NSCG Newsletter

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Author(s): Purwell, V.

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For those interested in choosing wood products to avoid acidic emissions, or to reduce emissions through coatings, CCI's 1999 technical bulletin provides all the information you need. (English oak generates a pH of 3.3 to 3.9). Coating for display and storage in museums, Canadian Conservation Institute Technical Bulletin no 12, by Jean Tetreault. ISBN 0-662-27955-7

Pollutants in Collection Stores-

Vicky Purwell, National Museum & Galleries of Wales, Cathays Park Cardiff CF1 3NP

Pollutants can manifest in collection stores in two main forms: -

- *Gaseous*
  - *From the outside environment* e.g. sulphurous and nitrous oxides, ozone, hydrogen sulphide.
  - *From the storage* e.g. carbonyl volatiles such as formaldehyde.
  - *From the specimens* e.g. acetic acid, formic acid, radon, mercury vapour, sulphur dioxide.
  - *From pesticide residues* e.g. mercuric chloride, naphthalene, dichlorvos.

- *Particulate* e.g. spores, dust, dirt or chemical deposits.

Within the older parts of the NMGW, in this case the east wing where the botany stores and offices are located, the air conditioning is controlled and maintained by the air-handling unit. This provides environmental control but does not incorporate a filtering system. The remainder of the building is air conditioned and filtered to the standard 80% efficiency. There are dust filters and carbon filters installed within the vents that the air passes over, which removes the greater part of the pollutants. The standard filtration recommended for a museum collection is Eurovent 4/5 with coarse and fine filter grades in the categories EU1 to EU9 (Cassar, 1995). For more sensitive collections a higher specification is required. The ARC,

which is a custom designed archive store situated approximately five miles from the main building, is installing a filter of Eurovent 8/9 which will filter material down to 90-95% efficiency.

Dust and dirt within the botany stores is a problem, collections are always boxed or bagged, and good housekeeping is implemented to keep dust from building up. Sensitive collections are housed within filtered and air conditioned environments.

Botanical material brings with it its own supply of dirt, which has usually been accumulated at the time of collecting. This can spread onto the herbarium sheet or packet and can often obscure the data. Dust and dirt will also provide an hygroscopic environment to attract mould growths that are far more difficult to remove. Loose, dry dirt can be brushed away using a soft bristle brush, and this will remove a surprisingly large amount. Old, ground in dirt can be removed quite easily with a rubber, but it must be stressed that plastic erasers are best and Staedtler Mars Plastic are recommended (available from most good stationers). This method of cleaning paper is termed surface or mechanical cleaning. It is recommended that the back of the label or paper article is cleaned first so that the upper surface is not introduced to further dirt once it has been cleaned. The dirt can be removed using small, gentle circular movements remembering to clean the rubber frequently against a clean surface so as not to introduce more dirt on to the paper. Old and dirty paper is usually quite delicate and to protect friable edges it is often advisable to hold the paper down with a clean piece of melinex that is inched along as each small area is completed at a time. Particularly delicate labels can be cleaned using grated up rubber, this is a very gentle method that will not damage the paper, but may not be as effective as basic surface cleaning. Paper tears should be tackled by cleaning from where the tear ends down to the edge of the paper. This is working with the paper grain and will prevent further stress.

Gaseous pollution from storage, specimens and from the outside will be reduced by filtering. 10% of clean air is incorporated hourly and within this hour there will be 6-8 complete air changes. Gaseous pollutants such as nitrous and sulphurous oxides should be kept below $10\mu g/m^3$ (this should be reduced to $5\mu g/m^3$ and $1\mu g/m^3$ respectively for sensitive collec-

tions) and ozone should be 2µg/m^3. Fine particulates (dusts) should not exceed 75µg/m^3. Pesticides that have been applied to collections will also be present, some such as naphthalene and mercuric chloride are extremely stable and will continue to form vapour around the specimens for an extremely long period of time. Air quality sampling is recommended for botanical and zoological collections, bearing in mind that the chemical species to be monitored must be known before analysis begins. The TWA (Time weighted average over a period of 8 hours) applies for the following three chemicals. Mercuric chloride should not exceed 0.025mg/m^3, naphthalene should not exceed 53 mg/m^3 or 10 PPM and dichlorvos (Vapona™) 0.92 mg/m^3. If the area in question is not air-conditioned then installing or increasing ventilation is essential to improve air flow and thus reduce toxic build ups.

Cassar, M. 1995. *Environmental Management; Guidelines for museums and galleries*. Museums and Galleries Commission. Routledge London and New York

Dust

Simon Moore, Natural Sciences Conservator, Hampshire County Council Museums Service, Winchester SO23 8RD

Dust, depending on its consistency can be a very harmful contaminant and cause specimen deterioration. Although we are aware of its damaging properties and try to exclude it from our work area, it still manages to seep in through the smallest of gaps.

In my experience, white-plumaged birds have been the most susceptible to the normal and everyday grey household dust. Once it gets into the feathers it is (so far) impossible to remove entirely, resulting in a pale grey bird. Specimens of coral, especially the larger colonial madrepores, once

bleached of their natural colour often fall victim to dust, thus appear drab. If the dust is at all acidic in nature, then feather proteins and coral aragonite may become corroded.

As always, we try to exclude dust from specimens and displays but we end up generating even more through our normal working procedures. Building and building fabric renovation generates masses of dust and despite precautions of moving specimens or covering with sheets, using dust traps and static electricity it still plagues us.

Reduction by prevention seems to be the only cure but how many of us have suddenly discovered that builders are in an adjacent room drilling through the wall (*didn't you get the memo*?) and it is back to square one.

Despite this rather depressing tone, I hope that contaminant analysis will continue and might produce some more detailed articles in the newsletter.

Dust Monitoring

Stuart Adams, Department of Chemistry, Queen Mary & Westfield College, Mile End Road, London E14NS

Introduction

Dusts deposited onto the surface of artefacts within museums can not only potentially cause harm by absorption of moisture or abrasion of fibres etc. but also may dull the visual appearance. Ambient dust levels are readily determined using a combination of gravimetric procedures and laser techniques such as the Grim Real Time Dust Monitor. Armed with this information it is possible to calculate the deposition time (see Ligocki *et al.*, 1990 and Nazaroff *et al.*, 1990). However, simpler techniques such as the glass deposition gauge (glass microscope slides) determine what is actually settling onto surfaces, and whilst glass may not