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THE RESTORATION PROJECT OF THE ROYAL SITE OF SAN LEUCIO IN THE 20^{TH} – CENTURY DEBATE ON THE ETHICS OF CONSOLIDATION

Abstract. The 20th century has seen the birth of the debate about the consolidation of cultural heritage and the use of different materials and techniques on those structures. The paper describes the Italian different schools of thought in those years using as an example the case of the restoration project of the Royal site of San Leucio. The debate focused on how to approach damaged masonry structures through consolidation and the correct technique.

Keywords: Real Sites; Restauration; Consolidation; Circolare Ballardini.

In 1997 the Royal Site of San Leucio (Fig. 1), a unique case in Italy of a production complex within a royal residence, was recognized together with the Royal Palace of Caserta and the Carolino Aqueduct UNESCO heritage. The extensive historiography on the Royal Site of San Leucio has highlighted the importance of several aspects such as (i) the construction of a place for the sloth and hunts of Borbone sovereign, firstly Carlo di Borbone and then Ferdinando IV; (ii) the "industrial" primates linked to the silk factory; (iii) the socialist utopia of the city-factory and the happy island of the Ferdinand statutes.

In the extended literature, few are gaps about the Royal Site of San Leucio, like the recent restoration of the factory whose survey and design plans and reports are kept in the archive of the Caserta superintendence.

The restoration of the San Leucio's complex differently from other Royal site interventions was the result of an in-depth cultural discussion that started in the early seventies and lasted many years.

The restoration of the Royal Site of San Leucio has its roots in the cultural panorama of the Eighties when experts, theorists, and some superintendents began a profound and articulated reflection on the cultural objectives of the restoration until then directed to put first the figurative message and the perception of the external image of the factories and their decorative apparatus concerning the structure and the material.

The restoration in Italy and, particularly in Campania, was strongly influenced by the recovery and consolidation interventions following the earthquake of 23 November 1980. As matter of fact the violent earthquake, which devastated the area of the Campania-Lucan Apennines, and Law 219/81 for the reconstruction, led to emptied buildings; the frame of the buildings completely replaced; masonry structures ruined with concrete; masonry elements replaced by steel bars immersed in resins or other types of binders, reinforced concrete beams and pillars inserted in masonry structures.

After the seismic event, the whole country goes through a very long season in which the anti-seismic logic corresponds with the logic of reinforced concrete, according to which the intervention on a masonry building realized with pre-modern techniques, is more effective if the structure is similar to a reinforced concrete frame.

In the early 1980s, the rules for seismic retrofitting were applied indiscriminately to every type of building including monuments, regardless that generalized application was not compatible with the principles of monumental conservation, would have opened the doors to restoration interventions, where the excessive use of iron or reinforced concrete would have prevailed on the same monument, altering it irreparably.



Figure 1. Plan and front elevation of the Belvedere of San Leucio

The volume "Restauro e cemento in architettura" [1], edited by Giovanni Carbonara provides, with the enthusiasm quite widespread in that period for the potential of concrete, an extended panorama of restoration techniques based on the use of reinforced concrete with the illustration of 95 interventions described analytically and through black and white photos of work on site. Another 300 short sheets summarize as many restoration interventions carried out in Italy with the material in question.

The second volume [2], a few years later, continues the work by updating the repertoire of interventions with another 28 analytical files, however, unlike the previous one, it has dealt with the question of the use of reinforced concrete in restoration interventions from a theoretical point of view, reporting texts on the subject by various authors with very different cultural settings.

Among these is the paper by Antonino Giuffrè, "Pietà per i monumenti" [3, 120–122] a warning signal for all the measures done on monuments without understanding their original language and statics. According to Giuffrè "the statics of the monuments are as sacred as the colors of the Cenacle and restoring them requires the religious respect of those who have the History as their interlocutor" [4]. The relationship between the restoration and the seismic vulnerability of the architectural heritage was a crucial aspect for Giuffrè [5], demonstrating that historical structural types if properly built are capable to stand when an earthquake occurs. The author also highlights the similarity between the reach for ancient construction to the requirements of a proper building to the stability assessments for a modern building.

While Mastrodicasa, had analyzed the correlation between damage and type of instability, Giuffrè on the other hand identified the correlations between earthquake, type of construction, and collapse mechanism, assuming that the construction methods of masonry buildings, despite being characterized by a very high number of variants, present an organizational constant due to a "recognizable matrix that reveals the simple and at the same time repetitive and generalizable logic" deriving from a uniform way of living [6].

Giuffrè [8] affirms that "earthquakes do not disintegrate the structures in a disordered way but select the structural parts and the weakest technological solutions. In other words, only the weakest part of the building yields to the earthquake, without dragging the adjacent portions with it".

Together with Giuffrè, Edoardo Benvenuto, Alfredo Cosanego, Salvatore Di Pasquale, Luigia Binda, Romeo Ballardini also work to recognize the centuries-old durability of ancient materials and techniques. They also work to resume studies on ancient mastery.

A phase of profound reflection on the culture of conservation begins with the use of slight and less invasive technologies than reinforced concrete that had shown their effectiveness over the centuries. This way of thinking was confirmed by the availability of manuals of local construction techniques, revealing elementary methods of seismic prevention long-forgotten by university programs.

The discussion of the relationship between built heritage and seismic vulnerability already began in the fifteenth century (G. Manetti, De Terraemotu,

1457), and finds in the eighteenth-century text by Giovanni Vivenzio, "Istoria e Teoria de' tremuoti" [8], a complete examination of the problem. In the 19th century Giuseppe Valadier, an architect sent to Romagna to repair the damaged buildings following the earthquake of 1786 and one of the major protagonists of the restorations promoted by Pio VII on monuments of the classical age, wrote several pages on intervention on buildings, how to build properly and the ancient teachings in his book "L'architettura pratica" [9]. Sections XX and XXI of the fourth volume are dedicated to the analysis of the deterioration of structures and the repair interventions. The former, entitled "Della maniera di osservare le lesioni negli edifizi, e metodo per rilevarne le cause, e delle cautele per le riparazioni", highlights the importance of observation in the process of knowledge of the monument and understanding of the damage. The latter, "Del modo di risarcire gli edifizj danneggiati dalla cessione dei fondamenti, e del metodo di accavallare, e puntellare l'edifizio durante la riparazione" examines the interventions to be implemented in such a way as "not to do greater damage to the factory by using of means that do not suit the circumstances" (Valadier 1828–1839). However, the fundamental text in the description of seismic events remains the text by Mario Baratta of 1901 "I terremoti d'Italia" [10].

The cultural change takes place starting from academic research, aimed at providing a theoretical foundation for the restoration and consolidation of the structural analyzes of framed structures.

In the general report presented at the third session of the 1st National Congress of ASS.I.R.C.CO in 1981, Roberto Di Stefano argues that "in the group of operations named "Restoration of monuments", aimed at the conservation of the monument, the consolidation is one of the fundamental. Therefore, the consolidation is a part of the restoration and not something different or even an alternative".

In 1986, the great debate on the conservation of architectural heritage in seismic areas has as protagonist the Ministry for Cultural and Environmental Heritage, through the establishment of the National Committee for the Protection of Cultural Heritage from Seismic Risk, coordinated by Romeo Ballardini.

Ballardini, who is one of the signatories of the 1985 project for the recovery of the Belvedere di San Leucio, as a professor of restoration and member of the Higher Council of Cultural Heritage, is called to chair the Committee, established in 1984 by Decree of 7 August 1984 of the Minister for Cultural Heritage and Activities in agreement with the Minister of the Interior and the Coordination of Civil Protection.

The Commission, known precisely by the name of Ballardini, gathers around single table technicians and researchers with heterogeneous skills, coming from different disciplinary areas such as Carlo Gavarini, Salvatore D'Agostino, Carlo Viggiani, Petrini, Frallone, Braga, Corsangelo, Gaetano Miarelli Mariani, Francesco Doglioni, Eugenio Coccia, Di Geso, Paolo Marconi and the representatives of the ministries concerned.

The Ballardini Circular is considered to be the first document capable of demonstrating the need to combine conservation activities and safety requirements for historical structures.

Born from the analysis of the state of the art also conducted through contacts with various Superintendencies, the document opens with a critical introduction towards the interventions carried out in the seismic area, which "alter the monument from its identity and value point of view" with "completely illusory security guarantees" placed at the base of the structural interventions that "try to remodel the ancient factories according to the resistant patterns typical of modern materials".

The Recommendations for interventions on monumental heritage with a specialized typology in the seismic area, drawn up by the Committee chaired by Ballardini, represent the achievement of a new cultural attitude that puts a stop to invasive interventions and gives priority to repairing interventions, rather than unjustified replacements, to be implemented with traditional and compatible techniques, as the Charters had already pointed out.

Thus, while most of the restoration and consolidation interventions carried out after the earthquake of 23 November 1980 are carried out using the seismic adjustment criterion, the restoration project for the Real Site of San Leucio is strongly influenced by the in-depth studies conducted by the designer as coordinator of the National Committee for the Protection of Cultural Heritage from Seismic Risk. The influence although it will not be able to exclude the use of concrete from the restoration site, will result in the reuse of the recoverable material (roof tiles and channels, peeled beams of wooden floors, etc.) with the differentiation of the integrated elements from the original ones.

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