



BOOK OF ABSTRACTS

23rd MARCH | SESSION 1 | ROOM A
CHAIR: LAMIA HADDA

Le vestigia della Grande Guerra: il contributo della manualistica militare per il riconoscimento delle caratteristiche costruttive delle permanenze

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Abstract

The militarization projects of the territories drawn up from the mid-nineteenth century in anticipation of the Great War initiated an important moment of deep development and modernization of fortification construction techniques, especially concerning the need to identify new construction and structural methods capable of adequately responding to the rapid evolution of artillery. The remains of *vestigia* that persist in contemporary landscapes represent the material evidence of these experiments, but their state of neglect and degradation often makes it difficult to recognize them and to understand their related construction/structural typologies, compromising their chances of preservation and future enhancement. To facilitate the understanding of this heritage, the study of the Fortification Manuals and the elaboration of specific 'abacuses of comparison' can help to build a broad and documented knowledge base as a support for the recognition of specific technical and structural features even in fragments of isolated vestiges within the current pluri-stratified landscapes, in perspective of their cure and enhancement.

Keywords: Great War vestiges, military manuals, special concrete, comparison abacuses.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

23rd MARCH | SESSION 1 | ROOM A
CHAIR: LAMIA HADDA

Lo scenario difensivo umbro-marchigiano nel primo Seicento: note dalla relazione dell'ingegnere militare Giulio Buratti a papa Urbano VIII

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Abstract

The central government of the Papal State and the administrations of its peripheral communities have paid constant attention to the protection of settlements, inhabitants and economic activities, preparing or reorganizing defensive systems over time aimed at facing expansionist attempts by neighboring powers or attacks by bandits. The repeated requests for verification of the protective conditions advanced by the popes and the many measures aimed at strengthening the urban walls, creating new strategic surveillance points, enhancing the quantity and type of heavy artillery and firearms of all kinds are proof of this. Following the definition of the fundamental rules for the general protection of the State, repeated territorial surveys are recorded, which are accounted for in various writings organized in the form of both essential inventories and articulated critical and propositional reports. Among the many reports dedicated to the subject, the unpublished manuscript drawn up in 1623 by the military engineer Giulio Buratti and included in the Barberiniano Latino code 6333 of the Vatican Library is of particular interest. The report, object of the investigation, is configured as a report of a journey made by order of Pope Urban VIII and aimed at inspecting both the coastal and internal defensive system of the central-northern Marche and part of Umbria, focusing on the most important positions fortified with related armaments, noting the necessary upgrades of the war apparatus without, however, neglecting the geographical description of landscapes, routes and places visited.

Keywords: Historical geography, cartography, Papal State, fortresses.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

23rd MARCH | SESSION 1 | ROOM A
CHAIR: LAMIA HADDA

Le motte e i dongioni de *La Tapisserie de Bayeux*. Materiali sulla storia e l'iconografia dell'architettura fortificata normanna dell'XI secolo

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Abstract

The essay examines the relationship between image and military architecture in an important iconographic apparatus of the Norman period: the 'Tapisserie de Bayeux'.

Beyond the ideological and narrative use of the elements present of the basic lexicon of the artistic masterpiece, the intensity of armed action, the different types of weapons employed and, above all, the engineering of the military defenses of the time emerge with extreme clarity. The astonishing number of drawings, whose scenes are reproduced in hundreds of medieval history books, offers a clear overview of the art of warfare and castle architecture in 11th century Western Europe.

Iconographic analysis, as the leitmotif of the research, makes it possible to delve into the different architectural realities represented, also with a view to possible comparisons from contemporary testimonies, archaeological artefacts and monuments that are still visible, which could offer stimulating ideas for new models of investigation aimed at extending knowledge of the fortified architectural culture of the Norman period.

Keywords: medieval architecture, iconography, castles, Normans, Tapisserie de Bayeux.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

23rd MARCH | SESSION 1 | ROOM A
CHAIR: LAMIA HADDA

La strada di soccorso e gli interventi veneziani a Sebenico nel '400

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Abstract

The city of Šibenik was for the Republic of Venice one of the most strategically important cities on the eastern Adriatic coast. With the seizure of power in Šibenik at the beginning of the 15th century, Venice undertook a series of constructions with the aim of securing military primacy over the city. In Dalmatian cities that resisted the establishment of their rule, Venetians built a castle for its military crew by the sea shore, surrounded with a defensive moat towards the city. In Šibenik, on the contrary, they renewed the existing medieval castle on the hill above the city, connecting it with the coastline by an isolated, highly fortified passage. This passage is currently the only example of a 'rescue road' on the eastern Adriatic coast. This paper dates its construction and tries to reconstruct its original appearance with the help of a series of graphic sources. In the second half of the century interventions on the Šibenik fortifications were focused on defending the city from an external enemy. At the initiative and insistence of the local population, Venice strengthened and modernized the land stretch of the city walls and present contribution provides a reconstruction of the construction chronology of the city walls and their original appearance.

Keywords: rescue road, Sebenico, Venice, Dalmatia, 15th century.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

23rd MARCH | SESSION 1 | ROOM A
CHAIR: LAMIA HADDA

Il disegno delle architetture militari sulle coste mediterranee nella raccolta di Michel Angelo Morello

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Abstract

The graphic work of the captain-engineer Michel Angelo Morello is part of those atlases of military architecture that have involved the Savoy technicians in the construction of the military image of the State for almost two centuries. The plates of his Codex, which are less known than those of his father Carlo, represent fortified complexes, defensive buildings, and drawings concerning the coastal territories between Nice and Savona, updating and amplifying his father's production. The graphic documentation corroborates the idea that from the end of the 17th century onwards, the Savoy military engineer gradually abandoned the representation for exclusively defensive purposes and instead moved towards a more 'representative' style of drawing to celebrate the court and its domains. Indeed, the plates of Nice, Villefranche sur mer, Porto Maurizio, Savona, and other minor seaside localities, show the coastal defence system, highlighting individual lookout and resistance points without bypassing the description of the surrounding territorial context. The integration between his representations, where the drawing defines the technical characteristics of the fortified systems, and the perspective views, which aimed at minutely describing the architectural and landscape details of the places, outlines Michel Angelo Morello's representative relationships and similarities with other protagonists. It is mainly the case of Ercole Negro di Sanfront and his father Carlo. They have anticipated a military representation associated with the design and documentation of defensive systems, placing the figures within a broader cultural context wherein the drawing is the main character.

Keywords: Michel Angelo Morello, defensive architecture representations, historical iconography, coastal territories of Savoia.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

23rd MARCH | SESSION 1 | ROOM A
CHAIR: LAMIA HADDA

Santa Magdalena: una villa de nueva planta para el sistema defensivo de la Horta d'Alacant (Alacant, España)

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Abstract

In the last decade of the 16th century, Pere Franquesa i Esteve bought some lands in the areas of El Palamó and Orgègia to build a new town in the future county of Villafranqueza. He engaged the engineer Cristóbal Garavelli Antonelli for this settlement, who made various proposals for the Santa Magdalena site in 1590 according to his orders. In this sense, the project shows a rectangular trace with two perpendicular axes that form a quadrangular space. The Gothic parochial church and the lord's house with a tower are located there. The complex is surrounded by a wall with four small bastions at its corners and two at the ends of the minor axis. It would be a new defensive system of the Horta d'Alacant together with Verónica Tower.

Keywords: Alacant, Spain, Cristóbal Garavelli Antonelli, defensive system.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

23rd MARCH | SESSION 1 | ROOM A
CHAIR: LAMIA HADDA

Le fonti archivistiche per la storia di un bastione e delle sue molteplici vicende (secc. XVI-XX)

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Abstract

The fortified bastion known as ‘del Salice’ is what is still preserved of the sixteenth-century walls that used to surround the urban nucleus of Fossano, in southern Piedmont. Designed by Gianmaria Olgiati after the first half of the sixteenth century, construction works began under the French occupation in 1536 and the structure was perfected during the period of Spanish domination. The events connected with its construction emerge from the archival documentation. Thanks to new historical sources, the latter has been updated on the many vicissitudes and the heterogeneity of uses to which the fortified structure has been adapting over the centuries. The stratification of solutions determined by the peculiar needs of different eras shows, according to the verification of sources, the experience of the bastion and its ability to adapt to unexpected solutions. And finally, it returns to present its first-born nature, although alienated from the original defensive purposes, after a careful restoration and its philological recovery. This is a characteristic example of how a community has adapted, over the centuries, an essential and significant presence of the town to the needs gradually required by the military, political and cultural transformations. It has been a place of aulic representation of the city in the eighteenth century, with the construction of a solemn staircase, it became a venue of social entertainment afterwards, an air-raid shelter in the war period, without in the meantime discarding the hypothesis of demolition: with the referendum involvement of the citizens to verify its feasibility. It eventually turned into the memorial site of the fallen soldiers, with the monument constructed by the architect Carlo Mollino. The examination of the archival production on the fortification is proposed as an added and parallel contribution to the architectural reading of the formal element, not to be intended as a replacement of the design interpretation and understanding of its plastic component, but to strengthen its presence, nowadays silent and stately, with the history that has been accompanying it for five centuries.

Keywords: fortified walls, bastion, military architecture, archival sources.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

23rd MARCH | SESSION 1 | ROOM B
CHAIR: STEFANO COLUMBU

Stone materials and construction technology in the Piscinnì tower (South-western Sardinia, Italy): archaeometric investigations and digital survey

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Abstract

The tower of Piscinnì (WGS84: 38°54'15"N 8°46'40"E) is located within a beautiful coastal enclave on the coast of *Teulada* (South-western Sardinia). The mighty building stands on a promontory dominating the wild and suggestive panorama of the beach surrounded by Mediterranean vegetation. It was built at the end of the XVI century and still stands out for its size and conservation state. It had a great strategic importance since it was meant to guard both the landing area towards the valley behind, and the homonymous pond, exploited in the XVI century by the merchant Pietro Porta as a fish reserve. In the Spanish period (between the XVI and XVII centuries), the tower was reinforced and guarded by an armed garrison. The area was previously frequented by the Punic and Roman people, who set up several sandstone and conglomerate quarries, used to build the villages and port structures of the various coastal settlements, e.g., Bithia (near to Chia village). The tower of Piscinnì is set in a very lively jagged coastline, characterized by rapid transitions from one landscape to another: from fine-grained, whitish sand beaches (as the not-so-far renowned Tuerredda and Capo Malfatano) to gravelly coves, from “rias” and ponds to high cliffs of intrusive magmatic (e.g. granitoids) and metamorphic rocks. The research involves several interdisciplinary work phases: 1) petrographic and physical-mechanical analysis of the building materials (stones and mortars) to understand their state of conservation, durability and their source in the surrounding area; 2) digital survey of the tower using photogrammetric techniques and 3d Laser Scanner technology to define the geometric-structural aspects; 3) stylistic-architectural analysis of the building and the load-bearing structures to understand the technologies and construction phases and any static-structural criticalities.

Keywords: fortifications, chemical-physical degradation, conservation, lasergrammetry.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 4 - CHARACTERIZATION OF GEOMATERIALS

23rd MARCH | SESSION 1 | ROOM B
CHAIR: STEFANO COLUMBU

**The Rocca Vecchia fortress in the Gorgona island (Tuscany, Italy):
building materials and conservation issues**

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Abstract

The ancient fortress known as Rocca Vecchia (Old Fortress) dominates the Gorgona island from a rocky spur on the western side, at about 200 m s.l.m. It was built by the Republic of Pisa and dated to the 13th century, but it seems that the settlement was originally represented by a single tower dating back to the 11th century, as evidenced by the dating of some ceramic finds in recent archaeological excavations. This tower was erected above previous structures that could also be very ancient. Around this structure, still identifiable in the current structure, other parts were added, up to give it a polygonal and asymmetrical plan, with three quarters of the perimeter exposed on a cliff overlooking the sea. The whole structure is currently in a severe state of conservation. The collapses are evident with the fall of some roofs and most of the summit ridges and with the presence of structural lesions. The action of the marine aerosol, in particular on the seafront, has caused extensive phenomena of alveolization in the bricks and in the stone ashlars with erosion of the plasters and bedding mortars. The study will examine the composition of the artificial stone materials (bricks, bedding mortars, plasters). The results will be useful from the historical point of view (origin of the raw materials from inside or outside the island) and for the future conservation intervention which, under the auspices of the former director of the jailhouse, will have to involve a group of prisoners who will also have the task of the subsequent maintenance.

Keywords: Pisan Fortress, geomaterials, building techniques.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 4 - CHARACTERIZATION OF GEOMATERIALS

23rd MARCH | SESSION 1 | ROOM B
CHAIR: STEFANO COLUMBU

Caracterización arqueométrica de morteros históricos en las torres nazaríes del reino de Granada

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Abstract

The analysis and identification of historical mortars is essential for decision-making in restoration processes. In addition, its mineralogical-petrographic analysis, as well as its chemical characteristics, can provide relevant information that allows determining the chronological sequence of later interventions, which makes it possible to delimit and define different construction phases. Based on the defensive towers of the Nasrid kingdom of Granada, the study has been approached from an archaeometric point of view for the characterization of the historical mortars of their factories, obtained from both their coatings and the constituent materials of the walls. In this paper the preliminary results obtained in the Torre de Pimentel or de los Molinos and the Torre del Salto de la Mora or de la Sal, both located on the coast of the province of Malaga, are shown. A comparison is established between the two types of towers, verifying their material constitution with the historical and constructive analysis, through the analysis and interpretation of the information extracted from the X-ray diffraction tests (XRD).

Keywords: mortero histórico, torres nazaríes, arqueometría, materiales.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 4 - CHARACTERIZATION OF GEOMATERIALS

23rd MARCH | SESSION 1 | ROOM B
CHAIR: STEFANO COLUMBU

Fortezza medicea di Volterra: progetto della ‘messa in sicurezza’ (restauro e recupero) del camminamento di ronda e degli elementi architettonici a sporgere -‘beccatelli’- del lato nord della cortina perimetrale (1472/1474)

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Abstract

The restoration and consolidation of the protruding apparatus of the Medici fortress of Volterra (1472-1474) aims to preserve this fortified architecture. In 2016, after the restoration of the keep of the “new fortress”, it was reopened to the public 542 years after its construction, creating the possibility of using it without intervening in the prison function of the complex. The north curtain consists of a very extensive front, from the “citadella” to the main door, attributed to Francesco di Giorgio known as il Francione (1425-1495) Florentine “architect” who also built the structures of Colle val d’Elsa, Pietrasanta, San Gimignano, Sarzana, Sarzanello, to the façade adjacent to it, attributed to M. Mazzei in the mid-19th century. The restoration of the curtain with 233 corbels on brick arches with shelves in “panchino di Volterra” and the control of rainwater on the patrol walkway gives the opportunity to enhance the knowledge and study of a construction typology in the context of fortified architecture. Renaissance of the Italian school called “transizione” with the use of the first artillery. This extraordinary complex is the result of the expansionist policy of Lorenzo “il magnifico” following the Alum War, for hegemony over the city of Volterra and to strengthen the control of the borders towards the Republic of Siena. It was born as a military garrison with a captain, a bomber, nine soldiers. At the time of Lorenzo only a part was used as a prison, it will be definitively transformed into a detention house during the Lorraine Grand Duchy in the mid-1800s.

Keywords: Volterra, external curtain wall.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 4 - CHARACTERIZATION OF GEOMATERIALS

23rd MARCH | SESSION 1 | ROOM B
CHAIR: STEFANO COLUMBU

The building materials of the Rocca della Verruca fortress (Tuscany-Italy)

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Abstract

The Rocca della Verruca fortress rises on the summit of the homonymous mountain, on the eastern side of the Pisan Mountain. It is located in a strategic position which allowed to control the whole mouth of the Arno River. The fortress remained under the Pisan influence until the 15th century, when the Florentine rule begun. After the Florentine takeover, the fortress was inspected by illustrious architects, such as Giuliano da Sangallo and Leonardo da Vinci, who planned to improve its defensive structure. It was the moment when the medieval fortress began to be modernized with the insertion of circular towers and pentagonal bastions, in the same way as the other castles conquered during the wars: the modernization of the defences was attributed to Luca del Caprina and Giuliano da Sangallo. The paper will examine the geomaterials used in the building with a particular focus on mortars and bricks studied according to mineralogical and petrographic methodologies and will verify both the variations occurred during the construction phases and the relationships with the local supply sources.

Keywords: Pisan fortress, Tuscany, geomaterials, building techniques.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 4 - CHARACTERIZATION OF GEOMATERIALS

23rd MARCH | SESSION 1 | ROOM B
CHAIR: STEFANO COLUMBU

Mannu tower (Central-western Sardinia, Italy): from petrographic, geomorphological investigations and digital survey to intervention proposal

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Abstract

The Capo Mannu tower rests on a cliff edge in the central-western coast of Sardinia (Italy). It is placed on a 50-60 metres-thick aeolian sequence of Plio-Pleistocene age (Capo Mannu Fm.), that lies above Miocene to Lower Pliocene marine sediments (mainly limestones, sandstones, marly clays). Archival documents attested the decay state of the tower since 1620: "...les torres de Orfano Puddo, Scala Sal y Cabo Maño del Campidano de la ciutat de Oristany ha necessitat deser reparadas en moltes parts...". Repair interventions were carried out in 1784-1786, and in 1822 by the Towers Administration; the tower was garrisoned until 1846 and then abandoned. The decay of the building materials and of the tower structure is mainly due to the weathering and to the continuous gravitational collapses, triggered by the wave erosion that also produces the cliff retreat. The aim of research is to define: i) petrographic features and chemical-physical degradation of geomaterials; ii) building decay and geomorphological processes through the elaboration of a digital model of the tower and cliff. It will help to better understand the factors that affect the structure decay, and to refer the building materials to the original shape of the ruined tower. The digital survey will be mainly based on drone/UAV photogrammetry, with integration in 3D laser-scanner survey. In its final stage will try to propose possible interventions of consolidation and conservation in such a complex condition.

Keywords: degradation, chemical-physical processes, conservation, photogrammetry.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 4 - CHARACTERIZATION OF GEOMATERIALS

Revitalization of tower fort Fort Monte Grosso and the restoration of the fortified path of Pula

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Abstract

A series of analyses show a fragmented and neglected Austro-Hungarian stronghold in the city's urban fabric eaten by the contemporary urban metastasis. The gradual development of the ring-shaped stronghold that formed over a period of less than 100 years is presented in a series of panels along with a study of different typologies of fortresses that led to understanding of their morphology in relation to the territory which could be useful for the future urban scenarios. A graphic analysis of the relationship between the city's historic and contemporary urban fabric helped in developing the project idea for the historical path that reconnects the fragmented Austro-Hungarian stronghold making it more appealing to the public. The focus of the thesis is the tower fort Fort Monte Grosso, situated in one of the highest parts of the city of Pula, on the top of the Istrian peninsula. Here in the woods of the not so long ago former military zone, we find an abandoned fort tower Fort Monte Grosso along with other abandoned Austro-Hungarian constructions nearby. The area of the project was not chosen by accident-the former military areas are the least affected by the urban metastasis, keeping the most original appearance. The restoration of the old military path connecting the fortifications materializes in a simple steel structure integrated in the tower of Monte Grosso. It is thought of as an extension of the path that runs through the city into the fortress itself without interfering with the existing fabric. The intention of this multiscale project is to come to an elegant solution through the analysis between historic and modern urban fabric relationship, while recognizing the typology of the fortresses and finding a universal way to connect the points of the stronghold into educational, recreational and excursion route.

Keywords: Austro-Hungarian fortress, multiscale project, Fort Monte Grosso, historical-contemporary fabric.



23rd MARCH | SESSION 1 | ROOM C
CHAIR: ANDREA PIRINU

On the Fort of Granatello, to keep its memory alive

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Abstract

The Fort of Granatello in Portici was built on an ancient coastal watchtower between 1703 and 1706, at the behest of the last Viceroy of Naples Juan Manuel Fernández Pacheco, Duke of Escalona and Marquess of Villena. The following paper is aimed to retrace its history based on the collected archival-bibliographic and iconographic documentation, in the framework of the wider context of coastal defensive buildings and of the story of the construction of the Royal Site of Portici and the Granatello harbor, highlighting their connections and historical ties. This is aimed to preserve its memory, as the Fort was destroyed by cannon fire by the Military Navy of the newborn Kingdom of Italy in 1873.

Keywords: coastal defenses, naumachia, Bourbon Sites.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

23rd MARCH | SESSION 1 | ROOM C
CHAIR: ANDREA PIRINU

Le mura romane di Aosta: le prime attività di Alfredo D'Andrade all'azione di tutela della Soprintendenza

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Abstract

The contribution aims to highlight the path of protection that has affected the Roman walls of the city of Aosta which still keeps about 95% of the Roman walls of the Augustan era. The first interest in the circuit of the city was placed by Alfredo D'Andrade, who worked in order to protect these structures from a continuous 'destructive' action operated by private citizens. Starting from the commitment of D'Andrade, the protection of this important historical-archaeological presence within the city of Aosta has always been supported through programs of protection and recovery, both of a conservative nature, and functional to its enhancement. The methods of approach and the objectives that the Superintendence of Aosta is now supporting, have changed. It remains now to act on the defence of matter preserved by actions related to the environment, and climate but often also carelessness, as well as due to the weakness of the building material.

Keywords: ancient roman wall, restoration.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

23rd MARCH | SESSION 1 | ROOM C
CHAIR: ANDREA PIRINU

Construction and development of the castle of Molyvos, Lesbos

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Abstract

The castle of Molyvos on the island of Lesbos most probably occupies the site of the acropolis of the ancient city of Methymna. Its strategic location offers control of the north entrance to the gulf of Adramyttium and the route to the Dardanelles. Very little of the ancient construction is still standing. However, the castle that was built in the Middle Ages made exclusive use of ancient stone blocks. It must be dated to the Byzantine period, but it is not possible to define the exact date. Its west part belongs mainly to this first construction phase. It has a polygonal layout with relatively small protruding rectangular towers. Two of the towers are closer to each other and protect the entrance gate. In a second phase, the castle extended eastwards, with more towers, one considerably larger. These interventions may be attributed to the Genovese Gattilusi family, who acquired control of the island in 1355, after the marriage of Francesco Gattilusio with the Byzantine princess Maria Paleologina. Recycled ancient material was used again extensively, but in a less elaborate manner. A first campaign may be dated to the 14th century, whereas a second one may be to the following century and be related to the defense of the Gattilusi against the Ottomans, who conquered the island in 1462. The castle developed during the Ottoman period in several construction phases with barbicans, bastions, and a tall rectangular tower, in an effort to adapt to the use of artillery. It is probable that the last works in the castle date to the mid-17th century and are related to the fifth Ottoman-Venetian war.

This research is based on the new architectural drawings of the castle, which were produced by the Laboratory for the Documentation and Conservation of Historic Buildings and Sites of the Technical University of Crete for the Ephorate of Antiquities of Lesbos of the Greek Ministry of Culture.

Keywords: Genovese fortifications, Byzantine fortifications, Lesbos, Methymna, Molyvos.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

23rd MARCH | SESSION 1 | ROOM C
CHAIR: ANDREA PIRINU

Conservazione e manutenzione all'interno di una città patrimonio UNESCO: il caso studio delle mura difensive di Urbino

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Abstract

The city walls of Urbino are considered among the main examples of military fortification of the sixteenth century and currently represent the limit that defines the urban space of the city. In the early decades of the sixteenth century, on request of Francesco Maria I della Rovere, the town was equipped with a defensive system. These walls represent an exceptional case of historical stratification. The restoration project, born within the Master in *Instruments and Methodologies for Cultural Heritage Conservation and Valorization* of the University of Urbino, was subsequently developed by the research group. In the conviction that there is a close link between restoration and the related concept of art and therefore of architecture, the artistic and historical qualities are been identified to maintain or return establishing the limits and the characters of the interventions. The design approach, of a historical-critical nature, has been flexible and permeable to information of different nature and has contextualized the walls in relation to the historical city. The theoretical vision has been translated into practical indications, but not for this empirical, able to preserve and enhance the walls.

Keywords: militar architecture, restoration, conservation, maintenance.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

23rd MARCH | SESSION 1 | ROOM C
CHAIR: ANDREA PIRINU

Integrated use of ground penetrating radar and time domain reflection for volumetric water content evaluation in wood structures inside the castle of Carosino (Taranto, Italy)

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Abstract

Ground-penetrating radar (GPR) and time domain reflectometry (TDR) was used to estimate the dielectric permittivity and successively the volumetric water content of several types of wood. An empirical relationship was found between the dielectric constant and volumetric water content. Results were applied to a case study of the Castle of Carosino (Taranto, Italy).

Keywords: TDR, GPR, Carosino Castle.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

23rd MARCH | SESSION 1 | ROOM C
CHAIR: ANDREA PIRINU

Il tema dei siti fortificati in Sardegna tra perdita, restauro e riuso

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Abstract

Referring only to the artifacts built between the tenth and fifteenth centuries and therefore from the Giudicale period to the Aragonese domination, we count more than ninety examples of which at least 70 still with material traces present that allow us, in the present essay, to analyze how the theme of medieval fortified places on the island: from their identification as elements worthy of protection to the current attempts at reuse and enhancement, passing through the many restoration interventions carried out in the last hundred years. Alongside the restorations that have affected the most important castles and the city walls (especially since the 1960s), it is significant to examine the transformations that the modern city and the use of the territory have brought about and not always in terms of conservation. Contrasting attitudes emerge, as well as different project outcomes in a scenario that, even today, is characterized in some cases by abandonment or neglect. The text intends to cross-reference the many archive data on the restorations found with the observation of the artefacts and their structural and morphological characteristics.

Keywords: military architecture, restoration, Sardinia heritage.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

Elba fortificata nella II Guerra Mondiale: le batterie costiere di Capo Poro e Capo d'Enfola

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Abstract

Elba Island, located between Corsica and Piombino cape, since Etruscan times has been, a disputed island and under attacks by would-be conquerors, due to its Geographic location and its mineral wealth.

For this reason, over the centuries, it was built a widespread defensive system, which adapted to natural landscape, or to existing fortresses and fortifications of the past.

Last fortifications, from a chronological point of view, were built after World War I, they were integrated during World War II and German occupation in 1943-1944, making Elba take on the role of real fortified Island.

Research studies building built by Royal Navy and Royal Army to defend the Island, by analysing sketches in military archives and artifact built and / or integrated by the Germans until June 16th, 1944, when, during operation 'Brassard' (Invasion of Elba) Allied release the Island.

These artifacts are still visible in Elba's landscape, and most of which are in advanced state of decay and completely abandonment: inhabitants and visitors are unable to understand real meaning and historical value of the buildings. Historical research, sketches design studies, integrated survey (TLS + drone), and 3D reconstructions allow to support and create a memory of recent defence system that integrates the one built by the Etruscans (Monte Castello, Castiglione di San Martino and Castiglione di Campo), then by the Pisans (Marciana Fortress, Volterraio Fortress, San Giovanni Tower), by the Principality of Piombino and Grand Duchy of Tuscany in the 16th century (Forte Falcone and Forte Stella in the original Cosmopoli, and towers scattered throughout the territory , fortified churches), and finally by the Spaniards in seventeenth century (Forte San Giacomo and Forte Focardo in Porto Longone).

Keywords: cultural heritage, 3D modeling, dissemination, fortification, Second World War.

23rd MARCH | SESSION 1 | ROOM D
CHAIR: M. CONCEPCIÓN LÓPEZ GONZÁLEZ

Application of new survey technologies for 3D restitution and the architectural study of the Spanish fort Gourraya in Bejaia (Algeria)

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Abstract

The Fort of Gouraya is an ancient military edifice built in the 16th century, during the Spanish occupation of the town of Bedjaia, on the northern coast of Algeria. It is located on the highest mountain peak, 672 m above sea level: a position which gave it considerable importance, as it protected the town from any foreign incursion, particularly from the sea. This fort was refurbished in 1830 following the French intervention so that it could simultaneously fulfil two functions: to resist a possible attack and to control the town and its surroundings as well as the maritime traffic of the region. It is a building of great patrimonial value and represents a vital period in the history of the city of Bejaia. Unfortunately, today it is completely ruined and only a few sections of the walls remain. Through the use of new digital tools, such as the laser scanner and photogrammetry, we have been able to reproduce an architectural representation of the building in its current state, as well as a virtual model of the whole of the edifice. By applying these new tools to the endangered architectural heritage, we have been able to preserve its image through 3D restitution, modelling and digital simulations. Such a restitution has not only highlighted the different phases in the evolution of the building, but it has also put forward an interpretation of the elements that have fallen into ruin, or have completely disappeared. It has, therefore, proved itself to be a valuable tool not only for understanding this building, but also for preserving the image and memory of the heritage and archaeological site. Its restitution and reopening to the public thus represents the culmination of this whole chain of operation.

Keywords: Fort Gouraya, 3D scanner, photogrammetry, modelling.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

23rd MARCH | SESSION 1 | ROOM D
CHAIR: M. CONCEPCIÓN LÓPEZ GONZÁLEZ

The Fort of the Holy Savior in Messina. Historical cartography and digital surveys

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Abstract

The restoration of monuments is inevitably translated throughout the modification of the state of things, which means. the modification of the only certain 'document' that makes it possible in understanding the history of the artefact, attributing chronologies to the different parts of which such architectures are composed of and in preparing calibrated projects for specific environmental requirements. Therefore, the documentation prior to the intervention is a necessity that in recent decades has had positive impulses throughout the use of laser scanning techniques making it possible to acquire a great deal of information that constitutes accurate apparatus for the project elaboration. The fort of the Holy Savior is located at the end of the neck of land facing the city of Messina, a curved shape similar to a sickle, which suggested to the Chalcidian Greeks the city name attribution of Zancle. The fortress was built in later periods and incorporates also a tower from the Norman era. From the Aragonese period onwards, but above all, as part of the reorganization of the strongholds ordered by Charles V, other fortification works were juxtaposed by Ferramolino, who also incorporated the remains of the Church of the Holy Saviour in the Phari language, which in the Norman period, all the so- called 'Basilian' churches of Valdemone depended. The survey of the fortress, which has undergone various tampering and transformations over the centuries, was carried out using photogrammetry and laser scanning techniques making it possible to identify and document important vestiges, recognizing certain historical events that affected the multi- layered site, as well as providing useful support for the design and control of the intervention.

Keywords: fort of the Holy Savior, fort Campana, Ferramolino, Charles V, fortifications.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

23rd MARCH | SESSION 1 | ROOM D
CHAIR: M. CONCEPCIÓN LÓPEZ GONZÁLEZ

Levantamiento gráfico integral para el análisis de la Fortaleza de Santa Ana en Oliva (Valencia)

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Abstract

The shoreline of the Valencian Gulf, due to its position in the Mediterranean Sea, has been target of pirate attacks starting from the XVI century, hence the need for a protection against this menace. During the reign of King Felipe II it was developed the defence plan for the entire Levantinian Coast, switching from the concept of defence across the water, to the land one. In this context is built the renaissance fortress of Santa Ana, nowadays known as Castle of Oliva.

This study is aimed to obtain an analysis of the fortress starting from the historical research til its digital integrated survey, mixing TLS and SfM-IM techniques. After a validation of the results through a deviation analysis between the two numerical models obtained, this geometrical database has been used for a critical restitution of the survey, obtaining a conceptual 3d NURBS model, as far as architectural drawings in its own scale. Through these, an analysis of the fortress was performed, finding and highlighting architectural and constructive peculiarities of the fortress that, in conjunction with a focused historical analysis, deepens the knowledge about the case of study and so about the Heritage of the Valencian coast.

Keywords: fortified architecture, integrated survey, laser scanning, drone photogrammetry.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

23rd MARCH | SESSION 1 | ROOM D
CHAIR: M. CONCEPCIÓN LÓPEZ GONZÁLEZ

La Torre degli Upezzinghi a Caprona: analisi storico-archivistica e rilievo digitale per la documentazione dell'evoluzione temporale

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Abstract

This paper brings together multidisciplinary studies on the relationship between architecture and territory, on historical-archival analysis and on 3D digital survey by drone photogrammetry, for the documentation of the Upezzinghi Tower or Torre di Caprona, in the province of Pisa. The aim of this research is to reconstruct the historical events that affected the Tower and to record the actual state of preservation of the monument, both considering the progressive transformation of the surrounding landscape -due to the activities of the Caprona stone quarries-, and the changes following the 2018 fire of the Monti Pisani.

Keywords: Torre degli Upezzinghi, Torre di Caprona, post-disaster survey, Monti Pisani fire.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

23rd MARCH | SESSION 1 | ROOM D
CHAIR: M. CONCEPCIÓN LÓPEZ GONZÁLEZ

Fruizione digitale dei paesaggi perduti. Il sistema fortificato di Palazzo d'Avalos a Procida

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Abstract

The technological evolution, which the digital world is constantly imposing, now makes it possible to test new methods of investigation and multidisciplinary information management, from the architectural scale to the urban and territorial one, for the knowledge, management, and enhancement of the fortified cultural heritage. With respect to these research orientations, the contribution highlights the unprecedented potential offered by the georeferencing and digital archiving of historical sources for the re-modeling and digital gaming enjoyment of the lost fortified architectural heritage, able to tell the users of virtual tourism the memory history of a complex scenario visible today only through the sources and documents related to it. Therefore, with the opportunity to test and verify the foregoing for the architectural-fortified and landscape complex of Palazzo d'Avalos on the island of Procida in the province of Naples (Italy), the contribution highlights the integration potential of the iconographic-archival and cartographic component in the definition of a 3D game model, starting from an integrated digital survey project, exploring its possible interactions and information organization in optimized semantic instances usable in AR / VR.

Keywords: historical fortified integrated systems, cultural serious Game, d'Avalos Palace, Carlo Vanvitelli.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

Fortificación y control estratégico del Camino de la Raya en el s.XV: análisis geoespacial del dominio visual de un territorio de frontera

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Abstract

After the conquest of the domains of Niebla by Alfonso X in 1262 (García Sanjuán, 2000:89), a process of 'incastellamento' of the territory began to reinforce the repopulating strategy of these possessions of *Gharb al-Andalus* linked to the primitive vassal kingdom of *Ibn Mahfūz*. In this process of structuring the historical territory, not only the incorporation of the primitive Andalusian fortifications, but also the strategic control of the main paths that crossed the border territory of Andevalo, putting in communication the center of power gained special relevance. For this purpose, the creation of new settlements around such paths near the Portuguese *raya* (Pérez Macías & Beltrán Pinzón, 1999; Pérez Macías, Beltrán & López Domínguez, 2001) was encouraged, building watchtowers and fortresses of new plant to ensure their guard, defense and visual dominance. Among them, the path named 'Camino de la Raya' (Fig.1), referred to in the medieval documentation as *carrera de Gibrleón a Mértola* (Anasagasti & Rodríguez, 2006). The councils of Niebla and Gibrleón struggled throughout the Late Middle Ages to exercise effective control over it. Their jurisdictional limits expanded towards the spaces close to this tractor axis of commercial exchanges with the neighboring kingdom of Portugal for its tributary rival (Fig.11). The article develops the geospatial analysis from its visual aspect, restoring the perceptive landscape subject to visual dominance over the historical territory from watchtowers and castles. However, the study involved complementary analytical developments already systematized in studies of the other defensive nets (Fondevilla et al, 2021; Fondevilla, 2020; Fondevilla et al, 2022).

Keywords: Fortification of the territory, GIS, cumulative viewshed, visual prominence.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

23rd MARCH | SESSION 2 | ROOM A
CHAIR: ANNA GUARDUCCI

L'opera di Francesco di Giorgio Martini in Abruzzo: alcune aggiunte e riflessioni

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Abstract

This research presents some innovations arising from the analysis of various fortified structures in the Abruzzi area influenced by the projects of Francesco di Giorgio Martini. The arrival of Martini in Abruzzi region in the last decades of the fifteenth century is linked to the need of the Duke of Calabria Alfonso d'Aragona to update the coastal defenses of the kingdom. Various fortified architectures in Abruzzi can certainly be connected with the architect's activity; while for others we will try to identify the evidence of Martin's languages.

The castle of Capestrano, whose original layout dates back to 1485, suggests that the Piccolomini family knew the modern instances of fortifying brought to the Kingdom of Naples by Francesco di Giorgio. This research adds some considerations regarding the fortress of Vasto, a city located in the south of Abruzzi region and on the fortress of Ortona; both in the province of Chieti.

Keywords: Francesco di Giorgio Martini, Alfonso d'Aragona, Abruzzi region, fortifications.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

23rd MARCH | SESSION 2 | ROOM A
CHAIR: ANNA GUARDUCCI

Fortified architecture in the name of the octagonal cross. Echo and criticism of the Cottonera bastioned line in Malta

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Abstract

This paper sheds new light on the fortified Cottonera line in Malta, a masterpiece of the Piedmontese military engineer Antonio Maurizio Valperga. In 1669, the Grand Master of the Order of Malta required Valperga's expertise in Valletta to modernise the coastal fortresses of the island. However, Valperga's project was considered not feasible and too extensive by contemporary military engineers, such as Gaspare Beretta. This contribution retraces the reasons for this criticism by analysing some drawings and Beretta's report sent to Malta. Despite the criticism, Valperga's work was highly influential. The Cottonera project was included in Carlos de Grunenbergh's *Teatro Geografico* (1686), Vincenzo Coronelli's engraving *Città e Fortezza di Malta* (c.1692) as well as in Nicolas de Fer's print *Plan des Vieilles et Nouvelles Fortif[ication]s de Malthe* (1694) and many other iconographic sources. This paper is part of a broader investigation about Maltese civil and military architecture of the Order of Saint John of Jerusalem carried out by the author over several years.

Keywords: Cottonera, Antonio Maurizio Valperga, military engineers, Gaspare Beretta.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

23rd MARCH | SESSION 2 | ROOM A
CHAIR: ANNA GUARDUCCI

Le tecniche costruttive del castello di Oriolo in Calabria

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Abstract

The castle of Oriolo in Calabria is located in a strategic natural point protecting the territory, which is particularly impervious and with the consequent difficulties related to the construction. Oriolo, of remote origins, is a small village in the province of Cosenza. The castle, born with the function of a military fortress is of Norman origin, was mistakenly associated with the Frederician period. Its building characteristics are strongly correlated with historical events and the morphology of the territory. The proposed theme is aimed at the analysis of building techniques. In 1552 the castle was purchased by the Pignone family, which ruled over the village for more than 350 years. It was originally presumed to consist of three towers with a circular base and one with a square base, the access was provided by a drawbridge. To the present day the castle appears to be surrounded by two towers, with a large access staircase; the northeast part, which faces a cliff, consists of a single wall, the only original one. In the work after a thorough survey, the three floors of the building will be analyzed, with the inner court, attic and roof. The subject of the analysis are also other elements such as the towers, with the construction materials used in the masonry, which has a few large stone elements along with the irregular stonework with its mode of processing and placement, the presence of the abundant mortar in the cavities, which gives a great structural quality. The technical-formal analysis of the pavilion roof made of brick tiles, which represents the traditional technique, as well as other structural elements; for example, the main floor access staircases, will be carried out. Of fundamental importance to emphasize the influence of foreign workers is the sign of the modernizations and renovations carried out between the 15th and 16th centuries.

Keywords: masonry, materials, traditional technique, Frederician period.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

23rd MARCH | SESSION 2 | ROOM A
CHAIR: ANNA GUARDUCCI

Il castello di Ischia e l'*insula minor*. Architettura militare, città e paesaggio (XV-XIX)

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Abstract

The castle of Ischia was built on the small island known as *insula minor* in the second half of the 13th century during the Angevin reign. The promontory, also protected from the sea, was particularly suited to defend the island but also the entire gulf. The catastrophic eruption of 1301 destroyed the village in the main island but led to the urbanisation of the islet. Before conquering Naples, Alfonso of Aragon stayed on Ischia, checking the strategic possibilities of these places. During his reign, in fact, he built a 'modern' castle next to the Angevin fortress. For the military renovations against the race war in the mid-16th century, the Aragonese castle on Ischia was renovated by the military engineer Benvenuto Tortelli. Tortelli carried out the survey of the islet and the castle. Today, two very similar drawings are known. They are important documents because they allow us to describe the Renaissance castle as well as some neighbouring buildings. This monument of great value, which was disastrously tampered with in the 20th century, has been neglected by the scientific community, perhaps due to the events of the 1970s, when, now privately owned, it was the subject of a renovation project that envisaged its conversion into flats, which was not completed.

Keywords: Cultural landscapes, military architects-engineers, Benvenuto Tortelli.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

23rd MARCH | SESSION 2 | ROOM A
CHAIR: ANNA GUARDUCCI

I Tosetti di Castagnola (Lugano): ruoli e gerarchie professionali nei cantieri delle difese sabaude nel corso del Seicento

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Abstract

Studying a rich body of documents from archives led to shed light on the role of the Tosetti, a family of engineers and builders from Castagnola (Lugano), in Piedmont and the County of Nizza. Interesting details, in part unpublished, emerged about dynamics related to the organization and the reshaping of the defence system of the Savoy dukedom in XVII century. Professional relationships held by Tosetti helped to dig deeper in the movements of engineers and technicians on the Savoy territory, underlying the importance of the interaction between these figures in the decisions related to the design of the defence system. The role of the duke and of the cadet branches in the definition of the defence system and in the requirements in term of preparation and competences for the builders that had to realize it emerged from the study, leading to important questions on their background education. The Tosetti family represented then a sort of *fil rouge* that helped to reconstruct the Savoy's plans about the definition of the image of State and of its defence system, and dig deeper into it, along the entire Seventeenth century.

Keywords: military engineers, Savoy defences, building sites, education.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

23rd MARCH | SESSION 2 | ROOM A
CHAIR: ANNA GUARDUCCI

Le fortificazioni di Mahdiya nel *Kitab Ghara'ib al-funun wa-mulah al-'uyun* (X-XII secolo)

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Abstract

The Arabic manuscript *Kitab Ghara'ib al-funun wa-mulah al-'uyun*, i.e. *The Book of Curiosities* is a cosmographical treatise by an anonymous author probably produced in Egypt in the first half of the XIth century. The rare copy of the original, although incomplete and datable between the XIIth and XIIIth centuries, is preserved in the Bodleian Library in Oxford. The city of Mahdiya appears in Chapter 13 of the second book, consisting of a page of text and a colour miniature depicting the main monuments, which are confirmed both by the description given by the historian al-Bekri and by the architectural and archaeological realities still visible in the ancient capital of the Fatimid kingdom. In addition, in the *Kitab Ghara'ib al-funun* reports the land and sea connections from Mahdiya to the main destinations, expressed in miles, to Ifriqiya and the Mediterranean basin.

Mahdiya was the work of the first Fatimid caliph 'Ubayd Allah al-Mahdi "The Rightly Guided One", founder of the new Shiite movement of the Ismaili branch in Ifriqiya. Founded in 916, Mahdiya became the new capital of the Fatimid dynasty located in a strategic place by the sea, more suitable to control the territory and impose the Shia doctrine due to the problems that arose immediately after the assumption of power in Raqqada. The caliph chose his own name to give the city al-Mahdiya and settled there in 921. The city lies on the narrow rocky peninsula of Cape Afrique linked to the mainland by an isthmus of a few hundred metres. From the beginning of its foundation, the Fatimid capital consisted of a royal medina (al-Mahdiya) and a popular suburb located to the west, outside the walls, called Zawila. Mahdiya still preserves some monuments from the Fatimid era: remains of the city walls, a harbour, a mosque and vestiges of the palace complex.

Keywords: Mahdiya, historical treatise, Mediterranean architecture, Fatimidi.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

23rd MARCH | SESSION 2 | ROOM B
CHAIR: DENISE ULIVIERI

The Castle of Cleto in Calabria. Singular characteristics of a fortress

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Abstract

Located on the top of a hill, the Cleto Castle has features common to similar fortifications scattered across the Calabrian Apennines, but it stands out by other singular interesting characteristics. In the paper, these are highlighted through a specific illustration and some considerations relating to the conservation and preservation of the building of undoubted historical-monumental value. From the historical references emerges a first character of the fortress, its construction by complementary parts in about 5 centuries, with differentiated construction techniques. The elevated position, dominating the surrounding environment, gives it a privileged lookout character, able to control a vast land, up to the sea more than 6 km away, and to prevent enemy incursions. The architectural and structural characteristics of the castle suggest an intermediate image between the simple wall fortification and the building closed on itself; different components clearly stand out such as two main towers, housing units, open spaces, mighty stone arches. A singular aspect consists in the presence of several cisterns and silos dug into the rock, used to ensure a reserve of water and cereals, a considerable potential for resistance to external aggressions. Also important is the urban relationship between the castle and the village below; the fortress appears clearly detached, but also closely linked to the village; moreover the same village was fortified with boundary walls and few gates, creating a sort of double protective belt for the inhabitants. Another peculiar feature is highlighted: the castle stands on a rocky formation of arenaceous limestone, with layers of different cohesion, subject to the erosive actions of the wind and rain, undermining the foundations. A safeguard action on the fortress requires collaborative interdisciplinary knowledge and skills; the paper mentions some of the potential needs for conservative actions.

Keywords: fortress, singular features, interdisciplinary knowledge and skills, conservative actions.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 7 - MISCELLANY

23rd MARCH | SESSION 2 | ROOM B
CHAIR: DENISE ULIVIERI

Architetture difensive nella Piana di Sibari in Calabria. Scenari per la conservazione e la valorizzazione

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Abstract

The essay aims at the knowledge of the defensive architectural heritage located in a landscape of ancient formation with a strong historical-architectural value: the plain of Sibari. In particular, the paper focuses attention on the area in which the municipality of Corigliano-Rossano falls, overlooking the bend of the Ionian coast, included in the Gulf of Taranto. The area considered, of complex historical-archaeological interest, is shown as a unitary system, in which a common historical and cultural matrix is evident. The territory is dotted with ancient watchtowers, some of which today are in a state of ruin (Torre di Milone in Cassano allo Jonio, Torre del Ferro near the hamlet of Thurio, Torre Sant' Angelo in Rossano, Torre del Cupo in Corigliano and others). This defense network is strengthened by the castle of Corigliano Calabro (since 2017 the municipality of Corigliano-Rossano) located within the settlement on the Serratore hill. While in the innermost area there is a particular example of a countryside fortress: the castle of San Mauro in Cantinelle. For the area considered, a series of historical-critical readings are proposed in the writing for the knowledge of the significant characters of fortified architectures, starting with the formal, typological, material and construction analyzes, up to the state of consistency of the assets. Through the study of the architectural and constructive characteristics of towers and castles, we want to highlight the signs of permanence and change over time, trace the structure of the defense system of the Piana area and contribute, through the knowledge of part of this territory to generate processes of conservation and revitalization of assets.

Keywords: knowledge, conservation, enhancement, fortified architecture.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

23rd MARCH | SESSION 2 | ROOM B
CHAIR: DENISE ULIVIERI

Rocca di Castrocaro: recupero, restauro e consolidamento degli spazi esterni e interni del mastio e della corte alta nel ‘primo girone’ e della cortina tra corte alta e bassa nel ‘secondo girone’ (sec. IX - sec. XIV)

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Abstract

The ‘Girone’ of the fortress of Castrocaro constitutes the oldest and highest part of the fortified structure and is in very serious conditions of decay and static. It is characterized by the presence of the keep, the imposing and daring tower with a pentagonal plan, dating back to before the year 1000, when the borders between the Lombards and Byzantines are found in this locality. Its construction, first as a wooden tower -guardingo-, is to be attributed to the Lombard Gens (7th century) and in the mid-9th century it was probably transformed into masonry with a wall enclosure around the hillock. The “Girone” can also be attributed to the rescue tower attributable to the 1500s and therefore to the restructuring of Antonio da Sangallo “the Elder”. This fortified complex includes, in addition to the keep and the rescue tower, the walled enclosure with its curtains, the tower of the guardhouse (door with antiporta), the tower of the keep (salient) and the upper courtyard with well-cistern. The restoration and consolidation, following cognitive tests on the wall structures, the keep and the upper court will allow the preservation of this fortification and its completion with the total recovery of the fortress and the safe opening to the public.

Keywords: keep, Castrocaro.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

23rd MARCH | SESSION 2 | ROOM B
CHAIR: DENISE ULIVIERI

**I ‘Torresini da Polvere’ di Bergamo: prospettive di conoscenza
conservazione e valorizzazione**

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Abstract

The invention of black powder and the use of firearms mark this crucial juncture in the history of the transition between the Middle Ages and modern times. The Venetian Republic soon realized the strategic role of the new invention. The Arsenal of Venice was among the oldest factories of the powerful mixture whose production was under the direct control of the Council of Ten, the supreme authority of the Serenissima. The storage took place inside small unusual and curious buildings, characterized by a particular pyramid roof; their perfect geometry, highlighted by the simplicity of the volumes, testifies to that rigor that never fails in military architecture, not even in small subsidiary deposits where it would have been possible to indulge in ornamental digressions. This essay, within a broader study of documentation and cataloging of the few surviving testimonies, focuses on the surviving examples in Bergamo (the upper Torresino of via Beltrami and the lower Torresino of San Marco), to highlight its peculiarities and present current activities aimed at their conservation and enhancement.

Keywords: 3D survey, drawing, conservation, enhancement.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

23rd MARCH | SESSION 2 | ROOM B
CHAIR: DENISE ULIVIERI

Il forte di Vigliena: conoscenza di un monumento dimenticato nella Napoli orientale

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Abstract

The paper aims to investigate the value of a significant fortified monument in the city of Naples that has long been destined to be forgotten: the Fort of Vigliena. It is a possible pivotal element for the urban regeneration of the eastern area of the metropolitan city, which is currently in a highly degraded and critical condition. The recent urban development of the area with strong industrial character has seen a progressive exclusion and overshadowing of testimonial traces, with the risk of losing an important tangible and intangible document of our culture. The monument can and must be the driving force for the sustainable transformation of an area of strategic importance for the city's development. The research, part of a third mission activity, focuses primarily on the knowledge and divulgation of the architecture to address its severe state of neglect and criticality. The action starts from the recognition of the monument's value and focuses on the importance of a shared process that identifies the Fortress as the driving force for a sustainable transformation of the built environment through the involvement of the local community.

Keywords: heritage, knowledge, fortification, Vigliena.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

23rd MARCH | SESSION 2 | ROOM B
CHAIR: DENISE ULIVIERI

Orchards in fortified Sala and the changing authenticity of the historical city

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Abstract

The medina of Salé or Sala is a historical and fortified city, on the Bu-Regreg River, on the Atlantic coast in Morocco. Medieval historians as leeseane edeen ibnu al khateeb cited the beautiful orchards of Sala and its architecture. The city had an arsenal inside its historical walls and the Bu-Regreg River went through them. The medina of Sala had a port. Besides, its fortifications are of various styles. Up to the beginning of the twentieth century, it included orchards. These latest were important for its survival in insecure times and offered to the inhabitants of Sala a green space for wandering safely inside its walls. It was an important feature of the historical city. Today, these orchards disappeared and reinforced concrete buildings took their places. Green spaces are really important for today cities concepts. However, these concrete buildings are today historical. Then it is important to examine Sala's authenticity before and after the 20th century. It is true that the question of authenticity evolved so much in time nevertheless this is really important to understand the genuine attributes of Sala that has so much historical values. History showed that the city evolved so much in time and has a great importance in Morocco's history. Then examining the fortified city's authenticity is important for its HIA so to make a statement of significance of the city evolution without orchards. Sala is a national landmark and it is really important because it is next to the capital Rabat that has a OUV of continuity. This induce that the management of Sala should take care of the evolution of its authenticity.

Keywords: historical orchards, medina, authenticity.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

23rd MARCH | SESSION 2 | ROOM C
CHAIR: LUCIA GIORGETTI

Evolución del frente murario más destacado y simbólico del recinto de la Alhambra: la muralla norte

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Abstract

This research is focused in the study of the northern wall of the Alhambra (Granada), with a deeper view to study its architecture, history and transformations till our days. The first palaces of the nasrid dynasty were established in the central and most elevated area of the Sabika hill. With the time, they were shifted to the north, until they were placed on the defence line of the military compound from a visually and structural point of view. This northern wall has projected the image of power over the city of Granada and its territory in every time in history. There are different milestones in its configuration, like the changes made by Yūsuf I (r. 1333-1354), the building of the Palaces of Comares and Leones or the modifications carried out by the Catholic Monarchs after the conquest of Granada. All these uses were superimposed, but with the prevalence of the palatial one above the fortified walkway that surrounded the Alhambra. Some mullioned windows were built above the wall. At the same time, the wall was changing in some parts, like in the Patio de la Reja area. There, the old walkway that existed until the fourteenth century was parallel to the south gallery of the Patio de Lindaraja. Ultimately, the building of the huge Tower of Comares by king Yūsuf I was the enlargement of a previous tower that existed in the northern wall of the Alhambra. It is a paradigm of the transformation of a defensive front to an element of royal power display.

Keywords: Alhambra, northern wall, Tower of Comares, conservation.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

23rd MARCH | SESSION 2 | ROOM C
CHAIR: LUCIA GIORGETTI

Nicosia Venetian Walls. Common conservation strategies for a divided palimpsest

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Abstract

Among the different episodes of fortified systems present along the coasts of the Mediterranean, the Venetian walls of Nicosia constitute an example of particular interest in monumental and architectural terms but also as they constitute a tangible symbol of identity and civic pride, clearly visible in the fact that both communities resident in the city (Turkish-Cypriot to the north, Greek-Cypriot to the south, divided by the so-called Green Line since 1974) have adopted the city walls as a symbol of the city in its unity. The monumental defensive system, built on a project by the architect Giulio Savorgnan in 1567 and today still preserved in its original structure, therefore constitutes an interesting case of study and research, both as regards the constructive and conservative aspects of its structures and as a potential catalyst in the process of reunification of the city, within which cultural heritage can play a central role given its recognition as a shared heritage.

Keywords: heritage, conservation, Venetian Walls, Nicosia.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

23rd MARCH | SESSION 2 | ROOM C
CHAIR: LUCIA GIORGETTI

Digital survey and architectural representation of a Genoese tower for the Museum of the city and territory of Galata

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Abstract

Galata, one of the oldest districts in Istanbul, still shows a historical and multi-layered urban texture. In 2019, within the “Urban Facade-Istanbul Waterfront” international workshop, a 3D laser scanner survey of Galata’s city walls was carried out. The raw data therein collected became the basis for a thesis in Architecture, as part of a joint research (Politecnico di Torino, Özyeğin University, Università di Firenze) on the fortified systems in the Mediterranean area. The multidisciplinary research comprised the historical study of the transformation of the urban tissue in the considered area, and the relationships between the city, the walls, and the towers. We processed the digital survey with the aim of realizing 3D models and orthophotos of a sector of the walls characterized by a Genoese semicircular tower, which today is abandoned. The final drawings are aimed at recognizing the building’s transformations, the different materials, and the relationship between the monument and the context. The research also outlined the damages, underlining the urgency of restoration works.

Keywords: digital survey, 3D modeling and representation, open-air museum, Galata.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

23rd MARCH | SESSION 2 | ROOM C
CHAIR: LUCIA GIORGETTI

Il castello di Francavilla di Sicilia. Un presidio fortificato sulla Valle dell'Alcantara. Dall'epoca medievale alla guerra austro-spagnola

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Abstract

The Ionian coast of Messina, in Sicily, is geomorphologically characterized by a system of fiumaras, on which many small settlements, spread throughout a large area, already in medieval times. In these territories, in the center of the valley that feeds the Alcantara Fiumara, there are the ruins of the castle of Francavilla dating back to the thirteenth century, which together with those of Fiumedinisi, Savoca, Forza d'Agrò, Sant'Alessio, Castiglione, Motta Camastra, Castelmola and Taormina villages, constituted the defensive system of this area. The study was organized into two different scales: one on the landscape value of the place regarding both the historical and the natural environment, and that of the detail of the architectural object. If the first has highlighted the relationships among all the other fortified structures of the area, the second, carried out by stratigraphic analysis of upstanding structures, has allowed to determine different historical-construction layers over time, from late 13th century to the first half of the 16th century. In 1719 the site was place of Francavilla military battle between the Spanish and Austrian armies, whose cartographic documents have been traced.

Keywords: fortifications, Francavilla, masonry tipologies, cultural landscape heritage.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

23rd MARCH | SESSION 2 | ROOM C
CHAIR: LUCIA GIORGETTI

**Le fortificazioni come elementi di reti difensive a scala territoriale.
La Fortezza di Agrò nel territorio della costa jonica messinese**

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Abstract

The Agrò Fortress, located on the Messina Ionian coast, is part of the fortified structures of the territory historically known as Agrò Valley, in the ancient Sicilian medieval administrative division of Valdemone, including the north-eastern portion of the island. The Agrò Valley, which the fortress controls, is a place full of residential settlements, as well as an area in the feud of pre-existing greek monasteries supported by the Normans, affected, in modern times, like others in the Messina area, by the transformations carried out by the Corps of Royal British Engineers, who came in the wake of the English army in defence of the Bourbon government in Sicily between 1806 and 1815.

The historical-archival research has systematized the data of the historical maps, the indirect sources and those of the historical road network, and the relationships with the fortifications of the contemporary era, in order to reconstruct the territorial scale system of the defence of the Valley.

The survey, carried out with digital photogrammetry methodology has, then, allowed to identify some stratigraphic historic sequences. The comparison between the iconographic, morpho-typological, construction data, and the partial application of the stratigraphic method of the elevations, for the central core, has allowed us to define a hypothesis of relative dating of the construction phases of the building.

Keywords: fortress, Greek monasteries, Agrò Valley, Valdemone.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

23rd MARCH | SESSION 2 | ROOM C
CHAIR: LUCIA GIORGETTI

The pioneering intercontinental framework of Portuguese fortification in the Expansion

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Abstract

In 2022 we celebrate 200 years of Brazil's independence, the huge country of the New World, separated from the *United Kingdom of Portugal, Brazil and Algarves*, the only State that had its capital on two continents (Lisboa and Rio de Janeiro). The Portuguese Expansion began very early (Ceuta, 1415) and the Portuguese Colonial Empire was the one that lasted the longest (1975), having its epilogue in the origin of one of the most recent independent states (East Timor, 2002). The irreplaceable role of the fortifications was decisive for the success of the mastery of the seas, highlighting some primal dates and cases, mainly from the 15th and 16th centuries and already classified by Unesco, as for example: - 1455 - first dedicated fort implanted outside Europe, Arguin/Mauritania (inside Bank of Arguin National Park); - 1507 - construction of the first European Fort on the eastern side of the world, Quíloa (Kilwa Kisivani)/Tanzania; - 1540 - Mazagão (El Jadida, *Cité Portugaise*)/Morocco, the innovative European bulwark city built overseas; - c. 1560 - Fortress of Qal'at al-Bahrain/Bahrain, built after the great bulwarked reform (1558) carried out on the first fortification of Hormuz/Iran (1507-1515); - 1593 - Fortress of Mombasa/Kenya, the last major achievement of the so-called *Portuguese Maritime Empire of the East*. However, we indicate many more cases, all of them from Portuguese origin within the same frame of time and also considered as World Heritage. Along with a chronological demonstration of the colonial Portuguese fortifications all over the world, it is intended to evoke the exceptional case of the establishment of the borders of Brazil, where last a lot of examples that cover almost four centuries of the history of military architecture, including the great fortresses *a la Vauban* of Macapá and of Príncipe da Beira (18th century), in the Amazon basin. These two major works, together with 17 other sites, appear on the Unesco's Tentative List of Brazil for the classification of the defensive network of the great frontier of South America as a World Heritage Site.

Keywords: portuguese fortification, expansion, overseas.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

23rd MARCH | SESSION 2 | ROOM D
CHAIR: SANTIAGO QUESADA-GARCÍA

Il ruolo del rilievo integrato nell'interpretazione dell'edificio storico: Rocca di Sala a Pietrasanta (Lu)

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Abstract

The subject of this paper is the architectural survey, realized with integrated methodology, of the Rocca di Sala fortress (Pietrasanta, Lucca, Italy) and the stratigraphic analysis of the elevations of the Palazzo Guinigi building, located inside the fortress. The task of surveying the fortress has been realized by us as a part of the ongoing feasibility study called “Restoration and reuse of the Rocca di Sala fortress and related access paths”, promoted by the Municipality of Pietrasanta. The medieval Rocca di Sala fortress (mentioned by historical sources since 1160 A.D.) is located on a promontory overlooking the old town-center. Because of the position, the fortification can be reached by citizens with difficulty: therefore, the feasibility study aims at solving the problem of accessibility to the fortified perimeter. Due the complexity of this area, the project of new routes has requested the detailed knowledge of the characteristics of the promontory on which the fortress is; in fact, the hill has been modified over time by irregular paths, terraces and stretches of masonry, today partially underground and hidden by vegetation. The use of the 3D laser scanner technology, integrated with drones, made it possible to acquire plano-altimetric data, returning an accurate reading of both the hill and the entire fortified complex. The result of the relief campaign was a point cloud from which CAD drawings were obtained. These survey data were also the starting point of preliminary, archaeological investigations: in particular, a stratigraphic analysis of walls was carried out on the fifteenth-century Palazzo Guinigi using a photogrammetric relief by drone. Through the identification of various stratigraphic wall units (USM), it was possible to reconstruct the relative sequence of transformations of the façade of the building, allowing us to read part of the history of the fortress, directly on the monument.

Keywords: Pietrasanta, fortress, drone survey, stratigraphic analysis.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

23rd MARCH | SESSION 2 | ROOM D
CHAIR: SANTIAGO QUESADA-GARCÍA

Levantamiento fotogramétrico de las atalayas medievales del Altiplano más septentrional de Granada

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Abstract

The district of Baza took up more than a fourth of the Nasrid kingdom of Granada, the last Islamic region in the Iberian Peninsula (thirteenth to fifteenth centuries). This area encompassed the northern highlands of this region, the Almanzora river valley and other areas that would later be incorporated into the province of Almería. The province of Granada came to include the municipalities that nowadays constitute the Baza and Huéscar highlands. There are more than thirty preserved watchtowers in these areas. They are in strategic points with wide visibility, enabling communication through smoke signals during daylight or beacons at night. In the Nasrid period this system was reinforced, and new towers were built in locations of special relevance. They are usually made in masonry with gravel filling, with circular base and cylindrical or tapered shape, with the solid base and a single chamber with elevated access for the tower watch, from which the plume of smoke could rise through a hole in the terrace. The upper part was intended for the canopy and, if necessary, to make a beacon. This network not only allowed the information about what was happening in the district to reach the main fortresses, and ultimately, to arrive to the Alhambra citadel, the seat of the Nasrid dynasty. This paper is focused in the digital survey that has been carried out on the towers preserved in these areas, in the northern border of the Nasrid kingdom of Granada, allowing a scientific and comparative analysis of this group of defensive elements from a morphological, architectural and constructive point of view (1).

Keywords: Tower, borderline, Late Middle Ages, Nasrid kingdom, Baza, Huéscar.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

23rd MARCH | SESSION 2 | ROOM D
CHAIR: SANTIAGO QUESADA-GARCÍA

Taranto underground: digital survey and virtual exploration of the hypogea along the Aragonese walls

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Abstract

The downtown of Taranto (commonly indicated as ‘Città Vecchia’, Old City) reserves traces of its millennia-old history. A highly fascinating system of these traces can be found in the underground of this downtown, with countless cave-built spaces. In time inhabitants have used to dig into the calcarenite embankment, which was easy to quarry and process. In general, it can be noticed that there are various spaces related to religious functions and burial hypogea all along the Northern side of the settlement, while along the ‘Mar Grande’ (The ‘Large Sea’) side the uses are mainly related to work and market activities, with storerooms, oil mills, grain pits and manufacturing or commercial spaces. This concentration of trade-related functions is due to the presence of aristocratic mansions above the walls and of the harbor. In time the border of the town center was well defined by the city walls, apparently emerging from the surface of the water, but based on bank and on the cliffs. The appearance of the walls came from a series of interventions, aimed to improve the military response wanted by Ferdinando D’Aragona. The walls were made delimiting the emerging cliffs and various materials filled the empty spaces between the walls, the natural rock, and the existing constructions. Buildings for any functions rose over this natural/artificial soil before and after the presence of the new walls, incorporating, transforming or bringing the presence of the (so called) hypogean cavities. Despite the completion of the work with the addition of bastions, in XVII century there was a progressive loss of military value of the fortifications. The need for a direct access to the sea from the commercial ‘underground’ activities brought the opening of various passages breaking through the walls. The subject of this study is the section close to the Aragonese walls, where various chambers beneath the buildings have access to the sea. The remarkable number of cavities and galleries are at different levels below the surface, very often they intersect and influence each other, forming what may be perceived like ‘another city’. The present research, proposes the results coming from the digital survey of this system, where lasergrammetry and photogrammetry were essential tools to improve the knowledge about historical stratigraphy and also defining better the relationship between the city and its subsoil. The survey was mainly conducted using 3D laser scanner technology, which has allowed to define a specific interpretation using a specific digital 3D model of the current state of hypogea and the following development of an interactive virtual exhibition.

Keywords: Taranto, digital survey, hypogeum, stratigraphy.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

23rd MARCH | SESSION 2 | ROOM D
CHAIR: SANTIAGO QUESADA-GARCÍA

Digital artefacts for the knowledge and documentation of the fortified heritage. The Castle of Torres Vedras in Portugal

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Abstract

The research presents the results of the study conducted on the Castle of Torres Vedras, located in the Portuguese city of the same name in the district of Lisbon, whose architectural palimpsest is characterised by an initial watchtower (built by the Turduli Veteres to take advantage of the site's excellent natural defences) fortified by the Romans and subsequently conquered and reinforced by the Moors until 1147, when it came under Christian rule. All that remains of the former medieval castle are the Romanesque remains of the Church of Our Lady and the walls that follow a pseudo-ovate layout.

In accordance with the provisions dictated by the most recent plans for the management and valorisation of cultural heritage, which have focused attention on the importance of the "digitisation" of cultural heritage and the various forms of archiving and dissemination of information associated with it, the study proposed here has as its objective the knowledge, documentation and digitisation of the asset under investigation, aimed at structuring both a graphic database and an archive of three-dimensional models that can subsequently be implemented with specific thematic elements. To this end, methodological recourse was made to the UAV survey. Specifically, the four-wheeled drone used allowed observation from new viewpoints and the collection of images, without any contact with the object, capable of effectively describing the space and morphology of the fortified architecture. The subsequent photogrammetric processing of the data (by means of specific software for obtaining dense point clouds and textured 3D meshes) made it possible to observe and analyse all the peculiarities of the architectural artefact also through the subsequent thematisation of multi-scalar two-dimensional data. The final aim of the operation is, as of today, the documentation of the asset, which, after the extensive damage caused to the castle by the catastrophic earthquake of 1755, is scarcely present.

Keywords: knowledge, digitisation, survey, Torres Vedras Castle.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

23rd MARCH | SESSION 2 | ROOM D
CHAIR: SANTIAGO QUESADA-GARCÍA

Castelnuovo: una fortezza dimenticata

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Abstract

Digital technologies give us the opportunity to apply new methods of analysis while studying urban and architectural transformations related to our cities. So, investigating the evolution and history of a building or a place, animating their different phases of construction or showing virtually how they occur, are topics much easier to achieve today. The common questions are: What did a particular place or building look like a few centuries ago? What are the changes occurred? What events have taken place, bringing them to the current appearances?

This essay presents an investigation back in time of an important Renaissance building for the history of Paduan fortifications: Castelnuovo. This fortress was designed by Barolomeo d'Alviano around 1513 soon after the defeat of Venice Republic by the League of Cambrai. Our reconstruction is based on the integration of writings, documents, maps, drawings and outcomes derived from archaeological excavations. So, the focus of this essay is the virtual reconstruction of the fortified building known in Padua as Castelnuovo to show its final design as well as its transformation over time. Indeed, this building was for about a century the subject of a debate, testified by numerous documents, whose aim was to solve defensive needs. This fortress, never completed, is today mostly unknown to citizens, who ignore the extraordinary history and complexity of the building. This happens because the municipal urban plans, applied from the end of the XIX century, have totally changed the original appearance of Castelnuovo, so this fortress has been slowly incorporated into the surroundings. Since it is impossible to erase the changes that have been carried out in the last centuries, our essay proposes to give virtual life to Castelnuovo, adding to the historical research the power of digital survey and representation. Our aim is answering the numerous questions about the appearance of the forgotten fortress.

Keywords: Padua, Castelnuovo, digital survey, digital reconstruction.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

23rd MARCH | SESSION 2 | ROOM D
CHAIR: SANTIAGO QUESADA-GARCÍA

Levantamiento digital y modelización 3D de la Torre Rubia, del siglo XVI en Molinos Marfagones (Cartagena, Región de Murcia)

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Abstract

Rubia Tower, in Molinos Marfagones (Cartagena, Region of Murcia, Spain), is one of the fortress towers that were built in the Campo de Cartagena at the end of the 16th century, with the aim of serving as surveillance and protection for shepherds and farmers who worked the lands of the owner of the tower against the frequent incursions of Barbary pirates who landed on the nearby coasts. Therefore, this type of post-coastal towers or strong-houses, also called “repopulation towers”, formed the second line of the system of coastal defensive towers developed during the reign of Felipe II. This tower is privately owned and is in a good state of preservation, although with more modern buildings attached to both sides. It has a rectangular floor plan and a structure of masonry walls that originally had to be plastered in an ochre tone (hence the “Rubia” wording). The current access is through the ground floor of the house attached to the west wall, and to communicate with the two upper floors and to access the roof there is a spiral staircase in the northeast corner.

The objective of the work carried out has been to obtain complete digital documentation of the tower by means of digital photogrammetry. The difficulties in correctly developing this work methodology meant that the survey was completed with the use of a drone. It was possible to visually tour the entire building and, with 3D modeling, obtain three-dimensional scale models with hyper-realistic texturing. The result is graphic information that facilitates the formal and constructive analysis of the monument, necessary for an adequate comprehensive restoration proposal. The methodology followed and the results obtained are described in order to contribute to the conservation and dissemination of this Tower.

Keywords: Rubia Tower, Cartagena, drone, photogrammetry, graphic documentation, 3D modeling.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

24th MARCH | SESSION 3 | ROOM A
CHAIR: GIOVANNI COPPOLA

Il forte di Santa Maria nel Golfo della Spezia. Materiali per la ricostruzione virtuale del manufatto storico andato distrutto

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Abstract

Current military settlement of Santa Maria occupies the same site of the star-shaped fort built by the Republic of Genoa starting from the 16th century on the west coast of the Gulf of La Spezia, an area historically interesting for its strategic position and for the physical appearance such as to guarantee good shelter of the vessels. This paper focuses on the historic fort, damaged by the British in 1800 and subject to a recovery program in the Napoleonic era, when French and Italian engineers are sent by the French government to the Gulf to carry out a vast statistical-descriptive and cartographic operation, aimed at an impressive urban-military infrastructure project. These surveys have produced a large number of topographical scale drawings describing in detail architectural features of the ancient fort. Through these sources it would be possible to virtually reconstruct the artefact that no longer exists. Fort of Santa Maria was in fact demolished in the second half of the nineteenth century and replaced by a new gun battery. Cartographic sources allows us to reconstruct appearance and functions also of this more recent infrastructure.

Keywords: Eastern Liguria, Genoese engineers, Napoleonic surveyors, forts of the Kingdom of Italy.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

24th MARCH | SESSION 3 | ROOM A
CHAIR: GIOVANNI COPPOLA

Castel Gonzaga di Messina

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Abstract

Located on the Tirone hill, that divides two streams that have always defined the city of Messina. The Camarro along the southern border of the town, the other the Portalegni stream, which runs through the center of the urban core. Referred to by Polybius as “Mons Calcidus”, it retains its name in the work of 1658 by Placido Reina, who referring to the same name, specifies where today the Gonzaga Fortress is. Under the hill, on the occasion of the excavations of the railway, the finds of the ancient Greek acropolis of the city were found. The basic question is that although it is a majestic work of the city, which dominates the Strait of Messina, it is unknown to many. The modest policy of the institutions in charge as well as the tortuous and narrow road path within a densified urban fabric, such as that of Monte Piselli, have represented obstacles partially filled by the admirable work of an ONLUS that attempts to spread its image and culture in the territory, with excellent results. In this paper we give the first hints of the studies undertaken to study the geometric conformation following a survey by laser scanner, but also to create three-dimensional models aimed at creating virtual (VR) and augmented reality (AR). The work is also inspired by the dissemination of the 3DLab Sicily project funded by the Region.

Keywords: digital survey, 3D modeling, VR/AR, laser scanner 3D.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

24th MARCH | SESSION 3 | ROOM A
CHAIR: GIOVANNI COPPOLA

**Notas investigativas sobre el legado de los Antonelli en el Caribe;
Reformas al Sistema de Defensa de la ciudad de San Juan de Puerto
Rico siglos XVI-XVII**

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Abstract

The theme of European defensive architecture is introduced in America from the event of the Discovery and subsequent conquest and colonization of the new territories by Spain, who soon saw the need to ensure the defense and retention of their new possessions against their European rivals, England, France, Holland, and Denmark. Spain took on the task of fortifying those strategic ports in the Caribbean to prevent them from falling under enemy rule. One of those main ports was the port of San Juan located on the Island of Puerto Rico, considered as the Key to the Indies since it depended on the protection of the ships that came and went from the New World carrying the riches to Spain.

The subject of the Antonelli has resurfaced from oblivion during the last three decades, carrying out numerous studies on their work in Europe, Africa, and America. But little has been studied about the legacy of the Antonelli in Puerto Rico. This study analyses the Defensive System of the City of San Juan Centuries XVI and XVII; from the beginning to the Military Reforms of the Fortifications of the city of San Juan de Puerto Rico carried out by the Military Engineers Bautista Antonelli and his son Juan Bautista Antonelli.

Keywords: Antonelli, Puerto Rico, Caribe, fortifications, defenses.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

24th MARCH | SESSION 3 | ROOM A
CHAIR: GIOVANNI COPPOLA

“Fora les muralles!” la excavación de la muralla renacentista de Cullera durante las obras de peatonalización del Paseo del Dr. Alemany

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Abstract

The objective of this communication is to publicize the results of the archaeological excavation carried out within the framework of the remodeling works of Passeig Dr. Alemany in Cullera. Thanks to this intervention, it has been possible to document the section of the town wall located at the intersection with Santa Marta Street, which was dismantled in the 19th century to open the promenade, as well as a part of the irrigation channel, of medieval origin, which ran parallel to it. In this communication it is intended to expose the historical-archaeological framework of the documented remains, their constructive characteristics, the archaeological stratigraphy recorded during the excavation and the interpretive analysis of the entire defensive complex of the Renaissance period in Cullera to reconstruct the history and define the urban evolution of the studied space.

Keywords: wall, ditch, archeology, Renaissance.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

Polyorctic adaptations of the fortifications of the Order of Calatrava: the case of the Castle of La Peña (Spain)

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Abstract

During the Late Middle Ages, the Command of the Calatrava Military Order controlled the south eastern territory of the province of Jaén (Spain). This region is situated between the flat lands of Cordoba to the west, the valley of the Guadalquivir river to the north and the mountainous border of the Nasrid kingdom of Granada to the east.

This region is defined by its topographic relief and is surrounded by mountains to the east. In front of them rises the limestone hill of La Peña of Martos, with its 1003 metres above sea level. A wide area can be visually controlled from this conical and symbolic promontory. The Calatrava Military Order built their main castle on top of this high hill, as a symbol of their power in this region. This fortification had a key role to protect the territory from attacks from the Nasrid kingdom of Granada during the thirteenth to the fifteenth century. As a result, several interesting defensive elements were added from the Late Middle Ages on that were also used in other military buildings of the Calatrava Military Order.

This paper analyses these defensive mechanisms and the improvement of military features used in this territory, vital to this Order and to the kingdom of Castile. This research departs from the study of the Castle of La Peña, the headquarters of the Command of the Calatrava Military Order in the district of Martos (1).

Keywords: Christian fortifications, masonry walls and towers, Late Middle Ages, border.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

24th MARCH | SESSION 3 | ROOM A
CHAIR: GIOVANNI COPPOLA

Disegni di città e fortezze. Gli interessi politici e culturali dei granduchi Medici di Toscana per le fortificazioni di terra e di mare tra '500 e '600

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Abstract

The interest of the Grand Dukes of the Medici family for geography, cartography and travel reports was really relevant, especially with Cosimo I. In 1561-62 he founded the Order of the Knights of Santo Stefano (war fleet of the Grand Duchy of Tuscany) and commissioned the pictorial cycles with geocartographic and urbanistic subjects on the Wardrobes and on the walls of Palazzo Vecchio (in Florence), by the cosmographer Egnazio Danti and other technicians. This interest, of a cultural, promotional and also political-strategic nature, was addressed, in particular, to the settlements and fortifications and is demonstrated by the extensive documentation, especially iconographic, dating back to the second half of the 16th century and the early 17th century, preserved in some collections of the State Archives of Florence. These documents are historically linked to the dynamics of maritime trade and to the complex geopolitical and military strategies for the use and control of the especially Mediterranean space, starting from the mid-sixteenth century. In this period, in fact, the small Italian states and above all Turkey and France (on the one hand) and Spain (on the other hand), and on certain occasions also England and Holland, are in competition. Unlike many systematic collections, produced by the navies of the modern age of the Italian and European states (such as the French ones presented by the Author in Florence in FortMed 2016), the sixteenth-seventeenth-century drawings of cities and fortresses that are considered here they are inhomogeneous, of almost always unknown provenance and most of them manuscripts. They depict, in great detail, settlements and fortifications of land and sea of the Mediterranean, Italy and Europe, sometimes with the military events that involved them. These documents allow – thanks also to the prevalence of the typical pictorial-landscape and perspective language – to perceive immediately the settlements and fortified architectures of this important historical phase, in their urban and construction form.

Keywords: drawings, fortifications, Medici Grand Dukes, geopolitical and cultural interest, 16th-17th centuries.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

24th MARCH | SESSION 3 | ROOM A
CHAIR: GIOVANNI COPPOLA

Muzio Oddi architetto di fortificazioni nell'Italia del Seicento

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Abstract

Muzio Oddi (1569-1639) was among the most distinguished representatives of the scientific community in the Duchy of Urbino between the sixteenth and seventeenth century. He was perhaps the last mathematician at the Della Rovere court, as well as being a philosopher, architect and military engineer. Oddi has not yet been fully studied, especially as regards these last two disciplines. In the campaigns with Philip II of Spain during his war against Henry IV of France, the young “urbinate” achieved fame as an expert planner of fortified buildings, as witnessed by his activity in this area over the following decades. He worked in northern Italy and in Lucca, to which city he moved in 1625 to assume the direction of the building of the city walls. Although this project had been begun in the previous century, it was still proceeding apace. From the extensive corpus of Oddi's unpublished drawings found in various European collections, often accompanied by detailed comments, for the first time some case studies of fortifications have been examined.

Keywords: Oddi, treatises, historical cartography, archives.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

24th MARCH | SESSION 3 | ROOM A
CHAIR: GIOVANNI COPPOLA

El modelo defensivo del presidio de la ciudad de San Agustín de la la Florida-USA, entre los siglos XVI y XVIII

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Abstract

The Presidio of San Agustín de la Florida that appears drawn in the historical planimetry and cartography between the 16th and 18th centuries has been investigated as a resource to virtually understand and reconstruct the type of urbanism presented in the plan by Juan Joseph Elixio de la Puente (1764). A defensive urban architectural typology used as a visible limit of the power of the Spanish Crown since the 16th century in America. These settlements initially designed with the instructions of Fernando el Católico in 1513, and later with 1573 Ordinance of Felipe II, were units of a large system. Each town was constituted by a military establishment and a religious mission. Due to this, when Pedro Menéndez de Avilés founded San Agustín in 1565, in the Atlantic Coast of North America, he located it near of the Fort Carolina. This wooden fortress, built and occupied by French Huguenot soldiers, was reused by Spanish conquerors. This is demonstrated in the first graphic representation of the city made by Hernando de Mestas in 1576, who located the settlement next to a fort, because the Spanish Crown needed to control, in the Florida, the return route of the Galleon fleets to the Iberian Peninsula. Although, the type of fortification that appears on this Map was temporary or campaign due to its precarious or more ephemeral nature. Thence, the process of constructive evolution of the urban architectural context in the three historical periods studied that the plans and maps shown, oriented to the development of its permanent strength. The military engineers, in charge of this procedure, regulated the designs with the principles of modern polyorhetics that combined defense and attack techniques to the site.

Keywords: presidio of St. Augustine in Florida, fortifications, historical cartography and planimetry, defensive model.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

24th MARCH | SESSION 3 | ROOM B
CHAIR: TERESA GIL PIQUERAS

La conoscenza dei sistemi fortificati della valle dell'alto Volturno, il caso del Castello Pandone di Cerro al Volturno

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Abstract

The paper presents an analysis of the Pandone Castle in Cerro al Volturno. Situated at the top of a hill, the fortification takes up a position above the medieval village, visually dominating a large section of the valley. The foundation is dated to the second half of the 10th century, but the castle underwent many transformations during its evolution. The analysis of the fortification passes through a necessary framing phase to evolve with the study of the state of conservation. All the areas are studied through the photogrammetric processes typical of the indirect survey methodology. The approach to knowledge of the building is aimed at the dissemination and promotion of the asset with the intention of attracting the attention of the scientific community. The contribution proposes the study of the Pandone Castle of Cerro al Volturno as an indispensable tool for the knowledge and promotion of an object of declared cultural interest, whose millenary history represents one of the points of concentration and stratification in which the phases of the evolutionary process of the territory of the high Volturno valley can be seen.

Keywords: Castello Pandone, Cerro al Volturno, conoscenza, patrimonio.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 3 | ROOM B
CHAIR: TERESA GIL PIQUERAS

Geophysical surveys at the Aragonese Castle of Taranto (Italy)

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Abstract

The Aragonese Castle is located in the south-western most part of the island, corresponding to the acropolis of Taranto during the Magna Grecia period. It is at the top of a calcarenite body ascribed to the Last Interglacial time (MIS 5). Its building was completed in 1492, but there aren't indications of an official beginning; some architectonic particulars, including the structure of the church inside, seem to indicate that the building started during the X/XII century. Calcarenite ashlar present in the wall have size characteristic of the Magna Grecia/Roman time; therefore, it is possible that parts of the current fortification were built up the Magna Grecia/Roman one or, at least, reworking their parts. The present structure of the castle is the result of different phases, not yet well documented, of improvement and re-utilization that occurred during the century of life. The channel that separated the past acropolis from the centre of Taranto was cut at the end of the XIX century, on the occasion of the realization in this city of the biggest base of the Italian fleet; however, old documents indicate that in this area a small valley could limit the acropolis from the outside. The goals of the present work are: I - to individuate the original topography of the natural environment; II - to individuate past structures covered by new ones or sediments. The preliminary results are encouraging and point out the presence of different structures that could be of archaeological interest.

Keywords: Aragonese Castle, Taranto, GPR.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 3 | ROOM B
CHAIR: TERESA GIL PIQUERAS

La torre di Tabbiano e il sistema di difesa dei confini della Repubblica Pisana in età medioevale: analisi storica finalizzata alla conservazione ed alla valorizzazione

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Abstract

The present study deals with the process of preparing a restoration project with the conversion of a turreted building with historical-architectural value, which has covered several functions over the centuries, with the intention of transmitting its intrinsic values. The case study presented is the so-called 'Torre di Tabbiano', which was built in the mid-12th century as the bell tower of the disappeared church of S. Ponziano di Tabbiano, in the current municipality of San Giuliano Terme, and then probably served as a watchtower within the communication system of the municipality of Pisa.

The method included an historical-architectural reconstruction of the asset and its context, assisted by the survey phase with visual analysis and comparisons with similar architecture in terms of construction techniques and historical functions in the surrounding area.

Keywords: restoration, watchtower, bell tower, Tabbiano.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 3 | ROOM B
CHAIR: TERESA GIL PIQUERAS

Feudi imperiali liguri ed età moderna: il destino dei castelli nell'Oltregiogo genovese

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Abstract

With the advent of the modern age, in the territories of the “imperial fiefdoms” of Valle Scrivia behind Genoa - ruled by city families but subject to imperial jurisdiction between the fourteenth and eighteenth centuries - we are witnessing a process of profound renewal of the feudal society that it moves from the castle perched on the heights to the newly built palace-fortress at the bottom of the valley, where the function of representation is associated with the defensive role. A more comfortable residence suited to the noble owners, contiguous to the main road to allow the Lord quick connections with Genoa - the place of origin of the family, where he continues to carry out his commercial and political activity. The aristocratic families (Spinola and Fieschi, Adorno, Pallavicino) moved within a few decades from the Castle to the Palace (Ronco, Arquata, Pietrabissara, Crocefieschi, Savignone), with some exceptions where the geographical and political conditions determine a different destiny for the original building: in some cases the castle itself was transformed into a palace (Montessoro), before being abandoned in favour of a new building (Borgo Fornari); or it is enlarged and converted into a fortress (Gavi and Serravalle); in the more isolated areas it is finally abandoned once its importance has been lost (Castello della Pietra di Vobbia). The new buildings are sturdy and austere, far from the refined style of the villa residences built at the same time in the suburbs of Genoa, but based on the same typological and architectural characteristics: the atrium-staircase-noble hall system develops within a building volume that it imposes itself on the surrounding landscape, overlooking it through loggias and large openings. In the manner of the Pre-Alessian and Alessian Villas built in the Genoese districts of Albaro and Sampierdarena, the new buildings constitute the nodes of an efficient political and military control network of the ‘Oltregiogo’ lands, along the connecting axis between the sea and the great plain, straddling the Apennines.

Keywords: castle, palace, society, suburbs, typology.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 3 | ROOM B
CHAIR: TERESA GIL PIQUERAS

Polo museale Federico II di Svevia *Stupor Mundi*

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Abstract

The Palatium of Federico II in Lucera, an integral part of the SwabianAngevin Fortress that stands on the top of the Albano hill east of the Daunia mountains, is one of the most important medieval architectures of Southern Italy characterized by a strong link with the surrounding landscape and its unique geometry. The intervention aims to activate a path in which the aspects of conservation are linked to those of refunctionalization through cultural, educational and museum activities that make the visitor participate and involved in the history of the city, including aspects concerning the activities and life of the monument and the impact it has had in the development of the city. In particular, interventions aimed at the conservation, protection and safety of the existing remains are envisaged, following the logic of minimum intervention, the criterion of distinguishability and the figurative identity of the additions. Inside there will be space for rest areas, in which to disseminate the history of the property, covered with steel and wood floor intended for exhibition hall with vertical connections consisting of a staircase and an elevator. A path made with a cantilevered steel structure, will run along the walls connecting the walk / walkway to the central body of the castle having a function for public events. As part of the restoration and redevelopment project, the investigations and in particular the survey operations with laser scanner and remotely guided drone were of fundamental importance, which, integrated with the traditional methodologies (direct, topographic and photogrammetric survey) allowed to acquire large amounts of data with high precision in a short time, creating composite works of great effect and exceptional documentary value.

Keywords: conservation, integration, usability, compatibility.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 3 | ROOM B
CHAIR: TERESA GIL PIQUERAS

Il castello di Castel Volturno: un esame tipologico e costruttivo

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Abstract

The paper presents the results of a study on the castle of Castel Volturno, located in Terra di Lavoro (Campania region). This important complex was erected, with the connected fortified village, near the Roman site of *Volturnum* as a coastal garrison of Capua and originated from the reconfiguration of the surviving structures of a bridge from the Flavian age located not far from the mouth of Volturno river. The research proposes a stratigraphic examination of the elevations of the castle, which made it possible to identify the remains of the classical bridge, the fortress of the 9th century and complex late medieval and modern phases. Some observations are also proposed regarding the residential typologies of the annexed *castrum*, where there are numerous Romanesque houses realized with tuff stones, unique in the early medieval southern context, generally characterized by wooden houses.

Keywords: Langobardia Minor, castle, cultural heritage, mensiochronology.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 3 | ROOM B
CHAIR: TERESA GIL PIQUERAS

Torre de Cope en Águilas (Región de Murcia, España). Análisis integral y musealización de una torre del siglo XVI para la defensa del litoral murciano

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Abstract

Cope Tower, in Águilas (Region of Murcia, Spain), is part of the extensive defensive system made up of coastal surveillance and defense towers, designed and built in the 16th century, for the defense of the Mediterranean coastline. This tower, built in 1573 by order of the Council of Lorca and a few meters from the shore of the sea, had the function of protecting the shepherds of the area and, especially, the fishermen, since in this part of the coast there was an abundance of fishing and tuna traps, in addition to having several sources of fresh water. For this reason, the tower suffered numerous attacks from Barbary pirates. Initially it was a free-standing tower, with a square floor plan and the characteristics of this type of defensive tower. In 1663, the tower is in ruins and must be rebuilt. It is transformed by adding a ravelin or exterior wall, with a trapezoidal plan, and two small circular towers at the ends, forming an irregular polygon whose shorter side faces the sea. The successive reforms, especially in 1702 and 1801, would only affect the interior distribution of the complex. The tower, owned by the municipality, is in a good state of conservation in the main body, while the rest (ravellin and circular towers) only have the start of the walls. It is located north of Cabo Cope, within the limits of the Cabo Cope and Puntas de Calnegre Regional Park, so its musealization would allow it to be definitively integrated into this significant natural, landscape and cultural environment. For this reason, a comprehensive analysis of the Tower has been carried out, completed with a museum proposal, with exhibition panels, to make it accessible and show the visitor the importance of this tower and its role in the defensive system of the Murcian coast over the centuries. XVI to XVIII.

Keywords: Cope Tower, musealization, Águilas, cultural tourism, comprehensive analysis.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 3 | ROOM B
CHAIR: TERESA GIL PIQUERAS

Il sistema delle fortificazioni lungo il corso del fiume Oglio nel Ducato di Mantova

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Abstract

The defense and control of the territory, its borders, resources and communication routes are factors that led to the construction of numerous fortifications in the Po valley. Analyzing the course of the Oglio river, in the stretch that goes from the exit of Lake Iseo to the Po river, a clear contrast can be found between two complex fortification systems. If in the stretch now afferent to the Parco Oglio Nord, where the river marked the border between the Duchy of Milan and the Serenissima Republic of Venice, there is a justified complex system of reciprocal fortifications on both banks, subject of previous research, in the stretch that was once under the dominion of the Duchy of Mantua, today Parco Oglio Sud, it is possible to read an articulated system of fortifications, partly disappeared, which garrisoned the territory of the Gonzagas for centuries. Only with a detailed analysis of the current territorial organization, both with inspections and surveys, and by comparing the cartography and historical iconography, it is possible to find, in addition to different types of fortifications, similar urban structures that are organized around them. Furthermore, the garrison of the territory entrusted to the cadet branches of the Gonzagas, especially under the dominion of Vespasian I, and to the main families in the service of the duchy, such as the Castiglione, has allowed, in some cases, the maintenance of some defensive structures up to now and, in others, to the dismantling of the garrisons that lined the river starting from 1708. In fact, with the fall of the last Duke and the annexation of the Gonzaga dominions to the Austrian empire, many fortifications lost their defensive value leading to their inevitable disposal with the consequent destruction. This first step of the study aims to understand the identification and cataloging of castle emergencies in anticipation of the development of a path aimed at enhancing them, also from a tourist point of view.

Keywords: cabrei, enhancement, Oglio river, castel.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 3 | ROOM C
CHAIR: MARCO VITALI

Fenomeni di incastellamento lungo il litorale cilentano

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Abstract

In the Angevin age, the Cilento coast was the most exposed to enemy attacks. Charles I already from 1269 ordered to “repair and fortify the towers of the Kingdom for defense against pirates” and with the War of the Vespers this danger intensified. The Angevins therefore created the first complete and permanent defense and signaling system that extended to the coasts. The first study concerning the fortified architecture of central-southern Italy was carried out in the 1980s by Lucio Santoro (Santoro, 1982) who analyzed the buildings of the Angevin royal commission and carried out a typological analysis of the towers, highlighting the differences with respect to the previous constructions of the Norman era. This contribution aims to analyze the traces of this defensive system, with particular reference to the Amalfi area, rich in towers and ruins that still testify to the original unitary character of the complex, which has now been lost. Through the analysis of two case studies, the Torre dello Ziro and the Torre Assiola, we also want to question the role that these artifacts can play in the contemporary landscape, highlighting the issues relating to their protection and conservation and the image we have received.

Keywords: fortification, defensive system, towers.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 3 | ROOM C
CHAIR: MARCO VITALI

Interventi normanni, svevi, angioini e aragonesi nel castello di Oria (Brindisi)

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Abstract

The territory of Oria is characterized by a hilly chain consisting of fossil dunes of the Pleistocene aligned in an east-west direction, which, emerging in a purely flat territorial context, are highlighted with notable morphological prominence in the surrounding landscape. The highest elevation, 166 meters above sea level, has been the site of human settlements since the Middle Bronze Age with defensive structures that have been adapted to the various war requirements in different historical periods. In the Middle Ages, the castle was built on it, whose origin is attributed by all scholars to Frederick II of Swabia. In the light of new data that have emerged as a result of research of a different nature (historical, archaeological, topographical, sculptural, toponymic), this work proposes a temporal re-examination of the other construction phases of the manor.

Keywords: castle, middle ages, Oria, Puglia.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 3 | ROOM C
CHAIR: MARCO VITALI

Le strutture di difesa ad Alghero (Sardegna). Tra restauro e tutela

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Abstract

The construction of the first walls built in Alghero probably dates back to the 12th century, when the city was founded by the Genoese Doria family. In the thirteenth century, an important extension of the walls was carried out, during the Aragonese domination: there was the presence of 26 towers, square or polygonal towers, about three meters higher than the walls (6-7 meters high), of which today remains testimony of a part of this masonry incorporated in the sixteenth-century tower of Porta Terra. In the 16th century the defensive wall circuit was redefined again. In 1861 Alghero, as others city, was cancelled from the strongholds of Italy and, to ensure the expansion of the city, parts of the walls were demolished. Today the walls of the city of Alghero are preserved for about 1.3 km of total linear development, coinciding with about 70% of the historical wall circuit. It is interesting to observe the restorations made so far, the various activities aimed at enhancing the value that have taken place in these spaces, whether they are the towers or the open spaces adjacent to the wall circuit in particular, where parts of the walls have been demolished. In this paper there are analyse the different approaches to solve problems generated by historical fortified buildings transformations and walls partially demolitions. How is possible have a compatible use in these spaces and guarantee a conservation of cultural heritage? It is also interesting to make an assessment of the state of conservation and the current damage present in this architectural complex, in order to identify a future direction and investment needs in terms of various types of resources (human or monetary).

Keywords: restoration, fortification, damage, walls.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 3 | ROOM C
CHAIR: MARCO VITALI

New data on the fortifications of the Santo Stefano Castle in Monopoli in Puglia

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Abstract

Puglia, a long strip of land that extends over the eastern Mediterranean, a land of conquest, transit and trade, is identified with a coastal morphological model, still evident in the case study presented here of the Castle of Santo Stefano, located south of the coast town of Monopoli, along the route of the Via Traiana. The castle stands on a small peninsula protected by two natural ports that come out towards the sea from an articulated erosive furrow. In general, these Apulian coastal peninsulas since the Bronze Age were protected by a defensive 'agger'. The major peninsulas, in the period between the tenth and thirteenth centuries, became fortified coastal cities, unlike those of smaller dimensions, sites of stratified artifacts as in the case of the Castle of Santo Stefano, born on the remains of a Roman villa, later Benedictine abbey dedicated to Saint Stephen the proto martyr. From the fourteenth to the eighteenth century the castle, seat of the Knights of Jerusalem, was affected by different fortification systems, each time designed by virtue of the oldest pre-existing structures; of the indissoluble relationship with the place of the peninsula; protect the building from the degradation of the sea; protect from enemy raids; be seen from afar. In this article we want to present the new data that emerged from the systematic research carried out on the castle of Santo Stefano in relation to the multilayer fortification system. The investigations carried out were of different types: critical findings; archaeological investigations, diagnostic investigations, historical-documentary investigations, investigations on low-altitude aerial images; comparisons with similar artifacts; studies on masonry stratifications; morpho-typological analysis of the walls. The data that emerged from the reading of the relationship between the 'locus' of the peninsula and the fortified building compared to other castles, similar in the relationship with the locus, of the Apulian coast, provided a further contribution to the research carried out.

Keywords: fortifications, gardens, multi-layered site.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 3 | ROOM C
CHAIR: MARCO VITALI

***Castrum Lodroni* in valli Giudicarie (Storo, TN). Constructive peculiarities and conservation state of a border castle**

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Abstract

The Lodrone castle in Storo (Trento district) is mentioned for the first time in some documents dating back to 1189 and represents a peculiar case from many points of view. Historical sources give the only mention (for the Trento area) a *dolone*, a fortified settlement probably identifiable with the oldest part of the current architectural complex. At the end of the XII century, it was already organized into an upper and a lower castle which seem to have been subject to two different managements in those years. As for the material aspect, the current state partially in ruins allows us to carry out privileged observations on the construction techniques quality, on the particular finishing methods, on the parts connection and on the conservation state. At the same time, it requires our attention to a monument that needs to be recovered and preserved. This is also part of the objectives of the Italian Institute of Castles Onlus, which is active on a regional scale. The restoration is not a trivial challenge, primarily due to the size of the fortification, which is located at 520 m asl, occupies an area of about 2,275 sqm and is spread over a slope of almost 20 m. height. The urgency of defining a multidisciplinary and structured “knowledge path”, as required by the current regulations on the prevention of cultural heritage (DPCM 2011), would allow for the acquisition of new data on the castle and could direct the intervention, ensuring the design and executive quality according to the shared principles of minimum intervention. This work is meant to update the observations made during the APSAT Project “Ambiente e Paesaggi dei Siti d’Altura Trentini” (2013) and is intended as a contribution to the development of the historical construction “Interpretative model”, the first step in the safety assessment.

Keywords: Trentino castles, construction techniques quality, conservation state, knowledge path.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 3 | ROOM C
CHAIR: MARCO VITALI

Forts ecologies: an interspecific approach to fortified heritage

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Abstract

‘Landscapes-forts’ is an independent research and curatorial project started in 2019 and aimed at building a new territorial imaginary for the abandoned WWI Austro-Hungarian forts of Trentino-Alto Adige alpine region, linked to a renewed ecological vision. Drawing insights from landscape archeology, built heritage, emotional geography, contemporary philosophy (posthuman, multispecies and interspecific approaches), natural sciences (geology, botany, biochemistry), phenomenology and feminism, the project focuses on the post-war life span of these structures. Our reading promotes interspecific approach to forts heritage that interlink multispecies and landscape as a comprehensive framework, able to rediscover and narrate all those micro-facts and more-than-human beings involved in shaping their environments, contributing to turning them into unconscious ecosystems. From history, the focus shifts to the stories, from heroes to the actors, from leaders to the guests: a ruin is not a process of destruction, but the process of a construction shared between humans and the other species. Establishing a parallel from queer and gender theory, the research challenges the very notion of ‘natural’ and ‘artificial’, proposing a queer approach to landscape where both dimensions fuse into a single hybrid presence. During their last one hundred years in fact, these abandoned structures became landscape and contributed to shape whole new mountains parts: concrete turns into stone, stalactites and stalagmites spring from underground parts, fungi and moss constitute new layers and everything fuses into a new coexistence. Therefore, these century-old mountain forts could offer the key to imagine spatial and material futures based on radical integration of species, genders, and categories, turning conflict archaeologies into traces of welcoming rituals. An untold story which opens up a space for possibilities and alternative assemblages to exist.

Keywords: landscapes-forts, ecologies, multispecies, hybrid.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 3 | ROOM C
CHAIR: MARCO VITALI

La demolición de las murallas de Almería en la segunda mitad del siglo XIX

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Abstract

Two dates define the foundation of the city of Almería, the raising of its walls in 955, and its bourgeois urban reform in 1855, with the demolition of these defences. On the one hand, the military attack by the Fatimid fleet on the old enclave of Mariyyat al-Bayyana on 3 July 955, which caused the Caliphate fleet of al-Andalus moored in its dock to be set on fire. This event highlighted the defensive shortcomings of the main coastal enclaves of the Caliphate of 'Abd al-Rahman III, which led to their reorganisation and fortification. The direct consequence of this affront to Almería, until then a port suburb of the neighbouring Bayyana (now Pechina), was its administrative independence and the new city became known as Madinat al-Mariyya. Along with its status as a city, the construction of a city wall and an al-Qasaba was quickly begun to provide a stable defence for the port, due to its geostrategic role in the Mediterranean as the eastern sea gateway to al-Andalus. The city and its walled defences grew with the commercial flourishing of the later Taifa (11th century) and Almohad (12th century) periods, and the defences of the city inherited by the Catholic Monarchs in 1489 were largely indebted to those periods of construction. The new Castilian administration tried to maintain and extend the old medieval defences of the city with little success. The destruction caused by the earthquakes that occurred between the end of the 15th century and the first quarter of the 16th century highlighted the vulnerability of these walls, most of which were built using the rammed earth technique. However, the refortification works were important, with the construction of a new wall on the eastern flank as well as the artillery bastions of the sea curtain. The other fundamental date for the urban development of the city was 19 July 1855, after the royal approval of the suppression of the military square of Almería and the approval of the State so that the city could demolish its old walls, thus accepting the municipal demand to undertake an urban reorganisation and widening for hygienic and sanitary reasons. Following this order, the demolition of the walls began rapidly, with ingenious procedures whereby private individuals could demolish large sections of the walls at their own expense in exchange for keeping the materials. In this way, the city shed the defensive gates and bastions that had defined its material history until then.

Keywords: Almería, walls, demolition, urban, expansion.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 3 | ROOM C
CHAIR: MARCO VITALI

La città e il restauro. La stratificazione dell'area urbana di Trento letta attraverso le strutture della casa torre Bellesini

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Abstract

With the opening of the restoration site of the compendium of the Gerloni house located in Piazza Duomo in Trento, the Superintendence for Cultural Heritage requested the property owner to integrate the architectural project with the morphological-stratigraphic study on towerhouse Bellesini, part of the architectural complex. It is a medieval building with a quadrangular plant covering an area of 58 square meters, rising to a height of 16 meters. The building insists on Roman pre-existing structures; in particular at the basement level, in the fundo turris, on the wall to the west there are the wall sections of the first Roman wall from the Augustan age against which the second Roman wall (second half of III century AD) is attached. Stone pillars are added to these, which, although not in their original position, are the remains of the ancient Roman secondary gate present on the southwestern perimeter of the city. Between the end of the XII century and the beginning of the XIII century, the tower began to be built on the Roman ruins, which, due to its internal dimensions (26 square meters) and the thickness of the perimeter walls, can be defined as towerhouse (1 meter). The material knowledge on the building through the construction and transformation phases identified according to different construction techniques, architectural elements and plasters becomes a guiding tool for the restoration project. But it also becomes a moment of archaeological insight study on the basis of the discovery by the entrepreneur Francesco Ranzi in 1869. All the information collected is recorded in the database at urban scale and allows us to add a new page to the reconstruction of the development dynamics of the city of Trento throughout the centuries, using the territory and the recognition of the functions that have come in succession.

Keywords: towerhouse, stratigraphy, knowledge, masonry.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 3 | ROOM D
CHAIR: VALERIA CROCE

Rilievo architettonico remote sensing della Fortezza della Verruca sui Monti Pisani, Toscana (Italia)

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Abstract

The paper describes the digital survey project of the Verruca fortress, a medieval fortress built on top of one of the peaks of the Pisan Mountains to control the valley of the Arno river; the fortress was fortified in modern times by the Florentines and was visited by important architects such as Giuliano da Sangallo and Leonardo da Vinci. Today the fortress is in a state of ruin, and recently a summer fire caused the loss of the vegetation that had massified around the building, thus allowing to program the analysis of the walls of the fortress to deepen its construction history and state of material and structural conservation. The fortress survey project integrates range based, image based and UAV technologies, focusing attention on the methodologies used to ensure the high morphological reliability of the data obtained from the survey, in a very complex area to reach: in fact the position of the Verruca fortress does not present optimal landscape conditions to plan measurement operations. The three-dimensional model obtained by the drone, which is necessary for the reconstruction of reliable textures, has been verified to be reliable compared to the laser scanner model. Highly reliable drawings were obtained which are useful for analyzing the state of conservation of the architecture; thanks to the use of the drone it was possible to measure points that were not accessible until now. The results of the survey made it possible to reconstruct graphical drawings that made it possible to deepen the architectural and historical analyzes on the fortress.

Keywords: remote sensing, Verruca, UAV, TLS.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

24th MARCH | SESSION 3 | ROOM D
CHAIR: VALERIA CROCE

Analysis and definition of intervention strategies for the conservation of the boundary walls in Verona

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Abstract

The research concerns a process of documentation and analysis for the development of guidelines useful for the conservation, maintenance and enhancement of a portion of the Magistral Walls of Verona. Within an agreement between the Municipality of Verona and the University of Pavia, numerous documentation campaigns were developed to define an overall knowledge of the diagnostic conditions of a 300 m portion from the 11 km boundary of the mediaeval Scaliger's wall. The project, with the participation of an interdisciplinary group of professors and researchers, aims to simplify the intervention procedures on the entire Magistral fortified route. The goal is to define, through a dialogue with the superintendence, standard identifications of documentation and conservation approaches. It regarded the integration of multiple phases of digital documentation for morphometric drawing and 3D modelling, to support mineralogical, petrographic, archaeological, geo-seismic, endoscopic, structural and design evaluations for restoration and conservation. It has been possible to cross-reference data on the construction and technological characteristics with aspects relating to the documented conditions of degradation, generating synthesis frameworks and matrixes useful for guiding the conservation interventions on typological and formal classifications of the fortified system.

Keywords: Scaliger's walls, integrated survey, planned conservation, Verona.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

24th MARCH | SESSION 3 | ROOM D
CHAIR: VALERIA CROCE

Digitalizzare, ricostruire e fruire il Castello di Montorio. Un tassello nella definizione della rotta culturale dei castelli scaligeri

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Abstract

Between the mid-13th and late 14th centuries the Scaliger lordship ruled a vast territory in which Verona was the main center. The Scaliger period is reflected in the extraordinary architecture and military constructions, castles and palaces that define the territory and are today important tourist sites. To initiate a digital cultural route to link and promote these architectural evidences, the Tourism Department, the Chamber of Commerce and the UNESCO Office of the Municipality of Verona, involved the laboratory DAdA-LAB of the University of Pavia. The aim of the project was to design a new educational/informative digital route on the castles around the region. The present paper illustrates some outcomes of the research conducted on the Montorio Castle: the goal was testing a strategy of fast acquisition in order to obtain a digital database. The output of the acquisition phase was define as a reliable base to structure realistic 3D models of the main historical phases that affected the Castle. In this way, fast survey actions followed by the elaboration of 3D models by videogrammetry techniques, were also supplemented with the analysis of archival documents, archaeological reports and historical cartography. From the obtained photogrammetric database, it was then possible through the philological process to elaborate 3D models of the main hypothetical developments of the castle. This paper illustrates the strategy adopted in the case study and provides the groundwork for its replicability on other Scaliger castles, in order to define graphic and communicative methods for the digital products.

Keywords: Scaliger castles, videogrammetry, 3D reconstruction, Castle of Montorio Veronese.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

24th MARCH | SESSION 3 | ROOM D
CHAIR: VALERIA CROCE

La fotogrametría SfM mediante UAS para la documentación de las fortificaciones de la Alpujarra (Granada y Almería, España)

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Abstract

Structure from Motion photogrammetry has become in the last years one of the most used methodologies for three-dimensional recording in several scientific fields thanks to its great precision and low cost. Documentation of the building heritage has not been blind to this advance in technique. The aim of this paper is to present the methodology, issues and results of the application of the photogrammetry to record the Andalusian fortresses of the Alpujarra, the southern face of Sierra Nevada (Almeria and Granada, Spain). This was carried out through drone-based photogrammetry with GNSS topographical support. Altogether, we have documented 20 rural fortresses. Photogrammetry has revealed itself as a surveying method of great quality and versatility on field. The 3D models of the fortifications have been the core base for the subsequent archaeological analysis. They have also become an essential repository for the future, given the difficult conservation of these structures located in marginalized rural areas.

Keywords: al-Andalus, medieval, drone, photogrammetry.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

24th MARCH | SESSION 3 | ROOM D
CHAIR: VALERIA CROCE

A 3D integrated survey of fortified architectures: the medieval Canossa castle

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Abstract

Castles are complex fortified systems based on a solid relationship between the territory and the built architecture. The former defines the context of development, access, and defense conditions. The latter adapts to the context, proposing fortified structures in continuity with the orography of the territory. Both factors are crucial to understanding castles' historical evolution and social roles over time. In this knowledge path, the survey process assumes a primary role as a tool to analyze and interpret the built environment through bibliographic and iconographic analysis and the study of reality. Within the castle domain became essential to manage multiple scales of knowledge, acquisition, and representation, deepening the territory and the fortress systems. The case study analyzed is the Castle of Canossa, the epicenter of some critical events in medieval times. The authors describe an integrated survey process between active and passive techniques at architectural and territorial scales. Several geometrical validation steps have been introduced to verify the geometrical reliability. The pipeline highlights also the crucial relationship between territory and buildings, laying the groundwork for a more articulated analysis of the entire architectural complex. At the end, a superimposition between the geometrical model and a historical mock-up is suggested, collecting helpful information for the next reconstruction step.

Keywords: fortified castle, integrated 3D survey, spatial analysis, territorial representation.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

24th MARCH | SESSION 3 | ROOM D
CHAIR: VALERIA CROCE

Architetture fortificate in Istria: analisi, restituzione BIM e comunicazione avanzata di due forti a Pola

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Abstract

The defensive system of Pola and the Southern Istria consists of about thirty fortifications built during the XIX century by the Habsburg Empire, to realize and protect the arsenal in those territories.

The research aims to outline the historical reasons and the constructive motivations of these fortresses characterized by different types of geometric plan -Polesana tower, segmented Polesana tower and polygonal fortress *Feldwerk*- with their own constructive logic, functions, and inner distribution. Many of these, following the directives of the general urban plan of Pula of 1966, were destroyed, or abandoned. This is due to the logic of the *damnatio Memoriae* that involves several buildings built before 1947.

Fort Bourguignon and Fort San Giorgio, built around 1850 in Pola, are two circular fortifications made of Istrian stone with an inner courtyard, covered for camouflage reasons by ground and grass: a type of structures that quickly became obsolete due to the rapid development of military engineering.

The studio deals with these forts and deepens them through the informative modeling of the architecture based on archival materials and surveys, to obtain a graphic restitution and to integrate the photographic documentation. The aim is also to enhance these buildings not protected by safeguard policies, to disseminate their history through the new technologies such as rapid prototyping and virtual reality.

Keywords: Pola, fortifications, survey, advanced representation.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

24th MARCH | SESSION 3 | ROOM D
CHAIR: VALERIA CROCE

Elementi fortificati dal territorio di Palmi e Seminara: la cittadella di Carlopoli

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Abstract

The study presents the results of an investigation relating to an almost completely disappeared fortification, today made up of a few fragments, within the territorial context of Palmi and Seminara (RC), in Calabria. The fortified citadel of Carlopoli, built between 1559 and 1566, was designed according to the canons of trace italienne fortification, in one of its most elementary schemes, with four bastioned corners and a rectangular plan. Today little remains of the mighty walls: a portion of the north-west corner bastion and, presumably, a trace of the curtain walls of the south elevation, surmounted by more recent buildings. A reading of the iconographic sources referable to the fortification itself or to fortified elements related to it is proposed. After the execution of a photogrammetric survey, a planimetric reconstruction highlights the geometric ratio used by the unknown designer. Carlopoli could therefore represent a case of fortification built essentially for dissuasive and representative purposes at the same time, a wall built to discourage the landing of raiders, and to celebrate the prestige of the Spinelli family: a symbol of power to be exhibited to the sailors of the Strait of Messina. From an urbanistic point of view, it can be said that the citadel was configured as an element around which the events of the city developed, an architecture around which the historical and urban developments of the city are based, perhaps ephemeral, but decisive in the historical-morphological definition of a territory in continuous and rapid transformation.

Keywords: Carlopoli, fortification, survey, heritage, Calabria.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

24th MARCH | SESSION 3 | ROOM D
CHAIR: VALERIA CROCE

Documentation, understanding and enhancement of Cultural Heritage through integrated digital survey: Ínsua fort in Caminha (Portugal)

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Abstract

The Ínsua fort is located on a small island, south of the Minho River mouth (north of Portugal, at the border with Spain). The construction of the fort took place in the mid-17th century (during the Portuguese Restoration War) and surrounded the pre-existing convent of Santa Maria da Ínsua, founded in 1392 by the first observant Franciscans. This fort allowed the protection of the entrance via the Minho River, integrating a defensive system formed by a network of small coastal forts and other fortresses already standing along this river. During the first French Invasion (1807), the space was invaded by Spanish troops. Moreover, the Franciscan community was forced to abandon the convent, due to the Portuguese dissolution of religious orders (1834). Ínsua was managed and occupied by the Army until 1970's. However, despite its classification as a National Monument (1910), the abandonment and degradation of the last decades, as well as the lack of alternative reuse, led to the on-going conversion into a tourist accommodation. Scholars, mostly in the historical and architectural fields, have deepened the diachronic evolution of both the convent and the fort. However, there is a lack of studies that analyse the physical evidence through the elaboration of digital documentation. This study seeks to fill in this gap, and it is even more relevant, because it was conducted before the building rehabilitation. The digital documentation of the whole complex was carried out through integrated digital survey methodologies, with TLS and photographic instruments, combining terrestrial and aerial data. First results of the digital survey operation allow the creation of a digital model for further studies on the historical and architectural evolution of the complex. Moreover, different outputs for the visualisation, the preservation and sharing of this historical cultural heritage can be enabled.

Keywords: digital documentation, cultural heritage, Portugal, TLS and SfM photogrammetry.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

24th MARCH | SESSION 4 | ROOM A
CHAIR: ANNALISA DAMERI

La propuesta de fortificación del castillo de Bellver realizada en el siglo XVIII

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Abstract

Bellver Castle (Palma de Mallorca, Spain) was built between 1300 and 1311. It is a fortification in the Mallorcan Gothic style erected 112 m above sea level with a unique 360° view. It is one of the four circular castles in Europe. It is the oldest castle of this shape on the European continent and the only one in Spain. The construction consists of a Gothic-style building with a perfectly circular floor plan, which is organised around a central courtyard that is also circular, with four large towers facing the four cardinal points. It has an albarrana tower, free from the rest of the complex, while the rest of the towers are embedded in the main body of the building. After the War of the Spanish Succession (1700-1715), the fortification became the main political and military prison on the island, with illustrious prisoners within its walls. The aim of this work is the study and three-dimensional graphic elaboration of the fortification proposal designed in 1740 by the engineer Juan Ballester y Zafra (1688-1766), which was never carried out. The project has been located in the General Military Archive in Madrid.

Keywords: Ballester Zafra, Bellver castle, hornwork, ravelins.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

24th MARCH | SESSION 4 | ROOM A
CHAIR: ANNALISA DAMERI

La lunga pianificazione del sistema di difesa costiera del Regno di Sardegna

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Abstract

Until the mid-sixteenth century, the defense of the Kingdom of Sardinia was essentially based on the fortifications of the Royal Cities (Cagliari, Alghero and Castellaragonese *in primis*). Only from the second half of the century the king and local authorities began to think about the defense of the entire coastal perimeter of the island. The actual construction of the coastal defense system of the Kingdom, at the end consisting of over one hundred towers, was undertaken only after the determined action of reform of the administration by Philip II; but the realization could develop only after the sovereign and his lieutenant were able to view some accurate and detailed reports on the Kingdom and its coasts, previously commissioned. In fact, these are the decades in which Philip II used the collaboration of able architects for the study and design of coastal defense against the threat of the Turkish, which has become a real obsession. As regards the Kingdom of Sardinia, between the 60s and 80s of the century, in the context of a fervour of cartographic and descriptive works, three official reports were produced on the Sardinian territories and coasts, one of which is still unpublished. We can certainly speak of a real action of careful study and planning of the territory, a necessary premise so that, starting from the end of the 16th century and throughout the 17th century, the construction of the static defense system of the coasts of island and Kingdom of Sardinia began and completed.

Keywords: coastal defense, Kingdom of Sardinia, Philip II, planning.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

24th MARCH | SESSION 4 | ROOM A
CHAIR: ANNALISA DAMERI

El alzamiento de la isla Plana (o de Santa Pola) para su fortificación, hoy Nueva Tabarca

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Abstract

Along the 18th century Spain still executes important works of fortification in its Mediterranean coast. From 1721 (in discussion) is the first detailed survey of the section between the mouth of the Seco River, to the north, to the Nuevo Sitio of Santa Pola, to the south, which covers the entire bay of the city of Alicante, which is closed to the meridian by the Plana Island, whose shape and perimeter did not fit reality. Four decades later, the government of Carlos III decided to incorporate this uninhabited islet into the network of coastal defenses so that it would not serve as a refuge for pirates. For this, in 1766, an expedition was sent to the island for its exact measurement in order to project and build the architectures that were considered most convenient. At the head of the mission is the engineer Fernando Méndez de Rao, who signs the first three drawings of the place: a view of the cove where criminals are supposed to be sheltered, an initial project for a watchtower and a relief plan from Alicante to Cape Santa Pola, in front of which the island is located. This last floor plan and elevation of the territorial profile is of extraordinary beauty and technical quality, providing a large amount of information about the area unknown until then. In fact, in this phase, the engineer accepts the initial contour as the base cartography to name all the geographical features. Four years later, in 1770, Méndez de Rao signed the fortification project for the island on a plan measured at the time, which would become known as Nueva Tabarca with the construction of a fortified citadel, a double pincer, a ravelin and the castle of San Carlos, all this to control the sea passage between the island and the cape and the defense of the coast.

Keywords: Méndez de Rao, Nueva Tabarca Island, Santa Pola Cape, Alicante Bay, fortified citadel.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

24th MARCH | SESSION 4 | ROOM A
CHAIR: ANNALISA DAMERI

The Torre chica: Reconstruction of the history of Sidi Fredj (Algeria)

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Abstract

Today, Sidi Fredj or Sidi Ferruch implies one of the most famous touristic and seaside sites from west of Algiers (the capital of Algeria). It refers, historically, to the place of landing of the French fleets on June 14, 1830, a historic event which had been followed by the capture of the city of Algiers on July 5 of the same year. However, before this date, the place had another name with a Spanish connotation: Torre chica. The expression means ‘the little tower’. This was built near a zaouia called Sidi Fredj from where the Arabic designation of the place.

Beyond its contemporary reputation touristic and the historical event that was followed by more than a century of colonization of the country, what was the history of the locality before 1830? What was the history and role of the torre-chica in this place? What is the history of the Spaniards in this place?

This present essay is a contribution to reconstruct the history of the place called Sidi Fredj, a place that, before 1830, bore the name of the tower that punctuated it: the torre chica. The research is essentially based on the exploration of historical documentation (texts, archives, etc.) and the reading of plans and maps kept in the general archives of Semonças in Spain and in the archives of French military engineers at the castle of Vincennes, in France.

Keywords: history of the place, Torre-chica, Sidi-Fredj, historical reconstruction.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

24th MARCH | SESSION 4 | ROOM A
CHAIR: ANNALISA DAMERI

**“Sit obligatus artem docere omens querentes et volentes discere”:
seguaci ed allievi di Baldassarre Peruzzi, architetto militare senese**

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Abstract

Siena was the birthplace of personalities who have left their mark on military architecture, from the Siennese Archimedes, Mariano di Jacomo known as Taccola (1381-1453/1458), to the better known Francesco di Giorgio Martini (1439-1501), a leading exponent in a significant phase in the evolution of military architecture, such as the second half of the 15th century, to Baldassarre Peruzzi (1481-1536), perhaps best known for his work as a civil architect and painter, who was also engaged as a military architect on behalf of the Siennese Republic. Giorgio Vasari records in the ‘Lives’ among Baldassarre’s pupils, Anton Maria Lari (1505-1550?), “a citizen of Siena and a most excellent engineer,” who, with the defeat of the Siennese Republic, which saw him play a leading role in the updating of the fortress of Porto Ercole, preferred to follow the Count of Pitigliano Giovan Francesco Orsini to Rome; “Fu anco suo creato Giovambatista Peloro, architetto sanese, (1483-1558)” who made “the plans of many fortifications”, but carried out his activity as a military architect mainly outside Siena; as well as Bartolomeo Neroni, known as Riccio (1500? -1571), stage painter but also architect of the Republic, engaged in the maintenance and adaptation of its architecture. Literature subsequent to Vasari also includes Pietro Cataneo (1511-1572?), author of a celebrated treatise published in its first draft in 1564, expanded in 1567, or Tommaso Pomarelli and one of his probable relatives, Lorenzo di Francesco, about whom very little is known. This already representative parterre could probably be joined by architects such as Girolamo Bellarmati (1493-1555), and Baldassarre’s son, Sallustio Peruzzi (1511/1512-1572), though Roman by birth. On this occasion we present the initiation of research on the students or possible Siennese followers of Baldassarre Peruzzi, for some of whom news is fragmentary, architects who were able to leave a trace of a Siennese school in the field of military architecture.

Keywords: Siena, Baldassarre Peruzzi, pupils, military architecture.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

24th MARCH | SESSION 4 | ROOM A
CHAIR: ANNALISA DAMERI

Fortification Inventories in the Early Modern eastern Adriatic as Research Tools (1)

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Abstract

Between the 15th and 17th centuries, the incessant wars in the eastern Adriatic triggered extensive construction of the fortifications, thus making the territory fertile for studying changes in military architecture. This paper focuses on fortifications in the former territories of the Venetian and Dubrovnik Republics, whose importance is also reflected in the multitude of archival records. Among them, a particular serial source has been chosen: the fortification inventories in the State Archives of Zadar, Šibenik, and Dubrovnik. These critical supports for a better understanding of the circulation of knowledge on the military architecture in the region are virtually unstudied. However, they provide quantifiable information on firearms and other necessities, thus suggesting a vivid picture of the functioning of the fortifications. In order to understand the thinking behind these lists, their codification has been traced to a “modern military prototreatise” written in 1410 by Christine de Pizan. Her estimated/ideal fortress budget, with particular emphasis on modern firearms, here serves as a proto-model and provides comparative material for real-time archival inventories of non-ideal fortifications, also permitting speculation of the relation between theory and practice in the *longue durée*.

Keywords: Eastern Adriatic, fortification inventory, firearms, Christine de Pizan.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

24th MARCH | SESSION 4 | ROOM A
CHAIR: ANNALISA DAMERI

Il castello-palazzo della ‘Rocca’ dei Valdina nella Sicilia orientale

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Abstract

In 1623, Pietro Valdina, Marquis of Rocca, acquired the right to add his name to the fief of Rocca, which he transformed into Roccavaldina. Documents from the early 14th and 15th centuries show the evolution of the toponym from ‘Casale del Conte’ or ‘La Rocca’, until its transformation into ‘Roccavaldina’ in the 17th century with the addition of the surname of the then dominant family. The ancient casale, in the Peloritani mountains, is characterised by the presence of a fortified structure defending the eastern Sicilian coast, destined as the residence of the feudal family between the 16th and 17th centuries. The building overlooks the hills sloping towards the Milazzo plain. The origins and evolution of the building are almost unknown. The original floor plan consists of a quadrangular structure enclosed, on the main façade, by two circular towers and later transformed into a residence, with linguistic features distinctly linked to late Renaissance and Baroque culture. At the end of the 16th century, the Lords of Rocca were thinking of transforming the primitive fortified nucleus, creating a residence suited to the new family needs. A rectangular building, added to the previous one and flanked by other rooms, juts out from the western elevation. This addition was added to the older nucleus, defining a quadrangular courtyard that on three sides leans against the pre-existing buildings and is closed by a loggia onto which the new rooms open. Historiography indicates the artists Camillo Camilliani (16th century-1603) and Jacopo del Duca (1520-1604), of whom there is no documentary evidence, as the possible authors of the linguistic transformation that, having surpassed the main façade with its canonical medieval features, gave the building a refined and unexpected appearance.

Keywords: Sicily, baronial palace, architecture, 16th century.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

24th MARCH | SESSION 4 | ROOM B
CHAIR: ANNA MAROTTA

Il Castello Carlo V di Monopoli. Restauro delle facciate prospicienti il Porto Vecchio

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Abstract

The Carlo V Castle stands in a strategic position defending the port and a long portion of the walls of the maritime city of Monopoli. Built as part of the fortification works of the cities of the Kingdom by Pedro Álvarez de Toledo y Zúñiga (Salamanca, 1484 - Florence, 1553), viceroy of Naples in 1532, it would have been built starting from some pre-existing structures: the church dedicated to San Nicola in Pinna, whose presence is attested between the eleventh and thirteenth centuries, and a Roman gate of the first century BC, raised on the Messapian walls of the fifth century BC. Completed in 1552, it underwent uninterrupted and documented works of expansion, demolition, adaptation, reuse which altered the conformation of the defensive and residential structures, such as the demolition of the 'diamond tip' spur in 1953 or even more recent interventions of 'liberation' of alleged superfetations. The restorations carried out between the end of the twentieth century and the early years of the twenty-first century, useful for returning the manor to use after a long period of neglect, made it possible to stem the state of instability made worse by the peculiar climatic-environmental and material conditions of the building, with the limits deriving from use of invasive and not compatible techniques, which have led to the need for new maintenance interventions after many years. The recent conservation works that involved the facades overlooking the Old Port, completed in 2022, preceded by diagnostic investigations, photogrammetric and archival surveys, are to be considered as a functional and preparatory case study for both the completion of the restoration of the remaining surfaces, characterized by peculiar forms of degradation due to the different exposure to prevailing winds, the position with respect to the coast line and the measures adopted in previous intervention occasions, supporting the verification of structural still open problems.

Keywords: Monopoli, castle, Carlo V, restoration.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 4 | ROOM B
CHAIR: ANNA MAROTTA

Rigenerazione del Complesso Monumentale della Fortezza Nuova di Livorno: un nuovo accesso per la città

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Abstract

The first stone of Fortezza Nuova was placed on January 10, 1590: a military citadel born with the purpose of defending the newborn city of Leghorn from inland. The military purpose has gradually decayed due to the later eras' needs. Nowadays, the entire complex looks like a large, monumental area, used as a public park in the heart of the city: inside only remain the ruins of the ancient military citadel's buildings. Despite a series of contemporary interventions that led to its reopening to the public since 2014, the whole fort isn't properly valued from a cultural and tourist perspective. Actually, the fortress is essentially used to organize temporary events, that have nothing to do with the original vocation and with the storic-architectural importance of the place. The current fate of the fortitude is due not only to its degradation conditions, highlighted by a historical-stratigraphic and landscape study, but also to the total absence of a system of pathway that can factually connected it to citizens' and tourists' life, like the urban analysis have demonstrated. For this reason, the project concerned not only the fortress itself but also the system of accessibility, traffic, and the central places in the surrounding area. In addition to the project of the recovery and reuse of the interior buildings and the reorganization of the vehicular, pedestrian and public transport system, we have designed two new arched bridges to access the complex and a new public square directly connected to one of them. In this way the Fortezza Nuova is configured as a new cultural pole, which thanks to its strategic position can rise to the role of a new access to the city.

Keywords: Livorno, bastions, bridges, urban regeneration.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 4 | ROOM B
CHAIR: ANNA MAROTTA

Taouehsit Tafza mâallems: the fifteen inhabited fortresses limestone master builders of the Gourara (Algerian Sahara)

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Abstract

Taouehsit is one of the fortified settlement oases forming the network of the Gourara defensive structures situated in the south of Timimoun sebkha (salty soil) on the edge of the Meguiden, an erosion glaciis of a sandstone cuesta area of the Continental Intercalaire. Taouehsit fortresses are located in the south-west of Algeria on the ancient caravan trails linking sub-Saharan Africa to the Atlantic shores and the Mediterranean world, a famous meeting place on the pilgrimage route to Mecca until the 19th century. By using a space anthropological approach prevailing oral tradition we have tried to understand why Taouehsit is known as the seat of the limestone master builders, called *Tafza mâallems* in zenete berber language and how the inhabited spatial organization grew inside and around the bour, a non-irrigated palm tree area of this Saharan settlement formed by fifteen distinct defensive structures. Despite their advanced state of ruins, whether occupied or abandoned, the fortresses and their landscape are still identified and referred to as the representatives of Tafza master builders' limestone constructive know-how. The building technic is based on curved and right-angled stone masonry of the defensive walls as well as circular and squared angles towers like those of Agham At Gaffa which is one of the fifteen ancient inhabited fortresses where the Haratin master builders, former slave descendants, were also specialized in major limestone irrigation structures. The fortresses toponymy, the cemetery position together with the saints' tomb and mausoleum structures highlight the stone architecture construction technics and allow to follow throughout time the development of the Saharan stone building culture that led about the 17th century to stone conical domed mausoleums.

Keywords: fortified habitat, *mâalem* (master builder), *tafza* (limestone), stone Saharan architecture.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 4 | ROOM B
CHAIR: ANNA MAROTTA

Il GIS per la conoscenza e la valorizzazione del sistema delle strutture fortificate della Sicilia centrale

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Abstract

Fortified structures, despite the loss of their initial function, preserve innumerable levels of meanings and testimonial values linked to the memory of historical and military events, to the architectural and construction language as well as to the relations with the urban context and natural elements.

The need to learn about, preserve and re-evaluate the fortified structures of the Sicilian hinterland gave rise to the ongoing research project on the system of castles and towers in the provinces of Enna and Caltanissetta, dating from the 10th to the 16th century, which, although considered as punctual elements, belong to a broader and more complex network of resources with historical, artistic and environmental value.

The inspections and the study of bibliographic and archive sources allowed the identification of 35 assets, whose data, collected in a database, allowed the elaboration of thematic synthesis studies. The data were spatially interrelated by means of a GIS system, in order to highlight the spatial analyses and thematic maps most useful for the valorisation of the network system. The project, in addition to expanding the total knowledge of the historical-cultural system, can become a useful tool available to organisations (for monitoring the state of consistency and for planning interventions), but above all for the development of projects for the valorisation and enjoyment of the heritage.

Keywords: GIS, fortified architecture, Sicily, cataloguing.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 4 | ROOM B
CHAIR: ANNA MAROTTA

The Angevin Castle of Gaeta: from fortification to penal bath

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Abstract

The Angevin castle of Gaeta, an imposing monumental complex, has a high historical-artistic-landscape value and represents a powerful symbol of identity for the local community and beyond. Its origins probably date back to the sixth-seventh century, but the first specific information comes from the fortification interventions of the castle wanted by Frederick II of Swabia (1223-1227). The fortified structure of the Angevin period is part of the more extensive architectural system called the Angevin-Aragonese Castle, located on a rocky outcrop of Monte Orlando. The system is made up of two communicating buildings. The oldest, built by Charles of Anjou, has an irregular polygonal plan with mighty truncated-cylindrical towers located slightly further downstream. The other one, erected by Alfonso d'Aragona, conforms to a rectangular plan, surrounded by circular towers of different heights, among which stands an imposing keep. The Bourbon domination united the two castles intending to create one of the most majestic and well-equipped fortresses in Europe, located on the extreme offshoot of the Kingdom. The complex, which involves the two forts, thus becomes a model of extraordinary interest characterized by a modern fortification designed to enclose the entire peninsula of Gaeta. Over the centuries, this mighty fortification, created to protect the territory and the kingdom's population, has become increasingly important from a military point of view, as a seat and as a prison activity carried out until 1990, determining a break with the city. Foreclosed to the peninsula, the city has had a linear urban development along the coast. The entire fortification system is the guardian of the memory of events that made Gaeta a protagonist in the history of the peninsula and represents an immaterial heritage, as well as an identity of great importance to be preserved, enhanced, and returned to citizenship. Based on digital surveys and historical maps, this research investigates the transformations undergone by the fortified complex, focusing attention on the Angevin castle and its intended use as a penal bath.

Keywords: fortress, fortification system, survey, representation.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 4 | ROOM B
CHAIR: ANNA MAROTTA

Las Casas de Carabineros en la Costa Oriental Gaditana

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Abstract

The old Carabineros Houses of the Cadiz Coast constitute a humble architectural typology that left a trail of small, very characteristic buildings. They served as defence and surveillance against smuggling and nowadays they are in a fragile situation, close to disappearing, under the threat of real estate speculation attracted by their strategic and peerless locations in front of the Strait of Gibraltar and the abandonment and plundering made official by certain administrations, with the excuse of the renaturation of natural spaces they occupy on the coast.

The objective of the communication is to provide a reflection oriented towards the diagnosis of Protection and Conservation for the necessary enhancement of the Architectural Heritage that makes up the Casas de Carabineros. For this, the interventions carried out, the current state, the evolution, the management of these heritage groups, have been analysed to structure their study and propose measures for their correct protection.

The approach of general guidelines that can later be applied to different geographical areas marked by the same characteristics is one of the assets of the research. Thus, documentary research has been fulfilled, followed by a surveying case of study where the graphic documentation has been carried out as a first step for the enhancement of this architectural heritage.

Keywords: Architectural heritage, Carabineros, coastal surveillance, military architecture.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 4 | ROOM B
CHAIR: ANNA MAROTTA

Gripe Fortress the key defence element of Split

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Abstract

In the late 16th and the first half of the 17th century, Split had great economic significance for the Venetian Republic by being a port through which's Lazaret an exchange and disinfection of goods took place between the Venetians and the Ottomans. Unfortunately, these were also politically turbulent times between the two forces, culminating in the outbreak of the War of Candia in 1645. Due to these circumstances, the Venetians devoted themselves to improving the defence of Split through several stages, and the overall system, completed in the second half of the 17th century, was comprised of three detached parts - a bastion ring around the city and two separate fortresses - Gripe and Bačvice. The Gripe Fortress, located on a hill east of the city, was crucial for its defence due to the strategic position, recognized even by a famous military engineer Antoine de Ville in 1630. He suggested constructing on the hill a fortress in the form of *tenaglia*, and it was done between 1647-51. This was followed by a series of modifications, aiming to reinforce this position even further by applying various fortification systems and elements. In the last stage, the northwestern bastion was constructed according to the Onofrio del Campo's design, but it was demolished as early as in 1663, so the common opinion was that it had never been built. Recent archaeological research has revealed its remains, thus proving its existence, just as the author of this article has proved through her theoretical research. (1)

Keywords: Gripe Fortress, Split, War of Candia, military engineers.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 4 | ROOM C
CHAIR: ROBERTA SPALLONE

Paisajes fortificados. Análisis espacial de los sistemas defensivos bajomedievales de la zona occidental de Sierra Mágina (Andalucía, España)

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Abstract

Sierra Mágina, a massif of the Subbética System, is located in the south of the province of Jaén (Andalusia, Spain). Throughout history this place has been populated continuously. One of the most interesting moments from the political-military point of view is that of the establishment of the border between the Nasrid Kingdom of Granada and the Crown of Castile between the 13th and 15th centuries.

The presence of multiple watchtowers and fortresses on both sides of the border configures two solid opposing defensive systems. These constructions have been the subject of some research. However, today they raise some questions and inaccuracies that are necessary and interesting to resolve.

The methodology has been based on performing GIS spatial analyses. Calculations of various kinds have made it possible to give topographical and functional meaning to medieval construction programs by proposing various models and hypothetical assumptions based on the variables altitude and visibility. Along with this, archaeological prospecting has been necessary to confirm various aspects.

The results of this research have updated the historical information of this rural environment, responding to the questions raised. Likewise, the applied interdisciplinary perspective, which conceives the landscape as a cultural space, has facilitated its diachronic reading.

Keywords: Castilian-Nasrid frontier, GIS, landscape fortification, Sierra Mágina.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 4 | ROOM C
CHAIR: ROBERTA SPALLONE

Il castello di Cicala: analisi di un contesto fortificato sul *limes* dell'*Ager nolanus* in Campania

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Abstract

The contribution aims to illustrate, in a preliminary way, the architectural and historical-artistic data deduced from the investigations carried out at the fortified site of Castel Cicala to the east of the city of Nola in Campania. A defensive structure already existing in the Lombard age overlapped a pre-existing settlement of the Roman age. The castle is mentioned for the first time in a document of the first half of the tenth century. It had probably entered, a few years earlier, the sphere of influence of the Neapolitan Byzantine duchy where it will remain until the conquest of the Normans. The numerous written sources from the beginning of the twelfth century allow us to retrace the history of the castle, its structure and the village through the centuries until today. The castle stands on the hill overlooking the town of Nola. The fortification occupies an area of about 40.000 square meters. The fortifications on the hill of Cicala are organized in three walls almost circular and concentric. The first wall, located on the top of the hill, encloses the main structure of the castle; the second incorporates the other structures of the castle located mainly to south and east. The third includes the sides of the hill and part of the current town of Cicala. The historical-architectural analysis of the remains of the fortification, helped through the support of SAPR systems, makes the reading of the site and the defensive structure of particular interest.

Keywords: Nola, *ager nolanus*, early Middle Ages, *incastellamento*.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 4 | ROOM C
CHAIR: ROBERTA SPALLONE

La Torre de Haches (Bogarra, Albacete): hacia una propuesta territorial entre al-Andalus y la conquista de Castilla en la serranía de Alcaraz

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Abstract

This research deals with the archaeological and historical study of the fortified enclave of andalusian origin known as 'Torre de Haches' (Bogarra, Albacete) in the Sierra de Alcaraz. It is a defensive system comprising a lower masonry wall, surrounding a half-height hill, and a rectangular tower made of tapial. An exhaustive documentation study has been carried out on the construction characteristics of this defensive system, firstly to understand its morphology and construction techniques, and secondly to generate a comparative framework that will allow us to insert the tower into larger territorial systems. For these reasons, an intensive survey of the surrounding territory was carried out in order to get to know the enclave, carry out an exhaustive study of the preserved structures, study the ceramic material on the surface and approach the nearby territory to understand its agricultural potential or territorial control.

Keywords: middle ages, al-Andalus, fortification, tower.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 4 | ROOM C
CHAIR: ROBERTA SPALLONE

Le Casematte in Calabria. Architetture di un sistema difensivo del Novecento

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Abstract

In the early years of the Second World War, in compliance with the 1941 directive “Difesa delle frontiere marittime”, a defence system centred on bunkers, batteries and casemates was built along the Mediterranean coast, structures in many cases still preserved, in many others now lost. The casemates, in particular, were built in concrete on the basis of plans drawn up by the Genio Militare, with varying shapes and sizes to respond to the functions for which they were intended and distributed over the territory in relation to tactical criteria of control and capacity to respond to enemy attack. The of Calabria, compared to the better known examples of Sardinia and Sicily, represents a new and unexplored case. On this occasion, the intention is to focus on the casemates scattered across the territory, verifying and identifying their typology, their distribution and their relationship with the topography of the place. Today, these architectures, traces of the palimpsests of places, appear as small ‘forts’ suspended between the land and the sea, camouflaged with the surrounding landscape or even assailed by nature and concealed by the urban infrastructure that has taken over.

Keywords: Calabria, casemates, defence system, Twentieth century.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 4 | ROOM C
CHAIR: ROBERTA SPALLONE

Il borgo fortificato di Navelli, letture grafiche tra passato e presente

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Abstract

The contribution is part of the research aimed at understanding the numerous fortified villages scattered throughout the Abruzzo region that have gradually suffered the phenomenon of depopulation. The analysis examines the transformations from the ancient historic center of Navelli once the center of an important network of routes, that of the sheep-tracks hinged on transhumance, which fed a flourishing commercial activity also linked to the cultivation of saffron. The buildings layout defines the structure of the borgo following the orography from which the baronial palace emerges, in its priority role of domination and sighting, which perceptively returns the semblance of the ossidionale layout. The historic center, now abandoned, actually has many buildings in the state of ruins with deteriorations resulting from the 2009 earthquake. Studies and survey campaigns are therefore the necessary tool to document the state of affairs, to provide representations and graphic readings of the transformations of places, housing types and architectural elements analyzed with the aim of enhancing the architectural and landscape heritage, custodians of the cultural, tangible and intangible inheritance.

Keywords: heritage, borgo, survey, enhancement.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 4 | ROOM C

CHAIR: ROBERTA SPALLONE

Castle of Fylla, History and Architecture

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Abstract

The monuments of the Frankish period in Greece have been examined by researchers, mainly historians but also architects and archaeologists, in the context of attempts to interpret the architecture and art of this important period. The above context includes the examination of a 13th century feudal castle, in central Euboea. The castle is found on a remote steep rocky hill, 7 km south of Chalcis, east of the plain of the river Lilas at an altitude of about 160 m above sea level. At a small distance to the west of the castle the two towers of Mytikas dominate on a lower hill. The outline of the castle has the shape of an almost equilateral triangle with the three sides curved freely and following the natural configuration of the rock mainly on the west and southeast side. The general dimensions of the complex are about 50 X 60 m. The naturally fortified edge of this rock is surrounded by walls that surround an area of 1700 m²., and includes a large enclosure, two large two-storey buildings on the south side of the walls, two auxiliary buildings - probably barracks and warehouses - attached to the north side of the walls and a three-room vaulted tank. The castle had three entrances. The walls are 1.20 m thick at their base and continued with the same width until their top. At the top of the walls were ramparts, while behind them to the inside there was a narrow corridor (perimeter). The most interesting and undoubtedly the most impressive building of the castle is the two-storey Great Hall in the southwest corner, whose two walls are part of the castle walls, at the most extreme and naturally fortified point of the hill, at the edge of the remote rock. Despite its ruinous state the castle of Fylla is one of the best preserved castles from the period of the Latin domination in Greece.

Keywords: medieval fortifications, frankish fortifications, Greece.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 4 | ROOM C
CHAIR: ROBERTA SPALLONE

La restauración de la Torreta del Castillo de Jérica (Castellón, España)

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Abstract

The town of Jérica (Castellón, Spain), with its castle and small narrow streets enclosed within a walled complex, is of great heritage and landscape interest; the town has been designated a Historical Complex, while the castle is considered an Asset of Cultural Interest. The castle's Torre del Homenaje or keep, which in recent years had severely deteriorated, is the subject of a restoration project and action carried out by the authors of this text. As well as proposing the archaeological excavation of the interior and exterior of the tower and the cleaning and protection of the rammed earth and ashlar constructions, this restoration has addressed complex issues in terms of conservation, architectural repercussions and impact on the heritage asset.

Keywords: conservation, intervention, vaults, donjon, rammed earth, ashlar.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 4 | ROOM D
CHAIR: SANDRO PARRINELLO

Le rocce raccontano: la cripta, le prigioni e i sotterranei del castello di Otranto. Dal rilievo al modello di fruizione virtuale

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Abstract

The Castle of Otranto (Puglia, Italy), located south of the citadel, close to the port area, hides underground environments of great charm, mysterious places where the stories of men, of different rank and social class are intertwined, narrated on the rocky walls from which numerous completely unpublished graffiti and bas-reliefs appear; a varied story, made up of symbols and artistic manifestations, still mysterious, but with numerous ideas, which allows us to perceive the human presences who lived in the most archaic places of the manor, probably from the Middle Ages up to the whole of the seventeenth century. The completion of the study of the basement has given us the opportunity to understand the evolution of the castle structure since its construction. Furthermore, the exceptional discovery of the crypt, below the parade ground, belonging to the rock settlement that extended on this side of the city before the construction of the manor, puts the Idruntino landing place in a new light, seen not only as a port on the Adriatic for trade routes in the Mediterranean but also as a place of worship included in the pilgrimage routes, especially in the Middle Ages. The hundreds of significant religious symbols scratched into the rocks suggest the need for the faithful first and then for the prisoners to impress a sign of their devotion, an imprint of their passage, an expression of their suffering, an ex voto. The problems related to the location, inaccessibility and instability of these underground portions made it necessary to acquire and store all the metric information for the current state, using digital data for the study and management of the assets detected. Image-based 3D modelling, digital graffiti mapping, the aid of 3D laser scanner technology and virtual reality have made places “accessible” that otherwise could not be enjoyed except through an immersive story and the creation of a model of virtual use.

Keywords: Otranto, castle, crypt, graffiti.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

24th MARCH | SESSION 4 | ROOM D
CHAIR: SANDRO PARRINELLO

**Studio preliminare sul complesso fortificato di Trogir (Croazia)
basato su un approccio multi-disciplinare**

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Abstract

The city center of Trogir represents an important example of Romanesque, early Renaissance and Baroque architecture and is part of the UNESCO World Heritage list. In this paper, the authors propose a multidisciplinary approach for the reconstruction of the stratigraphic succession of the interventions and documentation at the masonry level of the Kamerlengo castle by combining digital, photographic and thermographic data. The Kamerlengo castle was built in the 15th century and, together with the Saint Mark chapel, represents the only part of the ancient fortification complex that is still present in the city. Today it has many conservation problems due mainly to the decay of the original parts and the prolonged absence of maintenance works. The first step in the conservation process is the diagnosis of the structural integrity of the fort. At this first stage, recognition using non-destructive techniques based on imaging systems such as a combination of IR thermography, photogrammetric surveys and visual inspection is preferable. Through IR thermography analysis it is possible to verify the presence of inhomogeneities in the masonry (air cavities, water infiltration, different materials, etc.), contributing to the reading of the construction phases of the castle. The study of the structural integrity was completed by the 3D laser scanner survey and the SfM photogrammetric survey, which also enables the morphometry and environmental aspects of the fort to be documented. The output produced at the end of this activity represents an important support for the definition of the diagnostic campaign and for the promotion of the site.

Keywords: digital integrated technologies, infrared thermography, 3D laser scanner, stratigraphic documentation, non-destructive techniques.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

24th MARCH | SESSION 4 | ROOM D
CHAIR: SANDRO PARRINELLO

Drawing and interactive architectural walkthrough to communicate complex spaces

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Abstract

The communication of Cultural Heritage based on interactive tools and heterogeneous data is a current research topic. The article investigates different ways of using 3D point clouds to improve the communication of complex artifacts. It evaluates a communication system based on an active and exploratory experience that triggers new cognitive processes and proposes a virtual place for learning about complex architectures. The case study analyzed is Porta San Sebastiano, one of the historical Roman gates. The representation of orthogonal projections is the first necessary step to explaining the whole building, but it is insufficient to provide a comprehensive overview of its complexity. The introduction of interactive 3D data navigation based on point clouds and linked 2D images allows for broader and more dynamic exploration. It serves as a complementary and integrative tool for the understanding complex asset.

Keywords: point cloud, representation, interactive navigation, visual communication.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

24th MARCH | SESSION 4 | ROOM D
CHAIR: SANDRO PARRINELLO

Digital survey and 3D virtual reconstruction for mapping historical phases and urban integration of the fortified gates in the city of Pavia, Italy

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Abstract

Over the centuries, the fortified route of the city of Pavia has undergone different phases of construction, expansion and reconstruction of the defensive walls, adapting both to the requirements of modern military fighting techniques and to the urban expansion plans. Its fortified gates have been preserved in the succession of the different city walls, Roman, Gothic and Spanish ones, identifying fundamental elements in the urban structure, while the architectural configuration of each one has undergone intense changes. From the original eleven gates, only three remain visible today in a critical state of preservation and lacking a cultural enhancement despite their key position in the city. Through joint research and didactic activities, a digital documentation programme is ongoing on the remaining portions of Pavia's walls, in order to document the state of preservation and to develop a preparatory knowledge to the integration of existing maps and virtual reconstructions. Starting from the data collected with close-range measuring instruments (Terrestrial Laser Scanner and UAV), a 3D modelling activity was carried out at the double architectural and urban scale. The 3D model of the architectural system was compared with historical photos and archival documents, to redefine in the digital space the construction and demolition phases of the monuments. These configurations were included in the spatial mapping of the historical centre and compared both with the current and historical urban asset, defining the role of the fortified ruins for the cultural promotion and military historical enhancement of Pavia.

Keywords: fortified gates, digital survey, virtual reconstruction, Pavia.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 5 - DIGITAL HERITAGE

24th MARCH | SESSION 4 | ROOM D
CHAIR: SANDRO PARRINELLO

Fortified city's heritage and urban archaeology. The Neapolitan fortified port town through the archaeological discoveries

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Abstract

In this presentation I would like to emphasize the importance of the urban archaeology for the urban history new methodology. Particularly I would like to illustrate the Naples' port town significant archaeological discoveries and the evidences of the ancient harbour's fortifications. Moreover the Mediterranean urban archaeology discoveries in the port town of Marseille, *Puteoli* etc. and their *mise en valeur*.

Naples is a port town with a long continuity of life since its foundation in the Greek period; due to the exceptional stratification of its urban heritage it is a UNESCO World Heritage Site, since 1995.

The port town has developed a continuous increase of the city walls along the southern coast line below the ancient Greek centre, from the Roman port dock, discovered 15 metres under the *Municipio* square to the East. The ancient waterfronts fortifications have come to light under the level of the contemporary city with the scientific archaeological interventions as consequence of the public works into the Metrolines-Underground-Line.1, running for about 3 kilometres in the historical 'low city', along the ancient sea coast line, with their towers and gateways. The same public works brought to light the Angevin *Beverello* pier facing the *Chateau neuf*, with its towered Renaissance turreted/bastioned Citadel in the South 16th century city walls. Moreover these discoveries shed new light on the long dimension of the Southern city walls and its relationship with the continuous advance of the sea coast line from the port to the *Sperone* Castle. One of the most important transformation inside the fortification system during the long period (Angevin, Aragona-Spanish) emerged with evidence, unit with the preservation, enhancement and management difficulties to make visible this heritage to a vast public, in observance of the International Charters' related to the conservation of archaeology and fortifications. The archaeological evidences have allowed a network of technical resources that contributed to outline the urban Mediterranean fortifications with the possibility to redesign the 'new maps' of the ancient fortified waterfronts with the 'reconstruction' of the fortified port-towns urban history.

Keywords: fortified cities, urban history, urban archaeology, Naples' enhancement.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 6 - CULTURE AND MANAGEMENT

24th MARCH | SESSION 4 | ROOM D
CHAIR: SANDRO PARRINELLO

Culture, tourism and fortifications-Educational centre on St. John's Fortress in Šibenik, Croatia

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Abstract

Šibenik is a city in Central Dalmatia where the river Krka flows into the Adriatic Sea. It is the only city in Croatia with two UNESCO World Heritage Sites: Cathedral of St. James and St. Nicholas Fortress. The old city of Šibenik, with its central square, gothic and renaissance sacral and public buildings and many other sights is one of the best preserved authentic medieval environments. Revitalisation of St. John's Fortress area is the largest EU-funded project that the City of Šibenik has ever implemented, thus continuing the restoration of its old fortification system, after the successful completion of similar projects on St. Michael's Fortress in 2014 and Barone Fortress in 2016. These fortresses are managed by Public cultural institution Fortress of Culture Šibenik, which has become a best-practice example and received multiple awards and recognitions. The institution has developed numerous partnerships with related national and European organizations, aspiring to exchange knowledge and ideas about the sustainable management of cultural heritage. One new feature of this 17th century fortress is an educational centre concealed within its external fortifications. The 2000 m² large centre contains three classrooms, a dining and living room with a small kitchen, office rooms, 14 sleeping rooms with 50 beds, along with sanitary and service facilities. This infrastructure is used for implementation of various programmes (professional training classes, field classes, seminars, summer schools...) developed in cooperation with a wide range of partners from the cultural and creative industry. Some of the goals are: to develop and diversify new educational, cultural and touristic products; to encourage the dispersion of activities throughout the year; to raise the levels of skills and competencies of local cultural and educational institutions by empowering them to create and implement projects; to enrich the overall visibility of the destination.

Keywords: Šibenik, Croatia, management, educational facilities.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 6 - CULTURE AND MANAGEMENT

24th MARCH | SESSION 4 | ROOM D
CHAIR: SANDRO PARRINELLO

Identification and Prioritization of Conservation Measures at the Castle of Gjirokastra, Albania

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Abstract

Gjirokastra, in southern Albania, is a rare example of a well-preserved Ottoman town built around a fortified hilltop. The history of the fortifications is long and unsurprising given its natural defensive geology, prominent views controlling the valley, and nearby fertile fields with access to water. The rocky outcroppings were inhabited as early as 500 BCE, and later, it is speculated that this was the location of the famous Castle of Pyrrhus, built to resist the Roman hegemony. The fortifications and the surrounding settlement underwent numerous changes, especially in the 15th CE century under the Ottoman Empire during the reign of Sultan Bayezid II (1481-1512). The defenses reached their zenith in the early 19th century with numerous additions, including an aqueduct by Ali Pasha Tepelena, a local Ottoman administrator. By the 20th century, the castle was converted into a prison under King Zog and continued as a political prison under Albania's communist regime. In 1969, the castle was converted into a museum; in 2005, Gjirokastra and its castle were placed on the World Heritage List. The uninterrupted use and continuous changes culminated in a sizeable multi-layered structure with a wide variety of materials and construction techniques. These changes, combined with unstable geology, active faults, poor drainage, and periods without maintenance, resulted in a structure with areas in poor condition. This paper describes the methodology for identifying and prioritizing emergency conservation measures with limited resources and time. The project began with extensive documentation, a rigorous inspection of all spaces, materials, construction methods, detailed historical research, and stakeholder input. Critically, the project also incorporated geological, hydrological, and structural assessment and analysis. A multidisciplinary decision-making method was developed to identify the most at-risk significant elements while seeking to achieve the objectives of the larger project, i.e., to open currently closed areas of the castle to improve the visitors' experience while enhancing their understanding of the fortifications. The investigations led to the creation of a complete set of drawings, technical specifications, and bills of quantity. The methodology and documentation proved invaluable as soon after starting, the site was closed for six months, travel bans enacted, and in-person meetings prohibited due to the global COVID-19 pandemic. Even given this significant event, the team completed project planning on schedule. The castle is currently undergoing conservation managed by the Albanian Development Fund with the support of the World Bank and collaboration with the Ministry of Culture.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 6 - CULTURE AND MANAGEMENT

24th MARCH | SESSION 4 | ROOM D
CHAIR: SANDRO PARRINELLO

The project investigations and designs were executed by Cultural Heritage without Borders, Albania, and Proskene Conservation and Cultural Heritage of Spain.

Keywords: emergency conservation, priority measures, Gjirokastra, Albania, World Heritage



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 6 - CULTURE AND MANAGEMENT

The uncovering of forgotten fortifications and other findings from recent field surveys and archival research of the frontiers of Šibenik district (2018-2021)

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Abstract

This paper provides an overview of historical and archival research, as well as numerous field surveys made by the Heritage Department of public cultural institution Fortress of Culture Šibenik from 2018 to 2021. The recently awakened interest for late medieval and early modern fortifications in the wider Šibenik area has resulted in the discovery of several sites with traces of earlier (15th-17th century) fortifications are still visible today. These fortifications, scattered on the borders of former Šibenik district, were built for the defence against the increasingly frequent incursions of the Ottoman *akinči* troops that were ravaging the Dalmatian hinterland since mid-15th century. They were set on dominant positions, which were not only excellent defensive points, but also had a visual control of wider surrounding areas. The strategic importance of these positions has been recognized in earlier times, as most of them were used in prehistoric times or antiquity. Some of the forts were made by noble families of Šibenik, as peasant refuges near their estates. Other were made by districtual or Venetian government in hope of containing the Ottoman threat. They usually had a plain rectangular shape, with towers on two or all four corners. Even more rudimentary fortifications were ramparts built as barriers over peninsulas or on the edges of mountain cliffs which enclosed a certain area where the local population would take refuge when in danger. One particular example are the traces of large building in the hinterland of Šibenik, for which archival sources indicate that it was a fortified residential complex.

Keywords: Šibenik, Dalmatia, late medieval fortification, Venetian-Ottoman wars.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

24th MARCH | SESSION 5 | ROOM A
CHAIR: ANDRÉS MARTÍNEZ MEDINA

Leggere e rappresentare l'architettura militare. Forma e progetto della cinta muraria di Castelsardo in epoca moderna

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Abstract

The walls of Castelsardo were erected by the Doria family in the second half of the 13th century. The fortress, located on a promontory to control the coastline of north Sardinia, defended by steep slopes and cliffs and almost impossible to conquer, will require, in modern times, only a few interventions to strengthen his defences. During the Spanish Kingdom, from the second half of the sixteenth century to the first half of the seventeenth century, intervention and maintenance are documented; among these the realization of embankment, aimed at increasing the resistance of the walls to the force of heavy artillery, suggested several times by military experts in the sixteenth century or present in the memory of the Viceroy Vivas (1625); this is the case of the “Spalti Manganella”, reinforced in the period 1640-1660 by an embankment with thickness more than 2 meters, a work carried out at a time of great difficulty for the island, threatened by the danger of French attacks. Even in the Piedmontese era the repairs of the fortress were minimal and the project to create a defensive system of the city gate (located on the ground front) was not implemented. This intervention, dated 1740, is described in a document signed by the military engineer Craveri and testifies that the repairs to be carried out were of little importance; this project indicates the realization of additional works to make inaccessible the main door of the stronghold. Starting from the analysis of cartographic representations, archive documentation, knowledge of modern fortifications and with the contribution of recent archaeological excavations, the contribution proposes a first graphical reconstruction of the transformations happened in modern age.

Keywords: representation, modern fortification, Castelsardo, Sardinia (Italy).



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

24th MARCH | SESSION 5 | ROOM A
CHAIR: ANDRÉS MARTÍNEZ MEDINA

Torino, Borgo nuovo (1800-1839). Bastioni vs crescita urbana

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Abstract

June 23rd, 1800: Napoleon ordered the demolition of Piedmont's defensive systems for both strategic and symbolic reasons. Savoyan power had to be quickly dismissed especially in Turin, the capital of the newly created Department of Po and former capital of the late dukedom. The opening of the city gates initiated a gradual 'domino effect' that led to the complete demolition of the fortified walls at the end of the 19th century. Indeed, in the 1820's the permanence of some bastions in the southern part of Turin strongly conditioned the city by separating two areas of recent expansion. During the following decade professionals wondered about the problem of solving the orographic jump to patch up the building structure between the new Piazza di Po and Borgo Nuovo. The study of some of the plans for the "Ripari promenade", preserved in the Historical Archives of the City of Turin and recently identified, can now allow us to understand how the shape and volume of the modern fortified systems have influenced the growth rhythm and design of the city in the 19th century.

Keywords: Turin, history of the city, fortification, demolitions.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

24th MARCH | SESSION 5 | ROOM A
CHAIR: ANDRÉS MARTÍNEZ MEDINA

L'ampliamento del fronte bastionato orientale di Cagliari e la demolizione del convento di Nostra Signora di Gesù (1717-1732)

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Abstract

The reconquest of the Kingdom of Sardinia by the Spanish Empire, in 1717, highlights the criticalities of the island fortified system; in the case of Cagliari, the military authorities are worried about the stability of the eastern bastion front, on which the attack plan to the city was concentrated. After the passage of the Sardinian kingdom to the Savoy territories (1720), the new government apparatus invests huge resources in strengthening the strongholds of Cagliari, Alghero, Castelsardo: in the capital, the construction of an advanced circuit to protect the existing fortifications takes shape. The new ramparts clash with private interests and with the presence of some religious complexes, located in the lower quarters of the city, whose grounds would be occupied by the new defensive works.

Above all, the convent of Santa Maria di Gesù, of the Observant Friars Minor, located on the southern edge of the Marina district, pays the price. Damaged during the Spanish invasion, the convent was rebuilt in 1721, on a project by the Piedmontese military engineer Antonio Felice de Vincenti, but it soon had to give way to new Bulwarks (1732), designed by same designer.

The episode illustrates the difficult to match military needs, in particular the evolution of modern fortifications, and religious complexes, often animated by debates between the public interest and ecclesiastical authorities.

Keywords: bastion of Jesus Cagliari, Antonio Felice de Vincenti, convent of Our Lady of Jesus Cagliari, eighteen century fortifications Cagliari.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

24th MARCH | SESSION 5 | ROOM A
CHAIR: ANDRÉS MARTÍNEZ MEDINA

Livorno vista dal mare. L'evoluzione fortificatoria del waterfront portuale

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Abstract

Today port areas are definitively separated from the city centre and during the centuries they have acquired independence different from the past. The urban identity, like its form, encompassed that of the port and was completely integrated with it. We can clearly find this organicity not only in the planimetric representations, views, and portolan descriptions of harbours from the Middle Age until the 19th century, but also in treatises, which from Vitruvius – a compulsory source since the modern era - via Leon Battista Alberti, include the harbour in the city's public buildings. The port, seen as an architecture, as a unique project that fits into the overall design of the city, remained until the beginning of the 19th century. In this sense, Livorno is a unique case. From the Middle Age, as part of the construction of the Pisan maritime defence system, the castle of Livorno was nothing more than the result of a slow evolution of the Pisan port system in relation to which it grew to become its centre. On closer inspection, even when Livorno was only a port with a medieval castle, it was conceived and built as an infrastructure of the city, or rather the outpost of Pisa. The symbiotic connection between the two systems of the city and the port persisted until the mid-19th, when the port organically related to the other parts of the city.

The view from the sea is the preferential observation point guiding the analysis of the fortification evolution of the waterfront of the port of Livorno, supported by the reading of historical-iconographic sources and portolan descriptions that, over time, slavishly record the change in the coastal landscape.

Keywords: Livorno, fortification evolution, port waterfront evolution, Middle Age, advent of firearms.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

24th MARCH | SESSION 5 | ROOM A
CHAIR: ANDRÉS MARTÍNEZ MEDINA

Al soldo di Richelieu: un frate spia e i lavori di potenziamento alla piazzaforte spagnola di Breme

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Abstract

A network, or rather several networks, of espionage intersected in seventeenth-century Europe. Every war, every conflict and, perhaps even more so, every tenuous truce was based on a more or less clandestine exchange of information carried out by soldiers, engineers and unsuspected “ordinary” travelers. The rapid gathering of information on the work of strengthening fortifications enabled the enemy armies to coordinate activities in response. Each action had to be suddenly matched by a reaction, especially for strongholds near borders. By the late 1630's the Savoy dukedom and the Milanese were in conflict. The cities conquered by Governor Leganés had to be shaped by the exigencies of the war and immediately strengthened. Wall circuits were modernized to prevent a possible and feared redemption by the Savoy army that was allied with the French. A Neapolitan Capuchin father, Brother Paolo d'Angilis, was captured in the fall of 1638 by Leganés's troops and interrogated under pressure. He confessed to being a spy in the service of Cardinal de la Valette, head of Richelieu's troops in Italy, and to having visited, by various expedients, some of the most strategic Spanish strongholds and reported to the French. The record of the interrogation is an account of convulsed weeks in the territories wrested from the enemy. Since the previous spring, Leganés had opened upgrade work sites for Breme and Vercelli: the French wanted to know their particular features

Keywords: espionage, military engineers, fortifications, Savoy Piedmont, State of Milan.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

24th MARCH | SESSION 5 | ROOM A
CHAIR: ANDRÉS MARTÍNEZ MEDINA

Cronaca e propaganda. Immagini di fortificazioni anatoliche nel primo decennio del XVII secolo

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Abstract

Among the amphibious enterprises that engaged the Order of Saint Stephen at the beginning of the 17th century, those targeting some fortresses on the southern Anatolian coast had great resonance: Namur, Laiazzo and Finica in 1606, to which was added, in 1608, the failed attack on the citadel of Alanya and again in 1613, the conquest of Acliman. The original images contained in diaries and reports drawn up by the protagonists of the operations, together with the engravings that accompany the printed pamphlets and aimed mainly at illustrating the theater of war operations, contain numerous information on territorial arrangements and fortified structures. Although, at times, the celebratory or propaganda needs or even just the difficulty of observation condition the reality of the places, forcing graphic licenses or free interpretations, they are still important documents, especially because they are filtered by the eye of those who know the systems well. and the means of Western defense and is thus able to identify their differences, strengths and weaknesses.

Keywords: historical iconography, Ottoman fortifications, Order of the knights of Santo Stefano, Eastern Mediterranean, Turkey, 17th century.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 1 - HISTORICAL RESEARCH

24th MARCH | SESSION 5 | ROOM B
CHAIR: ORNELLA ZERLENGA

Il bastione di Sant'Agnolo a Volterra. Riqualificazione della struttura fortificata e rigenerazione urbana

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Abstract

Volterra is located in central Tuscany. Founded by the Etruscans for its favourable strategic position and the rich mineral deposits of the surrounding area, it saw a slowing expansion but not in its importance, first in Roman times and then from the 8th century onwards with the construction of the medieval walls. Volterra, an episcopal city, with its Etruscan, Roman and medieval components, is one of the most important cities for art in Tuscany. Moreover, it was recently distinguished as the first Tuscan capital of culture. The mighty bastion of Saint Agnolo was built by Cosimo I of the Medici Family in the mid-16th century and designed by the military architect Giova Battista Belluzzi. The defensive structure was built by the Florentines many years after the conquest of Volterra to protect the city from the north, near the medieval Fiorentina Gate. The enhancement of the bastion, which opens onto one of the city's urban parks, represents a fundamental theme of the municipal administration in the broader framework of urban regeneration projects. The contribution intends to establish a framework for the project with aims for the recovery and enhancement of the fortified structure and the surrounding park supported by results of historical research and knowledge acquired from the survey.

Keywords: fortified structure, urban regeneration, Volterra, survey.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 5 | ROOM B
CHAIR: ORNELLA ZERLENGA

Metodologie di ricerca per la conservazione/valorizzazione della Rocca Borsca di Camerino (Marche)

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Abstract

The Rocca Borsca of Camerino is an ancient fortification built by Cesare Borgia in 1503. The cylindrical towers and the mighty keep are among the examples of military architecture of the early Renaissance. The fortress was considered so safe and impregnable that it was subjected to continuous works, as well as providing it with artillery and soldiers. In 1799, Camerino was hit by a very strong earthquake which also involved the Rocca. As Andrea Vici describes in the Report to the General Council of Camerino Municipality in conjunction with the seismic event, various sections of the walls had collapsed and were only partially rebuilt. In 1867 the keep was lowered by a floor and deprived of the Guelph battlements of the crown. In the second half of the 1900s, the Rocca was transformed into a public garden, in which the signs of its ancient history resurface. The recent earthquake that hit central Italy in 2016 has once again compromised the remaining structures of the fortress that is waiting to be restored and enhanced, also through the application of modern communication methods.

Keywords: earthquake, knowledge, project, valorisation, interactive experience.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 5 | ROOM B
CHAIR: ORNELLA ZERLENGA

Tra memoria e oblio. Tutela e restauri del forte di Vigliena

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Abstract

The Vigliena fort is located in the district of San Giovanni a Teduccio, on the east coast of Naples. The small fort, relic in a difficult and changing landscape, represents an example of fortification from the early 18th century, and bears the memory of a significant historical moment for Naples, the Revolution of 1799. The contribution proposes a critical reflection on the protection and conservation projects inherent in the fortress from the late 19th century to the present day. Starting from the historical investigation and the comparison between the archival sources and the current state of conservation, the essay intends to offer a new piece to the history of knowledge and protection of the fort, a symbolic architecture for the history and identity of the city.

Keywords: coastal defences, Neapolitan fortifications, conservation, protection.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 5 | ROOM B
CHAIR: ORNELLA ZERLENGA

El Castell de Miravet: una fortaleza olvidada

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Abstract

The BIC of the *Castell de Miravet* is located on the border of the *Desert de les Palmes* mountains, and is part of the former communication control system between Tortosa and Valencia. With 20.000 m² surface, it adopts the usual distribution of Andalusian castles of tripartite enclosure: *alcazaba*, *albacara* and village. The oval-shaped *alcazaba*, adapted to the topography, is divided in two enclosures: the *jussá* and the *sobirá*. The upper section, or *sobirá*, preserves the entire north wall and a section of the east wall, as well as a 'bestorre', that gives the key to its scale. The lower enclosure or *jussá* preserves the wall, the main entrance gate and rooms with Gothic diaphragmatic arches. The *albacara* is delimited by the wall of the *alcazaba* to the south, the natural cliffs of the mountain to the east and west, and by a powerful structure of masonry formwork to the north. The village extends at the base of the northern wall of the *albacara*, preserving part of its walled perimeter and certain traces of its initial urban planning. Scientifically removing sediment layers, consolidating structures and protecting it from vandalism are the initial objectives of the recently drafted Master Plan.

Keywords: castle, fortress, Miravet, settlement.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 5 | ROOM B
CHAIR: ORNELLA ZERLENGA

Altri castelli. I mulini fortificati delle Marche

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Abstract

In the multitude of castles that characterize the Mediterranean area - walled villages, towers, fortresses, forts - a prominent place is occupied by a singular type of productive buildings, often of medieval layout, that resorted to munition structures to secure themselves from attacks and raids along the rivers or routes to which they were strategically located. These are hydraulic mills that are widespread in Italy but in some regions have found interesting declinations, certainly linked to the historical events of individual territories as well as to their political and economic circumstances.

In Le Marche, a region in the center of the peninsula, almost 10 percent of the approximately 200 hydraulic mills surveyed to date correspond to real fortified factories, although diminished in their formal and material culture by time and abandonment to the point of often being reduced to the state of ruins.

Taking advantage of first-hand documentation, especially in terms of graphic surveys attentive to the material culture of individual buildings and the extraordinary landscape context in which they are located, the present contribution aims to bring new arguments to bear on a heritage largely neglected by official historiography. The opportunity is valuable not only to explore in depth the conjugation between the characters proper to castles and those of protoindustrial productive buildings such as watermills, but also to prefigure a recovery that is not only desirable but also possible.

Keywords: fortified mills, Marche, landscape, recovery.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 5 | ROOM B
CHAIR: ORNELLA ZERLENGA

Ottoman fortification works at Koroni castle, Messenia, Greece (1500-1685)

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Abstract

Koroni (gr. Κορώνη, eng. *Corone*), a diachronically prominent city of southwestern Messenia region at the Peloponnese peninsula in Greece, gained significant attention under Venetian rule from 13th century as an intermediate naval station for important trade routes of eastern Mediterranean. It consisted together with the neighbouring city of Methoni (gr. Μεθώνη, eng. *Modon*) the so called “eyes of the Republic in the East.” Following the Ottoman conquest by Sultan Bayezid II in 1500, Koroni became a strategically important ottoman city and the castle undergone new fortification and restoration works in order to host up-to-date artillery provisions. Ottomans constructed the eastern-front complex of Livadye-kalesi with round tower-bastions and a moat and implement reinforcements at the acropolis and at selective places of the northern outer section of the castle. A big part of these sophisticated and experimental works can be dated at the first half of 16th century, mainly based on comparative typological characteristics and sparse archival references. The current essay examines the ottoman fortification works at Koroni from 1500 till the reconquest of the castle in 1685 by the Venetians, who delivered rich archival records on the castle’s condition. The study presents the results of the Ph.D. research on Ottoman fortifications at Peloponnese during the first period of ottoman occupation and recent elements deriving from the writer’s involvement in restoration project of the Messenia Ephorate of Antiquities for Livadye complex.

Keywords: Ottoman fortifications, Peloponnese, Koroni, fortifications 16th century.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 5 | ROOM B
CHAIR: ORNELLA ZERLENGA

La rete dei forti ottomani nell' isola di Creta 1866-1868

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Abstract

During the most insistent and bloody of the revolts of the Christian population of Crete in the 19th century, between 1866 and 1868, the command of the Ottoman troops was given to Pasha Hussein Avni (1820-1876). He is credited with designing a network of almost sixty small and large forts, capable of controlling all the passages and roads connecting the major settlements. These “control lines” (hatt-i muhafaza) for the most part inside the island were created in a short time between the summer of 1867 and the spring of 1868. The surveillance network is characterized by the great density of chosen locations and the ability to transform the initial building types in order to comply with the geomorphologic characteristics of each place, the location of the settlements and the hypotheses of movement of the rioters. This system of roads, forts and barracks has left a strong mark in the countryside of the entire island. The presentation accompanying the text includes: 1. Map of the island with the main groups of forts, 2. The building types, 3. The relationship with the landscape and the conservation projects. This research is based on a conservation program for the forts of the Sfakia area, funded by the Region of Crete (2018-2022) and the drawings that are presented are products of the Laboratory for the Documentation and Restoration of Historic Buildings and Sites of the Technical University of Crete.

Keywords: Crete, revolts, forts, ottoman empire.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 5 | ROOM C
CHAIR: MARCO GIORGIO BEVILACQUA

**Le torri difensive con funzione di porta nelle cinte urbane medievali.
La torre di Mariano II a Oristano: ascendenze e derivazioni di una
tipologia**

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Abstract

The tower of Mariano II, also known as S. Cristoforo or Porta Manna, a symbolic building of the judicial city, stands today isolated in the center of Piazza Roma, in Oristano's historic center. The only survivor of the two majestic towers-door of the turreted walls, erected by the will of the judge of Arborea Mariano II de Bas-Serra (the tower of San Filippo with a similar structure collapsed at the end of the nineteenth century and the remains were demolished in the early 20th century), is dated to 1290 thanks to the epigraph once placed above the rib of the ogival arch of transverse bipartition of the passage, which from the outside is practiced through the round front fornix.

The tower (9.40 x 9.80 m) has a U-shaped planimetric system with three sides closed in thick masonry and the fourth open towards the town; 28 m high in total, it is composed of two separate and overlapping buildings, the first 19 m high (from the base to the first round of battlements) and the second, with the walls set back from the outer edge of the four which stands, is 10 m high.

The wall faces are made of local sandstone ashlar of large and medium size, cut with perfect stereotomy. Up to an altitude of about 7 m, corresponding to the ground floor, there is a plinth made of ashlar ashlar, while the upper floors have smooth faces with the top floor crowned by Guelph battlements.

The study, starting from a careful analysis of the construction techniques and the typological and functional characteristics of the tower-town gate typology, intends to highlight the particularities that together give the Mariano II tower characters of absolute originality. As far as certain affinities with some civic towers built in the same time range (second half of the 13th century) - both in the island area (Iglesias, Cagliari) and overseas, particularly in central Italy: Lazio (Barbarano Romano, Rieti, Viterbo etc.) and Tuscany -, derivations and contaminations ancestry have not yet been fully investigated.

Keywords: fortified walls, defensive towers, city gates, construction techniques.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 5 | ROOM C
CHAIR: MARCO GIORGIO BEVILACQUA

Conservare, disvelare, reintegrare le ‘vestigia’ della Grande Guerra nel paesaggio degli Altipiani. Strategie narrative per il sistema fortificato di Cima Vezzena

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Abstract

The fortified landscape comprising the surroundings of Busa Verle and Cima Vezzena forts (TN-Italy) is today recognized as a “place of memory” because, in the aftermath of Italy’s entry into the war in 1915, it was the theatre of the first very harsh phase of the conflict. The “signs of destruction” overlaid the already articulated system of existing permanent and field fortifications, defining a highly complex palimpsest of historical traces. After more than a century, the permanences of these vestigia are still partially visible but with varying degrees of recognizability, and the world of “minor signs” such as entrenchments, defensive posts, underground shelters and walkways, is at risk of loss. This contribution presents both the elaboration of a knowledge-based method that facilitates their unveiling through a deep study of archival sources, Austro-Hungarian design drawings and their comparison with the current morphology of the sites, and some design scenarios with different degrees of narrative reinterpretation, useful for their future preservation and enhancement.

Keywords: Great War fortifications, analytical strategies, conservation, enhancement.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 5 | ROOM C
CHAIR: MARCO GIORGIO BEVILACQUA

Cartografía del paisaje de la colonización agrícola musulmana (s. VIII-XII) en la Sierra de Segura (Jaén, España) mediante Sistemas de Información Geográfica

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Abstract

In order to orient in a landscape, it is necessary to draw a map. A cartography that accurately represents the elements involved in the formation of the territory. This work focuses on the landscape defined by a system of medieval rural settlements, preserved in a Sierra de Segura valley (Jaén) in the southeast of the Iberian Peninsula. Thirty-eight sites with structures and remains built with rammed earth technique. The aim is to analyse new sources of information useful for drawing up a map with which to interpret the palimpsest of the landscape. An interdisciplinary methodology has been designed based on a multicriteria decision analysis (MCDA) developed in geographic information systems (GIS). These tools allow a macro-spatial reading of the territory and measure the influence of variables such as altitude, slope, visibility or distance to rivers or roads, among others. From here it is possible to determine settlement patterns. This process has shed light on the agricultural colonisation process of Arab, Yemeni and Berber tribes in a specific valley of al-Andalus between the 8th and 12th centuries.

Keywords: muslim agricultural colonization, andalusi medieval settlements, landscape archaeology, geographic information systems (GISs).



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 5 | ROOM C
CHAIR: MARCO GIORGIO BEVILACQUA

**Tutela dei sistemi fortificati in Campania alla fine del secolo XIX.
Le premesse storiche per le attuali politiche di conservazione**

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Abstract

The protection policies of post-unification Italy gave particular importance, as culturally suggested by the safeguard institutions, to medieval architecture and to those complexes that more than others represented “the glory of our past that could not be forgotten”. In this sense, the Conservation Commission of Terra di Lavoro, the current province of Caserta, launched an intense program of identification, cataloging and study of some fortified structures which, more than others, met the aforementioned requirements. For these reasons, attention was focused on two medieval Capuan monuments that represented “the glorious past of the city”: the Frederick II Towers and the Stones Castle. The latter was considered the most attractive element of the Norman fortification system, including the castles of Casaluce and San Felice a Cancellio; these, from Napoli to Capua, presided over a significant portion of the Campania plain. If these monuments contributed to insert the history of the province of Caserta in the national panorama, the conservation of the Roman and medieval fortifications of Alife responded, instead, to more specific ante-litteram enhancement actions aimed at the knowledge of the heritage, also triggering processes of economic development of a marginal territory. On the basis of these premises, the contribution aims to highlight, through the analysis of unpublished documents and drawings, how much the aforementioned protection actions, and only partially implemented, were also the basis of the most recent restoration and enhancement interventions of the Capuan complex and the fortified system of Alife.

Keywords: northern Campania, fortresses, preservation, restoration.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 5 | ROOM C
CHAIR: MARCO GIORGIO BEVILACQUA

Ḥiṣn Aqaba. El castillo de la Cuesta en Mojácar la Vieja, Mojácar, Almería (siglos XII-XIII)

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Abstract

Mojácar la Vieja is an al-Andalus settlement located in northeast coast of the province of Almería (Spain). It had an occupation between the 12th and 13th centuries, situated close to the border. The aim of this paper is to present a preliminary analysis of the fortifications of this site after the archaeological excavations of 2018, 2019 and 2021. Mojácar la Vieja, placed on a hill, had two fortified enclosures. The first one is located on the slope, surrounding the entire hill with curtain walls and towers. It had also a complex access system in its western part through a stone staircase and a gate-tower. The inner part of this enclosure was the main area of settlement on the site. The other enclosure was located in the inner part of the hill. Also walled, there were at least two big towers that were used as keeps, as well as a huge cistern. In the eastern of this upper enclosure was also documented a courtyard for the garrison. Therefore, Mojácar la Vieja is a fortress of importance that, given the short period of occupation of the site, is a remarkable example of the poliorcetic and building systems of Almoravid and, above all, Almohad times.

Keywords: al-Andalus, medieval, fortification, border town.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 5 | ROOM C
CHAIR: MARCO GIORGIO BEVILACQUA

La via dei castelli lungo il fiume Sele

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Abstract

Campania boasts the largest river basin in southern Italy and, among the instruments that guarantee its protection and enhancement, there are river contracts. The river contract is a strategic-programmatic tool that, through a bottom-up approach, aims at the proper management of water resources and the enhancement of the surrounding territories. While this is true and we consider the protection of Campania's natural resources to be one of our priorities, it is equally true that the region is densely characterized by an important artistic and cultural heritage scattered throughout the territory, evidence of the most ancient civilizations that have inhabited it. This is the case of the fortifications and castles one encounters along the coasts and river territories of Campania, architectures that, although now mostly in a state of ruins, tell us the history of these places. The idea of the project therefore stems from the desire to integrate the work carried out by the river contracts to safeguard the natural heritage, with a systematic study of Campania's fortifications aimed, instead, at enhancing the cultural heritage. In particular, starting from the *Sele-Tanagro-Calore salernitano* river contract, which is currently being implemented, what could be defined as a 'route of the castles' has been identified, which, running along the banks of the Sele, starts from the source of the river in the municipality of Caposele and reaches its mouth, near Capaccio Paestum.

Keywords: Campania, fortified architecture/castles, Contratto di fiume, Sele river.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 5 | ROOM C
CHAIR: MARCO GIORGIO BEVILACQUA

Análisis integral de las torres de alquería de la frontera occidental del reino nazarí de Granada

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Abstract

Due to the proximity of the Nasrid western sector of the kingdom of Granada to the border with Castile, some rural settlements had to equip themselves with defensive structures between the thirteenth to the fifteenth century, especially when the insecurity conditions were particularly pressing. Consequently, in some of the farmsteads a tower has been preserved. It was the most visible and predominant element of defensive enclosures that often had walled spaces to protect people, animals, and movable property. From an architectural and functional point of view, this type of towers with an enclosure for protection present great typological diversity in terms of the dimensions of plan and elevation, interior rooms, interior levels, layout of stairways or presence of cisterns or warehouses. Constructively, the walls of rammed earth with lime and gravel content, which allowed for the modulation of prism-shaped towers, were gradually replaced by masonry from the fourteenth century onwards due to Castilian influence. The change towards masonry construction was also born from a need to reinforce the earlier defences built with earth and facilitate the construction of structures with fewer edges, as those were less vulnerable for the increasingly widespread use of artillery system as a whole was completed and reinforced during the Nasrid period. This paper is devoted to the environmental and constructional analysis of a number of selected watchtowers from the western border of Granada, some of them built with crusted rammed earth and others in masonry with gravel filling. The structural stability of these towers has also been studied. They have been documented and analysed in depth due to the preservation of enough material structures for their physiognomy and materiality to be recognized. This allowed developing a set of in situ tests that has made its characterization possible from an integral perspective.

Keywords: constructional analysis, structural stability, late middle ages, Nasrid kingdom of Granada.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 5 | ROOM D
CHAIR: STEFANO BERTOCCI

Da struttura fortificata a centro per la comunità: il caso del castello di Hylton a Sunderland (UK)

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Abstract

Hylton Castle was commissioned by Sir William Hylton as a fortified residence from the 14th century. Major alterations were made to the complex in the 18th century, and it remained the family's principal seat until 1746. Over the following centuries, the castle underwent changes in ownership, resulting in changes of use. The site was taken over by the state in 1950 and is now owned by English Heritage. The currently surviving structures (the west watchtower and St Catherine's Chapel) are subject to national protection orders (Grade I Listed Building and Scheduled Monument).

Between 2017 and 2020, the castle underwent a major restoration and re-functionalisation campaign promoted by a partnership of organisations (Sunderland City Council, The Friends of Hylton Castle and Dene, National Lottery Heritage Fund, The Garfield and Wolfson Foundations, English Heritage, and Historic England). The intervention included the insertion of new floors and vertical connections as well as improved accessibility, with the creation of flexible spaces for community and educational use. Alongside the physical intervention, the management entrusted by the Hylton Castle Trust has involved the community by providing volunteering opportunities, activities and events for the population and visitors, educational visits for schools and training for young people, with an emphasis on the collective memories of the place as a means of strengthening the bond with the asset.

The contribution aims to illustrate the results of the actions carried out on the castle, questioning the degree of compatibility with the historical architectural heritage of an intervention oriented towards community use. It also highlights the characteristics that emerge from a project involving public and non-profit organisations in the conservation, regeneration, and management of an asset with a strong social value.

Keywords: castle, reuse, management, community.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 6 - CULTURE AND MANAGEMENT

24th MARCH | SESSION 5 | ROOM D
CHAIR: STEFANO BERTOCCI

Le mura invisibili

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Abstract

The Genoese city wall, with its more than 20 kilometres of linear development, is the most extensive system of urban fortifications and the second largest if we also consider the Great Wall of China, which stretches over eight thousand kilometres and crosses different cities and nations. This extension could easily exceed 30 kilometres if one considered all the sections related to the seven walls that were erected to defend the city at particular moments in its history. Subsequent extensions of the defensive rings followed the natural expansion of the city mainly northwards and westwards, until the construction of the so-called *Mura Nuove* which, in the first half of the 17th century, clearly delineated the limits of the city. They followed the natural conformation of the two major ridges that descend from Monte Peralto down to the sea. Thus, sections of walls built in different periods were added and integrated, leading to a true ‘stratification’ of defensive structures that today, in some parts, are hidden by later urban developments.

Thanks to the work started over thirty years ago by a group of Genoese speleologists, it has been possible to ‘rediscover’ some sections of the ancient fortifications that lie, forgotten, underground in the contemporary city. These are curtain walls that were buried as a result of the great 19th century works; elements that are now inadequate for the city’s renewed defensive needs; true ‘invisible walls’ that, for the moment, only show themselves to the eyes of the speleologists who descend into the hidden belly of the city.

The survey, study and systematisation of this hidden heritage, as well as its guided enjoyment, can become an important driving force for the development and dissemination of knowledge of the underground part of this city that already holds the *Strade Nuove* and the *Sistema dei Palazzi dei Rolli* as Unesco heritage sites.

Keywords: fortifications, enhancement, communication, speleology.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 6 - CULTURE AND MANAGEMENT

Adaptive Reuse for Fortifications as a Strategy towards Conservation and Urban Regeneration. The case of ‘Canto di Stampace’ in Pisa

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Abstract

The purpose of this paper is to illustrate a strategy for restoration and enhancement of historical fortifications. The target is to guarantee the physical conservation and the maintenance of use. Without a continuous employment a physical declining process would rapidly occur causing abandonment. Therefore, these historical buildings shall be restored, connected to and integrated into the cultural activities and itineraries of their area.

The main objective for this research is the study of the south-west section of the medieval city walls of Pisa including the sixteenth-century bastion, so-called Canto di Stampace. The definition of the restoration proposal is based on its strengths and weaknesses in order to increase the value of the firsts and rectify the seconds. The aim is to integrate the area inside the city life through the realization of new social spaces. The outdoor spaces have been redesigned as a new urban park, including multi-functional areas for several activities that will involve the University and the museums of Pisa. The addition of technological features employs a contemporary language. These new additions are meant to not be excessive or invasive and the design uses light materials and solutions in order to be respectful to the identity of the location, chasing the concept of “compatibility”. The design of the street furniture consists of elements that strive to be versatile, adaptable, and integrated within the context. It also includes the choice of specific plant species, in order to improve the environment both from an esthetical and ecological point of view.

In conclusion, the area known as Canto di Stampace shall be converted from a neglected unsafe area to an important landmark destination with a high cultural and social value. With new vitality and dynamism to the neighbourhood, it will immensely improve the environmental qualities, adding new social catalysts and attractions.

Keywords: re-use, integration, landmark, enhancement.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 6 - CULTURE AND MANAGEMENT

24th MARCH | SESSION 5 | ROOM D
CHAIR: STEFANO BERTOCCI

La Cittadella di Alessandria, ‘Faro’ di pace in Europa

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Abstract

This article describes the virtuous path that led, with the support of the Council of Europe, to the proposal of the Patrimonial Community project “The Citadel of Alexandria”, Lighthouse “of peace in Europe” (Framework Convention, 2005), in full conviction that the knowledge and awareness of a cultural asset themselves constitute a cultural heritage, the first and indispensable premise in which the possibility of every subject (public or private) to contribute to the conservation and transmission of the heritage, to all levels. Indeed, the Convention itself confirms (as a right / duty) the individual and collective responsibility towards the heritage in question, making it the subject of actions aimed at sustaining and preserving its qualities and characteristics, in order to pass them on to future generations. The programmatically and systematically organized confrontation led to an effective and effective convergence between all the interested and involved subjects. The Index of the project - by points and by phases - was structured as follows: 1: The Citadel in the complexity of European Defense Systems: itineraries from History and Tradition. Fortified types and systems. Networks, sources, matrices, protagonists, examples. 2: The historical building as a “monument / document”, testimony of History and Memory “. Places, times, events. 3: The historical building as a “monument / document of itself”. 4: Events and “Heritage Walks” “in real and virtual”: in the Citadel and city, territory, landscape, in nature (and not only ...). 5: Training, education, orientation, from war to peace. 6: Studies and research, dissemination and dissemination. Digital archives. National and international research exchanges. 7: Functions and Usage. 8: National and international cultural tourism, organization and marketing. 9: An ethical code of conduct.

Keywords: Heritage Community Faro Convention, Council of Europe, Culture of Peace, enhancement of tangible and intangible assets, international cooperation and tourism.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 6 - CULTURE AND MANAGEMENT

24th MARCH | SESSION 5 | ROOM D
CHAIR: STEFANO BERTOCCI

Recupero dei camminamenti in quota delle mura urbane limitrofe al Giardino Scotto di Pisa

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Abstract

Giardino Scotto (Scotto's Garden) is the main urban garden in Pisa, enclosed by a triangular fortress known as Cittadella Nuova (New Citadel), built as a reinforcement of the medieval fortifications between the 14th and the 15th century, later on disarmed from its military use and sold in 1798 to shipowner Domenico Scotto, who transformed the fortress into an extensive garden with terraces and promenades, serving the adjoining palace.

A peculiar feature of Giardino Scotto is a vaulted gallery located on the first level of the fortified wall, running for the whole extension of the fortress, which on the western side becomes an ambulatory with 19th century arched openings; another unusual feature is the Tower of St. Anthony, which was cut off at the fortification level like in almost all the other towers in Pisa, located at the northern end of the fortress and presenting an important lean in respect of the ground level and the town walls as well. The whole of fortifications and galleries has not been allowed to the public, due to necessary maintenance and the presence of a few structural damages.

As part of a larger project for the valorisation of such important heritage in the historical town centre, the restoration of the walkways has recently begun; such rehabilitation campaign includes the construction of a new access to ascend to the two promenades, consisting of a staircase and an elevator located inside the Tower of St. Anthony; the latter will be raised to the summit of the walls with a timber enclosure.

Keywords: fortifications, enhancement, walls, routes.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 6 - CULTURE AND MANAGEMENT

24th MARCH | SESSION 5 | ROOM D
CHAIR: STEFANO BERTOCCI

The Military Heritage and its natural environment of the Veracruz-Mexico Royal Road

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Abstract

In this research we propose to establish and take advantage of a management model for the conservation of the fortifications and their natural environment, with the objective of making the municipalities included in the route of the fortified inland road more productive in the cultural tourism sector. We will apply a methodology that facilitates the participation and integration of academics with the communities.

We handle and apply the research model that was created in a project carried out in the Polytechnic University of Valencia, Spain, with a duration of 3 years, where the corresponding experiences were contributed in order to interact and achieve proposals for solutions to the problems that arise in each city in which the study is carried out. The respective experiences are provided to interrelate and achieve proposals for solutions to the problems of each city in which the study is conducted, and are developed around four major groups: Identification, Valuation, Use and Management, this research addresses the Inland Fortified Road that includes its municipalities with the purpose of serving as a paradigm for the recovery of the Fortified Road, with emphasis on the cultural landscape of the state of Veracruz, this will contribute to illustrate the current social conception of the values of military heritage as a resource for its sustainable social, cultural and economic development.

Keywords: fortifications, natural landscape, sustainable, management, valorization.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 6 - CULTURE AND MANAGEMENT

24th MARCH | SESSION 5 | ROOM D
CHAIR: STEFANO BERTOCCI

Identidad y memoria: nuevos enfoques para la gestión de los castillos en la provincia de Alicante (España)

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Abstract

The management of defensive architecture is largely based on archaeological, architectural and historical research, which becomes a fundamental pillar to carry out any action of preservation, restoration, didactics and dissemination. At the same time, a new research approach has been developed on the management of castles in public ownership at the beginning of the 21st century in different administrative territories such as the province of Alicante (Spain). In order to analyse it in more detail, a pilot project has been designed for Castalla Castle, one of the most outstanding fortifications in Alicante. It is aimed at finding out what the castle represents for its community and how it is perceived through the qualitative methodology, as well as improving its management. In this sense, is it a reference heritage landmark? Or is it a great unknown that represents a great economic burden and does not provide any benefit? These questions are of great interest because, without the effective involvement of the community, the correct management of defensive architecture cannot be complete as pointed out by the ICOMOS Guidelines on Fortifications and Military Heritage and the National Plan for Defensive Architecture of the Spanish Cultural Heritage Institute.

Keywords: defensive architecture, castles, management, province of Alicante.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 6 - CULTURE AND MANAGEMENT

24th MARCH | SESSION 6 | ROOM A
CHAIR: GIORGIO VERDIANI

Giacomo De Lanteri. Il ruolo del disegno nell'architettura della difesa tardo-cinquecentesca

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Abstract

This paper has as object of study the dissemination through Treatises of a new way to conceive the role of drawing in the conception and graphical representation of design of new defensive forms such as bastions systems of the sixteenth century. In a historical period characterized by deep theoretical and social transformations (which affect the formulation of the defense design) the drawing intervenes with an important role for knowledge and configuration processes of defense architecture. In this panorama, is investigated the theoretical and practical implications contained in the late-sixteenth-century Treatise production by Giacomo De Lanteri. He is author of two volumes that introduce the nascent 'Arte del Fortificare' (Art of Fortifying) which anticipate a fervent print activity of specialized works such as by Iacopo Castriotto and Girolamo Maggi (1564), Giovanni Scala (1596), Buonaiuto Lorini (1597). The Lanteri's work introduces a new cultural vision where the bastion defense design is based on the integration of science and technology as well as on the functionality verification before the construction of fortified structure *in situ*. In this context, Lanteri anticipates and formulates a design method based on the knowledge of both the principles of Euclidean geometry and the practice of drawing to configure a 'perfect bastion shape' and check its efficiency in relation to artillery fire before its realization.

Keywords: bastioned architecture, military treatises, geometry, drawing, Giacomo De Lanteri.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 2 - THEORETICAL CONCEPTS

24th MARCH | SESSION 6 | ROOM A
CHAIR: GIORGIO VERDIANI

Castel Nuovo: un castello-fortezza sul waterfront di Napoli

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Abstract

A landmark in the skyline of the Neapolitan capital, Castel Nuovo in Naples is an important archetype of castle-palace near the sea. Its history and its transformations are linked to the choices made by the dominations that followed one another at the helm of the city and which changed its consistency and character, adapting them to changes in the art of warfare. The iconographic images reveal the significant changes in the fortress, which over the centuries had to take into account the evolution of artillery. In particular, in the Spanish Viceregal age, a vast program of interventions was developed for Castel Nuovo, which was heavily damaged: the construction of a fortified enclosure outside the moat, the addition of two pentagonal bastions, the expansion of the moat. The significant innovations in the art of war were recorded in the sixteenth century for the use of explosive bullets, both in the form of hand grenades and mortars, especially useful in sieges. The contribution highlights the transformations due to war defense reasons, underlining the attitude taken by Filangieri towards the factory in carrying out a long and complex restoration of the transformations of the moment.

Keywords: Castel Nuovo, Napoli, military engineering, artillery.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 2 - THEORETICAL CONCEPTS

Le cittadelle pentagonali: dalle rive del Po alle coste dello Stato dei Presidi

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Abstract

This study aims at defining the structural and defensive characteristics of the Renaissance pentagonal citadels in the Po Valley and at comparing them with the fortified structures of the Presidium State.

The five-sided bastioned fortresses, such as those in Piacenza and Parma, built on a land which is a river itinerary on the route that joined Genoa and Venice, are a pragmatic “topos” and at the same time a symbolic value, of the Renaissance military leaders.

The comparison between the bastioned citadels built in the Po Valley not far from the banks of the river Po and the coastal fortifications such as those found in the State of the Presidi highlights a little, albeit limited, common defensive features but also some different inspiring principles and constructive and strategic ideals.

The study showed that not only did the geo-topographical location of the fortified structures influence their constructive philosophy, but above all the relationship between the Prince and his territory played a primary role in defining and inspiring the strategies and construction solutions adopted to construct these defensive complexes. Using a metaphor, it is possible to say that each pentagonal citadel constitutes a “move” of the Prince on a chessboard, namely the Po Valley, where what can make a difference in the subjugation of the adversaries is the use of a fortified castle scheme, based on the five-sided polygon. Its analysis allows us to distinguish the type of defensive provision and to identify a scenario that outlines the conceptual and philosophical meaning of the “central plan”, as well as the functional advantages of this choice in the art of war.

Keywords: geometry, artillery, coastal defence, river defence.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 2 - THEORETICAL CONCEPTS

24th MARCH | SESSION 6 | ROOM A
CHAIR: GIORGIO VERDIANI

Dos fortificaciones de campaña en los Andes colombianos (s. XIX)

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Abstract

On the current territory of Colombia, the armies at the service of the Spanish Crown built numerous field fortifications, either as defense works on the coasts, or as points of advance towards the interior, although very few have deserved any kind of historiographical recognition. In this communication there is an account of two temporary fortifications erected by the Spanish troops that defended themselves from the local army during the first years of the 19th century, located on the route that connected Santafe with Caracas, conceived by the military engineer Antonio José Galluzo. Of both structures, drawn with a practically identical geometric approach, only one is preserved in good condition despite the fact that it has been forgotten and neglected for decades. The conclusions seek to highlight the importance of field fortifications and promote research on other similar structures, of which physical remains are preserved in American territories.

Keywords: field fortification, redoubt, temporary fortification, supporting points.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 2 - THEORETICAL CONCEPTS

24th MARCH | SESSION 6 | ROOM A
CHAIR: GIORGIO VERDIANI

“...Per non entrare in spesa de’ baloardi...” Il progetto della fortificazione ibrida di Gaspare Beretta per Domodossola

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Abstract

Thirty-five years of slow psychophysical decline did not prevent Charles II, king of Spain, to face the recurrent wars that, during the 17th Century, were threatening the Empire’s borders. It didn’t even prevent him from planning and ordering visits and inspections to his fortified cities, often providing for the necessary adjustments inspired by the latest 17th Century fortifications of French and Flemish schools. The Milanesado, a decisive intersection on the “Spanish Road”, didn’t avoid the reorganization, even if it hadn’t been subjected to any substantial land downsizing. For Domodossola, situated on the eastern border, the governor of the Milanesado (1678-1686), Count of Melgar, hired Gaspare Beretta, a skilled and experienced camp-master, to devise the transition to the modern fortified system. Drawings, documents and calculations are being kept in the Biblioteca Trivulziana in Milan. The imperial military intentions were not always followed by suitable funding, therefore Gaspare Beretta envisioned for the city an hybrid fortified system, which preserved the existing pentagonal medieval circuit (1306-1321), refraining from the replacement of the angular towers with ramparts, financially too expensive. Having abandoned the grazing defense ensured by the ramparts, Beretta opted for the provision of counter guards located in the moat (doubled in front of the castle and the city gate), protruding in front of the corners and protected by connecting traverse with towers. The building inside the walls would have been dismantled for the construction of ramparts set against the existing city walls. The project was started (1686) but soon abandoned for lack of funding. Therefore, the instance of Domodossola is to be added to the universe of the Spanish king’s “paper ramparts”, attested, over the century, in the magnificent projects he conceived but never accomplished.

Keywords: Charles II of Spain, Gaspare Beretta, Sébastien Le Prestre de Vauban, Giuseppe Formenti, Domodossola, hybrid fortification.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 2 - THEORETICAL CONCEPTS

Comprehensive typomorphological approach to the studies on the bastion castle phenomenon in the former Polish lands

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Abstract

The importance of this article lies in developing a comprehensive typomorphological approach to bastion castles and its application to the case studies in the former Polish lands to explain the phenomenon of bastion castles there. This type of complex has not been defined in architectural theory yet. The existing individual studies deal with only one of the components of bastion castles, either residential (palace) or military (defensive walls). The methodology presented in this article relies on the architectural complex itself as the primary source. Since the studied type combines two components of a 17th-century building that at first sight appear contradictory, namely military and civil, it was necessary to find an approach that goes beyond the primary analysis of the building function and type. Thus, bastion castles' geometry, spatial relationships, and location in the landscape were examined here. Critical examination of the well-preserved cases using a comprehensive analysis revealed the fundamental characteristics of bastion castles in the former Polish lands and similar and distinct patterns between the case studies and the models in European treatises. Such discoveries bring new insights into the question of bastion castles in the studied area and enrich the architectural knowledge of the phenomenon of bastion castles in Europe. The methodology developed here may lend itself to studies on the phenomenon of bastion castles in other areas, and the results may help analyze other European examples.

Keywords: Bastion castle, typomorphology, compositional analysis, Poland, Ukraine.



24th MARCH | SESSION 6 | ROOM B
CHAIR: STEFANO COLUMBU

Research and restoration of an auxiliary fortified position (spur) on St. Michael's Fortress in Šibenik, Croatia

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Abstract

St. Michael's Fortress is the oldest existing historical monument in the city of Šibenik, with archaeological findings ranging from prehistory up until today. Various external fortifications were built from 15th to 17th century around the medieval castle, giving the fortress its irregular shape. One of its peripheral structures – for many years unrecognized as a part of the fortress – is located on the northwestern slopes. Archaeological excavations at this position began in late 2017, and after three campaigns it became clear that this was a distinct (albeit a small) tower, a proto-bastion for early handguns. It was constructed in the late 15th century to flank the existing ramparts (*strada di soccorso*) leading from the fortress to the sea. Archival research did not uncover the exact date of construction or the original term by which the structure was called, and following the examples or structures of the same period, the research team chose to designate it as a spur (It. *sperone*), or in local vernacular – 'špirun'. A publication of scientific paper (available online on Croatian scientific database) in mid-2019 was followed by several public presentations and walks. At the same time, a restoration project was made as the western wall of the spur was estimated to be seriously impaired. After the completion and the approval of the restoration project, the construction works partly financed by the Croatian Ministry of Culture and Media were finally carried out from November 2021 to April 2022. This entire process, which included detection, archaeological and historical analysis, publication and presentation of research, interdisciplinary discussion and agreement on the methods of restoration and the subsequent use, and finally the implementation of the restoration project, is perhaps a good example of how the fortification heritage in Croatia should be treated in the future.

Keywords: Šibenik, Dalmatia, 15th century fortifications, restoration project.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 6 | ROOM B
CHAIR: STEFANO COLUMBU

Case-torri del Tirreno cosentino

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Abstract

Calabria is the mainland Italian region with the longest coastal circuit, in the centre of the Mediterranean, for centuries scene of continuous invasions. Consequential are the numerous and different defensive structures, among which the tower-houses of the Tyrrhenian coast of Cosenza, in the territory of Fiumefreddo Bruzio, are of certain importance. It concerns fortified rural buildings, equipped with sighting towers, built from the fifteenth century to the modern age. They protect properties connected to agricultural activities and the historic village, which is surrounded by them. The models are of cultured and traditional matrices mixed, referring to the cultures that have taken root in the territory, including the Arab one. The military features are relevant: the battlements, the cubic module, the loopholes, the narrow and elongated openings, and the traces of drawbridges. Made of stone and lime walls, they characterize the landscape, of which they represent historical cornerstones, recently, in truth, a little altered.

Keywords: tower houses, rural fortified constructions, arab crenellation.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 6 | ROOM B
CHAIR: STEFANO COLUMBU

I Forti di Roma: una lettura a scala urbana

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Abstract

The area of the compound of the Forts of Rome may be interpreted as the *threshold*, while the dry moat which encloses them as a *limit*. Together they afford one the opportunity to explore the functional and symbolic relationships which they establish with the surrounding urban areas. The map of the Ager Romanus, those of the IGM (Military Geographic Institute) since 1885, and the satellite images, highlight the hiatus between how the Forts were represented cartographically and the difficulty in how they are perceived, and narrate the changes that have taken place in the spatial, dimensional, and volumetric relationships they have progressively established with their immediate surroundings. The aim of the research is to investigate, recognize, and represent, via an analysis of the archival documentation and drawings as an aid, the connotative and qualitative elements of the Forts of Rome, of the structures, and of the lands that constitute an indivisible unity of architecture and landscape to be restored and promoted in restoration and re-utilization projects.

Keywords: forts of Rome, defensive walls, cartography, urban analysis.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 6 | ROOM B
CHAIR: STEFANO COLUMBU

Il Castello Malaspina di Mulazzo in Lunigiana: conoscenza, conservazione e valorizzazione

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Abstract

The Malaspina Castle in the village of Mulazzo (Italy) belongs to the complex system of historical castles of Lunigiana; in this territory, located on the northern part of Tuscany, there are the so-called 'hundred castles' belonging to the two branches of Malaspina family: the 'Spino Secco' and the 'Spino Fiorito'. In the Middle Ages, Mulazzo represented the head of the feuds belonging to the 'Spino Secco', placed on the right side of the Magra River, facing the village of Filattiera, on the left side of the river, belonging to the 'Spino Fiorito'. The 'Lords of the Castle' dwelled in the castle of Mulazzo, as opposed to the 'Lords of the Palace', who dwelled in the northeastern part of the village. Equipped with a small tower, surrounded by a moat, and served by the Malaspina aqueduct, it was founded on an unstable terrain, and for this reason, was abandoned quite soon. Nowadays, the fortification is in a state of ruins, and there is an urgent need for documentation, analysis, and development of strategies to preserve and make the site accessible. Therefore, the present study aims to develop strategies for its restoration and enhancement.

Keywords: Malaspina, Lunigiana's castles, integrated survey, conservation, accessibility.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 6 | ROOM B
CHAIR: STEFANO COLUMBU

Strategie di conoscenza e di progetto: un nuovo percorso urbano per il borgo storico di Massa Marittima

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Abstract

The research site is located in Tuscany, in the suggestive medieval village of Massa Marittima, immersed in the context of the metalliferous hills dominated by the fortress of Monteregio, which was the first building built by the Aldobrandeschi in the 9th century, around which the current town developed.

Connecting the upper town and the lower town is not just about giving a solution to a specific problem but it is a strategy that aims to make a historic place like this, with a lot of significant slopes, usable and accessible to all overcoming architectural barriers and improving the landscape tourist routes.

The survey strategy integrates the aerial one via drone with the terrestrial one via laser scanner, making geometric and material analysis possible, obtaining a complete point cloud that forms the base for the creation of a digital model, which constitutes the scientific base of the project, and the restoration information sheets.

So the project is therefore born from an approved digital scientific base and can aspire to be an example for future interventions. The project develops a proposal for a new connection between the former Mazzini cinema and the fortress of Monteregio creates a new path, integrated in the landscape and in the open-air museum.

Keywords: fortification, heritage, renovation, digital survey.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 7 - MISCELLANY

24th MARCH | SESSION 6 | ROOM B
CHAIR: STEFANO COLUMBU

Esplorazione visuale del dibattito intorno al secondo fianco

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Abstract

Between the end of the sixteenth and mid-eighteenth centuries, the ‘second flank’ has been an interesting topic within the cultural debate around military architecture, since its implementation in the curtain-ramparts system would have allowed a greater volume of fire along the faces of the bastions. The contribution proposes an analysis of the graphic apparatuses of some treatises, investigating the methods used to represent, analyse, and discuss the theme of the second flank. Among all its estimators, there is also Giuseppe Ignazio Bertola. In his *Dizionario e repertorio...* he noted the ideas of some of the previous authors. Starting from Bertola’s *Dizionario*, available in the critical edition by Amelio Fara, the paper proposes the analysis of the sources cited, expanding the search to other treatises. Through a critical interpretation of the relationships between textual descriptions and various representations, a first visual exploration of the debate around the second flank is carried out, opening to the comparison with the visual culture of the time. Different relationships emerge between texts and images, used by each author to strengthen the communication of his idea. In this sense, images become graphic proof of the goodness of the system, or illustrations in support of a broader discussion. The paper focus also on the ambiguity of the term, as used over the centuries XVI and XIX, also from the graphic point of view.

Keywords: representation, treatises, second flank, visual culture.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 7 - MISCELLANY

24th MARCH | SESSION 6 | ROOM C
CHAIR: PABLO RODRÍGUEZ-NAVARRO

Elementos fortificados en los monasterios jerónimos de la Corona de Aragón

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Abstract

The monasteries of the Order of Saint Jerome (OSH) in Spain received large donations that allowed them to build important buildings to house their communities. The Order was founded in the 14th century and has always maintained direct links with the Spanish monarchy and aristocracy. Unlike the Cistercian or Carthusian monasteries, these do not have a fixed building model. The main rooms (church, sacristy, refectory, library, etc.) are common to all of them and similar to those of any other order, but the organization varies from one house to another depending on the implantation on the territory. Although the appearance of the Order was practically simultaneous in the crowns of Castilla and Aragon, the monasteries of the latter, located on the Mediterranean slope of the Iberian Peninsula, present some differential characteristics. Typologically they are configured as compact buildings, developed around a single cloister, and in which defensive elements appear. In particular, and as a distinctive element in all the houses of the founding phase, a powerful fortified tower appears. Thus, the monasteries of Santa María de la Murta in Alzira, San Jeroni de Cotalba, and Sant Jeroni de la Murtra in Badalona present this common characteristic. The tower, designed as a defensive element, has the function of providing shelter to the community of monks and their property against possible attacks. The history of the first community of the Order that, in its first years of existence, suffered looting, plundering and the kidnapping of its monks by barbary pirates, was undoubtedly a recurring memory that prompted the construction of these elements. In this paper, the similarities and typological, constructive and structural differences of these monasteries are given, with special attention to the fortified tower piece.

Keywords: tower, order hieronymites, defensive architecture.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 6 | ROOM C
CHAIR: PABLO RODRÍGUEZ-NAVARRO

The Rivellino degli Invalidi and the fortification system of Turin

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Abstract

This contribution, of a multidisciplinary nature, connects the very recent digital survey of the Rivellino degli Invalidi with the decades-long archaeological studies culminating with the 2015-2016 excavations and with the historical cartography that reveals the substantial consistency with the digital survey in terms of position, geometry and shape of the revelin.

Keywords: archaeological excavations, integrated survey, digital modeling, Rivellino degli Invalidi.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 6 | ROOM C
CHAIR: PABLO RODRÍGUEZ-NAVARRO

Il rilievo integrato del castello-recinto di Pesche (IS): conoscenza e strategie di valorizzazione di un insediamento fortificato in Molise

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Abstract

Perched on the slopes of San Marco Mount, in a perfect symbiosis of architecture and landscape, there is the small village of Pesche in the province of Isernia, which traces its origins back to the 5th-6th centuries, when the steep natural slope was chosen as the site for the construction of a safe village. On the top of the site, the ruins of the so-called *Castrum Pesclarum* emerge, evidence of a particular type of fortified structure in Molise, that of the castle-enclosure. Built as early as the Norman era to reinforce the defence and transformed over the following centuries due to damage caused by natural disasters and human actions, the small fortified citadel is characterised by a perimeter marked by curtain walls that follow the natural slope, interspersed with towers, while its interior contains small rooms placed side by side and built using the typical limestone of the area.

The present contribution intends to show the current state of conservation of the fortified citadel of Pesche, outlining the methodology followed in the study of the site, and then proposing a possible enhancement strategy. The work was conducted starting from an integrated instrumental survey, based on laser scanning and aerial digital photogrammetry with a drone, thus showing the efficiency of these systems not only at the single architectural scale, but also at the urban scale, even in complex sites such as that of Pesche. The combination of these two techniques has made it possible to obtain an accurate knowledge of a large part of the site, thus making it possible to propose design strategies for its conservation and enhancement.

Keywords: castrum, survey, laser scanning, conservation, Pesche.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 6 | ROOM C
CHAIR: PABLO RODRÍGUEZ-NAVARRO

Balkan Coastal Fortifications. The case study of Kaštelina between conservation and valorisation

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Abstract

The research proposes the analysis of the Balkan fortification system with special attention to the structures built along the Dalmatian coast during the 16th century. In particular, it proposes the study of the fort of Kaštelina, the construction of which was ordered by the Venetian authorities to protect the population of the region of Vir from the uscocchi and the attacks of the Turks who invaded the area at that time. The research was conducted thanks to a preliminary analysis of historical and iconographic sources and several survey campaigns aimed at documenting the current state of conservation. The objective of the analysis of the data acquired is to draw up guidelines aimed at defining a useful tool for the interpretation and conservation of this area of high cultural and architectural value, preserving it from problems of conservation and use and attributing it a fundamental role in defining a relationship with the organisms of the hinterland and the surrounding landscape.

Keywords: fortifications, Balkans, conservation, valorisation.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

24th MARCH | SESSION 6 | ROOM C
CHAIR: PABLO RODRÍGUEZ-NAVARRO

Protection and rehabilitation of Fort Kosmač at Brajići, Montenegro

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Abstract

Fort Kosmač was constructed by the Austrian Empire in 1858, as a fortification to protect the southern border of the empire. Abandoned and demolished by the imperial army of Austria-Hungary, in 1918 it became a part of Kingdom of Yugoslavia. It remained a ruin until today. The condition of the fort worsened over the time, as it had no use any more. Today, it is a monument but because of its bad condition, lack of infrastructure and poor approach, it is only sometimes visited by locals and hikers, who come to enjoy the great view over the Bay of Budva. The building is a ruin, completely unsecured and as such it poses a danger to the curious visitors, who want to explore it. The fort lies near the main road that connects Budva with Cetinje. From the main road there is an old road leading to the fort. Even though this old road is in bad condition the fort is also accessible by car over the newly built part of the road. The serpentine approach is partially collapsed and in danger of bigger parts collapsing, the site is in danger to lose its important parts. Although protected as a national cultural monument, until now nothing has been done to physically protect it and equip it with any infrastructure for safe touristic visits (1). This project focuses on analyzing the site. Besides the detailed research, the project should extract the best possible solutions for future treatment to avoid the complete loss of this unique piece of history. The detailed building archaeology including a documentation of its current status will be the first part of the project. After collecting and processing the data, an analysis and evaluation will be made to determine the needed minimum to rehabilitate the site. Afterwards further options will be designed.

Keywords: fortification, rehabilitation, Austria-Hungary, Montenegro.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 3 - RESEARCH ON BUILT HERITAGE

Il progetto incompiuto di Massimo Carmassi per il restauro della Fortezza Nuova di Pisa

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Abstract

The Fortezza Nuova of Pisa is the most important fortification attached to the city's medieval walls. Built as a military garrison at the beginning of the 15th century, when Florence conquered the Republic of Pisa for the first time, architects such as Filippo Brunelleschi, Giuliano da Sangallo and Antonio da Sangallo were involved in its design and construction. First abandoned, then transformed into a private garden, it finally turned back into a public space at the beginning of the twentieth century. At the end of the 1970s, the Fortress appeared as a place of decay in the city's heart. Following a brief overview of the events that determined its architectural morphology, the article focuses on the recovery plan of the Fortress, as it was designed in 1981 by the Project Office of the Municipality of Pisa, directed by Massimo Carmassi. As part of the redevelopment project of the south-eastern vertex of the city walls, Carmassi's project was carried out only for the demolition part, and just the preliminary drawings from the archive can show today what the subsequent phases should have been. From a methodologically analytical reading of the project, first at the urban scale and then at the architectural one, three main distinct moments emerge: the demolition of the additions, the reconstruction of the historical components, and the new construction characterized by a contemporary language. Starting from this analysis, it has been possible to carry out a critical interpretation of the unfinished recovery project of the Fortezza Nuova, investigating its theoretical intuitions and formal intentions. The study shows how Massimo Carmassi's project has conceived the recovery of the Fortress, not as the restoration of an independent building, but as the main engine of a wider urban redevelopment, where contemporary architecture should have filled the urban voids in dialogue with the historic building. After highlighting the peculiar design characteristics and the intellectual reasons deduced from the drawings, the project is thus framed within the restoration methodology of the Carmassian school, a method that has been constituting the primary strategy for the recovery of the urban image of Pisa from the 1970s to the 1990s.

Keywords: Massimo Carmassi, Fortezza Nuova, Giardino Scotto, Regionalismo Critico.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 7 - MISCELLANY

24th MARCH | SESSION 6 | ROOM D
CHAIR: LUIS J. GARCÍA-PULIDO

Torri nel paesaggio urbano. La ‘turrita’ Forio d’Ischia tra alterazioni e possibilità di valorizzazione delle architetture fortificate

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Abstract

The island of Ischia has an articulated system of watchtowers, which in different forms characterises the entire territory. In particular, Forio, a municipality located on the western strip of the island, is called the ‘Turrita’ because of the particular concentration of towers built to face the Saracen invasions that, between the end of the XV century and the first half of the XVI century, led to the building of this defensive network, organised on two lines, one more internal, the other external.

Today, the towers are incorporated in a dense urban framework, the result of speculative phenomena that in the last decades of the XX century gave rise to cases of unauthorised building. Today, the weave of these turreted garrisons is still visible; they are articulated, starting from the port, in the central-western area of the municipality, following the gentle slope that defines it.

By virtue of the tourist attendance linked to the island’s cultural and geo-historical resources, Forio’s turreted network, as a significant historical-architectural testimony, is potentially the object of concrete enhancement strategies.

Therefore, on the basis of studies conducted on the current state of conservation of the fortified landscape of Forio, the contribution intends to highlight the desirable possibilities of use and management of the defence system, which - through a profitable interaction between public bodies and private property - aim to increase cultural tourism throughout the island of Ischia.

Keywords: Ischia island, Forio, fortified landscape, cultural tourism.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 6 - CULTURE AND MANAGEMENT

24th MARCH | SESSION 6 | ROOM D
CHAIR: LUIS J. GARCÍA-PULIDO

Architetture fortificate e gestione dell'emergenza post-sisma: nuovi possibili strumenti per il rilievo del danno

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Abstract

The Emilia 2012 earthquake highlighted, once again, the vulnerability of the Italian architectural heritage, and in particular of fortified architectures. In order to safe this asset, it is essential to manage properly the post-earthquake phase and to ensure fast and more correct emergency surveys, currently carried out through the two existing damage assessment inventory sheets for listed buildings: A-DC form for churches and B-DP form for palaces. After the Emilia earthquake, the B-DP form was used to survey the seismic mechanisms of the 21 damaged castles. However, some difficulties emerged. Indeed, the B-DP form does not provide for the census of kinematics typical of castle macro-elements, such as: towers, curtain walls, merlons, corbels etc. For this reason, in collaboration with the Regional Agency for Reconstruction-Earthquake 2012, a damage assessment inventory sheet for fortified architectures was proposed, including a specific abacus of collapse mechanisms and a related compilation manual. These tools should help survey teams to provide evaluations in a more immediate and correct manner. However, the real turning point, for a better management of the emergency phase, could be the digitization of the forms, especially if this step is carried out with a view to interoperability with the digital databases already in use by the Ministry of Culture (MiC).

Keywords: fortified architecture, 2012 Emilia earthquake, damage assessment, inventory sheets.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 6 - CULTURE AND MANAGEMENT

24th MARCH | SESSION 6 | ROOM D
CHAIR: LUIS J. GARCÍA-PULIDO

L'antico castello di Alba: studi per la conservazione e la valorizzazione di un sito archeologico

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Abstract

The former hospital S. Lazzaro of Alba (CN), built at the end of the eighteenth century, conceals in the basement some remains of the ancient castle; a defensive structure used mainly as a military garrison. The building was created near the historical layout of the defensive walls of *Alba Pompeia*, already attested by the 1st century B.C. and later transformed during the Middle Ages. The structure of the ancient castle, depicted in the drawing of Alba in *Theatrum Sabaudiae* (1682), has a regular plan, with a central courtyard and four circular towers at the corners. In the last two centuries, this portion of the old town, has undergone a radical urban transformation, with changes in soil elevation, destruction of buildings and new reconstructions. These have contributed significantly to erasing the image of the castle that now has disappeared from the urban fabric. The extension of the hospital, through a long series of excavations, has brought out some archaeological ruins known by the superintendency of cultural heritage but completely unknown to the community. Starting three years ago, with the relocation of the hospital, the local authorities started a redevelopment project of the area, with the re-functionalization of the historical parts of the hospital structure and the demolition and subsequent rebuilding of the structure built during the economic boom without any architectural interest. Therefore, in the light of the above, the contribution proposes a strategy of conservation and enhancement, that with a careful project could create a dedicated cultural path, to highlight a significant historical milestone of the town, which remains relatively unknown general public.

Keywords: castle, archaeological area, conservation, enhancement.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 6 - CULTURE AND MANAGEMENT

24th MARCH | SESSION 6 | ROOM D
CHAIR: LUIS J. GARCÍA-PULIDO

Bunker landscapes. From traces of a traumatic past to key elements in the citizen identity

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Abstract

Abandoned as watchmen along the European coastlines and national borders, bunkers are monolithic and super-resistant architectures, considered an academic taboo for a long time: as it is known, defined as 'difficult heritage', they are material and immaterial traces linked to traumatic and cumbersome events of a recent past. By losing their strategic position in the defence of the territory, they gradually became 'modern ruins'. After a long period of neglect, bunkers have been recently included in rehabilitation, enhancement and reuse programs as part of a territorial and historical network, essential places able to support and encourage collective memories and citizen identity.

Starting from these considerations, the proposed research is focused on the investigation of two case studies: the system of batteries of Plan Barron in Lisbon, and the bunker network of South Sardinia, in Italy. Plan Barron includes eight batteries that were built between 1948 and 1958 by a British-Portuguese commission to defend the capital and Setúbal's ports. Four of them are in a good state of conservation, one disappeared and the rest abandoned and neglected since 1999. On the other hand, the system of bunkers deployed along the coastline of South Sardinia was built during the WWII, mainly located near the major urban centres and ports, both in urban and landscape contexts. Once lost their defence function, they have been abandoned and, after several decades of neglect, some of them disappeared and others are still awaiting appropriate conservation and enhancement processes.

These case studies are analysed in the paper under landscape, historical, architectural and archaeological terms, through indirect and direct analysis, in order to highlight their formal, typological, spatial, dimensional, technological and materic features and the relationship to their different environmental context. The research aim is twofold: 1. to create appropriate instruments able to trigger value acknowledgement and enhancement processes; 2. To provide guidelines for opportune strategies of re-appropriation of the places, attributing to the bunker a key role in the policies of management and cultural tourism.

Keywords: difficult heritage, memories, enhancement, WWII fortifications.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

TOPIC 6 - CULTURE AND MANAGEMENT

24th MARCH | SESSION 6 | ROOM D
CHAIR: LUIS J. GARCÍA-PULIDO

Andar per castelli: Calendasco lungo la via Francigena

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Abstract

Despite its importance, the castle of Calendasco (Piacenza) and the buildings nearby are neglected by the 'pilgrims' walking along the Via Francigena, because of their inaccessibility - as they are partly private and partly public but still under restoration - and a lacking circulation of studies. Furthermore, leg 16, the connection between Orio Litta, in Lombardy, in the province of Lodi, and Piacenza, passing throughout the place, has a relatively dull and dangerous part. Shortcuts are recommended to avoid the most trafficked segments. The small village and its architecture are thus bypassed. In the following paper, the case study is described and its strategic importance as one of the architectures of the defensive or offensive circle of the Emilian city is recalled. What was probably a disputed garrison should therefore be re-appreciated as such: that is considering the rarefied 'texture of castles' that dots this border area of the Po valley. For it to somehow return to being recognized by residents and travellers, it seems first of all helpful to reflect on its past. In the future, it will be to ideally reconstruct connections: authentic and feasible departure from the composed itinerary of the Francigena; opportunities for the more widespread development of this peripheral and neglected area.

Keywords: cultural itineraries and pilgrim routes, tangible and intangible heritage, sustainable tourism.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

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24th MARCH | SESSION 6 | ROOM D
CHAIR: LUIS J. GARCÍA-PULIDO

La Real Piazza di Pescara: prospettive per la ricerca di un'identità urbana

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Abstract

The speculative dynamics - indifferent to the logic of preservation and protection - that have altered the historic fabric of Pescara after World War II to the present, actually arose as early as the post-unification phase and took hold with the demolition of the fortress that had delimited the town for centuries. The erasure of the city's past, therefore, began with the demolition of the walls of the "Real Piazza" and led, within a few generations, to the total oblivion of the fortress.

The fortified structure, in its mid-16th-century configuration, was defined by a bastioned perimeter: within it was located the residential area, which is still legible today in its general outlines. But the presence of the defensive wall was perceived by the community after 1986 as an impediment to the city's development, desired, rather than a testimony to a historical step in the city's history.

The research carried out on the urban fabric of Pescara, focusing in particular on the architectural elements of what remains of the fortified perimeter and its urban area, aims to clarify the consistency and evolutionary phases of the fortress and its residential area, define strategies and a preliminary framework of interventions aimed at the knowledge of such a complex identity as that of the so-called "trident." It also seems essential to prepare congruent operations useful for directing future interventions that can reconcile instances of adaptation with respect for testimonial values and the necessary redevelopment of the urban environment.

But the whole acts of protecting and preserving a heritage prove unsustainable when they are not based on the active participation of the communities of reference (Faro Convention 2005). Pescara from the Fortress to the Twentieth Century (2013) and discussions with members of city associations are evidence of how in recent years-thanks in part to recent discoveries of underground rooms at the ramparts-there is a first attempt to resurface the history of this city.

Keywords: Pescara, urban identity, stronghold, knowledge.



FORTIFICATIONS OF THE MEDITERRANEAN COAST
23 - 24 - 25 March 2023 | Università di Pisa | Italy

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