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Role of museum environment for textile conservation and restoration

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Abstract
Textiles are an important part of our culture. Future historians will examine the textiles of today to find out about whom we are, how we live and what we value, just as we look at the textiles of previous generations to find out about them. The conservation and restoration of textiles refers to the processes by which textiles are cared for and maintained to be preserved from future damage. Museum environment plays an important role to maximize the life of textiles. The chief cause for decay in textiles is almost always the environment in which they are displayed and stored. Light, temperature and humidity can all contribute to a textiles health or deterioration, depending on their intensity. Additionally, pests, chemicals and pollutants may also cause damage to antique textiles. Airborne chemicals, such as smog or cigarette smoke are also harmful to textiles, and should be avoided if at all possible: high efficiency air filters should be installed throughout the building to reduce the airborne chemicals that may stain, discolour or weaken textiles.

Keywords: Museum environment textile conservation, restoration, antique textiles, relative humidity, light, pests, pollution

Introduction
Museums collect and care for objects of scientific, artistic or historical importance and make them available for public viewing through exhibits. Museums form the treasure of the country. It throws light on the cultural heritage of that country. Environmental factors like relative Humidity, temperature light, insects, pests and pollution deteriorate, decay or degrade the organic or inorganic objects, so control of basic museum environment plays an important role to increase the life of the antiquities preserved.
Antique textiles and costumes can be maintained for years of use and enjoyment provided that some basic attention is given to their care and preservation. The first step in the care of collection is to understand and minimize or eliminate factors that cause damage. The second step is to follow basic guidelines for handling, display, storage and cleaning.

The Nature of Textiles
Most antique textiles are composed of natural fibers that may include wool, cotton, linen or silk. Nature of fibers, their composition, and their physical, chemical and biological characteristics are very important in conserving the textiles.

Causes of Deterioration
There are varieties of factors that contribute to the degradation of textiles. These factors include poor environment, pollution, inherent stability and careless handling, in addition to inappropriate storage, display and cleaning.

Environment
The chief cause for decay in textiles is almost always the environment in which they are stored. Light, temperature, and humidity can all contribute to a textile's health or deterioration, depending on their intensity. Additionally, pests, chemicals, and pollutants may also cause damage to an antique fabric. Control of museum environment is of prime importance for good conservation of all museum articles.

Basic control of the museum environment

1) Relative Humidity and temperature
2) Light
3) Pests
4) Pollution

1. Relative humidity and Temperature

Extreme fluctuations in the temperature and humidity damage the textile fibers. In the museum environment relative humidity should be maintained between 50-55%. If RH drops very low, brittleness of the fibers increases & elasticity of the fibers decreases. RH above 70% are dangerous because moulds and fungi get favourable dampness to grown in this condition. These changes decrease resiliency, elasticity and strength of the fibres. Ideal temperature is between 65-70° F. Temperature can be controlled with central heating and air conditioning system. Humidity can be modified with humidifiers or dehumidifiers.

2. Light

One of the greatest threats to textiles in the museum environment is light. The worst damage is caused by ultraviolet (UV) radiations from natural day light and from fluorescent light bulbs, however, while the UV rays damage most rapidly, the entire light spectrum causes textile dyes to fad and the fibers to become brittle. There is some protection in keeping window shades pulled down or shutter closed during the sunniest times of the day. UV filtering materials or films can be placed over windows and fluorescent bulbs and used in glass or Plexiglas framing textiles. Display textiles for limited period to avoid lighting. Visible light is also harmful, although to lesser degree than UV, it must also be controlled. An illumination value which is currently being recommended to museum allows a maximum of 150 LUX for moderately sensitive and not more than 50 LUX for very sensitive objects.

3. Pests

Pests are another significant threat to textiles collection in museum, as there are number of insects and microorganism that can cause damage to fibers. Among the most common are clothes moths, carpet beetle, silverfish, firebrats and rodents. Clothes moths are attracted to protein fibers and so are especially drawn to textiles made of silk, wool and feather. Silverfish and firebrats consume starch, usually found in sizing or other treatment applied to fabrics as well as cellulosic fibers. In all the cases, chemical means of pest control should be avoided if possible, not only due to harm to humans who come in contact with them but the chemical may cause damage to the textiles. Insecticide and fungicides should be used only, if other methods of preservation fail. Compounds should be used by checking their compatibility with the textiles concerned. Good Housekeeping, regular inspection and vigilance provide a sound base for the control of undesirable insect pests and microorganism in collection of textiles.

4. Pollution

Air Pollution is also an enemy of textiles. The two major type of pollutants are gases and particulates. Gaseous contaminant Sulphur-dioxide, Nitrogen oxide, peroxides and ozone. Damaging effect of sulphur-dioxide applies strongly to cellulosic textiles. In the presence of trace of iron and many other metals, SO_2 is oxidized to sulphuric acid. This sulphuric acid degrade the cellulosic materials. SO_2 can be removed from museum air by passing the air through an activated carbon filters or by water spray. Ozone is detrimental to many organic materials. Gaseous contaminants can be removed by chemical filters, wet scrubber, or combination of both.

Textiles and costumes are particularly susceptible to the dirt present in the atmosphere. It embedded in the fibers, degrade it and become difficult to remove. All suspended dirt and dust particles can be removed by [1] either forcing the air through tiny passage as in a fabric or foamed plastic filter [2] By electrostatic precipitation but this is not recommended for museum exhibiting textiles and the organic materials because of small amount of ozone and nitrogen oxide which they produce fabric filters removes more than 99% of incoming suspended dirt.

Conclusion

Basic control of museum environment plays an important role to maximize the life of textiles. It helps in preserving antique textiles and costumes for years of use and enjoyment.

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