

Dossier: L'aerobiologia applicata alla conservazione dei beni culturali

Dossier: Aerobiology applied to conserving the cultural heritage

Over the last ten years or so, research into bio-deterioration of artworks has moved ahead rapidly, and it is now known that various types of airborne biological agents can cause damage to art objects and documents of cultural-historical importance. Within the field of preventive conservation, considerable importance is attached to studies on the biological components of air (aerosol biology) and on the effects they produce when they come into contact with exposed surfaces. More and more frequently aerobiological surveys are conducted alongside the monitoring of microclimatic parameters and airborne chemical pollutants with the aim of establishing the most suitable approach for designing and protecting indoor conservation areas such as museums, libraries and archives. The subject is referred to in a decree issued by the Cultural Heritage Ministry in 2001: "Guidelines for the technical-scientific criteria for the functional and development standards of museums". This dossier contains the results of the most recent research on subjects relating to aerobiology applied to conservation. In particular it examines the problems concerning the spread of biodeteriogenesis in the various areas where artworks are preserved (museums, libraries, archives and outdoor areas) and suggests the most suitable methods for analysing air quality in conservation areas; it also contains a number of case studies illustrating the practical application of these methods.

Un prodotto alternativo per il consolidamento del legno archeologico saturo d'acqua

New chemical for the waterlogged wood strengthening

As proved by the international literature, the waterlogged wood impregnation with soluble organic products is a method of minor importance; this is probably due to the practical difficulties entailed by the process. In fact, due to the high volatility of the solvents, to the high temperatures and the low operating pressures, both the total cost of the equipment and the risk for the restorers increased enormously. Furthermore, the effectiveness of the treatment was far from satisfactory. In the method here proposed the saturation water is replaced in two steps: firstly by isopropyl alcohol and then by n-hexane, a non-polar solvent whose strengthener offers total solubility. The water substitution occurs at room temperature and pressure by means of several short baths in alcohol which is completely substituted by hexane; then the wood impregnation with Escorez may be effected. The strengthener Escorez 5380 (Exxon Chemical - USA) is a Paraffinic organic compound that is solid and chemically stable at room conditions; furthermore it is insoluble in water. The experimental tests were performed using a wooden frame from the XII century shipwreck of Marsala. All the collected data confirm the high effectiveness of the treatment process both in term of ASE and of the low capillary absorption coefficient of the treated wood. At the same time the experiment made possible to define the optimal conditions for the impregnation treatment, as well as the desiccation time in order to reach the optimal effectiveness in relation to the archaeological oak wood we made use of.

ABSTRACT

Valutazione dell'efficacia di alcuni nuovi biocidi per il trattamento di microflora fotosintetica e di briofite su materiali lapidei

Measuring the effectiveness of some new biocides for treating photosynthetic micro-flora and briofite on stone materials

This article refers to trials on the effectiveness and applicability of three new biocides prior to their use in the restoration field as alternatives to products which are no longer available or are being withdrawn. Rocima 103 and Biotin R are two recently produced disinfectants with low environmental impact; Toterbane 50 F is a herbicide derived from urea. The trials were carried out on the archaeological site at Ostia Antica (Rome) and involved applying the substances to stone objects located both in the open air and in confined spaces, with extensive areas of photosynthetic micro-flora (ciano-bacteria and green algae) and of briofite. Several analytical methods were used to check the effectiveness of the treatment: microbiological analysis, observation under optical microscope in fluorescence, and spectro-photometric analysis for the level of chlorophyll *a*. Two of the products, Rocima 103 and Biotin R, gave satisfactory results in their ability to devitalize both micro-flora and briofite. On the other hand, Toterbane 50 F was not effective for controlling micro-flora, while it produced good results on briofite, but required more time than was available for the trial period.

Un database per la schedatura dei manufatti archeologici sommersi

A database for recording submerged archaeological items

The SAMAS database is designed for recording the state of conservation of submerged archaeological sites and for scheduling the conservation work to be carried out on them *in situ*. The article describes the main features of a software program which has been developed to record and handle the data collected. The basic elements to be recorded on the database are the architectural features and archaeological items discovered on a submerged site. As the work of surveying the settlement proceeds, the individual elements found on the site are recorded and grouped together in categories so that the basic information about each one can be called up on the database at a later stage. The data is organised in such a way as to separate the information regarding the constituent aspects of each item from the information relating to forms of alteration and deterioration that might occur over time. More details about the same object can be added at a later stage, making it possible to expand the amount of information held on the database and to monitor the course of degenerative phenomena. The detailed information about each item contained on the database is immediately available to provide an overall picture of the most critical situations, in order to plan future actions of restoration and maintenance work.

Il degrado biologico dei manufatti archeologici dell'area marina protetta di Baia

Biological deterioration of archaeological items in the Baia protected marine area

Projects for conservation work in protected marine areas must take into account the dual needs of safeguarding not only archaeological items but also the natural surroundings. For this reason, interdisciplinary studies combining scientific and conservation skills are important for examining the different aspects of such areas in order to work out the best approach with full respect for all the needs. Studying the ecology of the marine organisms which inhabit architectural structures is one of the first steps towards planning restoration work. The long-term aim is of course to make such items more visible and hence more accessible, not only for purposes of historical research and documentation, but also to enable people to visit them. The observations that were carried out provided useful information on how marine organisms colonise submerged archaeological items and the rate at which they do so. One conclusion was that maintenance programmes involving the application of protective screens in "fabric-non fabric" seem to be the only way of ensuring a degree of protection against biological re-colonisation over fairly long periods.

Restaurare sott'acqua: cinque anni di sperimentazione del NIAS-ICR

Underwater restoration: five years of trials by the NIAS-ICR

The purpose of the "Underwater Restoration" project set up by the underwater archaeology unit from the Central Institute for Restoration (ICR) is to record the state of deterioration of submerged architectural structures and to work out appropriate methodologies for preserving and restoring them *in situ*. Projects include restoration work conducted in 2001 on the fish pools (*peschiere*) of a Roman villa in Torre Astura (Nettuno), and work carried out from 2003 to 2006 at the submerged archaeological park of Baia (Naples). The article describes the materials, the specially designed tools and instruments, and the restoration techniques used on various types of buildings affected by a wide variety of harmful agents. The systems used for protecting and preserving them *in situ* are also described. As part of the project, the SAMAS software program has been created as a database to record the state of conservation of submerged structures, with a view to setting up a location-based archive (GIS).

Un nuovo montaggio per l'Arco di Trionfo di Massimiliano I d'Asburgo di Dürer della Collezione Corsini

A new display mounting for the Triumphal Arch of Maximilian I of Hapsburg by Dürer, from the Corsini collection

The version of the *Triumphal Arch of Maximilian I of Hapsburg* by Albrecht Dürer, from the Corsini collection, is made up of thirty-six sheets from the third edition produced in Vienna in 1559. A special display mounting has been designed and constructed for this large and valuable xylographic print, using long-lasting materials and special techniques adapted from Japanese Hyogu art, in order to make it available for consultation and to simplify moving and transport operations. The approach to the project was guided by an awareness of the importance of this graphic work. To be appreciated, such a work has to be put on display, however occasionally. Therefore it is important to provide accessibility by appropriate technical means designed not only to preserve it but also to make it easily available for consultation.