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# Textile conservation – introduction

A textile is any filament, fibre or yarn that can be made into fabric or cloth, but the word 'textile' is also used to mean the fabric or cloth itself.

Textiles are important to us and throughout history people have used them as a way of expressing personality and status. They are used in clothing, decoration of accommodation, flags and banners, the interiors of cars and in many other ways.

Textiles can also have very important protective functions – firefighters need non-flammable uniforms; members of the armed forces often rely on bullet-proof clothing to protect them when they are at work.

Textiles are an important part of our culture. Future historians will examine the textiles of today to find out about who we are, how we live and what we value, just as we look at the textiles of previous generations to find out about them.

Most textiles, however, are not designed to last forever. Many come from animals or plants and can be attacked by bacteria, moths and moulds. Some can be degraded or destroyed by prolonged contact with the air. Textile conservators understand these changes and try to stabilise the textile. They also recommend ways for owners and museum curators to slow the degradation down.

Some of the most challenging materials to look after are synthetic fibres like PVC, Nylon™ and polyester, which have been developed in the last 80 years. We think of these materials as lasting forever, but they do not. They break down after a period of time. However, as these materials have only been in existence for a short time, the first articles that were made from them are only now beginning to break down. This means that the chemistry of how these materials break down is far less well understood than the processes by which more traditional materials like linen, cotton, silk and wool degrade.

## Damage

Textile damage can occur in a wide variety of ways. Some of the causes of this damage are things that seem harmless at first.

### Water

The amount of water in the atmosphere can have a huge impact on textiles, particularly those of natural origin. Most fibres, particularly natural ones, already contain water but if there is a lot in the atmosphere they absorb even more.

1. What effect would a damp atmosphere have on the weight of a textile?

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2. If something made of delicate fibres is hanging up in a damp atmosphere, what might happen to the fibres?

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If the air around the textile is warm as well as damp then moulds can grow on it. These moulds can stain the textile and ugly marks can appear that are sometimes impossible to remove. A mould is made of a number of thread-like structures called hyphae. These hyphae eat away at the textile as they grow through it and the damage can be very severe if it is not discovered quickly.

A very dry atmosphere is not the answer either as this can cause the textile to release the water from its fibres, which leaves them dry and brittle.

Many museums with textile collections have humidity meters inside the glass display cases.

### Temperature

3. If you heat an object up, what happens to the size of it? What happens when it cools?

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Textiles change in the same way as other objects when the temperature rises and falls. The structure of textiles can mean that this behaviour has a more devastating effect on them than on other things.



Textiles are usually woven. The fibres are very close together. They move as the temperature changes and rub against each other. Eventually this rubbing can wear them out so that they fall to pieces.

A rise in temperature can also cause the textile to dry out.

It is important to control the environment of textiles in a museum. Most museums try to maintain a moderate temperature (often about 18 °C) and a relative humidity of about 55%.

### Dust

Dust can do a great deal of damage to textiles. Dust is made of things like grains of sand, pollutant particles, skin cells and bits of clothing that have flaked off museum visitors. It can get in between the fibres of the textile and cause a huge amount of damage by abrasion of the surface, particularly if there is also a temperature change. This is a bit like what happens if you rub your fingers with sandpaper – the skin flakes off and severe damage can result if you keep rubbing for too long.

4. Explain why the combination of a change in temperature and the presence of dust is worse than either one of these factors on its own.

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## Light

Light is a problem for the textile itself but it mainly damages the dyes used to decorate the textile. In order for us to see a particular colour, a dye must absorb some parts of the visible electromagnetic spectrum and reflect back others. When light is absorbed, energy is absorbed by the textile. This can cause bonds to break and so damage the structure of the material. This occurs mainly in the dyes and can cause them to change colour.

Several hundred years ago it was common practice for people to hang large tapestries on their walls to help keep their rooms warm. Many of these tapestries now look rather odd because the dyes in them have faded at different rates. It is quite common to see blue fields in old tapestries. These fields were originally green. The green dye was made by mixing blue and yellow dyes together but yellow fades faster than most other colours so blue fields were left behind as the tapestry aged.

Many people look at old tapestries and admire the lovely, muted colours. However, these colours are often the result of fading. Sometimes you can see the original, bright colours in folds or pockets or on the back of old tapestries where light could not reach the dyes.

## Other causes of damage

Textiles can also be damaged by a variety of living things. Moths and silverfish enjoy eating textiles, carpet beetles munch on anything containing wool and rats, mice and other small animals both eat textiles and take pieces away to use in their nests. Many of these animals prefer textiles which have human residues on them such as sweat and oils from the skin.

Touching objects can damage them both by abrasion and because oils and secretions from the skin are often acidic. Frequent touching can cause a huge amount of damage as can handling and moving an object – even if gloves are used.

5. Explain why textiles in museums are often displayed in glass cases in rooms with low light levels.

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