

**ARCHITECTURAL, ARCHAEOLOGIC AND ENVIRONMENTAL RESTORATION  
PLANNING METHODOLOGY: HISTORIC RESEARCHES AND TECHNIQUES OF SURVEY  
AIMING TO CONSERVATION**

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**ABSTRACT**

In the modern culture of conservation, the historic authenticity of cultural property arises as a priority value, asserting that restoration is never based on aleatory hypothesis.

Being understood that for each monument and site to restore we have to realize a specific and singular study from which a peculiar planning solution can spring, it is moreover possible to identify a research process for the restoration based on three essential moments:

- a) the “connotation”, allowing us to know the object with the necessary critical comprehension;
- b) the “diagnosis”, where we effect the reading and the recognizing of the state of decay and we identify all the available means to guarantee the physical conservation of the work;
- c) the definition of the “ plan”, through which the utilization of the monument is realized, for the aims proposed and within the bounds allowed by the integrated conservation.

Therefore, before operating any intervention, the restorer must reach the deep and complete knowledge of the cultural property, through a deepened bibliographic and archival research, the gathering of the detailed iconographic documentation even through prints, drawings, ancient photographs, with the double aim to documentate, on one side, the existing situation before the restoration, and on the other side, to control the exactness of the survey we are realizing, in order to supply with documentary evidence, not only the history of construction, but also all the existing deformations and anomalies, the analysis of the decay, the evaluation of damages, the analysis of the fissuring panel, the knowledge of which is necessary to fully understand the stability conditions.

From here the exigency of achieving the physical knowledge of the restoration objects, through a high quality level survey, not leading to the representation of a generic, approximate or conjectural shape, but giving instead the «effective shape» that is to say «perfectly objective, total, with all its irregularities, wanted or not, relevant or not, having an aesthetic, technical or historical interest» (Hans Foramitti).

In this context, the *dialogue* between coordinators of training in architectural conservation of cultural property and technicians of the representation becomes indispensable and may give relevant results only if the specialists of the conservation and the restorers try to approach the new possibilities offered by the developments of the constantly evolutive technique and have a good knowledge of the basic techniques of survey, to utilize in the phase of the deepening of the knowledge of monuments and sites and if, meanwhile, the specialists of survey know the themes of the conservation and are conscious that restoration - the technical tool for the achievement of the conservation as an aim - is based on the historical and critical, technical and material comprehension of the cultural property, given certainly not by the summation of the contributions of each discipline, but by their integration and by their reciprocal and mutual verification.

In the modern culture of conservation, the historic authenticity of cultural property arises as a priority value, asserting that restoration is never based on aleatory hypothesis.

What is to be conserved in its material integrity is therefore the original authenticity, although respecting the successive contributions to history.

Roberto Di Stefano has pointed out in many occasions the authenticity of the values the monument brings, stating that restoration never has to destroy the ancient and original authenticity by replacing it with a new historic reality, but has to characterize itself as a historic event.

«We have therefore to critically define which is, in an object (monument), the value we think could offer the greatest utility to the man observing it, or better, the greatest utility to the majority of men observing it; a majority variable along the historic moments and through the cultures of the different Countries» (1).

During last years, the debate on authenticity has been more and more investigated and enriched with elements leading us to consider in conservation all the aspects of the collective memory of mankind in the awareness that the diversity of cultures and cultural heritage constitutes an irreplaceable richness for the

whole mankind.

But, what is restoration?

In a work (2) recently published in Italy based on an idea of Paolo Torsello, relating the positions of some historic “masters” too, nine experts were confronted with the definition of architectural restoration and with the actually basic principles of the discipline, first considering that among the numerous protagonists of restoration, only E. E. Viollet – Le – Duc and C. Brandi have given a definition of it, while the majority of the authoritative scholars (as G. Giovannoni, R. Bonelli, R. Pane, C. Boito, A. Riegl), even providing relevant contributions to the theoretic organization of the matter, never have given a final enunciation of it.

The confrontation between the different points of view of the discipline analyzing the connotation of what (the object), how (the modalities) and why (the aims), emphasize the vision of a restoration considered more than ever beginning from conservation and getting on well in measuring itself with scientific knowledge and technological practices; this vision is certainly far from the definition of Viollet – Le – Duc : «To restore a building is certainly not to maintain, to repair or to reconstruct it [...] but to bring it

again to a condition of completeness which could never have existed at a given time».

We can, therefore, say that the restoration meant as an intervention directed to protect and to transmit integrally to the future the historic and artistic, architectural and environmental property by conserving its values, remains a rigorously scientific, philologically founded activity, aiming to the conservation and valorization of the cultural property in the modern conception. In this restoration, the operations having a strictly conservative characteristic, aiming to prevent and to control the decay of materials are pre-eminent. Particularly, the architectural restoration, has to be considered as the discipline availing itself of a historical and critical basis, together with the added contributions of the techniques of analysis, survey and graphic representation, besides the diagnostic techniques more properly constructive (of the static consolidation) and the physical and chemical sciences techniques for the renewal of the decayed materials. It strives for the conservation of such a heritage through adequate and respectful technical processes, but, most of all, through awarding functions compatible with the vocations of the building and the consequent satisfaction of the social and economic reasons in the framework of the integrated conservation.

Beginning from the international Venice Charter of 1964, the evolution of the culture of conservation and restoration has led to assert, among other things, the importance of adopting with severity and objectivity, the logic and scientific method which has to supply the real knowledge of the cultural property, starting from the analysis of all its aspects: from the geometric shape to the peculiarity of its architectural characteristics, from the characteristics of materials to the structural consistency.

The research for the acquisition of such a knowledge doesn't end with the analytic and planning phase, but goes on unceasingly even during the execution of restoration.

In 1837 Prosper Merimée underlined (3) the relevant contribution given by E. E. Viollet – Le – Duc, suggesting that his name should be more connected with the birth of the methodology and practice of architectural restoration, than with that of the “stylistic restoration”. Through the writings of the french restorer, we can really observe, that the method of restoration is clearly traced and applied; it will be more and more consolidating and improving during the following century and till nowadays.

As everybody knows, each restoration represents a new problem, the solution of which must spring from a deep knowledge of the object and from the direct confrontation with the monument.

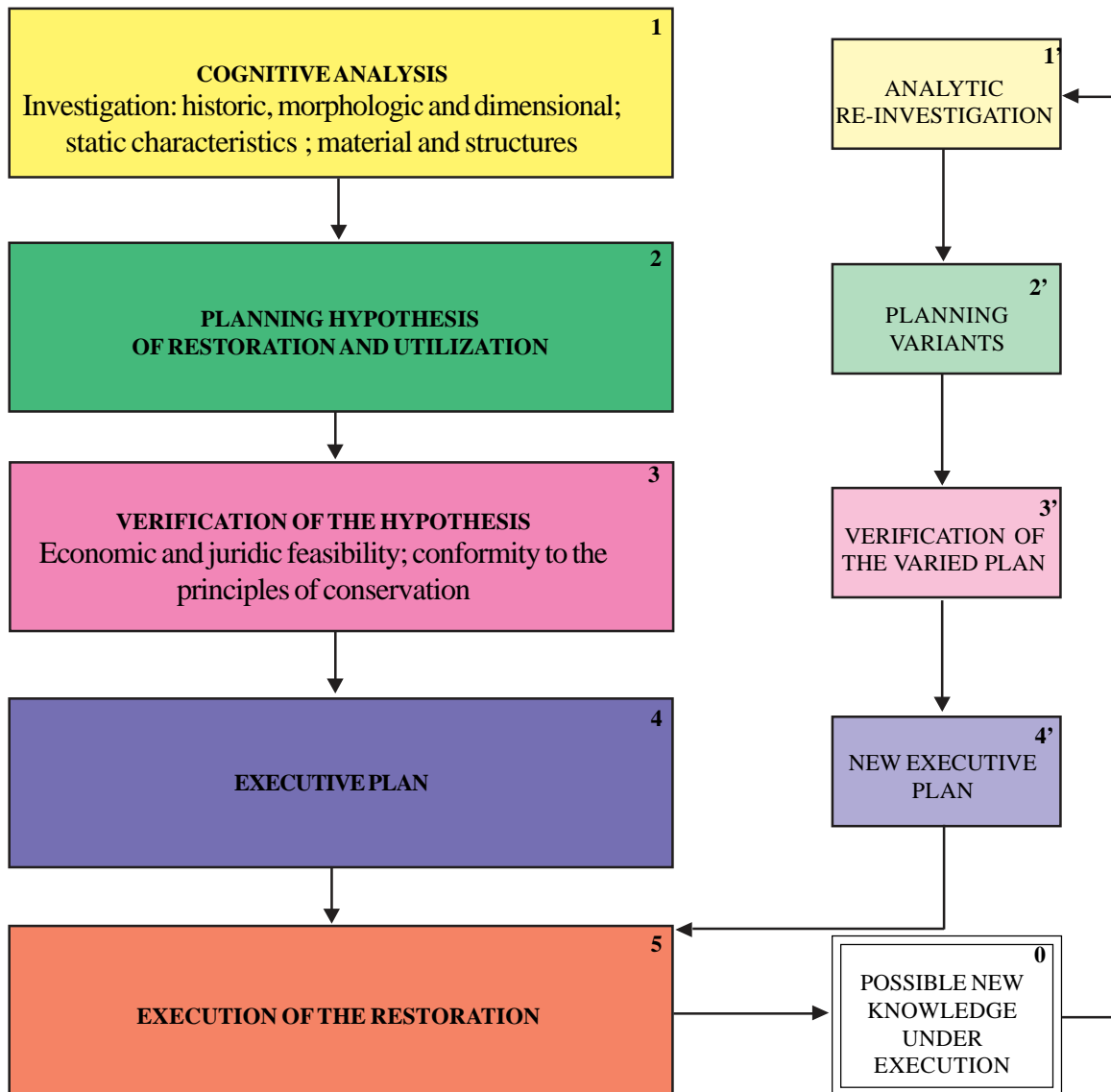


Table 1

According to Gino Chierici «The only real and secure way is the monument we work around. We must know how to question the monument and if the monument doesn't answer, we must have the courage of stopping» (4).

Although conscious that a general method doesn't exist, able to solve in the space and in the time or better, for all sites and all times, the problems to face in the architectural and archaeological restoration, being understood that for each monument to restore we have to realize a specific and singular study from which a peculiar planning solution can spring, it is moreover possible to identify a research process for the restoration based on three essential moments:

- a) the "connotation", allowing us to know the monument with the necessary critical comprehension;
- b) the "diagnosis", where we effect the reading and the recognizing of the state of decay and we identify all the available means to guarantee the physical conservation of the work;
- c) the definition of the "plan", through which the utilization of the monument is realized, for the aims proposed and within the bounds allowed by the integrated conservation.

Roberto Di Stefano underlines (5) «These three moments articulate the succession of the actions having to lead to the operative choices of restoration and to effective results for the conservation; I refer to the definition of the method, the phase of which (see table) can synthetically be indicated as follows:

- 1) cognitive analysis and diagnosis of the damages (coinciding with the moment of the connotation),
- 2) intervention hypothesis or planning schema,
- 3) verifications,
- 4) operative choices and executive plan (coinciding with the moment of the technical restoration and utilization),
- 5) executive phase.

It is well understood that this succession of actions doesn't exhaust itself with point 4), because during the executive phase, new (unforeseeable and unforeseen) elements are very often acquired, giving rise to further investigations of the cognitive analysis, so to make sometimes necessary to iterate the succession of actions pointed out and, therefore, to modify the final choices too. Differently, therefore, from what happens in other fields of the technique, in restoration a clear definition between the planning and the executive phase doesn't exist.

On the contrary, the logical process of restoration includes planning and execution, linked in an intimate relationship of mutual and continuous conditioning».

Therefore, before operating any intervention, the restorer must reach the deep and complete knowledge of the monument, through a deepened bibliographic and archival research, the gathering of the detailed iconographic documentation even through prints, drawings, ancient photographs, with the double aim to documentate, on one side, the existing situation before the restoration, and on the other side, to control the exactness of the survey we are realizing, in order to supply with documentary evidence, not only the history of construction, but also all the existing deformations and anomalies, the analysis of the decay, the evaluation of damages, the analysis of the fissuring panel, the knowledge of which is necessary to fully understand the stability conditions (6).

«From here the exigency of achieving the physical knowledge of the restoration objects, through a high quality level survey, not leading to the representation of a generic, approximate or conjectural shape, but giving instead the «effective shape» that is to say «perfectly objective, total, with all its irregularities, wanted or not, relevant or not, having an aesthetic, technical or historical interest» (Hans Foramitti).

A real shape shape which, as everybody knows, is different from

the theoretical shape (the one the architect would have wanted to realize) and from the apparent shape (the shape we see). And we must add here that – extending the concept of cultural property to the historic urban ensembles too– this refers not only to the great architectural works, but to all, even humble, evidences «having acquired during times a cultural signification» (art. 1 Venice Charter).

This leads to enlarge, quantitatively too, the field of the survey necessary to satisfy among others, the exigency of elaborating the interventions of the cultural property located in the historic centres» (7).

In the archaeological restoration, which identifies the operations having a conservative aim for the traces of antiquity but also for the finds and sites originating from (sometimes traumatic) excavation operations, it is important, even more than in the architectural restoration, that rigorous diagnostic investigations should be realized before the interventions, aiming to preserve the decay of the materials contributing to the physical constitution of the works. For the archaeological restoration as well, the methodology can only be unique and coordinate within the various competences, from the historic and documentary study to the survey (meant as the act of measuring) and to the mapping (meant as all the papers graphically representing the result), from the technical and constructive investigation to the spatial and figurative comprehension, from the selection of materials and techniques, to the formulation of criteria and protection necessary for the conservation of archaeological finds and sites.

At this point, we must ask ourselves if and in which way the survey and the mapping are methods and tools for the historic knowledge and, through it, for the restoration of cultural property. On this subject we recall that Guglielmo De Angelis D'Ossat has placed the graphic survey among the principal elements of the documentation, listing the historical data we could deduce from, together with the typological, structural and functional legibility of the building.

Giovanni Carbonara underlines «To survey a monument in a complete and scientific way is as if we trace in imaginary archives an important and often decisive document specifically concerning the construction or the ensemble we are studying. The scientific survey, from this particular point of view, is thus a sophisticated technique able to make emerge from a building structure often illegible at a first sight, an exceptional kind of documents all of guaranteed authenticity» (8).

Concerning the importance of the direct survey, developed by the author of the study or of the restoration, Piero Sanpaulesi expressed himself, observing that even if the survey comes before the restoration, it has an autonomous life and constitutes a documentation assuming an interpretative value of great efficacy, asserting that the survey «remains a branch of the architectural critique distinguishing the connoisseurs from those who stay on the surface» (9).

More recently the research guidelines aim at considering the survey as a basic tool for the analysis of the processes and of the decay condition of the monument, in a perspective more careful for the maintenance and conservation questions than to the traditional questions of restoration, by using the survey techniques as a tool for the preventive diagnosis of the monument and as a non destructive investigation tool. In that way, even maintaining its traditional characteristics, the survey shows wider methods, meanings and motivations.

Today, we have to record a gradual and by now wide diffusion of the computer tools (from laser-scan to laser radar, from geo-radar to T-scan, only to mention some of them) for the survey and for the mapping for restoration, but also, as underlined by Giovanni

Carbonara «an improvement of the research and experimentation of restoration in different fields, from the study and classification of the decay to the problems of consolidation and restoration of the plastered and painted surfaces, from the representation of the colour (even of the same constitutive materials modified under the action of time and, therefore, in a wide sense, of their 'patina') to the investigation on the ancient constructive and structural systems, not excluding some forms of precision survey, in order to estimate, for example, the deformations of vaults and arches or the overhanging and the inflexions of wall surfaces and vertical supports, or even the bottom subsiding» (10).

The more relevant innovation is perhaps constituted, at the level of data logging; communication and archiving, by the improvement of computer elaboration, with new modalities required to conform procedures and symbols and with the possibility of realizing confrontations in time, in order to measure the 'speedness' of the decay or the efficacy of the past interventions and to update, every time, the archived data, ensuring their immediate consultability.

Concerning the urban property, various initiatives have been undertaken at the international level to identify the better cartographic and orthographic large-scale documentation, beginning from the first conference on "Urban Photogrammetry" organized in Paris in October 1965 by the Centre de Recherche d'Urbanisme, with the contribution of many urbanists, coordinators of training in architectural conservation and survey specialists till the various international Symposia promoted by CIPA (as those held in Paris in 1980 and Strasbourg in 1986 at the Council of Europe).

The conceptual progression originated in this scientific field has started the transformation of the traditional technical documentation on paper support in the new numeric product on magnetic support called "numerical technical cartography" promoting, as a natural and consequent logical development, the gradual setting up of virtual spatial models of synthesis images. Meanwhile, the methodological evolution realized has opened new possibilities in the documentation of this cultural heritage, through the introduction of the most evolutive techniques of laser scanning and the formation of solid or 3D images. This ensemble of innovative techniques seems to open new and wider horizons for the documentation, offering the possibility to better perceive the volumetries and their connected spaces, the description of materials constituting the historic monuments and sites and their chromatic scanning.

In this context, the *dialogue* between coordinators of training in architectural conservation of cultural property and technicians of the representation becomes indispensable and may give relevant results only if the specialists of the conservation and the restorers try to approach the new possibilities offered by the developments of the constantly evolutive technique and have a good knowledge of the basic techniques of survey, to utilize in the phase of the deepening of the knowledge of monuments and sites and if, meanwhile, the specialists of survey know the themes of the conservation and are conscious that restoration - the technical tool for the achievement of the conservation as an aim - is based on the historical and critical, technical and material comprehension of the monument, given certainly not by the summation of the contributions of each discipline, but by their integration and by their reciprocal and mutual verification.

We thus arrive to the necessity of a good *vocational training*.

In the preparation of a coordinator of training in architectural conservation of cultural property, Yves Boiret underlines the importance of the sensibility for the monument resulting, as already pointed out, from the complete and deep knowledge both of its history and of its technical, constructive comprehension of the

material too, corroborating the importance of the drawing which, even more than photograph, he considers as an irreplaceable mean of the analysis, the propaedeutic moment for the way of seeing, deepening and representing, in the whole and in details, the cultural property (11).

At this point, I would like to recall the experience, I had the privilege of accomplishing, of a positive cooperation, occurred between specialists of the conservation and techniques of survey, beginning from the end of the Eighties, at the Specialization School in Restoration of Monuments of Naples. This scientific cooperation made it possible to realize an interesting research (under the scientific direction of Roberto Di Stefano and Mario Fondelli and the joint work of the technicians of Galileo Siscam and Alisud) which, through a wide experimentation, has proved the feasibility, both technical and economic, of the survey method for the elevation fronts, within the precision bounds allowable for the operations of urbanistic restoration, reaching the identification of the software (Archis) to obtain the mapping of façades, through shooting inclined photographs, their straightening, their assemblage in a photomosaic, their mapping in scale and graphic restitution, in particular situations (as those of the neapolitan case, where the ancient center is based upon the hippodameus tracing of the greco-roman town and where we find a great disproportion between the height of the buildings and the bare width of the streets) (12).

Starting from the results of this fundamental experience, I had the opportunity to go on further studying the themes concerning the survey and the architectural; archaeological and environmental mapping, thanks to the organization of Study Days — developed with an annual rhythm, at the end of my courses held at the Specialization School in Restoration of Monuments of Naples and at the University of Studies "Suor Orsola Benincasa" and with the support of these university structures— having ensured to the specialists intervened the opportunity of always further deepen these themes; through a profitable exchange of experiences on the state of the research on the investigating non destructive techniques for restoration, aiming at the direct, complete and systematic knowledge of the monument; the experiences proved to be highly formative even for the students of the named courses. The scientific contributions offered by the rapporteurs intervened which have been further published, give a wide panorama of the most relevant methods, tools, and consequent results for the survey and the mapping for the restoration and for the achievement of a fundamental documentation of the cultural property analyzed of reliable authenticity (13).

These results show that we must go on working on the way of the interdisciplinary cooperation so as different competences (from the historic study to the mapping, from the morphologic and dimensional analysis of the static characteristics, of materials and structures, from the verification of the economic and legal feasibility to the formulation of the criteria conform to the principles of conservation) will be opportunely coordinated and join together in the methodology of restoration.

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