A Guide to the Care and Storage of Archival Material

Introduction

The main inherent problem with paper – acidity – is introduced during manufacture. The causes are numerous but the greatest is the inclusion of ground wood pulp to produce bulk. Unless the pulp has been chemically treated to remove lignin and the chemicals themselves completely removed, tremendous acidity is produced, gradually causing breakdown of the chemical bonds in the cellulose fibre of the paper. This process is accelerated by the action of detrimental environmental factors. Other causes of acidity are the use of rosin, alum and bleach during paper manufacture. Paper produced since about 1830 may contain any of these; before that date virtually all paper was naturally alkaline, being made from linen and cotton rags.

Leather may also contain inherent problems. During the first half of the nineteenth century the traditional chemistry of tanning was changed to speed up the process. The result is leather that may powder to a condition termed red rot. This is thought to be caused by sulphur fumes associated with the burning of fossil fuels.

Environmental Factors

- Excessive light levels (mainly daylight) contain high proportions of ultra violet light radiation that can cause accelerated embrittlement, yellowing and breakdown of paper.

- High temperatures speed up the chemical breakdown of paper, 20℃ is a good temperature to aim for in rooms where books and documents are stored.

- Relative humidity (the amount of water vapour in the air) is also important, 55% is the recommended level for most library materials. High humidity causes deteriorative chemical reactions to speed up and may also lead to mould growth. Low relative humidity causes material to become dry and brittle.

- Dust is the most prevalent form of airborne pollution. Under the microscope, dust partials are seen as being rough and jagged. As these partials move over and between the paper fibres they cause abrasion. Other harmful pollutants are gases. Sulphur dioxide from fossil fuels and nitrogen from motor cars.

- Biological enemies are fungus (mould) and various animals and insects. Mould outbreaks may occur if the

relative humidity is above 65% for more than 48 hours. Animal (rats, mice, bats etc.) and insects may take up residence if access is easy and they are undisturbed.

Books

- Average size books are best stored upright on shelves supported by bookends, loose enough to allow easy removal but tight enough to prevent dust penetrating down into the books.

- Books on shelves should have space at the back to allow air circulation. Books in closed bookcases should be ventilated weekly. Mould can attack books left undisturbed in tightly closed cupboards for long periods.

- Heavy or fragile volumes should be stored horizontally, preferably singly but never more than three together, to preserve the swell of the spine and to make retrieval less damaging.

- Books in need of repair, perhaps with loose covers, broken hinges etc. will require extra protection such as tying with unbleached cotton tape, wrapping or boxing in acid free materials.

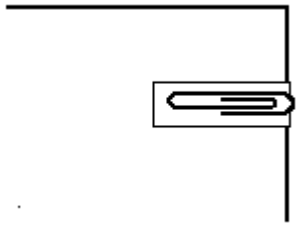
Book with loose boards tied up (note position of bow to avoid wear too adjacent volumes)

- Remove any loose enclosures in books such as cuttings, bookmarks and pressed flowers. If left inside the book they may cause staining or acid migration.

Documents

- Remove metal paperclips, paper fasteners, pins and staples from documents, if left they will damage the paper by causing rust stains and holes. There are various options for their replacement: stainless steel or brass paperclips with an acid free paper tab to protect

the document, acid free folders or tying with cotton tape.



Protective paper strip under paper-clip

- Remove all rubber bands as they will perish and may leave a permanent stain.

- Torn documents must not be repaired with adhesive tape as this will rapidly deteriorate causing further damage to the document. Storing in a polyester sleeve welded on two sides (for ease of access) is a good way to prevent further damage.

- Documents are best stored flat and unfolded as repeated folding of documents can cause the paper to split. Store in acid-free folders, envelopes or boxes. Unsupported upright storage allows single sheets to bend and curl causing stress.

- Polyester sleeves or photocopying are a good way of protecting documents that are frequently handled.

Pamphlets, brochures, magazines

- Examine staples for rust; they may need to be removed to prevent future damage.

- Store horizontally in acid free wrappers, wallets or boxes. Magazine storage files are only suitable if spacers are inserted to provide enough support during long term storage

Replace rusty staples in pamphlets with bookbinders sewing thread (use the staple holes if possible)

Newspapers

- These can often be very brittle due to the high ground wood pulp content in the paper. Newspapers should be placed between acid-free boards before wrapping; this not only supports the paper but also protects the paper from tape damage when tied up.

- Newspaper cuttings in albums are just as liable to degrade, the adhesives used to secure them often adding to their problems. Photocopying onto acid free paper may be the best way of preserving the information.

Maps and Plans

- Should preferably be stored flat in acid-free folders. If maps or plans must be rolled then it should be round an acid free cardboard tube with acid-free paper wrapped around the outside. Brittle rolled maps should be left to a conservator to unroll.

- Maps should not be put on display, but if they must, make sure that they have been mounted to a museum standard. Display should be well away from direct daylight and heat source such as radiators and fires.

Photographic Materials

- Photographs are composed of two layers, the image carrier (usually gelatine) and the support. The image layer is required to be slightly acidic to remain stable so it is necessary to provide a neutral environment during storage

- Polyester and polypropylene film or neutral pH photographic storage paper (‘Silversafe’) used as sleeves, envelopes or interleaves will provide the recommended neutral environment.

- Photographs not in sleeves should be handled only by the edges or when wearing clean white cotton gloves to lessen the possibility of leaving fingerprints and soiling the materials

- Original photographs should not be put on display as they are very sensitive to light.

- Ideally, relative humidity and temperature should be very low for the storage of photographic material but it is more important that the levels do not fluctuate (this may cause cracking or flaking of the carrier).

- Prints are best stored on edge, even when mounted, so that each one only supports its own weight. Flat storage can lead to uneven support causing deformation of the backing that may cause delamination or cracking of the film layer.

- Glass negative and slides should be stored upright, in custom made lidded boxes and housed in individual folders or interleaves of polyester film.

- Albums are best boxed as protection against light and dust.

- Never use PVC (poly vinyl chloride) plastic folders or envelopes. This plastic deteriorates giving off vapours that tarnish the silver photographic images of black and white prints and negatives. Do not store prints in albums of the self-adhesive type as the combination of acidic paper and poor quality adhesive may stain the print and make removal impossible after a few years.

- Chemical instability is a major factor in the deterioration of early film-based materials. If film-based negatives are brittle, discoloured, sticky, or appear wavy and full of air bubbles, separate the negatives from the rest of the collection and consult a photographic materials conservator

- Place broken glass negatives carefully in archival paper enclosures. Use a separate, clearly marked enclosure for each piece to reduce the possibility of scratching or further damage.

- Black & white and colour films should be stored vertically in snugly fitting rust free canisters in a cool, dark and dust free environment. It is important that film is evenly wound. Run through annually examining the film after each use. Ensure projectors are kept clean and in good order

Machine Readable Records

Gramophone records:

- Keep in polythene sleeves inside original or replacement covers.
- Store racked upright in a cool dark well ventilated area.

- Playing equipment must be well maintained, the stylus can be cleaned with a dry water-colour brush.
- Handle the records by the edge to keep fingerprints of the playing surface which will attract dust which can become embedded in the playing surface

Magnetic tapes & disks (videos, cassette tapes and floppy disks):

- Store upright in a dust free atmosphere away from strong light and sudden fluctuations in temperature and humidity.
- Store tapes in there played state where the tape is not under as much tension as after rewinding
- Keep well away from magnetic fields produced by electric motors, TV sets and photocopiers to prevent the tapes or disks being wiped.
- Always run tapes through to the end so that popular sections are not unevenly worn.
- Regularly run a cleaning tape through the machine.
- This technology is rapidly becoming obsolete and should be transferred onto disk or stored on a computer hard drive as soon as possible so the information is not lost.

Optical disks (CD's and DVD's):

- Avoid touching the surface, it can easily become scratched, acids and oils from fingers are equally destructive.
- Protect electronic and digital material from liquids and dust, as well as direct sunlight or extreme heat.
- The disks should be stored vertically in purpose made rigid containers.
- Clean the drives routinely to prevent damage to the media.
- Do not leave disks in drives.
- Apply labels only to the areas recommended by the manufacturer
- This technology is rapidly evolving and to ensure records are not lost they need to be transferred to any new storage system which is adopted.

Further Advice

The conservation and repair of damaged or deteriorated material are beyond the scope of leaflets such as this. The conservation of valuable records, whether that value is historical, personal or financial should only be carried out by a qualified conservator. Free advice and, for a fee, conservation services can be obtained from Glamorgan Archives' conservation department. Small amounts of archival quality storage materials can also be purchased from Glamorgan Archives.