

## The Agents of Deterioration

### Light

- Light causes permanent photochemical changes, loss of strength in the material structure will cause them to be brittle and possibly difficult to handle
- The main cause of damage from light is from UV radiation
- Light also causes dyes to fade – blue and red are particularly susceptible
- Suitable light levels are: 50 lux for light sensitive objects (including water colours, leather, textiles, paper, lacquered furniture) and max 250 lux for less light sensitive material (including metals, glass, ceramics)
- Light protection can include the use of blinds, UV film, covering objects when the museum is not open and moving items that are regularly in direct sunlight

### Pests

- This includes insects, fungi and mould
- Can be a H&S issue for people but can also weaken the structural integrity of the object
- Insects like to live in warm damp places, and mould flourishes about 70% RH. Therefore we try and keep with RH in a museum between 45-65%
- Pests should be checked for regularly with the aid of pest traps and visual inspection of the collection. Some insects can be attracted with pheromones, such as moths
- If mould occurs on an object it can damage the surface so should be removed using the appropriate PPE. A professional conservator should be consulted
- Prevention for pests includes good housekeeping (so the insects do not have anything to feed on), keeping the RH and temperature at an appropriate level, keeping doors and windows closed, regular monitoring so an outbreak is discovered quickly, and quarantining new objects coming into the museum to ensure they are not infested with insects, fungi or mould
- Prevention for mould and fungi include keeping the RH levels steady and below 70%, quarantining any new objects that come into the museum and ensuring there is enough ventilation so microclimates are not being made (such as in the drawers of a dresser)

### Pollutants

- Dust is one of the major pollutants and is hydroscopic which means it attracts water to the surface of the object and can become ingrained into the surface
- Dust can cause corrosion on metals by attracting water to the surface

- Other pollutants include sulphur dioxide (mainly from fuel in cars), ozone (can come from items such as photocopiers) and volatile organic compounds (can come from some paints and wood). These can all cause tarnishing on metals, degradation of textile fabrics and causes paper to go brittle
- Prevention against dust includes, good housekeeping, easy to clean spaces, ensuring there are good door mats at the front door, ensuring that open displays are far enough away from the visitor route and the cabinets are well sealed
- Prevention against other air borne pollutants include, good filters on any air condition system, not having electrical equipment in your storage areas, keeping doors and windows closed, and making sure cabinets and mounting materials inside are conservation grade and will not off gas, causing harm to the collection

### **Incorrect Temperature and Relative Humidity**

- Temperature and relative humidity are linked - generally as the temperature goes up the relative humidity comes down
- Incorrect RH can cause shrinking and cracking/swelling which means adhesives fail, textile fibres lose their flexibility and break, and wooden items especially can be permanently damaged
- Fluctuating RH can cause the most damage as it causes objects to swell and shrink over a short time frame
- Both should be monitored regularly – minimum of once a day if taking spot readings and if continuously monitoring with an electronic system the information should be downloaded minimum of once a month
- The temperature and relative humidity can be kept stable using oil filled radiators, fans, and air conditioning units which can be connected to humidistats

### **Physical Damage**

- Major contributors to physical damage are accidents and wear and tear
- This is why we try not to handle objects too much and ensure they are handled in the correct way
- Using incorrect cleaning methods and materials can be very destructive over time and cause accumulative damage (wear and tear)
- What we wear that could cause damage to an object when handling / cleaning: zips, name badges, keys, jewellery, nail varnish, long hair
- Always allow enough time and enough people when moving objects
- Think about the object and what support it needs when being handled or packed – never lift anything by the handle

### **Chemical**

- Perspiration is mildly acidic, becoming alkaline as it ages. This is especially bad for costumes and metals as it corrodes the surface
- Always wear gloves when handling metals

- Important to use acid free materials in packing so it does not affect the object. Also important to change the packing materials from time to time as they absorb any acidity given off by the object

## Loss

- Be aware of your surroundings and where you are moving object to and from
- Always think about security when you are moving object and do not leave my unattended in a non secure space
- Always document if you move objects around
- Be familiar with your evacuation policy and emergency salvage plans
- Know your stored / important items

Snowhill Manor, National Trust	Smithsonian Museum
Light damage – faded and degraded silk	Light damage – severely faded material
Snowhill Manor, National Trust	Charlecote Park, National Trust
Biological damage - Woodworm damage causing structural damage	Biological damage - Mould on the back of a painting attacking the lining
Snowhill Manor, National Trust	
Pollutants – dust can become ingrained and can attract moisture	Pollutants – silver is tarnished by pollutants in the air
Snowhill Manor, National Trust	Snowhill Manor, National Trust
Incorrect humidity - caused the corrosion to form on this copper surface	Incorrect humidity - caused this velum parchment to cockle and darken
Snowhill Manor, National Trust	Sharjah Museum, Sharjah UAE
Physical damage – leather seat detaching and being picked at by visitors	Physical damage – wear of the painted surface on the bottom of the saddle due to use
Snowhill Manor, National Trust	
Chemical damage – chemicals from the skin have corroded a hand print into this armour	Chemical damage – perspiration damage to historic textile