Preventive conservation and restoration: a matter of costs

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ABSTRACT
In the treatment of seriously decayed monuments, the objective of the conservator is to return the monument to the point where ordinary maintenance is once again possible. One of the main difficulties is persuading administrations to approve programmes for the maintenance of newly restored monuments. Conservators have to change their language if they want to be understood: what message is more effective with an administrator than that of the bottom line? One of the strong points of maintenance is how much can be saved by developing a maintenance programme which avoids the need to repeat expensive restoration every 10 years. The authors present the maintenance programme planned for the structures of the Atrium of the Capitoline Museum and the collection of Roman sculptures on display, just restored after two years of work.

1 INTRODUCTION

The history of conservation treatments on monuments has taught us that, beyond the theoretical or technical debate as to whether the project has been successful, one thing at least is certain: when such treatments are not followed by complementary measures, such as environmental modifications or maintenance programmes, the results obtained during the treatment are quickly nullified. For this reason, the authors have maintained for some time that during the treatment of seriously decayed monuments, the objective of the conservator is to return the monument to the point where ordinary maintenance is once again possible: maintenance as prevention against the risk of new deterioration. But as this is still being discussed, it is evidently not always possible to implement such programmes.

In this sense, one of the main difficulties that we face in the field today - that of having administrations approve programmes for the maintenance of newly restored monuments - is no longer a scientific issue, but a bureaucratic one. The question we often receive in response to our proposal is no longer 'What do you mean by maintenance?' but 'How can I convince the administration (that is, the non-archaeologist and non-historian administrators who deal with budgets) that this expense is necessary?'.

The difficulties do not end here. There is at least one more, a very important one: the lack of field experience that would help to codify the techniques and costs of a maintenance programme. What does it mean, in practical terms, to maintain a sculpture collection? What operations must be carried out? Who should do them and for how much?

The authors will attempt to answer these questions by describing the maintenance programme planned for the structures of the Atrium of the Capitoline Museum and the collection of Roman sculpture on display there, just restored after two years of works carried out by the Centro di Conservazione Archeologica (CCA) under contract to the Comune di Roma.

2 PRECEDING TREATMENT

As mentioned above, the maintenance plan is connected with conservation treatments that have just been completed and is a natural extension of them. It is based on the premise that the preceding conservation work was carried out using techniques, materials and forms of documentation that would lend themselves to a subsequent maintenance plan. This means reversing the concept of restoration as an end in itself - a once and for all treatment - that uses invasive techniques and 'everlasting' materials. A more gentle approach must be adopted, one which sees the objective of the conservator as returning the artifacts to the point where ordinary maintenance is once again possible. The conservation treatment is understood as a preparation for future maintenance and the maintenance is seen as preventing the risk of new deterioration.

This is what was accomplished in the Atrium of the Capitoline Museum, and in practical terms means the following:

- minimum treatment and maximum attention to detail;
- use of materials compatible with the original material and history of the object;
- use of a computerized documentation technique;
- use of specialized technicians hired on long-term contracts.

'Minimum treatment' means working only where necessary, in well-defined areas, with minimum use of materials; this is made possible by careful attention to detail and the option to return in the future, thanks to a constant review of what has been done.

The use of materials that are compatible with the original (in practice, atomized water and mechanical means for cleaning, lime-based mixes without organic additives for stuccoing and consolidation), together with respect for the ancient working techniques and historic restorations, means that the original is modified as little as possible and interference by the conservator with the history of the work is limited.

The use of a computerized documentation technique makes it possible to register the information in a flexible form, which can be continually updated and which responds to a variety of queries with different combinations of data [1].

Finally, the use of specialized staff on long-term contracts means that each individual is responsible for a complete work cycle; this helps them to acquire the knowledge and confidence in the work which are necessary to implement the subsequent maintenance programme.

Once the conservation treatment has been completed, and provided that these preliminary conditions have been met, there begins a phase of study and preparation that will lead to definition of the maintenance plan.

It is useful to repeat that, at least from the technical viewpoint, maintenance is a field where further study and experimentation are required: although maintenance is increasingly talked about, we still do not have enough experience to draft final work plans directly. It was therefore decided to develop a programme that comprises the following phases: project, testing, implementation, information, training.

3 PROJECT

After establishing the project activities and their length, the activities must be linked in a logical sequence. At this point, tasks are allocated, the costs of materials and equipment are calculated, and the project can be considered ready. When, however, the project parameters include a historic, seventeenth-century museum building, with 2500m^2 of travertine and plaster, and a collection of classical sculptures that 12 specialized technicians took 24 months to conserve, the situation becomes far more complicated.

To facilitate the management of all this information, we resorted to computer software designed for project management [2]. In summary, the programming of work is divided into three phases: planning, scheduling and control. The planning phase concentrates on gathering the 'job information', with a list of activities. The scheduling phase grows out of the previous phase: the plan is taken and analyzed with reference to the optimum use of time, resources and equipment. The control phase develops from the scheduling phase and allows actual progress to be monitored and corrections to be made to ensure adherence to the schedule, or modified schedule. There are numerous ways to use the data generated by the computer:

- to keep an eye on the calendar of the work, controlling the flow and making any necessary changes;
- as a tool to inform the works overseer, the press, the conservation staff, the public or anyone else, in a clear and immediate way;
- to quantify expenses and analyze resources.

The importance of being able to manage a project in a dynamic way cannot be overstressed: efficient project management involves not only planning and subsequent verification of development, but also the proper channeling of activities toward the goal. The advantage of using a computer program is that, at any moment, it is possible to evaluate new factors that have emerged during the work and re-plan and re-establish the best way of completing the project within the deadline.

The benefits of evaluating the global course of a programme at the end of operations cannot be ignored. An evaluation of the initial decisions will provide a much clearer picture of the requirements and aspects of the next project. By studying and noting mistakes, we should be able to avoid repeating them. An objective review could include the following points:

- comparison of the predicted length of activities and the time actually required;
- evaluation of whether the resources were truly adequate for each activity;
- an attempt to interpret unexpected developments;
- analysis of the productivity of resources.

Most people would agree that planning contributes to the outcome of a project, if only because

planning helps to produce at least two levels of information: a 'balance sheet' of the activities carried out, and basic elements for future planning. Seen in historical terms, every project will act as a repository of experience for future projects. Critical analysis of what was planned and how events actually transpired will be of help in future planning. A person who does not plan can only hope for better luck next time; the planner accumulates experience and develops corrective measures for future projects. The more one plans, the better the contribution to future planning [3-5].

4 TESTING

The maintenance operation will include the following activities:

- removing deposits of atmospheric particulates, by vacuum-cleaning and light brushing;
- assessing the stucco, and replacing deteriorated areas;
- checking the response of marble surfaces to particulate deposits, with possible localized application of protective coatings;
- checking repairs and metal elements;
- verifying the stability of old restorations;
- checking for possible cracks and colour changes;
- verifying whether salts are present (Figs. 1, 2).

These tasks will be carried out three times a year for five years (Fig. 3).

All information collected and every operation performed will be carefully recorded on computer charts, adding to the data already entered in the course of the recent treatment. Comparison between the existing material and that produced in the future will provide the elements necessary for detailed study of how deterioration of the monument proceeds. The estimated costs are about US$6,000 a year, including expenses for materials, equipment, transport and documentation.

5 IMPLEMENTATION

At the end of five years, when all the operations have been carried out and the forecasts verified in the field, it will be possible to see what modifications are necessary in the programme and to draw up the definitive maintenance plan for the monument. The details of the technical operations will be available and, above all, we will have a clearer idea of the mechanisms and times of deterioration of each individual component of the monument, with the possibility of producing drawings with topographical indications of priorities and urgent items. At this point the potential of the computer for programme management and graphic documentation will come into its own.

6 INFORMATION

During this maintenance programme, as also during the two years of the preceding conservation treatment, particular attention will be devoted to information for museum visitors. A questionnaire was distributed to museum visitors at the end of the conservation work, and responses fully supported the choice of leaving the worksite open to the public. Given its position and visitor levels, the Atrium of the Capitoline Museum represents a valuable opportunity for contact with the public. Therefore it was decided to exploit the cultural potential of the conservation phase as well as the current maintenance phase by organizing an information campaign on the theme of conservation and protection of cultural heritage.

An open worksite enables the public to watch the technical operations as they happen, encouraging contact with the conservators. For this reason, particular attention has been paid to the arrangement of the worksite: movable aluminium scaffolding takes up little space and gives visitors a clear view of the technicians and the monument; the public is kept at a safe distance by means of fake travertine posts and fake chains, in imitation of ancient kerb posts which are compatible with the general ambience; systems to supply water, compressed air and electrical power have been concealed in a space beneath the floor; the staff is continually updated on the general progress of the project and is prepared to communicate with the public in various languages.

7 TRAINING

Maintenance is a field that, from the technical standpoint, must still be thoroughly studied and, above all, tested. It is intended to take advantage of the project at the Capitoline Atrium to produce a video as a didactic instrument for museum personnel, even though it does not appear formally or financially in the

budget. Like the video made of the preceding conservation treatment, it will follow a strictly technical style, to transmit in a simple and clear way as much technical detail as possible.

8 CONCLUSIONS

When the authors speak about maintenance, we refer to a programme based on a plan and not to a single technical operation. We would not like to fall into the trap of comparing the maintenance of a monument to mere surface dusting: the old, beloved and sometimes sorely missed image of a janitor with feather duster and cloth in hand.

Desirable as it might be to maintain collections merely with dusting, this would exploit only a fractional part of what maintenance should be. First of all, maintenance must be a tool for the study of the mechanisms of the deterioration of a monument, in order to permit modifications of the environmental and architectural context (including the use of the monument) which are capable of slowing down deterioration and acting as measures of preventive conservation.

Maintenance must then become part of the history of the monument, and therefore every operation performed must be recorded and made available. It must serve as an informational tool for anyone who uses the monument and as training for anyone who might work on the monument itself.

No matter how long it takes to achieve a satisfactory way of protecting the cultural heritage, it is possible to close on a note of optimism. Much work has already been done and the results are visible: importantly, the word 'maintenance', for example, is no longer unknown, even to administrators. In recent years a significant change has occurred in one part of the public administration and this is the moment to take advantage of it. In order to have maintenance plans accepted, it is necessary to speak the administration's own language and to be convincing: conservators must speak the language of numbers. What message is more effective with an administrator than that of 'the bottom line'? And this is one of the strong points of maintenance: the amount that can be saved by developing a maintenance programme which will avoid the need to repeat expensive restoration every 10 years. It could be argued that a collection and a monument such as those recently conserved would lose all the benefits of the treatment in the course of 10 years (and would be incalculably damaged by irreversible deterioration). The expenditure of US$300,000 that the administration has just invested in the conservation treatment would be required again, re-calculated at US$489,000. In comparison, the US$30,000 cost of five years' maintenance, plus US$37,000 (adjusted for inflation) for another five, gives a total of US$67,000 and would obviate the need for new conservation treatment. The administration would save US$422,000, or 86% of the amount they would otherwise have to spend. What argument could be more convincing than that?

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CAPTIONS

Fig. 1 Activities planned for one sculpture, presented in a sequential order.

Fig. 2 Activities planned for one sculpture, developed in a time frame. This gives a full picture of the programme, with activities and times.

Fig. 3 Activities planned for 27 sculptures and the structures in travertine. The diagram shows the entire project developed in a time frame, with operators and costs displayed. This helps to identify the path through activities where implementation does not permit fluctuation and, therefore, delays; in this way, operators are fully allocated and the total time of the project is condensed. The diagram shows detailed costs: with a simple instruction, the program will produce any information concerning detailed or general costs. The work plan presented in this diagram will be repeated every four months for five years.