quaderni di assorestauro

QA

YEAR08NR03
OCTOBER 2019

GRAND TOUR RESTAURO 2019

6TH-12TH OCTOBER 2019

07 OCTOBER
MILANO

08 OCTOBER
BOLOGNA

08|09 OCTOBER
RAVENNA

09 OCTOBER
FERRARA

10 OCTOBER
PADOVA

11 OCTOBER
VENEZIA

Project organized by

assorestauro

API INTERNATIONAL

Financed by

RegioneEmilia-Romagna

In cooperation with

GREEN BUILDING COUNCIL ITALIA

Quaderni di Assorestauro

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PROJECT PRESENTATION

GRAND TOUR RESTAURO 2019

MILANO | 7TH OCTOBER

BOLOGNA | 8TH OCTOBER

RAVENNA | 8TH OCTOBER

RAVENNA | 9TH OCTOBER

PADOVA | 10TH OCTOBER

INTERNATIONAL PROJECT

assorestauro®

associazione italiana per il restauro architettonico, artistico, urbano

italian association for architecture, art and urban restoration

Project coordinator:
Andrea Griletto

WHO IS ASSORESTAURO ?

Established in 2005 as the first Italian association of manufacturers of materials, equipment and technology, suppliers of services and specialized companies, Assorestauro represents the Italian sector of restoration and conservation of material heritage. To date, it is the sole association and a reference in the domestic and international market for anyone willing to start working in the conservation sector in Italy, to be intended in its broadest sense, that is, as a synthesis of the various disciplines involved, of the professional specialists, of the available technology and of the growing business community. If examined as a whole, the sector accounts for a large market share and has a meaningful impact on tourism, industry and bioconstruction.

WHAT ARE ASSORESTAURO'S GOALS ?

Assorestauro is the National Trade Association for the Restoration Sector, representing manufacturers of materials, equipment, technology, specialist companies, designers and suppliers of services for analyses, surveys and diffusion. The Association offers its members information, assistance, advice and training both directly and through its partners, with a view to building a consistent and unitary orientation to the different sectors of the restoration industry at national and international level.

As a national association, Assorestauro is aimed at coordinating, protecting and promoting the interests of the restoration sector and it represents before the outer market, in Italy and abroad, the common positions for technical and economic issues, as well as image, by carrying out targeted activities in such relevant fields of the sector as information and communication, protection of common interests (economy, image, standards), research and development, promotion.

WHAT DOES ASSORESTAURO DO ?

Several activities aimed at promoting the professional skills in the restoration sector fall in the scopes of the Association. They include diagnostic analysis, design and on site execution, producing technology and materials, as well as contributing technological innovation, with the support of Institutions, Universities, Agencies for the protection of cultural heritage and ICE, the Agency for the internationalization and the promotion abroad of Italian businesses. This type of action includes both promotion in Italy (conferences and training seminars, trade exhibitions, courses and similar initiatives) and abroad (foreign missions, training, b2b encounters, restoration sites), where member companies are involved and offered the chance to study and penetrate foreign markets through projects co-sponsored by national and international bodies.






assorestauro®
associazione italiana per il restauro architettonico, artistico, urbano
italian association for architecture, art and urban restoration

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PROJECT RE USA

PROJECT ORGANIZED BY

assorestauro®

APT INTERNATIONAL

FINANCED BY

Regione Emilia-Romagna

IN COOPERATION WITH

GREEN BUILDING COUNCIL ITALIA

The project intends to create new exchanging relationship between the companies belonging to sectors of architectural restoration, sustainability and energy efficiency of the historical and modern buildings in the United States and Italy.

For the last few years, Assorestauro has registered an always growing demand from its member companies to turn a greater attention to the North American market, which is increasingly moving towards the redevelopment of the existing buildings and the revaluation of the historical ones as an identity trace of its roots.

WHY KNOWING THE ITALIAN MARKET?

Italy is the country of history and beauty. The sector companies are:

_ Manufacturers of specific materials and technologies dedicated to the preservation of Cultural Heritage

_ High experience of Designers and service providers for the development and analysis of listed buildings

_ Companies in the sustainability-built sector and energy retrofitting focused of adaptive reuse of buildings

WHAT ARE THE PRINCIPAL ACTIVITIES OF THE PROJECT?

From January 2019

_ Market research performed by Assorestauro and commercial partners

_ Management of the project by Assorestauro and APT

_ Communication and promotion actions on the North American market

October 2019

_ "Grand Tour Restauro" expert delegates from USA, will visit the companies and the restoration work sites in Italy

November 2019

_ Annual Convention of APT in Miami 2019. Technical conferences and collective exhibition of the Re-USA project (10 companies)

ASSORESTAURO AND APTI

Since 2016, we collaborate in North America with the association APT, having a techni-

cal and commercial exchange in the field of conservation and the restoration of modern architecture.

From 2016 to 2019 Incoming of the US technical delegation in Italy visiting sites of excellence.

In 2017 Assorestauro in Ottawa - technical conference in collaboration with the embassy and the collective exhibition.

In 2018 Assorestauro in Buffalo - exhibition and sponsorship on the occasion of the APT annual convention.

In 2019 launch of APT European Chapter – New forum for the promotion of the continued development of preservation technology in Europe.

INVOLVED ITALIAN COMPANIES

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PROGRAM GRAND TOUR

ITALY | OCTOBER 6TH-12TH

MILANO | SUNDAY 6TH OCTOBER		
	Arrival at Milano Malpensa Airport International	
19:30 - 20:30	**WELCOME CEREMONY** **Welcome cocktail, greeting to the guests and presentation of the Grand Tour**	Andrea Griletto Sonia Vallese Martina Bosin **Assorestauro**
20:30 - 22:00	**Welcome Dinner**	
MILANO | MONDAY 7TH OCTOBER		
09:30 - 10:30	Visit to: **Veneranda Fabbrica del Duomo**	**Veneranda Fabbrica del Duomo di Milano** **Ibix** **Magistri srl** **Polifusion Italia**
11:00 - 12:00	**Technical presentation and Visit to the restoration works at "Sala delle Asse"**	**Castello Sforzesco Milano** **El.En.** **F06**
14:30 - 16:30	Visit to: **Basilica di Sant Ambrogio**	Claudia Tedeschi Alberto Raschieri **Geomar**
BOLOGNA - RAVENNA | TUESDAY 8TH OCTOBER		
09:30 - 12:10	Visit to: **San Petronio Cathedral (Roof visit)** **Piazza Maggiore Buildings**	**Leonardo**
15:30 - 17:30	Visit to: **Palazzo Guiccioli**	Anna Claudio Cicognani **Ediltecnica** **B5 srl**
RAVENNA - FERRARA | WEDNESDAY 9TH OCTOBER		
09:30 - 11:30	Visit to: **Mercato Coperto**	
14.00 - 17:30	**MEETING WITH Re.U.S.A. italian companies** **Networking and technical presentation at Castello Estense - Sala dei Comuni**	Presentation: **Regione Emilia Romagna** **Nuova Mondialmec** Companies: **El.En.** **Ibix** **Leonardo** **Ediltecnica** **Marmiroli** **Umiblok** **F06** **Geomar**
PADOVA | THURSDAY 10TH OCTOBER		
10:00 - 11:30	Visit to: **Villa Giovannelli**	**Lithos Restauri** **Ibix** **Marmiroli**
14:30 - 16:30	Visit to: **Tomba Brion**	**Leonardo**
VENEZIA | FRIDAY 11TH OCTOBER		
09:00 - 10:30	**Walking trought the Historic Venice**	
10:30 - 12:15	Visit to: **San Lorenzo**	**Lares** **F06**
12:30 - 14:30	**Lunch and final ceremony**	
MILANO | SATURDAY 12TH OCTOBER		
	Departure from Milano Malpensa	

07 OCTOBER
MILANO

SALA DELLE ASSE AT THE SFORZA CASTLE IN MILAN. HISTORY AND RESTORATION

AUTHORS

Michela Palazzo
Ministero dei Beni e delle Attività culturali Polo Museale Regionale della Lombardia

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- Area Soprintendenza Castello Musei Archeologici e Musei Storici -Sforza Castle - Milan - Italy

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PROMOTER

ELECTRONIC ENGINEERING

Conservation Technologies Department

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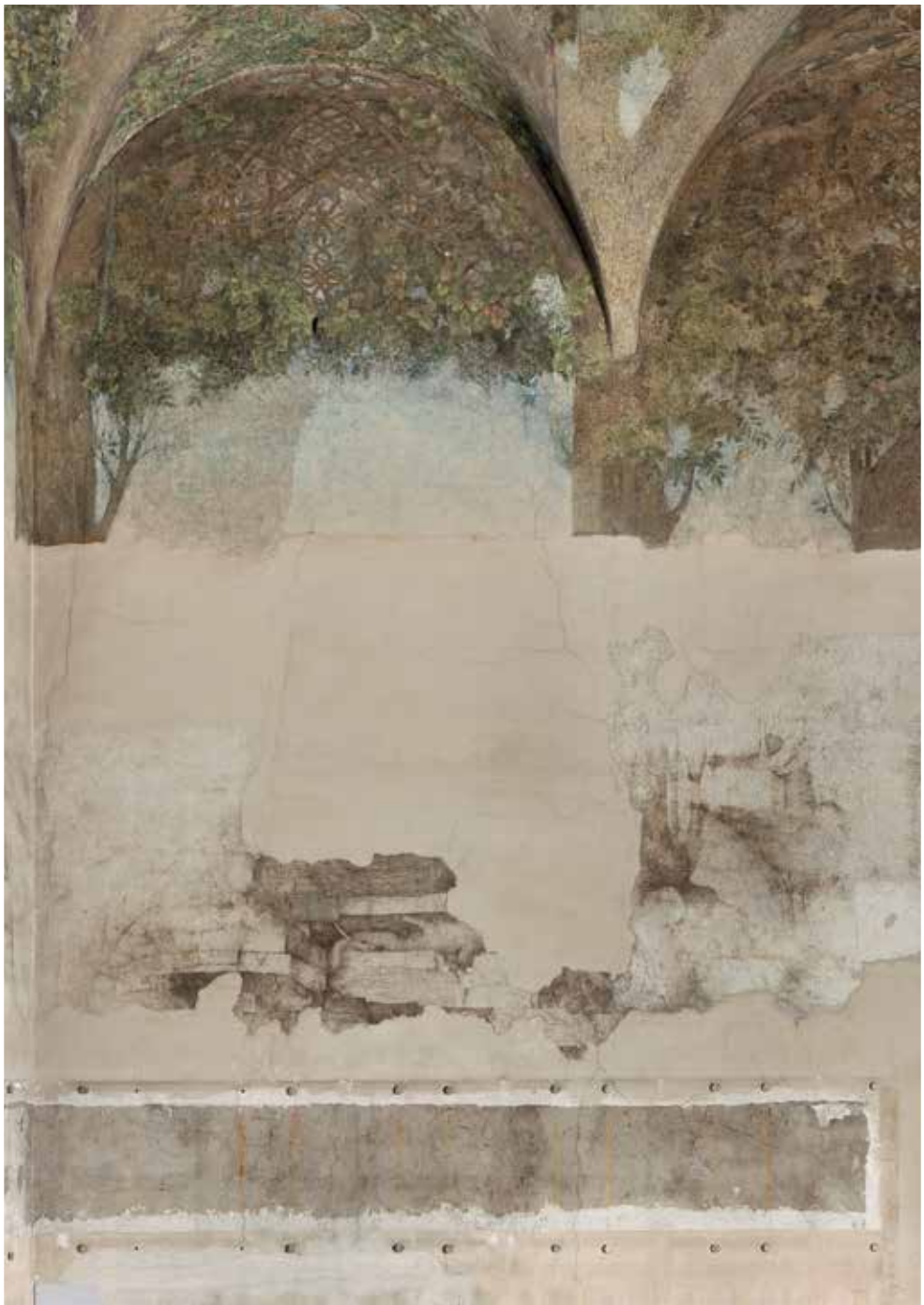
F06

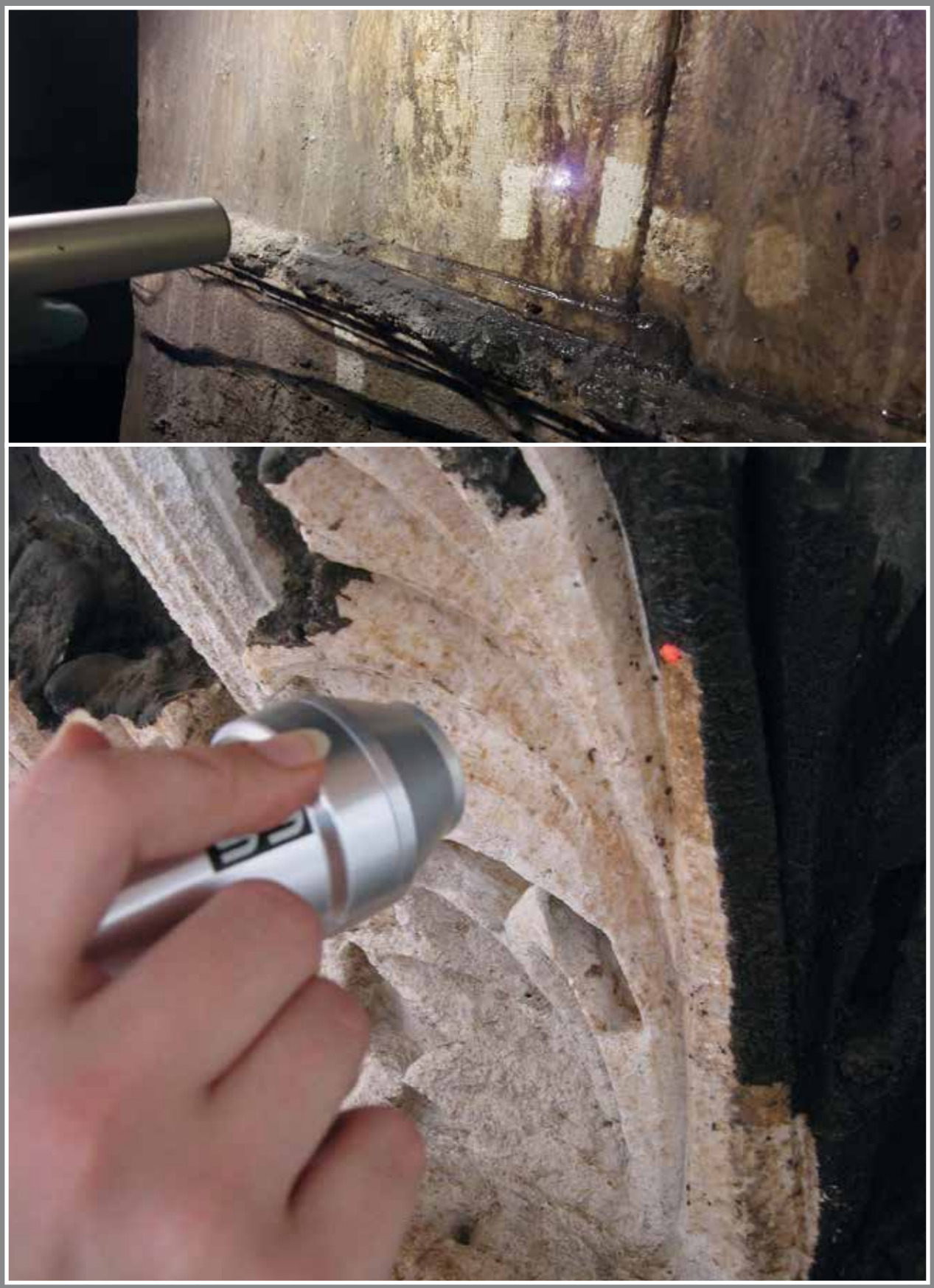
In a letter dated 21st April 1498, the secretary Gualtiero da Bascapè informed the duke Ludovico Maria Sforza called *il Moro* that Leonardo da Vinci had promised to complete the decoration of the Sala delle Asse, a large square room in the north-east corner of the Sforza Castle in Milan, at the bottom of the Falconiere tower.
The decoration designed by Leonardo in 1498, perhaps aided by a team, includes a large mulberry-tree pergola that, starting from the large trees painted along the walls, develops to cover the entire vault in a dense tangle of branches and golden ropes, intertwined in complicated knots of great elegance. On the walls of the north corner of the room is the so-called Monochrome, a large portion of preparatory drawing depicting the strong roots of a mulberry tree that creep into the ground and, with disruptive force, split rocks and blocks of square shape. This composition illusionistically framed the mouth of the large fireplace in the room at the time of Ludovico il Moro. However, with the arrival of the French and the fall of the Duchy of Milan in 1499, Leonardo had to leave the city leaving the work probably unfinished.
The surprising choice of the mulberry tree, in Italian moro or, in Lombard dialect morone, to decorate Ludovico's hall was a clear reference to his nickname of il Moro and recalled his role in encouraging the plantation of mulberries, on which Lombardy's flourishing silk production was based. Also, from a symbolical viewpoint, this tree, defined as sapientissima omnium arborum, was used to celebrate Ludovico's wise policies and the stability achieved by the duchy under his rule.
A letter dated 1498 specified that "Lunedì si desarmerà la camera grande da le asse c<i>oè da la tore."– that is to say that the wooden planks on the walls, often used at the time to insulate rooms against cold and damp, would be removed. Based on this element, architect Luca Beltrami, who supervised the complete restoration of Sforza Castle at the end of



the nineteenth century, rechristened it the "Sala delle Asse (Room of Planks)". In fact, in Ludovico's time the room was known as la camera detta de'moroni (the mulberry room), as recorded in chapter 20 of Luca Pacioli's Divina Proporzione (1509).
Over the years, the Leonardesque decoration was covered several times with white lime, often used in the past to sanitize the rooms, and the room was used for the most different uses. The Sforza Castle was in fact used as a barracks during foreign dominations and the Sala delle Asse was systematically used as a shelter for horses. From 1893, when the Sforza Castle became the property of the municipality of Milan, the Sala delle Asse underwent two major restorations.
At the end of the nineteenth century, under the direction of the architect Luca Beltrami, the polychrome decoration of the vault and lunettes was brought to light together with some fragments of monochrome in the northern corner of the room, the latter left hidden from the public because they were evaluated from the Spanish period .
The painter and restorer Ernesto Rusca completely redid the polychrome decoration of the vault and the lunettes, accurately following the traces found, and the Sala delle Asse was inaugurated in 1902. The result however surprised negatively both the experts and the public because of the use of vibrant colors very far from the common imagination about Leonardo's work.
After the Second World War the phase of reconstruction of the Sforzesco Castle began because of the damages suffered, at the same time as a general reorganization of the exhibition rooms. The Sala delle Asse was restored by Ottemi della Rotta who did not entirely remove Rusca's repainting, but just lightened it. Furthermore, the Monochrome was entirely brought to light and made visible to the public thanks to the new installation designed by the BBPR architects that provided a boiserie to frame the preparatory design in the north corner while in the remaining walls it reached the base of the polychrome lunettes.
The Monochrome, as indeed the entire decoration of the hall, was affected by extensive phenomena of degradation which, in addition to threatening the conservation of the work, distorted its correct reading.
The recovery project of the Sala delle Asse was started in 2006, with a first phase of diagnostic investigations that highlighted the degradation of the pictorial surfaces, caused by pollutants and the surfacing of salts that have progressively degraded the decoration. Beginning in 2012, the wooden boards of the BBPR set-up were removed from the walls and an important study and investigation campaign was initiated aimed at getting to know the work and its restoration, in collaboration with the Opificio delle Pietre Dure of Florence and the Ministry of Cultural Heritage.
The first phase of the restoration project ended in 2015 with the important recovery of the Monochrome. The preparatory design, executed with charcoal graphic signs finished with ocher-based pigments spread by brush, presented several superficial incoherent deposits and film-forming materials applied during previous restorations. These, together with a diffuse whitish patina due to the presence of saline efflorescences, as well as damaging from a conservative point of view significantly altered the perception, compromising their correct reading. It was therefore decided to intervene through a conservative restoration with the dry removal of inconsistent surface deposits and saline efflorescences, proceeding in parallel with constant monitoring of environmental values. Furthermore, localized

detachments of the plaster were fixed, ensuring stability through punctual anchoring and targeted injections of premixed mortar.
Thanks to the systematic campaign of diagnostic investigations that involved the Sala delle Asse as a whole, a band of ancient plaster was found, still hidden under numerous layers of lime and repainting, which runs continuously along the four walls of the hall. A second phase of study was therefore opened for the identification of the most appropriate methodology for the removal of the lime layers and the repainting overlays. These layers were tenacious and strongly adherent to the most superficial layer of ancient plaster and traditional removal techniques would inevitably have led to a loss of the fifteenth-century material. The correct use of laser technology, thanks to its gradual and selective action, allows instead to remove the numerous layers of lime very quickly until reaching the last plaster veiling that hides the preparatory drawing traces underneath it, without compromising the ancient material.
For such a complex operation, a single type of laser could not be used. In general, the most common devices are lasers that operate in the near IR with different pulse durations, from microseconds to nanoseconds. Their main use is the direct removal (ablation) of degradations of various kinds, but mainly inorganic, which cover both artworks and architectural surfaces. In recent years the number of applications of this technology has considerably increased, above all on the different problems regarding restoration of wall paintings.
In this context, an operational protocol (secondary spallation) has been devised that is very useful for the *"descialbo"* of polychrome surfaces. The term *"descialbo"* means the removal of one or more layers of plaster covering a pictorial wall surface. In many of our

Italian monumental complexes, both palaces and churches, this is a common event due to the subsequent renovations and modifications that these buildings have undergone over the centuries.
After the first experiments in the Roman catacombs (S. Tecla's and Priscilla's) where this procedure allowed to free the ancient paleochristian funerary paintings from the earthy and carbonatic incrustations typical of those contexts, this methodology has been applied also on real wall paintings. Over time and with experience, very complex situations were faced in which action was taken not only on actual frescoes but also on monochrome charcoal drawings.
The most significant experience was that of Rome in the Farnese Gallery of Palazzo Farnese. Here in the lower part of the hall several layers of plaster covered drawings, sketches, signatures of visitors and artists who came to admire the frescoes of the Carracci brothers' vault (1597 -1607). It is thanks to this long and delicate intervention that it was possible to acquire the indispensable experience to be able to intervene on the Leonardesque masterpiece of Milan.
The relevance and complexity of the case have required the use of innovative techniques. including the laser cleaning on the decoration surfaces in order to remove scialbature (whitewash), altered retouches and organic fixatives applied during past restoration interventions, biological infestation and soluble salts. Compared with other techniques, the laser allows more versatility, accurate control and minimum surface damage In fact it provides a selective elimination of unwanted layers without any mechanical contact with the surface and the preservation of superficial Texture. The used lasers have been provided



by the Conservation Technologies Department of the El.en. Group. The cleaning of painted surfaces represents a big challenge for laser cleaning and three kinds of laser have been used taking into account two main parameters : the variation of the wavelength and the variation of the pulse duration.
The Nd:YAG Q-switched laser (EOS QS), with its characteristic wavelength of 1064 nm, allows to work using two different pulse durations: Q-switch pulse (15 ns) and Short Free Running (30-100 µs) and it is flexible and useful to solve many cases of cleaning on different materials.
The other Nd:YAG laser (EOS 1000 LQS) has a pulse duration optimized for the cleaning of Cultural Heritage: the Long Q-Switch one (100 ns) . This laser was designed and tested for the first time on the gilded bronze of the Porta del Paradiso, by Lorenzo Ghiberti, in the Baptistery of Florence, so it is suitable for particularly accurate interventions. ,with its optimized pulse durationin fact, The last employed system is an Erbium laser (Er:YAG – Light Brush 2). Its technology is based on the strong absorption of the wavelength at 2940nm by surface layers that contain OH bonds. This feature makes it particularly suitable for the removal of repainting, varnishes and patinas from wall paintings, in the highest respect of the inner layers.
The delicate *descialbo* intervention has thus brought to light the exceptional preparatory drawing of the mighty mulberry trunks in the foreground that mark the walls, some younger trees and shrubs and an extended hilly profile with a small piece of landscape along the horizon line.
On the occasion of the celebrations of the fifth centenary of the death of Leonardo da Vinci, the restoration work is temporarily suspended and the Sala delle Asse has been extraordinarily reopened to the public from 16 May 2019 until 12 January 2020, for the exhibition “Sotto l’ombra del Moro. La Sala delle Asse”, curated by Francesca Tasso and Michela Palazzo, allowing the public to admire the monochrome and to discover the exceptional traces of the preparatory drawing re-emerged during the restoration work. The study and restoration of the hall, in particular of the polychrome decoration, will resume in 2020.

Francesco Canali
CANALI ASSOCIATI
Parma
Veneranda Fabbrica of Milan
Worksite Supervisor

THE "VENERANDA FABBRICA DEL DUOMO" IN MILAN: A PECULIAR APPROACH TO CONSERVATION

The new expanded Museum of the Cathedral in Milan, inaugurated late in 2013, is the last accomplishment by the Veneranda Fabbrica (the trust entitles for the preservation and maintenance of the Cathedral) in the conservation and enhancement of the sculptural heritage of the Cathedral. The project engineering and realization implied the allocation of considerable means and resources, which were however deemed necessary and inevitable by the Board of Trustees to reach the ultimate goal of making the most of the artistic heritage they are responsible for. The large affluence of visitors (amounting to some 1,000 daily during the Expo exhibition) is witness to the successful achievement of the intervention, which involved the contribution of several historians and art experts, restorers, designers and qualified workers. The creation of the new Museum also highlighted the peculiar character of the Cathedral System: a centuries-long bond between the Cathedral, the Fabbrica and the Archives, as well as manual work excellence and the recourse to artistic expression as a natural communication medium. Sculpture remains a living thing and a privileged form of expression, as witnessed by the recent temporary while stimulating exhibition of some works of historic and contemporary art.

Beside exhibiting extraordinary artefacts, the new Museum implicitly tells the story of the construction of the cathedral and of its most important structural material, the Candoglia marble. The bond between the edifice and the material is stronger here than in most other constructions. The exceptional aspect in the case of Milan Cathedral lies in the fact that each block of Candoglia marble too has a special and very peculiar story to tell about its geological characteristics, about the evolution of quarrying and working methods, about its interaction with the environment and with other materials.

"...Nature...wished to leave a small mark, almost a thin cascade of the purest water, as the quarry in Candoglia may appear at first sight, plunged in a dark and austere environment (...) in the fairly barren valley of the Ossola".

With these words, still suggestive and stimulating today, Carlo Ferrari da Passano described the beautiful quarry at the mouth of the Toce Valley fifty years ago. Candoglia marble is known to have been used since the Roman times, though for limited purposes. In 1386, the duke of Milan Gian Galeazzo Visconti started, with all the inhabitants of Milan, the construction of the great Cathedral. The emissaries of the Veneranda Fabbrica, bearing the Letters Patent now preserved in the archives of Milan, scanned the land of the Viscontis to its boundaries and eventually chose this rare saccharoid limestone as the material of their liking. Since then and for some seven centuries uninterruptedly, all the marble extracted from Candoglia quarry was meant to adorn the Cathedral, but for few exceptions.

All the statues are made of this special material, Candoglia marble, which invariably stupefies the restorers who take care of the numerous populations of statues exposed to weathering. Consider, for instance, the basement section of Saint Quintilian standing on top of the small spire named Gugliotto Pestagalli. All in all, the statue is not in bad conditions, although it is still the original one, carved together with the spire in the mid 19th century. The statue, however, shows a deep crack in the foot, which runs along the vein of the marble. Now consider the huge cost of erecting a service scaffold to restore the spire

(see Figure), mounted above the springer of the dome cladding, that is, about 60 meters above the square. Clearly enough, the scaffold cannot be kept there for long years, because of its cost. It is therefore urgent to make a decision about the stability of the statue. After a careful study, seeking the advice of restorers and of the qualified marble experts of the Fabbrica, as well as of the site manager and foremen, the decision was taken to keep the statue in place and consolidate the basement with a number of convenient solutions.

Decisions of this kind have been taken on a daily basis in the centuries-long history of the Fabbrica. Statues have been often replaced, when their own safety or the safety of their support could not be guaranteed. In these cases, a statue is removed, brought in the Marble Yard and hand-copied by the sculptors working for the Fabbrica, with the same skills of the craftsmen who have worked with this method for six centuries and ensuring the consistency of a historical tradition handed over to them. Nonetheless, constant efforts are made to improve the maintenance methods so as to postpone or even avoid such extreme measures. The Politecnico University of Milan frequently collaborates with the Fabbrica to develop these improvements. In particular, the main façade, where restoration works have been recently completed, makes the object of a special conservation research. Hence, the collection of the original statues or ancient copies, removed from their original position over the centuries, makes quite a meaningful number today; therefore, the Fabbrica decided it was time to improve their exhibition. This is why the Museum of the Cathedral has been reorganized and almost doubled in space since 2013, while being still accommodated in the ground floor of the Royal Palace.

The New Large Museum has allowed Milan citizens (whom the Cathedral belongs to!) to enjoy the view of the stunning artefacts gathered during seven centuries of history. The new exhibition itinerary is intended to tell the story of the Cathedral while keeping the visitors' attention high and stimulating their curiosity. To this end, the character of the exhibition halls constantly changes, offering twists and turns similarly to what happens in a drama plot, by growing or diminishing the number of exhibits in the halls, alternatively enlarged or compressed in space, and enhanced or reduced in height.

AUTHOR

Eros Zanotti
Margherita Bertoldi

MAGISTRI S.R.L.

DIVERSIFIED CLEANING METHODS FOR SENSITIVE AND HIGHLY FREQUENTED VENUES: THE CATHEDRAL OF MILAN

PROMOTER

POLIFUSION ITALIA

Photo Credit
Marco Ligabue

ORGANIZATION OF WORKS

Restoring the interiors of Milan Cathedral makes a complex task, as the surfaces needing treatment are heavily coated with deposits. As a result, an essential step consisted in cleaning them with varied techniques, adjusted to the specific problem and type of surface.

The works have been started in 2013 on the counter-façade and are currently in progress on the interior walls of the northern transept. Supervised by Eros Zanotti, the chief technical officer of Magistri S.r.l., a team of qualified restorers has carried out the works with the help of specialized experts, including PhD Engineer Dario Benedetti as scientific advisor for on-site diagnostics, PhD Architect Margherita Bertoldi as technical advisor and coordinator, Marco Ligabue as professional video maker and Irene Scarpa as advisor for the chemical formulation of the products used.

The interaction of restorers with visitors can happen on a daily basis in the cathedral, because all current safety regulations aimed at protecting the health of the workers and of any people visiting the neighbourhood of the works are fully met and implemented.

To this aim, signboards are provided to warn visitors about any dangers and areas of unauthorized access; tour itineraries are carefully studied; the use of any products liable to cause nuisance for bad smells, in spite of their low toxicity, is reduced to the minimum. Equally,

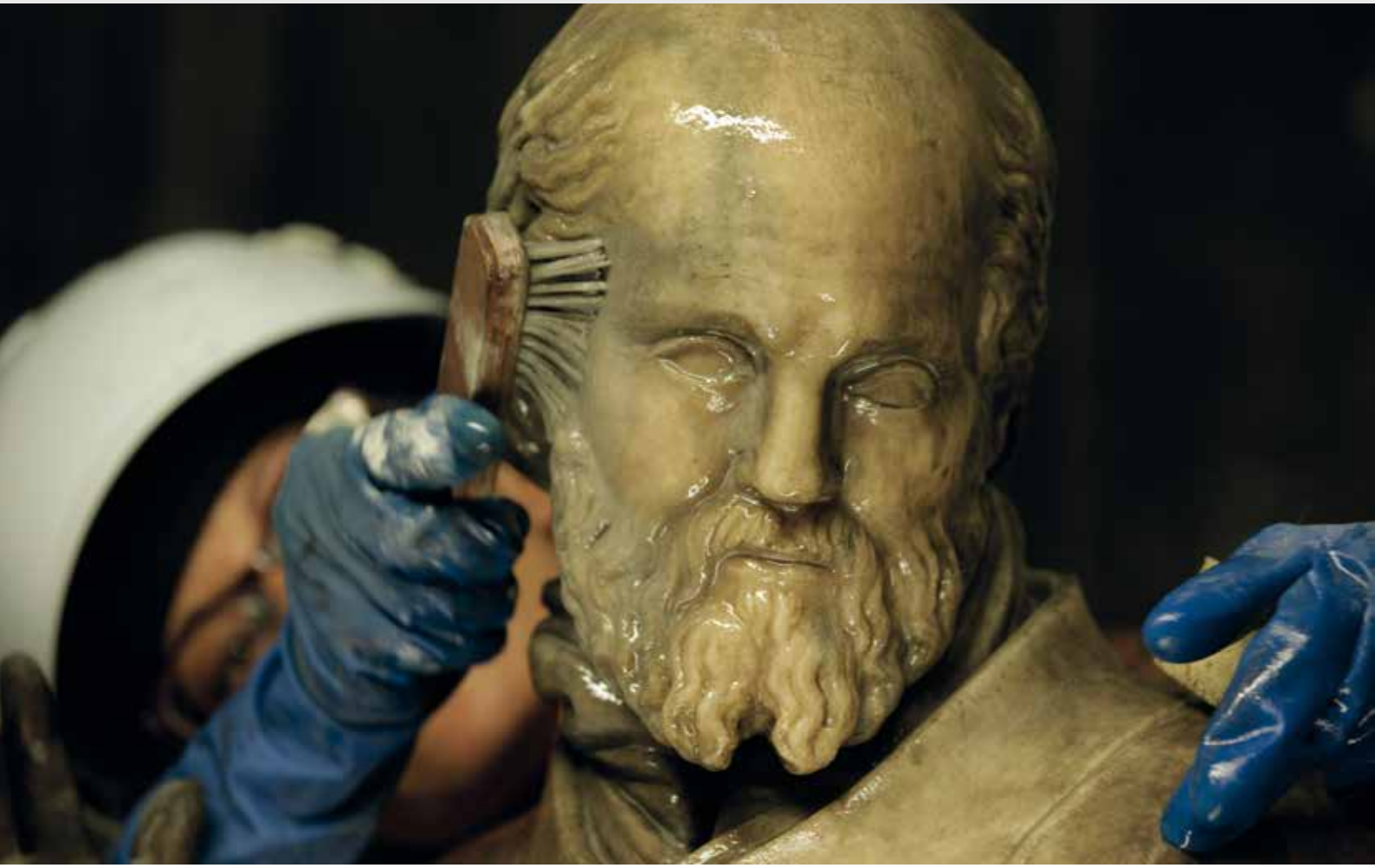
noisy tools are used below the decibel sound limit as fixed by the law to ensure minimum sound impact and avoid nuisance, especially because the cathedral is a place of worship.

Another paramount issue was using products that are chemically, physically, mechanically, as well as cosmetically and chromatically, as much compatible as possible with the existing materials and capable of guaranteeing the safety and health of restorers and visitors alike. Therefore, restoration products and techniques were carefully and specifically selected, and special care was taken in choosing innovative products adjusted to the peculiar state of conservation, materials and shape of the ornaments.

DIVERSIFIED AND COMBINED CLEANING TECHNIQUES

Samples taken on site were brought to a laboratory to be analyzed. Diagnostic surveys with Fourier Transform Infrared Spectroscopy (FTIR) on conveniently prepared samples helped obtain information about the composition of both the deposits and joints between bricks. Diagnostic analysis and cleaning tests make preliminary tools for understanding and designing ad hoc cleaning and consolidation based on real conditions.

In addition to using neutral gel cleanser and wet micro air abrasion by inert Garnet 120 mesh, cleaning operations included wrapping on ornaments and treating statues with steam or precision tools.



GEL AND ENZYME CLEANING

Lipase enzyme coming as a gel acts selectively on the waxy patina and acrylic resin found on the surfaces without affecting the underlying stone, making it possible to avoid using solvents. Lipase gel reacts in 30 minutes and can be removed easily with blotting paper and water or distilled water, by rubbing gently with a soft brush or a sponge.

This product was also chosen because it is safe in highly frequented environments, as it does not release any pollutants or other hazardous substances.

NEUTRAL CLEANSER

Surfaces were cleaned with a neutral AB57 gel cleanser, which makes cleaning operations easier and efficient also on valuable surfaces and ornaments. The texture of the product helps spread it evenly, so that the agent will act directly on the surface with no need for any supporting substances. After removing the cleanser, the surfaces were rinsed off with distilled water. When the surfaces required to stay in contact with the agent for a longer time, the cleanser was mixed with paper pulp and meerschaum to help keep the surface wet for longer.

The product comes with special additives to remove the ammonia odours that are released when the cleanser acts.








WET MICRO AIR ABRASION

Different types of air abrasion tools and compressors were used to clean stone surfaces. Larger tools were used on flat areas for greater working speed; smaller tools were selected for more sensitive surfaces and ornaments, like statues and artifacts.

These tools come provided with water spray systems capable of reducing dust and guaranteeing better control of surface abrasion.

To avoid slowing down micro air abrasion operations, all tools are connected to a blower, so that the inert material remains dry and will not clog pipes and fail to get out.

STEAM CLEANING

An industrial steam generator with adjustable spray gun can be used alone to obtain efficient cleaning with no cleanser added, or else as a precious tool to get rid of any residues, for instance to entirely remove all residual substances after wrapping, with no need for mechanical cleaning of the surfaces.

A steam generator provided with a large-sized boiler capable of reaching operating temperature soon helps saving a huge amount of time.

After the surfaces were treated with an AB57 cleanser, they were rinsed off with a steam jet to easily remove any waxy residues on Candoglia marble surfaces.

08 OCTOBER
BOLOGNA

THE RESTORATION OF HISTORICAL SURFACES BELONGING TO THE ARCHITECTURE OF BOLOGNA: SOME EXAMPLES OF «RESTORATION OF THE RESTORATION» AND NEW TECHNOLOGIES

AUTHOR AND PROMOTER

Clelia La Mantia

Rossana Gabrielli

Leonardo

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www.studioleonardo.it

Starting from 2012 we had the opportunity to restore some of the most important monuments in Bologna. These have historical facades characterized by the most popular items widespread in the historical centre: brick masonries and architectural elements in moulded sandstone (cornices, capitals, etc.). The typical finish of their wall surfaces had a light pink veil, because of the earthenware which let the underlying masonry texture be visible. This kind of finish is inspired by the medieval technique called "sagramatura" (1).
This is exactly the appearance of the facades of two buildings that the ICE delegation is going to visit in Bologna: Podestà Palace, restored between 2012 and 2015 and Scappi Palace, that is still under work. Since these palaces have been restored many times in the past, it was necessary to make a preliminary accurate analysis campaign aimed both to define the preservation state of the surfaces and to identify materials and product (such as application of stucco or strenghtening), used in the previous interventions that require a specific work: a real "restoration of the restoration".

PODESTÀ PALACE

THE STORY

"Podestà" palace was built in 1200 in Maggiore Square to a public use, but now it has such a different appearance. It is a complex and the most ancient part is the one corresponding to the Arengo tower, 39 mt long. In 1245 the palace was united with "Re Enzo" palace and "Capitano del Popolo" palace. At the lower level we can see a space covered by a cross vault called "Voltone del Podestà", supported by 4 columns with 4 terracotta sculptures on their top. In the second half of XV century Giovanni II di Bentivoglio decided to modernize the facades that changed their look from medieval to Renaissance. However the work remained unfinished because Bentivoglio was sent away from the city after a people's insurrection. Nowadays we can see a lower level with 9 arches and an higher part with 9 corresponding arch windows. Sandstone is the most used material even for the decorations. In the base there is a bossage and decorated tiles. We can remind the criticized restoration of 1910 by Alfonso Rubbiani who built battlements as crowning elements, to complete the Bentivoglio's project and made demolitions and remaking in the loggia. Rubbiani's idea of restoration was the one of reinstatement, made by removing disharmonious elements and remaking others (2).

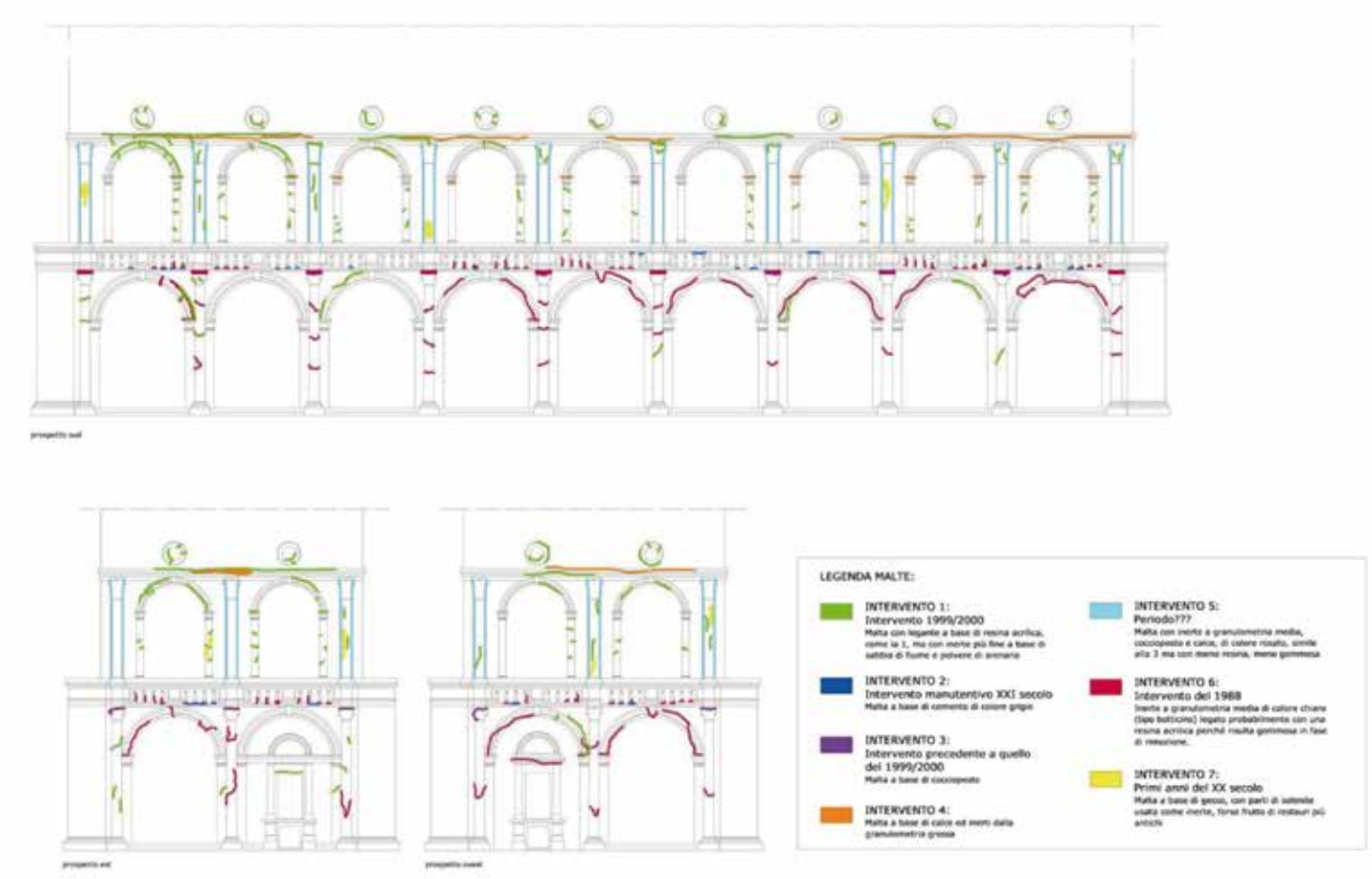
(1) *Gabrielli R. e Geminiani F., Le finiture dell'edilizia storica bolognese: la sagramatura ed il restauro delle facciate nell'esempio di palazzo Agucchi, in "Dossier n.5/2001", Maggioli Editore*

(2) *Antonella Ranaldi, Il restauro di Rubbiani del Palazzo Re Enzo, in Palazzo Re Enzo. Storia e restauri, a cura di Paola Foschi e Francisco Giordano, Costa Editore, Bologna 2003. Pp. 95-118*

A POSSIBLE METHOD OF INTERVENTION:
THE CHOICE OF MATERIALS AND PRODUCTS

According to what we have already said, before the operational phase, we made an accurate analysis campaign not only direct on the ground, but also with an archive and library research aimed to understand the type and the preservation state of the materials used at the moment of the foundation and in the next interventions. For example, correlating analysis's results on materials and the information achieved, it has been possible to realize a stratigraphical analysis about the various types of mortar founded in the masonries. This kind of analysis has been used to develop a mapping and a cataloguing of these materials and to decide what were the best product to use in the cases of reintegration or filling. For this reason we used various types of mortar with an appropriate formulation, to respect the principle of compatibility (of composition, particle size, and colour) with the sandstone. Besides we observed that in the past was applied a strengthening product, silicon based, exclusively in correspondence to the sandstone elements of the higher part of the facade, whose preservation state is clearly better than the one of the lower part.

During this intervention we had the opportunity, in collaboration with the Department of Material Sciences of Bologna University, to test a nanotechnologic protective system titanium dioxide based that protects the surfaces from atmospheric agents and in addition absorbs pollution giving back clean substances to the air.



PALAZZO SCAPPI

THE STORY

Palazzo Scappi, located in the historic centre of Bologna was the senate palace of the family from which it takes its name. It is located in the so called "Canton'dei Fiori" where in the past had place the flower market.

It was built in the middle of '500 [3] on the place where stood the houses of the family which included a thirteenth-century tower that still exists. Its current appearance is due to the reconstruction made by Augusto Sezanne in 1892.

The building doesn't have a very developed height, but can include 5 rows of small and big windows, including those of the portico: the smaller ones are rectangular and decorated with sandstone frames; those of the main floor, the most majestic, are decorated with triangular gables "in rock" and with sill supported by long grooved shelves. Today some of these are buffered, others were expanded and became some longest openings.

The lower part consists of six arches supported by brick columns, with composite and Corinthian capitals in stone characterized by different decorative motifs.

Scappi family died out in 1707 with the death of the last member. Later on the building underwent several changes of ownership.

THE INTERVENTION

Also in the case of the restoration of Palazzo Scappi's facade (which have consisted more in securing sandstone element that were at risk of detachment) it was fundamental an accurate phase of stratigraphical analysis that has been used to detect different types of mortars (made of lime and sand, gypsum, up to a cement-based mortars), used for fillings, reintegration and partial reconstruction of the sandstone elements under construction and subsequent maintenance operations or restoration. Through the comparison between

(3) *Roversi Giancarlo, Palazzi e case nobili del '500 a Bologna, Grafis Edizioni, Bologna 1986, pp. 341-348*

direct stratigraphical analysis and the information gleaned from laboratory investigations, carried out on samples taken appropriately, types of finishes applied on surfaces have been identified. Even in this situation all the data collected during the analysis phase represent an extremely important tool for the definition of the methods and materials to be used at different stages of intervention in order to run an effective restoration, sustainable and respectful of the historic features of the building .

SAN PETRONIO BASILICA

THE STORY

The restoration methodologies described above were also used in the case of the important intervention made on the San Petronio Basilica [(4)].

The San Petronio Basilica is located in the large Piazza Maggiore in Bologna.

Its construction began June 7, 1390 under the direction of the work of Antonio di Vincenzo, but we cannot set a date for the conclusion. It is a late-Gothic basilica with three naves. According to the original plan, its length should have been even greater [(5)].

The current structure of the facade is characterized very clearly by a lower part made of brick whereas the lower part, which includes the three portals, is covered with white Istrian stone and red Verona marble. This coating is clearly unfinished. The main portal is the work of Jacopo della Quercia, with representations of the Old and New Testaments. On the tympanum sculptures of the Madonna and Child are visible, and of Sant'Ambrogio and San Petronio too. The portal was unfinished: missing the terminating cusp.

The first major renovation which was submitted in modern times the façade dates back to the seventies and had as protagonists Ottorino Nonfarmale, Eugenio Riccomini and Raffaella Rossi Manaresi, at the center of a heated debate; during the nineties they were then carried out a series of maintenance interventions.

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(4) *RESTORATION OF SAN PETRONIO BASILICA: FOUR-YEAR PROJECT BETWEEN INNOVATION AND ECO-SUSTAINABILITY, Dott. Arch. Roberto Terra1 , Dott. Rossana Gabrielli2 , Dott. Michela Boni3 1 freelance architect, Studio Cavina Terra Architetti, Bologna; 2 architectural archaeologist, Leonardo s.r.l., Bologna; 3 restorer and art historian, Leonardo s.r.l., Bologna, in Built Heritage 2013 Monitoring Conservation Management, pp. 1461-1471*

(5) *Bellosi Luciano, La Basilica di San Petronio in Bologna, voll. 1-2, Cassa di risparmio in Bologna, 1983*

THE ANALYSES AND THE CLEANING OF THE SURFACES

Cognitive campaigns conducted on the structures, the study of historical archival sources, documentation on the restorations and the development of operational protocols, including the experimental and innovative ones, have enabled the collection and systematization of many data, that in many cases were unpublished, useful on scientific level and for the planning of future maintenance.

The restoration work on the stones and on the sculptures of the facade cannot ignore the conservation history that preceded it: much of the current intervention focuses on dialogue with what has been done in the past.

The state of preservation of the facade was discrete, the consolidating product that has been used, known as “mista Bolognese” (acrylic-silicone resin) acquitted in part its function and the stone facing has only required some precise and circumscribed interventions of consolidation or bonding of parts with epoxy resins di-components. The largest work was the accurate cleaning articulated in successive and progressive stages. A first phase of removal of surface deposits, made with soft brushes and with the aid of an aspirator, was

followed by a cleaning by compress with demineralized water, a localized solvent cleaning made by buffer. Particularly tenacious deposits has been removed by laser technology, to obtain a selective removal only of the deposits and the preservation of the patina of oxalate and traces of previous treatments. The operation of filling of the joints and more or less consistent cracks played a major role also for its conservative aspect of bringing them to the level of the stone in order to facilitate the drain rainwater. For the same reason some covers were made of lime-based mortar, earthenware and sand, to make the surface waterproof and reinforced with a honeycomb mesh. The last phase is that of the application of the protective product specially formulated to be laid out on a surface already treated with acryl-silicone resins.

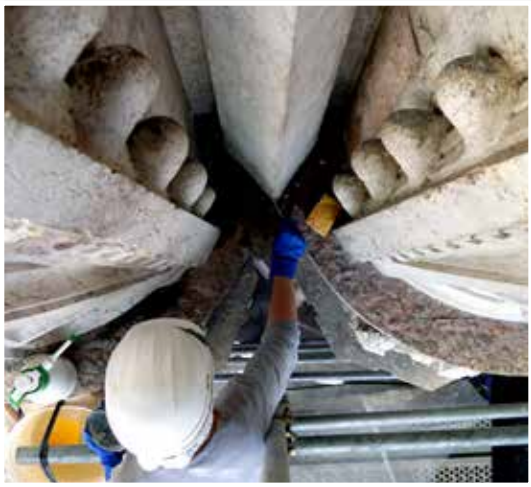
The three sculpted portals and more decorative elements of the facade were subjected to a scanning three-dimensional relief in high precision useful to the acquisition of a perfect virtual model of the entire complex, realized with digital techniques and without direct contact with the elements. Thanks to the model it is possible the material reconstruction work in full-scale, in order of its valorization, study, exhibition, or to prototype partial or integral elements to replace the original in case of loss of the same.

The church square, also in stone, was the subject of a cleaning operation performed with the use of pressure-controlled precision sandblasting machine: a conservative intervention, respectful of the historical monument.

The project also involved the completion of the restoration of the interior chapels of St. Vincent Ferrer, St. Rocco, St. Michael and St. Rosalia-S. Barbara.

Outside, in addition to marble, for which were applied the same methods of the facade, there are pieces of plaster in which were found traces of a decoration, portions of cotto "unfinished" tiles, which also characterizes the upper part of the facade and finally there is the cotto "sagramato", not present in other areas, but particularly important as a surface to be preserved as it contains the traces of the original finish. In fact, the "sagramatura" has characterized much medieval building in Bologna but it remains preserved in very few original examples. A careful diagnostic campaign has brought to the knowledge of materials and of diseases and causes of degradation that characterize both the part in stone that the brick.





For the part stone a special mention should be made to the trial, carried out thanks to the instructions of the Opificio delle Pietre Dure, of sulfate reducers bacteria which have the advantage (even in an environmentally friendly way), to make an extremely controlled cleaning respecting the object, the operators and in the environment in which it operates.
At a structural level there were no significant problems except for a large lesion on a capital that was a through lesion and parallel to the surface and has necessitated a bandage with carbon fiber tapes stacked in three layers, glued with di-component epoxy resins, later treated with inert conform to the original for grain size and color.
On the brick part of the wall, after a consolidating process of the "sagramatura" parts with micro injections of acrylic resin diluted, it proceeded with a cleaning with atomizer system that combines the mechanical action obtained by the run-off with the chemical action of the water which slowly dissolves plaster or the secondary calcite, of redeposition, which act as ligands of the black crust and let it be easily removed. The laser has been used to remove black crusts in the lower part of the windows, in correspondence of the brick parts. The use of this nanotechnology has enabled a controlled surface cleaning without the risk of damaging the protective coating present. The joints, in the portions that required it, were grouted with mortar of lime and sand, in accordance with the original.

THE RESTAURO VERDE® SYSTEM

The actions described above were conducted using the Restauro Verde® system, an approach to restoration work (conceived by Leonardo on the basis of guidelines set by the Green Building Council - to which Leonardo joined and with whom is working to define the Protocol of Historical Buildings) in view of environmental sustainability and energy conservation. The growing awareness of environmental issues has led to think that the restoration is necessary to arrive at a sustainable preservation of cultural heritage. Much attention is paid to the control of the environmental impact created by restoration activities, trying to reduce pollution. Specifically, the Restauro Verde® system is divided into four main categories:

_ The procedures for the evaluation and selection of products to use in the recovery and restoration of the buildings;
_ The preservation of health and safety of operators and people unrelated to the construction site;
_ The procedures for a correct management of the works with low environmental impact;
_ The research and innovation through the realization of research projects for the application of substances, innovative methodologies and tools for the restoration works and for the recovery of the buildings.

According to the same principles great attention is also paid to the reduction of water's use in the cleaning operations, thanks to the use of alternative systems such as spray water and the correct management of discharge.
Another important element for the containment of water consumption is the use of the technology for the microsandblasting developed by Ibix used in a selective and calibrated way for cleaning or finishing works. This system is much used also for the removal of graffiti in the historical centres.

08 OCTOBER
RAVENNA

SCIENTIFIC RESTORATION PROJECT OF PALAZZO GUICCIOLI (ALREADY OSIO)

AUTHORS

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PROMOTER

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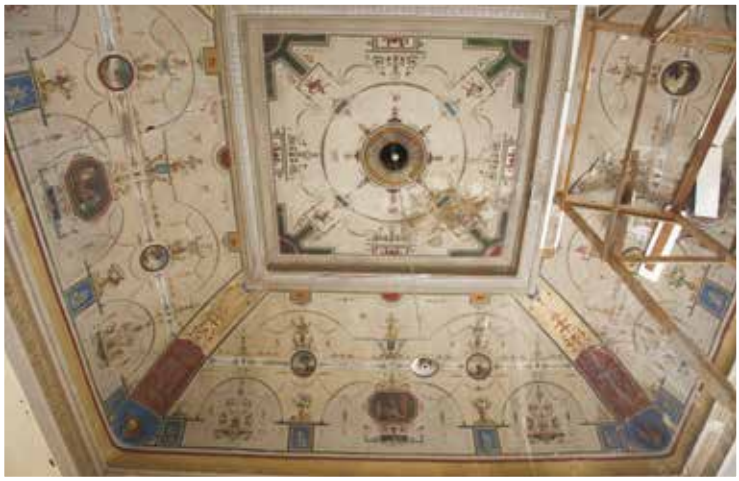
It's been years since Palazzo Guiccioli has been an absent building, lying in the heart of Ravenna in a dimension of mutual indifference with the passers-by. This is what a building mirrors when, unlived, it doesn'live.
The essence of the project is to give back to the building its historical memory; it is morphologically made of a complex of buildings facing an inner yard, with constant changes and transformations.
This means to rebuild the genesis of the building through a careful philological reading. This gave life to an articulated structure, different in its building characteristics, as well: an incomplete and severe structure built by a foreign family (The Osio) which left just a few traces of itself except for the Palace, in the territory of Ravenna, buildings added in successive ages to complete the functions and uses of the period.
The essential core of the compound was realized between the end of the 17th century and the beginning of the 19th century, when the Guiccioli Family used to live there. It became a witness of strong family events both for their historical importance and for the characters' value: the young Teresa Gamba Guiccioli, her husband the Count Guiccioli, Lord Byron, Luigi Carlo Farini with many other protagonists and historical and social events. The restoration projects consists in a reorganization of the monumental complex as a site of different activities with its cultural heart in two museums, The Byron Museum and the Risorgimento Museum.

Educational classes, a management area, commercial units, cafès and an inn – a restaurant in the underground will complete the painting facing the inner yard. As the main theme is the 19th century, the place becomes a sort of stage where each single element has its own peculiar significance.
The focus point of this approach is based on a few considerations on the cultural atmosphere of the age. The atmosphere is emphasized by the museum lay – out at a high interactive technology. The diving in the "dwelling", which is the main theme of the project, starts directly from the entrance. The high ceilings will put up images of contemporary graphics and the space will be redundant of evocative sounds.
Through the open gates you enter the garden yard that will allow the visitor to enjoy the restaurants and shops. From the hallway you enter directly the museum side, articulated on two floors throughout the saloon and by the elevator in the middle of the stairs. From the garden you can enter the high terrace through the existing stair and, from here, to the terrace located above the Literary Cafè.
The two terraces will allow a transition altitude which is important for the distribution in the palace and the beauty of the view. The same staircase is the emergency stair, as well.
On the west side, inside the area hosting the cafè, an elevator for disabled people opens an access to the upper floor of the main building where we can find the offices. Inside the so – called Literary Cafè there is another elevator which gives access to the Cafeteria roof - garden.
It's a place for conferences and poetical performances, books' presentations and a simple relaxing break.
It's connected to the main floor, where the Risorgimento Museum stands, through an iron staircase which leads to a tiny but functional chamber, before entering one of the halls of the Museum.
The Cafè terrace is connected, as above mentioned, to the covering terrace of the wing structure with a porch.
To this terrace you can get by making use of the staircase in the corner between the east and south wing with an exit on the porch. The exit is gifted with landings of access from the upper and main floor, as well.

This gives way to a communication, even if articulated between outside and inside, between the wings of the palace.
From the entrance hall you can get straight to the restaurant through a passage wall brought to life, again.
The restaurant is forged like a Taverna (Taverna Byron) whose dark tones and refined warmth mirror the brick masonry and the paneling and furnishing wood. To allow the use of the yard for a restorative purpose, a connection between this and the restaurant has been hypothesized.
From the entrance hall, on the opposite ceiling, another reopened gate will allow the entrance to a bookshop.
A third existing reopening, to the right of the door, allows to inspect the technical places where several technical plant elements are located. (electrical wiring, antifire, air conditioning)
On the entrance hall ceiling, scenes with iconographic themes connected to the museums will be put.
In the upper floor a ticket center and a cloakroom service will be placed in the first hall. The other halls will be dedicated to the Byron Museum. From the first stair landing of the flight of steps, you go straight to the main floor through the wide staircase in whose chamber a glass elevator with an above lighting is located.
On the stairwell ceilings we will find a wall decor with the technique of trompe l'oeil in theme with the content of the museum. We will restore the existing parapet of the early twentieth century, just like the whole stairway, by
adapting it to the rules on safety. The existing pavement restoration and the risers and treads of the staircase will be executed.
The main floor will host the Risorgimento Museum, part of the preliminary project whose purpose is to make rooms accessible.
The diagnostic activity has returned the type of building elements and their state of preservation. It allowed the knowledge of the site through the identification of new tracks and morphological sediments, allowing for a more accurate reading of the historical and stylistic characteristics of the building and its events. The diagnostic investigation carried out, have allowed, compared to the final draft, greater precision in the identification of the issues of intervention on the structures, methods and criteria for the treatment and restoration of finishes and the choice of plant systems at the level of general distribution.
The diagnostic technique was effective especially for the plant changes, allowing you to identify pathways that complied with the wall hangings, through the adoption of existing tracks and pits, voids, walls and crawlspaces, many of which are the result of work carried out during the late nineteenth century and the last century. The building also has decorations of particular value but in a degraded mode. In particular, the painted vaults, many of them in serious condition, were first carefully inspected at a close range via mobile scaffolding to assess the conservation status and to prevent further losses of decorations. In some cases there were collapsing plaster or even serious gaps in upheavals and disruption of the paint film. These preliminary operations safety measures have served to curb the degradation into which they poured the decorations and prepare them for future restoration.



It followed a widespread campaign of stratigraphic surveys, which involved the vaults that didn't show decorations and especially the walls of the rooms, which were often covered by layers of wallpaper or paintwork. The essays, aimed at the discovery of the original decorations and coloring, have proved to be largely what was the hidden face of the building, which was manifested in generous layers of decorative testimony to the social and cultural status of the owners and the constructive and decorative vicissitudes of the building. The findings from the surveys provided a rough guideline on the decorative trim of the Palace, which is expected rich and multifaceted and that only a radical uncovering will be able to complete.

A common denominator of many rooms is a white plaster whose surface is smooth and compact. This is probably the finishing coeval to the construction of the building. On top of it, several traces of decorative cycles have been revealed. This testifies the presence of materials and styles belonging to the end of the seventeenth century up to the early twentieth century. Stucco, gilding, wooden frames and probably precious curtains enriched the halls of the Palace. The walls have surfaced, at times, solemn decorations, such as emblems of the Osio family, intriguing gallant scenes or allegorical plants with exquisitely decorative curtains, Herms or flowers belonging to the eighteenth – century taste or calligraphic decorations of a neoclassical taste, all with the common denominator of the extreme elegance.






FOUNDATION AND WALLS

On the foundations of reinforced concrete below the main walls of the oldest buildings magnetometric tests were carried out to identify the internal armor . To verify the consistency of the concrete casting we have used a sclerometer . The walls, which were detected with the endoscope, resulted of various types and genesis.

In the basement a wide excavation was carried out where the foundation suffered of such dissimilarity, we proceeded with the removal of the concrete pavement and we discovered a pavement of terracotta tiles.

The construction of the wing with a porch that separates the two yards, was built with no doubts in the second half of the 19th century, referring to the data collected in the city's registers. The two courtyards are completely separated in the next map made by the City in 1882.

During the surveys on the walls , in the western part of the building two large arches subsequently swabbed are clearly visible from the inside of the rooms. It is therefore possible that the building had an upper floor in connection to the main building.

The foundation of the body to the west has been rebuilt with concrete over the works carried out over 30's by the State Military . This part of the building, is substantially rebuilt in its entirety at that time, as evidenced by the elaborate planimetric found in the archives of the Military Command of Bologna. The boundary wall with the other property is the only thing remaining probably from the Renaissance or the 17th century.

BEARING WALLS AND FLOORS

We could give the same details we briefly described regarding the foundations for bearing walls and floors . Many were, in fact , the interventions occurred over time. The thermographic surveys revealed, under the plaster, several walled gates, some of which will be reviewed and replicated in the project.

From the walls of the basement and ground floors were picked up some samples of brick, on which tensile tests were carried out. In the laboratory it was then analyzed the density, to determine the resistance. Various tests like the sclerometer , were made in the mortar to determine the degree of compression and resistance .

ACTIONS ON STRUCTURES

The interventions aimed at restructuring are varied and widespread. The intervention is based primarily on the need to make an improvement to the structural behavior in relation to possible sismic events. Then we have faced the need to adapt the lift of the floors for future use (the construction of two museums open to the public). Each intervention was compatible with the fulfillment of the original construction techniques and the use of suitable materials . It therefore adhered to the principles of conservation.
The depth of the foundation are first verified by the archaeological surveys. With the technique of Georadar the archaeological risk of the court has been verified in order not to compromise any pre-existing with the construction of underground utilities.

WALLS

On the walls we will proceed with “cuci-scuci” technique in detached parts and couplings with carbon fiber for the clamping of cracks and lesions. The joints are emaciated and will be removed and replaced with similar and homogeneous mortar.

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RECORDING EXPERIENCES AND DATA FOR PRESERVATION AND MAINTENANCE: GIS DATABASE ON COLISEUM (ROME) AND H-BIM IN THE MILITARY SACRARIUM OF FOGLIANO REDIPUGLIA (GORIZIA)

How to maintain ad preserve cultural assets: in this presentation we will focus on preservation and maintenance of assets in cultural heritage with the help of computer technologies through **two case studies**, two concrete and recent experiences.

The first will give us the opportunity of showing the work that has been done for gathering and collecting all data in a GIS - Geographic information system all along the conservation activities in the restoration project and worksite of the Northern and Southern façades of the Coliseum in Rome.

The second case deals with the restoration of the Military Sacrarium, a Memorial that stands in Fogliano Redipuglia in Gorizia in the North East of Italy, where we applied H-BIM Heritage Building Information Model, from the beginning of the project and during all worksite.

I was personally charged - together with my company B5 s.r.l. and our highly specialized technicians - of the coordination of these two projects, and our aim is to show the core of some general and specific topics that we faced in maintaining and preserve cultural assets.

The key point today is – in general - on digital transformation that can play an essential role to help protecting our cultural heritage, in particular, in nowadays context where more and more stakeholders, decision makers and citizen has access to work and culture via computer and internet.

Through technological development, we can truly better protect our cultural assets and prevent sites, monuments, objects, and even intangible heritage from future damages

We can therefore harness the crucial role that cultural heritage plays in fostering social cohesion, promoting a more innovative and creative economy, and contributing to a stronger role for linking people and countries.

These two experiences tell us about two different and similar stories. These two different stories, both on huge stone monuments, could be considered anyway very similar stories in conservation, maintaining, protection and preservation.

The story of the Coliseum in Rome, the famous Roman Amphitheatre, is a "very old story". It started in 75-80 after Christ. During its restoration a GIS Geographical Information System oriented database was used to collect all data. One of the possibilities of implementation of GIS is heritage-oriented, which facilitate the heritage conservation, documentation and communication. We will see how this database not only helps the architectural conservation, but also raise the community awareness of cultural heritage and prompting the development of cultural tourism.

The second experience is an almost contemporary story, or at least a more recent one, the story of the Military Sacrarium in Redipuglia in the North East of Italy. It is a Memorial built at the end of the first half of the twentieth century. Here we applied HBiM which stands for Heritage Building Information Model. Even if two different technological solutions were applied for gathering and collecting data, the stories of these two experiences are very similar because the purposes and the aim are the same: better understanding the cultural assets, in order to do all the best for conservation, make all the efforts for improving their knowledge and try to record all the findings in order to give a strong contribution to maintaining and protecting them in future.

When we first started working on Colosseum, in 2013, we were not able to get any complementary data or information from previous researches or works. It might be unbelievable but information was scarce, not available, fragmented and only related to already published and often research-oriented results. Even the superintendence (the Ministry of Culture charged of the building) was not able to manage with the short history of its old restoration in the fifties or in the sixties. They never recorded information in a useful way, they were not even recording any ordinary maintenance activities, which were commissioned on emergency purposes, neither they got more recent extraordinary activities records.

The only recorded activities were the results on the pilot case study of the first four arches of the northern façade, started in 1999, as a pilot worksite: not the analysis along the process were available, which were may be hided separately by the experts willing to publish

them in future, but only the results were used in order to establish protocols of interventions concerning the way of cleaning travertine and bricks and integrating lacks or removing layers.

For this new project which lasted from 2013 to 2016 we wanted to be different, to share information, gather and collect them, all data, coming from interdisciplinary analysis and investigations, were collected through a GIS construction. We wanted it to be within two modules of definition: a territorial representation form (MRT), and an Architectural / Archaeological representation module (MRA)

The Presentation of the analysis and survey, of the findings along the worksite and of the results at end of the work would have eventually been all collected and ordered in a GIS and in a digital map of the monument. All this information was gathered and updated in progress all along the process.

The restoration project aimed to protect, clean, consolidate and present the monument in the most appropriate both traditional and innovative way. We can therefore say, talking about the "intervention plan" for the restoration of the Flavian Amphitheatre requested by the government and supported by Tod's, that the works consisted in:

1_ The restoration of the northern and southern prospectus (approx. 13,300 sq. mt.) by cleaning them with nebulization of water and local interventions of integration, punctual consolidation, iron passivation

2_The replacement of the locking system of arches with new gates

The survey and the study of the monument was documented stone by stone and element by element, before during and after the worksite, with the contemporary record of all discovered data for preservation and maintenance plans on GIS database giving a final digital map of the monument.

We had the control and monitoring of progressive acquisitions during the analysis and design phase, during construction and plenty of material recorded for dissemination along the worksite and at the end of the works. We were able to update data progressively.

All already known and published historic iconographic sources – from the first images on roman coins till the photograms of Colosseum showed in famous films, were collected and put in a geo referred system, in order not only to have them in an archive, but also to be able to find immediately the direct and immediate correspondence with a specific view of the building. It will always be possible to implement them, with new series or findings.

The Amphitheater itself was considered and analyzed as an architectural, as well as an archaeological, theme of interposition. For the correct knowledge a complete survey and graphic rendering was carried out, with the aim of keeping analytical account carried stone by stone on the walls, identifying - together with the scientific team of technical assistance (detector, photographer, archaeologist, architect, restorer, engineer) - all tracks, and the materials, in terms of architectural / archaeological unit identifiable and therefore intervention units. Each element has been designed on bi-dimensional and tri-dimensional CAD with closed polylines, placed on different "layers": the walls with identification of different textures, the constituent elements of the structure, the traces of arriccio, the portions of plaster, the pictorial film, consolidation fragments, the restoration metallic ele-

ments, distinguishing all materials and structures in relation to the building's history. The principle of "minimum intervention" and the vision of maintenance lead to delicate operations and recovery of deteriorated walls, carefully studied case by case through a balanced use of traditional and modern materials. The historical records are maintained in their full witnesses while, at the same time, they are adequately protected.

Once restoration finished, maintenance and preservation start or can go on. Knowledge was considered the basis for the best transmission of the Flavian Amphitheater to the future: maintenance, repair and - in some cases - improvements, can lighten and localize the causes of the continuous disruptive action of external agents, such as rainwater, smog, weeds, micro-organisms.

The second case is about a modern building, classified as contemporary architecture heritage. The Memorial of Redipuglia is Italy's largest and most majestic memorial dedicated to the soldiers who fell in the Great War, next to Gorizia, in the North West of Italy.

The intervention includes the conservative restoration of the monument, which is considered a cultural heritage monument according to Italian laws.

The project aims to develop a dual synergistic action, aimed at the enhancement and use of the cultural asset, object of the intervention, understood in its broadest sense.

it will be considered, as a result of the planned works, as the best and most effective presentation of the monument and, over time, above all as a form of "maintenance" or, better, "planned conservation", therefore dependent on an adequate and possibly regular availability financial and by careful planning, even seasonal, of the interventions.

All this within a precise organizational and programmatic framework of absolute respect for the complex and delicate nature of the area. The Memorial was opened in 1938 after ten years of construction. It is structured on three levels, symbolising the army descending from the sky, led by its Commander towards the Path of Heroes. On the top, three crosses evoke Mt. Golgotha and the crucifixion of Christ. Each burial niche is surmounted by the wording "Present" and can be reached via the lateral stairs leading to the top.

The first activities involved the survey and the BIM modelling at certain Level of Development (LOD) which must be forecasted before starting

The introduction of the BIM methodology for the planning and for the execution of the restoration works is an innovative choice. The result has translated into a constant search for the best solutions offered by the BIM tools for the translation in it of all that derives from the design of the restoration interventions. The design in BIM has been carried out in accordance with the requirements of the UNI 11337: 2017 standard. The relevance and particularity of the design and the work carried out is that it will be a basis for all future similar activities. In general, the BIM methodology makes it possible to create an interactive, expandable and constantly evolving tool, in step with the progress of the works, useful for the design, management of works and management of the life of the work. This approach essentially involves the creation of a model that is, throughout its use time, "informed" with everything that is detected, designed and executed on the object.

Architectural graphics describe the geometric and architectural consistency of the monu-

ment and the design of architectural interventions, providing in detail the elaboration of specific planned operations.

All historical data, iconography, documents were studied, classified and linked to the 3D model. In full respect of the theory on the BIM methodology maximum efforts have been concentrated - even greater than for a traditional design, given the complexity and wealth of data returned - so that all the subsequent modifications, updates and additions will happen quickly with the real-time update of all the drawings and the elements linked to the model.

This activity involved the survey and the BIM modelling at the following LOD (level of development):

_Executive planning phase: LOD 350;

_Implementation phase: LOD 400;

_Delivery and Testing phase: LOD 500

Restoration is the "methodological moment of the recognition of cultural assets, in its physical consistency and in its dual aesthetic and historical polarity, in view of its transmission to the future". It is important to find the assets, to identify them. It is meant as a commemorative place linked to the original intention transmit specific messages. The intervention aimed at maintaining the material characteristics (signifying) that allow the transmission of the content (meaning). The "historical instance" together with "the aesthetic instance", are expressed in the aim of preserving the substance, facilitating the reading of the values of the Monument, without erasing the traces of time. All the stone, natural and artificial, constitutes the main structure of the Monument and makes more than half of the final image that, in its two-colour, sees in the stone and in the concrete fundamental elements of its language.

The project, moving from the choices made during the design, intends to choose all the solutions and evaluate the execution of the works, detailing the technical indications, quantities and operations required.

The restoration includes many processes but, in quantitative terms, see the cleaning of the three types of surfaces, present in greater quantities, the most extensive works and which constitute a good part of the entire project.

These operations aim, in the first instance, to guarantee the correct preservation of the materials - stone, concrete and bronze - and to restore, in the proper sense of the term, the Monument, that is to restore the correct sequence of visual plans of the architecture that, as previously analysed, are altered because the overall colour balance is altered, which in this case is an important value in the characterization of the work on the aesthetic level.

In order to satisfy the two main requirements for the restoration, cleaning operations have been planned on the materials constituting the Monument.

The concrete paving of the Scalea and the Piazzale is affected, in essence, by all the phenomena and pathologies connected to the action of atmospheric agents and to wear caused by the public. These phenomena have led to a widespread erosive state that, where it is in an advanced state, to become disruption and subsequent formation of gaps, will

involve, as the only possible intervention, the demolition of the damaged paving and the reconstruction of concrete slabs which, as already documented during the definitive planning, they are made up of a single jet, later subdivided with bitumen joints and joints. On the other hand, if the flooring is in a good state of preservation but covered with superficial deposits that alter its colour, we will proceed with the cleaning of the same for which, during the executive design, we proceeded with the execution of a cleaning test at the end to evaluate the cleaning techniques and the degree of intervention to be achieved.

During the executive planning, tests were carried out on the stone surfaces for the evaluation of the main degradation pathologies currently present on the Monument, and consequently, cleaning tests were also carried out to evaluate, and with scientific evidence, the methodologies, the times and the dosage of the techniques and the products for the cleaning of the surfaces. The phenomena found at the area affected by the test are:

Widespread patinas of a prevalently biological type;

_Concretions and deposits of biological nature;

_Surface fissures of the segments;

_Widespread degradation of mortar joints;

_Previous reconstruction works;

_Shortcomings and gaps.

Methodological, organizational and instrumental solutions adopted: In order to be able to carry out all the design and work management activities by adopting the BIM methodology, an information management plan (PGI) was drawn up has regulated and prepared all activities, actors and final products.

An experimental work was carried out to create instances related to BIM restoration in order to inform the model also with the characteristics of the state of conservation of materials, degradation phenomena and restoration interventions. The final model, which can be consulted on several levels, provides an accurate and continuously expandable basis of qualitative and quantitative data on the monument.

09 OCTOBER
RAVENNA

THE ADAPTIVE REUSE PROJECT OF MERCATO COPERTO OF RAVENNA

AUTHOR AND PROMOTER

Anna Claudia Cicognani

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EDILTECNICA GLOBAL SERVICE is a consortium cooperative company operating in the construction industry, with over 60 years of experience in the field of Restoration and Conservative Renewal, in Italy and abroad, a company that aims to have a knowledge and a competence at 360º and, really for this, we have acquired an archaeological section: we think that the immovable property must be known in all its aspects since its foundations.
Our archaeological section carry out preventive archaeology and archaeological excavations, it operates in the field of Archaeology and Cultural Heritage and works at the national level with public and private entities and providing a wide range of services aimed at the design, implementation and promotion of rapid cultural and archaeological heritage, ensuring a final product with a high standard on land and underwater. We have many professional archaeologists, surveyors, historians and restorers specializing in the areas pre-protohistoric, classical and medieval.
The point of strength of our activity is the ability to be a general contractor: knowing the immovable property since its foundations, it is possible to have a total and exhaustive perception of that can happen to it a process that enriches in a more satisfactory way the diagnostic process.

Coverage of the river Padenna of the XV century. Seen by South. We clearly seen as the vault has been used as support for the construction of building and floor structures of following epochs

THE PROJECT

The Mercato Coperto of Ravenna reuse Project, historical and cultural heritage of the city, aims to the functional requalification of the interior of the property, entrusted by Ravenna to Coop Adriatica, in respect of the historical and artistic features of the building.

The new Mercato Coperto will offer to the old town an innovative space dedicated to culinary excellence and culture, a place that can regenerate and recreate the urban city center in respect of the historical structure of the building , an heritage to preserve, appreciate and relive, where the innovative fulcrum of aggregation and identity will be food, chosen among a wide selection of excellent local products.

The intervention project design, signed Arch. Paolo Lucchetta, provides the opening of a new entrance on Via Cavour "which helps to create an urban inside route in continuity with the Mercato" and a distribution of uses on two levels:

on the ground Floor will found place an ice cream / chocolate shop, a Coop supermarket, a place dedicated to the craft beer production, dining facilities, Fresh Market, a Cooplibrary;

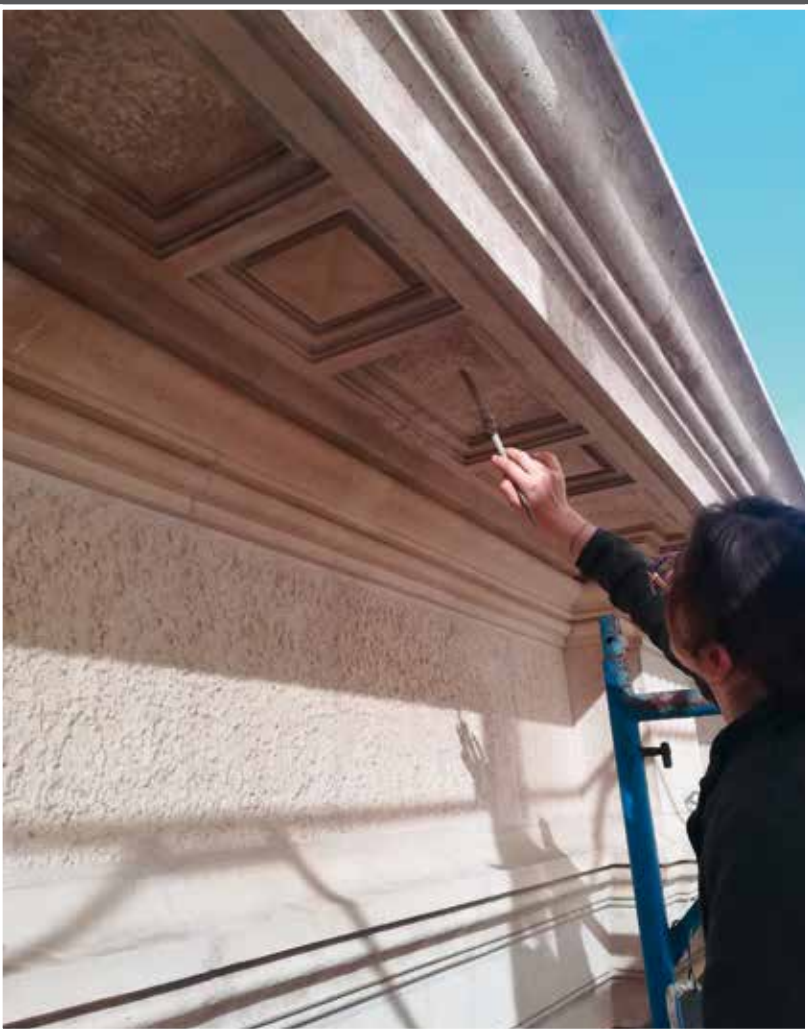
on the first floor will be located space for cultural events and activities, a space cafe/ bookstore, an area for restaurants and a cooking school.

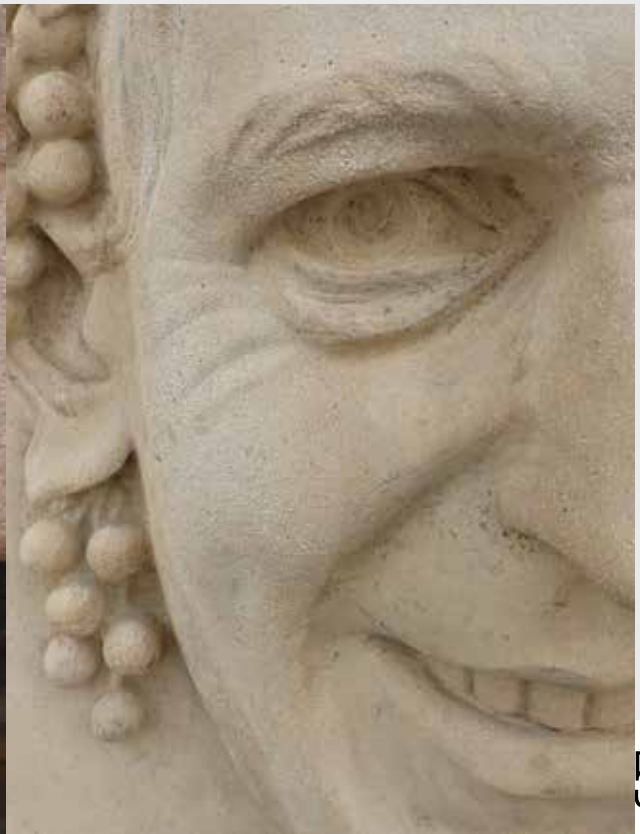
The archaeological survey, was propaedeutic to the final design and the structural intervention; the excavation surveys below the pavement share have unearthed the structural

On the left:
Panning from the top of the excavation yard

On the right:
Brick floor rests recovered in the trench B referable to one of the modern phase precedents to the construction of the Mercato Coperto

remains of buildings demolished at the beginning of the twentieth century to make way to the Mercato Coperto. It is archaeological structures related to a period from the Venetian dominion of the city (XV century) and the first years of the '900.
Extremely interesting is the discovery of large traits of Padenna tombamento coverage, an ancient river of Ravenna of which we have news since Roman times, whose tombatura probably dates from the late fifteenth century to the Venetian era, earlier found in Piazza Andrea Costa concurrently with the work on the project of underground drop Island, executed in 2009 by Hera SpA. The recovered structures were investigated with stratigraphic method under the scientific direction of the Superintendence Archaeology of the Emilia Romagna.
During the worksite the archaeologists identified the chronological phases of frequentation of the area through the analysis of the ground layers, of the masonries, their foundations and of the share. The graphic documentation was held through the photogrammetric method and the restitution of the topographical relief is georeferenced on the interactive digital paper of the province of Ravenna.





09 OCTOBER
RAVENNA

NETWORKING AND TECHNICAL PRESENTATION

14:00 - 14:40	**INSTITUTIONAL OPENING**
09:30 - 10:30	**Moderator** Andrea Griletto – *Technical Director*
	Ruben Sacerdoti *Attractiveness and Internationalization, DG Economy of Knowledge, Labor and Enterprise, Emilia-Romagna Region*
	Giorgina Arlotti *Director of Ferrara Fiere, Salone Internazionale del Restauro*
	Caterina Giovannini *President of APT Europe*
	Annabelle Redcliffe-Tenner *APT International*
14.40-16.20	**TECHNICAL SESSION**
09:30 - 11:30	**Mauro Savoretti** **Michele Pievani** *Nuova Mondialmec*
14.00 - 17:30	**Laura Bartoli** *El.En.*
	Caterina Giovannini *Ibix*
	Rossana Gabrielli *Leonardo*
	Anna Claudia Cicognani *Ediltecnica*
16.30 - 17.30	**COFFEE TIME AND NETWORKING**

MEETING WITH RE U.S.A. ITALIAN COMPANIES

CASTELLO ESTENSE | SALA DEI COMUNI | FERRARA

NUOVA MONDIAL MEC SRL

Nuova Mondial Mec srl is a manufacturer of a wide range of stone processing machines since 1979.

In the early '80s, Nuova Mondial Mec was imposed on the market with its stone floor polishing machines .

At a later stage production was enlarged to include radial and bench cutting machines and stone slab saws, which put it at the top in the world ranking for the manufacture of machines and equipment for the building and natural stone industries.
Today, with a range of over 150 different models, Nuova Mondial Mec is able to meet the most varied needs and applications.
The success is due to that the company is ready to tackle every new challenge, meeting the specific requirements of each customer that can count on a reliable partner.
Nuova Mondial Mec has sold thousands of machines in 40 countries around the world, often working under extreme conditions, and this just confirms the validity of the Company's motto : Reliability, Robustness and Simplicity.
In addition to this, it can boast short lead times and an excellent after sales service, indispensable in emerging countries where there are not many repair shops.

Another reason to buy Nuova Mondial Mec machines is that spare parts are easily found on the market at standard prices.
The entire production is presented on the website at
www.nuovamondialmec.com

Nuova Mondial Mec | Via la pastora, 82 – Cerasolo Ausa di Coriano (RN)
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85
ALLUMINIUM
120
INOX

10 OCTOBER
PADOVA

VILLA GIOVANELLI IN NOVENTA PADOVANA

AUTHOR

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THE CONSERVATIVE RESTORATION OF THE CENTRAL SALON

Villa Giovanelli of Noventa Padovana is the last of the great villas of the Brenta canal, on the route between Venice and Padua. Of great impact for its monumental appearance and its imposing size, its construction dates back to the 17th century, at the behest of Giovanni Paolo and Giovanni Benedetto Giovanelli and designed by Antonio Gaspari, known in the Venetian environment as a pupil and continuator of Baldassarre Longhena.

The date of the construction of the villa dates back to 1668, the year in which the Giovanellis, wealthy Bergamo merchants, ascended to the Venetian aristocracy with the donation of a large sum of money in support of the Republic, economically proved by the wars against the Turks.

The main body has a rectangular plan, of about 45x20 meters, with a tripartite layout with a passing central hall (portego), modeled on the Venetian palace. In height the building develops for about 27 meters. In the central part the building is on two levels, of which the upper one has a double height; in the side wings instead it develops on three levels.

The octagonal avant-corps, with the monumental colonnade and the tympanum, inspired from the classical temple, corresponds for width and height, to the central part of the portego.

The first layout of the villa did not include the monumental staircase, which was added in the early decades of the eighteenth century.

The rich interior decoration party, characterized by stuccoes, frescoes, wall paintings and canvases, was done in the first half of the eighteenth century. The first works consisted on a fresco squares of the hall, entrusted to the Bolognese artist Ferdinando Fochi in the spring of the 1700s, which echo longhenian architectural motifs. This circumstance, which reinforces the unified vision of architecture and its decorative cycle, suggests once again a design direction by Gaspari extended to all the components of the building. The decorations of the hall were completed only in 1747, with episodes of Roman history, by Giuseppe Angeli. At the beginning of the eighteenth century the fine stucco decorations can be as-

cribed, which are certainly among the most valuable works present in the villa. Among the works that adorn the villa, we must remember the four large wall paintings, placed in the two main rooms on the sides of the central hall, by Sebastiano Ricci and Antonio Pellegrini. In the nineteenth century began the decline of the villa, whose history was marked by some changes of ownership and various vicissitudes. The events of the 20th century were rather troubled. During the First World War it was the seat of the command of several armies, while during the Second World War it was occupied by the German command, then by the allied one, therefore it was the seat of the refugees of the bombings of Padua and military hospital of the Red Cross. In 1954 it was bought by the Friars Minor Conventuals of Sant'Antonio, who used it as an orphanage.

THE CONSERVATIVE RESTORATION PROJECT

The restoration project of Villa Giovanelli includes, in addition to the restoration of the external facades and interior decorated surfaces, building, structural and plant works including: consolidation work on the wooden roofing and floor structures, review of the roof covering, restoration of fixtures, structural consolidation of foundations, construction of services and facilities.

The intervention described below, related to the consolidation of the decorated plaster and the re-fitting with chromatic integration of the pictorial films, is part of this complex and wide executive project realized by Ing. Gianni Breda of W.E.I 'N VENICE s.r.l. and by the Arch. Claudio Menichelli.

EXECUTIVE TECHNIQUES FOR THE CONSERVATIVE RESTORATION OF DECORATED PLASTERS

The central hall on the noble floor, characterized by a decorative apparatus of eighteenth-century origin, hosted the conservative restoration intervention on plaster and pictorial films.

The state of conservation of the surfaces was diversified and critical. Following close surveys and surface beating, it was possible to carry out a targeted and descriptive mapping of the various forms of degradation. In particular, various forms of plaster detachment have been detected: of a deep type, both punctual and widespread, of a milder type and limited as they are the subject of previous interventions.

The nature of the deep detachment has been identified in the inconsistency of the layer of material present between masonry and plaster. This condition was found both in the form of "pockets", particularly deep and localized punctual detachments, and widespread. The first case, mainly close to external doors and windows, was treated intervening through shoring and consolidating injections of fluid mortar specific for the re-adhesion of decorated plaster, based on natural limes, selected aggregates and without salts.

As for the widespread detachment of decorated plaster, it was possible to identify some

PROSPETTO EST

areas subject to previous interventions aimed at containing the phenomenon. In particular, a thick mesh of nails had been applied above the interior doors, which now appeared to be oxidized and unstable. In this circumstance, considered risky for the integrity of the surfaces the removal of the nails, a fixing operation was performed by bandaging with Japanese acrylic resin paper diluted in water.

With the remaining surfaces of the hall, affected by widespread phenomena of posting but not subjected to previous consolidation, a specific intervention was developed. Here the possibility of intervening punctually through the traditional injections of mortar was excluded and a system aimed at re-establishing the re-adhesion of the plaster to the masonry support was studied, in collaboration with the Superintendency and Scientific Committee , in order to keep the plasticity of the material unchanged, thus avoiding the differential stiffening of the surfaces.

A process was then carried out consisting in the execution of a strand of basalt fiber strands, in a number equal to three per square meter of surface. Each connector was made with a diameter of 3 mm and inserted inside the walls, for a variable length of 5-7 cm depending on the depth of the detachment identified area by area. Once the hole has been made, cleaned with alcohol diluted in water, the incoherent material surrounding it has been consolidated by applying acrylic resin diluted in water. The strands, cut to size, were then waxed, positioned and “touched in the thickness of the existing plasterboard. Finally we proceeded to fix the connectors with injections of specific fluid mortar, based on natural limes, selected aggregates and free from salts.

The intervention phase was preceded by an off-site sampling, to test the actual tightness of the system and determine the methodological phases of the intervention in detail.
Similarly to the plaster, also the pictorial film showed serious degradation phenomena with non-cohesion and significant loss of material, design and original colors. This refers particularly to the four large paintings with “scenes of Roman history” by Angeli, which adorn the walls of the hall. It was certainly the decorated surfaces affected by the most serious forms of degradation. The technique, currently under study, did not resist the passage of time and the effects of heating with traditional radiators, placed immediately below the paintings.
The intervention to be performed had therefore to restore cohesion to the pictorial film and give a unity of reading to the images.
Preliminary to the formulation of an adequate design hypothesis, the pictorial surface was subjected to laboratory analysis, which identified the presence of calcium stearate, stearic acid salt. This substance, often used on elastomers, could have come from previous interventions aimed at preserving surfaces. The painted surface thus treated now appeared stiff, fragile and severely decayed.
It was therefore decided to intervene, in the first phase, by reducing the rigidity of the pictorial film, and then allowing its subsequent fixing. A thermocautery was first used to reactivate the substance recovered and to soften the pictorial film, later fixed with very low percentage resin and Japanese paper.
Parallel to the problematic of material re-establishment, was studied the theme of chro-

matic integration aimed at reconstituting the unity of the images.
The reconfiguration started with the study of some sketches by Guardi, which depicted scenes very similar to those undergoing intervention. Through the critical analysis of the documentation, the representations were then reconstructed. In this way the chromatic integration, with subdued glazes, was carried out following a trace based on in-depth preliminary studies and samples.

PRELIMINARY ANALYSES AND RESTORATION TESTS

The villa Giovannelli project is a perfect case for describing the preventive analyses process. It presents a precarious state of preservation due to high exposure to the environment and lack of maintenance: presence of widespread coherent deposits and high colonization biological, as well as problems of cracking and loss of materials inherent.
The preventive evaluation of the state of conservation of a cultural asset, through the use of diagnostic techniques both to deepen the knowledge of the construction materials and to identify problems due to the relationship between the building and the environment, constitutes an essential component for the restoration process. In fact, on-site diagnostic techniques are essential during every work phase. The diagnostic process is mainly based on the following steps:
1. Preliminary phase: identification of the morphology of materials and degradation products, detection of environmental conditions, detailed photographic documentation, historic and stratigraphic research;
2. Design phase: identification of the links between the degradation and the environment, definition of the most suitable diagnostic tools based on both the potential of the instrument and the impact on the artwork (destructive/non-destructive analyses);
3. Implementation phase: sampling, identifying the most representative areas;
4. Conservation phase: creating the conditions that allow the work to be preserved for longer through a maintenance plan and periodic controls
The preventive diagnostic investigation, using the IBIX Mobile Lab, was aimed at identifying the most correct cleaning process and calibrating the performance parameters of the selective air micro-abrasion procedure. The Cleaning process is among the most critical and consequently one of the most specialized operations in restoration. It consists in the selective removal of substances present on the surface that can cause both an intrinsic damage to the material and an alteration of the aesthetic aspect, without damaging the surface of the material itself and the its interaction with the environment, the so-called patina.. For this reason, control, selectivity and gradualness in the intervention phase are fundamental aspects. To support the restorer it has been defined a metodologhy that allows, through the diagnostic process, to evaluate the effectiveness of the cleaning process, the interaction between the selective micro-abrasion systems and the IBIX mobile laboratory.
After a first decontamination of the biological patina with the Ibix Biocare Essenzio, an ecological product based on essential oils (Oregano and Thyme), the cleaning samples had been perfomed by means of the IBIX Special Cleaning micro-aeroabrasion syestem. This technicology allows sampling (and later cleaning) through the low-pressure emission of inerts of natural origin with various granulometry with an operating pressure varieable from 0.2 bar, equivalent to a puff, to a maximum of 8 bar.

AUTHOR AND PROMOTER

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TOMBA BRION OF CARLO SCARPA: AN EXPERIMENTAL RESTORATION

THE PILOT PROJECT

The methodological proposal of intervention on the concrete surfaces of the monumental complex of the Tombra Brion, a masterpiece of the Maestro Carlo Scarpa, has planned to work for different degrees of detail. The occasion of the first "pilot" construction phase gave the opportunity to expand the knowledge of the architectural artefact by carrying out an in-depth diagnostic campaign and detailed sampling of the planned interventions.

Analysis was carried out in the preliminary phase, during the working phase and it is expected to continue the campaign of investigations even after the work has been carried out.

Through the constant synergy between the results of the analyses and the consequent choice of the restoration methods, the execution of the planned interventions is taking the form of a careful scientific restoration of the monument, which will guarantee respect for the historical and material characteristics of the work, through the preservation of historical signs and sedimentations.

FROM EXPERIMENTATION TO RESTORATION WORK

The work was mainly structured in three phases, including the following processes:

-Mapping and study of the main morphologies of degradation, with particular attention to biological patina and general continuity solutions;

- Sampling of the main operational phases

- Analysis to monitor the effectiveness of the operations before, during and at the end of the interventions. The sampling carried out aimed to identify the right methodology and suitable products: Clean, progressive, selective and aimed at a good contextual efficiency of the biocide to a delicate cleaning action. The effectiveness was tested with portable analysis tools, such as the mobile lab and the bioluminometer.

THE STATE OF PRESERVATION OF THE MONUMENT

As a first operation a punctual autopsy analysis and a mapping of the conservation status of the surfaces was carried out. Subsequently, comparison samples were conducted, such as verification and comparison with what was detected in the preliminary phase and to define the level of cleaning to be obtained. The surfaces subject to intervention were affected by a widespread biological attack and by a localized upper vegetation.

The colonization of biological patinas, with particular reference to dark coloured lichens and mosses, had found an ideal condition of growth also in the surface roughness of the concrete, which by nature tends to retain water and therefore to be a favourable substrate for the development of microorganisms. Furthermore, the surfaces themselves present local intrinsic asperities linked to the horizontal panelling of the jet, such as air bubbles or

gravel nests, areas where fungal hyphae have found optimal colonization conditions.

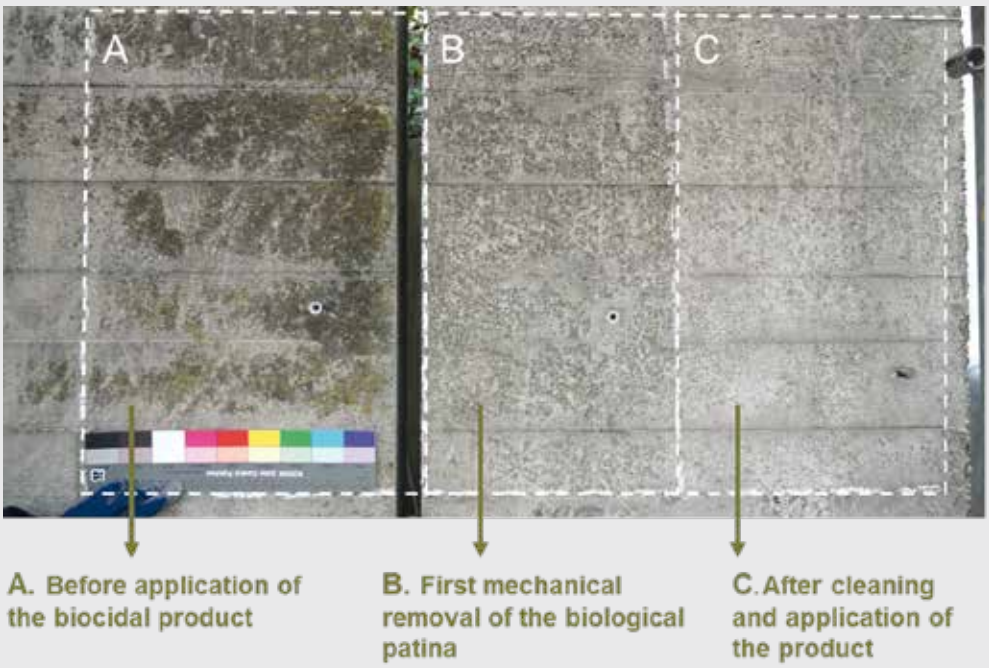
For the operations of repairing injuries, deficiencies or continuity solutions, many samples were made according to the definition of the material and the recipe of a mixture aesthetically and physically similar to the original: Roman Cement.

Targets:

_Respect for the texture of the original surfaces;

_ Respect for the physical-chemical characteristics of the surfaces and their colours to minimize chromatic interference and support solutions with continuity.

The formulation of the mortar is characterized by natural cement (which has a good physical and chromatic compatibility with the medium), aggregates and pozzolan in order to reduce the formation of gypsum as a second reaction in the carbonation phase.







IN COLLABORATION WITH

API INTERNATIONAL

JOIN US AT THE GRAND TOUR RESTAURO 2020!

The grand tour is addressed to foreign operators in cultural heritage, architecture and restoration sectors from USA and Canada. It will focus on strategic worksites in several Italian cities as symbols of the methodologies and techniques in restoration and reuse. During the training days, the participants will have the chance to visit both restoration sites and to attend to special seminars with experts, architects and local institutions.
Assorestauro will organize a full immersion journey in Italy. Its decennial experience will allow to move freely through important worksites, showing their detail and get into the new Italian methodologies and techniques in restoration.
Seminars will be organized in some peculiar site, about specific material and processing, held by speakers as, worksite directors, architects and Superintends
The delegates will travel together with private transportation, supported by the technical staff of Assorestauro.

The heritage of Italy relates on architecture and historical site, but also on the traditional food. The grand tour will follow a culinary route stepping into the traditional restaurant both during lunch and dinner.

FOR MORE INFORMATION WRITE TO
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ASSOCIATION FOR PRESERVATION TECHNOLOGIES EUROPE

1 WHO

The **Association for Preservation Technology International (APT)** is a multidisciplinary organization dedicated to promoting the best technology for maintaining and repairing historic buildings and their grounds.

APT is the only organization dedicated solely to promoting the best technology for conserving historic structures and their settings.

assorestauro®
associazione italiana per il restauro architettonico, artistico, urbano
italian association for architecture, art and urban restoration

Assorestauro - Italian Association for Architectural, Artistic and Urban Restoration - was established in 2005 as the first Italian association of manufacturers of materials, equipment and technology, suppliers of services and specialized companies to represent the sector of restoration and conservation of heritage both in Italy and abroad.

2 WHAT

Assorestauro wishes to promote and be the leader in the inception of **APT's European Chapter**. The main mission is to advance appropriate traditional and new technologies to care for, protect, and promote the longevity of the built environment and to cultivate the exchange of knowledge throughout the European community.

3 AIMS | OBJECTIVES

- To provide a useful **forum** for the promotion of the continued development of preservation technology in Europe
- To contribute to the **research**, **collection** and **publication** of information on all aspects of preservation technology.
- To encourage and participate in the **education** and t**raining** in the **knowledge**, techniques and skills of preservation technology.
- To collaborate with other **European preservation/conservation organizations**.

Foster **collaboration**, joint **activities** and **partnerships** with other European preservation/conservation organizations. Provide **leadership** in consolidating the preservation/conservation community and augment activity.

4 HOW

- To **contact** and **meet** all APT members based in Europe, to promote their entry into the European Chapter, and to **reach** as many practicing professionals, academics, associations and companies as possible that are akin to APT for enrollment in the Chapter.
- **Launch** of the European Chapter, organization of a **meeting** in Milan (Assorestauro's headquarters) to **formalize** the Chapter's inception and to elect a Steering Committee to **finalize** and **endorse** the rules. (**September 16th, 2019**)

LEARN MORE ON WWW.APTEUROPE.ORG

THE EUROPEAN NETWORK

2019 FIRST MEETING

16 SEPTEMBER 2019
MILANO
Open Conference for the launch of the European Chapter in Milano

12-23 NOVEMBER 2019
MIAMI
Presentation of European Chapter during the 2019 annual meeting in Miami

2020
COMING SOON...

MED-ART ISRAEL PROJECT

MEET THE RESTORATION MADE IN ITALY

MED-ART ISRAEL

WHAT?

The project intends to create connection between Italian companies belonging to sectors of architectural restoration, sustainability and energy efficiency with Israeli professionals as Architect, Engineers, Companies and Institutions.

For the last few years, has been registered an always growing demand from Italian companies to turn a greater attention to the Israeli market, which is increasingly moving towards the redevelopment of the existing buildings and the revaluation of the historical ones as an identity trace of local roots.

ITALIAN COMPANIES INVOLVED

FIBRE NET composite engineering
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Kimia PRODOTTI & TECNOLOGIE PER IL RECUPERO EDILIZIO
E.E.C. ELECTRONIC ENGINEERING
IBIX
LARES Diagnostica e conservazione di opere d'arte VENEZIA

ACTIVITIES

GRAND TOUR NOVEMBER 3RD-9TH

The Grand Tour is an itinerary workshop addressed to foreign operators in cultural heritage, architecture and restoration sectors from Israel. It will focus on strategic worksites in Milan, Bologna, Ravenna and Venice as symbols of the Italian methodologies and techniques in restoration and reuse.

During the training days, the participants will have the chance to visit both restoration sites and to attend special seminars with experts, architects and local institutions.

During the visits, the guests could improve their knowledge about restoration and history and meet and discuss directly with local experts and institutions, to begin new economic and cultural relations.

TEL AVIV CONFERENCE DECEMBER 10TH

The 5th International Exhibition of Building Conservation – Habima Theater in Tel Aviv – The theme is "Conservation heritage as a lever for urban renewal".

The Italian companies will take part to it in a collective exhibition, participating to B2B meetings and will present the Italian restoration during a conference.

WHY KNOW US?

We are:

- Manufacturers of materials and technologies
- Designers and service providers
- Specialized companies
- Companies in the sustainability-built sector and energy retrofitting

You can have the opportunity to meet and to begin new collaboration with the Italian restoration companies.

For further information contact Assorestauro at segreteria@assorestauro.org

MEET US AND FOLLOW OUR ACTIVITIES

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italian association for architecture, art and urban restoration

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