

MECHANICAL ENGINEERING | PHYSICS |
PRESERVATION OF THE ARCHITECTURAL
HERITAGE | STRUCTURAL, SEISMIC
AND GEOTECHNICAL ENGINEERING |
URBAN PLANNING, DESIGN AND
POLICY | AEROSPACE ENGINEERING |
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ARCHITECTURAL, URBAN AND INTERIOR
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CHEMICAL ENGINEERING | INFORMATION
TECHNOLOGY | MANAGEMENT ENGINEERING
| MATERIALS ENGINEERING | MATHEMATICAL
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Chair:
Prof. Francesca Albani

DOCTORAL PROGRAM IN PRESERVATION OF THE ARCHITECTURAL HERITAGE

The Doctorate Course in Preservation of Built Heritage was first held at Milan-based Politecnico back in 1983.

The PhD program focuses its attention to some currently crucial themes for the preservation, conservation, management and valorization of Architectural Heritage. Starting from the fundamental topics of knowledge, preservation, design and intervention, the PhD program takes care of the most important and urgent problems affecting the Built Heritage and Cultural Landscapes: the fragility of 20th century architecture; the abandonment of historic marginal areas; the climate change and its effects on the built environment; the improper pressure of mass tourism on our historic settlements and sites of cultural interest, the needs for a wider social involvement in the field also through appropriate ICT mediums, the management and the use of architectural Heritage.

The conservation of Built Heritage is, in fact, a strategic field as well as one of the main important resources for worldwide economy and for a sustainable future in different areas of the world.

The team of professors, promoting and participating in the debate about these matters on a national and international scale, will thus deal with a broad range of issues requiring strong and real multi-disciplinary approach.

In addition to the professors of architectural restoration, history of architecture and structural strengthening of the Politecnico di Milano, the Faculty Board includes representatives from other well-known universities and research institutes (Università IUAV, Venezia; Università di Genova; Università degli Studi di Bergamo; ISPC-CNR, ISAC-CNR); they collaborate actively in the teaching and research activities.

The ultimate purpose of the Faculty Board not only resides in broadening the experiences that the PhD candidates acquire over the first three years of the course, where they have the opportunity to interact with scholars from different backgrounds; it chiefly aims at providing the PhD candidates with a unique training experience in the Italian panorama, so far unparalleled also in domains other than the preservation and restoration of the cultural heritage. Such context investigates the synergies and responses to the modern themes of cultural heritage protection.

The PhD programme is meant as the place where theorization, methodology, investigation into the most significant chapters of the protection of historic architectural and cultural heritage are connected to complex, challenging operating research themes, on-site and lab experimentation of analytical and diagnostic stages. The relationship with Italian Ministero della Cultura (MIC) has been definitely fruitful, especially when we consider that many among the best PhDs in Preservation of

Architectural Heritage have been hired as officers and executives to the above ministry.

Teaching aims

The Faculty Board organization allows to investigate and share extremely relevant, up-to-date topics that, architectural heritage being the high spot of research, describe the complex domain of preservation, a strategic field and, at the same time, one of the chief resources of the Italian economy and future. Being a mix of differentiated research, experimentation and operating methods, the PhD programme provides the candidate with a rich and very interesting experience. The on-going contact with the breakthroughs from studies and research carried out in Italian and international contexts and the will to promote joint projects are fostered through expanding the network of relations the university entertain with other universities and research centres in different geographic areas of the world.

In this regard, over the past 5 years the PhD programme in Preservation of the Architectural Heritage has been committed to promoting and coordinating inter-doctoral courses contributed by foreign professors from different European countries.

Coursework

The PhD Programmes and the PhD School activate teaching forms of different kind and credit value, including courses, seminars, project workshops. Teaching activities both cover the basic research issues (problems, theories, methods), which represent the founding element of the PhD programme and clearly identify its cultural position, and deepening in a specialist way some research issues connected with the problems developed in the theses.

Within this plan, different experiences are organized in order to get PhD candidates in touch with study and research developed in Italian and International context.

Visits to important restoration site are organized, such as the ones to the area in the central part of Italy damaged by the earthquakes (Amatrice Accumoli, etc.); to the Procuratie, Rialto Bridge and the Palazzo Vendramin Calergi in Venice; to the Colosseo in Rome under intervention of maintenance (with ISCR, formerly Istituto Centrale del Restauro), to the Sanctuary of Vicoforte (in collaboration with Politecnico di Torino); to the underwater archaeological site in Baia (Napoli) in relation to the ISCR project "Restoring Unerwater". Four workshops organized as interdoctoral program in Sulmona (Italy), in Nicosia (Cyprus), Elbasan (Albania) and Cuba allowed students to gain experience

in national and international contexts with highly topical issues. The second and the third years are aimed at personal study and research for the PhD thesis.

The activities undertaken during the second and third year also include attendance of workshops, seminars, international meetings related to individual research, with great attention to conferences wherein PhD candidates present the results, even partial, of their research theses.

Research organization and topics

Educational activities are related to research either under way or at an early stage of development, some of which addresses major monumental structures and some of the most renowned sites of the world. This aspect increases the technical characteristics and will make PhD immediately competitive at the European level.

To the aim of their thesis research, PhD candidates have the opportunity to rely on facilities and laboratories, both inside and outside the University, the breadth and width of which provides them with a crucial support to the aim of acquiring "competence for highly qualified research activities" in the domain of cultural heritage protection.

In this connection, the PhD programme deems to carry on the long-standing collaboration with the ISPC CNR (the Institute for the Preservation and Enhancement of Cultural Heritage) and new collaboration with ISAC-CNR regarding climate change and Heritage.

As for the thesis research, candidates thus have the opportunity to address and investigate in-depth the wide-ranging themes connected to heritage knowledge and preservation broadly meant, such as advanced methods of investigation.

The multi-disciplinary nature of the doctoral courses, encouraged in the framework of the PhD programme since its establishment, equally values the fundamental contribution of historical research and its methods; at the same time it features innovative, pioneering themes: problems of conservation and reuse of 20th century architecture; impacts of climate change on architectural heritage and cultural landscapes; Inner Areas: census, conservation and re-use of Architectural Heritage; strategic approaches for the preservation; social involvement and Communities engagement in the protection and management of their Heritage; Impact of mass tourism on architectural heritage and cultural landscapes; cultural and sustainable tourism policies and practices; Architectural Heritage at risk in seismic or in conflict areas; Architectural Heritage and Cultural Landscapes in Countries in transition; Cultural Heritage and Economic Evaluation.

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THE CULTURAL HERITAGE IN THE POST-WAR ALEPPO TRANSFORMATIONS: IDENTITY AND FEATURES

Lilas Abdulmawla - Supervisor: Claudio Chesi, Adalberto Del Bo

The city of Aleppo, in northwestern Syria, has been recognised as a UNESCO World Heritage Site since 1986. The violence that raged in Aleppo from 2012 to 2016, as part of Syria's ongoing war that began in 2011, caused significant damage to the city's cultural heritage, destroying the city's urban fabric and built heritage, with far-reaching consequences for the social fabric. The city was added to the World Heritage Sites in Danger list in 2013 due to its war destruction, which was further compounded by a series of seismic events in February 2023, resulting in thousands of deaths and further damage to its built heritage.

The central question driving this thesis is **whether the reconstruction of Aleppo's cultural heritage is a viable possibility**, considering the city's historical context of destruction and reconstruction as one of the main keys of this research. However, the lack of economic possibilities, the post-war situation, sanctions, and the need to meet a "correct" reconstruction approach have made it difficult to retain a clear strategy for reconstruction. Furthermore, international interests are focused on the reconstruction of the city's "symbolic" monuments,

whereas the old city of Aleppo must be recovered as a whole to preserve its living heritage character. Therefore, this dissertation aims to investigate the relationship between the local community and their heritage, particularly in terms of how they dealt with their inherited culture before, during, and after the war. Hence, it elaborates on the question of Aleppo's cultural heritage reconstruction in the aftermath of the war with its numerous complexities. The situation was **further aggravated by the devastating earthquake**, which raised further concerns and challenges regarding the feasibility and capacity for reconstructing the old city and introduced yet another layer of destruction. Thus, the research examines numerous reconstruction efforts carried out by the local community during these various occurrences, analysing, on the one hand, the resilience of the local people and their attachment to their heritage, which also reflects the locals' cultural identities. On the other hand, it examines the conservation of traditional building techniques, addressing the question of the used materials. To achieve these objectives,

this dissertation explores both Arabic sources and Western ones as well. It examines Aleppo's historical narrative, its unique characteristics, and the gradual historical reconstruction process over time. The research took also special advantage from the "bottom-up" approach, which focuses on people's daily lives and their relationship with their cultural heritage, and demonstrates possible approaches based on traditional building techniques and materials. However, this study's real-time 'ongoing' nature is the primary challenge and particularity. As a result, the research relies on gathering data from a variety of sources, both in the field and online. Field visits, such as photographic documentation and expert interviews, highlight the value of traditional sources and oral knowledge in today's context, while social media and virtual information also play an important role in the research. As the extensive use of social media platforms during the Syrian war provided a unique opportunity to learn about the actions taken towards the city's cultural heritage, their "real-time" nature makes them valuable sources of information and serves as primary data. They enable the analysis of case studies

and a more comprehensive understanding of the challenges faced by cultural heritage during and after the war. However, this research represents more than just a collection of materials; it has required a complex process of translating these materials into scientific and critical results. This special complexity has come from the ambitious attempt to perform a scientific investigation into a case characterised by an unfolding event. The lack of written materials in the current situation created a challenge in converting a photographic narrative, expressed with a colloquial spoken language, into a scientific result. The methodology is described through the five chapters of this dissertation. Chapter 1 researches the meaning of heritage in the Arab world, examining its development and the impact of political events and Western influence on its transformation. It examines the cultural identity within the Arab world and the intricate dynamics between heritage, war, and identity. Chapter 2 examines the cultural identity and heritage of the old city of Aleppo between the 19th and 20th centuries. This involves historical research focusing on the city's transformation due to destructive events like earthquakes and fires, exploring the unique characteristics of the old city, as well as the city's historical development after its destruction. It also looks into the 20th-century transformation due to political settings and Western development plans.

Chapter 3 examines the impact of the war (2012-16) and the earthquake (2023) on the city's cultural heritage. It highlights the architectural damage caused by the war, and preservation efforts made by the local community between 2013 and 2014 to protect it. The community's resilience from 2017 to 2022 is also discussed, covering various initiatives for debris cleaning and emphasising the importance of traditional knowledge in recovering cultural heritage; it also explores the relationship between social initiatives and trauma experienced during both the war and the earthquake. Chapter 4, researches the architectural identity of Aleppo, researching its distinctiveness and unique characteristics. It explores the city's structural materials and elements and involves an examination of various preservation methods used before the war from 2006 to 2011. Finally, chapter 5 delves into the complex post-war reconstruction of Aleppo's cultural heritage. It involves the selection of case studies from the damage assessment phase and reconstruction works from 2018 to 2022. It further discusses the challenges in reconstructing Aleppo's cultural heritage, emphasising the importance of cultural continuity as a fundamental element in revitalising the Old City of Aleppo. The case studies selection were guided by various architectural elements that define the architecture of the city. Moreover, it highlights the constructive

material selection and the preservation of the traditional building techniques presented by the presence of skilled workers who are aware of the traditional knowledge, and yet the incorporation of modern materials in the process of reconstruction and consolidation. Thus, the thesis's general feature derives from its multidisciplinary approach that focuses on the city's cultural heritage and identity, examining its architectural language, characteristics and transformations. It examines the city's transformation during and after the war, considering various initiatives and interventions to protect and reconstruct the cultural heritage. Thus, it marks a critical initial step in documenting and reconstructing both past and recent history, particularly regarding post-war reconstruction and recovery methods. Notably, it uncovers previously obscure or less-known information, especially from Arabic texts and direct testimonies that aim to enrich historical and cultural knowledge. In addition to the scientific dimension, researching this topic involves a personal dimension rooted in my experience with the war. This personal involvement can also influence the perspective of the research. All this allowed me to validate various pieces of research and events that occurred during that period with my own lived experiences.

ASTRONOMY AND FENG SHUI IN MING URBAN PLANNING KEYS TO THE INTERPRETATION AND PRESERVATION OF ANCIENT CHINESE CITIES

Norma Camilla Baratta - Supervisors: Maria Cristina Giambruno, Giulio Magli

Chinese cities have undergone significant transformations since the late twentieth century, characterized by reconstructions of historic city centers and urban expansion into rural regions. Within this context, understanding the characteristics and themes of ancient Chinese urban planning is crucial for the preservation of historic cities. This interdisciplinary thesis investigates the roles of two key elements in traditional planning, astronomy, and feng shui, aiming to provide a new interpretation and perspective for the conservation of historic cities.

In the Chinese context, distinguishing between natural, rural, and urban landscapes is intricate, as all contribute to shaping a comprehensive "cultural" landscape. The research seeks to deepen our understanding of this landscape, offering a novel cognitive tool to address planning and conservation issues with heightened awareness.

The thesis contextualizes the interplay between astronomy and *feng shui* in imperial Chinese culture, where they symbolize and validate imperial power. It explores the evolving connection

between imperial authority and these symbolic references, which have influenced the design of entire cities over time. In this complex framework, Archaeoastronomy serves as a guide, providing a method for investigating ancient planning and the historical and cultural significance of the terrestrial and celestial landscape. The study focuses on the Ming dynasty, with particular attention to capital cities as the epitome of imperial power and prefectural cities with political/administrative roles. Cognitive archaeology tools, remote sensing techniques, and statistical analyses are employed to examine site geomorphology,

layout, orientation, horizons, and other aspects of ancient planning. Two case studies (Fengyang and Guide Fu) are examined to deepen the understanding of conservation and urban development themes.

Therefore, this thesis has a twofold aim: to investigate the influence of astronomy and traditional Chinese landscape doctrine (*feng shui*) on the design of ancient Chinese imperial cities and to offer valuable insights for the protection and preservation of these historical cities. It can provide a new, scientifically analytical perspective on the roles played by celestial and

terrestrial landscapes in Ming urban planning, advocating for more informed strategies in urban management and exploring the potential role of Archaeoastronomy in guiding conservation efforts amidst rapid urban changes.



Fig. 1 - Mingzhong Meridian Gate from the southern square, in Fengyang County, Anhui Province. The central arch of the gate frames the Phoenix hill. (By the author)



Fig. 2 - View of the central axis of Guide Fu from the top of the Meridian Gate, in Shangqiu, Henan Province. (By the author)

ARCHEOSEISMOLOGY OF ARCHITECTURE AND SEISMIC PREVENTION: POSSIBLE CONTRIBUTIONS IN LIGHT OF SELECTED CASE STUDIES IN THE VENETO REGION

Margherita Ganz – Supervisor: Francesco Doglioni

Co-Supervisor: Giulio Mirabella Roberti

What are the possible contributions of archaeoseismological research to architecture? What role can the archaeoseismology of architecture play in the protection and conservation of architectural heritage in seismic zones? This dissertation attempts to answer these questions. Archaeoseismology of architecture examines past earthquakes through the study of architectural sources, based on the assumption that heritage building in a seismic zone can narrate its own history through its architectural transformations. While the main goal is very ambitious and challenging, the final result can be obtained through a careful and thorough evaluation of the architectural artefact and its state of damage. This process provides valuable information about the actual vulnerability of the objects being studied. Thus, an attempt will be made to provide an overview of the intermediate goals that can be reasonably achieved through these studies and identify their limitations. To this end, a comparative analysis of archaeoseismological evidence from eastern Veneto will be presented and discussed.

The dissertation is divided into two parts, each consisting of two chapters. The first part explores the framework of archaeoseismology as a discipline, which focuses on the study of past earthquakes, and examines how archaeoseismology fits within the architectural field. The second part focuses on the archaeoseismological analysis of four case studies, the comparison of individual cases, and the interpretation of the results.

The first chapter presents the study of past earthquakes, primarily investigated through four disciplines: historical seismology, instrumental seismology, earthquake geology, and archaeoseismology. Special emphasis is placed on the latter, as architectural archaeoseismology originates from it and partially shares its methods and tools. In particular, the main archaeoseismological projects developed in Europe over the past fifteen years are reviewed. The second chapter describes archaeoseismology in the architectural field, tracing its development through significant case studies, as well as discussing its methodology and tools. One of the main challenges of this emerging discipline is the

lack of a shared methodology. Therefore, different approaches will be presented to highlight the variety of possible results.

The third chapter first introduces the study context, focusing on the seismic-tectonic situation of Eastern Veneto and the reference earthquake: the January 25, 1348 Eastern Alps earthquake, considered one of the most powerful earthquakes in Central Europe. This is followed by an in-depth archaeoseismological analysis of four case studies: the medieval bell towers of Venice, the bell tower of San Nicolò in Treviso, the ancient staircase towers of Santi Vittore and Corona's shrine in Feltre, and the bell tower of the Abbey of Santa Maria in Follina. These case studies were selected due



Fig. 1 - Saints Vittore and Corona's shrine: the structural intervention counteracts the out-of-plane rotation of the south façade of the transept without compromising the readability of the seismic damage.

to their significant geographical distribution, forming an ideal line that intersects the main seismic hazard zones of the study area. They also share important historical, cultural, and architectural-constructional similarities, as they are all tower structures built between the 12th and 14th centuries within the Venetian sphere of influence, sharing construction techniques, materials, and historical-political events. Furthermore, all the architectural sites have been extensively studied, allowing the research to focus exclusively on archaeoseismological aspects, specifically: identifying and classifying seismic damage observed in the structures, assessing the seismic vulnerability of the analysed complexes, understanding the geological context of the architectural sites, and comparing findings with known historical seismic records. These four parameters were systematically analysed to identify similarities and differences among the case studies.

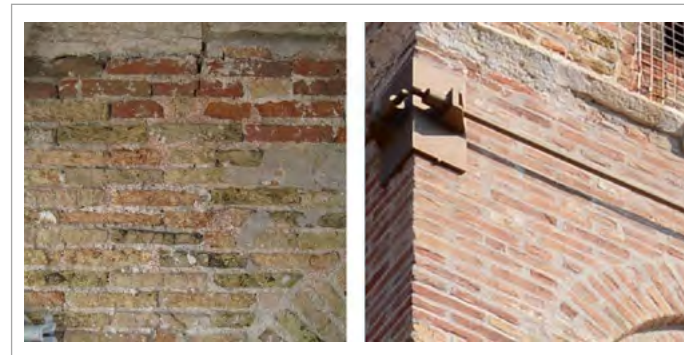


Fig. 2 - South front of the bell tower of Sant'Aponal before (on the left) and after (on the right) the restoration work. The ancient restoration in *cocciopesto* mortar, which sealed a previous seismic damage, has been removed by the latest intervention.

The comparison of archaeoseismological parameters reveals that the cases of the medieval bell towers of Venice and the bell tower of San Nicolò in Treviso are consistent both with each other and with the historical and seismic context. In fact, the extent of damage in these structures aligns with their vulnerability, the seismic hazard of their locations, and, to some extent, with known historical seismic sources. Conversely, the ancient staircase towers of the Sanctuary of Santi Vittore and Corona in Feltre and the bell tower of the Abbey of Santa Maria in Follina deviate—excessively in the former case and insufficiently in the latter—from the general framework. The ancient seismic damages observed in the staircase towers of the Sanctuary appear significantly more severe than those of Venice and Treviso and do not correspond to the low vulnerability of the structure or to available historical seismic sources. Meanwhile, the bell tower of the Abbey of Santa Maria in Follina exhibits a complete absence of seismic effects on its

shaft, despite its high structural vulnerability in a seismogenic zone.

In the fourth and final chapter, based on the results obtained, the possible contributions of archaeoseismology in reducing the vulnerability of architectural heritage in seismic zones, its conservation, and the assessment of site-specific seismic hazards are analysed. Despite some methodological limitations, particularly concerning the recognition and dating of damages, the insights gained on architectural structures in seismic zones for conservation purposes are highly promising. Additionally, a shared methodology supported by other scientific fields could lead to unprecedented contributions to seismic hazard assessment. One key issue that emerges throughout the discussion is the importance of preserving seismic damage as a source of seismic information. This introduces a new paradigm for conservation architects: restoration projects should aim to mitigate the structural vulnerabilities caused by seismic damage while preserving archaeoseismological evidence, ensuring its readability for future studies.

THE ARCHITECTURE OF KINDERGARTENS IN THE 1920S AND 1930S IN THE PROVINCE OF COMO AND THE CASE OF THE TERRAGNI KINDERGARTEN, BETWEEN REQUESTS FOR PRESERVATION AND PERSPECTIVES OF USE

Anna Greppi – Supervisor: Carolina Di Biase

The research originates from the questions concerning the famous Sant'Elia Kindergarten, designed and built in the 1930s by Giuseppe Terragni, internationally recognised as icon of modern architecture, listed since 1991. In recent years, doubts about its maintenance of function and the latest proposals for intervention have put its future at risk. This architecture has come down to the present day maintaining the function for which it was conceived, after multiple interventions over time that have changed its material and, in part, formal components. This research examines a panorama of constructions built as kindergartens in the historical period between 1923, when the Gentile Reform recognised them as part of the "preparatory grade" in the "elementary education" of the Italian school, and 1939, when the regime's policies led to the enactment of the School Charter by Giuseppe Bottai. The cultural, regulatory and pedagogical related to school building from its origins provides a better understanding of the recurring themes characterising these architectures in the national context, the innovative aspects, the rootedness of model examples and consolidated references for their design.

The slow transition in the conception of the purpose of the kindergarten, from the original welfare nature to recognition as part of school education, is decisive. The kindergarten takes on and changes characteristics, depending on the architectural language chosen, the evolution of hygiene issues, educational principles and methods. The comparison with European architectural culture in the field of kindergartens shows the relationships and recurrences between the different expressions. This is particularly significant for the realisations taken as reference by the authors of the projects, whose research also looks beyond national boundaries, as in the case of Terragni and, more generally, the exponents of Rationalism. Manuals, architectural magazines and exhibitions attest to a wide diffusion of the typological theme in the international territory. In the same years, the Italian situation is determined by the ongoing policy that influences publications; the growing number of structures used as kindergartens is emphasised from a quantitative point of view. The research field is focused on the geo-cultural context of the province of Como to be able to analyze a significant panorama

of realizations: in terms of the number of cases (29 buildings), the heterogeneity of the architectural characteristics, and because it reflects the prevailing condition in many areas of Italy. This is the area geographically closest to the Sant'Elia kindergarten. At the same time, for the most cases, it is the territory conceptually furthest from the rational architecture close to Giuseppe Terragni. The research is based on consultation of numerous municipal, parish, kindergarten, association, professional, university and local authority archives, as well as the superintendencies. The archival documents are mostly 'first-hand' and have made it possible to learn and analyze the unpublished history of the design and construction of each



Fig. 1 - Asilo Sant'Elia Kindergarten. The recreation hall before its closure in 2019 (Photo A. Greppi, 27 marzo 2019) Gjirakastër (Pompejano, 2015)

of these architectures. The capillary survey is elaborated by considering the question of authorship – expressions of Larian Rationalism and kindergartens by 20th-century Milanese architects, permanence of the historicist tradition and architectures "without architects" –, building and formal characteristics, and design references. In this network of buildings with very different characters, most of the realizations are still based on traditional building references and typological models already widely used in the first decades of the 20th century. The innovative examples, which are much uncommon, are based on the authors' design research, combining the architectural vocabulary with the specific typological requirements. This is the context for the Sant'Elia kindergarten: the design and construction history has been extensively researched and has been the subject of a vast international literature. However, a re-reading of the archival documents, extending beyond the design phases, to the construction site and the subsequent decades of the building's life, right up to the present day, has made it possible to highlight the extent to which the complex construction phases constitute the premise for the problems of the building and its fate. The parallel between the evolution of the critical fortune and the vicissitudes of the successive restoration campaigns – works of different conception, methodology and

results – in relation to the cultural references, disciplinary evolution, and the protective action exercised since 1991, allows us to understand the repercussions on this architecture and the possibilities for its use. The open questions concerning the architectural heritage of the kindergartens built in the 1920s and 1930s are confronted today with the current conditions of the buildings and their use. The research on the building practices following construction is related to the results of the surveys carried out to verify the actual state of the external and internal spaces of these buildings. This made it possible to identify, understand and built a framework of permanence and mutations, highlighting recurring problems. All these buildings have undergone small and/or extensive modifications, additions and replacements. These works have transformed them over time, the traces of which are more or less easily identifiable today. However, the permanence of the same function has involved numerous building interventions over time, implemented because of changed pedagogical, regulatory, comfort and capacity requirements. Many buildings are still used today as pre-schools, even among those built and/or transformed with projects of a modest scale and character from an architectural point of view and less up to date with respect to the needs of the typology. The future use perspective of the Sant'Elia kindergarten takes on a particular significance if considering its special architectural

characteristics, which in the field of children's realizations have always distinguished it as an extraordinary innovative example, and which are still relevant with respect to the most up-to-date guidelines for the 'School of the Future' drawn up for the National Recovery and Resilience Plan. Today the continuity of use of these kindergartens suggests the same perspective for the Sant'Elia kindergarten; in the future the destiny of this architecture and the methods of intervention may be a useful example for the others. An interesting perspective can be identified for this architecture: integrating the cultural dimension into the day-to-day activity of the kindergarten. The preservation of the original function is further strengthened by the guarantee that this cultural asset is also enjoyed by the community that recognizes its value.

THE ISMEO LEGACY IN ISFAHAN: REFLECTING ON IRAN'S ARCHITECTURAL RESTORATION CULTURE

Panteha Karimi – Supervisor: Maurizio Boriani

This PhD research investigates the legacy of the *Istituto per il Medio ed Estremo Oriente* (ISMEO) in Iran, particularly focusing on its influence on architectural restoration methodologies and practices in the city of Isfahan. The study critically examines the transformative phase in Iran's restoration history when traditional repair and reconstruction techniques evolved towards modern, conservation-oriented principles. ISMEO initiated its engagement with Iran in 1958 through archaeological research activities in the Sistan province, following a cultural collaboration agreement signed between Mohammad Reza Shah and the Italian government. Prompted by strengthened diplomatic relations and successful outcomes of initial projects, in 1964 ISMEO was entrusted with the architectural restoration of significant historical sites, notably the ruins of ancient Persepolis—capital of the Achaemenid Empire (8th–7th century BCE to 330 BCE)—and key monuments in Isfahan, a city recognized as the apex of Islamic art in Iran and historically significant as the capital of the Safavid dynasty (1502–1736). Under the leadership of Professor Guglielmo De Angelis d'Ossat, head of ISMEO's Restoration

Center, a distinguished Italian team—including experts such as Giuseppe Zander, Eugenio Galdieri, Ann-Britt and Giuseppe Tilia, and Paolo Mora—carried out extensive restoration work in Iran for fifteen years. The presence of ISMEO represented a crucial component within a broader panorama of transformations in Iranian heritage conservation, aimed at establishing a centralized institution dedicated to the preservation of architectural and archaeological monuments. Indeed, in 1965, the National Organization for the Conservation of Iran's Historic Monuments (NOCHMI) was founded with the goal of creating a network of regional offices and experts capable of operating according to international standards under the

supervision of a central authority. From 1964 to 1979, ISMEO served as a consultant and collaborator with NOCHMI through restoration projects carried out at the renowned archaeological site of Persepolis and significant civil and religious monuments, such as the Safavid palaces and the Jameh Mosque in Isfahan. Alongside these interventions, ISMEO conducted extensive training programs for local technicians and wide-ranging research campaigns. This research specifically emphasizes ISMEO's activities in Isfahan, guided by two main considerations. Firstly, the Italian Committee of ISMEO, in collaboration with specialists from the *Istituto Centrale del Restauro*, undertook varied restoration interventions encompassing



Fig. 1- From left to right, De Angelis d'Ossat, Giuseppe Zander and Giuseppe Tucci at the exhibition of ISMEO's works in Iran at the Sapienza University, 1974. (source: Galdieri Archive, Folder, F.94)

structural consolidation, pictorial restoration, urban restoration, and archaeological as well as architectural studies. This multifaceted approach provides a distinctive lens through which to critically analyze the evolution of restoration methodologies as practiced by the Italian Committee of ISMEO.

Secondly, Isfahan presented a unique and rich architectural context prior to ISMEO's arrival, possessing an established tradition of skilled master builders and traditional architects operating at a national level. This existing expertise provided a receptive environment for ISMEO's work, facilitating meaningful collaboration between Italian specialists and local professionals, thus solidifying Isfahan's role as a prominent center for architectural restoration in Iran.

The dissertation draws primarily from two fundamental archival sources: the Eugenio Galdieri Archive, housed in the Central State Archive in Rome, and the ICHHTO Archive at the headquarters of the Iranian organization responsible for cultural heritage preservation. Complemented by extensive bibliographic research, detailed field surveys conducted in Isfahan, and in-depth interviews with Italian and Iranian collaborators involved in ISMEO's projects, these archival resources have provided comprehensive insights and formed a solid foundation for the critical analysis of the restoration methodologies employed. Despite the evident need in Iran for theoretical and practical advancements tailored

specifically to local historical, architectural, and environmental contexts, a considerable gap remains regarding the systematic documentation and critical evaluation of past restoration efforts. The period between 1965 and 1979, notably critical in the evolution of restoration practices in Iran, remains underexplored in the existing academic literature, which primarily focuses on cultural policies and institutional developments rather than the practical methodologies employed. Thus, this research aims precisely to address this gap by providing detailed documentation, comprehensive analysis, and a critical reassessment of ISMEO's interventions in Isfahan. The dissertation is structured into six chapters, each carefully designed to address specific themes and critical aspects of the study, enabling readers to gradually immerse themselves in the content. Below is an overview of how each chapter contributes to the broader context of the research, highlighting the main topics: Chapters 1 and 2 establish the historical backdrop by exploring the evolution of archaeology and heritage preservation in Iran, emphasizing the influential role of Western scholars from the late nineteenth to mid-twentieth centuries. These chapters outline the cultural policies and legislative frameworks that shaped national heritage conservation practices. Chapter 3 addresses the institutional origins and development of ISMEO, highlighting the visionary

leadership and foundational role of Giuseppe Tucci. The analysis includes a detailed review of the institute's influential journal, "East and West," summarizing its extensive archaeological and restoration projects across Iran. Chapter 4 offers an in-depth exploration of ISMEO's restoration efforts in Isfahan, providing detailed case studies of interventions on key monuments. The methodologies and practices employed are meticulously reconstructed using primary archival sources and published scholarly works. Chapter 5 pays homage to Eugenio Galdieri, a central figure whose personal archive, housed at the Central State Archive in Rome, offers rich and compelling insights into his professional life and profound respect for Iranian culture. Analyzing his correspondence, manuscripts, publications, and personal notes reveals his enduring legacy as a leading scholar and restorer. Finally, Chapter 6 places ISMEO's activities within a broader theoretical and practical context, integrating perspectives from the "Roman School of Restoration" and critically evaluating structural consolidation, architectural restoration, and decorative surface conservation. This chapter also incorporates comparative case studies of Iranian restoration practices, illuminating the interplay and adaptation of Italian methodologies within the Iranian context.

NAVIGATING LIVING HERITAGE WITH SOCIO-RELIGIOUS VALUES AND CONSERVATION PARADOXES: CASE OF LEH OLD TOWN

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This thesis contributes to advancing knowledge in understanding the dynamics of living heritage sites with their associated socio-religious values and, most importantly, their importance in planning conservation strategies. It focuses on ideologies stemming from the 'Living Heritage Approach' (Poulios, 2014a; Wijesuriya, 2015a, 2015b) to better understand and put conservation models in the context of their local socio-religious heritage values rather than discussing generic strategies. By doing so, it also highlights different perspectives on conserving religious heritage that have a common aim- to protect heritage values, both tangible and intangible. The following research explicitly explores and employs this approach to discuss the current conservation discourse of Leh Old Town, a historic urban landscape in the Northern Indian region of Ladakh that not only possesses a 'living' built heritage with rich socio-religious values but also has a fascinating yet complicated take on its conservation framework. At present, the old town lacks in crucial areas of conservation, as there has not been and still is no dedicated government

department or council and no formation of a conservation management plan and strategy for the town. Moreover, the so-called government-led 'vision documents and statements' of the past, which were prepared for the town's heritage protection, lack proper acknowledgement of the role of religious heritage and associated values. This provides an opportunity for this research to identify and analyse the gaps in conservation strategy and potentially open a dialogue among the local communities and experts by cohesively addressing these issues. For this, the thesis first discusses the current condition and vulnerabilities of (Buddhist) living heritage sites in the Ladakh region as well as Leh Old Town. It then further explores how and why their socio-religious values affect the built heritage conservation of the town while critically analysing the past, present, and future conservation discourse within that scope. The research later suggests a few strategies using a mixed-methods approach that could acknowledge and help preserve the built heritage with socio-religious associated values. Instead of

focusing on meeting generalised international standards of protection, it attempts to promote an alignment of material and immaterial heritage values that is suitable for the town's conservation context.

FOR A DYNAMIC CONSERVATION OF THE RURAL CULTURAL LANDSCAPE. CRITERIA FOR MONITORING THE EFFECTIVENESS OF PROTECTION AND MANAGEMENT PLANS IN THE ASIAN CONTEXT

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In recent years, the proliferation of “fake” ancient architecture has emerged as a significant trend across China. This trend encompasses the construction of replicas of iconic historical buildings, newly built districts that emulate ancient styles, and the reconstruction of significant historical sites. While China possesses a rich array of tangible and intangible cultural heritage, the widespread replacement of genuine historical structures with counterfeit ones raises concerns about the preservation of authentic architectural heritage. This study seeks to explore the driving factors behind this phenomenon, analyze its implications, and propose strategies.

Employing a mixed-methods approach, the research begins with the establishment of a comprehensive database documenting “fake” ancient buildings across China, detailing each structure’s location, construction date, and architectural style. This data serves as the foundation for systematic analysis, yielding the subsequent results:

1. Construction Era and Distribution

The “pseudo-antique architecture” samples, which have been extensively discussed by Chinese scholars and the public, were predominantly constructed

between 1980 and 2016. The growth trend initiated in the 1970s, reaching its peak in the 2010s. These samples exhibit a wide distribution, being present in various provinces and autonomous regions across China, with the exception of Xinjiang, Tibet, Qinghai.

2. Appearance Characteristics

All of the samples encompass newly constructed architectural structures that induce a perceptual “illusion” of antique buildings or architectural elements. The primary imitated objects are buildings from the Tang, Song, and Ming-Qing dynastic periods. The “antique-style” appearance of such structures generally aligns with the intended expression of cultural information, whether to commemorate historical figures or to present the historical characteristics of a specific place or period. However, the accuracy of their expression is subject to discussion.

3. Different Construction Motivation

The project objectives primarily fall into three categories: first, the preservation of architectural heritage through activities such as restoration and reconstruction; second, development initiatives, including the creation of tourist attractions and commercial streets; and third, the enhancement of the existing environment, encompassing projects such as the revitalization of old cities

and landscape construction. Since the 1990s, there has been a significant increase in projects with development-oriented purposes.

4. Design and Intervention

Characteristics of Protection Driven Projects

In the database, there are the 18 samples with the objective of architectural heritage preservation. Four samples have no existing site, involving the relocation of historical buildings from other locations. While this approach preserves historical architectural elements and enhances the historical ambiance of the “ancient town,” the lack of clarification may lead visitors to mistakenly believe these structures were originally present. The buildings have been rebuilt in various historical styles throughout different dynasties, inheriting names and culture rather than merely the physical structures. Almost all historical remnants in these 18 samples have been (partially) dismantled, replaced, or covered by new components, making it challenging to sense the historical atmosphere.

In-depth case study focus on Langzhong Ancient City, utilizing judgmental sampling to unravel the processes and decisions involved in 4 projects, “Langzhong Confucius Temple”, “Chuan Bei Dao Shu”, “City Gates and City Walls” and “Fire God

Building”. The study identifies key factors contributing to the rise of counterfeit architecture, including cultural, ideological, developmental, and policy-related dimensions, and constructs a multidimensional framework to interpret these dynamics:

- 1) The Influence Of Traditional Chinese Thought
The traditional Chinese philosophies which pursue practicability, influenced by Taoism, Buddhism, and Confucianism has provided space for the growth of “fake” ancient buildings in the modern sense.
- 2) Economic Influence
Among the collected cases of “fake” ancient buildings, a substantial proportion demonstrates underlying motivations rooted in land development or the promotion of tourism. After analyzing the development context of China’s real estate and tourism industries, we find the synchronization between “fake ancient buildings” and economic development, and it is confirmed in the four research cases of Langzhong Ancient City.
- 3) Culture Development Policy Influence
In certain sense, these architectures are supported by a series of Chinese cultural development policies, such as “Report of the Ministry of Culture on Several Economic Undertakings”(1990), “Cultural Industry Revitalization Plan” (2009), “Guiding Opinions on Financial Support for the Revitalization, Development

- and Prosperity of the Cultural Industry”(2010), “Notice on Further Improving the Overall Protection and Utilization of Traditional Villages Concentrated by National Cultural Relics Protection Units and Provincial Cultural Relics Protection Units.” (2014), “National Thirteenth Five-Year Plan for Cultural Heritage Protection and Public Cultural Services Science and Technology Innovation Plan” (2016).
- 4) Chinese Historical Architecture Restoration Technology
China’s traditional building restoration methods often favor “updating” structures, resulting in a certain loss of historical texture in old houses. Over time, this approach of replacing the “old” with the “new” in traditional building protection technology can lead to the creation of “fake” ancient buildings, subject to criticism—especially when design solutions lacking scrutiny are incorporated.

The research concludes with a few trend predictions and strategic recommendations to enhance the protection of China’s authentic architectural heritage and outlines potential areas for future research. “Preserving ‘true’ historical architectural heritage against ‘fake’ ancient buildings” is a dynamic issue. During the research the context in China kept changing. The development of historical architecture valorization and protection will be probably still tough: Firstly, continuation of conservation-focused reconstructions expected;

advancements in research and preservation techniques might reduce full reconstructions, but regional disparities persist. Secondly, the expected effective suppression of low-quality, large-scale imitation projects due to financial challenges in real estate and local debt issues; focus may shift towards upgrading historical urban areas with attention to regional characteristics. Thirdly, projects might adhere more closely to traditional construction norms or take innovative approaches; clear documentation or “fashionable” designs could avoid historical confusion. Lastly, digital technologies like AI and VR could enhance non-material cultural preservation and data management for historical sites, with applications in digital restoration, gaming, and real-time protection of historical areas.

In the future, if related professional education, archives and document management could be improved, it will contribute architectural heritage preservation. Diversifying funding sources and clarifying related requirements and regulations could also help improve the situation.

This work not only contributes valuable insights into the “fake” ancient buildings phenomenon but also informs broader discussions on cultural heritage preservation, both in China and internationally, particularly in regions navigating similar challenges at the intersection of heritage conservation and economic development.