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**Title:** Preventive Conservation: a Key Method to Ensure Cultural Heritage's Authenticity and Integrity in Preservation Process

**Year:** 2012

**Version:**

**Please cite the original version:**

Wirilander, H. (2012). Preventive Conservation: a Key Method to Ensure Cultural Heritage's Authenticity and Integrity in Preservation Process. e-conservation magazine, 6(24). <http://www.e-conservationline.com/content/view/1081>

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**PREVENTIVE CONSERVATION**

*A Key Method  
to Ensure Cultural Heritage  
Authenticity and Integrity in the  
Preservation Process*

*By  
Heidi Wirilander*

*This article studies the role of preventive conservation in cultural heritage preservation. It shows through cultural heritage theory and conservation professions development process how important part preventive conservation has had and still has in cultural heritage preservation and damage prevention. Preventive conservation is a multidisciplinary orientation that uses indirect measures and actions to avoid or to minimize future deterioration or loss of cultural heritage. Conservation professionals should recognize its importance as the most effective method in promoting the long-term preservation of cultural heritage. Therefore, preventive conservation should be the basic theoretical perspective in all cultural heritage preservation. It can and ought to be used in the entire field of cultural heritage and maintenance work because it considers all the circumstances that may cause deterioration of cultural heritage. Additionally, it is the key method of ensuring that cultural heritage is preserved as authentically as possible through cultural heritage management and care.*

## Introduction

Cultural heritage represents society's collective memory and its self-image [1]. Society's heritage also possesses a universal perspective. This is a matter that concerns all mankind because all the nations' cultural heritage can be seen as part of the world's cultural heritage [2]. Preservation of cultural heritage has been seen as a moral responsibility in societies because it maintains and strengthens a nation's identity and understanding of its past. In general, preservation and conservation of cultural heritage aims to safeguard the existence of cultural heritage of all mankind [3]. The preserved cultural heritage from different centuries indicates that societies have valued aspects of both their past and contemporary cultures: all the cultural phenomena are first contemporary culture and if they are valued and preserved they may become past culture representatives.

Societies have also actively ensured the transmission of its valued cultural features to the future generations: institutions such as museums, libraries and archives were established to preserve their heritage [4]. Cultural heritage is used in societies to construct and reconstruct identities and multiple cultural and social values [5].

The concept of cultural heritage is always a result of definition and evaluation based processes [6]. International cultural heritage conventions and legislation (Table I) play a significant role in establishing the frameworks through which social cultural elements and features are evaluated at national level. This criterion is used by organized societies cultural heritage professionals and institutions in determining the valued elements in the nation culture and past [7]. International conventions and legislation have a significant part in the cultural heritage process [8]. Table I presents international conventions that have influenced the norms through which the concept of cultural heritage is evaluated.

There are two main criteria in the evaluation process, authenticity and integrity of cultural heritage, which arise from UNESCO's World Heritage Convention (WHC) that started the List of World Heritage Sites [1]. Integrity comes from the operational guidelines of WHC from 1977. Integrity is used in measuring the wholeness and intactness of natural or cultural heritage sites [9] and it has been defined as the object's continuing significance over time [10]. The concept of authenticity is a creation of cultural identity that consists of comprehensive cultures and communities

Table I. Cultural heritage conventions that have influenced the norms through which cultural heritage is evaluated.

Convention	Institution	Year
European Cultural Convention	European Council	1954
Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict	UNESCO	1954
Charter of Venice	ICOMOS	1964
World Heritage Convention	UNESCO	1972
Nara Document on Authenticity in Relation to the World Heritage Convention	UNESCO	1994
Second Protocol for the Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict	UNESCO	1999
Convention on the Protection and Promotion of the Diversity of Cultural Expressions	UNESCO	2005
Framework Convention on the Value of Cultural Heritage for Society	European Council	2005

in societies [1]. Authenticity is often defined as being genuinely and exactly what is claimed to be [11]. The World Heritage Convention gives parameters through which the authenticity of cultural heritage can be evaluated using the "test of authenticity". This test is used in WHC to justify nominations to the World Heritage List. There was a need to study the meaning and applicability of authenticity dimensions in WHC context and, therefore, UNESCO's World Heritage Committee's eighteenth session published *The Nara Document on Authenticity in Relation to the World Heritage Convention* in 1994, which was drafted at the conference with the same name in Japan in November 1993. The purpose of the Nara document was to clarify the dimensions of authenticity in different cultures in WHC relation [12].

The test of authenticity creates a picture of genuine cultural heritage in the World Heritage Convention. In this test, the first criterion is that the work of human creativity is genuine and it stands on its own merits. The second criterion is that the authentic work refers to testimony or is a representative sample of true cultural tradition. The third criterion is that the authenticity refers

to the interchange of values or ideas and that the interchange of values has originally taken place in the cultural heritage site in question [12]. According to the Nara Document, authenticity is defined as an essential element in defining, assessing and monitoring cultural heritage. The document asserts that an object's authenticity originates from a specific cultural context that should be evaluated to confirm its existence [13].

The Nara Document on Authenticity also declares that the diversity of cultures and heritage are irreplaceable sources of intellectual richness of humankind and, therefore, should be protected. The document states that diversity in cultural heritage exists in modern societies and its survival demands respect for other cultures and all aspects of their belief systems. Authenticity is linked to a large variety of information sources on cultural heritage. Relevant information on authenticity enables evaluation of the form, design, materials, use, function, traditions, techniques, location, setting, spirit, feeling, as well as internal and external factors of cultural heritage. These factors define the originality level of cultural heritage [13].



Even though international conventions and legal instruments create the frame through which cultural heritage is defined and evaluated globally, the applications that select the cultural elements of societies for the cultural heritage process are managed at national level. The cultural heritage process at the national level represents the nation's vision of its significant history and cultural elements. This process of definition results in that cultural heritage has a significant role in the construction of national identities and commonly appreciated cultural customs [7].

Cultural heritage has sometimes been seen as a way society has to preserve its cultural values. The ability of an individual people to understand these values depends on the amount and the quality of information that is produced in the cultural heritage process [13]. Additionally, the concept of authenticity has sometimes become an indicator of shifting tastes that change through generations and times [1]. The credibility and truthfulness of the values connected to cultural heritage can be revealed by evaluating society's history [13].

The concept of authenticity can also give rise to phenomena that influence negatively the process of cultural heritage. Cultural identities are sometimes presented through aggressive nationalism, which strives to eliminate minority cultures in societies [13]. When true authenticity is at risk, the credibility of cultural heritage is lost [11]. Therefore, the meaning of authenticity in the preservation of cultural heritage is to illuminate the collective and diverse nature of the memory and history of society [13].

The concept of cultural heritage began to broaden after the World Heritage Convention (1972). Cultural heritage began to include both human and natural environment as well as architectural

and archaeological sites. Cultural heritage could exist in countryside landscapes and in urban and industrial sites [8]. New museology tendencies have defined cultural heritage as a representation of contemporary society values. It produces information that creates a vision of cultural elements chosen to be part of cultural heritage and others that have been left out [14]. According to Tomislav Šola, cultural heritage is always an expression of society tradition and values. Šola's general theory on heritology affords the understanding on the background and meaning of cultural heritage and the objectives of heritage professionals. This results in that the concept of cultural heritage is influenced by memory institutions, their visions and missions, as well as their position in society [15].

UNESCO released the Universal Declaration on Cultural Diversity in 2001. This document recognized the multiform nature of culture in time and space. According to it, versatile nature of culture can be reached through unique and plural groups identities, which make up human societies. Cultural diversity was declared to be as important to humankind as biodiversity because it is a source of cultural exchange, innovation and creativity [8]. Therefore, cultural heritage process should be as open and democratic as possible, engaging different groups and entire societies in the cultural heritage definition process.

### **The Tradition of Preservation**

Conservation means to keep and to preserve [16]. Conservation of cultural heritage has, in all its forms and history, pursued the preservation of values that are attached to the features of heritage [13]. The aim of preventive conservation at minimizing deterioration and loss of cultural heritage has a long history and tradition in societies. This is

evident in the long standing practice of cultural heritage protection such as buildings, sculptures, aesthetic objects and work of art from fire, floods, rainwater, earthquakes, insects, mould and high humidity [17]. The tradition of preservation is much older than the modern conservation history.

The *De Architectura (On Architecture, published as Ten Books on Architecture)* by Marcus Vitruvius Pollio, written around 15 BC, recorded the expertise about roman materials, techniques and construction processes. The work of Vitruvius was followed in the 15<sup>th</sup> century Italian Renaissance by Leon Battista Alberti in his *De Re Aedificatoria (1452, On the Art of Building)* [18]. Simon Lambert introduces the idea that there are written documents from around the seventeenth century that discuss the idea of protecting cultural heritage from damage and further destruction [17]. One of these instances was the conservation projects of the frescoes by Raphael in Rome in 1659 and 1702, which were documented thoroughly. Prevention methods were used in these intervention projects to avoid damages to the frescos during the conservation works [17]. According to Lambert, conservation professionals in the late 18<sup>th</sup> and early 19<sup>th</sup> centuries also understood the possibility that certain treatments themselves could cause harm to cultural heritage. As an example of this, Lambert [17] brings up Pietro Edwards' writings from 1777 [19] and 1798 [20]. Pietro Edwards was the director of Restoration of The Public Pictures of Venice and Rialto and managed the painting restorers and inspectors. Edwards was against highly invasive interventions and ensured that the preventive care methods were applied to entire collections during restoration works [17].

Simon Lambert states that one of the earliest written documents on preventive conservation applications were introduced in Casper F. Neickel's *Museographia*, a guide to museums, galleries and

libraries in Europe published in 1727. In his guide, Neickel provides instructions on how to avoid moisture problems, how insect pests should constantly be monitored for, and how damages to the exhibits can be avoided through careful planning. Additionally, Neickel listed 25 rules<sup>1</sup> for collection care that resemble modern methods [17].

Protection of cultural heritage has often meant planned activities that included regular monitoring and maintenance of objects. In 16<sup>th</sup> century England, care of cultural heritage was introduced through the idea of "housekeeping". Housekeeping guidelines were given to maintenance and management personnel and included practical advice and recommendations about dust, humidity, heat, light, insect control and even damage that could be caused by abrasion [17].

### Modern Conservation

According to Jukka Jokilehto, the theoretical foundations for modern conservation gave John Ruskin and the anti-restoration movement in mid and late 19<sup>th</sup> century. The anti-restoration movement criticized restoration architects for destroying the authenticity of historic buildings and fought for the protection, conservation and maintenance of the authentic values in buildings. Although Ruskin did not write a theory for conservation practise, he identified the values and significance of historic authenticity in buildings and objects. Ruskin's guiding principles in identification were: sacrifice, truth, power, beauty, life, memory and obedience [21].

<sup>1</sup> Neickel's guide included for example guidance in object handling and theft prevention.

<sup>2</sup> The International Museum Office was a body of the Leagues of Nations that existed before UN [4, p. 2].

Progress in scientific research in the beginning of the 20<sup>th</sup> century also provided new means that could be applied to cultural heritage preservation [17]. It may be considered that modern conservation started in 1930, when the International Museum Office<sup>2</sup> organized the first International Conference for the Study of Scientific Methods for the Examination and Conservation of Works of Art. Once the United Nations (UN) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) were established, the International Museum Office was integrated with the International Council of Museums (ICOM) in 1946. The International Council on Monuments and Sites (ICOMOS) was founded by UNESCO in 1965 [22]. The first international measure for conservation practice was given in 1931 in the Athens Charter. This charter later inspired the second measure setting document, the Venice charter in 1961 [23].

The conservation profession began to develop in Europe and in the United States during the 1950's and 1960's [24]. The incentive behind this development was the rising concern over lack of control over treatments carried out by poorly trained conservation technicians and artisans [24]. The history of organized conservation training begun in 1956 when UNESCO established the Rome Centre which started working three years after the initial proposal in 1959. The Rome Centre has been known as ICCROM since 1977 [25]. Since the early 1980's many countries have established their conservation training at higher education institutions, mostly at universities [22].

The International Institute for Conservation of Historic and Artistic Works' (IIC) American Group presented its first set of guidelines and standards in the field of conservation in 1963 in a document known as the Murray Pease Report. A code of professional ethics was later added to this

document and it was published as *The Code of Ethics and Practice* in 1979 [24].

Standards in conservation are based on past experiences and current knowledge. The objective was to improve the preservation of cultural heritage and maintain its usability [24]. According to Rebeca Alcántara, the use of standards was introduced in the field of conservation through recommendations for preservation of collections in the late 1940's. These standards gave recommendations for suitable levels of relative humidity, temperature and light. During the 1960's, these early recommendations began to be used by the word standard in relation to preventive conservation measures. The earliest standards concerning preventive conservation were Robert Fuller's *Standards of Exposure to Light* (1963) and Nathan Stolow's *Standards for the Care of Works of Art in Transit* (1981) [24].

In the 1970's, the theoretical concepts of conservation started to evolve into appreciation of minimal intervention in the care of cultural heritage objects, which influenced the fast development of preventive conservation theory. This development and the re-evaluation of the reversibility question resulted in minimalist tendencies becoming dominant in conservation [25]. This progress made preventive conservation methods more precise and extensive [26].

### **Theory of Preventive Conservation and Risk Management**

The intention of conservation is to safeguard the authenticity and the integrity of cultural heritage [27]. It uses all measures and actions to ensure the accessibility of cultural heritage in the present and future times. Conservation prevents or retards the deterioration of cultural heritage by controlling

the environment and item's structure to maintain the items as unchanged as possible [28]. According to the latest definitions, conservation includes preventive conservation, remedial conservation and restoration. All measures and actions in conservation respect the significance and the physical properties of cultural heritage item [29].

Preventive conservation actions are taken in the context or surroundings of cultural heritage object or group of objects. The measures and actions are indirect and should not interfere with the objects structure and materials. Preventive conservation methods do not modify the appearance of object. Remedial conservation actions are all those directly carried out on an item or group of items. According to ICOM-CC, remedial actions should be carried out when the objects are so fragile and deteriorated so severely that they could be lost in a relatively short time period if left without treatment [29]. Remedial conservation actions may also sometimes modify the appearance of the objects. Restoration actions are applied to a single item when it has lost part of its significance or function because of past change or deterioration, although it should be always based on respect for the original materials. Restoration actions often modify object's appearance [29].

The actions and measures of conservation have been organized according to four criteria. First of all they target future, current and past deterioration. Secondly, they influence the materials and structures of the cultural heritage items both directly and indirectly. Thirdly, they can be applied to only one object or groups of objects. The fourth criterion evaluates conservation actions by evaluating whether these actions can be seen or not on the cultural heritage item [30]. Preventive conservation is more than a technical set of methods of monitoring and adjusting climate,

light and handling conditions to non-destructive levels, it seeks answers to questions of how and why cultural heritage is preserved [17]. Preventive conservation activities also include learning from prior traditions and experiences in collection care [18].

Scientific research on the factors that cause deterioration in cultural heritage have made possible to apply more specific methods of preventive care in collection management [31]. Planning based preventive conservation applications are also a cost-effective way to reduce deterioration and to maintain integrity and authenticity of cultural heritage [32]. The theory of preventive conservation is strongly influenced by the concept of non-interventive approaches [25]. This theory also provides tools for the development of damage prevention in catastrophic situations and daily maintenance of cultural heritage sites.

Barclay Jones defined two deterioration mechanisms that threaten cultural heritage: the factors that slowly deteriorate cultural heritage materially, and the incidents that rapidly and catastrophically destroy cultural heritage in a very short time period [33]. Slow deterioration of objects over a long time period is generally caused, for example, by environmental, storage material or place of storage issues. Rapid and catastrophic damage in cultural heritage are caused by, for example, water damages such as floods, fires, sabotage, natural disasters, terror attacks or acts of war [34].

There are two important aspects to preventive conservation, the technical and the organisational aspects. The technical aspect deals with monitoring and controlling the collections. The organisational aspect involves people who are working with cultural heritage or who are in contact with



it [35]. At the institutional level the preventive care begins with the collection policies and the means of collection management [31]. To work effectively, preventive conservation methods require multidisciplinary approach and awareness in everyday actions. The organizational level in preventive conservation should be viewed more broadly especially in the cases of cultural heritage sites and landscapes. In these cases, the preventive conservation process should involve all people and entire communities that live nearby the cultural heritage site [32].

Simon Knell has presented the idea that there are four scientific research levels when preventive conservation methods are developed to protect cultural heritage [36]: at the first stage, parameters of the factors threatening the cultural heritage are listed and evaluated; at the second level the significance of the listed safety threats are evaluated; the third step in the development process is to find methods to estimate the effects of these threats on cultural heritage; and the fourth level in the development process is to apply methods to remove the collection safety threats.

The main risk factors for collections are found in indoor storage environments. These factors are climate, gases, pollution and microbiological factors. Significant risks in indoor climate relate to inappropriate humidity, temperature and light, and it is affected by wall thickness, air leakage, ventilation system, heating, solar radiation and the number of visitors. The amount of outdoor pollens in indoor environment depends on the building's ventilation system. Microbiological attacks in indoor environment are related to the temperature and relative humidity of the air [35].

Risk assessment and risk-based models have been increasingly applied to preventive conservation field since the 1990's [37]. Jonathan

Ashley-Smith's *Risk Assessment for Object Conservation* that was published in 1999 is a fundamental publication in the field of risk assessment.

According to Robert Waller, risk analysis, material research on cultural heritage items and more precise definition of deteriorative parameters effects on cultural heritage have enabled the use of risk management applications in preventive conservation methods [37]. This has made the evaluation of potential damages and threats to collections very effective. Evaluation does not concentrate on existing damage when setting overall priorities for the preservation [36]. Risk assessment is always based on surveys evaluating the collection condition. Otherwise, the chosen treatments to manage the collection are not targeted specifically to what is affecting it at the moment and what might affect it in the future [38].

Minimal intervention can be examined individually for each item in the collection as well as for one entire collection inside a large and diverse collections complex. This conservation approach can sometimes be considered problematic if an item is important from both cultural history and aesthetic standpoint. Minimal intervention treatments can sometimes focus on short-term results on individual object's deterioration. Long-term effects on the object's aesthetic appearance might fail in this preservation process. Minimal intervention approach has also been seen as problematic from the collection's accessibility perspective. For example, this has sometimes meant that objects are considered unfit to be loaned or displayed because of their poor condition [25].

According to Joel Taylor, integration of the collection condition study and risk assessment has made possible to establish a probable cause of damage in addition to the type of damage. Robert Waller introduced the idea that the format of risk assessment can be based on the following

mathematical formula of risk:  $P \times FS \times E \times LV$ , where P stands for probability of damage, FS is the fraction of the collection susceptible to damage, E stands for the extent of damage, and LV the expected loss of value in the collection [38]. This risk assessment makes possible to identify the methods of control. Robert Waller presents three general methods of control in collections risk management: to eliminate the source of risk; to place a barrier between the source of the risk and the collection; and to act on the agent responsible for the risk [26].

Risk assessment and risk-based applications in preventive conservation have enabled mathematical modelling<sup>3</sup> of environmental conditions in historic buildings from the early 2000's. The computer model is not only used to simulate the historic building's environmental conditions, but also to predict the effects a single change might have on the preservation process of the collection [39].

## Conclusions

The extent of cultural heritage and collections in memory institutions that ought to be preserved is growing rapidly. It is not possible to secure cultural heritage through individual item's remedial conservation now or in the coming years. Although all three aspects of conservation have their place, it is the preventive conservation applications that will secure the future of cultural heritage.

Through all the theories on cultural heritage evaluation and preservation ethics presented, it

is prudent to say that the ethics of conservation support the idea of minimal intervention tendencies. All the ethical principles of conservation support the idea that treatments should be performed using a minimalist approach. Conservation treatments, both interventive and non-interventive, should therefore be based on the needs of the items to secure their values and functions. In order to keep the integrity of cultural heritage objects intact, these items should be preserved through preventive conservation methods so carefully that the remedial conservation actions could be avoided or minimized.

Preventive conservation is likely the only theoretical approach in conservation that enables preservative actions to reach entire cultural heritage sites or collections at the same time. Because preventive conservation actions are indirect and they do not interfere with the structure and materials of objects, it best preserves the objects' authenticity and integrity.

All the conservation treatments that are directly carried out on an item have influence in its materials, raising the question of reversibility. The conservation treatments may later on lead to more complex problems from the preservation and re-treatment point of view. Preventive conservation is the only conservation approach which does not raise concerns about the treatments reversibility of an object. The reason for this is that preventive conservation operates on the object own material degradation process.

Today, the concept of continuous preventive conservation and risk management has a leading role in many organisations' conservation strategies for cultural heritage. Minimal intervention has proven to protect the historical integrity and authenticity of objects and provided the possibility of re-treatability. Planning based

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<sup>3</sup> Changing parameters in this modelling are such as indoor environment, air quality, pollution, decay and human interaction.

preventive conservation and risk management has proven to be a cost-effective way to maintain the value of cultural heritage. Cultural heritage items will preserve their integrity and authenticity the best way possible by avoiding or minimizing deterioration. A deteriorated item that has been conserved using remedial conservation treatments does not reverse its deterioration even if the item's condition is stabilized.

Preventive conservation approach should be expanded to a wider range of activities that might have an impact on the preservation of cultural heritage in the future. Preventive conservation theory provides large scale of areas in which preventive conservation based models could be developed and applied to improve the preservation of individual items and enlarging collections. Growing understanding of the deterioration processes plays an important part in this development process. One of the areas where preventive conservation applications could contribute significantly is the maintenance and basic cleaning of outdoor museums and historic buildings. These sites are in intensive use and have to be continuously maintained by using various cleaning methods.

### Acknowledgements

I would like to thank the Jenny and Antti Wihuri Foundation, Alfred Kordelin Foundation and the Department of Art and Culture Studies of the University of Jyväskylä for financial support and funding of my PhD research. Valuable comments on my article have been given to me by my PhD supervisors professor of arts education Pauline von Bonsdorff and professor of museology Janne Vilkkuna both from University of Jyväskylä. My sister Heli Wirilander-Crotty has been a great help in proofreading my English translation.

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Heidi Wirilander is a textile conservator. She holds a BA (2004) and a MA (2008) in Conservation at EVTEK, Finland and a MA (2010) in Museology at the University of Jyväskylä, Finland. In addition, she possesses qualifications to supervise and plan maintenance and basic cleaning measures in outdoor museums and historic buildings. Heidi works as an entrepreneur in the area of conservation in Helsinki Finland and works on her Ph.D. studies in museology at University of Jyväskylä. Heidi's Ph.D. thesis discusses preventive conservation of cultural heritage collections and collection management issues in catastrophic situations, covering 19 incidents that have occurred in Finland between 1990 and 2010. She is a member of ICOM (Finland), ICOM-CC (textiles working group and preventive conservation working group) and IIC the Nordic Group Finland (NKF Finland).

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**No. 24, Autumn 2012 LICENCE**

**ISSN: 1646-9283**

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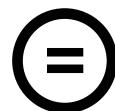
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