Preventive Conservation in Historic Houses and Palace Museums: Assessment Methodologies and Applications

SilvanaEditoriale

Preventive Conservation in Historic Houses and Palace Museums: Assessment Methodologies and Applications

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and the Research Centre
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Field Experiment to Study Responses of Objects to Variations in Climate

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Abstract

Object deterioration is affected by climate, but also a variety of object-related factors, such as the type of construction and existing damage. Investigations using new material and mock-ups are limited in their applicability to characterize in-situ damage of real objects. This means that making preservation decisions remains a complex and uncertain task.

In order to deepen understanding of damage to collections, a selection of real, non-accessioned objects were exposed to different climatic conditions over time. This allowed observed or recorded changes to be directly related to climatic conditions, providing greater insight into deterioration and preservation management.

The environments were controlled, but developed to simulate in-situ conditions with increasing intensity. This approach narrows the gap between laboratory research and the practicalities of display environments. The objects were housed in a room with precise climatic control, so each object was exposed to the same ambient climate (as they would be on open display).

The climatic conditions were adjusted, moving from object equilibrium at 20 °C and 50% RH to periods at 65% RH, 40%, 30% and 20%. Each time the conditions were held until equilibrium was reached (approx. 4 weeks), and each time returning to 50% RH (until equilibrium was reached) before moving again.

Objects were chosen to represent a variety of object types and assemblies. Their responses were monitored with high precision dimensional measurements and photography (14 objects), and acoustic emission (6 objects) allowing for direct tracing of micro-damage development. This provided the opportunity to examine how these approaches could be used in cultural institutions, and the extent to which their data could be linked.

Although the sample of objects was small, the study has provided insight into responses of historic objects to changes in relative humidity that have implications to possible broadening the acceptable range of climate fluctuations for museum collections.

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