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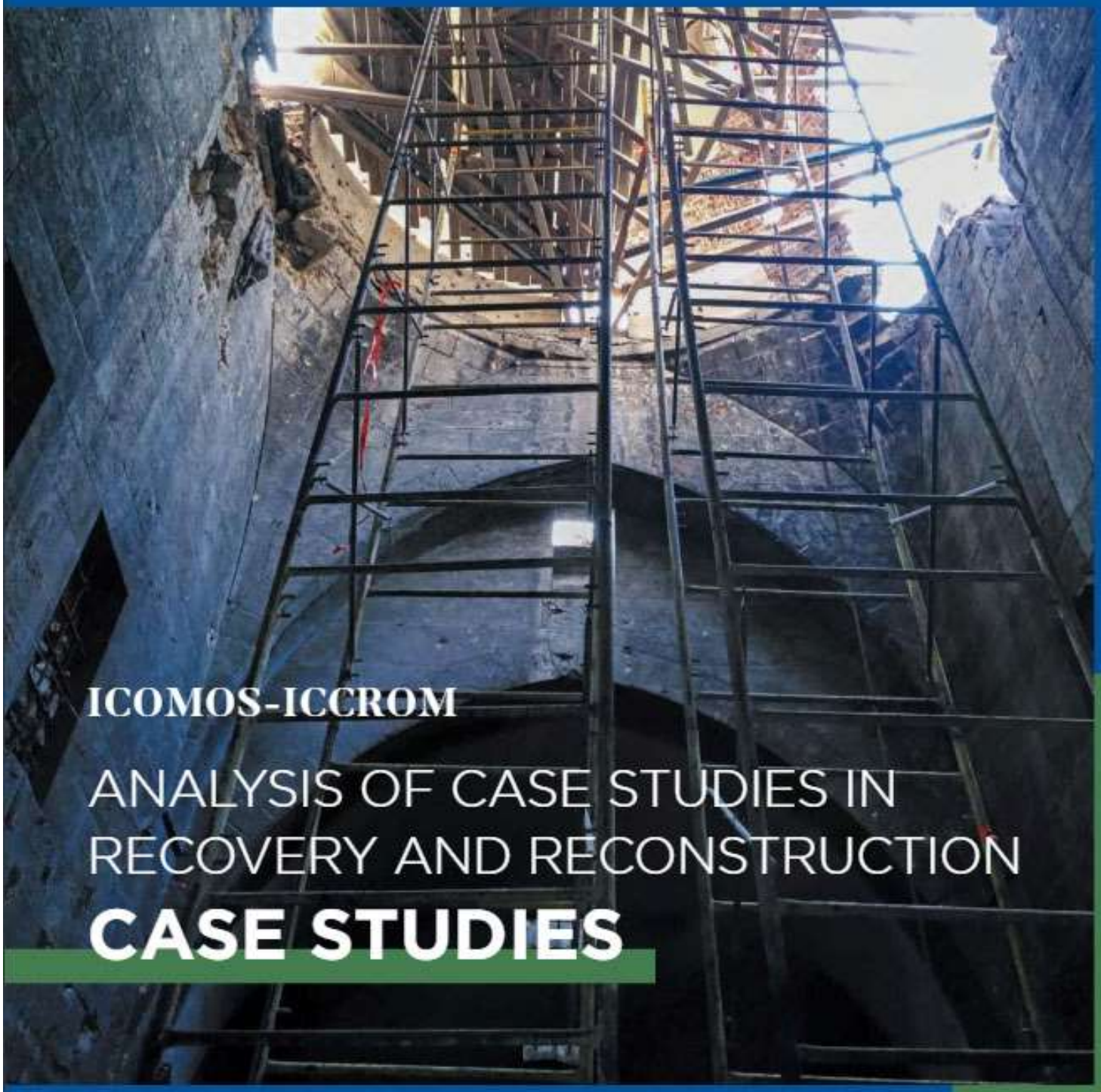

ICOMOS-ICCROM

ANALYSIS OF CASE STUDIES IN RECOVERY AND RECONSTRUCTION

CASE STUDIES

2020

Mostar, Bosnia and Herzegovina • Nablus, West Bank
L'Aquila, Italy • Christchurch, New Zealand

VOL. 1

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Foreword

ICCROM and ICOMOS have closely worked together for the protection of cultural heritage, especially in the field of the World Heritage. We are pleased that the case studies project for reconstruction and recovery of cultural heritage added a new dimension to the relationship of the two organisations. The secretariats as well as the experts selected by the two institutions met physically and virtually on regular basis over a period of two years to have this work produced and contribute to knowledge in this field.

We discussed every aspect of the project, from the text of every case study included in the two volumes to our joint letters, until we agreed on all required steps together. This collection of case studies is an outcome of such fruitful collaboration between the two organisations. We are convinced that each case study report, which was carefully and rigorously peer reviewed by a team experts, will stimulate and promote further research and analysis. We look forward to the resonances of this joint work.

Last but not least, we express our sincere gratitude to all colleagues who worked in this project, including the ICCROM-ICOMOS experts and researchers who worked on this volume, for their wonderful contributions. We do hope that other similar joint projects will further be developed by the two organisations in the near future.

For ICOMOS,
Toshiyuki Kono, *Honorary President*
Marie-Laure Lavenir, *Director General*

For ICCROM,
Webber Ndoro, *Director General*
Zaki Aslan, *ICCROM-Sharjah Director*

Introduction

Analysis of Case Studies in Recovery and Reconstruction

The scale, intensity and frequency of catastrophic events affecting cultural property have been a subject of international concern. Efforts at recovery and reconstruction of damaged communities and environments have increasingly attracted attention, from the perspective of supporting peoples impacted by such events while attempting to maintain the cultural significance of places. This project arose from the decision of the World Heritage Committee of 24 June 2018, directing the attention of advisory bodies towards the examination of case studies. The need to learn from the experiences captured through case studies had been apparent for some time.

Separately, ICCROM and ICOMOS have addressed the issues involved in post trauma recovery and reconstruction in the context of cultural heritage. The Project, **Analysis of Case Studies in Recovery and Reconstruction**, was a joint endeavour that sought to bring the knowledge and capacities of both bodies to bear, in order to enhance understanding of experience with the aim of clarifying issues and improving guidance. The Project was launched in 2019 for completion in 2020. It was managed through a joint Working Group comprising members of both organisations and administered through the ICOMOS Secretariat in Paris and the office of ICCROM Sharjah.

The Project commissioned a range of case studies that represented a comprehensive set of factors, namely geographical, cultural and causational, utilising the *ICOMOS Matrix for the Compilation of Case Studies* to provide a common structuring framework for compilation and analysis. Eleven case studies were analysed, covering sixteen significant sites and buildings. The project was able to draw from the case studies lessons that have wider application, and its findings are published online in **ICOMOS-ICCROM Project. Analysis of Case Studies of Recovery and Reconstruction. Report**

The case studies that were the subject of analysis are published in two volumes.

Case Studies Volume 1.
Mostar, Bosnia and Herzegovina
Nablus, West Bank
L'Aquila, Italy
Christchurch, New Zealand

Case Studies Volume 2.
Patan, Nepal
Taishun, China
Nyanza, Rwanda
Aleppo, Syria
San Pedro de Alcántara, O'Higgins Region, Chile
WH Cultural Landscape Wachau, Austria
San Luis Potosí, México

ICOMOS-ICCROM: Analysis of Case Studies of Recovery and Reconstruction

ICOMOS-ICCROM Analysis of Case Studies in Recovery and Reconstruction: Working Group
Loughlin Kealy (Coordinator), Zaki Aslan, Luisa de Marco, Amra Hadzimuhamedovic, Toshiyuki Kono, Marie-Laure Lavenir, Trevor Marchand.

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Loughlin Kealy, Luisa de Marco, Amra Hadzimuhamedovic, Trevor Marchand, Alyssa Rose Gregory, supported by Angelique Pioteau.

Volume 1

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THE CONSERVATION OF PALAZZO CARLI-BENEDETTI AFTER THE 2009 EARTHQUAKE IN L'AQUILA (ITALY)

Carla Bartolomucci, Donatella Fiorani

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1. The Heritage Resource and its Context Before the Impacting Event(s)

Palazzo Carli-Benedetti is a historic palace located in the centre of L'Aquila, near Santa Maria Paganica square (one of the four quarters that structured the foundation of the city). The church, dating from 1308, and its surrounding residential tissue are located on the highest site of the ancient town and show a regular urban structure, as planned after the earthquake in 1349 (fig. 1).

In the fifteenth-century the area was inhabited by the aristocracy: Giacomo Carli (who built the palace) was a wealthy merchant and had commercial relations with Florence, then the capital of the Renaissance.

The palace is known for its Renaissance courtyard, considered to be among the main monuments of the city and is attributed to Silvestro, one of the greatest fifteenth-century artists in L'Aquila (Leosini 1848: 98; Chini 1954).

The palace does not show monumental features from the outside, but some important traces of previous phases are visible on its wide fronts; these include the strong square stones of the corner and the succession of portals with pointed arches in the façade on via Mazzini.

Fig. 1. Palazzo Carli-Benedetti and the surrounding urban fabric; the church of Santa Maria Paganica is still in ruins today (Google maps)

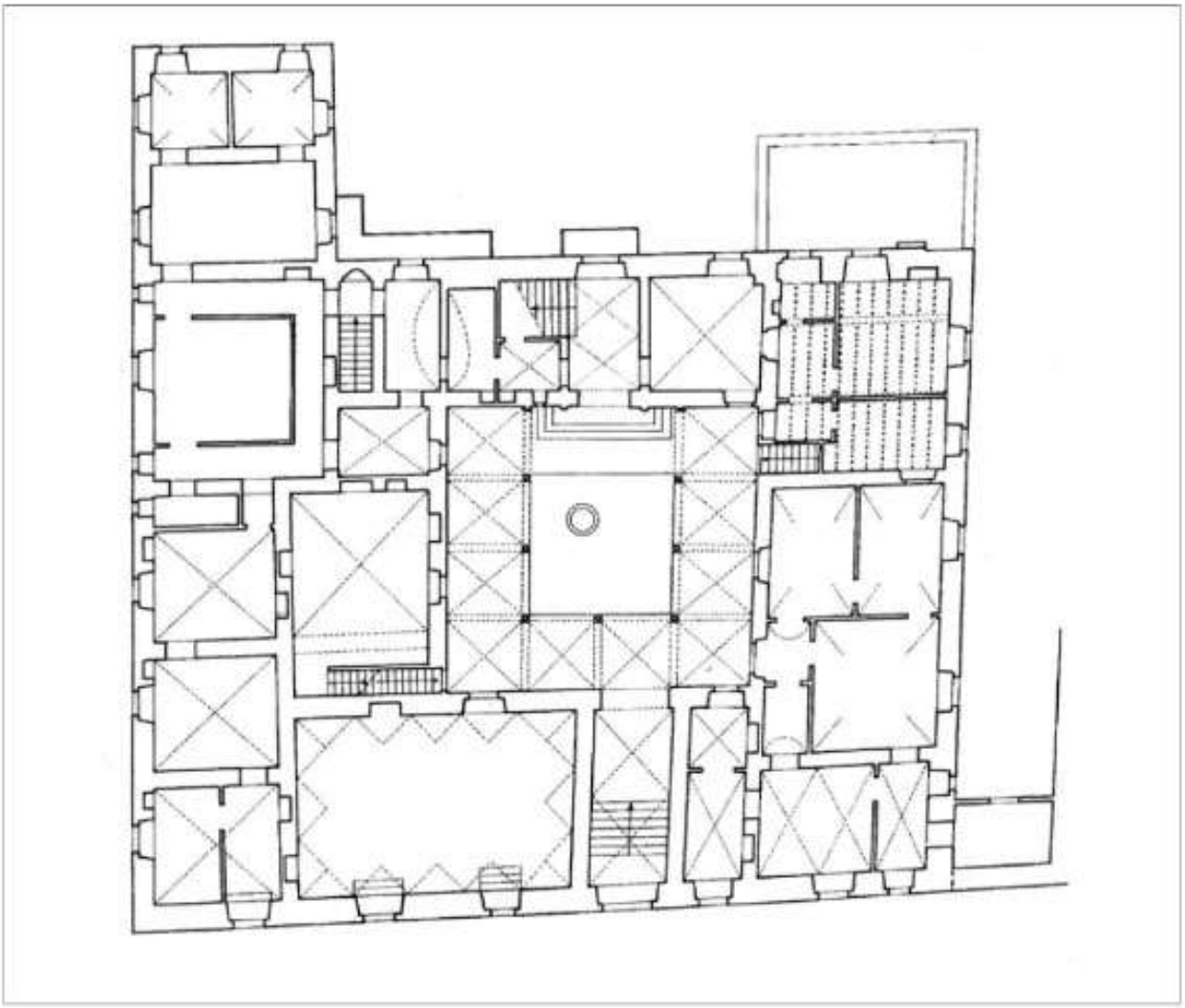
The initial use of the edifice as a dwelling remains to this date, although the Renaissance palace was later divided into several apartments.

Form, Function, Creation and Subsequent Transformations

The building is quadrangular in form with an inner courtyard. The façades on the streets are organised with three stories, with a partially visible basement. The courtyard is organised at the ground floor with an arched colonnade on three sides and a scenographic gate on the fourth, leading to the staircase (fig. 2). The pre-existing medieval constructions of the basement are now used as cellars; the upper floors were reconfigured and partly rebuilt in the eighteenth-century, when the division into apartments – now at the first and second level – occurred.

The walls are composed of irregular masonry in stones with squared cornerstones. The vaults of the first level are in stone, those of the second one in bricks; painted wooden ceilings are also present. Some false ceilings with wooden structures were introduced under the roof in the renovation after the earthquake of 1703; at the same time, some partitions in wooden framework and doors with stucco frames were introduced.

Fig. 2. The plan of Palazzo Carli Benedetti at courtyard level – intermediate floor (drawing by C. Bartolomucci, 1999)



From left to right:
Fig. 3. The courtyard of Palazzo Carli Benedetti in a photo from the early 1900s (ph. Alinari). Note the eighteenth-century frames at the windows of the loggia
Fig. 4. The courtyard after the 1947 restoration: note the removal of the eighteenth-century frames from the loggia (ph. Chini collection)

The original upper loggia of the courtyard changed in the eighteenth-century renovation with the enclosure of the space between the columns and the pillars at the corner and the insertion of stucco cornices around the windows (Bartolomucci 2018: 18, 43-48). These cornices were in the restoration of the last century (fig. 3).

The palace, originally built as a residence for the Carli family, was later transformed with the changes of ownership (see para. 1.2), and was divided into apartments. In 2009, when the earthquake occurred, there were nine residential units and two shops; all units were permanently occupied by residents or tenants.

1.1 Description, Designation and Recognition

The recognition of the historical and artistic interest in the building goes back to 1934, when the palace was listed by the Ministry of Cultural Heritage.[1]

The recognition of value seems to be only motivated by the presence of the Renaissance courtyard: no importance was attributed to the stratification of the different historical phases or to other relevant components, such as the medieval remains incorporated within the palace, the eighteenth-century remodelling, and the recently discovered chapel of the nineteenth-century. For this reason, the restoration carried out in 1947 eliminated the nineteenth-century cornices over the windows in the courtyard loggia, aiming to reproduce, at least partially, the Renaissance aspect (Bartolomucci 2018: 52-60) (fig. 4).

1.1.1 Scholarly for Recognition

The historian Ludovico Antinori quoted Giacomo Carli in his manuscript about L'Aquila as the customer of the palace, which was completed in 1494 (Antinori 18th century).

The first descriptions date back to the nineteenth-century, when Angelo Leosini described the courtyard in his book on the monuments of L'Aquila (Leosini 1848). Since then, historians have described the courtyard but neglected the palace.

From left to right:
Fig. 5. The photo showing Palazzo Carli Benedetti in the History of Architecture in Abruzzo by Gavini (1927-28)
Fig. 6. An exhibition of embroidery tools in the courtyard before the 1947 restoration (ph. Chini collection)

Carlo Ignazio Gavini, in his *History of Architecture in Abruzzo* (Gavini 1927-28: 319–321), describes the building but neglects the eighteenth-century components. (fig. 5), Mario Chini did likewise in a later essay (Chini 1954).

In several books dealing with palaces in L'Aquila, the same exclusive importance is given only to the courtyard (Moretti, Dander 1974; Mancini 1994; Centofanti 1997).

1.1.2 Popular for Recognition

A photograph from the early 1900s represents some women showing tools used for preparing the precious *'tombolo'* (a special kind of embroidery); this document could testify to the use of the palace also as a location for exhibitions or a market of artisanal goods (fig. 6).

The courtyard was often portrayed in drawings and paintings by local artists. Before the last earthquake in 2009 the site was often used in advertising or for wedding photographs.

At the present time, the notoriety of the Renaissance courtyard has favoured the organisation of concerts, exhibitions and other cultural events within the palace both before and after the earthquake and the last restoration (see the "Italian Jazz for the earthquake lands" since 2015 until 2019).[2]

1.2 History and Context

1.2.1 History, ownership and environment

The <<masterpiece of the Florentine Renaissance>>, as defined by some authors (Moretti, Dander 1974: 38), actually shows three main building phases – the medieval age, the fifteenth and the eighteenth-century (after the earthquake of 1703).

As previously mentioned, the palace was built in the second half of the fifteenth-century by the Count Carli family. The property remained the same until the beginning of the eighteenth-century, when it was sold to the nuns of the adjacent monastery of Santa Maria dei Raccomandati.

In 1703, an earthquake seriously damaged the whole town; later, the abbot of Collemaggio and of Santa Maria dei Raccomandati, Ludovico Quatrari, renovated the building extensively.

The eighteenth-century transformation is particularly evident on the upper floor, due to the closure of the loggia and the division into apartments.

At the beginning of the nineteenth-century the palace became the property of Antonio Benedetti (who changed its name) and it was later divided among his heirs.

In the twenty-first-century the palace is still often referred to as the Benedetti Palace, in spite of the many current owners. The official current double designation Palazzo Carli Benedetti sums up the complex history of the building.

Another earthquake in 1915 caused minor damage to the building, which then continued to be inhabited; in 1947 the courtyard was restored by Umberto Chierici (superintendent of Cultural Heritage), who eliminated the eighteenth-century windows (figg. 4, 7). However, the transformation of that period, with the filling of the empty space between the columns, was considered to be an inappropriate alteration of the Renaissance courtyard. As the elimination of the walls from that period was not allowed for structural reasons, the architect decided to eliminate the figurative elements – the cornices of the windows – on them.

In the 1970s the urban context was altered by the construction of an adjoining building in concrete, arising from the demolition of minor surrounding houses, originally used as stables.

Chronology

Fourteenth-century: site occupied by dwelling houses.
1349: a strong earthquake struck the existing houses, later incorporated within the palace with the Renaissance reconstruction.
1461: another important earthquake damages the medieval houses. Probably the construction of the building began before the earthquake and after 1461 the works resumed with some modifications to the initial project.
1494: completion of the reconstruction commissioned by Giacomo Carli.
1642: the nuns of Santa Maria dei Raccomandati bought part of the building from the heirs of the Carli family. In **1702:** they completed the property (a few months before the earthquake of 2 February 1703).
1703: earthquake and subsequent restorations by Ludovico Quatrari, the abbot of Celestine nuns. The building was divided into apartments and rented around 1720.
1807: the monastery is abolished (Law on the Abolition of Religious Orders, 13 February 1807).
After 1807-before 1824: Antonio Benedetti, new owner of the palace, has partly transformed it, creating a new entrance, many inner decorations and adding a chapel. The property was later divided among his heirs.
1915: earthquake (low damage).
1947: the courtyard was restored by Umberto Chierici, Superintendent of Cultural Heritage in Abruzzo.
1998: intervention involving conservation and strengthening of the roof.
6 April 2009: earthquake (partial collapse of the upper loggia, damage to walls and vaults)
2013-2016: post-seismic intervention.

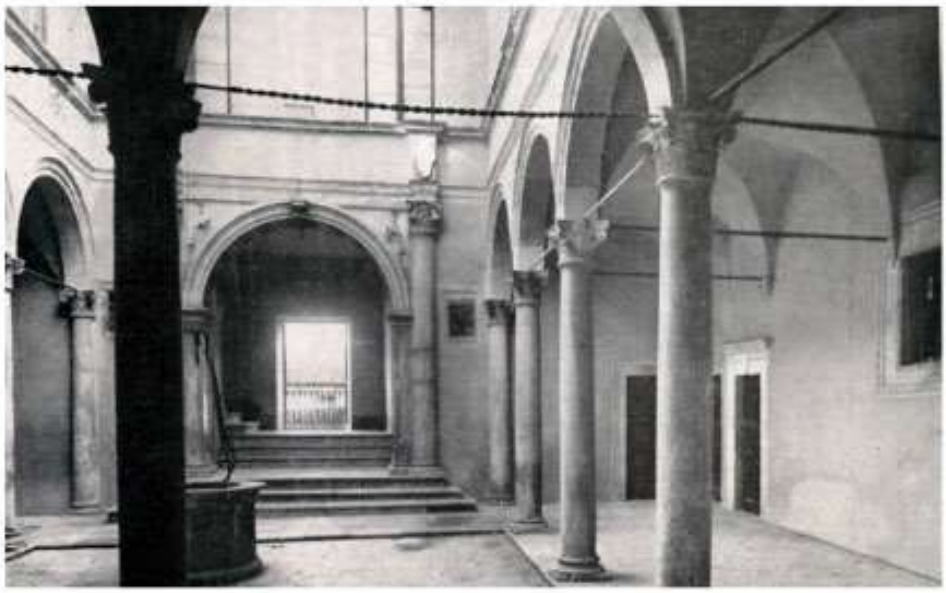


Fig. 7. The palazzo after the restoration of 1947 (ph. Chini collection)

Fig. 8. The population in L'Aquila before and after the earthquake (ISTAT data)

1.2.2 Social and Economic Setting

L'Aquila, the regional centre for administration in Abruzzo, was seriously affected by the seismic events of 6 April 2009. In 2009 the Municipality had more than 70,000 inhabitants; following the earthquake, the population declined by 3,000 between 2010 and 2011. There was a gradual increase in the number of inhabitants until 2013, as people returned from other locations following the destruction of their homes in the 2009 earthquake. The current number of inhabitants is slightly lower than before the earthquake, but it remains fundamentally stable (fig. 8).

The economy of L'Aquila is based on trade, administrative offices, tourism, industry; the city hosts the oldest university in Abruzzo. There is a special focus on mountain tourism, thanks to the position of the town, just a few kilometres from the highest peaks of the Appennini and from three National Parks (Parco del Gran Sasso e Monti della Laga; Parco del Sirente Velino; Parco Nazionale d'Abruzzo, Lazio e Molise), with small towns that are very interesting from the point of view of history, art and landscape. These natural and urban landscapes risk being reconstructed more to recover the use of the building estates and to improve the tourist business rather than to conserve the authentic values of the sites.

The reconstruction of L'Aquila started from its suburbs, through the repair of recent buildings and the construction of new buildings. After the earthquake the city grew considerably with the construction of new neighbourhoods and reconstruction in the town centre only began in 2013, so the historic core has been abandoned for many years. The works are still ongoing, and in the meantime many buildings have no function. Furthermore, many small historical towns around L'Aquila are still largely abandoned.

1.2.3 Frameworks, Agents and Communication

There is an enormous amount of literature on the 2009 earthquake, concerning both the damage to the cultural heritage (Calderini 2009; Fiorani 2009; Pace 2010; Milano *et al.* 2011) and social issues (Nicita 2010; Italia Nostra 2010; OECD 2013).

Several initiatives opposed the forced abandonment of the city; in 2013 the historic centre of L'Aquila was included in the "2014 Watch List" of the World Monument Funds.[5] The abandonment was imposed by a decision of the authorities, who initially declared all the buildings <<unsuitable for use>> (the historic centre was guarded by the army who prevented any access), but later on it was not possible to live even in those that could be used for fear of further damage, lack of electricity, gas, any shop and the total absence of other inhabitants.

From a regulatory point of view, the reconstruction after the 2009 earthquake is governed by a complex system of rules which were gradually modified and updated over time.[4] This system regulates the transfer of public funds to the reconstruction works.

Private reconstruction entails the repair of damage to private property buildings. The city has been divided into *aggregates* (urban blocks with structural connections between the buildings) and these are represented by

owners' *consortia*. Each consortium has an administrator who is responsible for the reconstruction and choses the designers and the construction companies.

The projects on the listed buildings must be approved by the *Soprintendenza* of L'Aquila, the local authority of the Ministry of Cultural Heritage. The interventions on the historical unlisted buildings follow the standard procedures used for other existing edifices and they must be approved by the Special Office for Reconstruction of L'Aquila (http://www.usra.it/). The absence of a historical interest decree determines different attitudes to reconstruction, since the engineer and client can demonstrate, based on the criterion of economic convenience, that it is better to demolish and rebuild a building instead of repairing it.

The economic compensation of the reconstruction costs is based on a special *parametric form* concerning the size of the building – defined as *useful* area – and the historical and aesthetic values. These values are related to the presence of single special elements in the façades - such as stone frames of doors and windows or remnants of ancient buildings inserted – or courtyards that are visible from the street.[5]

These rules have been modified since the earthquake and are sometime different from place to place; there is a Special Office for the Reconstruction of L'Aquila and a Special Office for the Reconstruction of the Municipalities of the seismic crater of 2009. Moreover, other Offices for the Reconstruction have been added after the new seismic events of 2016 and 2017 in Central Italy, partly including the same area.

2. The Nature of the Impacting Event(s)

2.1 General Description

The earthquake of 6 April 2009 hit a large area around the city with a seismic sequence (max. magnitude Mw 6.3); it resulted in 310 deaths and over 1,600 injured with over €10 billion in estimated damage.

The seismic event was preceded by a long seismic sequence that began in December 2008. The main shake was followed by thousands of tremors that further damaged the buildings.

Abruzzo is one of the higher seismic risk regions in Italy. L'Aquila has been hit by destructive earthquakes several times; among the more serious events recorded are those in 1315, 1349, 1461, 1703, 1915 and the recent ones of 2009 and 2017 (fig. 9).

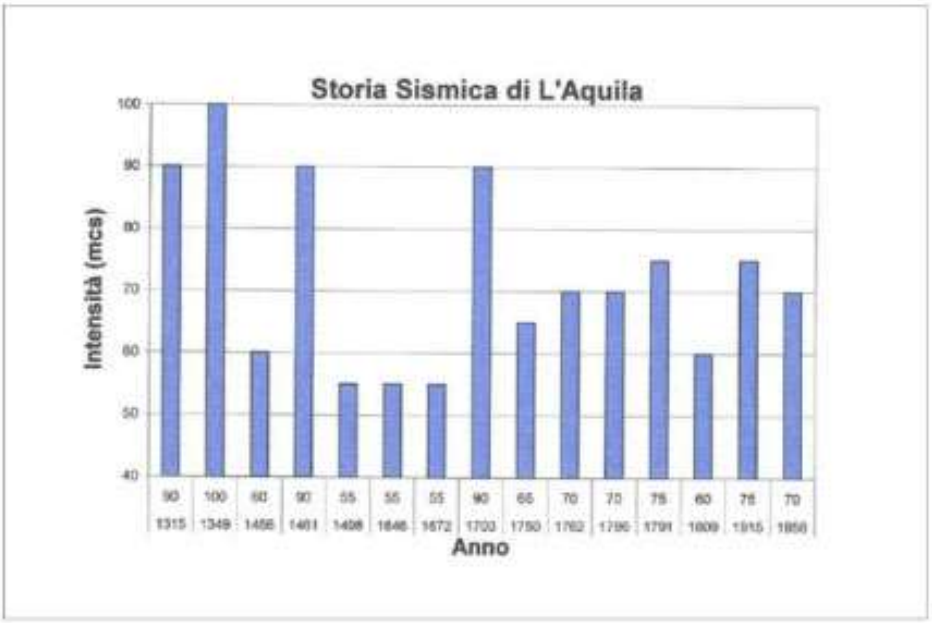


Fig. 9. The seismic history of L'Aquila before 2009 (INGV data)

From left to right:
Fig. 10. Palazzo Carli Benedetti after the earthquake: the courtyard (ph. Bartolomucci 2009)
Fig. 11. Palazzo Carli Benedetti after the earthquake: the collapse in the staircase (ph. Bartolomucci 2009)

2.2 General Impact of the Event(s)

The earthquake in 2009 seriously damaged the city of L'Aquila and the surrounding small towns; the area hit by the earthquake includes 56 municipalities, affecting a population of 80,000 persons who were displaced to other safer locations.

In April 2009, all the buildings of the historic centre of L'Aquila and the surrounding towns, even those without damage, were, due to security reasons, declared unfit for use. Following this decision many historic areas were abandoned and people relocated to new constructions in the suburbs.

The damage inflicted by the earthquake affected both the historic buildings – built during the past centuries or, at least, more than 60 years ago – and the more recent ones. Among the historic edifices built with traditional techniques, wall cracks and partial collapses of vaults, ceilings and roofs represented the main seismic destructions. Much of the damage to the historic buildings can be attributed to previous interventions, mainly those carried out in the second half of the twentieth-century. Internal modifications of walls and rooms, partial demolitions of masonry, reinforced concrete roofs and, in general, the use of incompatible technologies weakened the ancient structures.

Interestingly, the historic buildings in L'Aquila did not suffer full collapse. However, some of them were demolished after the earthquake (for example, a palace built in the 1930s on Corso Federico II, listed by the *Soprintendenza*, was demolished and rebuilt in identical form). Among the historic unlisted buildings, some were demolished for <<economic convenience>> because the Regional Law n. 49 of 15 October 2012 grants a <<volume bonus>> in case of demolition and reconstruction, allowing to increase the original dimensions of the building.

Other more recently constructed buildings that collapsed included a building for student housing and other reinforced concrete buildings built in the 1960s and 1970s in the town centre.

2.3 Impact on the Significance and Values of the Resource

The Basilica of Santa Maria di Collemaggio, whose presbytery area collapsed, the Church of Santa Maria del Suffragio, with its partially ruined dome, the Cathedral of San Massimo, whose presbytery area was destroyed, and the Church of Santa Maria Paganica, which lost its roof, vault and part of the walls have been the most affected monumental buildings in L'Aquila. Serious damage also occurred in other monumental sites: the former convent of Sant'Agostino – location of the Prefecture office –, the Convitto Nazionale – hosting the Tommasiana library –, the Spanish fortress, from the sixteenth-century – the headquarters of the *Soprintendenza* of L'Aquila and of the National Museum of Abruzzo.

As has happened in other similar situations, the historical architectural heritage was initially perceived as unsafe, as not important and too expensive to maintain.

From left to right:
Fig. 12. Palazzo Carli Benedetti after the earthquake: the collapse in the loggia (ph. Bartolomucci 2009)
Fig. 13. The painted "sovraporta" pierced by tie rods during the shoring work (ph. Bartolomucci 2010)

Currently, the historical value of buildings is perceived in a reductive way and, accordingly, functional restitution or aesthetic restoration – as journalists are used to saying: <<the coming back to the ancient splendour>> – are seen as the main aims, while the possibility of preserving the material authenticity of the architecture is not considered as much.

The 2009 earthquake caused serious damage to the Palazzo Carli-Benedetti: the collapse of the northern upper loggia in the courtyard, the loss of the corresponding eighteenth-century inner ceiling vault (figg. 10, 12), the partial ruin of the staircase wall (fig. 11) and the extensive damage to walls, most pronounced on the upper floor. Luckily, no loss of life occurred.

Since the earthquake, the building has not featured on the itineraries of citizens or tourists, this and the fact that access to the street which is currently closed – due to the dangerous situation of the nearby Church of Santa Maria Paganica – have strengthened the isolation of the palazzo from the life of the town.

The relocation of the inhabitants far from the town centre due to the earthquake provoked serious economic consequences; among the more serious are the cessation of many commercial activities and the decrease in university life. Many university students came from the south and the centre of Italy, finding in L'Aquila the right climate for studying thanks to the calm and friendly atmosphere the town could guarantee. These conditions have inevitably changed in a city wounded by the seismic event.

2.4 Emergency Repair(s) to Date

Immediately after the earthquake, teams were organised to assess the damage to monuments and buildings. The teams were set up to verify the viability of the buildings and to establish the degree of damage and to decide what safeguarding devices (supporting beams, scaffolding, tie rods, provisional coverings) were most appropriate.

The inspection of the Palazzo Carli-Benedetti was carried out by groups of specialists for the Protection of Cultural Heritage (NOPSA by Ministero per i Beni e le Attività Culturali ed il Turismo – MiBACT) during the months following the earthquake. Palazzo Carli-Benedetti was classified as category: E = unusable.[6]

Meanwhile, the Municipality of L'Aquila (for private buildings) and MiBACT (for public buildings) carried out works to stabilise damaged town structures. The safety works for the Palazzo Carli-Benedetti began in June 2009 and ended in September 2010 (at a cost of €974,173; The Municipality of L'Aquila appointed the architect Maurizio Sbaffo to implement the project).

During these works, wall paintings were damaged by the insertion of metal wire ropes, which was done without the necessary attention to the decorative elements (fig. 13).[7] Moreover, some fragments of stucco frames and wall paintings were lost during the removal of rubble.

When the restoration work began, the shoring was progressively dismantled as the consolidation work proceeded.

The supporting scaffolding prevented further collapses in the long period before the start of restoration works in June 2013, but they hindered the observation of damage during the elaboration of the project.

2.5 Documentation and Narratives

The surveys of the seismic damage were drawn up according to official standard models dedicated to monumental buildings ("A-DC Churches" and "B-DP Palaces" by the Presidency of Council of Ministers – Department for Civil Protection and MiBACT).

Currently the survey forms are in the archives of the Regional Secretariat for Abruzzo.[8]

Publications about the recovery and safety activities, in chronological order:

MiBACT, 2009. *Sisma in Abruzzo: il recupero dei monumenti*, XIII Salone dei Beni e delle Attività Culturali (Venezia, 3-5 dicembre 2009).

Di Persia, M.G. ed., 2010. *Le macerie rivelano: L'Aquila 6 aprile 2009, inediti archeologici per la storia della città*, Catalogue of the Exhibition (L'Aquila, 31 July-31 October 2010). Teramo.

VVFF, 2010. *I giorni dell'Aquila: il cuore, l'ingegno e la scienza negli interventi dei Vigili del Fuoco e del CNR*. Pisa.

Legambiente, 2011. *Il volontariato nella salvaguardia del patrimonio culturale dai rischi naturali: manuale tecnico d'intervento sui beni culturali mobili in caso di calamità*. Roma.

Basti, S.; Marchetti, L., 2013. eds., *MISAQ: Messe in sicurezza a L'Aquila dopo il terremoto del 6 aprile 2009*, Avezzano.

Several articles on Palazzo Carli-Benedetti, its construction history and seismic damage have been written after the earthquake of 2009 (Bartolomucci, De Cesaris 2009; Bartolomucci *et al.* 2011; Borri *et al.* 2011). A recent monograph (Bartolomucci 2018) refers to the previous studies and the in-depth analysis of the building following the earthquake and during the restoration.

3. Post-Event Appraisals

3.1 Impact Assessment

The evaluation of the impact of the seismic events on the historical buildings was based on some scientific studies (Direttiva Rischio Sismico 2011),[9] but the reconstruction practices began on the basis of rules and techniques mainly aimed at recovering the functionality of buildings, without any real consideration to the tangible and intangible values of the historical architecture.

The impact assessment has been guided by the matrix of the "B-DP Palaces" by the Presidency of the Council of Ministers – Department for Civil Protection and MiBACT. This matrix mainly refers to the building features – typology, masonry, building components – and to the evidence of damage – cracks, deformations, collapses. Due to its expeditious character, it does not consider the vulnerability derived from constructive transformation.

Damage levels and recoverability options were appraised in the surveys for damage assessment, but these official forms appear to have only provided information on the safety measures carried out immediately after the earthquake. Unfortunately, the difficulty in accessing these forms made the use of their data impossible in the later phase of the project development. The Archive of the Regional Secretariat of MiBACT has only recently made these data available to scholars and technicians.

3.2 Post-Event Documentation

The Palazzo Carli-Benedetti was initially the topic of a postgraduate thesis on architectural conservation at Sapienza University of Rome (Bartolomucci 1999). This circumstance was important, because it meant that a reliable survey was already available, prior to the earthquake, from the Municipality of L'Aquila for defining the safety project.

The documentation from the thesis included a survey of the building before the seismic damage, important information about materials and construction techniques and identification of the different construction phases of the palace. Therefore, it has been possible to recover

When the restoration work began, the shoring was progressively dismantled as the consolidation work proceeded.

The supporting scaffolding prevented further collapses in the long period before the start of restoration works in June 2013, but they hindered the observation of damage during the elaboration of the project.

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Several articles on Palazzo Carli-Benedetti, its construction history and seismic damage have been written after the earthquake of 2009 (Bartolomucci, De Cesaris 2009; Bartolomucci *et al.* 2011; Borri *et al.* 2011). A recent monograph (Bartolomucci 2018) refers to the previous studies and the in-depth analysis of the building following the earthquake and during the restoration.

3. Post-Event Appraisals

3.1 Impact Assessment

The evaluation of the impact of the seismic events on the historical buildings was based on some scientific studies (Direttiva Rischio Sismico 2011),[9] but the reconstruction practices began on the basis of rules and techniques mainly aimed at recovering the functionality of buildings, without any real consideration to the tangible and intangible values of the historical architecture.

The impact assessment has been guided by the matrix of the "B-DP Palaces" by the Presidency of the Council of Ministers – Department for Civil Protection and MiBACT. This matrix mainly refers to the building features – typology, masonry, building components – and to the evidence of damage – cracks, deformations, collapses. Due to its expeditious character, it does not consider the vulnerability derived from constructive transformation.

Damage levels and recoverability options were appraised in the surveys for damage assessment, but these official forms appear to have only provided information on the safety measures carried out immediately after the earthquake. Unfortunately, the difficulty in accessing these forms made the use of their data impossible in the later phase of the project development. The Archive of the Regional Secretariat of MiBACT has only recently made these data available to scholars and technicians.

3.2 Post-Event Documentation

The Palazzo Carli-Benedetti was initially the topic of a postgraduate thesis on architectural conservation at Sapienza University of Rome (Bartolomucci 1999). This circumstance was important, because it meant that a reliable survey was already available, prior to the earthquake, from the Municipality of L'Aquila for defining the safety project.

The documentation from the thesis included a survey of the building before the seismic damage, important information about materials and construction techniques and identification of the different construction phases of the palace. Therefore, it has been possible to recover

these data, some of them being not easy to investigate in the post-seismic condition of the site, and new specific considerations about seismic damage have been added. It was thus possible to analyse the effects of the earthquake on the edifice in relation to its building history, framing the structural phenomenon inside the wider understanding of the architecture (Bartolomucci, De Cesaris 2009; Bartolomucci *et al.* 2011).

The documentation of the project and the works, containing the damage survey, are kept in the archives of the *Soprintendenza* of L'Aquila and of the Municipality of Aquila – Office for the private reconstruction (paperwork no. AQ MBAC 12382 of 30 July 2012).

3.3 Challenges for Recovery

The restoration of the Palazzo Carli-Benedetti proceeded in parallel on two fronts: on the one hand the consolidation and the functional rehabilitation of the building, which had to be re-inhabited to get public financing (fig. 14); on the other hand the historical-constructive study of the building and its transformations over time, which formed the basis for the choices made in the conservation project.

This double focus sometimes created problems between the specific interests of the private owners of the apartments and the general cultural significance, connected with the public importance of the monument. The unsophisticated rules imposed for the reconstruction were aimed at restoring the buildings as they were before the earthquake, but this task has not always matched the conservation requirements of the architecture. For instance, some past transformations had led to a deterioration in the condition of the building, for example the internal partitions of some halls or the chapel for storage.

In this case, the challenge has been to harmonise the practical needs of the reconstruction – regaining a sustainable function – with the cultural exigence, mainly aimed to study, preserve and transmit the historical heritage.

Fig. 14. The consolidation project: the section along the courtyard shows the reinforces on the more damaged walls (drawing by F. De Cesaris, 2012)

4. Response Actions, Timeframes, Resources and Costs and Recovery Programme

The intervention after the earthquake of 2009 aimed to restore the palace with consideration to its historical and formal features and the functional organisation of the apartments, while also respecting the structural needs of seismic safety.

One of the main focuses was on the reconstruction of the courtyard aimed at not falsifying the historic building.

An initial proposal intended not to rebuild the wall in the upper loggia of the courtyard, leaving an open space between the columns on the left side while the other façades would still visibly preserve the eighteenth-century transformation (fig. 15). This solution was refused by the owners of the building, who preferred a reconstruction <<how it was and where it was>>, mainly for practical reasons. The solution from the eighteenth-century with a closed wall on the courtyard allowed in fact a more comfortable – warmer and with no rain access – entrance to the upper apartments.

The final choice was to reconstruct the fallen wall using thin panels so as to leave the columns visible inside and outside (fig. 16). This means that the new structure is distinguishable from the still preserved eighteenth-century façades (Bartolomucci 2018: 115, 125).

Similarly, the damaged walls were repaired and reconstructed in a recognisable way, using materials other than the original ones (fig. 17). The inner plans of the apartments have been carefully revised, looking

Images, Clockwise from top right:
Fig. 15. The reconstruction of the loggia in progress: the collapsed columns have already been recomposed with anastylosis (ph. Bartolomucci 2015)
Fig. 16. The loggia after the reconstruction: the thin wall and the recess show the columns previously closed in the masonry (ph. Bartolomucci 2018)
Fig. 17. Reconstruction of the walls surrounding the staircase: the damaged masonry was integrated and connected by FRP reinforcements (ph. Bartolomucci 2015)

for a new distribution of rooms if needed by new discoveries or structural necessities.

The recovery programme has been mainly oriented by the will to conserve as much as possible of what remained of the building. This means that the reconstruction pursued has been considered as more of an integration of the existing architecture than a remake.

4.1 Values and Sustainability

The restoration project has been based on the knowledge of the history and values of the building, so the need to repair the damage and to consolidate the structure was oriented in a cultural perspective wider than what was required by the regulations for reconstruction.

The analysis of seismic damage revealed some pre-existing structural vulnerabilities caused by earlier renovations of the apartments: cracks in the masonry due to the insertion of services, changes in room layout and new openings cut through the walls. In addition, some modifications had altered previous configurations. In some cases, the false ceilings had hidden vaults, wooden roofs and wall paintings (figg. 18-20), in others, the superimposed layers of plaster and painting had covered frescoes from the fourteenth and sixteenth centuries (fig. 21).

Important decorative elements, totally unknown previously, were discovered: among them, paintings with musical scores and instruments, attributed to the early sixteenth-century (figg. 22-24). These discoveries meant that the project had to be modified and new authorisations had to be obtained, leading to a delay of a year in completing the project.

Images, Clockwise from top left:
Fig. 18. One of the decorated wooden ceilings that were hidden by false ceilings and repainting (ph. Bartolomucci 2015)
Fig. 19. Detail of the cleaned ceiling (ph. Bartolomucci 2015)
Fig. 20. The rediscovered painted ceiling after the conservation work (ph. Bartolomucci 2015)

However, the restoration of these elements did not lead to additional costs compared to the original estimate. A final report previously published (Bartolomucci 2018: 148), clearly showed the economic sustainability of the intervention, demonstrating that greater attention to cultural needs of conservation does not necessarily mean bigger building costs.

4.2 Drivers, Agents and Governance

The restoration project – seismic damage repair, structural reinforcement, functional reinstatement – was financed by the State, which allocated the funds for reconstruction. Contributions were received from foreign governments or other associations during the first years after the earthquake (the French government financed the restoration of the dome in the Church of Santa Maria del Suffragio, the Russian Government contributed to the reconstruction of Palazzo Ardinghelli). Palazzo Carli-Benedetti was fully paid for by public funds, but some local implementations – such as higher quality floor finishes or services – were paid directly by the owners of the apartments.

The project was approved by the *Soprintendenza* of L'Aquila and the towns of the seismic crater (the local authority of the Ministry of Cultural Heritage) and then transmitted to the Municipality of L'Aquila, which disbursed the money as the work progressed. The Municipality and the *Soprintendenza* monitored the progress of the works through site visits and the verification of accounts.

Images, Clockwise from top left:
Fig. 21. Detail of the frescoes discovered under a fifteenth-century painted ceiling (ph. Bartolomucci 2015)
Fig. 22. The wall paintings of musical scores discovered during the consolidation works of the brick vaults by FRP reinforcements. The decoration was discovered over the plaster covered by the wooden floor (ph. Bartolomucci 2014)
Fig. 23. Paintings with peacocks (symbol of the Carli family) and musical instruments discovered under a floor. The decoration belonged to the musical study on the lower level, which was then transformed and closed by vaults (ph. Bartolomucci 2015)
Fig. 24. Detail of a musical score discovered under the same floor, attributed to the early sixteenth-century. Note the wall damage, already repaired in the past (ph. Bartolomucci 2014)

In general, the local community initially showed a strong desire to live again in the historic town; the groups of activists being referred to as:<<the people of the wheelbarrows>> because of their determination to remove the rubble. Nevertheless, a feeling of frustration grew in the later years, due to the slowness and the complexity of the bureaucracy related to the reconstruction.

4.3 Actual Implementation and Timescales for the Recovery Programme

The Palazzo Carli-Benedetti was among the first buildings to be reconstructed. It is located on the *central axis* of L'Aquila, which represents the priority area of the town reconstruction plan.

The owners of the apartments of the palace in October 2009 entrusted the restoration project to the team of specialists formed by:

- Architect Carla Bartolomucci, as team leader and director of works;
- Prof. Donatella Fiorani, as scientific consultant on architectural conservation project;
- Prof. Fabrizio De Cesaris, as scientific consultant on the consolidation project;
- Engineer Alessia Placidi, specialist for the architectural project;
- Engineer Franco Iacobelli, specialist for the consolidation project;
- Architect Carolina De Camillis and Riccardo Fibbi, as specialists for plant design.

The project was presented to the *Soprintendenza* of L'Aquila on 26 July 2012 (prot. AQ MBAC 12382 of 30 July 2012); this granted the *Nulla Osta* on 4 April 2013 (prot. 5278) approving the works for an amount of almost €7 million (€6,986,799).

The financing of the works was granted on 15 May 2013 (prot. 399418). The works began on 26 June 2013 and ended on 19 August 2016 (prot. 83290).

The deadline was initially established within two years from the commencement, but the discoveries during construction required a variation of the project and the works therefore took three years to complete.

Between autumn 2016 and winter 2017 the building was once again inhabited by the families who previously lived there and by some new owners.

4.4 Resources and Costs of Implementation

The post-seismic reconstruction of Palazzo Carli-Bendetti financed by the Italian Government was actually completed for less than the budget originally forecast (€6,701,824.50).

This lower cost is related to the variation of some works in that certain local conditions of the building were different from the original budget. As a matter of fact, the presence of damage and shoring made some parts of the building inaccessible after the earthquake. Consequently, some planned works became unnecessary, and the unused amount was returned to the municipality.

The works were contracted to the ICIET Engineering company of construction (Castelli, Teramo). The company was chosen by the assembly of the owners, based on the CVs received.

The condominium manager represented the apartment owners.
The programme was implemented with the supervision of the *Soprintendenza* of L'Aquila (Ministry of Cultural Heritage) and the local Municipality (see above).

5. Documenting the Outcomes and Effects

5.1 Assessment of the Outcomes with Regard to the Recovery of the Heritage Resource

The aims of the reconstruction – repair of seismic damage, restoration of functionality, structural improvement – have been achieved within the established times and with considerable cost savings.

From the cultural viewpoint, the latest knowledge of the building derived from historical construction research and the new discoveries do not appear to be fully understood by the inhabitants.

Even now, local people show a certain indifference to the cultural issues of reconstruction and are more concerned with practical and financial matters. However, in this case the inhabitants have been informed about the importance of conservation choices and were involved in discussions.

A particular issue that has been controversial and difficult is that of the preservation of the ancient finishes: the decision of the group of architects who prepared the reconstruction and conservation project has allowed the discovery of wall paintings previously unknown, but it has been totally counter to the general approach – and difficult to impose – considering the prevailing practice of complete remaking plasterwork carried out in the historical town.

The conservation of material surfaces is a critical point in the ongoing reconstruction: citizens often prefer completely renovated buildings instead of ancient plasterwork showing the signs of time.

Furthermore, construction companies prefer to use new plaster and new paints to ensure *efficient* results and, above all, because the conservation of architectural surfaces requires specialised skills.

An important educational effort has to be made to let people better appreciate the importance of the traces of time over our ancient buildings.

Due to the presence of professors Donatella Fiorani and Fabrizio De Cesaris as consultants, the conservation project and the working site have been a topic of many university seminars and have been visited by national and foreign specialists in architecture.

5.2. Ownership of the Results

As already mentioned, Palazzo Carli-Benedetti is divided into eight apartments and some commercial rooms.

The owners are almost the same as in 2009: only two apartments have recently been bought by new residents.

The Order of Architects of the Province of L'Aquila was originally located in Palazzo Carli-Benedetti, however, after the 2009 earthquake they moved to a new building in an industrial and commercial area of the city where they still remain. Evidently, practical aspects such as accessibility or parking availability have prevailed over the prestige of the former location within the historic centre.

Generally, the return of the residents back to the town centre is slow and hampered for several reasons: there are many construction sites, many areas are still damaged and commercial activities for daily life are missing, but there is a thriving nightlife with many bars and restaurants.

6. Additional Comments

The materials and techniques used for the intervention in Palazzo Carli-Benedetti were specifically chosen to respect the priority of the conservation issue, with the conviction that aprioristic and ideological choices in this field are useless and substantially wrong.

Modern technologies and materials allow the original material of the building to be better conserved, avoiding extra demolitions, but often have problems with compatibility and expected duration, so their use has to stem from a reasonable compromise among the global exigence of the project. Traditional technologies and materials almost always derive from industrial production, see for instance the lime for mortars and plasters, so they have always to be adapted in the contemporary context, always checking their compatibility.

Following this criteria, integration of the missing parts of the walls and vaults have been done using traditional materials, mostly bricks, while the structural consolidation took advantage of the introduction of fibre-reinforced ribbons, located on the internal surface of the walls and above the vaults (figg. 17, 22).

The conservation works, the damage, studies and new discoveries have been described in a book about Palazzo Carli-Benedetti, published almost two years after the restoration works were completed (Bartolomucci 2018).

The publication was supported by the National Research Council – Institute for Construction Technologies –,

Fig. 25. The courtyard at the end of the works: the air colour on the loggia returns the sense of the open loggia, without denying the eighteenth-century transformation (ph. Bartolomucci 2018).

where the author worked as a researcher from 2009 to 2018.

This work serves to demonstrate how the restoration of a building can contribute to the cultural revival of the town, going beyond the banal restoration of functionality. The book is initially dedicated to the historical study and the analysis of the architecture and the transformations of urban context, then it focuses on descriptions of the damages and the restoration project and illustrates the various important findings from the restoration phases and the knowledge resulting from them. A specific contribution is dedicated to the interesting wall paintings – which depict various historical musical instruments and the musical score – found during the restoration works (early sixteenth-century).

On 26 May 2018 a conference with a concert was held at the courtyard of Palazzo Carli-Benedetti to present the book to the citizens of L'Aquila. A group of musicians marked the occasion by playing ancient instruments with the melody as transcribed in the painted scores.

From the last discoveries in the palace a new awareness has emerged on the seismic history and the cultural role that the city has had in past centuries, especially between the fifteenth and the sixteenth centuries thanks to the cultural relationships which derived from Florence and Urbino (fig. 25).

7. Details of the Expert(s) Completing the Case Study

Carla Bartolomucci, architect PhD and specialist in the Conservation of Architectural Heritage, is professor of Architectural Restoration at the University of L'Aquila.

Following the 2009 earthquake in Abruzzo (Italy), she carried out several inspections to detect the damage on monumental buildings participating in the NOPSA team (Operative Units for Protection of Artistic Historical Heritage) as a specialist in historic structures.

She is the author of many essays on architectural conservation and of two monographs concerning the historical architecture of L'Aquila.

Donatella Fiorani, architect, is a full professor at Sapienza University of Rome. She has been responsible for the restoration of churches, monasteries and other buildings. She works in monitoring, planning and scientific direction for the restoration of historical buildings in Italy and abroad. She has taught at the universities of Valencia (Spain), Budapest (Hungary), and Podgorica (Montenegro) Lausanne (EPFL – Switzerland). In 2019, she was awarded the title of *Doctorem honoris causa* from the University of Technology and Economy of Budapest. She is Director of the scientific magazine in architectural conservation *Materiali e Strutture. Problemi di conservazione.*

Endnotes

[1] (Law no. 364 of 20 June 1909; later confirmed by Law no.1089 of 1st June 1939 and now D.Lgs. 490/1999).
[2] https://www.europejazz.net/news/italian-jazz-unites-again-support-areas-hit-earthquake
[3] See «https://www.wmf.org/project/historic-center-l%E2%80%99aquila» [Accessed 29 September 2019].
[4] See «http://www.usra.it/wp-content/uploads/2013/10/TestoCoordinato.pdf and http://www.usra.it/wp-content/uploads/2014/04/DPCM04022013.pdf» [Accessed 29 October 2019].
[5] See http://www.usra.it/schedaparametrica/ [30/09/2019].
[6] no. 246; id 4907800; publication of the Municipality Register: 22/04/2011.
[7] See Corriere della Sera, 12 June 2010, Available at «https://www.corriere.it/cronache/10_giugno_12/restauro-aquila-affreschi-paolo-conti_901032e8-7610-11df-9eaf-00144f02aabe.shtml?refresh_ce-cp» [Accessed 30 September 2019].
[8] Available at «http://abruzzo.beniculturali.it/», [Accessed 30 September 2019].
[9] The «Directive of the President of the Council of Ministers of 9 February 2011: Evaluation and reduction of the seismic risk of cultural heritage» (*Direttiva del Presidente del Consiglio dei Ministri del 9 febbraio 2011: Valutazione e riduzione del rischio sismico del patrimonio culturale*), in *Gazzetta Ufficiale* n.47 del 26 febbraio 2011 – Supplemento ordinario n. 54.

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ICOMOS-ICCROM

ANALYSIS OF CASE STUDIES IN RECOVERY AND RECONSTRUCTION **CASE STUDIES**

The Joint ICOMOS-ICCROM Project "Analysis of Case Studies in Recovery and Reconstruction" sought to harness the knowledge and capacities of both bodies to explore how best to learn from experience. Its objective was to clarify issues of recovery and reconstruction and to provide insights that could improve guidance. The project involved the commissioning of a range of case studies, chosen to represent a comprehensive set of factors, namely geographical, cultural and causational. The project was managed through a joint Working Group comprising members of both organizations and administered through both the ICOMOS Secretariat and the ICCROM-Sharjah Regional Office.

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