NSCG Newsletter

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Author(s): Andrew, K.

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The Ten Agents of Deterioration -
Forthcoming themes for the Natural Sciences Conservation Group Newsletter.

Your committee decided recently to apply a theme to our newsletter of the ten agents of deterioration and to address one risk per issue, starting with perhaps the most commonly thought-of risk to collections, that of fire.

Those of you who attended the Canadian Museum of Nature's Conservation Risk Assessment workshop that we organised in September 1995 will remember that the process of assessing risks to collections requires a calculation combining the likely damage to collections, the percentage loss in value and frequency of the event. (See David Carter's report on the meeting in issue 1, NSCG Newsletter). Thus fire, though fortunately an infrequent event, can be catastrophic with collections largely destroyed. What we aim to show in the next ten newsletters are examples of the ten agents of deterioration and their effect on natural history collections or museums with natural history collections and the amount and type of damage caused. This will build up a picture of the frequency of such events and should help us to establish the often simple damage limitation measures.

This issue is devoted to fire, we will tackle flood next and just to remind you the other eight agents are: physical forces, theft and vandalism, pests, light and UV, incorrect temperature, incorrect relative humidity, pollutants and custodial neglect.

Since disaster planning is likely to be high on the agenda as part of the Museums and Galleries Commission Registration phase I, we will cover the agents linked to this type of planning first. We cannot rely solely on anecdotes from committee members - we need your contributions, however succinct and intend to publish supplementary sections should you miss out on the relevant issue.

Kate Andrew

Case Study - Fire at Eccles College

Kate Andrew, Ludlow Museum, Old Street, Ludlow, SY8 1NW

Eccles College, a sixth form college in Greater Manchester suffered severe structural and smoke damage from a fire in the building in May 1993. The insurance company loss adjuster and the college approached me shortly afterwards to assess the value, level of damage and the cost for recovery of the college geological collection. Following an initial one day visit, I prepared a report on the damage to the geology collection and several options in a fully-costed recovery programme, one of which was commissioned. The insurance company paid for the conservation work.

Cause of the fire

The fire was started at night and although not proven, was thought to be the result of arson.

Extent of fire damage

Eccles College is a single storey edifice, built in the late 1960s with large windows, flat or gently pitched roofs and a timber-framed panel construction. The fire was centred around the college library and computer room and these areas were completely destroyed. They were demolished soon after my initial visit and later rebuilt. Since some walls did not extend into the roof voids smoke was able to spread into many other parts of the building and the smell of smoke lingered for many months after the fire.

The fire was put out by the fire brigade, there was no sprinkler system in place, it is not known if smoke detectors were present.

Extent of damage to the geology collection.

The college geology collection was housed in the classroom adjacent to the library. Although this room escaped the ravages of the flames and subsequent water damage from the fire hoses, parts of the collection were badly smoke damaged. The smoke appears to have condensed onto the specimens forming a matt, opaque and rather sticky layer. It is presumed that the large amount of plastics in the fire, for example library book covers, contributed to the large amount of carbon in the soot.

Relationship between soot damage and type of container

Specimens on open display were coated in a uniform matt black layer, totally obscuring detail, it was difficult to identify many of these specimens until they were cleaned. The specimens remained stained with a pale sepia colour.

Specimens that had not been put away were matt black on upper layers, cleaner below. Handling material, heaped into trays and containers, showed both clean areas where they were covered by other specimens but were totally black where the surface was exposed.

Specimens in wooden drawers and shallow metal drawered office stationery units suffered a gradation of damage; soot accumulation at the fronts of upper and poorly fitting drawers was as bad as that found on specimens left out in the open; damage in better fitting drawers was less. Smoke damage graded noticeably from front to back with only minor damage at the rear. Damage was similar in both metal and wooden drawers.

Specimens in sliding plastic drawer-trays in cupboard units with doors seemed to be largely unaffected although the exteriors of the units were so thickly coated in soot that they were beyond salvage.

Specimens in boxes with flat lids - e.g. cigar boxes and microscope slide boxes showed a minor amount of smoke creep under the lids.

Specimens inside boxes with full length lids were completely unaffected by smoke even though the boxes were completely blackened and these were discarded.

Soot Removal

The soot proved insoluble in the normal range of cleaning solvents and solutions applied by swab and so enquiries were made to determine what cleaning methods had been used to remove soot from similar objects.

The papers about the fire at the Saskatchewan Museum of Natural History (Spafford, Graham and Pingert, 1991) deal with soot accumulation and refer to cleaning of most kinds of natural history specimen but not geological specimens. A commercially available sponge used in fire clean-up operations such as cleaning walls prior to repainting, vacuuming, dry brushing and dry-cleaning with glass beads had even been used on taxidermy specimens.

A fire in an archaeological small finds store, where Stewart Plastic storage boxes had melted and burned, depositing thick black soot on pottery shards, proved the most useful comparison. Clean up from this event led to specimens being scrubbed with old toothbrushes and detergent.

Historically, carbon-tetrachloride was used to remove carbon deposits, however, its highly carcinogenic nature and COSHH regulations precluded its use for this task. After extensive trials with a combination of the commonly-used cleaning solvents, a cleaning method was devised of scrubbing specimens in a mix of de-ionised water and Symperonic N anionic detergent, followed by rinsing in clean de-ionised water and drying on paper towelling. Where specimens were sufficiently robust and soot accumulation was thickest, the toothbrush was dipped

into a paste made of Symperonic N and 40 micron airbrasive glass beads in de-ionised water, the beads providing additional scouring. Even with repeated scrubbing, porous specimens retained a sepia coloured tint on soot covered areas.

Though far from ideal, for a collection of some 2,000 items, this proved to be by far the quickest and easiest cleaning method. Draining on several changes of paper towelling promoted rapid drying and reduced the risk of relative humidity related damage. Specimens with pyrite decay were cleaned using an airbrasive machine and glass beads before being treated with the experimental ammonia method (Waller, 1987).

The paper specimen labels proved harder to clean. Draft-clean powdered eraser was partially successful, a very dilute ammonia solution (1-2%) proved effective on the glossy paper surface on a souvenir box of volcanic rock samples from Mount Teide.

Conclusion

Lidded containers provided the best means of defence against smoke damage and since these were relatively low cost, were simply replaced. Closed cupboard doors also provided an effective smoke barrier but free standing drawer units especially those with loosely fitting drawers proved to be an ineffective barrier. Specimen details on the outside of boxes and drawers were obliterated by soot, specimens inside boxes could only be fully identified if a second label was inside the box. No catalogue could be found for this collection; if a catalogue had been present, data retrieval would have been possible from specimen accession numbers. In the event, complete re-identification and re-curation was undertaken.

Although the compartmentalisation of the building into rooms combined with the rapid response of the fire brigade, which prevented the spread of this fire, a sprinkler system would have extinguished it at a far earlier stage and reduced the amount of time required for the conservation cleanup and collection recovery project.

Drawered units without doors proved an ineffective barrier against smoke.

References

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Waller, R.R. 1987 An experimental ammonia gas treatment method for oxidizing pyritic mineral specimens. Pre-prints of 8th triennial meeting of ICOM Committee for Conservation, working group 13, Natural History Collections. Sydney, 1987. pp 625-630

A tale of effective smoke detectors

Kate Andrew, Ludlow Museum

Whilst carrying out a geology collection survey at Bolton Museum and Art Gallery, I experienced a minor fire at first hand. The fire alarm sounded at about 12 midday. The building, which includes an aquarium and public library as well as the museum and art gallery, was quickly and efficiently evacuated and staff and visitors gathered outside on the other side of the road.

The fire brigade arrived within a matter of minutes and entered the building, the fire detection system indicated the source of the alarm to be one of the public toilets. A fire in a toilet paper dispenser was rapidly put out, the building checked over and after about forty five minutes from the alarm sounding, the building was open to the public again.

As with the Eccles College fire, the cause was apparently arson, but an effective fire detection system and an automatic fire alarm brought a rapid response with only minor damage.

Fire at National Museum of Natural History, Paris

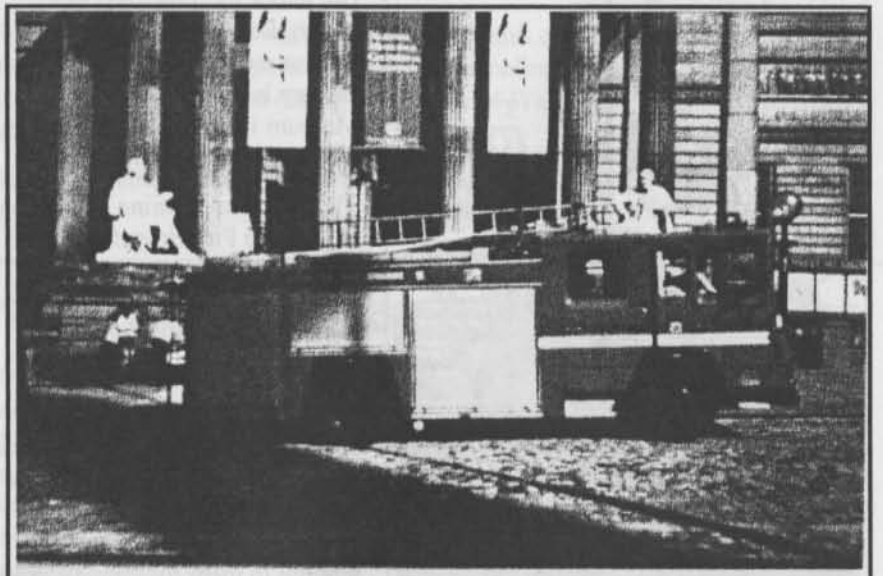
BCG nearly didn't see the star attraction of the 1996 trip to Paris.
Declan Butler writing in *Nature* (30th January 1997, #378) reports that a serious fire at the National Museum of Natural History in Paris in August 1996 got within metres of the world's largest herbarium, some 8 million specimens. Decades of neglect have allowed the buildings to fall into a dangerous state of decay with many areas of the museum failing to meet minimum safety requirements, antiquated electrical systems, dangerous roofs and poorly stored chemicals. A major report by the CNE, an independent advisory committee to the French Government, has led to the government agreeing to carry out a detailed audit of museum improvement requirements before the summer of 1997.

Fire Procedures at National Museums and Galleries on Merseyside

Sally-Ann Yates, National Museums and Galleries on Merseyide

The Conservation Centre of the National Museums and Galleries on Merseyside was developed to support NMGM's seven venues in and around Liverpool. The rich and varied collections held by the Walker and Lady Lever Art Galleries, Sudley House, Liverpool Museum, Merseyside Maritime Museum incorporating HM Customs and Excise Museum and Museum of Liverpool Life draw an average of 1.3 million visits a year.

With so many buildings and collections to consider - everything from full-sized ships through to natural history collections - emergency preparedness is the top priority. Conservation staff operating from the new centre have concentrated on protection and salvage of objects from the new centre. The commonly used words 'emergency' and 'disaster' cover a wide range of events. From a small water leak to a major fire, physical damage or even total destruction may be the fate of any objects in the vicinity.



Fire exercise at Walker Art Gallery, July 1995. PAP 3977