



BISHOP MUSEUM
Art Conservation Handout

DISASTER PREPAREDNESS AND RECOVERY FOR WORKS OF ART ON PAPER

Introduction

We all know Hawai'i is not immune to natural disasters such as hurricanes, earthquakes, tsunamis or uncontrolled fire. Knowing how to react in such a situation is everyone's responsibility. The Honolulu Fire Department and the Hawai'i State Civil Defense have invaluable advice leaflets on disaster preparedness. Everyone should be familiar with this information for their own safety. This handout was written to assist people in salvaging important or valuable paper objects in the event of a large or small disaster which results in flood or fire damage. Thought and preparation will eliminate panic and assure that proper decisions will be made and carried out step-by-step. This is very important with objects made of paper whether they are framed or unframed works of art, documents, records, photographs or books.

Paper is an organic material and is exposed to greater dangers during fires or floods than are ceramic, metal, stone or glass objects. Paper expands as it absorbs moisture and shrinks as it dries out. Effects of this include distortion of the paper itself, flaking of surfaces such as paint or gold leaf, swelling of adhesives, and splitting and warping of bindings. Inks, dyes, pigments or coatings may be soluble in water and will bleed when wet. Paper will burn at low temperatures and has a porous surface into which soot particles will embed themselves. At raised temperatures and humidities, mold growth proceeds rapidly causing irreversible damage. Planning ahead will reduce these types of damages and limit the cost of recovery.

Prevention

The first thing which should be considered when thinking of preventive measures is the environment (i.e., the house or apartment) in which you live. Are drains and gutters regularly cleaned? Does the roof leak or do you see stains on the ceilings? Are paper items stored in a room below ground level or under an air conditioning unit or water pipes? Perhaps an upstairs room has a large fish tank or water bed? An accident can be avoided by not placing book shelves or hanging a photograph on the wall directly below such a water source.

No collection items should ever be placed directly on the floor. Keep in mind many accidents happen during renovation or remodeling of homes, such as broken water pipes and dangerously exposed electrical wires. Flammable solvents or cleaning products should be stored separately in a protective metal cabinet, and smoke alarms should be present throughout the house. Electrical overloading should be avoided, and at least one fire extinguisher should be strategically on hand.

While such measures can be taken to prevent minor flooding problems and fire damage, natural disasters such as earthquakes, tsunamis, hurricanes or uncontrolled brush fires are not so easily dealt with. These disasters are not uncommon here in the Hawaiian islands. Until you have experienced a disaster, it is hard to imagine the sense of shock and helplessness they generate. One must use common sense and adapt to the situation when the ideal response is not possible.

Initially, one must think of their own safety before proceeding to salvage any objects. The building must be designated safe by fire or police departments. With either flood or fire disasters, water-logged paper results, and there are many variables for wet paper, photographs and books. The following instructions will fall in a random order: it is a personal decision what objects take priority in the salvage operation. A letter and photograph of a beloved family member may take precedence over a framed etching by Whistler. Sometimes insurance coverage on artwork plays a role in the decision of priorities.

Air-Drying

All items must first be immediately removed from their wet environment to a clean, dry room where the temperature and humidity are as low as possible to prevent an outbreak of mold growth. This can be best achieved at home with fans, placed indirectly so as not to blow loose papers or pages undergoing the drying process. Since relative humidity is frequently over 60%, dehumidifiers will assist greatly to create a drier environment. Raised, flat surfaces are needed which can be constructed from picnic table benches or saw horses with bed frame slats, two-by-fours or plywood covered with polyethylene plastic sheets and then an absorbant material such as towels or sheets, preferably cotton.

Unprinted newsprint works well, if it is on-hand, as it is cheap and can be replaced frequently. Paper towels absorb moisture readily and can be continually replaced also. Always remove the wet absorbant materials from the drying area, so they do not add to the humidity of the room. Other surfaces for single-sheet drying can be constructed from fish line strung across an area in parallel lines, close enough together to form a surface, or even rust-proof screening stretched on a frame is adequate. Nylon netting can be used, such as the sweater drying racks which have legs. These surfaces allow air to flow from below, quickening the drying process. If the materials have to be dried outside for lack of a clean, dry room, remember that prolonged exposure to direct sunlight may fade inks or pigments and accelerate the aging of paper.

(Framed) Artwork and Photographs

Wet artwork and photographs are very fragile and may be permanently disfigured. But dried negatives, prints or slides can be copied, and often damaged artwork or photographs can be repaired by a paper conservator. The first priority is to get them dry, and this may mean first that they have to be unframed. Lift the glazing, the artwork or photograph, and the backboard together from the frame and turn them over, together, face up. Lift one corner of the glazing to be sure it is not stuck to the surface of the artwork and proceed cautiously.

If surfaces are stuck, stop and consult a conservator. If not, separate the individual supports and lay them on your absorbant surface to air dry face up in single layers

(photographic emulsions will stick together if stacked). Oriental scrolls will need to be unrolled to dry. Extreme care must be taken in handling these fragile materials. Remember to have the fans blowing indirectly in the room, and continually replace the absorbant material if possible.

Do not be tempted to wipe the surface of an artwork because certain media such as pastel, charcoal, malachite pigment, chalk or pencil will smudge. Do not touch the surfaces of photographs either, especially the earlier ones. Never use heat to accelerate the drying process; materials such as parchment will undergo extreme distortion and shrinkage. After air-drying, warping of paper supports should be expected, especially with photographs because of the uneven drying of the paper base and the emulsion layer. Do not worry about it now, consult a conservator about repair or flattening of the dried materials.

Documents

Single pages of records or documents, like the artwork and photographs, must be dried in a single layer on the flat surfaces, as mentioned above, with absorbant materials beneath them in a room where the air is continually circulating by fans. These papers may be even more fragile when wet because they often are made of inferior quality paper. The inks may also be soluble.

If the paper is shiny, it means it is a coated paper and must be separated from any others immediately, or they will dry stuck together. Place a polyester film or plastic wrap (such as Saran Wrap®) on the wet stack of records and rub the top surface gently. Slowly lift the film which will pick up the top sheet with it, and hang the film to dry on strung clothesline or fish line using clothespins. Proceed in the same way with all coated papers.

As they dry, they will separate from the surfaces of the polyester film and can be removed to finish drying on a flat surface. Cockling or distortion should be expected. If necessary, the papers may be flattened by pressing them gently between clean blotters in a book press or between flat boards weighted lightly.

Books

If books are soaking wet they need to be drained before they can safely be fanned out for air-drying. Stand each closed book upright on its top edge and open only the covers slightly. Lay a chopstick or pencil underneath and perpendicular to the open edge to tilt the book slightly backwards. Several layers of absorbant paper should be placed underneath the book, replaced as they become saturated and removed from the area. The cover of a book holds more water and is the last part to dry out; therefore, the area between the board papers and flyleaves will be the first area attacked by mold. Insert a sheet of aluminum foil or polyester film between the cover and the leaves to prevent moisture held in the cover from migrating to the inside of the book. Proceed this way with all bound books.

Circulating air and frequently changed absorbant paper will dry the books enough to be cautiously opened to approximately a 30 degree angle. Begin interleaving the pages with sheets of paper towels or unprinted newsprint, every 50 pages, keeping the books in an upright position. The interleaving may extend outside the edges to promote wicking of the moisture and evaporation. If high humidity in the room is preventing quick drying, it may be necessary to interleave every 10 pages. Doing so will cause more distortion to the

books, but this is preferable to moldy volumes. *Frequent changes of interleaving materials is most important.* Saturated books with coated paper do not respond well to air-drying unless they are interleaved between each page so they do not stick together. This causes greater distortion, however.

Books with soft covers do not always stand on their own. They can be propped against one another with cardboard spacers between.

Books may also be dried, if they are not too wet, hanging on fish lines or clotheslines not more than 1/32" in diameter strung approximately 1/2" apart. Three lines are enough for a book of 1 1/2" thickness. Thicker volumes will require more lines, but one should not be hung if it weighs more than 6 lbs. or the inner folds of sections will fracture. Hanging a book to dry will help the spine to return to its original shape. This technique is especially good for pamphlets and small volumes.

When books are dry to the touch they may be pressed between boards weighted with concrete blocks or bricks. Books should never be pressed while still damp nor with the interleaving material still in place. Never return the books to their shelves until you are certain they are dry, and continually check for mold along the inner margins, along the spine and between the boards and flyleaves. Books will be approximately 1/3 larger in size after drying due to distortion.

Mold growth is always a danger in the air-drying process because of our warm, humid environment in Hawai'i. If it appears, one should not rub or scrub it off books or paper. Cob-web like growth may be gently brushed away (do this outdoors) with a soft brush, like an unused Japanese makeup brush, or vacuumed. Exposure to ultraviolet light for short periods of time will discourage mold growth, though it may cause fading of pigments and inks, or darkening of acidic paper.

Fire Damage

With fire comes damage caused by smoke, soot and water. Many materials cannot be recovered from fire and its effects, no matter how sophisticated the conservation techniques. In addition to charring of paper materials, the high temperatures will affect the cellulose structures causing embrittlement even if not burned. Leather and vellum will shrink while photographic emulsions shrivel. Soot will embed itself into the surface of paper and may carry with it residues from burned plastic materials which are impossible to remove. Any burned material is more fragile, especially if it is wet.

Extra support may be needed in handling such as sturdy cardboard or a polyester "sling." Minimally burned and wet collections may be air-dried following the steps above, but rare or valuable materials such as artwork will require the experience of a conservator to salvage them. Charred edges of books can be trimmed and the covers replaced by a book binder.

Materials:

- Fans
- Dehumidifiers
- Industrial-Quality Extension Cords
- Cotton Towels
- Cotton Sheets
- Paper Towels

Blotter Paper

Hawaiian Graphics
1923 S. Beretainia Street, Honolulu, HI 96822
808.973.7171

Unprinted Newsprint

Hawaiian Graphics
1923 S. Beretainia Street, Honolulu, HI 96822
808.973.7171

Polyester or Polyethylene (Plastic) Sheeting (Hardware stores)

Aluminum Foil

Plywood or Two-by-Fours

Picnic Tables and Benches

Fish Line or Clothesline

Clothespins or Plastic Clips

Concrete Blocks or Bricks

Soft Brushes (Hawaiian Graphics, 1923 S. Beretainia Street, Honolulu, HI 96822,
808.973.7171)

Vacuum

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