

## **Introduction**

Almost everyone has paper documents (old school drawings, income tax returns, old deeds, yellowed newspaper clippings, etc.) they want to keep as mementos. The key to preserving these family treasures lies in proper handling and storage.

Early paper was handmade from a variety of plant fibres (e.g. flax, hemp, and cotton), and it is generally quite durable. When machine-made paper was introduced in the 1840s, wood became the most common ingredient. Wood was abundant, inexpensive, and easy to use, but the presence of lignin and the acidic additives that are commonly found in wood pulp paper make it susceptible to yellowing and embrittlement over time.

Newspaper is particularly unstable due to the large percentage of acidic ground wood pulp in the manufacturing process and the lack of protective alkaline buffers.

## **Causes of Damage**

Papers made from wood fibres are vulnerable to heat, light, dampness, and airborne pollutants, all of which can speed up the chemical reactions that weaken the paper and cause it to discolour and become brittle.

Dampness promotes the growth of mould and mildew, and can attract insect pests such as silverfish and book lice.

Silverfish feed on mould and starchy materials found on paper, especially if it is stored in a cool, moist environment. A silverfish infestation will roughen and weaken paper.

Book lice feed on mould spores found on paper and cardboard. These lice thrive in heat and humidity and, although they do not cause visible damage, their squashed bodies and excretions can stain paper and may also nourish other pests, continuing the cycle of damage.

Light (especially fluorescent light and sunlight) promotes chemical degradation and may fade many inks. Light exposure from repeated photocopying, scanning, and flash photography can cause additional damage.

Frequent or careless handling can lead to tears, folds, creases, and abrasions. The oil from human hands can stain or transfer dirt to the surface of paper.

Lamination can be harmful. In addition to the damage caused by the heat and adhesives used in the lamination process, many plastics will turn yellow, become brittle, and produce acids that attack paper.

## **Handling**

Wear clean white cotton gloves when handling old documents, and be very careful because these gloves will likely reduce dexterity. Alternatively, wash and dry hands immediately before handling objects. Carry vulnerable papers on a slightly larger support such as a folder.

Storage systems should be designed to safeguard documents while in storage and to minimize their handling during retrieval or use. They should provide protection from light, dust, and physical damage, and keep papers separated from each other with individual folders, window mats, Mylar envelopes, or tissue interleaving. Any paper products in physical contact with valuable documents should be plain white and acid-free. A number of segregated documents can then be placed within a rigid storage box made from polyethylene, polypropylene, or acid-free cardboard. Suitable storage materials are available at local art conservation supply stores, framing shops, conservation suppliers, and some stationery or photocopy outlets. [Note: Simply being labelled "archival" is not a guarantee of stability; look specifically for the words "acid-free" when buying storage materials. For long-term protection, look for acid-free paper storage

products that also contain a buffer. A buffer is a substance or compound that stabilizes the pH value of a solution or material. Buffered conservation products, such as paper and matboard, have a chemical (usually calcium carbonate) added to them to neutralize any acids that are present in the product. Buffers also have an alkaline reserve to counteract acids that may form in the future. ]

When filling storage boxes, don't overstuff them. When partially full containers are stored vertically, ensure that documents are not allowed to slump; use spacers or store the container horizontally. Store fragile papers, such as newsprint or damaged items, horizontally.

Do not store important papers in the attic, basement, or garage (environments that are generally too humid). Inspect the storage area often for signs of insects or mould growth.

Avoid eating, drinking, or smoking around important documents, and be aware of other potential dangers, e.g. ballpoint pens rarely leak but it would still be safer to use a pencil near these items. As well, be conscious of your body (including upcoming sneezes, loose jewelry, buttons, stable footing, etc.) when handling papers.

Take action to protect papers against unforeseen disasters; overflowing gutters, melting snowbanks, a burst pipe, or water used in fighting a fire can all cause serious moisture damage which may not even be noticed at the time. Most flood damage can be averted simply by raising storage containers 5-7.5 cm (2-3 in.) off the floor and keeping at least 2.5 cm (1 in.) of space between the storage unit and any exterior walls. Sturdy boxes will protect papers should shelving collapse.

Consider making photocopies or digital copies of papers so that the originals do not have to be handled often. Although copying requires a short exposure to intense light, it will allow the originals to be kept safely in dark storage thereafter and may be beneficial in the long run.

Another option is to mat and frame old documents. Request that the framer use starch paste hinges and acid-free mats, and make sure that the document is not touching the glass in the frame. If the framed document is to be displayed, conservation glass that filters most harmful UV light is available from better framers.

Do not use tape, glue, paper clips, or staples on valuable papers. The damage caused by these items over time is difficult, if not impossible, to repair.

## **Cleaning and Repairs**

Cleaning and repair of paper documents and books should generally be left to a professional conservator.

For documents in good condition (not badly soiled or damaged), the surface can be lightly dusted with a soft brush. Proceed carefully with this procedure as overcleaning can cause more damage than dirt. The wrong cleaning technique could permanently ingrain dirt that might have been removable. Objects with powdery, flaking media or sooty or mouldy deposits should not be brushed.

If a collection smells musty but there is no visible mould, dry out the objects and storage area with fans, space heaters, or by opening windows until the smell is gone.

If mould is discovered, do not attempt to treat the damaged documents yourself (mould spores are very difficult to remove thoroughly). Instead, wrap the mouldy papers in plastic and contact a conservator. Mould spores pose a hazard to other possessions, and some types cause acute and chronic health problems.