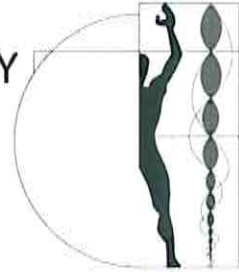


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Not restoration but planned and preventive conservation

Barbara SCALA,¹

⁽¹⁾ DICATAM, University Study, Brescia, Italy.

E-mail Barbara.scala@unibs.it

Abstract

Cultural heritage is exposed to a continuous risk of degradation that may be more or less worsened and accelerated by the environmental conditions in which the property is located. Both technological innovation (new investigation techniques and new materials) and process innovation (new methods of prevention and conservation) may help to reduce or delay the degradation or, at least, the costs of maintenance and restoration. However, the solutions adopted so far in our country seem to be characterized by a poor diffusion of technological and process innovation, according to the aforementioned definitions, and this is due mostly not to a particular lack of knowledge and research in the field, but rather to a limited implementation of conservative quality processes in which these technologies can be applied. The diffusion of technological and process innovation is particularly deficient in the area regarding the historical-architectural and archaeological heritage, which is exposed to a high risk of degradation by external agents. In this context, although the Code of Cultural Heritage and Landscape (Legislative Decree 42/2004, art. 29) has stated the need to spread the conservation planning approach, stressing that the conservative process must be based on "a coordinated, coherent and planned activity of study, prevention, maintenance and restoration", there are still few interventions based on the use of innovative technologies.

Policies are mostly concentrated on large restorations, often dictated by conditions of urgency or communication, and neglect instead investments in continuing care in time of the cultural heritage and in the diffusion of a good practice among the institutions and the owners of the assets. Nevertheless, it should be noted that, at the national level, there are currently some protocols for the diagnosis and monitoring. Furthermore, in restricted areas, some Guidelines for the programmed Conservation have been defined and computer applications have been implemented for the conservation plans of monuments. That being so, the widespread adoption of innovative methods in the context of the planned conservation practice can become a tool for the development of the sector, generating cognitive, conservative and economic benefits for the cultural heritage.

The contribution that we would like to present in this forum regards two cases of study, for which specific methods, experiments and actions have been developed and tested to conduct the policy of heritage conservation, by virtue of the adoption of technological and process innovation, essential elements for the sustainable management of the cultural heritage of our country.

The projects were organized in three stages: Mind, the study of a methodological approach, scientifically verifiable at different levels. Knowledge, understood as appropriation of information across multiple subjects activities made available by various sectors of diagnostics (understood as surveys and investigations to verify the preservation conditions of the heritage and the causes of degradation, and to identify preventive interventions designed to limit risk situations) and as monitoring of the historical research and of the direct investigation (understood as activities of regular and systematic control of the condition of the asset in its context).

Experience, tested on two heterogeneous case of studies which have completed a first fundamental step to ensure their care.

Keywords: Preventive and planned conservation, maintenance building, conservation officer

Principles

After a ten-year debate about the theme of planned preservation, this is the time for assessment. In this context there have been numerous occasions when various actors have shown their interest in historical heritage, funds have been invested and new ideas have emerged in order to develop tools and methods of execution to assess and validate the operations for the preservation of artifacts. Thanks to this new discipline, new work activities have been promoted, while old procedures, which had been abandoned as obsolete, have been rediscovered and long debates about the methods and the practice of the new approach have ensued.

Before describing the results of two highly dissimilar experiences, both of which have the possibility of receiving non-repayable money to be spent on the promotion of planned preservation activities, it would be useful to go over the stages that have led to the definition of this discipline.

When talking about restoration in relation to planned preservation, the first aspect that needs immediate consideration is the ambiguity behind the description of the maintenance activities relating to the architectural heritage. Maintenance is often superficially regarded as the occasion for small, minor restorations. Maintenance was meant to be a care prevention activity but it simultaneously introduced interventions which were not properly executed with respect to preservation. This fact seems all the more serious if we consider the fact that existing buildings care works have used the preservation excuse, seemingly innocently, to avoid bureaucratically long planning procedures.

The lack of planning, even of minor interventions, results in a casual series of actions, which do not correspond to the activation of a "preservation process". This process is characterized by the necessity to include a sequence of distinct consecutive stages (scheduling, planning, execution and management) instead of limiting actions to existing buildings to a restricted time period.

In accordance with what has been affirmed above, without a vision defined as "process-related" it is not possible to ensure that planned and reliable preservation will be achieved.

The cultural trend that needs to be promoted is a life cycle oriented approach, which relies on constant care to suggest positive, ongoing, sustainable practices. The sustainability of this method lies in the smaller impact of single interventions on factories, in less economic commitments in the long run, and in the constant checking of the "health state" of artifacts.

The second principle of "planned preventive Conservation" depends on the awareness that any and all interventions on existing buildings are possible thanks to the multidisciplinary contributions of operators who have realized that it is not possible to go on working independently. Today, more than ever before, every choice relating to historical factories requires assessments that are not limited to architectural conservation only. Today, knowledge is implemented by the support of disciplines such as archiving, history, archeology, use of modern scientific methods (chemical, physical and mechanical investigations), modelling, and monitoring.

The evolution of architectural conservation objectives has gradually turned the restoration site from a place of traditional (knowledge based) learning, into an occasion for innovation. Today, with modern techniques and new tools now available, it is possible to revise material culture, to learn historical building techniques and to discover the materials features and devices that have ensured the durability and sustainability of the factories of the past.

The third key aspect to develop this knowledge is found in the definition of maintenance, that is, the "set of necessary operations to preserve the proper efficiency and functionality of something".

This definition may lead to dangerous and hasty conclusions.

In fact, historical factories are not usually in operation and they rarely reach the level of efficiency. In fact, with the parameters (conventionally used) that are suitable for new buildings, efficiency is rarely achieved and, at any rate, only after restoration. At this point, it seems difficult to carry out maintenance work on a historical artifact because, in most cases, it is not ready for further use.

Here, the definition of maintenance must shift to the definition of planned conservation. Contrary to maintenance, the latter does not imply efficiency, but rather, consists of constant care interventions. The interventions are useful to slow down and keep the process of slow deterioration under control and help avoid any serious degradation of artifacts.

The difference between conservation and maintenance becomes less clear as every maintenance action "acquires the relevance and the awareness that are typical of the conservation project".

However, this process may involve disciplines which, thanks to their pragmatic approach, are not greatly related to the world of restoration. These include management economics, which is particularly useful to gain involvement of local people that take up the proactive roles of promoting activities of development and enhancement.

From this perspective, it is important to recall the key words given as guidelines for the preservation process of existing buildings. They are the conceptual links that support the idea that conservation is not bound to theoretical or abstract logics, but to practical systems that imply constant and regular activity. As far as organization is concerned, constantly proposed virtuous strategies, planning abilities, the high quality of execution and assessment competence can maximize conservation. Meanwhile access, enhancement and

positive economic results allow for money and reinvestment of resources.

The procedural framework is reflected in current regulations, which are intended to preserve material authenticity, to check the deterioration evolution and to adopt interventions that are valid and effective for the existing buildings. In this way, management possibilities may find positive synergies with historic architecture and may guarantee redevelopment.

Last, but not least, is the ability to learn as a natural consequence from constant visits to the property.

According to the role of the different actors involved, there are different levels.

The managers of the property (owners or directors) must become aware that their role is decisive. It mainly consists in "living" the factory, reporting possible faults and identifying experienced consultants and operators.

The management of activity needs to be run according to a shared plan. Therefore, it is important for technicians and operators to use the same language and to share their experiences, which will be at the disposal of visitors to factories.

The projects concerning the Chiesa della Disciplina in Verolanuova and three castles in Valtenesi have been developed following the three suggested steps, namely Mind, Knowledge, Experience.

Mind is the study of a specific methodology that is scientifically verifiable at different levels. Knowledge is the appropriation of information through the wide range of multi-disciplinary activities made available by the various sectors of diagnostics (surveys and inspections to check the conservation conditions of properties and the causes for deterioration and to identify preventive actions in order to limit risk situations), of monitoring (regular and systematic controls of the property conditions in its context), of historical research and of direct survey.

"Experience" tested on two heterogeneous study cases that have completed the first key step to ensure their proper care.

The castles of the Valtenesi

Defensive structures of Valtenesi can be found along the shores of the western part of Garda Lake, and they are close to any town in the surroundings. These castles were built on top of moraine hills; over time, many small villages rose. In some cases, their walls have been demolished, which led to a partial loss of artifacts. "Recetto Castles", so called because inside their walls people settled their houses, never had a military purpose. In case of attack, people just used to shelter in there, but no other defensive action was undertaken. This quite marginal aim is the reason why these castles never caught Venetian governors' attention: just in a small percentage of travel reports of the time can accounts of these ancient buildings be found. The lack of interest provoked that only few documents were written about the topic, the majority of them consisting of singles sentences.

Different ways were to be found in order to study the subject. Specifically, attention was paid to direct analysis of buildings that presented analogies in their constructive phases, shapes, techniques, materials, status of conservation, ownership. In particular, uniqueness of ownership was a fundamental aspect in the project: in fact, walls and towers belong to towns, and towns are the only authority to speak to and interact with.

At the beginning of 2000, local administrations undertook some very expensive restoration works of the castles, and after some 7/8 years, those projects provoked critical damages, because the artifacts were weather-beaten, but not well protected. Unluckily, the economical situation made impossible another expensive intervention, so it was decided to organize a more precise and accurate project. In this case, the main goal was to safeguard an optimal level of preservation of the castles, by adopting innovative technological systems and good maintenance works. In this way, technological devices were supposed to keep their own functionality. The second goal was to optimize and standardize interventions on similar and close buildings, promoting in this way an economy of scale. Lastly, the third goal was to create professionals who, as public employees, guaranteed over time their presence and potential intervention.

During the years spent observing pathologies spotted on the buildings (the inspection began in 2006, even before planning a specific project of conservation), their own evolution could be evaluated, previous inappropriate interventions (such as stucco and tinge works) were registered and reported. Then, as stated in the publication by Regione Lombardia (Lombardy Region) "La conservazione programmata del patrimonio storico architettonico. Linee guida per il piano di manutenzione ed il consuntivo scientifico" (The programmed conservation of historical architectural heritage. Guidelines for maintenance plan and scientific evaluation.), technological devices were named; this operation highlighted how inappropriate the proposed method of cataloguing was, because it couldn't be adopted for single buildings such as city walls and towers. Analyzing the strategy of action prearranged and the one actually adopted, a delay of some operations, such as organizing the construction site, or undertaking other activities previously set as side-works. Especially, a good decision was to postpone some physiochemical analyses in occasion of the availability of structures for sample taking, as positive was also modifying the kind of these structures in order to optimize the catalogue of gathered information.

Similar changes were made in the study of humidity and dynamic action on towers. It was proved that good results about the same goals could be obtained with some equipment already in the building site, and in this way a good deal of money was saved. After the results of the investigation, and after reporting them to authorities, maintenance works proved positive the strategy adopted and announced during the education course held for administration staff and external technicians. Plus, the relatively low cost of scaffolding was another determining factor that stimulated the preservative project, even after obtaining a free grant. Indeed, from a previous research, a main issue was reported to be the excessive cost of scaffolding. On average, the burden of scaffolding reached a bearing of 1/3 or 1/2 of sum total.

Beside these economical considerations, there are also reasons of conservation that lead to consider the scaffolding to have a negative impact. When there are possibilities to set a scaffolding, it needs to hook to the real estate, thus provoking holes on surfaces, even precious ones, and no attention enough is paid to this qualitative aspect by workers: they just proceed in a hasty way. Plus, care for surfaces is left behind also because the choice of grip connectors is made according to specific considerations, and there are no wide possibilities of choice.

Using some lift platforms proved pointless too. In the territory around each castle it is not always possible to come close to their walls with this special kind of instruments, because of the very morphological shape of the ground. Either the platforms have their sides on the slopes, or there is a moat between the walls and the zone accessible to vehicles. The entry arcs of strongholds and of ravelins are an obstacle too to entering the site with lift machines, because usually these structures are very short and narrow. Even trees and woods grown around the walls can be an impediment. Final basket rotations and their limited extent make very difficult to get closer to the walls covered in branches. Moreover, even though rental charges are relatively low, also the "dead" time need to be taken into the account when evaluating rental days: it is the time required to climb up and down the machines.

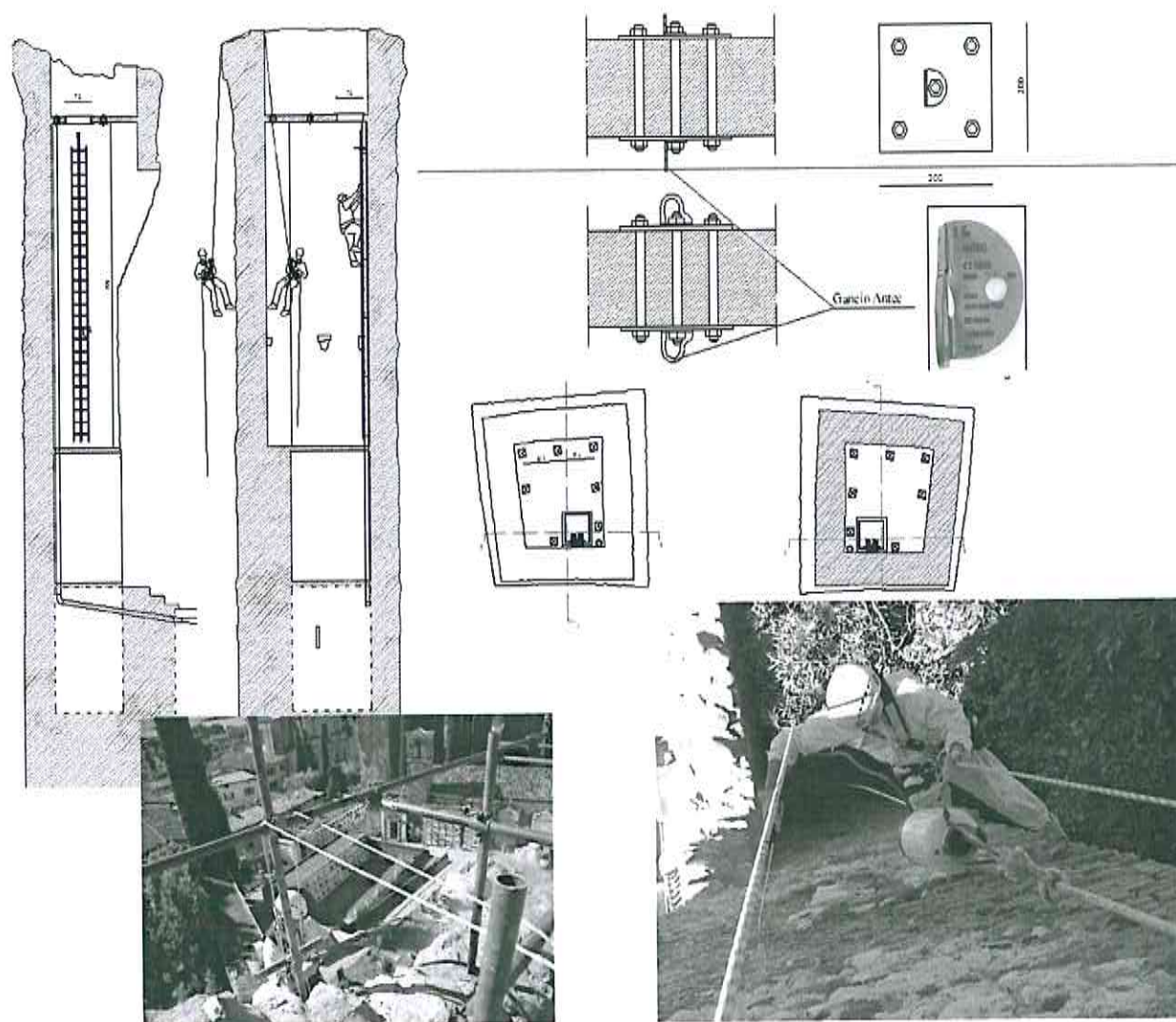


Fig. 1: Castle of San Felice del Benaco

In other cases, finally, also the architecture itself of the building can be an obstacle to observation through these platforms, as it happens for the towers: in order to be viewed from any perspective, it is necessary to figure out at least two accessible areas where to place the lift machine to go full circle around the towers.

Of course, these castles were built in order to defend and protect those within their walls, so it is quite natural that some obstacle comes up even nowadays, when it comes to "attacking" them.

What follows from these observations is that an intervention on an historical building can be undertaken just as long as the sum total of operations of restoration is determined in a limited percentage by the fixed cost of rental charges.

If the cost of operation on an artifact is moderate, not only can the project be set, but no discussion about the topic is even required. The added value to the restoration of the castles lays in carrying out the works just without any scaffolding: hooks were secured within the walls, so that the workers, licensed OG2 and for activities on rope, could fasten and climb down the ramparts and easily reach any surface to treat. Of course, the places where to set the hooks were studied on purpose, in order not only to be of help for workers, but also to facilitate some structural requirements. For example, when it came to set an anti-seismic metallic protection all around the wooden attics or on topping of towers, some eye-bolds (golfari) were used with a double purpose: securing the insert and sustaining the workers.

The idea not to use scaffolding on the towers highlighted a major problem. During the public tender it was noticed that double-licensed companies are very rare. Workers with a license for rope-working are not capable of dealing smoothly with cultural goods, because they're just used to activities on rocky surfaces. Promoting this kind of activity among restorers might prove a good lever for a growing occupation.



Fig. 2: Castle of Manerba del Garda

The particular project adopted for Valtenesi castles proved very positive, especially because of the spreading awareness about the tools and strategies used. In these kind of operation it is not possible to envisage a spot operation, which is by definition occasional and random. It is impossible to foresee how and where the vegetation will grow, because it is determined by the weather.

The highness of the castles and their unbreachability inspired an "assault" through ropes, displaying an economy that is likely to guarantee a long-lasting care of the buildings, if well administered. The construction

site for the "programmed maintenance" assumes the shapes of a "day-hospital", and it carries out focused intervention, done with specific timing and moderate costs. With the data gathered, a "medical record" was filled out, in order to allow a comparison between planning and operational experiences. Wish is that these data can be of renewed interest and help in following operations.



Fig. 3: Castle of San Felice del Benaco

The church of the Disciplina di Santa Croce in Verolanuova

The church of the Disciplina in Verolanuova is a complex and articulated monument that differs in many historical, archaeological and social aspects that have stimulated interest and solicited knowledge. The present church of the Disciplina di Santa Croce was the parish of San Lorenzo in Verolanuova, before the new basilica was built in 1633 in an adjacent area. After being given the title of parish the church was assigned to the Disciplini who promoted a campaign of structural changes that met the needs of the congregation. Since that time, various events have produced constructive and decorative changes, up to the current architectural conformation. In the last century, there has been less focus on the antique church, so much so that the original vivacity is replaced by a period of inactivity that culminates with the collapse of a portion of an external wall that supports the embankment adjacent to the church in 1930. This shows the precarious state in which some parts of the building were found. There was a long period until relatively recently (80's and 90's of the '900) when necessary restorations were made to guarantee the stability of the church. The works required a considerable investment but unfortunately it did not start the virtuous circuit necessary for the conservation of the temple and it was closed to the public again. Interest for cultural patrimony reflects the values in which the local society sees itself.

The forced closure of the church of the Disciplina, used as a storage place, as well as representing a general inattention provided occasions for wrong doers to damage and loot items of furnishings and works of art. Time, on the other hand, had proceeded to deteriorate the architecture that had completely lacked maintenance for years.

Only in more recent years (2007) following some site inspections, a series of virtuous interventions were undertaken to clean the inside, to catalogue goods that were still conserved and to periodically open the church, thanks to the availability of volunteers. As a result of a fortunate situation, the Cariplo Foundation promoted a competition, within the cultural sector with the purpose of "spreading innovative technology for the programed conservation of historical architectural patrimony". The objective of using the cultural heritage as a driving force for the economic and social development of the territory, provided the occasion to start a profitable campaign to promote knowledge about the historical building for its architectural restoration and functional recovery.

A cultural responsibility for maintenance, individuation and transfer of good practice for programmed conservation, diffusion of new methodologies and diagnostic technology represent only a few of the key elements of the presented project that while aimed at the church of Disciplina, can be extended, from a methodological and organisational point of view, to many other artistic heritage around the territory.

Knowledge, prevention, inspection, organization of interventions, dealt with through the collaboration and synergy of various professionals, have substituted the idea of restoration as a way of bringing back the original aspect (renovation) and without further changes, to promote the concept of conservation seen as an evolution open to the relationship between man and built heritage. The result of these principles, a testimony of the proposal and project outcome, is the richness of the contributions that offered, overall, a complete evaluation of the church of the Disciplini, the transformation process that had an effect on it, and the degradation phenomena that regard it.

The first part of the program concentrated on the historical background where it originated and the transformation of the temple. In this case, the archival documents that were examined in the "Notarile Brescia" fund were vast and ample. They were found at the State Archive during the "Pastoral visits" and conserved at the episcopal archive, in the hospital archive in Verolanuova and in the parish archive. The research shows how the visiting sub-delegate of Borromeo, considered the church as the private chapel of the Gambara palace, which was an important artistic commission in the Verolanuova territory and in general in the province of Brescia.

The cognitive methodological approach then led to planning the interventions directly after examining its architectural, material and structural characteristics. The architectural research done during the tests to verify the state of conservation of the foundation exploited seven test excavations to provide useful answers correlated to the archeological literature. This helped to understand the long history of this church that underwent continuous and irreversible transformations that were often barely visible but evidenced by the stratigraphic research on the coatings and the pictorial finishes. The occasion permitted to highlight the still present evidence regarding the decorations of the renaissance period that showed various conditions of conservation that were them in good condition in some areas, while in others, the paintings, if not torn showed very bad conservation conditions.

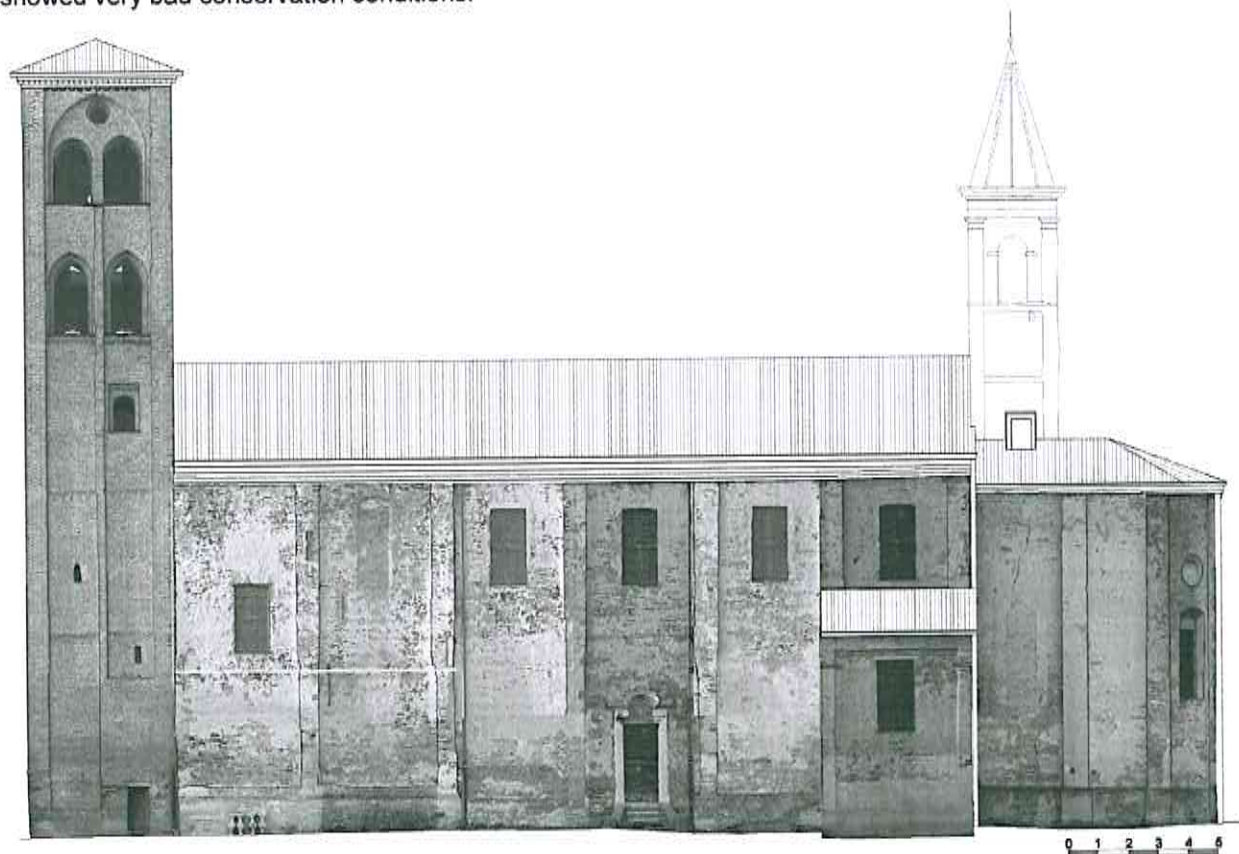


Fig. 4: Church of the Disciplina Santa Croce: prospectus

The direct reading of the building finished with the study of the vault in "cameracanna" that was built for the arrival of the Disciplini in the church. This constructional method was very diffused in churches and buildings

not only in the geographic area considered but also in other regions. It was an answer to the need or want to hide the existing coverage to radically change its aspect or the function it had in its setting also as a result of a change in style. The vaults made in "cantinelle" were lighter and faster to build with respect to those in masonry and more economical using construction technics that were still poorly understood. This revealed a series of critical situations regarding conservation that derived from the materials as well as from the solutions that were developed.

The last part of the program, finally, addressed a series of investigations that focused on a more accurate assessment of the problems of the building. The wide range of research done on the inside of the church prompts reflection: The acquisition of preliminary knowledge for conservation interventions, shared at most levels, in order to be effective, must be guided and governed inside a global frame that collects and organizes information from research that traces mutual connections and generates new relationships.

The valid choice of an analysis program and not less importantly, the correct management, interpretation, and use of results, constitute a guarantee and a quality base for the conservation project. In this respect, the first part of the test used the cognitive possibilities given by the thermography. The environmental situation on the inside of the church was verified including the reaction on the surface of the paintings that were subjected to various solicitations, in particular to fluorescence UV and to infrared riflettology. Small samples of material were used to recover samples of mortar for physical-chemical analysis. The characterization campaign was mainly addressed to the enticement mortar of the perimetral walls in order to have information to relate to the historic data in possession.

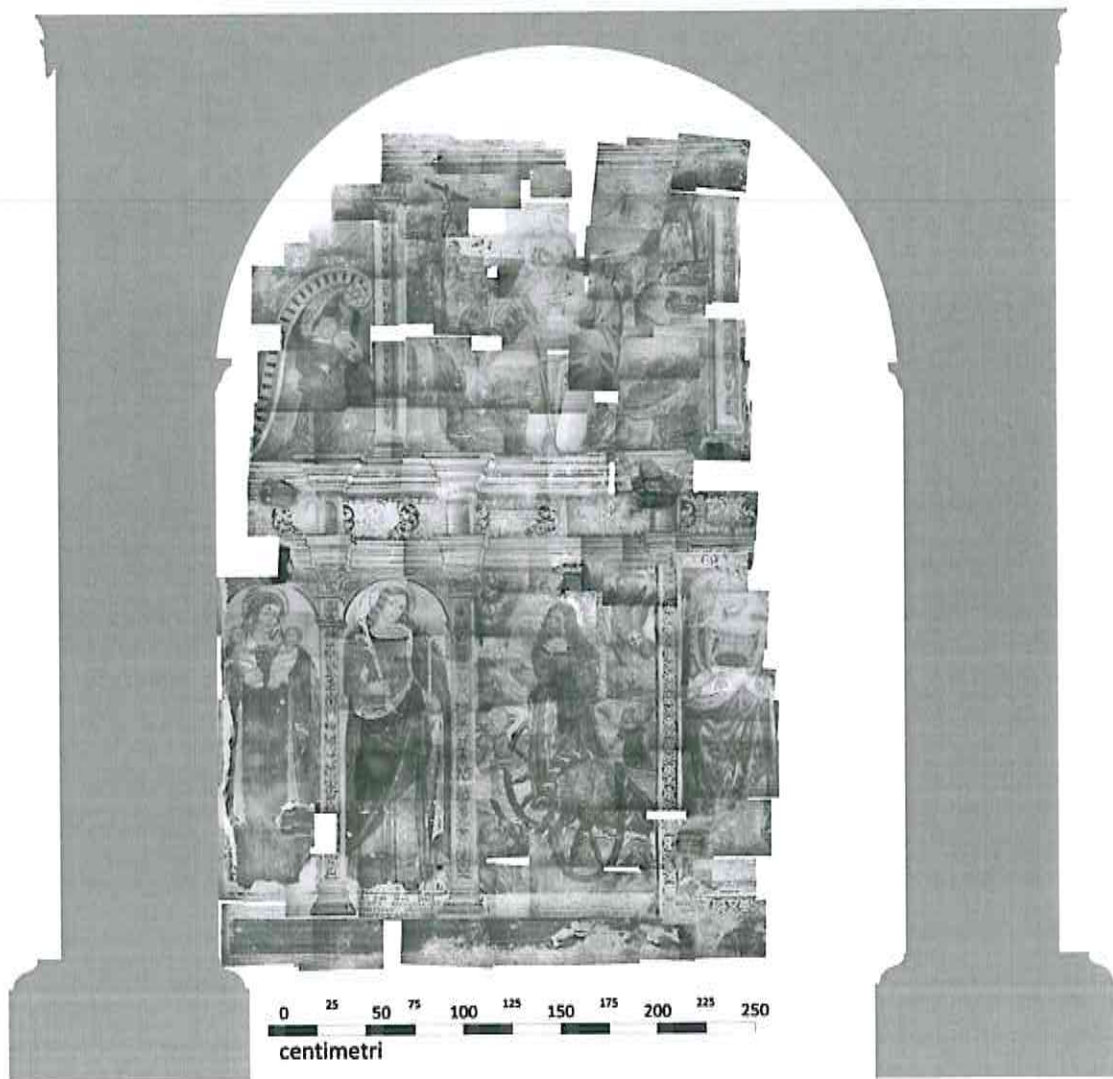


Fig. 5: Church of the Disciplina Santa Croce: photomontage of the painting hidden by a curtain

A different topic regarded the studies aimed at an in -depth analysis of the geomorphologic situation in the area and of the structure with the objective of offering a complete image of the subsoil and to obtain numerical and physical data to use in a consolidation project for anti-seismic purposes. An accurate analysis done by coring in depth was integrated with the collected data from the georadar directed in specific areas where construction elements that were not visible could be present. The process ended with the mechanical characterization and the prevision of the seismic behavior of the walls.

Conclusion

The two cases under analysis clearly show that the two operating paths pursued greatly differ each other. None of them exhibits higher quality with respect to the other, having the architectures traced the most suitable path depending on building features, typology and materials and having the usage triggered substantial transformation processes in some cases.

The different paths share the same objective, that is to identify the most suitable restoration work for the factory and to create a "medical record" or "identity card" transmissible to the personnel in charge of the property. In the first case the preliminary investigation process was more limited. The majority of the information have become visible only at the beginning of project. At the same stage some preliminary assumptions have been ascertained. It has been perceived that the standard cataloguing procedure applied to technological elements of the factory was both redundant and unable to clarify specific issues. Of primary importance has revealed the management of the building site, being conscious that within the military architecture an enclosure wall or a tower have played an important a role.

The second case depicts a more traditional investigation process suitable for a wider typology of buildings. Professionals with different background have kept in touch with the aim of sharing opinions about problems and expectations.

The valuable expertise in hand has demonstrated that the conservation intervention plan is prone to the understanding of the available expertise itself and, like a doctor, leads the therapy of the patient.

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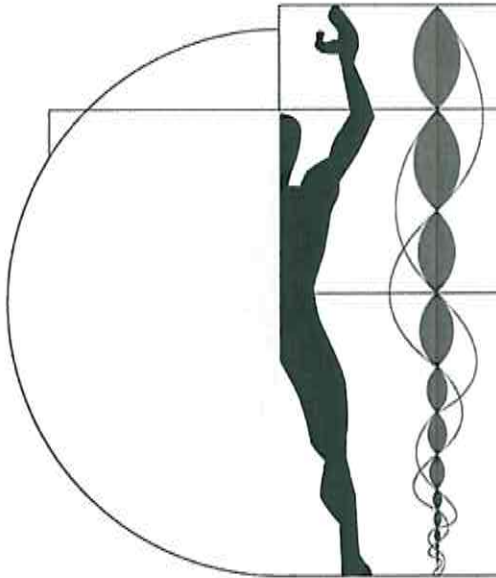
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Kutgun Eyupgiller

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Luciana Mainolfi

Administrative responsible for the management
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Alessandro Ciambrone

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Luigi Corniello, Giuseppe Giannini (logo)

Graphics and Layout

Giuseppe Klain

Web master

Pasquale Argenziano, Alessandra Avella, Nicola Pisacane

Peer review

Scholars has been invited to submit researches on theoretical and methodological aspects related to Heritage and Technology, and show real applications and experiences carried out on this themes.

Based on blind peer review, abstracts has been accepted, conditionally accepted, or rejected.

Authors of accepted and conditionally accepted papers has been invited to submit full papers. These has been again peer-reviewed and selected for the oral session and publication, or only for the publication in the conference proceedings.

Conference report

357 abstracts received from:

Albania, Argentina, Australia, Benin, Brazil, Bulgaria, Canada, Croatia, Egypt, France, Greece, Iraq, Israel, Italy, Japan, Latvia, Malta, Mexico, Norway, Poland, Portugal, P.R. China, Russia, Slovakia, Spain, Turkey, United Kingdom, USA.

More than 500 authors involved.

291 papers published.

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