

The Roman Forum. On-site conservation of floor surfaces during excavation.

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Over the last few decades the question of prevention in the field of archaeology has received widespread attention that the need for collaboration between conservator and archaeologist is taken for granted. There was a reciprocal, initial misunderstanding due mainly to various deficiencies in the training of conservators who found themselves working in (ideal) conditions far different from the ideal one they were used to in the laboratory. Here the causes of deterioration are discovered, isolated and removed. Instead, the conservator working with the archaeologist has learned to maneuver in a continually changing environment, where the causes of deterioration are directly linked to the most specific instrument of archaeology itself: the excavation.

During the lengthy period of its burial, the object did undergo on initial face of deterioration, with time, it developed a state of equilibrium with its surroundings, and this allowed the object to become a single entity with its environment. At the moment of excavation, this balance was abruptly destroyed.¹

Until recently, the restore was called only when there was a serious problem to solve, and he was asked to do something urgently to halt the effects of deterioration. He took "first aid" measures, as they were called, which were part of the exceptional service expected by the archaeologist, as is clearly explained by Melucco.²

Among these measures which generally were limited to parts or sections being excavated which were in danger, were discontinuous applications of **velatino** with Paraloid B72, protective or retaining stuccowork using hard mortars, prop structure made of organic materials, techniques for removing mosaics or wall plasters found in situ such as **stacco** and **strappo**; not to be overlooked where the cleaning operations that could be carried out either in small sections or extended to the entire construction, but were always performed without providing for the necessary maintenance in the future.

The **velatura** of sections that were either in peril or unstable is the best example of non-conservative intervention. This process creates surface irregularities detrimental to the entire structure which, instead of being guaranteed new conditions of stabilized surroundings immediately after the excavation, is subjected to the discontinuous application of an impermeable substance (in applying the **velatino**, the Paraloid B72 is diluted from 5 to 20% losing all its characteristics of permeability and porosity). The **velatino** will be removed only once the actual conservative proceedings have started, in the best hypothesis not until the excavation has been halted.

Currently, knowledge of the main deterioration process that set in once an object is removed from the dig, has led to the discovery of various methods to lessen "excavation shock"³. The object is simply to create an intermediate phase between underground conditions and exposure to air.

This phase can be created either by exploiting the actual excavation structure, or artificially by creating underground (or buried) conditions using other materials.

When possible, during the dig, a certain portion of the earth actually in contact with the mosaic or wall plaster is salvaged, so that the mosaic or painted surface does not undergo all the reaction due the exchanges with its new environment.⁴

The evaporation of any humidity in the structure's surface and the crystallization of soluble salts it contains are made to occur in a kind of "sacrifice layer", at a distance from the mosaic or plastered surface. The "sacrifice layer" can be created artificially, as well, by applying an absorbent material that will adhere to the surface to be preserved.

From the experience obtained in mediterranean-type climate excavations in medium clay soils, this technique as proved to be advantageous especially when the sacrifice layer of earth is left in place long enough to guarantee the structure's real adaption to new climatic values.

Naturally, it is impossible to define the necessary length of time: this varies according to the season, the geographic area, the sunlight...

In some cases the right length of time was equal to the time the excavation lasted: in this situation the organization of the dig was not disrupted and at the same time the surface was protected from involuntary damage.

The subsequent phases of cleaning and consolidation were put off until the end of the archaeological search.

However, when the mosaic or painted plaster is not in a vertical position, it is more difficult to estimate the depth of the excavation to preserve the earth layer in front of or above it. In this case it often becomes necessary to skip these preventive procedures that precede the actual excavation and start the consolidation process immediately.

This was in fact the case of the work carried out on a floor in **opus signinum** discovered in a mid-late Republican dwelling in the Roman Forum during the archaeological search carried out by A. Carandini. The research, begun in 1985 and still in progress, involves a vast area on the slopes of the Palatine, not far from the Via Sacra. It obtained a degree of publicity when the notorious wall dating from the Royal Age came to light. The area must have been dwelling whose floor plans, heights and interior decorations were recognizable.

Various original floors have been maintained **in situ**. In one room, about 6 square meters, the floor consist of a broad expanse of **coccipisto** in which white tesserae form a linear, geometric pattern that is very visible against the red background as is usual in the **opus signinum** technique.

There were various cracks, some of which were as deep as 30 cm., that had compromised the integrity of the flooring allowing water and earth to infiltrate the preparatory layers of the mosaic.

The request for an emergency intervention so that the photographer could document the mosaic technique and the archaeologists continue the excavation without the loss of the floor were ideal conditions for "first aid" measures.

The unwavering conviction that any "first aid" measures that do not take into consideration the entire structure are consistently damaging to any surface, removed any doubt regarding the kind of measures to use. Given the collaboration of the archaeologists, it was possible to organize a cleaning, consolidation and "reburial" operation extended to the entire area.

The solution was to create a structure that would ensure to the floor level a continuity of reaction to the open air without creating differences in its permeability or porosity.

The initial cleaning was done without water, and was subsequently perfected, on the surface level, by alternating synthetic brushes with sponges used as buffers and a surface-active agent (Neodesogen) with some water added to it. The cracks were cleaned by squirting water and alcohol into them. The cleaning was limited to removing the earth and water-soluble surface deposits, since there was no way to guarantee the maintenance of a perfectly cleaned surface **in situ** since this was linked to an entirely different kind of required accessibility of the entire site. The various rooms were to be reburied for an indefinite length of time when the research was suspended in the autumn.

The consolidation procedures called for materials that were compatible with those that made up the floor when it came to treating the edges of breaks and fissures. This would ensure that the entire structure would act as a single unit, since it would continue to react with its immediate surroundings in spite of the fact that it was to be re-buried. It was the observation of that floor surface of lime mortar and brick dust that provide the best aging trial that any material could undergo, and with the best guarantees of compatibility that conservator could ask of materials used in restoration. Thus the choice fell upon slaked lime (putty) to be used as a binder.

The parts to be consolidated were all exposed, obviating the need for deep infiltration and, therefore, there was no problem concerning lime carbonation. However an equal amount of lean lime was added to the air-hardening lime to make up for the low yield of putty from lime manufactured with modern processes. Finely sifted brick dust was used as extender so that the mixtures could be applied in the cracks with a syringe.

After having thoroughly dampened the parts to be consolidated, the reinforcing mixture, made up of one part binder, one part filler and one and a half part water, was applied. After just a few minutes the area was brushed with the same, slightly diluted mixture to ensure close adherence to the original mortar. Subsequent cleaning was carried out by buffing with a wet sponge.

The wider cracks that were not closed by the liquid mortar, were stuccoed with a mortar of putty and hydraulic lime mixed with brick dust (diameter granulometry between "fine powder" and 0.5 mm.), and increasing the amount of the filler with respect to binder (1:2).

This operation represented an effort to give the superficial plane a uniform evaporation surface: the preferred channels for evaporation are breaks and cracks in the surface; and these were given a degree of porosity similar to the original mortar by using lime-based stucco. On the other hand, forced evaporation channels were never formed since care was taken not to apply a Paraloid B72 glazing coat nor to stucco with overly hard materials, such as cement mortars.

Once the floor structure had been put in conditions to respond to external stresses homogeneously, it was the moment to assure stable surroundings to the **in situ** structure. In this case its underground environment was reproduced.

A 5 mm. mesh plastic net was applied to the floor to facilitate later removal of the covering and to prevent possible damage to the surface. Expanded clay mixed with **pozzolana** was then spread over the netting. When the mixture layer was 0.6 meters thick another plastic net was spread over it to separate it from subsequent layer of earth.⁵

Technically speaking, a very simple operation that was extended to cover the floors in the entire area in that as remained unaltered to the present time in spite of the periodic resumption of the excavation. It has demonstrated its effectiveness as a protection.

The entire operation as it was carried out, turns out to be a "non-intervention": the surfaced was not cleaned any more than was necessary since it was to be "re-buried", the ages of the cracks and breaks were not "temporarily" treated with Paraloid B72, pre-mixed industrial strengtheners were not used meaning that the granulometry of the filler could be selected according to the case and, finally, the entire structure cannot be seen and will remain covered until the proper conditions of site protection and maintenance are guaranteed.

An attempt has been made to show how archaeological conservation must step away from the concept of "first aid" emergency treatments and consider instead all the prevention and safeguarding operations that take into account the immediate surroundings, and generally have no evident verification.

Perhaps the tradition of restoration has made as used to the idea of judging the efficacy of the intervention by "before and after" photographs, but it has also taught us to look at objects in their context and this has provided the bases necessary to archaeological conservation.

Photo 1.

General view of the excavation site. The area is located on the slopes of the Palatine, not far from the Via Sacra, in front of the Arch of Titus.

Photo 2.

Cleaning of the Opus Signinum. The operation is limited to removing the earth and water-soluble surface deposits.

Photo 3.

Back-filling of the pavement using plastic net, expanded clay mixed with pozzolana.

¹ H.J.Plenderleith, A.E.A.Werner, The conservation of Antiquities and Works of Art, Milano 1986, pp. 11-13.

² A.Melucco, Archeologia e restauro, Milano 1989, pp.256 e ss.

³ G.de Guichen, Object interred, object disinterred, in "Conservation on Archaeological excavations", Rome, 1984; pp. 21-29.

⁴ A. Costanzi Cobau, Excavated wall plasters: conservation problems, in "Preventive measures during excavation and site protection", Ghent 1985, pp. 103-110.

⁵ P.Mora, Conservation of escavated intonaco, stucco and mosaics, in "Conservation on archaeological excavations", Roma 1984, pp. 97-107.