

Towards maintenance: concepts and Portuguese experiences.

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ABSTRACT: The sharp decrease in economic and ecological resources points to a paradigm shift for a more sustainable management of resources, based on the passage of a reactive and exceptional intervention to prevention and continued care over the time. The paper proposes a short introduction about concepts and experiences in the field of maintenance, followed by the presentation of a concrete case study, the *Rota do Românico*, in the North of Portugal.

1. CONTEXT

"Take proper care of your monuments and you will not need to restore them. A few sheets of lead put in time upon the roof, a few dead leaves and sticks swept in time out of a water course, will save both roof and walls from ruin. Watch an old building with an anxious care; guard it as best you may, and at any cost, from every influence of dilapidation. (...) And do this tenderly, and reverently, and continually, and many a generation will still be born and pass away beneath its shadow." (Ruskin, 1849).

So wrote John Ruskin in 1849, inciting others to the good practice of regular maintenance, contrary to the perverse and widespread tendency to leave buildings to ruin and to deep restore them later. Focusing on issues such as "authenticity", "truth", and "aura", Ruskin thus advocated conservation and maintenance practices as mandatory in the sense of being an ethical duty of transmitting heritage to future generations. It is in this perspective, necessarily contextualised, that in the same essay the English scholar openly expressed against "restoration", defining it as "the most total destruction which a building can suffer (...) accompanied with false description" (Ruskin, 1849).

Maintenance comes from the Latin word *manu-tenere* ("to hold in the hand"), which refers to either a continuous care and manual work, intrinsically linked to man and his actions. In other words, a "maintenance culture", which has always existed in the history of construction as an assimilated cultural act and transmitted from generation to generation. It would be the industrialisation of construction that would reverse the ratio of labour to material costs, thereby encouraging a practice of replacement instead of repair or maintenance.

During the 20th century, the International Charters and Recommendations were also insisting on the propensity of preventive and maintenance actions, as stated by the latest Charter of Krakow (2000): "Maintenance and repairs are a fundamental part of the process of heritage conservation. These actions have to be organised with systematic research, inspection, control, monitoring and testing. Possible decay has to be foreseen and reported on, and appropriate preventive measures have to be taken." (ICOMOS, 2000)

In the current context, the awareness of the decrease of economic and environmental resources available has encouraged a more sustainable safeguarding of the architectural heritage through the implementation of strategies for preventive conservation, monitoring and mainte-

nance. Thus, within the international panorama some recent measures are highlighted, such as the recommendation for the integration of Systematic Monitoring in World Heritage Management Plans (UNESCO) and the creation of UNESCO chair on Preventive Conservation, Monitoring and Maintenance of Monuments and Sites (PRECOMOS) (Van Balen, Sulens, 2001).

It is also important to mention some exemplary international experiences in the field of preventive conservation and maintenance of heritage. Amongst others, in the UK, the Society for Protection of Ancient Buildings (SPAB), under the motto of its founder "stave off decay by daily care" (Morris, 1877), has done prolific work in this field – training, recommendations and publications – as well as other recent programs, such as *Conservazione Programmata* in Lombardy (Della Torre et. al., 2003).

In the European context, we also highlight *Monumentenwachten*, an independent, non-profit organisation, founded in the Netherlands (1973) and in Belgium (1991) – whose model extends posteriorly to other European countries (Germany, Denmark, Hungary, Slovenia, amongst others) – which deals with prevention and maintenance activities for the conservation of the architectural heritage at national or regional scale. Their slogan, "Prevention is better than cure", leaves no doubt that "prevention is the highest form of conservation. If causes of decay can be removed, or at least reduced, something worthwhile has been achieved" (Feilden and J. Jokiletho, 1998).

Hence, nowadays as also the Portuguese Alvaro Siza sustains "the way we have lost the habit of maintaining houses is very serious. Basically, it's a cultural problem. Until we create an environment, such as the one that exists in the Netherlands, for instance (when spring comes, all you see is people painting windows and doors, and plastering), until we have the possibility of creating this habit and can find the resources to do so, it's clear that, on the one hand, you will recover some heritage, but, on the other hand, you also begin to accumulate new heritage that is already beginning to decay. Some of it won't be missed at all, but some of it will, and anyway it all costs a lot of money. If the money could be channelled into those resources, into creating the habits and culture of maintenance, the problem would be much less serious." (Siza 2004).

2. CONCEPTS AND EXPERIENCES

There is a vast lexicon used in the field of maintenance, which also varies according to languages, countries and contexts of action. Thus, it is important to distinguish the concept of "maintenance" when applied to buildings with heritage values. If in some sectors of civil construction "maintenance" provides comprehensive and cyclical replacements – regarding efficiency and performance levels (Calejo, 2009) – when dealing with historical heritage, these criteria may take second place if they put heritage values and material authenticity at risk.

In Portugal, the term "maintenance" is used broadly and understood as the "set of preventive operations to maintain in good state a building as a whole or each of its constituent parts" (Henriques, 1991). The maintenance is thus a system of preventive practices, control, repair and proper use, reversing the most common approach of post-damage or corrective intervention in favour of a pre-damage logic of anticipation and continued care over time.

In this regard, one can distinguish different types of maintenance: preventive or predictive maintenance (inspection and preventive actions), conditioned maintenance (post-symptomatic actions) and curative or corrective maintenance (post-damage actions) (Paiva et al, 2006). The productive cycle of maintenance is generally divided into three phases: (1) Information (research, databases, diagnosis), (2) Programming (scheduling inspections, controls and repairs) and (3) Implementation (of maintenance actions that can range from cleaning, visual inspection, measurement and testing, minor repair or replacement actions, instructions for use) (Flores-Collen and Brito, 2003). The field of maintenance is therefore very wide, encompassing a wide range of operations, which are direct or indirect, simple or qualified, varying also in their frequency (daily, weekly, monthly, biannual, multiannual) or based on the seasons (Coias, 2004).



Figure 1. Street workshop organised by Esmeralda Paupério, Domingas Vasconcelos, Francisco Sousa Rio, Teresa Ferreira and Xavier Romão, “Manobras no Porto”, 2-6 October 2012, Porto (Photograph by Attilio Fiumarella).



Figure 2. Teresa Ferreira. User Manual for frame conservation and painting, created under the Workshop organised by ICOMOS-Portugal in partnership with CEAU-FAUP-and IC-FEUP (“Manobras no Porto”, 2-6 October 2012, workshop organised by Esmeralda Paupério, Domingas Vasconcelos, Francisco Sousa Rio, Teresa Ferreira and Xavier Romão; graphic design Margarida Ramos)

An important aspect to consider in maintenance when applied to the architectural heritage is the knowledge of traditional constructive materials and techniques which enhance more compatible and sustainable repairs. These jobs require skilled and qualified labour, which in many cases are quite aged or undervalued against the effects of industrialisation of construction. However, the maintenance of the built heritage can be a means to foster local participation, professional qualification and employment, reactivating materials and technologies fallen into disuse or at risk of disappearing.

In addition, it is important to consider the potential on the involvement users in maintenance practices, namely through the "User Manuals", a kind of "instruction handbooks", with information and guidelines for use and maintenance with accessible language to all. Thus, users are a key factor in maintaining heritage in order to avoid improper use, prevent risky situations, contribute to the recording of information and collaborate on daily maintenance actions (cleaning, ventilation control, shading, etc.). From this point of view, civil society has an important role in preserving the heritage, contributing to a sustainable and culturally integrated development.

In this field, the workshop "JANELAS com TINTA têm muito + PINTA" was a successful participatory project for the conservation and maintenance of windows in Oporto's historical centre. The aim of the workshop was to focus on an essential constructive element in the characterization of the integrity and identity of this World Heritage site – the window - which is being a recurrent target for replacement, due to a lack of maintenance or as a result of intrusive renovation projects.

The workshop took place over several days and involved practical demonstrations and direct "hands on" experiences by the participants throughout the different stages, techniques, instruments and materials applied in the conservation and maintenance of windows. The whole process was compiled in a handbook of "good practices" and was also recorded in a video disseminated through YouTube (<http://www.youtube.com/watch?v=OO3nBLXlbnU>).

Furthermore, this experience sustains the importance of participatory actions and on the potential of engaging and empowering the local inhabitants through their active participation in the conservation process, by increasing their quality of life and self-esteem in enhancing their relationship with their heritage.

3. THE MAINTENANCE PLAN OF THE ROMANESQUE ROUTE IN PORTUGAL

The *Rota do Românico* (Romanesque Route), in the north of Portugal is an innovative process in the country, particularly as far as safeguard and conservation strategies are concerned, aiming at the strengthening of local economy by endogenous and integrated development. It is one of the few touristic structured itinerary in the country and it encloses 58 Romanesque monuments (such as bridges, chapels, churches, towers and monasteries), throughout an extension of 764 km².

Cultural heritage enhancement has been performed in two complementary directions: (1)- Information, participation and disclosure; (2)- Safeguard, conservation and enhancement of built heritage. Regarding to the conservation and enhancement of built heritage, it is based upon a multidisciplinary methodology: knowledge and diagnosis surveys (historical, archaeological, 'risk-charter', decay mapping, cracking-board, non-destructive inspections, etc), followed by conservation interventions (using traditional compatible materials and techniques, performance enhancement including passive ventilation systems, technical devices, etc.) and finally, its planned conservation and maintenance over time. Those projects are performed by multidisciplinary teams – historians, architects, engineers, conservators – with the cooperation of University researchers and laboratories.

Facing the progressive restriction of funding for heritage safeguard, the *Rota do Românico* administration has been aware of the urgency for the implementation of strategies of prevention and planned maintenance after interventions.



Fig.3. Romanesque Route (www.rotadoromanico.com)

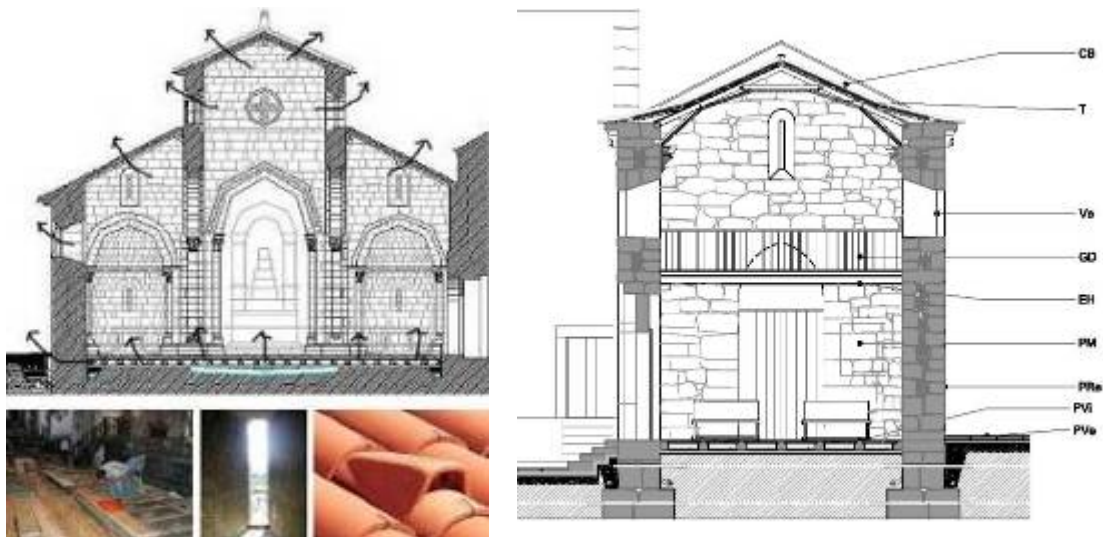


Figure.4. Scheme of ventilation with combined systems for natural air circulation (image of the author)
 Figure 5. Technical Handbook. Graphic Scheme with codification of technological elements. (image of the author)

The Maintenance Plan previews two complementary action levels: (1) Directly on the buildings - through Inspection, Monitoring, Maintenance and Repair actions; (2) Indirectly on the users - through 'Participatory Strategies' and 'Good Practices' of prevention and use, acknowledging that only with the qualification, involvement and empowerment of local users and agents, the daily maintenance can be achieved as well as the future sustainability of built heritage.

The phasing definition previews an instructive phase (1) concerning the methodological definition and collection of information, including the creation of a GIS – Geographic Information System - computerized database (which is also a good tool for improving management).

A second phase (2) consists of the elaboration of Manuals and Handbooks (Technical Handbook and Good Practices Handbook). The Technical Handbook previews the decomposition of the building in technological elements (TE), which are codified in order to be easily related to graphic schemes. This document includes graphic documentation (technical drawings, graphic schemes, photographs) and the Technical Forms with information on material composition and details, durability, decay, risk factor, as well as the guidelines for an improved maintenance. The Technical Handbook also includes the Maintenance Program, related to the schedule of the controls, as well as the executive proceedings and periodicity.

The Users Handbooks are the documents meant for the managers and users which have continued relation with the building, enclosing information on its correct use, on preventive actions, on routine or cleaning tasks, as well as on little maintenance and repair, and on the occurrences' log. This document must have an accessible language, be illustrated and have two versions: one for the managers and another more simplified and illustrated for the users, consisting of an Instructions or Good Practices Handbook.

A third phase (3) refers to the practical implementation of the manuals (monitoring, inspection, intervention, training actions), in articulation with participatory practices, namely by means of training actions on traditional constructive skills and maintenance (for technicians), as well as on good practices of prevention and use, aiming at the optimization of the performance and maintenance of buildings (for managers and users).

Moreover, the Maintenance Plan is a 'work in progress', continuously in actualization. With this scope, an annual balance (4) is previewed with evaluation and reset of methodology and documents. All the phases are accessed by a multidisciplinary team.

In order to improve the testing of the methodology, it has been proposed to implement the Maintenance Plan, in a first moment, in 10 pilot-monuments, one of each typology identified in Sousa and Tamega regions (monastery, church, tower, bridge, memorial and castle) with an average area for each typology.

Furthermore, an economical perspective has been done in order to compare (e.g. a church of 250m²), the money spent with and without regular maintenance, for a period of 30 years. This study revealed that the money spent on a monument with regular maintenance corresponds to approximately 1/3 of the money spent on the same monument without any maintenance for 30 years. Moreover, without funding from the European Union, it will always be more difficult to get money for heavy intervention, rather than little amounts for regular maintenance which can be redirected from the fees or donations to the monuments.

Hence, it is important to underline the economic advantages of the implementation of a Maintenance Plan, on the management of resources and cost control, as well as on the conservation of authenticity, on preserving its cultural and touristic value (and consequently, economical), on fostering local jobs and occupation, on involving local communities and empowering local agents for the future sustainability of their heritage.

4. FINAL CONSIDERATIONS AND OPEN QUESTIONS

The sharp decrease in economic and ecological resources, combined with the effects of a globalization that is largely determined by the demands of standardization and westernization, generates forms of instability in human society. These new conditions point to a paradigm shift in the significance of heritage and its preservation, defined by the appearance of new values (economic, ecological, social and political, among others) that largely transcend those that were established at the beginning of the 20th century (Riegl, 1903).

Hence, prevention and maintenance are strategies for balance and systematization, with great applicative potential, not only in single buildings, but also in public space, landscape and in the whole territory. Hence, maintenance will probably be the main activity of the construction sector for the next decades, and the central debate won't be on how to intervene, but rather on how to prevent and how to maintain the existing built heritage.

Despite the large operating potential, "maintenance" does not exist as a research or professional training field and, in the Portuguese context, its framework, modalities and instruments are still poorly defined, whether in the construction sector in general or in buildings with heritage values. In this sense, some questions remain open: What is the role of governmental organizations, institutions and civil society in defining strategies for prevention and maintenance? What are the instruments of their applicability, particularly in heritage? What are the basis of a contemporary culture of maintenance?

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