

### Additional Note regarding deodorising smelly bones/specimens:

Taxidermists with smelly specimen problems routinely use a product called Malogon, purchased as a concentrate. It has a lemon-lime smell and is water soluble. Fish to be mounted can be pre-soaked overnight. Available in half litre bottles (£9.95) from EYEdentity products (Wales), Tel: 01686 622675 Fax: 01686 622921.

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### New SPNHC Leaflets

Like ourselves (see 'View from the Chair'), the Society for the Preservation of Natural History Collections have brought out a new and more colourful leaflet. One contains information about SPNHC along with brochures and membership applications and the other promotes their two storage publications.

If your institution is hosting a meeting in the future and are willing to display the leaflets please contact Lisa Palmer (Treasurer) on [palmer.lisa@nmnh.si.edu](mailto:palmer.lisa@nmnh.si.edu) or Ann Pinzl (see below) to arrange a bulk delivery.

If you would like to know about joining this society you can contact Ann Pinzl (Membership Committee Co-chair) by email on [apinzl@iahonton.clan.lib.nv.us](mailto:apinzl@iahonton.clan.lib.nv.us)

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# The Ten Agents of Deterioration

An issue by issue guide to the risks facing museum collections



## 7. Light & UV

## Introduction

This is the seventh part of our series on the Ten Agents of Deterioration; the risks facing museum collections.

The next issue will deal with Pollutants. These could be cumulative over a period of time, such as items becoming contaminated by substances due to inadequate storage, or possibly an incidence of direct pollution e.g. the effects of a gaseous leak on specimens. Please do send in articles on the issue of Pollutants; in many cases it is only after the event that one considers the risk.

For details of recommended standards of light and UV levels for the display and the storage of natural history specimens see:

'2. Standards in the Museum Care of Collections of Biological Collections.1992' p. 54 ISBN 0-948630-18-3

and,

'3. Standards in the Museum Care of Collections of Geological Collections.1993' pp. 49-51 ISBN 0-948630-20-5

Both published by the Museums and Galleries Commission, U.K.

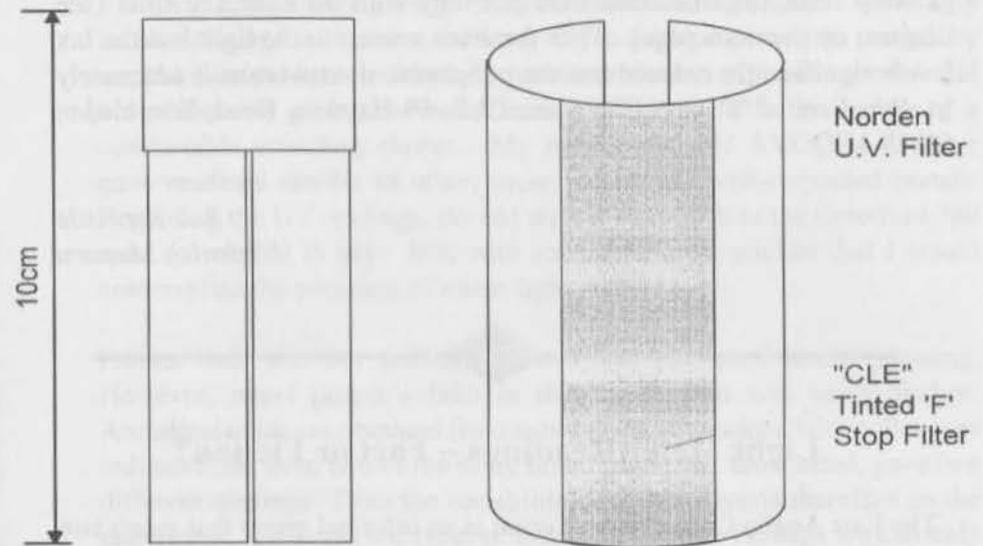
## Old Polecats Never Die, They only .....

Whilst re-displaying the Natural History Galleries in Ipswich Museum we found that some specimens had been on display so long they had completely faded on one side.

Some like the polecat in the title had faded on one side only, the side facing the gallery. The opposite side still retained its natural colour. Displaying these specimens the other way round was not an option. The polecat could not be used for educational purposes as mercuric soap had possibly been used during its preparation, and it could not be displayed in its faded form.

I decided to re-colour the specimen taking the unfaded side as my guide. Any re-colouring had to be reversible, so I used Windsor and Newton pigments blended/mixed to the right colour, and applied the pigment with a dry brush. The pigment was simply trailed through the previously

## Miniature Fluorescent Tube



cleaned fur. Since no medium has been mixed with the pigment it can be removed by vacuuming.

All the specimens were re-displayed in the original Victorian wall cases which had been re-wired and given a new lighting system. The new lighting system consisted of small 4 inch high, low voltage fluorescent tubes. These were placed centrally, four to a case. Although the lighting system was more discreet the light intensity in the central area was very severe, up to 1000 lux and the UV was above the recommended levels. The lights did not have a dimming facility, and in any case dimming them would have thrown the edges of the cases into almost total darkness.

The problem was how to reduce light in the central areas of the case and still retain adequate lighting for specimens on the periphery.

We cut down Morden fluorescent UV light filters into five inch lengths and down the central portion stapled CLE tinted "f" stop filter to cut lux levels. The filter comes in a number of grades "f" stop 1, 2 and 3. By combining

the different grades we could reduce lux levels.

Only the central front facing area of the tube was covered with the tinted "f" stop filter, the side areas were left only with the clear UV filter (see diagram on previous page). Thus the areas nearest to the light had the lux levels significantly reduced but the peripheral areas were still adequately lit. Suppliers of "f" stop filters are; CLE, 69 Haydons Road, Wimbledon SW19 1HQ.

*Bob Entwistle  
Ipswich Museum*

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### Light Meter Readings – Fact or Fiction?

The East Anglia Conservators Forum is an informal group that meets two or three times a year in the museums of members, either from private practice or both large and small museums.

Discussion topics vary from case studies to large issues such as pests.

At one meeting in November 1997 the focus was on lighting. Members were invited to bring their own light meters and compare the readings obtained by different types and makes of hand held light meter. Meters ranged from the twenty years old to the new such as the Novatron and Meaco digital UV and lux meters, and many reported that their equipment had recently been calibrated. About a dozen different meters were placed on a table and their lux readings compared. To our surprise the variations were considerable. The meters were moved to somewhere else in the room, and their readings taken again. The UV readings were compared, and these showed slightly less variation. There was no consensus as to the actual light reading in that place at that time.

Given that the recommended light levels are fairly precise at 50 lux for light sensitive organic material and 100 lux for inorganics, even a variation of 10% makes a difference for someone trying to place objects in an

exhibition environment where they will be subjected to light for some time. In the battle to reduce damaging ultra violet radiation on objects, having accurate data and reliable measuring equipment is fundamental. Yet these meters were giving wildly different readings, for lux seemingly in two clusters with some outliers. By a window, readings varied by several hundred lux. Incidentally, newer and more expensive models did not necessarily give more believable readings, or sit in the middle of a comfortable sounding cluster. My twenty-year-old AVO LM 4 meter gave readings similar to other, more recent and well-respected brands. Regarding the UV readings, the old style meters such as the Crawford 760 were as reliable as any. It is with considerable scepticism that I would contemplate the purchase of a new light meter.

Precise data was not gathered as this was just an informal meeting. However, many people's faith in their equipment was badly shaken. Anecdotal evidence obtained from subsequent discussions with colleagues indicates that even two of the same brand of meters, thus tested, gave two different readings. Does the variability of results depend therefore on the calibration, if it is not the type, or brand, of meter? Perhaps we can only rely on light meters to give us a relative picture of display conditions, and not an absolute reading we can trust. Is this good enough? Why not try this experiment yourselves if you think me unduly cynical. It would certainly make a good research topic, and a Which? style report would be welcome by all museum staff.

*Lynn Morrison  
Conservation Officer/Care of Collections*

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## Barton Bed Fossils - do they fade?

The Bracklesham and Barton Beds are two clayey formations of the British Middle and Upper Eocene that outcrop along the south coast of England between Bognor Regis and Poole. The formation tends to contain well-preserved fossil molluscs, in particular a wide range of gastropods, some up to 10cm long. The fine grained mud of these deposits is rich in pyrite and so Barton beds fossils tend to feature heavily in collection conservation programmes.

The mud trapped inside the whorls of the shell can be rich in finely disseminated pyrite, salt from the sea-shore localities adds to localised high humidity and pyrite decay sets it. The result a combination of some or all of the following - acrid smells, crusty yellow and green efflorescence, crumbled mud mixed with white efflorescence, upper whorls blow off turret shells. Any visible broken shell structure tends to have rather a ragged appearance presumably due to acid attack from the decay by-products.

Whilst conserving material from these formations for pyrite decay, I have noticed that some shells also seem to be susceptible to light damage. In particular are those specimens on display at the Horniman Museum in the north hall on the balcony. This display has been in place for in excess of twenty-five years and for the early period, the arched roof was glazed (much like a railway station terminus roof). Consequently, these specimens had been exposed to daylight for at least five years.

In 1990, the specimens were assessed as showing damage from pyrite decay and were removed for pyrite decay treatment, repair and consolidation. As part of the treatment, the shells were cleaned and in some areas, patches of mud picked and swabbed off. The main mud-free parts of the shell were rather chalky in texture and dull very pale grey or fawn colour, but where the mud had been present, the more solid shells seemed to be a pale pink colour and considerably less chalky. This suggests that these types of fossil shells may be susceptible to light damage causing fading. Specimens were displayed in wooden table cases painted with emulsion paint, so Byne's disease type damage from carboxylic acids may also have contributed, but similar pink patches underneath mud has been noted subsequently in other collections.

I have not collected this type of material in the field and most of the material I have conserved has been from older collections where specimens would have been on display for long periods. I have therefore not seen fresh specimens.

Has anyone else come across this problem?

*Kate Andrew  
Shropshire County Curator of Natural History  
Ludlow Museum*

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## Natural History Specimens on display - lighting considerations.

Because ultraviolet light cannot be detected by the human eye, its potential for damage needs to be assessed, and monitored prior and during the display of specimens to minimise this risk. This damage can in its simplest terms be described as 'fading' (though darkening or yellowing are other adverse effects from light). Whilst a herbarium sheet's scientific data may not suffer any notable fading, further to the amount lost during the pressing and drying process, its intrinsic value and state prior to display may be altered. As carers of these collections we have a responsibility to maintain and stabilise their condition. It could be argued that as with specimens assigned for 'handling' on the gallery, so particular specimens for display should be thought of as expendable. This may not always be desirable if the display itself deals with actual 'specimens' rather than 'species'.

UV light levels can be effectively reduced by the use of protective film or varnish applied to windows or the lamps themselves. In D. Lampard's article in Issue 8 (*Ten Agents No. 4*) he discusses the application of film directly onto the display case glass itself. Though the primary function of the film in this case was as a 'safety barrier' and little information was gathered on its physical or chemical make-up, it was found to contain filters capable of removing 95% of UV light.

UV filter film generally has a limited effective life, so therefore should be checked regularly with a hand-held UV meter and replaced when necessary. The actual specimens themselves should be regularly checked for signs of damage, as it is the cumulative effect of light rather than brightness which ultimately leads to a specimen's deterioration. A photograph taken prior to display could be used as a comparison.

The recommended maximum illuminance for the limitation of light damage is 50 lux for the exposure of botanical, entomological specimens, fur and feathers (*MGC Standards*). For un-dyed organic material such as leather, horn, bone, and wood, a higher level of 200 lux is acceptable. The maximum UV radiation limit for all biological specimens is 75µW/lumen.

Lighting within a case or gallery can be an intensive source of heat and reduce relative humidity. Exposure therefore should be monitored at different times during the day. Ventilation needs to be provided to dissipate any excess heat. It may not be the actual specimen that is directly affected by the heat but the means of mount/display method. At Liverpool we had an incident where the delicate petals of a herbarium specimen, which was adhered to its mount fragmented. This was most likely due to the contraction and expansion of the adhesive used.

If the lighting is within the case, ideally a cold source of light should be used, e.g. fibre optics or fluorescent tubes with the motor outside the case. Alternatively, keep the lighting outside the case altogether.

Rates of chemical degradation of organic material will also be increased with temperature. Light radiation, UV in particular, speeds up this degradation by photo-oxidation. Substances can be more or less susceptible to this type of damage depending on which parts of the spectrum they absorb or reflect. For example, materials that appear red to us will absorb mainly in the blue end of the spectrum (shorter wavelength; more damaging). Therefore, red materials are often weaker than the same materials which are coloured blue.

*Donna Young  
Liverpool Museum*

## Courses and Meetings

### Handling the Past

29 June 1999 Public Records Office, Kew

The Public records Office is holding a one day forum for a limited number of participants to discuss issues relating to the training of staff in the proper handling and care of archival and library material. It will be aimed specifically at non-specialist staff. The forum will take place at the Public Record Office, Kew. The fee for the day will be £30.00.

For further information and to reserve a place, please contact:

Sue Seber, Preservation Services  
PRO, Kew, Richmond, Surrey, TW9 4DU  
Tel: 0181 876 3444 ext 2440  
Fax: 0181 392 5254  
E-mail: [preservation@pro.gov.uk](mailto:preservation@pro.gov.uk)

### Reversibility – Does It Exist?

8 – 10 September 1999

London

The British Museum Department of Conservation, will hold a three-day conference from 8-10 September 1999 in London.

The concept of reversibility as applied to cleaning, stabilisation, consolidation, assembly, and restoration will be addressed, as will changes to the physical or chemical properties of objects as a result of conservation. The conference will be confined to the portable heritage, excluding buildings but including mosaics and wall paintings.

For further information and registration pack please contact:

Sara Carroll, Department of Conservation  
The British Museum  
Great Russell Street  
London  
WC1B 3DG  
Fax: 0171 323 8636  
E-mail: [conservation@british-museum.ac.uk](mailto:conservation@british-museum.ac.uk)