DISASTER SALVAGE TEAM

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NEWS LETTER

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WINTER ISSUE

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READY FOR THE WORST?

Winter, more than any other time of the year poses problems for the care of museum/library/archival items because of the inherent nature of potential disaster. These can come in the form of humidity, burst pipes, and other floodings caused by leaves in downpipes and gutterings, to name a few.

Damage from water and moisture causes despair among those who care for and conserve our heritage, whether it is from riverine or flash floods, sea surges, tsunamis, leaky roofs, or fire sprinkler or plumbing failures.

Natural disasters are inevitable and no one nor place is completely safe from them. Losses to museum collections and other cultural property, however, can be prevented or minimised.

First, it is necessary to recognise the dangers posed by natural elements and formally institute procedures to meet them. Second, identify the degree to which particular artifacts are exposed to specific hazards at the place they are located, and obtain information about each type of hazard. In Canterbury you can contact the Museum Liaison Officer or any member of the Executive of the Disaster Salvage Team. They will know the person to contact should they be unable to answer themselves. Thirdly, knowing the type of hazard and the extent to which a location is prone, a variety of preventive measures can be taken.

Temperature and Humidity

There is no such thing as an ideal temperature or humidity for storing all types of museum objects. Individual control of the conditions in each storeroom is highly desirable. This option is also expensive, and compromises may be necessary. For example, storerooms may be arranged so that one group is maintained at one temperature and humidity level and another group at a different level.

Maintaining high relative humidity (RH) when the outside air temperature is very low is one of the most difficult problems confronted by museums.

Constancy is the most important criterion for a successful climate control system. Rapid changes in temperature and relative humidity are very destructive to museum objects. If the ideal RH for a group of objects is 50 percent, it would be better to maintain the relative humidity at a constant 40 percent than to permit the humidity to vary between 35 and 60 percent RH from hour to hour or day to day. Exposure to such fluctuations can cause damage.

Temperature. Systems should maintain a constant temperature, regardless of outdoor weather conditions, at any desired setting between 60° and 72°F. Fluctuations of plus or minus 2 degrees are generally considered acceptable.

Humidity. Decisions concerning proper relative humidity will depend upon the objects' composition and their past storage history. Ideally, mechanical systems should constantly maintain any desired humidity level - between 30 and 60 percent - on a room-by-room basis. In general, metal objects that tend to rust or oxidize and unglazed ceramic objects or fossils that could leach salts need lower RH levels. Higher humidity levels are appropriate for wooden furniture, lacquers, furs or panel paintings that could dry out and crack.

In actual practice, room-by-room controls present a problem in that objects may not remain in the same room indefinitely. In addition, each time the storeroom door is opened and closed, temperature and humidity levels can change. An alternative would be to establish and maintain an acceptable median standard throughout the storage areas and all areas where objects are located. The development of microenvironment exhibition or storage cases permits museums to maintain general temperature and humidity levels throughout the building and provide special conditions for only those objects that require it. This general strategy will undoubtedly become increasingly common in the future.

Even if the desired temperature and humidity levels do not vary from room to room, individual room controls governing temperature and humidity levels are necessary. For example, one storeroom may be occupied, the door closed and the lights turned off, for days at a time. An adjacent storeroom may, during the same period, be the scene of considerable activity. New objects may be brought in, the collection reorganized, inventory taken, research or conservation activities carried out. This means that all the lights may be on and the door may be opened repeatedly during the day.

After hours, this same room will become dark and unoccupied. In such a situation, if the two rooms were controlled by a single thermostat and humidistat, it would be impossible to maintain constant temperature and humidity levels in both rooms. Separate temperature and humidity controls for each individual storeroom are not a luxury - they are a necessity for good conservation practice.

Winter/Water & Humidity

Water is an interesting substance because of the way the molecule is put together. Each end of the molecule attracts opposite charges, like a bar magnet. It attracts other molecules of water and holds on to them strongly and it also holds onto the hydrogen atoms of other molecules in the objects themselves and in dust or corrosion products on the surface. It is a good solvent for many different substances. This is why moisture is a very important consideration in art galleries and museums and libraries.

The air around us contains water vapour at all times. When the air cools the water is deposited like dew. As it heats up, the air can hold a rapidly increasing amount of moisture.

Air at 30C containing 10 grams of water per cubic metre can cause an object or paper to dry out, but if the area is cooled to 10C, condensation will occur on the object's surface. The amount of water in the air is exactly the same at both temperatures.

At 30C the maximum weight of water air can hold is 17 grams per cubic metre. (Air does not always hold the maximum weight of course.) If the weight of air is only 10 grams per cubic metre at 30C, as above, it is easy to calculate the Relative Humidity. This is the important measurement for museums and libraries. It describes the actual amount of water vapour as a percentage of the possible amount which can be held in the air at a certain temperature. It is obtained by dividing the actual weight of water, say 10 grams by the 17 grams which is the maximum weight which the air at 30C can hold and then multiplying the result by 100.

In the winter cold damp air is brought into the museum where it is warmed and becomes drier, if the heating is switched off the air is cooled and the air becomes damper at a startling rate.

Many objects will swell with dampness, and twist and split with dryness. There are optimum relative humidities for most objects. However it is often the sudden change in humidities which can cause the most damage. If an object achieves an equilibrium with a slightly unsatisfactory atmosphere, whatever it is, and then the object is forced to readjust to another more appropriate atmosphere suddenly, it might cause more damage than if the object were left in the original atmosphere. So be careful with heating which switches on and off, and if moving wooden objects like furniture from a domestic environment, for instance, allow it to adjust gradually to the different atmosphere of your museum.

Potential Water Damage

Although equipment rarely malfunctions, and pipes rarely break or leak, such mishaps are an unacceptable risk in a museum setting.

In general, pipes containing liquid or steam should run outside object storage areas and never overhead in a storeroom. Mechanical equipment should not be contained in the same area as collections storage. Not only is the potential risk of damage by water or continual vibration increased, but the security risk involved in making such an area accessible to engineers and repairmen is greater. Special precautions should be taken even if pipes or equipment are a level above object storage or in directly adjacent space. Ideally, pipes should run through corridor spaces, with the corridor on a slightly lower grade than the storerooms.

To prevent water seepage, mechanical rooms should have a raised curb at the doorway. Both corridors and mechanical rooms should have floor drains to carry away water that could result from a leak or malfunction. If it is necessary to run pipes through collections storage, consider sheathing them in sheet metal that drains into the corridor or into a device that detects the presence of water on the floor. Regardless of the exact situation, store all objects on screens, shelves, racks, skids or cabinets at least four inches off the floor.

Sinks and running water are often located in collections storage. However, this convenience must be weighed against the inherent risks of leaky pipes or plugged drains.

Careful review of mechanical plans and insistence upon limiting the exposure of the collections to possible water damage may eliminate future disasters.

It is important to note that cold air ducts in storerooms can cause possible water damage in high humidity areas. Condensation on the sheet-metal ducts may drip onto the collections. With proper insulation, this problem can be avoided.

Many museums will encounter falling leaves clogging gutterings and downpipes. Particular attention should be paid to maintenance to ensure that leaves do not accumulate to the point that spoutings will overflow and water will build up in valleys of roofs. If this happens water streaming down internal or external walls may occur damaging all that lies in its path. Check flashings and roofing iron to make sure everything is secure and able to withstand the strong winds that come with the changing seasons.

Fire and Pestilence

A further area of potential danger associated particularly with winter is the risk of fires caused by heaters. Faults in electrical equipment can occur at any time of the year, but during winter heaters are running more often. Take particular care not to place heaters close to walls, fabrics, paper or anything which could overheat and combust. Don't operate old and dangerous heaters. Obsolete technology might have a place in your museum collection but shouldn't be found amongst the electrical equipment you use from day to day.

If you get caught in the rain on the way to work, be careful how you dry your wet clothes. Draping them over heaters to dry will not only have a significant effect on the humidity levels in the room as the moisture evaporates into the surrounding air, but could also create a risk of fire.

Pestilence. Just as humans like somewhere warm and snug to retreat to over the colder months, so do undesirable rodents. Rats and mice are not uncommon in museums (although no museum will readily admit to having them in residence) and everyone needs to know how to discourage them from choosing your museum as their winter home, how to detect them and how to dispose of them quickly.

Preventing rats and mice setting up house is always easier than disposing of them and of course saves your collections from damage. Without a food source they won't be tempted to move into a museum and will probably continue on to a more hospitable building. So don't leave food lying around. If it is necessary make sure that it is contained in tins or metal containers.

Ensure that all collections are well boxed or wrapped in materials which don't attract rats and mice. Don't leave piles of paper sitting around or stacks of boxes in undisturbed corners - these provide rodents with an ideal nest. Check that there are no gaps under doors or floors where rats and mice could gain entry.

If these methods of discouraging rodents fail, and they do establish themselves, detecting their presence is simple as they leave larger tell tale signs than other pests - that is, bigger holes in textiles, woodwork and boxes and very distinctive chewed remnants lying about.

Disposing of rodents as soon as detected is critical because the damage they can do to your collections while you delay is enormous. It may be enough to lay some poison, but you might require someone to carry out a more professional eradication.

Flood, pestilence and fire sound like a Biblical retribution for past sins. In fact, one or all could simply be the result of what is a cardinal sin for museum people - negligence. Autumn and Winter are the times when regular maintenance can be a major factor in disaster prevention.

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