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CANTERBURY DISASTER SALVAGE TEAM

Guidelines for best practice in the event of a disaster Part 2

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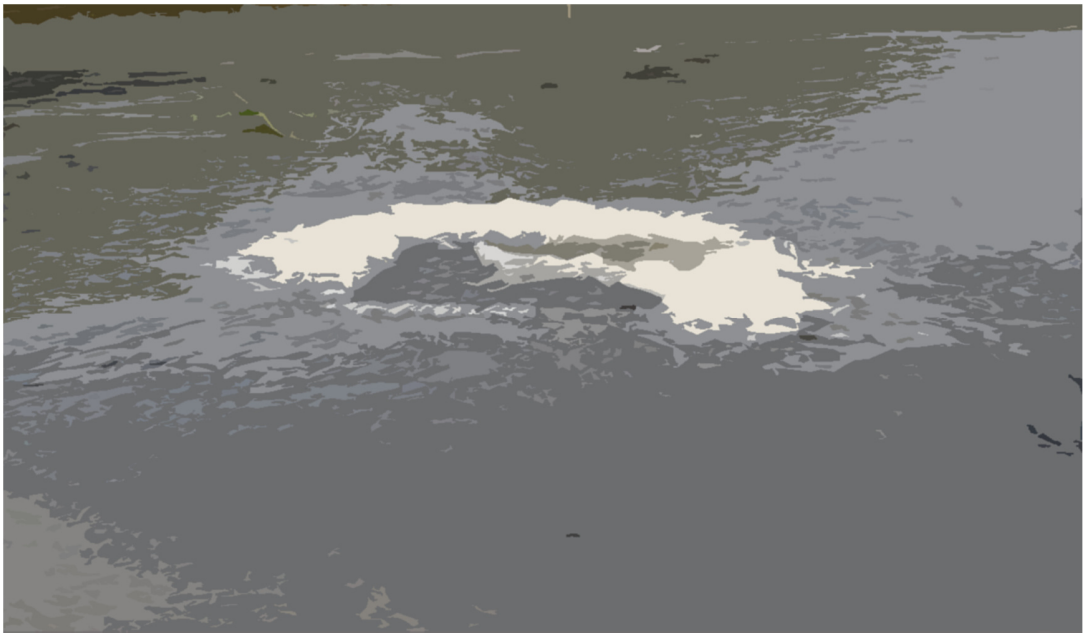

CONTENTS

Wood including furniture

Flood

The porous wood will soak up water and swell, as it does this its weight will increase and the wood, particularly the surface of the wood, will be more fragile:

- Joints may become weakened either because the glue may become weak from swelling/dissolution or as the object is drying out the joints might loosen particularly due to the compression of the wood parts during swelling.
- The joints may become so weak that the object collapses, particularly when the object has increased its weight due to water it has absorbed. Responders should look out for any deformation of sagging and separation of the joints.
- Differential absorption or loss of water may cause decorative veneers to split, warp or lift from the surface.

Salvagers should keep wet furniture or wooden objects under observation for movement, particularly during the drying process.

- Placing white blotting paper under and around damaged furniture, particularly if it has small decorative veneer elements, makes it possible to monitor any losses and to retrieve these.
- Water-soluble coatings, stains, or constituents may migrate causing stains or tide lines.
- Varnish, decorative finishes or wax may blanch or become cloudy.
- Gilding may lift, iron supports or internal fixtures may rust and stain, other metal fittings may corrode.

Fire

Direct burning weakens the structure of the piece of furniture, but so may heat. So evaluate the strength of the joints and observe any separation of the joints before handling or moving. Charred furniture should be evaluated carefully, things may not be as bad as they seem but the surface will be highly fragile.

Alkaline deposits, such as ash or soot or dust may harm finishes as will soot.

Ceramics

Flood

Some clays will completely disassociate in water or, at best, become highly fragile, soft and easily deformed. Most ceramics however are quite resistant to water. Problems can occur during drying if soluble mineral salts or other soluble or reactive minerals are present in the clay or decorative features:

Glazes can cloud and surfaces can begin to spall (flake away from the body of the object) or become "sugary" (loss of cohesion between particles) due to the migration and repeated crystallization of these soluble mineral species.

Staining might also be a problem if water-soluble materials are in or on the pot and are transported through the porous structure to the surface.

Flood waters may also contain staining substances.

Surfaces could be coated or decorated with water-soluble materials which become highly fragile and mobile when wet.

Fire

Intense heat may cause some "ceramic" objects to fracture and literally explode, especially if the heating is uneven and sudden.

Glazes and other decorative surfaces may micro fracture and become delaminated from the surface.

Soot from fires may become engrained and difficult to remove.

Metals

Flood
Most metal is resistant to water for short periods, but water is also one of the primary causes for corrosion processes to start up. For iron that process is rusting and it can occur very rapidly. Silver may tarnish due to sewage from the flood waters or other chemical constituents.

Fire

Some metals, like silver, may become extremely brittle if exposed to intensive heat. In general however, metals are reasonably resistant to damage due to fire. Decorative surfaces may be less than resistant, such as wax or resin patinas.

Repairs made to metal object may have quite low melting temperatures, sufficiently low that they may succumb during a fire and make the object structurally unsound.

Ethnology including organic based objects (animal and plant materials such as ivory, bone, skins, fur, baskets, wood, papier-mâché material, bark, etc.

Flood

These categories of materials are highly susceptible to damage when saturated with water and some respond dramatically to extremes of humidity. Many will revert to a stage in their original processing and many will almost immediately begin to decay, others will lose structural integrity, while others will deform severely upon being "relaxed" from a shape or form they were forced to take during their initial manufacture.

Leather and desiccated wood can become very weak when wetted.

Ivory, when wetted, is highly susceptible to swelling and then subsequent cracking or warping during the drying process.

Skins, which are not fully tanned, will quickly begin to putrefy.

Fire

All objects in this category will burn, some will burn rapidly. Intense heat will cause chemical alterations and physical deformation (due to drying and stress).

Soot (particularly greasy soot) from fire is difficult to remove from these substrates and must be done cautiously and preferably by a conservator experienced with the material.

Stone: including marble, limestone, alabaster and including mortars, cements and plaster

Flood
Most stone materials are resistant to damage due to water when exposure

occurs over relatively short periods. However, contaminants in the water will quickly absorb into the porous structure of stone or mortars and can result in staining or in the deposition of soluble salts (see ceramic section).

Acidic water will directly effect a highly polished surface through etching.

Some stone materials are more susceptible to dissolution than others, alabaster is far more soluble than marble.

Some sedimentary rock, may have inclusions that react adversely to prolonged exposure to water.

Fire

Damage is predominantly due to extreme heat and the deposition of soot. Extreme heat can change the basic chemical structure of limestone or marble, increasing their solubility while decreasing their inherent strength (also often resulting in micro fissuring and spalling of the surface).

Soot can become engrained in the porous structure and difficult to remove without extensive treatments.

Removing the smell of smoke

One of the biggest concerns among most institutions is getting rid of the odour of a fire. Unfortunately, this is also among the most difficult activities. Besides the use of chemicals to mask the smell, there are two general approaches used commercially. One is called Thermal Deodorization and the other is Ozone Treatment. Neither is acceptable for valuable museum, library, or archive collections.

Thermal deodorization uses high temperatures to drive off the smell. Having survived the fire, and suffered the resulting damage such as premature aging and increased brittleness, you should **NOT** subject collections to yet additional stress. Thermal deodorization is unacceptable and should be avoided.

Ozone treatments use ozone generators to create large quantities of ozone (O_3) — a very powerful oxidizer that attacks virtually all organic materials. When humans are exposed to ozone it causes irritation of lungs, eyes, and skin. When collections are exposed to ozone it will deteriorate leather, alter dyes, embrittle paper, and fade inks. In other words, it prematurely ages virtually everything in collections. Consequently, it, too, should never be used as a means of eliminating the smoke odor.

Clean everything — floors, walls, ceilings, carpets, drapes, furnishings. Structural damage should be sealed or replaced. By getting rid of as many odor sources as possible you will minimize the problem.

You should also flush the building with large volumes of fresh, clean air. If it is impossible, or impractical to open the building to gain fresh air, then use HEPA filters to capture the fine smoke particles. Remember to change filters often.

For a small number of relatively small objects, you can seal the items in a plastic bag with baking soda, clay cat litter, or activated charcoal — all will, over time, absorb much of the offending odor.

Remember, too, that the source of the odour can be very complex. For example, with furniture, the smell may be literally on the surface in the soot; or it may in impregnated into the finish, which perhaps softened during the fire; or it may actually be in the pores of the wood, especially if the furniture was exposed to high humidity levels during the fire. Consequently, there will likely be some objects that retain the fire smell for very long periods of time. However objectionable this smell may be, you will do your collection far more harm by subjecting it to either thermal or ozone treatments.

How to prevent disaster related damage to collections

Pre-emptive preservation

There are a number of things you can do before the fact that will help minimise the loss of valuable material in the event of a fire.

- Ensure that the most valuable material is kept stored in a container such as a suitcase that can be grabbed as you run out the door when the fire threatens.
- Purchase a fire-rated cabinet for storage, bearing in mind that these aren't very effective in major fires – they can act like an oven, rather than providing protection.
- Ensure that copies of your prized material are kept in another location. For example, scan any materials that can be scanned and keep copies off site.

Priorities

In planning a salvage operation, consider your priorities.

Time and effort are precious and should only be directed at material that warrants them.

Concentrate your salvage effort on material of high value.

Material of little value should be placed to one side until the irreplaceable material has been dealt with. Also, damaged material that can be easily replaced (e.g. paperback books) can often just be thrown away, again allowing you to deal with the more important material. If you own or are responsible for the material you are well-placed to make value judgements such as these, or at least know whom to ask.

How much time do you have?

In the aftermath of a fire, particularly one where water has been used to put the flames out, a rapid response is of prime importance. By the same token you need to proceed in a careful and unhurried fashion to minimise further damage.

Probably the greatest risk to the remaining material after the disaster could be water. Water may be the best way to put out a fire but it is extremely dangerous for collections. In the short term it can cause inks to run and

material to adhere together. In the longer term it can lead to the growth of mould, which greatly endangers the collections and is also a health hazard for persons working with the material. Mould will grow on most materials – it just requires warmth, high humidity, still air and time. The first three of these are generally prevalent in a site which has had a fire through it and under these conditions mould will start growing on wet material within about two or three days, so something to avert the danger of mould growth needs to be done before this.

POST-DISASTER

- ✓ Review disaster operations.
- ✓ Change plan accordingly.
- ✓ Send thanks to all who helped.
- ✓ Inspect collections over the next year to prevent mold outbreaks.

Publish the results to aid other institutions.