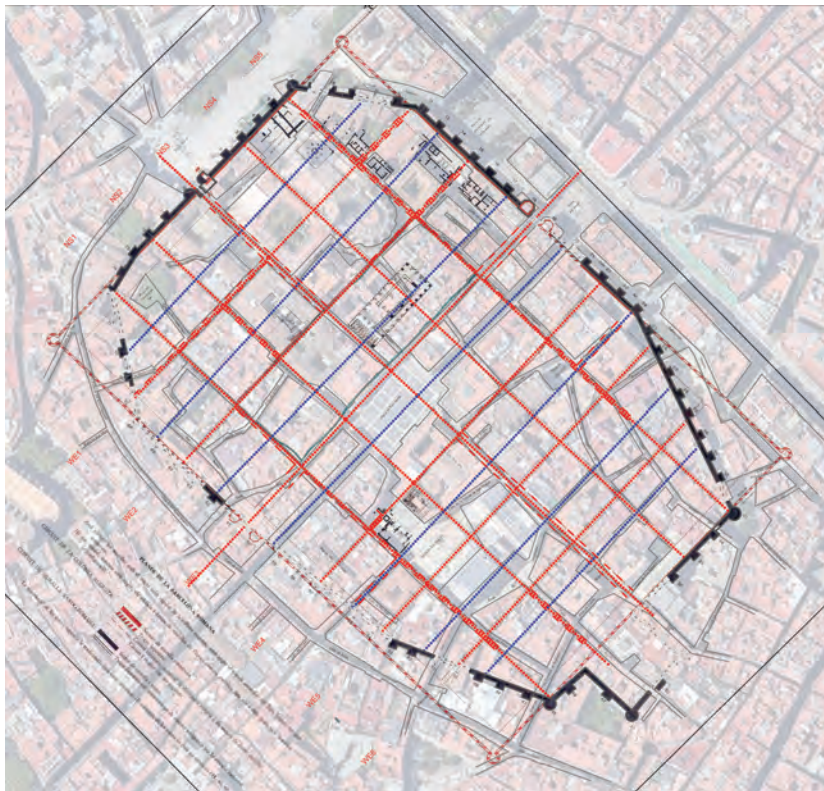


Fig. 2

one located between WE4 and WE5 – it shows at both ends evidence of coinciding ancient streets. Therefore, if this backward (or reverse) rationale could be accepted, it means that **the traditional urban fabric, and especially the street network can be considered as a hint for filling in the blanks of the archaeological plans.**

Thessaloniki

The study on Thessaloniki⁵² was the most time-consuming of all, partially because it was assembled for a dedicated publication,⁵³ but mainly because it was a complicated case to understand – therefore the title and content of the prepared article had to be changed a few times. I chose it from the various possible case studies for multiple reasons, both subjective and objective: I had previously visited it, read about it while preparing my PhD, thus had an idea about its considerable size (only the lower city has almost 200 ha), the greater regional importance in the Late Antiquity compared to the previous periods, and (partially for that) the very likely continuity into the present days.

When I learned about the Great Fire in 1917, very well documented with photographs, descriptions, and urban surveys, I became very enthusiastic about the opportunity to analyze how ruins get to be reintegrated after a great disaster, in a vernacular fashion. If so, it would have been a rare case of well documented destruction and repair after an event similar to many others in remote history: old enough to present the same basic conditions (materials and techniques, and type of destruction), but recent enough to be well documented. That I believed/hoped, but I was wrong, because it turned out that most of the ruins were further demolished, in the modern “bulldozer” fashion, and the newly built stock was largely built from scratch. Therefore, this first thread was abandoned.



Fig. 3

Another appealing aspect was that the plan of the city was encouraging at first glance, because it resembled quite well a Roman city. However, at a closer look, resemblance is all there is. The study consisted of comparing a city plan before the Great Fire and the present state for the analysis of the street network (Fig. 3), consulting different sources for the evaluation of the built stock, and finally, only for the area of the Palace of Galerius, comparing the same historical plan with the archaeological plans resulted from the interventions of modernization. The conclusions of the study indicate that the present urban imprint is similar to the traditional (meaning, the transformed ancient) city, but with significant alterations. While the street network still preserves part of the ancient grid, many historical streets were either significantly modified or even replaced. As for the main concern of our project, the buildings, they were almost completely replaced on basically the entire area of interest. Besides

realizing the bitterness of such a great loss (curiously underrated⁵⁴), this case study did pay off a great deal, but from a different direction than I might have expected. The main result of the last comparative analysis – also a very important methodological hint for the approach to the entire project – was presented in the last part of section 3; another illustration of the same result, not included in the dedicated study, is presented in section 6, *hippodromes*.

Sofia

The Capital of modern Bulgaria developed from the Roman *Serdica*, having had a significant regional importance throughout history, not only in Antiquity; notably, for a while it also functioned as headquarters of Constantine Ist.⁵⁵ The known fortified area is small (under 20 ha, see Fig. 4), but presumably the city was much larger in Antiquity; I could not identify such its perimeter, except for a fragment of it.⁵⁶

Sofia was the first case study approached; I chose it for the richness of the archaeological plan⁵⁷ – it seemed a convenient one to start with. However, by following the initial method (comparing various ancient and modern elements), at that moment there was not much I could say about or learn from it. I couldn't explain what I was seeing, only describe it as if I were half-blind (but this is a well-known phase in the research process). It was only later that I realized how unusual it is to have so much coherent (continuous) archaeological data for an urban site,⁵⁸ although nothing could be stated with certainty regarding the actual continuity of most structures. Thus, after analyzing Barcelona and Thessaloniki, a possible answer came forward, before even confirming it by other sources: modernization⁵⁹ (thus, massive programmatic interventions) is what favored such extensive discoveries, probably disconnecting many structures of the previous traditional urban fabric from what was subsequently built.⁶⁰ Except for two items of monumental architecture,⁶¹ what might have escaped under the few older buildings still unreplaced is of small proportion compared to the large areas already excavated on the surface of the (known) Roman fortification.



Fig. 4

5. The *Potential to Preserve Ancient Structures (PPAS)*⁶²

For the topic and the study area delimited in Sections 2 and 3, following the conclusions drawn from case studies in Section 4, it could be said that **modern interventions** are the most relevant **preliminary marker** for the evolution of a city, while still not actually knowing the context. **“Modern”** refers here to the last 150 years, during which the most accelerated changes may have occurred in their configuration; this framing

deliberately ignores the previous programmatic interventions implemented mainly in Western Europe, considering their number and impact to be reduced. For the purpose of investigating patterns and the transformation process, it is less important when were the programmatic interventions made (although it is important that they were programmatic, as distinct from vernacular). Furthermore, when turning to the preservation of urban heritage, it becomes very relevant that significant alterations pertain to the last fifty years or so – not to mention that there are still ongoing processes in some cases.

At this point, a classification of the living ancient cities based on the apparent (directly perceptible) modern interventions has only three categories. The corresponding descriptions are general/relative:

- (A) cities that were merely preserved, with **minimal** modern interventions: limited alignments of traditional streets, a limited number of new streets/boulevards for facilitating circulation, a limited replacement or vertical extension of the built fabric;
- (B) cities with some (more or less) **moderate** modern interventions: quasi-generalized alignments of traditional streets, several new streets/boulevards for enhancing circulation, limited replacement or extension of the built fabric;
- (C) cities that underwent **significant** modern interventions: same as B, including reconfiguration of the street network and extensive replacement of the built fabric.

These categories will certainly not cover all the particularities the cities may present, while the different sizes of the ancient cities can render different problems of proportion relative to proposed parameters (which will be discussed later). Either the exceptions can be explained (like Rome, below), or the classification can be further adapted. Yet, this is a good starting point because modern interventions are quite easy to observe (wide and straight streets, frequently regular islands, large buildings etc.), therefore a first evaluation of our cities could be rapidly obtained.

However, modern interventions are not actually my direct interest, therefore this criterion can be reformulated. Instead, the focus here is on the cities' ancient structures contained within the modern ones, a theoretical situation that was conventionally formulated as the ***Potential to Preserve [in situ Reused] Ancient Structures (PPAS)***.⁶³ Since the two criteria are inversely proportional, the previous classification could be translated into the relevant key-criteria which will be further used, by the following rule:

- (A) cities that were merely preserved in the traditional configuration – **high** PPAS;
- (B) cities with some visible modern interventions – **moderate** PPAS;⁶⁴
- (C) and cities that underwent significant modern interventions – **low** PPAS.

Based on this rough classification, around 90 cities, including the case studies presented in this paper, were thus briefly evaluated. The following statistic is not likely to be relevant because of the non-systematic approach for the *full* list of the eligible cities; in fact, most of the sources I used were focused on Italy (around a third of the total number), which surely explains a lot. However, I will present it as a work-in-progress, with random and not necessarily the best examples:

- (A) **high** PPAS – more than half of the evaluated cities (most of them in Italy, but also predominant in Spain, while also to be found in other modern countries): Rome, Pavia, Verona, Palermo, Metz, Arles, Bordeaux, Barcelona, Merida, Sevilla, but also York, Regensburg, Cluj-Napoca, Kavala, Split etc.
- (B) **moderate** PPAS – about a third of the evaluated cities (both in western and eastern countries): Colchester, Aosta, Milan, Cartagena, Plovdiv, Constanța etc.;
- (C) **low** PPAS – under a quarter of the evaluated cities, distributed in the NW and SE of Europe: London, Amiens, Nijmegen, Köln/Cologne, Athens, Thessaloniki, Sofia, Mangalia etc.⁶⁵

As a preliminary assessment, this is obviously not a precise measurement; the experience of the evaluator with different types of urban fabric is also relevant, as well as one's moment of subjectivity. Therefore, it is not necessary for the initial evaluations to correspond with later ones, especially in the border areas of the three categories (I did change some on the second view). The next step is meant to further reduce the approximation.

Presented above is **the urban PPAS**, thus the urban level evaluation of a city; for any relevant/operational results, further evaluations are required, depending on the necessary level of detail, but also on the data available. Certainly, in the case of larger cities (but not only), once we zoom in, the urban fabric presents distinct configurations which are to be evaluated similarly: by the apparent degree of modernization, hence

the corresponding PPAS for each distinct area in the city presenting a homogenous/resembling configuration. I will name this, preliminarily, the **zonal/area PPAS**, which has a few additional categories (detailed below). None of the previously presented case studies were sufficiently rewarding for this task, instead the following may be the best of all.

guest star: Rome

I will simply dive in, without (un)necessary introductions; Rome is an overwhelming city, no matter how you approach it – on foot or on paper. After hesitating for a long time – not knowing how to use the huge data set the city benefits from, including the very relevant instances of ancient structures still in use – I realized the great methodological potential it has, precisely because of what is already known from multiple sources. In fact, there is one particular reason for introducing it in my study: *Forma Urbis Romae* – the incredible, unique and simply invaluable marble city plan we have from Antiquity.⁶⁶ Hence, not only does Rome preserve so much of its ancient urban and architectural structures, but it has a blueprint from Antiquity, which enables us to know exactly what ancient element corresponds to a certain fragment of the actual urban fabric, and *vice versa*; not quite the entire plan, but a fairly good part of it.⁶⁷ For the purpose of this project, it is an incredible tool in (at least) two directions: to test/verify the *Potential to Preserve Ancient Structures* method developed in the previous section(s), and to grasp threads on the patterns of reuse (see section 6).

Rome is obviously too complex to fit my modest classification. Within its 3rd century fortification covering ca. 1270 ha, it has large areas where the configuration of the historical fabric is still almost intact within the contemporary fabric, while other large areas are practically modern in their configuration, regardless of what there may be underground (see Fig. 5). Hence, the overall modern indicator is *moderate* (because there certainly were modern interventions), but obviously the urban level PPAS could be nothing but *high* – considering both its huge potential for future discoveries, but also the astonishing built fabric preservation already documented (Piazza Navona and Crypta Balbi, for example).

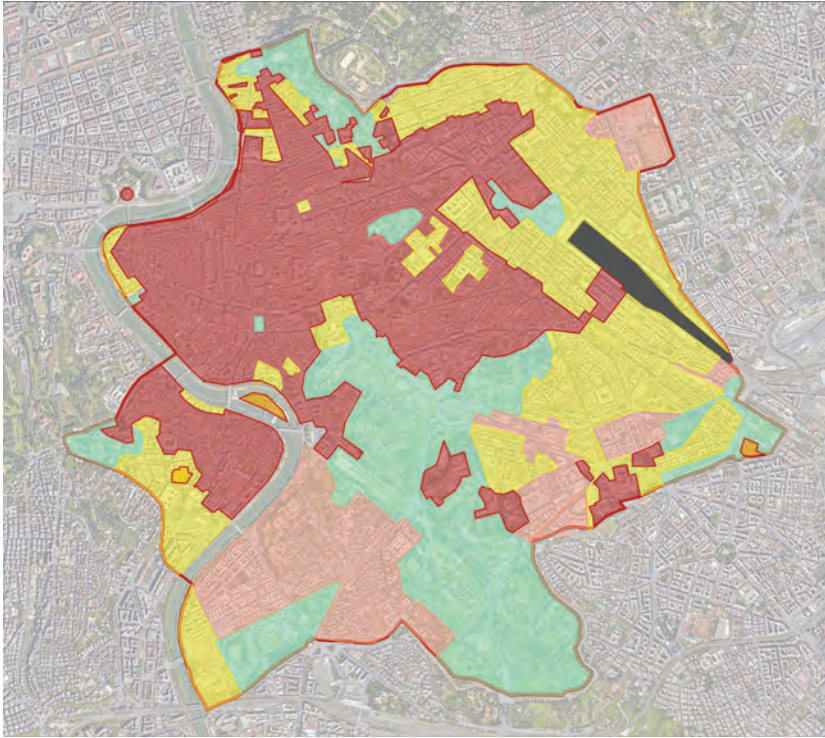


Fig. 5

For the perimeter of the ancient Rome, four categories of urban fabric were identified relative to the **zonal/area level PPAS**, within the fortified area (Fig. 5):

- high PPAS – areas with presumably preserved configuration from Antiquity, for streets, and some of the built structures; estimated to represent 35% (Fig. 6);
- moderate PPAS – areas having similar configuration with the ancient one, but visibly distinct: maybe a new street network having the same orientation; similar orientation of the buildings, but maybe smaller density or large buildings, hence lesser potential for the continuity of the built structures; estimated 15% (Fig. 7);
- low PPAS – areas having an entirely new configuration: different general orientation, including the streets, and obviously modern

buildings (here were also integrated the areas with insufficient data regarding the ancient structures); estimated 25% (Fig. 8);

- zero PPAS – archaeological and unbuilt areas – the ancient structures are preserved (or not), but their continuity with the current city has been obviously halted; and compromised areas – where the important infrastructure interventions definitively altered any archaeological deposit (with possible previous rescue excavations); estimated 25%.

Notably, the presumably discontinued area is considerable, around 50%.



Fig. 6



Fig. 7



Fig. 8

a comparative view of the PPAS

As an exploratory form of verification for the proposed methodology, similar areas from different cities will be compared for the high and the low PPAS. The moderate span is too wide between the two ends, and yet under-represented in the current analysis to be presented comparatively.



Fig. 9

The conclusions drawn from the two comparisons of the *high* and *low* ends of the PPAS span (Fig. 9 and Fig. 10) are synthesized in Table 1. Other conclusions relative to moderate and low PPAS will follow.

built fabric elements	PPAS <i>(Potential to Preserve Ancient Structures)</i>	
	HIGH	LOW
streets	main streets: slightly wider and straighter than the rest; secondary streets: not necessarily straight, frequently sinuous course, rather narrow;	wide and straight streets, frequently orthogonal
building islands	mostly irregular, of various sizes, shapes and proportions; sometimes close to rectangles and trapezes, arranged in multiple combinations; can get difficult to distinguish; numerous and irregular inner courts	rather regular aspect, similar sizes and shapes, frequently close to rectangles; unified or similar inner courts
buildings	various sizes and orientations within the island; clustering and high horizontal density;	nothing typical (= great variety), except maybe similar orientations

Table 1 - Comparative features for areas with high and low PPAS.

Things are quite clear for the urban fabric with high PPAS: it must be dense, and rather irregular... that's not an intuitive feature for someone looking for ancient urban configurations,⁶⁸ because it resembles more the definition of a medieval urban fabric. However, the explanation is obvious: the ancient structures had to be used during the long Middle Ages in order to be preserved; maybe not continuously, but surely for significant periods of time. Therefore, the "medieval" aspect of an urban fabric surviving from Antiquity to the present is merely camouflage (see section 6); it had to be "medieval" as well, in order to also become part of the present. The important nuance is that an urban fabric encapsulating structures from Antiquity to the present is neither ancient, nor medieval or modern – it is all its phases integrated⁶⁹, no matter how the buildings may

transform (but not if entirely replaced). Obviously, the proportion of these conventional phases is another matter – perhaps for another occasion.

What value does such an urban fabric have? The cumulative value of their age only to start with; the immaterial value of the continuous (or connecting) adaptive reuse process; the symbolic value of being witness to the entire history of the city; and, I may add, the great luck of not being flattened by bulldozers. The list is open, but when we draw the line, the result will be the same: *the richest historical record we possess*. And if the evaluation is proved to be wrong, it can be reassessed – the “undo” procedure for overrated protection is possible. Conversely, if the evaluation is right, but it gets to be ignored (or is never made), the losses will be unknown and permanent – no “undo” procedure out there.

One may ask what is there to study in such a dense urban fabric? It's true, results can only come gradually and in very limited areas, from a strictly archaeological point of view (as in earth stratigraphy). The real challenge is to enable, besides the classical archaeology, legal and practical procedures for investigations specific for the field of building archaeology into these areas, prior to any other kind of intervention. In Thessaloniki, in the 1960s and 1970s, and in the past decades of present days' Constanța, Cluj-Napoca, Sofia (to mention just a few examples I learned about), the modern houses were (or still are) being demolished within the area of the ancient cities *before* archaeologists enter the site, if they ever do...⁷⁰ This practice simply has to stop; it doesn't mean a modern house could never be demolished (it could, if no cultural values can be attributed), but before that it needs to be studied extensively, in order to make sure whether or not it contains older, valuable structures. In this sense, the Crypta Balbi Museum in Rome is a great example (maybe except for the fact that not every street corner in any city would render structures pertaining to a Roman theater); the great city had its own history of destruction in the 1930s (similar to the ones in Thessaloniki, albeit for different causes), but by the 1980s there was a new law committed to the safeguarding of the ancient remains, in accordance with which the urban actors subsequently played their rightful role.⁷¹

For the moderate and low PPAS, one may set largely different expectations (although not necessarily, because this is not a precise science; continuous, or connected structures could still survive even in such areas, rather by accident). In previously modernized or recently built areas overlapping ancient cities, there will probably be predominantly underground archaeological remains. Their significance for the history

of the city is by no means less valuable, but simply of different types of value than the ones on which I focus here.

The conclusions drawn above are set from a heritage management perspective. From a scientific point of view, their significance doesn't lend itself to comparison because each archaeological situation has something to say – whether by presence, or absence of evidence.⁷² The moderate and low PPAS areas could be extremely relevant for archaeologists interested in urban history, even if the sites give weak responses. The concept *città ad isole* could be considered a key one in the many cases of presumed urban discontinuity.⁷³ These insular cities “comprised disparate, unconnected ('spatial destructuring') communities occupying a common location defined as a place in Antiquity, as opposed to unitary settlements integrated by public works (and infrastructure) managed by a civic authority”.⁷⁴ Simply put, these former ancient cities were, at some point(s) in history, merely settlements where life continued to pulse – may it be in a non-urban manner, depending on one's understanding of the term – ready to receive any impulse (economic, political etc.) from the wider context; this could explain why, some centuries later, they gradually became cities (in the generally accepted conception), and not simply archaeological sites.⁷⁵ Hence, instead of discrediting the entire evolution of the whole surface of a historical city by invoking discontinuity, the absence of data may be regarded through a different approach – but only if the absence of data is recorded through archaeological methods, not when the data is simply canceled by bulldozers. Any historical city deserves a systematic, dedicated investigation – if not always for the sake of the city itself, at least for what we owe to future generations.

6. Preliminaries on the patterns of reuse

Structures like Piazza Navona in Rome or Piazza dell'Anfiteatro in Lucca are spectacular, but they are rather among the exceptions when one looks at how the spaces of former monumental structures tended to be later occupied; the common pattern is different, sometimes almost (apparently) clueless. Two types of built structures will be presented here based on this preliminary survey, yet systematic evaluations will be further required: fortifications and hippodromes. However, any of the major urban built structures can be a generous research topic in itself.

fortifications

Although only a limited series of cities was analyzed, a consistent (in the sense of potentially covering) typology of evolution patterns was identified for fortifications. This is also because the cities themselves don't have a unitary evolution, hence multiple patterns can emerge on the perimeter of a single fortification – in fact, this is probably the most common situation. The types of the evolution for the lines of fortification are as follows:

- **free standing on both sides**, with different heights in terms of preservation: Thessaloniki (some segments), Rome (most of the 3rd c. fortification), only a small segment in Barcelona – presumably a rare type of conservation (Fig. 11, no. 1-4);
- **integrated in the built fabric on one side** (either inner, or outer) – usually delimiting a street/square on the free side: Barcelona, Thessaloniki, Rome, Sofia (?) - possibly a frequent type (Fig. 11, no. 5-7);
- **integrated in the built fabric on both sides**, regardless of the height of the elevation preserved: this could be the most common type of preservation⁷⁶ – also, the most difficult to investigate (Fig. 11, no. 8-9);
- **disconnected from the modern built fabric** – hence, possible to be found anywhere underground, in any relation with what is built (or not) above – see Sofia. Notably, when (some of) their elevations were preserved for a longer time, it is very likely that they determined some of the nearby configurations.⁷⁷

A possible interpretation is that when the fortifications were used for a longer time (towards the Modern Period – see Thessaloniki and Rome), even if only in order to mark the limits of the city, they were predominantly preserved visible. When they were functionally replaced by other fortifications during subsequent phases, also enlarging the urban area, they tended to be integrated into the urban fabric, albeit with considerable variation on its perimeter (see Barcelona). This observation could sometimes be useful in less documented urban evolutions, even for other types of built structures.



Fig. 11

hippodromes

The hippodromes (*stadium*, in Greek, and *circus*, in Latin) may be one of the most interesting structures to be studied for their evolution in urban contexts, because they had a typical easy-to-recognize configuration –

which is also the case of theaters and amphitheaters –, while also being large structures.

Famous precisely for its evolution is the Stadium of Domitian in Rome, better known by its modern name, Piazza Navona. However, it was not properly a hippodrome, but the Greek version of *stadium* for the athletic games – used here for military exercises; although it looks like a hippodrome, there are some differences: it may have been shorter than the typical *stadium* dedicated to chariot race, and it didn't have the *spina*; it also may have functioned together with an *odeon*. Given all these particularities, I have not included it in the analysis.⁷⁸ It was also not possible to consider *Circus Flaminius*, because in the used version of *Forma Urbis* it was misplaced.⁷⁹ The plan of *Circus Maximus* (Fig. 12, bottom) was included in the illustration solely for the comparative aspect of the (typical) building plan in the initial state.

When they were not completely separated from the subsequent urban fabric (like *Circus Maximus*), the typical pattern of *preservation through transformation* of the ancient hippodromes is less obvious than the one in Piazza Navona, but it is much more provocative. They are **discreetly integrated within the urban fabric**, with more or less visible clues, as presented in the case study below, and subsequently confirmed for others.⁸⁰

The illustration for the Hippodrome of Thessaloniki⁸¹ (Fig. 12, top/middle) presents two versions of interpretation regarding the orientation of the hippodrome – the semicircular end is either on the right (N), or left (S); both are possible, since from my point of view none can be fully argued for, while both can be defended in relation to the late medieval/traditional street network.⁸² It is remarkable how all the surrounding and contained streets depend on the configuration of the ancient massive structure:⁸³

- The arched street to the left (S) was probably parallel (whether interior or exterior) to the *carceres* (or *sphendone*) (it is why I suggested a possibly shorter general contour, with blue);
- On the top long side (W) there are three segments with different, but obvious relation: to the left (S), the massive walls and containing structures were included in the subsequent built fabric – note the two short streets halting precisely near the outer wall; the middle segment parallel to the main walls and interior to the bench area; the right segment and the upper (E) half of the *sphendone* (or *carceres*) are outlined by another continuous street; the outer line is “lost” only for the lower (W) half of the *sphendone*;

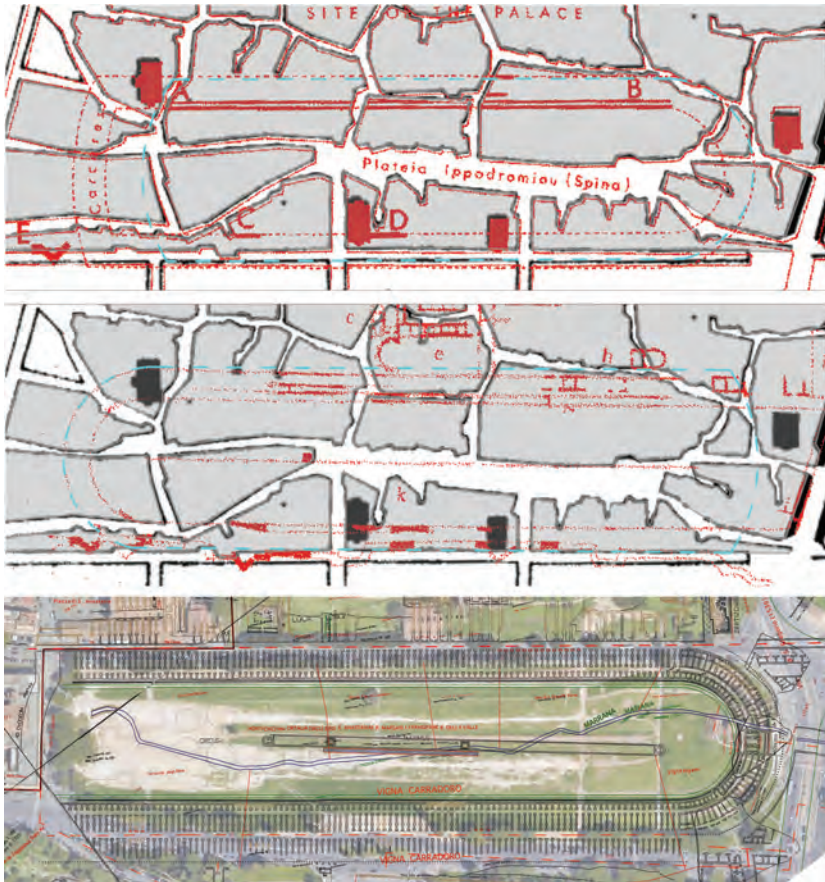


Fig. 12

- The bottom side (E) was delimited by the city's fortification, until this segment was demolished in the late 19th c; it was replaced by a new residential quarter, hence the “very straight” street for that time⁸⁴;
- The longitudinal street, crossing the former hippodrome, was recognized a long time ago to mark the *spina* and the possible processional routes connecting to both ends.⁸⁵ Notably, this street was wider than the rest, resembling a very elongated square, of which the historical toponym is very suggestive

(*Plateia Hippodromiou*, i.e. Hippodrome's Square).⁸⁶ This square was obviously the gathering place for all the surrounding streets, suggesting that the former arena, marked by the *spina*, remained in use since Antiquity, although gradually silting with new buildings.

- Last, but not least, all the radial streets which mark the two rounded ends of the former circus; these streets (or rather this pattern) are of great interest, I believe, because they indicate where and especially how the ancient structure was first breached after it went out of use, i.e., in direct connection to its shape and spatial organization. Their radial configuration points to the fact that the arena was in use (for whatever purpose, but most probably as a public space),⁸⁷ with the *spina* as a space coordinator, and new connections were made in time with the outer urban fabric; all these streets converge to the (now) imaginary (previously very much physical) line of the *spina* (corresponding to the upper limit of the late medieval square, see Fig. 12, middle).

Both fortifications and hippodromes, like any other large and solid structures, reveal similar patterns of transformation: they either delimitate a parallel street, or stop another's course into a *cul-de-sac*⁸⁸ when the building fragments are integrated in an island. Their structures simply couldn't be ignored, except for some passageways people pierced through to accommodate the necessary circulations once the area got to be used differently. Within a longer time span, the slow process of spoliating buildings could also have had neutralizing effects in terms of morphological determination, but I'd guess for such large structures it could have only been local, i.e. isolated when compared to the entire initial structure. Thus, it is relevant to see the spoliation as opposed to reusing the structure *in situ*. While they both could have coexisted as phenomena, at least for a while, the latter was far more pragmatic. My guess is that the abandonment and spoliation are complementary, and reflect a time of lesser urban population, hence reduced density of the residential fabric, while *in situ* reuse of the structures indicates at least a local concentration of population, if not a growing density in the entire city. Indirectly, this brings us back to the previously mentioned matter of *città ad isole*, to see its relevance from a different perspective – this time in using the buildings, not merely the urban area.

7. Conclusions

According to the widespread expression “can’t see the forest for the trees”, precisely because it is too obvious, before this study I couldn’t assess the impact of the recent interventions in living ancient cities, seen on the larger scale of two millennia. One could imagine things being changed anytime between the two periods of reference, thus not necessarily in the past century, for so many disasters and reconstructions are accountable in the histories of these cities; at the same time, intuition whispered that *tabula rasa* could only have occurred occasionally, and presumably not extensively at the urban scale, despite what the sources or their interpretations may suggest, usually in ambiguous terms. Since there was nothing to rely on, the premise was to (at least) pretend not knowing anything between the timeline points A and Z, where preconceived ideas could easily merge in, such as “discontinuity,” or “rebuilding (from foundation)” following “complete destructions” (whatever these expressions may mean, for any of the many authors using it).

This is what the case studies proved, beyond the obvious expectation: for most of the historical interval between Antiquity and the present, where conditions were favorable to some/any sort of continuity, the urban fabric (mainly streets and various built structures) was preserved and gradually transformed in a vernacular, organic manner. Therefore, it now seems safe to presume that one type of significant alterations in the long living urban fabrics are due to the interventions of the Modern Period, or even well into the Late Modern/Contemporary periods (depending on the context or conventions used)⁸⁹. These interventions are obviously associated with a higher degree of urban administrative control, with everything that it entails (politics, ideologies etc.). The other main cause for discontinuities in the historical urban fabric that one could argue for is the long periods of abandonment of certain areas of the living cities (thus not entirely!), as it happened in Rome – the *città ad isole* phenomena. While the latter can be seen as a local “natural death” in the evolution of the city, determined by the humans through their absence, the previous one implies direct human intervention, hence an “artificial death” (some would label it as “murder”, in other contexts). So far, I couldn’t identify a third or other more significant factors for important alterations of the urban configuration, but further studies may do so.

Things became a bit clearer now, at least theoretically: for a start, in a living ancient city, its entire known area is susceptible to contain

ancient structures, either underground or within the buildings; these can be continued by the present structures or discontinued (separated). According to the basic predictive approach proposed in this preliminary study, four large situations can occur: (1) the preserved traditional fabric has a high potential to preserve ancient structures; (2) the modern/contemporary fabric variably replacing the traditional one, upon a partially conserved configuration, has moderate PPAS (largely the same street network, with significant replacements in the built stock); (3) where long term abandonment or the modern interventions determined significant alterations of the ancient configuration, including the street network, there is a low PPAS; (4) the areas with urban fabric recently built on empty ground (the previously unbuilt areas), but also the archaeological areas, have zero PPAS (regardless of their archaeological content). Therefore, concerning the areas where the present urban fabric is not in a certain physical continuity to the ancient one, what can't be related to recent interventions needs to find an explanation in previous periods of evolution. Obviously, each case can provide important information for the evolution of the city if properly documented, and this study provides some starting hints on how, where and what to search for. There are probably a few hundreds of European cities out there for us to explore, and preferably to also preserve.⁹⁰

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ANNEX – Figure Labels

Fig. 1. Barcelona – **Pallarés 1975**, tav. 2 (both; blue on the right), overlapped on **Google Satellite Imagery** (left).

Fig. 2. Barcelona – **Pallarés 1975**, tav. 2, overlapped on **Google Satellite Imagery**. Red: the Roman street axes presumed by Pallarés; Blue - the added (or replacing) Roman street axes presumed here, based on the mediaeval streets which could correspond to fragments of the initial ancient streets.

Fig. 3. Thessaloniki – **Vickers 1972a**, fig. 3, overlapped on **Google Satellite Imagery**. In Vickers' interpretation, the highlighted streets pertained to the Hellenistic street network. Note that the plan presents the situation before the Great Fire of 1917, thus prior to most of the interventions which replaced the built fabric on almost the entire historical area (except the upper town - NE to the abovementioned grid).

Fig. 4. Sofia – **Ivanov 2017**, fig. 1, overlapped on **Google Satellite Imagery**. Note that some lines or structures are not necessarily representing ancient elements, such as the ones delimiting modern islands, and the former mosque integrated within the Museum of Archaeology (immediately E outside the fortification).

Fig. 5. Rome – the four types of PPAS areas mapped on the **Google Satellite Imagery**, based on the *FUR* plan of **Tani, Femia & Peluffo 2008** (not presented here for getting too difficult to read). Red: built areas with high PPAS; Light Red: built areas with moderate PPAS; Yellow: built areas with low PPAS; no PPAS are Green: archaeological areas or very low building density areas; and Gray, areas compromised by significant interventions (railways).

Fig. 6 – example of urban fabric in Rome with high PPAS; in the center, Piazza Navona/The Stadium of Domitian. **Tani, Femia & Peluffo 2008**, overlapped on **Google Satellite Imagery**.

Fig. 7 (left) – example of urban fabric in Rome with moderate PPAS: the former *castrum*, in the eastern part of the city. **Tani, Femia & Peluffo 2008**, overlapped on **Google Satellite Imagery**.

Fig. 8 (below) – example of urban fabric in Rome with low PPAS. **Tani, Femia & Peluffo 2008**, overlapped on **Google Satellite Imagery**.

Fig. 9 – example of urban fabric in Rome (left) and Barcelona (right) with high PPAS. **Tani, Femia & Peluffo 2008** (Rome); **Pallarés 1975**, tav. 2 (Barcelona), both overlapped on **Google Satellite Imagery**.

Fig. 10 – example of urban fabric in Rome (left) and Thessaloniki (right) with low PPAS. **Tani, Femia & Peluffo 2008** (Rome); (both) **Google Satellite Imagery**.

Fig. 11 – Patterns of preservation/transformation of the fortification lines in Barcelona, Thessaloniki, and Rome: preserved, free standing on both sides (1-4); integrated within the built fabric on one side (5-7); integrated within the built fabric on both sides (8-9). There is also the discontinued type, not illustrated. For all: **Google Satellite Imagery**: Rome: **Tani, Femia & Peluffo 2008**; Barcelona: **Pallarés 1975**, tav. 2.

Fig. 12 (top/middle) – The Hippodrome in Thessaloniki (part of/next to the Palace of Galerius), extras from overlapped **Vickers 1972a**, 160, fig. 3 (both; black), and **Vickers 1972b**, 27, fig. 1 (top, red); **Spieser 2015**, 20, fig. 1 (middle, red). Random scales and orientation. For both, the blue dashed line is my complementary interpretation of the building's outline, based on the presumed morphological correspondence with the traditional street network. **Bottom**: *Circus Maximus* in Rome, extras from **Tani, Femia & Peluffo 2008**, and **Google Satellite Imagery**.

NOTES

- ¹ W.G. Hoskins, quoted by **Aston 2002 (1985)**, 12. The author referred to the generic English landscape, but it can be applied to urban landscape as well (on the meaning of *landscape* see, the **European Landscape Convention 2000**, especially Art. 2).
- ² I perceived these disciplines to be dominant for my research; in fact, many more intersecting disciplines are involved, which will be mentioned where most appropriate – while others will surely be missed.
- ³ **Sitte 1945 (1889)**, 1-7, although focusing on the Middle Ages and Renaissance, uses Antiquity as foundation; **Unwin 1909**, especially chapter II; **Haverfield 1913**; obviously, prehistoric times were also consequently discussed, but the main or starting core was usually Antiquity, see **Lavedan 1926**. See also **Giovannoni 2016 (1931)**, 24 *sqq.* This focus on Antiquity also continued later, see **Ward-Perkins JB 1974**, **Gros & Torelli 2010 (1988)** etc.
- ⁴ It may not frequently occur literally in published materials, but it can be implied indirectly; it is also possible that I might have heard it more often in oral conversations. **Zahariade 2006**, 79, referring to Constanța: “The information on the general urban ordinance in Roman Tomis is today seriously stalled by the overlapping of the modern city over the ancient buildings. That makes the research and an exact evaluation of the urbanism in the city or the topographical disposition of the edifices almost impossible.” Although implied indirectly, see a similar perspective for Palermo in **Maurici 2015**, 13. While they are not entirely wrong in their evaluations, the emphasis is on what can’t be done or known, instead of the opposite perspective; after all, no archaeological site can benefit from an “exact evaluation”.
- ⁵ On the history of the discipline, see **Hodges 2015**, 274 *sqq.*; the basic methodology was elaborated in Italy in the 1980s, while the actual development in other European countries only started in the 2000s; for criticism of the Italian (leading) model, see *ibid.*, 283.
- ⁶ **La Valletta 1992**, see a relevant reference in **van Leusen and Kamermans 2005**, 9. The same is specified by the **European Landscape Convention 2000**, see especially the preamble – also relying on the previous relevant international documents mentioned there.
- ⁷ See a very recent approach here: Historical Urbanism - Shaping Cities Through Historical Research (<https://historicalurbanism.space/project-outline/>, June 30th, 2023). In fact, some scholars claim that “urban planning has declined and *de facto* ended as a unified management system of complex urban processes,” **Bandarin 2014**, 1.
- ⁸ **Bakirtzis 2003**, 40, n. 43 – referring to Thessaloniki, but the situation is similar elsewhere, perhaps with some exceptions.
- ⁹ On the divergence between the focus on the past (specific to archaeology) *versus* future (specific to urban and territorial planning), **Fairclough** argues

- that: “Such an approach [of Landscape Archaeology] can fail to engage with other landscape disciplines which firmly locate their landscape interest in the present or even (such as spatial planning and landscape architecture) the future”, **2012**, 474. On the connection to urban morphology, *id.* 475.
- 10 Largely the same idea in **Degraeve 2014**, 3: “we should be aware not to talk solely about subsoil archaeology in cities. All cities have, hidden underneath layers of plaster and wallpaper, treasures of history.”
- 11 One discipline connecting the two, albeit indirectly, is *building archaeology* – significantly less widespread: “Building archaeology should be handled in the same way as subsoil archaeological excavations, the distinction being of minimal relevance in an urban context organized around an ancient urban nucleus originating in the Middle Ages or the Roman times and even earlier,” **Degraeve 2014**, 3. A comprehensive work on the traditional building archaeology in **Schuller 2002**, with a preface signed by Michael Petzet
- 12 A response to the (more than reasonable) question: “Shouldn’t we consider preventive urban archaeology as a scientific strategy in itself?”, **Degraeve 2014**, 2. Hence, my answer is “Yes, but even more than that, *preventive* should be preceded by *predictive*.” The concept is explained below, in the text.
- 13 A Google search on “predictive urban archaeology” in April 2023 revealed many relevant webpages, most of them scientific articles containing all the terms – or maybe only two –, but none as an expression. Apparently, it is still an emerging (sub)discipline, gathering its strengths.
- 14 “(...) a technique that, at a minimum, tries to predict “the location of archaeological sites or materials in a region, based either on a sample of that region or on fundamental notions concerning human behaviour,” **Kohler and Parker 1986**, 400, *apud Verhagen & Whitley 2012*, 52 – see *id.*, 52 *sqq.* for more definitions. For over three decades, it “has been used successfully (...) as a decision-making tool in cultural resources management,” *id.*, 49; notably, not so much in archaeology: “This has largely resulted from the desire to use predictive models as tools for minimizing field effort rather than for explaining the differential spatial patterning of archaeological sites” (*id.*, 50).
- 15 A brief orientation in some of the literature on *landscape archaeology* (having yet another huge development, significantly different than the traditional urban archaeology or historical urbanism) – as the wider field of studies to which predictive urban archaeology would be subordinated – revealed limited examples for “living urban morphology” applications, at least in the European area I focused on. Projects on “living urban” are mentioned briefly in **van Leusen et al. 2005**, 41, where most of the examples are on other types of complementary archaeological studies (geological, geomorphological, and marine); the only other reference I found here for urban use is indirect, and inaccessible: “Municipal archaeologists, especially, tend to have a fund

- of local knowledge that they use to assess the archaeological potential of land within city limits (Arnhem, Delft),” *id.*, 52, *passim*. The UK (rather administrative) project, *English Heritage’s Urban Survey and Characterisation Programme* (Thomas 2006) and the more recent research project on Rome (Carafa 2022), although not explicitly having a predictive approach, head on the necessary technological premises towards it. The extensive study of Verhagen & Whitley 2012 (over 50 pages on predictive archaeology, including consistent bibliography) mentions nothing directly regarding urban applications. Perhaps the closest one, including urban morphology, is the study on mediaeval Brussels, see Vannieuwenhuze et al. 2012.
- 16 This question was a secondary result of a study I published almost ten years ago. At that time, I had absolutely no preoccupation with the present-day urban fabric, which I used in my illustration only for reference purposes. Hence, it was by accident that I noticed an area where the hypothetical street network of the ancient city resembled the modern street network (Teodor 2014a, 123 *sqq.* and Fig. 12).
- 17 Some general presentations of the site, here: Zahariade 2006, 71-9; Custurea & Nastasi 2014.
- 18 I presented some arguments and relevant literature here: Teodor 2017, 89-80, and notes 4-5.
- 19 A critique on this general historical approach in Curta 2016, especially 106.
- 20 Wickham 2005, 646. For the background of this conclusion generally accepted now, see *id.*, note 131, with the bibliography. The reciprocal is considered possibly valid, albeit hesitant (supposedly, due to a general lack of research in this direction): “the maintenance of a considerable degree of urban vitality, at least in the successful cities of the peninsula [ref. Italy]; hence, probably, their continued spatial coherence,” (*id.*, 653). For Italy, the concept of continuity is seen as nationalist (Hodges 2015, 282), and it was certainly used similarly elsewhere (e.g., Thessaloniki, in Greece, see Yerolympos 1996, 113, and note 36). However, urban continuity can exist, theoretically, regardless of these ideologies; at the same time, it is true that at least some of the archaeological documentation (as well as historical accounts) can be “contaminated” by these ideologies. It is why any other investigation method, addressing different questions, can be relevant for the bigger picture. For the ongoing debate on the generic urban (dis)continuity thread, see Curta 2016, especially pp. 89-91 and 106.
- 21 The Stadium of Domitian / Piazza Navona may be a very eloquent example since its structures were used in the state of ruin for centuries after it went out of its initial use. Only in the Renaissance period new buildings were erected upon the seating area, see Bernard 2007, 149, 151. This is a case of evident physical continuity of the built structures over the arguable functional continuity, although the ruins would have survived that long regardless of being used as deposits, dump, cemetery, workshops etc., or just abandoned.

- 22 On the “living city,” see also **Bandarin 2014**, 2, 5. In the same volume, **Bianca 2014**, argues that “‘Morphology’ could thus be interpreted as the knowledge of how to deal with the formal appearance of living structures,” 86 (my emphasis); see the entire paper for an extensive presentation on urban morphology.
- 23 I did exclude the property limits here only because they are difficult to document for the present day (especially for many cities), not to mention for historical periods. Otherwise, it is common knowledge that these are frequently more resilient than the buildings.
- 24 Natural, in the sense that the respective area ceased to exist at some point due to a process typical for the evolution of any human settlement; or artificial, if they were deliberately put to an end through human direct intervention. I returned to this idea in the concluding section.
- 25 Sometimes for good reason, because it can tend to be confused with *restoration*; for historical buildings these two terms can imply quite different approaches. This aspect is ignored by the Leeuwarden declaration on adaptive reuse (see note 29) – probably suitable to be further addressed (see “Through smart renovation and transformation, heritage sites can find new, mixed or extended uses,” p. 1 – my emphasis; in fact, renovation is frequently not compatible with built heritage, see **Petzet 2004**, 10-2 on *restoration*; 12-3 on *renovation*).
- 26 They are also valid for spoliation, but that will not be discussed here.
- 27 On the historical “adaptive reuse,” as well as a history of the practice and concept, see **Plevoets & van Cleempoel 2019**, especially chapter 1: “in the past, the practice of altering existing buildings for new uses occurred spontaneously and was handled in a pragmatic way. In this chapter we describe how adaptive reuse has evolved from a user-led process to a highly specialized discipline,” 7; the reduced circulation of the concept regarding the historical practice is also noted, *id.*, 8.
- 28 Although focusing on *spolia*, the idea is the same: “The contemporary fascination with *spolia* is part of a larger cultural preoccupation with reuse, recycling, appropriation, and re-presentation in the Western world. All of these practices speak to a desire to make use of preexisting artifacts (objects, images, expressions) for contemporary purposes.” **Brilliant & Kinney (eds.) 2011**, opening page.
- 29 The **Leeuwarden Declaration 2018**, preamble.
- 30 **Plevoets & van Cleempoel 2019** recently approached the urban scale *adaptive reuse*; however, the most relevant case study presented, on the *Historical centre of Split*, does not have a morphological character (115-9). The **Leeuwarden Declaration 2018** also mentions the “Multi-scale and territorial approach” referring to the architectural project which should integrate the existing structures into the contemporary building and its use: “heritage sites should be understood in their wider, surrounding context

(district and city) in order to fully consider their integration into their urban environment and natural landscape” (p. 2). This larger-scale approach is typical for any architectural project, but usually with reduced outcomes (treating one problem can’t always resolve others); only urban scale policies and projects can be effective.

31 In most cases, the reuse of temples and other important public buildings is highlighted, especially the ones being transformed into Christian churches, e.g. **Plevoets & van Cleempoel 2019**, 7, 121.

32 For example, it was observed that many *fora* in Italy became markets in the Middle Ages, or simply remained open spaces (naturally, with altered configurations), **Wickham 2005**, 652.

33 In the last volume of the three collections of studies *The Impact of The Ancient City* (covering the Greco-Roman Mediterranean), the editors claim that for their heavily funded ERC project of over six (!) years, they “soon discovered that it was impossible to do more than sample this vast area”, **Greaves & Wallace-Hadrill (eds.) 2022**, *Series preface*, p. v. For details on the project, see funder’s page (<https://cordis.europa.eu/project/id/693418>) and project’s website (<https://impanccit.wixsite.com/impanccit>) (June 17th 2023).

34 See, for example, **Haverfield 1913**, chapter VII; **Ward-Perkins JB 1974**, many of the figs. 39-78.

35 There is an impressive project entitled the *Historic Towns Atlas*, initiated in 1955, declaratively targeting (among others) comparative morphological studies. Although it is a great resource of collected data for the documented cities (provided the volumes would have a wider availability, like the Irish (<https://www.ria.ie/>) and the Austrian (<https://www.historiaurbium.org/activities/historic-towns-atlases/atlas-working-group/austrian-historic-towns-atlas/>) collections, June 26th, 2023), it is not properly *one atlas*, but rather a collection of atlases; they are useful for those interested in certain cities, but not so much for someone oriented towards a preliminary statistic evaluation. On the project (and urban morphology), see **Conzen 2008**.

36 The only database I found so far closer to the necessity of this project is **Hanson 2017**, but unfortunately it is not very reliable; although it contains a huge amount of data (very useful to many purposes), there are some flaws which render it inoperable for relevant filter interrogation – for example, the area of Thessaloniki is provided for the Hellenistic period, when the city was considerably smaller (therefore, in a classification by size, the site would be missed – although being in fact quite large from the Roman period onward); there are also consistent shortcomings for the region of Dobruja (that I know better, see note 39), which make one wonder about the data quality on some areas of the Empire.

37 **Unwin** wrote, in **1909**: “It is to be hoped that some competent authority will take in hand the complete history of town development and town planning,

with a classification of the different types of plan which have been evolved in the course of natural growth or have been designed at different periods by human art," 16. Such approaches did exist, but obviously only for limited geographical and chronological spans, with methodologies adapted to some specific purposes, see for example **Haverfield 1913**, **Gros & Torelli 2010 (1988)**.

38 Perhaps it could be approached only with AI support, since the data necessary to process is continuously growing.

39 The PhD dissertation was on the Roman cities in Dobrudja, Romania (**Teodor 2014b**).

40 For readers less initiated in historical and archaeological literature, note also that a recent date of a publication is not necessarily a guarantee for updated illustrations, therefore it would have been a futile criterion.

41 Based on my experience, the errors in the graphic scales of city or site plans are something quite common. However, this may be the least of the problems related to plan representations, see **Greaves & Wallace-Hadrill 2022**, 8, with reference to Millet's paper in the same volume. For similar issues, see also **Teodor 2014c**, 505, *passim*.

42 This was obtained freely via Quantum GIS, using the QuickMapServices plugin, developed by NextGIS.

43 I used AutoCAD and QGIS (for both obtaining the Google Satellite imagery, and layers overlapping); the former supports georeferenced data and is more suitable for a detailed spatial analysis, while the latter is useful for a quick first evaluation, but also for the development of a long-term spatial database.

44 **Maurici 2015**, 24 *sqq.*

45 **Teodor 2023**, in press.

46 I use this referring to the urban fabric spontaneously developed in time through vernacular interventions, regardless of the existence of an urban administration.

47 This is why I also changed the initial subtitle of the project, "preliminary classification and case studies on the adaptive reuse of antique structures in modern cities," to "predictive analysis for urban archaeology".

48 I used this paraphrase after the film *The Good, the Bad and the Ugly* with the historical detachment one can have when the damage has been done for long; it was not meant to diminish in any way the historical significance or archaeological values of these cities. Conversely, it was meant as a signal that these more or less damaging interventions need to access a new level in our awareness: yes, important heritage was lost during modernization, undoubtedly made with good intentions. While criticising what needs to be criticised, my paper in fact suggests a possible approach towards what can be changed in this (by now historical) wrong direction.

49 A historical account in **Pallarés 1975**, 5 *sqq.*; more recent synthetic data in **Wickham 2005**, 658.

- 50 The historical centre is very easy to find on the satellite imagery: towards the sea, surrounded by the regular urban fabric of the Eixample area; see the city plans available on Wikipedia (https://en.wikipedia.org/wiki/Urban_planning_of_Barcelona) (June 23rd, 2023).
- 51 On this direction, see **Greaves & Wallace-Hadrill (eds.) 2022**.
- 52 A historical account in **Yerolympos 1996**, 88-99.
- 53 The information provided in this section relies on **Teodor 2023**, in press.
- 54 Europa Nostra Award (<https://www.europeanheritageawards.eu/winners/archaeological-site-galerius-palace-thessaloniki/>) (June 23rd, 2023) was granted in 2008 for an archaeological site which resulted from such an intervention – albeit some decades ago; the site (the Galerius Palace) is the one discussed both in the dedicated paper and here in section 6.
- 55 A historical account in **Čurčić 2010**, 51 *sqq.*
- 56 There is a debate whether the ancient city was expanded by another fortification (as the plan published here (http://ulpiaserdica.com/history_map_en.html#6%20vek) would suggest – no scientific source provided; June 23rd, 2023), or not – see **Čurčić 2010**, 51 and especially note 19 (pp. 839-40). Regardless of the existence of a larger fortification, it is obvious that the city was much larger than the under 20 ha the known fortification has; this means that the surrounding urban fabric should also be considered for evaluation.
- 57 A plan similar to the one assembled here, also updated and containing more of the *extra muros* discoveries is here (http://ulpiaserdica.com/maps_en.html) (June 23rd, 2023); some archaeological sectors have links to the pages presenting them.
- 58 Notably, it is typical for sites which are unoccupied by modern settlements; for Serdica/Sofia, it is even more extensive than many plans of the latter category – a relevant detail for the rapidity of collecting the archaeological data.
- 59 See **Yerolympos 1996**, 45 *sqq.* for a brief account on the modernization of Sofia. Apparently, the core pretext was the destruction of the “bomb attack in 1944 which necessitates the reconstruction and the rebuilt of the stricken center” (http://ulpiaserdica.com/ulpia_serdica_en.html, June 23rd, 2023). In this case I have not expanded the verification – i. e. to confront historical city plans with the archaeological structures known by now, but at first glance this seems similar to the case of Thessaloniki, if not worse.
- 60 Some relevant pictures can be seen starting from http://ulpiaserdica.com/objects_en.html, namely the links for the Eastern Gateway (http://ulpiaserdica.com/east_gate_en.html) and Triangle Turret (http://ulpiaserdica.com/tr_tower_en.html) (June 23rd, 2023 for all).
- 61 It seems only Saint George Rotunda and Saint Sofia Basilica have survived as monumental architecture, see Ulpia Serdica (http://ulpiaserdica.com/ulpia_serdica_en.html) and St. Sofia Basilica (http://ulpiaserdica.com/b_sofia_en.html).

- 62 Although this is in fact a methodological part, I preferred to separate it from the dedicated section 2 because it is also an outcome of this study; furthermore, it is also suitable to be continued (see section 7).
- 63 The [in situ *Reused*] inserted is to stress that this parameter refers to *living* (used) structures, not to the exclusively archaeological ones, possibly to be found anywhere in the city, functionally and/or structurally disconnected from the current urban fabric. Also, these should not be confused with *spolia* (which are usually elements rather than built structures) – a slightly distantly related and incredibly interesting topic, but frankly a very different one. When I first surveyed the literature for this project, it was mostly the *spolia* direction that I found approached, rather than the *in situ* reuse I was interested in – e.g. the work of Michael Greenhalgh (<https://www.librarything.com/author/greenhalghmichael>) (June 30th, 2023), or the volume **Brilliant & Kinney (eds.) 2011**, suggestively named *Reuse value: spolia and appropriation in art and architecture, from Constantine to Sherrie Levine* (as the subtitle indicates, it is largely on *spolia*, although the main title could also cover the *in situ* reuse).
- 64 All the situations that would not fit either the *high*, or the *low* categories can be preliminarily categorized as moderate (or preventively *low*, if there are such signs, since in a strategic approach this category should have a certain amount of priority in the “rescue” area), and then adapt depending on the detailed analysis.
- 65 Except for the case studies presented in this paper, the main sources used for the city plans briefly evaluated are: **Brogiolo 2013**, **Gros & Torelli 2010**; **Ward-Perkins JB 1974**; **Castagnoli 1971**; if not mentioned, online non-scientific material was used for orientation.
- 66 In terms of timespan, this document has probably one of the longest/histories of research, as it has been studied for about five hundred years since it was discovered, with intermittences. However, only recently it has been assembled for a proper investigation of the urban configuration. Many details about the marble plan, its discovery, investigation, potential etc. can be found at Stanford Digital Forma Urbis Romae Project (<http://formaurbis.stanford.edu/>); a promising project is Mapping Rome (<http://mappingrome.com/>), with a written introduction in **Tice 2013**, and a video (<https://www.nga.gov/audio-video/video/digital-history-conference/dah-tice-2.html>) (June 15th, 2023, for all links). I found no recent news on the latter, instead another very ambitious project has recently started, focused on collecting data in a dedicated Archaeological Information System, see **Carafa 2022**.
- 67 A vectorized version of Rodolfo Lanciani’s plan was used for this analysis (**Tani, Femia & Peluffo 2008**). The original plan can be consulted at David Rumsey Map Collection (https://www.davidrumsey.com/luna/servlet/view/search?q=pub_list_no%3d%2210199.000%22&qvq=lc:RUMSEY~8~1&mi=0) (May 20th, 2023). On the recognized validity (including the reading

- keys of the plan), but also on another continuation of the *Forma Urbis* project with new technologies, see **Carafa 2022**, 53-4.
- 68 Having to do rather with the typical (mis)conceptions about the ancient Greco-Roman cities – lately contested by more than one voice, **Greaves & Wallace-Hadrill 2022**, *passim*, with references, especially p. 9.
- 69 The same idea in **Giovannoni 2016 (1931)**, 24, but also in a recent theoretical approach on Landscape Archaeology (although referring rather to non-urban, it also applies to the urban environment): “(...) by presenting the continuum of (pre)history (as represented by past material culture) as a part of present-day landscape not merely as a pointer to understanding past environments or landscapes, Landscape Archaeology could become an important part of broader landscape research in addition to being a sub-discipline of archaeology,” **Fairclough 2012**, 471.
- 70 Presumably modest structures would not raise attention (not to mention the “invisible” earth stratigraphy for non-archaeologists) within a typical construction site; only the monumental ones, or human bones, may have such an effect: “In 2004 *the construction works* of the new Arena di Serdica Hotel of FPI Hotels & Resorts chain *unexpectedly* came across a part of a Roman wall. Archaeological excavations immediately started – thus the Amphitheatre of Serdica (...) was discovered!” (m.e.) (<https://www.arenadiserdica.com/pages/the-amphiteater-of-ancient-serdica>, June 23rd, 2023). Note the “unexpected” keyword, so frequently met in many news relating various discoveries within or around ancient cities – I am more familiar with the ones referring to the (otherwise well known) necropolises of ancient Tomis in Constanța. Similar comment for Thessaloniki in **Bakirtzis 2003**, 40, n. 43.
- 71 **Manacorda 1982**, section 1.
- 72 Any type of evidence also needs to be judged in context: e.g. most probably, it was a compromised archaeological deposit, but to what extent? – **van Leusen et al. 2005**, 59.
- 73 **Hodges 2015**, 269-70, also for “polyfocal communities (...) [as] a definable archaeological model,” and “a widespread European settlement form in the early Middle Ages,” *ibid.*, with notes; **Wickham 2005**, 652, with the cited literature.
- 74 **Hodges 2015**, 269.
- 75 See also Andrea Augenti, quoted by **Hodges 2015**, 282, with note 91.
- 76 Still, not in Rome, where it’s quite difficult to identify such a segment, if it exists; the only one I found that might contain fragments integrated on both sides is located south of the *castrum*, between “Porta Clausa” and Via Mozambano – a section of only about 50 m. Also, apparently none in Thessaloniki.
- 77 In Constanța, the modern Ferdinand Blvd. is quasi-parallel to the line of fortification towards the territory (**Teodor 2014a**, 117-8 and Fig. 12); it is

similar in Mangalia (**Teodor 2014c**, 524, and Figs. 13-4), presumably in many other places.

78 **Bernard 2007**, 149 *sqq.*

79 It was later proved that in the place where *Circus Flaminius* was located by Lanciani it was in fact the Theatre of Balbus. The confusion, which lasted for centuries, is due to the similarity between the semicircular end of the circus and the shape of the theater, see **Manacorda 1982**, 2.2.1.

80 The configuration is comparable for the stadium in Plovdiv, see Ancient Stadium Map (<https://ancient-stadium-plovdiv.eu/?p=92&l=2>, June, 26th 2023), and the one in Tarragona, around Plaça de la Font (Google Maps).

81 Presented from a slightly different perspective in **Teodor 2023**, in press.

82 Opposed to the *sphendone* (the semicircular end) are the *carceres* - also considered (here, at least) to have an arched shape - see it mentioned on the plan (top). Only limited archaeological evidence was revealed for both ends, difficult to interpret based on the drawings I found (but this could be my limitation). To some extent, until further evidence, both versions can be considered for restitution – but if we are to look at the historical street network overlapping with it, the variant of Vickers is more convincing.

83 Notably, not only the street network can be analyzed, but also the built fabric of the pre-modern Thessaloniki. Unfortunately, the entire area was modernized, therefore the connections preserved *in situ* are probably scarce, if any; however, the various archival documentation (archaeological, urbanistic, historical photographs and descriptions) may be very relevant for future investigations, see **Vickers 1972b** for some hints in this direction.

84 The Hamidiye Boulevard operation, **Yerolympos 1996**, 68 *sqq.*

85 **Vickers 1972b**, 28-9.

86 **Vickers 1972b**, 28.

87 *Ibid.*

88 **Bakirtzis 2003**, 55-6.

89 Wikipedia: Late modern period (https://en.wikipedia.org/wiki/Late_modern_period, June 26th, 2023).

90 “(...) practice shows that when predictive models are not used, there will be less opportunity for archaeologists to influence spatial planning in the early stages,” **Verhagen & Whitley 2012**, 54. Notably, “heritage managers and politicians in the Netherlands have elected to assign an increasingly important role to archaeological predictive models in the planning process at the local and regional levels of government,” **van Leusen and Kamermans 2005**, 9.

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