Journal of Cultural Heritage xxx (2017) xxx–xxx

Available online at
ScienceDirect
www.sciencedirect.com

Elsevier Masson France
EM|consulte
www.em-consulte.com/en

Review

Review of preventive conservation in museum buildings

Elena Lucchi *

Politecnico di Milano, 9, via Bonardi, 20133 Milano, Italy

ARTICLE INFO

Article history:
Received 19 September 2016
Accepted 4 September 2017
Available online xxx

Keywords:
Museum buildings
Conservation history
Preventive conservation
Human comfort
Energy efficiency

ABSTRACT

The paper presents a critical review of preventive conservation in museum buildings. It summarizes theories and approaches spanning from fifty years (1965–2016) in Europe, Canada, and US. From a wide range of bibliography (110 publications composed by books, guidelines, researches, and other documents), the study wants to identify recurring topics in different historical periods, geographical countries, and cultural approaches. Main fields of action of preventive conservation regard: damage preservation and environmental management; architecture and exhibit design; environmental and energy simulations; monitoring, recording and controlling of the environmental agents; management and training. Particularly, the consciousness of the importance of the environmental impact on museum buildings, introduced a broad debate on the definition of the standards for minimizing and assessing heritage risks, considering single factors (light, temperature, relative humidity, and indoor air pollution) and their cumulative effects. The attention on energy efficiency started from the last decade, focusing mainly on energy audit, modelling, and retrofit of historic buildings. Generally, these works are not specific for museums but, anyway, criteria, methodologies, monitoring procedures, simulation models, and technical solutions are suitable also for museum buildings. The design has central role both for passive and active indoor control. Besides, everyday management, regular maintenance, and training are considered key actions for promoting safeguard, users' comfort and energy efficiency. The research aims to serve as a reference for technicians and conservators to amplify and to ordinate their knowledge in the field of preventive conservation in museum buildings.

1. Introduction

"[...] Conservation today is a complex activity. Just a few years ago it was much simpler, and some decades before that, it did not even exist" ([1], p. 1). Today, the conservation activities play an important role for transmitting the "meaning" of cultural heritage. They influence the appearance, the materials, and the structures of cultural items [2]. The International Council of Museums (ICOM), authoritative on matters of cultural heritage and museum buildings, defines the conservation as: "[...] all measures and actions aimed at safeguarding tangible cultural heritage while ensuring its accessibility to present and future generations" [3]. Particularly, three forms of conservation are introduced: "[...] conservation embraces preventive conservation, remedial conservation and restoration" [3]. These activities are target to "future", "current" and "past" deteriorations:

- "preventive conservation" aims at avoiding and minimizing "future" losses;
- "remedial conservation" aims at arresting "current" damage or reinforcing the structure while;
- "restoration" aims at refurbishing "past" alterations. In all case, conservation is no longer an action for conserving truths, but is a decision on the meanings of cultural assets [1].

Referred to the "future", preventive conservation is essential to minimize decay, enhance cultural features, and valorize economic values of the heritage. Historically, it is mainly applied to museum buildings, the places dedicated to preservation, enhancement and transmission of cultural values. In the last century, the need of the integration between the conflicting requirements of safeguard and tourism promotion has developed an international notion of "museum", considered as a dynamic place with different roles [4]. Beside the traditional functions of research, preservation, display, management, and storage, new activities and spaces arose, related to marketing, communication, education, and tourist entertainment (e.g. conference rooms, laboratories, bookshops, libraries, play zones, restaurants, cafeterias, and shops) [5]. This situation complicated a lot the environmental conservation of the heritage.

* Correspondence. EURAC Research, 1, viale Druso, 39100, Bolzano, Italy.
E-mail address: elena.lucchi@polimi.it

http://dx.doi.org/10.1016/j.culher.2017.09.003
1296-2074/

Preventive conservation includes any strategies, actions, skills, and judgments to balance heritage protection and public access [3,6]. Its plan for a museum building involves a variety of topics, in order to assure damage minimization, free access, users' comfort, energy efficiency, public enjoyment, communication, education, and safety precaution. It requires the achievement of the right equilibrium between a number of complex and frequently contradictory environmental parameters. Damage causes the progressive loss of tangible and intangible artifacts, related to physical properties, significance, economic value, and social-educative role [3]. Thus, care of building and collection needs a strict control of light, air temperature, relative humidity, and pollutants for minimizing losses and ensuring long-term control of indoor conditions. This situation often imposes the use of lighting and air-conditioning systems, with consequently high-energy consumptions [2,5,7–11]. Vice-versa, free access, tourist visitation, and cultural learning require appropriate comfort levels for the occupancies [12–16]. However, it has been experienced that the over-visitation of the monuments may catalyze the deterioration, due to variable environmental conditions, improper handling, air and indoor pollution, impact of HVAC, and so on [16]. Furthermore complex activities (i.e. restoration, didactics, selling, cleaning, and maintenance), laboratories (tanning, taxidermy, and embalming), food areas, and gardens may generate microclimatic instability and pollutants [5,12,13,17,18], not always compatible with users' comfort. Finally, the museums have an important educational role for citizens and visitors related to environmental sustainability and energy efficiency [7,13]. Therefore, preventive conservation is the best sustainable and cost-effective strategy to reduce energy demands and operative costs, without jeopardizing conservation and human comfort.

2. Aims and methodology

The paper presents a review of preventive conservation in museum buildings. Given the complexity and the extension of the topic treated, we are aware that a complete and exhaustive presentation of all topic is not possible. The paper tried to define a historiography of preventive conservation, departing from de Guichen's [19], Lambert's [20,21] and Muñoz Viñaz's [1] theories. After introducing the early history of preventive conservation, the research summarizes finding spanning from 1965 to 2016, trying to outline a critical historiography through pioneering studies and strategic theories with different approaches. Fifty years of its history are summarized, simplifying the technical aspects and considering a great variety of bibliography (more than 110 publications and 40 Internet sites in English, Italian, and French). It contains a wide range of publications, composed by books, guidelines, conference and scientific papers, standards, legislations, and other materials elaborated by European researches, museum institutions, and associations. The selected literature is written mainly in English, Italian, and French, due to the accessibility of the papers and the understanding of the languages. Furthermore, many Swedish, Danish, and Dutch studies on this topic has been translated in English. In addition, English is the language commonly used in scientific papers, both for journals and conference papers. We looked also for Spanish texts, but we do not find interesting texts accessible by the Internet sites. We looked for publications on this topic in Asia, discovering a very different approach oriented mainly to restoration, renovation, and reconstruction instead of conservation. Thus, we decided not to consider these publications. Clearly, taking into consideration German, Swedish and Danish languages, the selected bibliography would be wider. Also, the accessibility to museum publications and old books conserved in local libraries can further develop this research. This situation may exclude relevant contributions at national level not translated in English. In addition, it may omit the field not used to publish in English (i.e. humanities, social and legal fields). Thus, we hope that the research will be expanded considering other studies, especially from the countries that worked extensively on this subject (i.e. Germany, France, Netherlands and Sweden). Aware of these limits, the study wants to identify recurring topics in different historical periods, geographical countries (mainly Europe, Canada, and US), cultural approaches, and so on. The research neither means to be exhaustive or definitive, but simply aims to serve as a reference for technicians and conservators to amplify and to ordinate their knowledge in the field of preventive conservation in museum buildings.

3. Overview on preventive conservation theories

The early literature on conservation of cultural heritage was characterized by the progressive integration of science into conservation activities, providing instructions to avoid moisture, insects, and pest problems through a careful planning of the indoor environment [2,15,20,21]. Lambert [21] described a cohesive body of knowledge emerged in England during the XVI Century known as "housekeeping". It consisted in practical advices for the maintenance and the staff management, to control the indoor climate in estate homes. The parameters considered were light, heat, humidity, insects, dust, and damage. Thus, the first literature encourage maintenance, continuous care, and management as important action for preventing the damage of heritage. Lambert [21] found also several examples from the XVII Century that reveal a preoccupation for the protection of cultural heritage from further damage or restoration treatments. Muñoz Viñaz [1] revisited the tenets of the classical theories ranging from XVIII to XX centuries, augmenting concisely the early history of the contemporary theory of conservation. He introduced the set of norms defined by Pietro Evans in the XVII Century (1777) for preventing the excess committed by the restores in the Venetian paintings (i.e. use non corrosive products, no cover the lacunas in old paintings, . . .). Today, these advices were an important point for setting out the criteria of minimum intervention and physical compatibility between heritage and restoration activities. The fundamental debate on conservation Eugène Viollet-le-Duc and John Ruskin signed two different visions of restoration and preservation. First, Viollet-le-Duc authorized to "fill-in-the blanks" ([1], p. 4) for not completed monuments and buildings. On the contrary, Ruskin criticized the work made for rebuilt damaged buildings [1]. He disapproved the restoration process for destroying the authenticity of heritage buildings and disturbing the original remnants. He and his "anti-restoration movement" fought the continuous maintenance as fundamental for limit damage and restoration activities: "[. . .] take proper care of your monuments and you will not need to restore them" ([22] p. 196). Other theories tried to balance between the extremes proposed by Ruskin and Viollet-le-Duc (i.e. Camillo Boito, Beltrami, and Gustavo Giovannoni), but "[. . .] no single theory managed to clearly triumph over the others" ([1], p. 5). These theories created considerable divergences between "conservation" and "restoration" activities. For this reason, several institutions focused their activity on the normalization of the restoration principles, promulgating "Charters" and normative documents. The publication tried to compare the work of scientists and technicians. The first document was the Athens Charter [23] published in 1931, which was followed by several contributions [24–26]. Particularly, the Athens [23] and the Venice [24] Charters influenced the thinking on cultural heritage in many countries, providing the basis for a new approach based on the conservation principles.

After these less sporadic cases, the idea of "cultural heritage protection" changed significantly in the last century [20,21,23,26–28].

Please cite this article in press as: E. Lucchi, Review of preventive conservation in museum buildings, Journal of Cultural Heritage (2017), http://dx.doi.org/10.1016/j.culher.2017.09.003