

Cyclical inversion of limits and centres: the formation process of the *Regio quartadecima*, Constantinople

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Abstract

The paper reconstructs the topography of Constantinople's fourteenth region (regio XIV) applying the urban morphology analysis methods (Caniggia and Maffei, 1979) and the attractors' theory (Camiz, 2018) to the fragmentary documental sources and scarce archaeological data. The pontem sublicium sive ligneum's location was determined as part of a street network, in analogy with the pons sublicius in Rome, according to the formation process of the territorial organism. This was the starting point for the reconstruction of the topographic mosaic. By redefining the path of the Constantinian walls upon quantitative sources it was possible to localise the monumental buildings of the XIV region, as listed in the Notitia Urbis Constantinopolitanae, with reference to the morphology of the territory described by Dionysius of Byzantium and the Patria Konstantinopoleos. The form of the territory is a permanent element within urban contexts of continuous changes, demolitions and reconstructions. The analysis of the urban tissues, the road network's diachronic attraction and the reconstruction of the territorial organism provided the general methodological framework for the placement of the topographical urban fragments mentioned by historical sources upon a GIS.

Keyword: attractors, morphological process, urban morphology, topography

"Nam urbs ipsa moenia sunt, civitas autem non saxa, sed habitatores vocantur".
Isidore of Seville, *Etymologiae*, I, xv, 2.

Introduction

This paper is part of an ongoing wider research project on the topography of Byzantine Constantinople (Camiz, Özkuvancı and Verdiani, 2019) and is based on the morphological analysis of urban tissues, the attraction analysis of the diachronic evolution of street networks, combined with archaeological data, geological data, historical sources, cadastral plans and numismatic sources in order to create, using a GIS, a predictive model for the localisation of the buildings mentioned in the *Notitia Urbis Constantinopolitana*. The XIII region, also known as Galata or Pera, is across the Golden Horn, the XIV region is instead the territory of the historic peninsula delimited by the Constantinian walls and the Theodosian walls.

Methodology

The cyclical limit and centre inversion was theorised by Caniggia and Maffei (1979) and it assumes that the evolution of an urban organism follows different phases and each part is added to the other so that what used to be the limit becomes the centre in the following configuration.

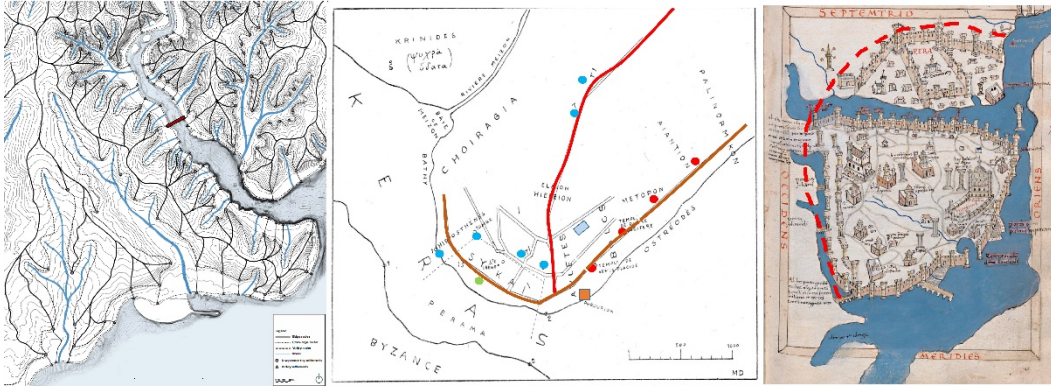


Figure 1. Left: Istanbul, formation process of the territorial organism (Özkuvancı, 2021); centre: Galata's plan showing in red the Megarean monuments, in blue the tombs (Dallegio d'Alessio, 1946); right: the curious mistaken alignment of the Theodosian land walls and Galata walls (Buondelmonti, 1470).

The authors illustrated different examples in relation to the site's morphology, in valleys, on the mountains or next to a river's, sea or lake shore. Pera's configuration resembles closely the scheme provided by Caniggia and Maffei (1979) for an urban settlement along the shore. Figure 2 illustrates the formation process of Constantinople through 1500 years in 4 phases, starting from the earliest foundation of Byzantium as a Megarean colony (VII BC). In phase 1 the original walls of Byzantium are outlined, and in the next phase what used to be the gate of the city became the centre. It is the location of today's Hagia Sophia which was built much later. In the following phase that gate became the *Tetrastoon* and later the *Augusteion*. What used to be the limit became the centre. In the III century Septimius Severus built new city walls and gates, and in the following urban enlargement, the main gate along the Mese became the new centre, the forum of Constantine the great. The following step was the construction of the Theodosian walls (404-413), but the location of the new forum of Arcadius does not correspond with the Golden gate along the earlier city limit of the Constantinian walls as we know them (Mango, 1985). So either the theory is wrong or the location of the walls should be updated. The XIII region as depicted in Buondelmonti's city view (fig. 1, right) shows the walls of Pera built in the XIV century as the continuation in plan of the Theodosian walls. This is not true, you can see the real proportion instead in figure 2. Either this plan is a collage of two different plans to fit the drawing or there is something wrong with the drawing itself. Instead, if we continue the Theodosian walls on the opposite side of the Golden Horn we would obtain a limit corresponding to where Taksim square is today. The XIII region is described in the *Notitia Urbis Constantinopolitana* including: 431 houses, 2 porticoes, 5 private baths, a church, the *thermae*, the forum of Honorius, a theatre and the shipyards. Figure 1 (centre) shows in blue the archaeological evidence of some tombs, and in red the location according to written sources of Greek temples dating to the Megarean phase: the temple of Venus Placide, the temple of Diana Lucifera and the Aianton (Dallegio d'Alessio, 1946). These were compared with the population's distribution according the survey established by the Ottomans after capturing Constantinople, showing the location of the Greek community (Eldem, 1993). This overlaps with the position of the early Megarean monuments. We may therefore assume that *Argyropolis* was established in that area as the first colony.

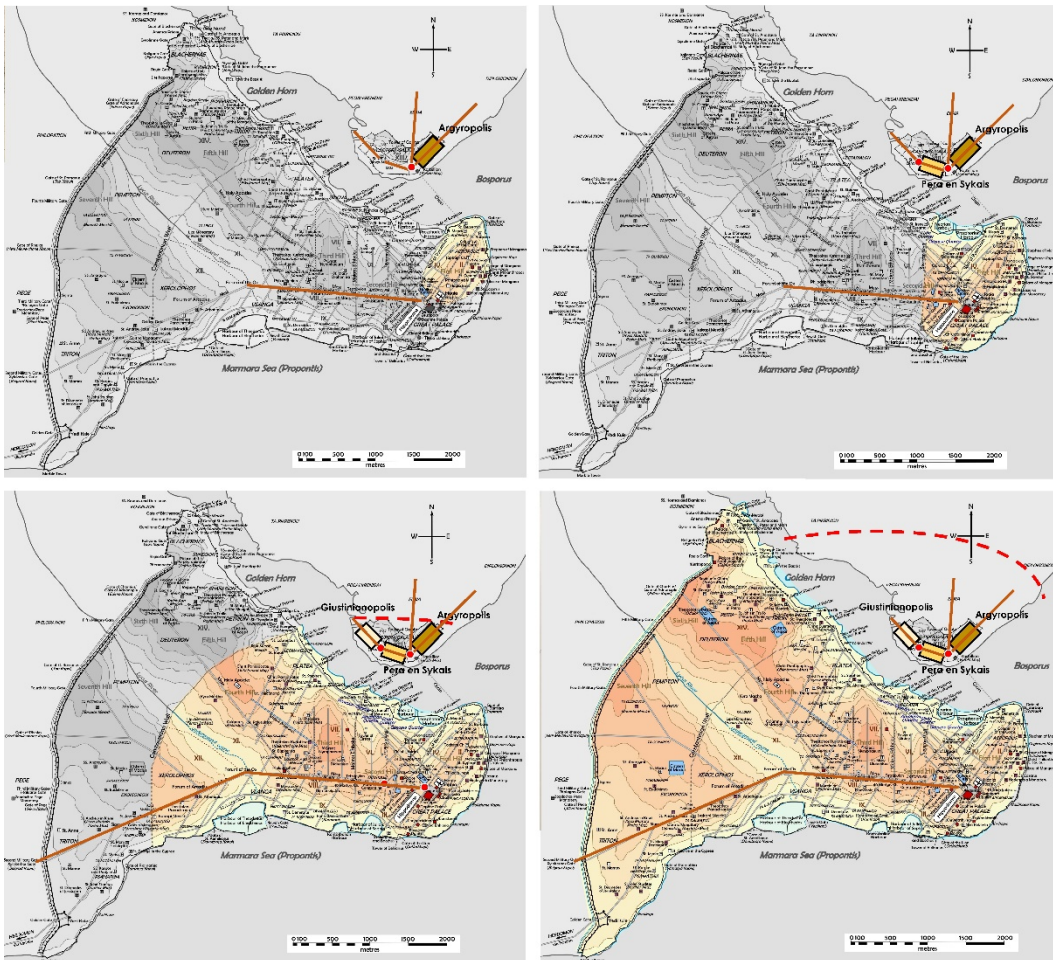


Figure 2. Cyclical inversion of limits and centre, comparing the XIII and XIV regions of Constantinole; upper left: Megarean foundation, VII cent. BC; upper right: Severan expansion, III cent. AD; lower left: Constantinian refoundation 324 AD; lower right: Theodosian walls, 404-413 AD (Author's drawings, 2021, on Constantinople in the Byzantine period (2008) https://en.wikipedia.org/wiki/File:Byzantine_Constantinople-en.png).

The subsequent growth phases of the XIII region, *Justinianopolis*, follows the Byzantium's evolution with the direction of the streets parallel to those on the opposite side of the Golden Horn. Tentatively we reconstructed the evolution of the XIII region in analogy to what is known on the opposite side. The theory of attractors (Camiz, 2018) has been introduced to explain the diachronic evolution of routes, describing how streets change in time according to the attractors deforming their path in time. The description of the XIV region in the *Notitia* gives important morphological indications: "Est vero progressis a porta modicum situ planum, dextro autem latere in clivum surgente usque ad medium fere plateae spatium nimis pronum; unde mare usque mediocris haec, quae civitatis continet partem, explicatur aequalitas", outside of the gate we have a valley, a flat area and on the right side climbing uphill and reaching the top, we can go to all the way to the other side. The position of this gate and of the flat area is not clear not yet, but our reconstruction provided a coherent interpretation for it. The limits of the XIV region have been discussed in the last 400 years, where Du Cange (1826) believed that the XIV, XII and XI were all included in the area between the Theodosian and the Constantinian walls, but more recently Schneider (1950) has clarified that the XIV region corresponded to the entire territory between the two walls.

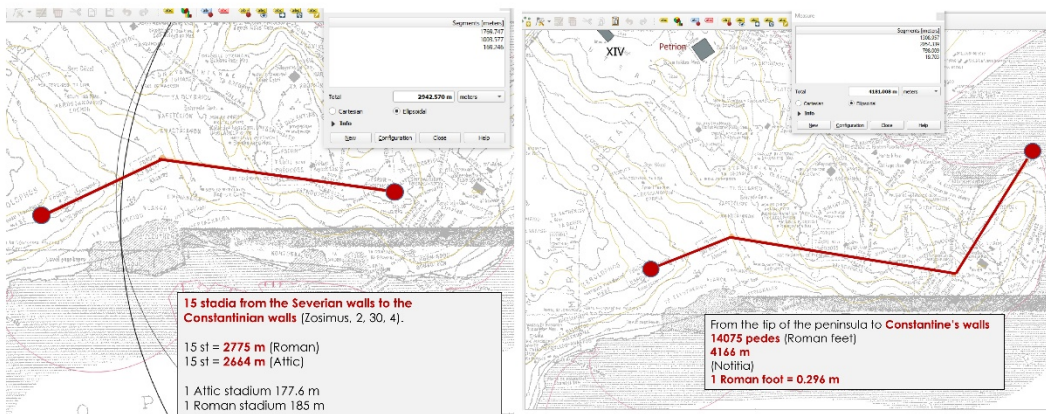


Figure 3. Above left: Distance between the Constantinian and Severian walls (Zosimus); above right: distance between the Constantinian walls and the peninsula's tip (Notitia), QGIS version 2.18.27. Las Palmas de G.C. (Author's drawing, 2021); below: dashed red line outlining the path of Constantine's walls, Valvassori, G.A. (1479-1490) *Byzantium sive Constantineopolis*, detail.

Table 1. Constantine's walls path according to the editions of the *Patria Konstantinopoleos*

	Patria, 995 AD (Preger, 1901)	Patria, Codinus, XIV cent. (Bekker, 1843)
Sea walls north	Tower of Eugenios	Acropolis
	S. Antonios	Tower of s. Eugenios
Sea walls south		Zeugma s. Antonii
	Topoi	A Topis
	S. Mary of the rod	S. Mary of the rod
Land walls	Rod	
	Exakoinion	Hexacionium et miliario
	Old gate of John prodromos	Old gate of John prodromos
	Monastery of Dios	Monastery of Studii
	Monastery of Ikasia	Monastery of Ikasia
	Cistern of Bonos	Ad cisternam Boni
	S. Manuel and Samuel and Ismael	Templum ss. Martyrum Manuel, Sabel et Ismael
	Ta Armatiou (s. Antonios)	Armari (s. Antonios)

In the XIV region according to the *Notitia*, there was a church (*ecclesiam*) a palace, a *nymphaeum*, *thermas*, *theatrum*, *lusorium* (hippodrome) and a bridge, a wooden bridge, plus 11 streets, 167 houses, two porticoes and five baths. The bridge could only have been across the Golden horn, connecting the XIII and XIV region. It is quite evident that the name *pons sublicius* was meant to be the replica of the Roman *pons sublicius*, the earliest bridge of Rom, also a wooden bridge, on which *Horatius Coclidis* defended heroically the city according to *Titus Livius*.

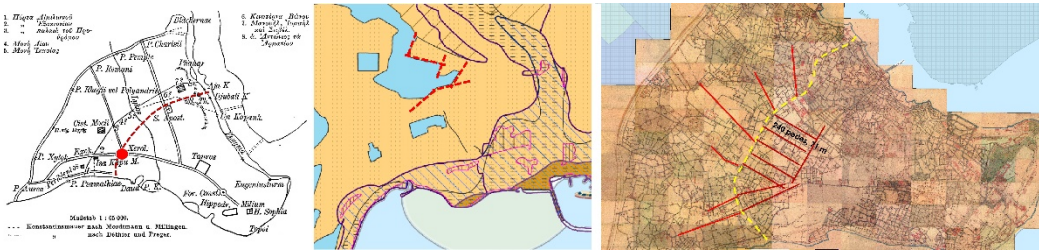


Figure 4. Left: Constantinine's walls (Preger, 1910) in red our proposal including the Golden gate; centre: the rock cuts evidenced (in red), Fener's Geological Map, <https://gis.fatih.bel.tr/webgis>; right: regular grid and organic tissue (in red), the dividing line (in yellow) interpreted as the path of Constantinine's walls (Alman Mavileri, 1913-1914) <https://gis.fatih.bel.tr/webgis/>

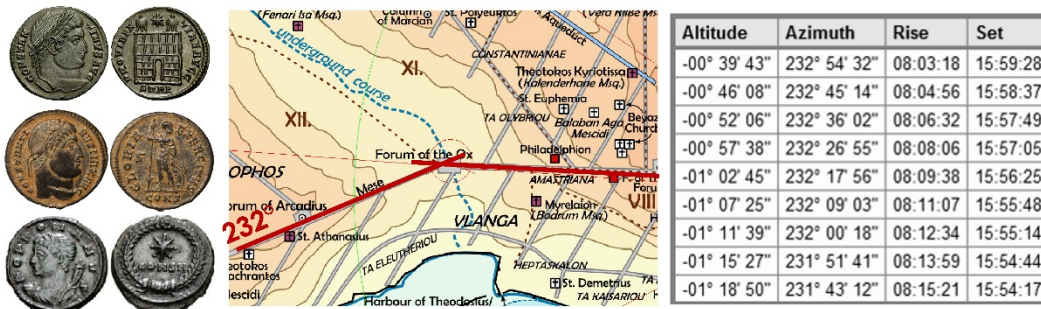


Figure 5. Left: Constantinople foundation coins; centre: the Mese changes direction to 232° after the Forum of the Oxen; right: sun ephemeris on the city's refoundation, 26/11/324 AD, 2nd indiction, 5837, 1, CCLXV Olympiad (Patria) (SkyMap Pro v 9.0.9, Copyright 1992-2002 C. A. Mariott).

The exact location of the Roman bridge is still under discussion, with Tucci (2012) as last proposal, anyhow it was connecting the XIV region *Transtiberim* with the XIII region *Aventinus* of Rome, just like the bridge with the same name in Constantinople was connecting the XIII and XIV region. In 330 AD, following the city refoundation by Constantine, a coin was minted in Constantinople depicting a bridge, which has been interpreted as the Milvian Bridge in Rome. This interpretation is very unlikely because the coin shows a wooden bridge whereas the Milvian Bridge is in masonry. It should be interpreted instead as a bridge in Constantinople, more coherently with the foundation: why depict a building of another city in the time of the transformation of Constantinople into the new capital of the Roman Empire? Analysing the description of Dyonisius of Byzantium (Reitemeier, 1784) it was possible to localise the toponyms mentioned therein along the Golden Horn including a bridge, built by Philippus II in 340 BC. According to the reconstruction of the territorial organism (fig. 1, left) we tentatively placed the bridge along the shortest path across the Golden Horn so to connect the territorial routes from either side. Surprisingly that location found correspondence in the bathymetry of the Golden Horn where you can still recognise underwater the 2 submerged piers, also clearly represented in the coin. Moreover Gyllius described the location of the bridge noting that he could still see the foundations of the piers “ubi prope fundamenta pilarum pontis videtur” (Gyllius, 1611: 10) confirming our interpretation. Constantine the great in 324 AD on November 11th refounded the city with the construction of new walls. Their path is described in the *Patria Constantinopoleos* by listing the buildings along those walls in the X century, some 600 years after the walls were built. None of those buildings existed

at the time of Roman Constantinople, neither the walls existed anymore at that time as they collapsed following the earthquake of 447 AD, and furthermore none of the buildings listed in *Notitia* exist anymore today. In fact the *Patria* is describing the walls according to the topography of the X century, so it is indeed very difficult to locate the line of the walls today. But Valvassori in his perspective drawing illustrates the walls including gates and towers, providing a hint for their position as a continuation of the western edge of the harbour of Theodosius. The buildings mentioned in *Patria* are listed in table 1, and the previous topographical reconstructions of the walls are all based on the *Isa Kapi* mosque (Jesus gate in Turkish) assuming that this place name corresponded with the Golden Gate's position. If the walls and the Golden Gate were located here, it would not correspond with the position of the forum of Arcadius, contradicting the centre limit inversion theory. By analysing quantitative data from the historical sources we could redefine the location of that Gate. Zozimus (2, 40, 4) mentions the distance between the two sets of walls as 15 stadia (fig. 3, upper left) corresponding to the forum of Arcadius. The *Notitia* indicates 14.075 feet from the tip of the peninsula to Constantine's walls, which measured along the *Mese* also corresponds again to the location of the forum of Arcadius (fig. 3, upper right). Furthermore *Patria* describes the foundation of the city including details about the stonecutters cutting out the side of the mountain along the walls, and the geological map shows (in red, fig. 4, centre) some geometrical cuts in the rock corresponding with that description, and their position is again along the path that other sources suggest. Finally the morphological analysis of the street network on the German map of 1913, (fig. 4, right) shows a regular grid on the inside with a typical Roman block measure of 240 feet (71 m), and a very organic pattern on the outside of a dividing line (in yellow) matching the location given by quantitative data.

Conclusions

Following these considerations it was possible to relocate the walls (fig. 6, red line) confirming the centre limit inversion theory: the limit given by the walls became the new centre in the next phase with the forum of Arcadius. This interpretation was confirmed by archaeological findings, recently next the western edge of the harbour of Theodosius archaeologists uncovered the junction between the Constantine walls and the Theodosian walls. On this updated information we based a predictive model for the localisation of the buildings listed in the *Notitia* using an algorithm which would require more space to be described in detail. We localised the buildings listed in *Notitia* (fig. 6, in grey): the church of the forerunner next to the gate of the *prodromos*, the *nymphaeum* and the theatre. For the *palatium* we found 4 possible locations, based on the morphological analysis, the orientation, and the probable connection with the water distribution system. The *lusorium* was localised along the longest straight street in Constantinople, along the bottom of the *Lycus* valley in analogy to the location of the Circus Maximus in Rome. The baths have seven possible locations in relationship with the water distribution system, so their position was not determined with certainty. The *Sigma*, a columned street in the form of the lowercase crescent S in the Greek alphabet which is listed in the *Book of ceremonies*, is clearly still recognisable in the urban tissue. (Berger, 1996).

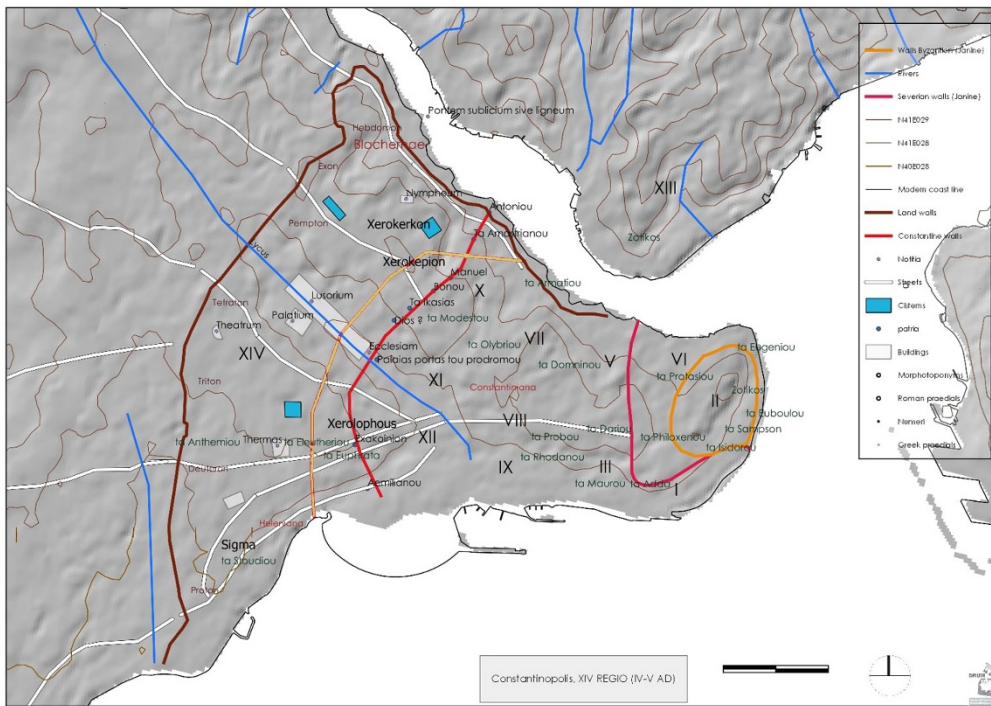


Figure 6. Historical GIS with the indication of the city walls (in red our proposal for Constantine’s walls), the buildings listed in Notitia, the regions, the noumeroi and the praedial toponyms, QGIS version 2.18.27. Las Palmas de G.C. (Author’s drawing, 2021).

Finally by examining Constantine’s urban project we noticed that the orientation of the *Mese*, turning to that direction after the forum of the Oxen, is 232° , corresponding to the sunset on the day of the foundation, 26 November 324 AD. The foundation of the new capital of the empire was done following the Roman pagan tradition or orienting the main street on the sunset of the foundation day. Like in Rome the *via sacra* and the structure of the forum is directed towards the sunset on the foundation day (April 21st, 754 BC) (Camiz, 2004). Therefore the foundation was entirely pagan, in fact at that time Constantine was not a Christian yet, he was baptised on the bed of death. One of the foundation coins (fig. 5, left) shows the Golden Gate with the sun represented above, and another one the Angel planting the spear in the earth. This corresponds with the Patria’s narrative of an Angel indicating in such a way to the emperor the location of the new walls. Finally we know that Justinian, in 537 AD, after conquering Ravenna from the Goths redesigned the city walls following the model of Constantinople. There the 12 *numeroi*, corresponded to 12 groups of soldiers each guarding one section of the walls. Consequently we can assume that the place names *proton*, *deuteron*, *triton*, *tetraton*, *pempton*, *exon* and *hebdmon*, were located accordingly in Constantinople (fig. 6). Using the GIS we located the sequence of the different city limits, the position of the main roads, the bridge, the main buildings, the main gates and a set of praedial place names, *ta rodanou*, *tra probou*, *ta dominiou*, *ta prothasiou*, corresponding to the 12 generals which Constantine brought from Rome and to whom he gave a plot for their *domus* in order to build the new Rome similar to Rome.

Acknowledgements

This paper presents the preliminary results of an ongoing research aimed at the reconstruction of the topography of Byzantine Constantinople, and it was carried out within the premises of the Dynamic Research on Urban Morphology-DRUM Lab at Özyeğin University, Istanbul, Turkey in cooperation with Sercan Sağlam and Özge Özkuvancı.

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ISUF2021

G L A S G O W

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of the

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“Urban Form and the Sustainable and Prosperous City”

29th June - 03rd July 2021 - Glasgow, UK

Edited by

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Foreword

Dear Authors, esteemed Readers,

It is with deep satisfaction that we write this Foreword to the Annual Proceedings of the XXVIII International Seminar on Urban Form held virtually in Glasgow, United Kingdom, between June 29th and July 3rd 2021.

When, at the closing of ISUF2019, the Urban Design Studies Unit at the University of Strathclyde in Glasgow (UK) was announced as the host of the XXVIII International Seminar on Urban Form, the world was indeed very different from what, in just few months, we all came to know, and in ways which, at the time, we could not possibly imagine.

Due to the protracted impact of the Covid-19 pandemic and related restrictions to travel and in-person gathering, we found ourselves to forfeit our plan to host the conference in our beautiful and welcoming Glasgow and, very much like our colleagues in Salt Lake City, to deliver the event as fully online instead. We were truly sorry not to be able share a dram of Single Malt Scotch Whisky, have you taste Scottish haggis neeps and tatties, or take you for a spin at an evening Ceilidh in our Dear Green Place. In addition to this, just few days before the opening of ISUF2021, we were shocked and saddened by the unexpected loss of Emeritus Professor Jeremy Whitehand, founding father of ISUF, leading scholar, inspiring educator, and dear friend to many.

But despite the odds being stuck against us, and while our community is still mourning this great loss, we believe we achieved the feat of delivering a thought-provoking and engaging event, continuing the long and prestigious tradition of the International Seminar on Urban Form, while also doing our best to remember and honour Professor Whitehand as he deserved.

A difficult goal, this one, that we could achieve only thanks to the valuable experience of our colleagues in Salt Lake City, the involvement of a formidable team of colleagues and students who volunteered their time to help through all the phases of this complex event and the guidance of the ISUF Council and, to Jeremy himself who, with his meticulous and impeccable planning, granted all of us a once in a lifetime opportunity to have him at ISUF2021 after all and in many different forms, through the voices of his fellow scholars and, quite extraordinarily, through his own recorded voice.

We were able to reach a wide audience of over 370 delegates presenting and attending from some 52 countries around the world, allowing us to bring urban morphology and its values to new colleagues and friends, as well as to audiences that would not have been able to join us in Glasgow, or that would normally not consider attending a conference. We held a total of 95 sessions - including keynotes, round tables, opening and closing sessions - each moderated by a chair and supported by a host, for over 230 hours of live content. All the sessions were also recorded and made available to conference delegates for a period of 60 days after the conference, allowing people attending from different time-zones to listen to each and every one of them at their own pace. Surely, we missed informal gatherings, tours, meals, and parties but we did our best to give all delegates the best of the Scottish hospitality, through virtual walking tours prepared and delivered by current and former students of the Department of Architecture at the University of Strathclyde and lectures delivered by representatives of the Glasgow City Heritage Trust.

And now, after little over six months from the end of ISUF2021, we are finally able to release to the public the Annual Conference Proceedings of the XXVIII International Seminar on Urban Form: "Urban Form and The Sustainable and Prosperous City" a work curated by Dr Alessandra Feliciotti and Dr Martin Fleischmann. The contributions collated in this edited book illustrate the great variety of research streams investigated within ISUF and represent the heterogeneous geographical distribution of contributions, both telling aspects of this florid and growing interdisciplinary field, characterised by deep solid roots as well as vigorous far-reaching branches.

We believe these Proceedings will provide urban form researchers and practitioners of the world with an excellent reference book on the latest advances in the broad area of urban morphology, stimulate new connections and research partnerships, and be an impetus for further research.

We thank all authors and participants for their contributions.

Dr Alessandra Feliciotti

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Dr Martin Fleischmann

Geographic Data Science Lab

Department of Geography and Planning

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Preface by ISUF2021 chair

The 28th ISUF Conference was organised by the Urban design Studies Unit at the Department of Architecture of the University of Strathclyde in Glasgow, from the 29 of June to the 3rd of July 2021. The weather was excellent in Glasgow in those days, with a daytime high of around 20 degrees Celsius and no rain throughout. Too bad we could not enjoy it, for all the good reasons that travelling had been a question mark all year round and despite all our commitment we just could not take any other decision than going fully online. Which we did, and it was a dizzy jump into the unknown for us all. Things got sorted out, eventually, and in style, thanks to Alessandra and Martin and all our incredible folks here at UDSU, the Department of Architecture and the University at large, ISUF's support and the enthusiastic contributions of splendid guests who committed themselves to enrich the environment of the conference – though virtually – with invaluable and unreplaceable insights of the real place.

We decided to focus on “Urban Form and the Sustainable Prosperous City”. The more we study cities, the more we realise that their form is never neutral. On the contrary, space is active: how it interacts with social, economic, environmental and economic systems, is central to their success. On urban form also depends cities' capacity to be and remain successful and engaging in time. Form is central across all scales of urban systems and we are at a stage in which our capacity to study social, economic and environmental systems can be related to the analysis of urban form like never before. Furthermore, new technologies, as well as new interpretative frameworks that put time and resilience at the heart of cities' life, have grown in clarity and capacity over the past years, helping immensely our understandings of these complexities.

Theories, methods and practices in the study of urban form were explored in the conference, with two special focuses proposed: “The resilient city: ecological perspectives in Urban Morphology” and “Urban Morphology for SDG 11”. Sustainability and resilience are terms often used interchangeably, while they can be regarded as complementary in capturing both normative and descriptive aspects of change. As associated to urban form, these terms are still open avenues of research as well as promising areas of growth in the ability of urban morphology to further inform urban policy and practice.

Urban morphology is an inherently multi-disciplinary field of research, and each of its many convergent strands of knowledge brings its own set of tools and practices. To the foundational backbone of the discipline, still solidly developing around the Conzenian and Muratorian historico-geographical and morpho-typological living traditions, as well as to the more recent space-syntax quantitative-configurational approach, new impulses have been shaping up in the last few years that have conspicuously marked their presence in this 28th edition of the ISUF conference: these are quantitative approaches building on geographic data science, which rely on advanced techniques of data processing to push the boundaries of large-scale analysis to unprecedented levels, and – even more importantly – without compromising the richness of information. Which is fundamental: urban morphology's core-scale, that of the building/plot, street and neighbourhood, requires information at that scale. That is why other quantitative methods that look at the form of the city as a whole, or beyond to the metropolitan or regional forms of urbanisation, have always struggled to fit in, and contribute to, the development of urban morphology. The unprecedented flood of papers in this area of studies characterized the event. They also seemed to seamlessly and even delicately find their own place and meaning in the rich flow of the urban morphology discourse, building on – and making value of – its quantitative side. In fact, “metrology” studies of urban form have always been part of the discipline since its very foundations in the 1960s. This was also the focus of Jeremy's own contribution to the round table at the conference, entitled “Urban Morphometrics in Urban Morphology: Disciplinary Roots and New Perspectives”, where he explored these roots drawing them back to the inter-war period and Herbert Louis' precursory studies at the Geographical Institute in Berlin. A young geography student at that time in Berlin, MRG Conzen was there in attendance before leaving to Britain in 1933. This red thread of urban morphology metrology studies is now quite clearly evolving into novel “morphometric”

methods of reading and understanding urban form, under the impetus of new technologies, processes and large-scale, fine-grained geo-data.

Jeremy would have liked to bring this point of view in person to the round table, with his usual crystalline open mindedness and genuine generosity. We'll miss him dearly.

Prof Sergio Porta

Chair of ISUF2021

Urban Design Studies Unit (UDSU)

Department of Architecture

University of Strathclyde

Preface by ISUF Presidents

Over the last three decades, since ISUF's first meeting in Lausanne in 1994, our knowledge about the physical form of cities has substantially increased. Today, we know more about the different elements of urban form, how these are combined generating different patterns, and how these are shaped by different agents and processes over time. We also have a better understanding of urban form's influence on the social, economic, and environmental dimensions of our cities. Multiple concepts and methods as developed by founding scholars such as M. R. G. Conzen, Jeremy Whitehand, Saverio Muratori and Gianfranco Caniggia have proven to be quite effective in describing and explaining urban form, resulting in their widespread adaptation by urban morphologists today. Examples of these foundational tools for urban studies include town-plan analysis, fringe belts, morphological regions, typological processes, basic and special buildings, poles and nodes, to name just a few. Findings surrounding applications of morphological existing methods coupled with new tools for urban analysis continue to evolve further enriching our interpretations of urban environments. We realize how street systems can influence movement, social interaction, and the location of economic activities. We use new geometries and new mathematical models where agents have a key role and where the different elements of the urban landscape can be transformed into cells, enabling the simulation of alternative scenarios of development.

While the early years of an organization are challenging by nature, for ISUF the last five years brought unprecedented challenges. The organization of our annual conferences was first faced with significant political barriers in a world with so many authoritarian regimes. It is with great sadness and concern that we see Ukraine being invaded by Russian forces at the time of writing this Preface. On the other hand, since early 2020 the Covid-19 pandemic has completely changed our lives. And yet, between 2018 and 2020, Irina Kukina, Nadia Charalambous and Brenda Case Scheer have successfully overcome these tremendous challenges, offering us three enlightening conferences in Krasnoyarsk, Nicosia, and Salt Lake City (online conference). As the pandemic has continued to inhibit in person gatherings and international travel, the organizers of the Glasgow conference have exhibited resilience by offering ISUF's second fully online conference.

One day after the 2021 meeting of the ISUF Council, and two days before the official opening of the Glasgow conference, we were shocked to learn of Jeremy Whitehand's sudden passing. Until the last weeks before the conference, Jeremy was working with us on a Task Force on Teaching Urban Morphology, on two special sessions (on the relation between research and practice, and on quantification in urban morphology) and on a keynote speech for this conference entitled 'The nature of urban morphology' (Whitehand, 2021). Jeremy was central in the creation of ISUF in the mid-1990s, and he has always been at the centre of our organization over the last three decades. He organized two conferences – the first open event in Birmingham, in 1997, and the Newcastle / Glasgow conference, in 2004, together with Michael Barke. For over almost 25 years he has edited with singular rigor the journal 'Urban Morphology'. Jeremy's legacy (see Oliveira, 2019) will always be part of our organization and of our morphological research.

Two generations of notable and committed researchers based at the University of Strathclyde collaborated over the past two years to organize ISUF 2021. They include Sergio Porta, Alessandra Feliciotti, Ombretta Romice and Martin Fleischmann. This book of proceedings, as the conference itself, is framed by the on-going debate about the role of urban form in creating sustainable and prosperous cities. Sergio and his colleagues propose a fourfold structure for debate including four main themes that are fundamental for ISUF and for urban morphology as a field of knowledge. Theory and method are the first and second of this set. Urban morphologists should be able to establish an open, but coherent, body of theories and methods for understanding the structure and functioning of cities. In addressing these two challenges, we must find a common ground, allowing each one of us to learn from each other, while maintaining the specificity of his own work. The third theme is practice. We must continue to search for effective ways of moving from morphological research to practice in planning,

urban design, and architecture. In this task it is not enough for urban morphologists to simply assert their relevance and claim that they could play a part, if only they were asked (Barke, 2021). It is not enough to create single events of interaction; we must create effective processes, involving many moments for researchers to understand and engage into real practice, and for practitioners to be exposed to and get involved in research on streets, plots and buildings, and how these change over time. Finally, the Glasgow team proposes a focus on sustainability. Urban morphologists must be able to show the relevance of urban form to several key aspects of our daily life in cities, and in the design of strategies for adaptation and mitigation.

This book of proceedings is built from the participation of over 350 researchers from more than 50 countries, presenting their work in almost 100 sessions – including keynote, round tables, and opening and closing sessions – representing almost 250 hours of live contents. The publication of this book takes place in between the realization of the Glasgow (June/July 2021) and Lodz/Cracow (September 2022) conferences. We owe a debt of gratitude to Sergio, Alessandra, Ombretta and Martin for their remarkable work. The second conference, led by Anna Agata Kantarek and Malgorzata Hanzl, is expected to bring us back the possibility of meeting face-to-face to restore place-based collaboration, presenting our investigation, establishing and reinforcing research networks, and visiting and exploring the physical fabrics of cities – the privileged object of morphological inquiry.

Prof Vitor Oliveira

President of ISUF

Research Centre for Territory Transports and Environment (CITTA)

Division of Spatial and Environmental Planning

Department of Civil Engineering,

University of Porto

Prof Emerita Wendy McClure

Former president of ISUF

Architecture Program

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University of Idaho

Barke, M. (2021) 'Foreword', in Oliveira, V. (ed.) *Morphological research in planning, urban design and architecture* (Springer, Cham) v-viii.

Oliveira, V. (ed.) (2019) *J.W.R. Whitehand and the historico-geographical approach to urban morphology*, Springer, Cham.

Whitehand, J. W. R. (2021) 'The nature of urban morphology' (prerecorded video), *28th International Seminar on Urban Form*, Glasgow, 29 June – 3 July.

Organization of the Proceedings

The Annual Conference Proceedings of the XXVIII International Seminar on Urban Form: “Urban Form and The Sustainable and Prosperous City” collates 178 papers, and 3 posters and 1 viewpoint. In keeping with the structure implemented during submission, review and presentation of individual contributions, the present book is divided into four main sections: Theory, Methods, Practice and Focus. Within each section, papers were further grouped in a number of themes, as defined below.

Section I, **Theory**, contains contributions deepening our understanding of existing morphological and typo-morphological theories, models and concepts as well as exploring new avenues of knowledge and perspectives from affine disciplines, linking them up to established or original morphological theories. Themes in the theory section include:

- **The epistemology of Urban Morphology:** retracing the evolution of a discipline and charting new research paths.
- **Towards a descriptive science of urban form:** old and new models explaining generative and transformative processes driving complex trajectories of urban evolution.
- **New trans-disciplinary perspectives in urban morphology:** new hybridisations for a holistic understanding of complex city systems.

Section II, **Methods**, looks at existing and innovative tools and procedures for the reading and understanding of urban form and its dynamics, encompassing both qualitative and quantitative approaches. Within the Methods sections, contributions are divided into the following themes:

- **Innovations in qualitative research in Urban Morphology:** methodological perspectives linking to classic Conzenian and Muratorian traditions, with an emphasis on qualitative research methods.
- **Innovations in Urban Morphometrics:** perspectives bringing new quantitative methods into Urban Morphology building on the rise of the digital age, including digital cartography, big data and remote sensing.
- **Engaging with the social, cultural and institutional discourse:** novel and original research methods capturing the interaction of urban form and human life engaging with complementary disciplinary fields.

Section III, **Practice**, looks at urban form as an active player in shaping tomorrow’s cities and at the world of professional practice, policy and education. Contributions within this section address the following themes:

- **Urban Morphology for design, planning and policy:** the practical role of urban form towards the sustainable and resilient, safe and inclusive cities for all.
- **Urban Morphology, Architecture and Heritage:** preservation, reuse, valorisation of built heritage as asset for future prosperity.
- **Teaching Urban Morphology:** methods, experiences and lessons learned to shape the next generation of architects, planners, urban designers and policy makers.

Section IV, **Focus**, reflects on urban morphology in light of emergent global drivers and in relation to the wider debate on Sustainable Development and Climate Change. Contributions within this section revolve around two main topics:

- **The resilient city: ecological perspectives in Urban Morphology:** perspectives and approaches linking urban form to the overall resilience of urban systems.
- **Urban Morphology for SDG 11:** contributions relating urban form to sustainable development goal targets.

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