# Archives and Records Management Conservation Sheet No. 2/2010

## REMOVING MOULD FROM ARTEFACTS

The following is intended as a general guideline only. Refer to the pamphlet for specific information regarding vacuuming, personal protective equipment (PPE) and health and safety issues pertaining to cleaning mouldy artefacts. Take steps to deactivate vegetative mould before cleaning the artefacts. Consult sheet for information on how to deactivate mould growth on artefacts. Before performing any treatment to remove mould, thoroughly examine the artefact to determine its condition and to find any loose or fragile components. If such components are found, secure them or be prepared to bag them and document their location if they become detached. Be prepared to document your actions. Any treatment to remove mould should be recorded and the documentation retained. Neither vacuuming nor brushing will remove mould stains from an artefact. These stains require treatment by a conservator and may prove difficult, if not impossible, to remove.

### *Water-damaged artefacts*

Handle artefacts with care because they may be physically weak. A few artefacts can be dried by lowering the RH and increasing air circulation. Artefacts with mould growth should be air dried in a manner that mould spores are not dispersed near people or in the building. For example, if fans are used to dry a mouldy artefact, direct the gentle flow of air away from the object and cover it with a tissue paper during drying in order to capture any spores that become airborne as the artefact dries. Alternatively, air dry artefacts outdoors or in a fume hood or class one biological safety enclosure. Once the mould growth has been deactivated, the artefact can be cleaned, as described.

Freezing stops mould growth. Numerous water-damaged artefacts can be frozen and either freeze-dried or air dried when time and circumstances permit. The hyphae (living filament) of the mould will be killed by freezing, but the spores (reproductive bodies) will not. Mould spores can withstand freezing temperatures while in the dormant state although they are less resistant to alternative freeze-thaw conditions. Active mould spores, however, will be killed by the freeze-thaw treatment. This method is suitable for numerous water-damage or mouldy artefacts provided they can be frozen and freeze-dried when possible. For more information, refer to the conservation literature on disaster recovery for heritage collections.

### *Books*

Inspect for mould on the inside and outside covers, the spine and throughout the text block. Mould may cause softening and weakening of the paper and cover boards. This softening will present handling and cleaning challenges. If the book exhibits mould within the text block, each affected page should be examined and cleaned. If pages are not affected, keep the book firmly closed when cleaning the exterior. Use a vacuum cleaner fitted with a HEPA filter to vacuum the edges of the text block and cover boards. Mini tool attachments are useful for cleaning small crevices in the spine. Do overall vacuuming to reduce total spore amount. If necessary, dry or damp wipe the cover boards after vacuuming. This will remove residual mould spores. Discard or wash cleaning cloths.

***Paper***

Use a vacuum cleaner fitted with a HEPA filter. If necessary, use a brush to dislodge tenacious mould. If paper is fragile, carefully vacuum through a cleaning screen. Do overall vacuuming, on both sides to reduce total spore amount. After vacuuming, surface clean the paper with recommended erasing compounds to remove embedded spores and mould fragments, as well as dirt that acts as a nutrient for future growth. The erasing compound will be contaminated with mould spores. Thoroughly remove it from the artefacts and carefully discard it by sealing it in waste paper and placing it in the garbage. Dry Methods for surface Cleaning Paper and for more information on surface cleaning consult the Archives & Records Management.

Washing, solvent cleaning, enzyme treatment and bleaching may be further treatment options. However, they require the expertise of a paper conservator. Even so, stains caused by mould growth may not be completely removed.

***Photographs***

Remove surface mould with gentle techniques, such as using a soft brush or mini brush attachments on a vacuum cleaner fitted with a HEPA filter. Do not use water or solutions containing water because mould may have made the photograph's emulsion water-soluble.

Gelatin, the major component in the emulsion of films and prints, is an excellent nutrient for fungi. Fungal growth frequently concentrates around fingerprints on prints and film, due to salts in the fingerprints, which create localized moist conditions. It is not recommended to treat photographs with fungicides; therefore, it is important to control RH in areas where photographs are stored. Alternatively, a suitable frost-free refrigerator will provide an excellent humidity controlled micro-environment for storing both colour and black and white photographs. Photographs must be packaged in envelopes or boxes and placed in polyethylene bags or wrapped with polyethylene and the seams taped with freezer tape before they are placed in a frost-free refrigerator. Consult a photographic conservator for more information before storing photographs in this manner.

***Paintings***

Deactivate mould growth. To avoid an abrupt change and extremely dry conditions, both of which can promote cracking in oil paintings, lower the RH conditions gradually, over one to two hours, and do not lower the conditions below 40% RH. Loosely wrap the painting to prevent dispersion of mould spores. Consult a paintings conservator for further advice. Due to complex structure of paintings, permanent damage can result from even the most cautious attempts to clean a painting by untrained personnel.

***For more information contact the Archives & Records Management Unit.***

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