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RISK MANAGEMENT: FASHION AND UNCERTAINTY

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ABSTRACT

Preventive conservation is taught as if it were a systematic and scientific subject. This positive view neglects uncertainties and the fact that all fields of management are subject to fashion. One sign of being up to date with the latest management fashion is fluent use of the appropriate vocabulary. But the introduction of a new phrase may not mean a clearer definition of the appropriate way to think and act. 'Integrated risk management' is an example. The word 'integrated', used in museum, can mean a variety of things related to the extent of involvement and understanding within the organisation. In a specific field, such as pest management 'integrated' means following all of the necessary steps: setting action thresholds, monitoring and identification of pests, prevention and control. In risk assessment 'integration' can mean looking at the interactions between hazards, such as synergies between pollutants.

Lighting in museums and historic houses involves all the meanings of the word 'integrated'. Although it is easy to teach simple conservation guidelines for lighting it is also easy to overlook the uncertainties in the underlying principles. Fashionable technologies such as the microfader are adopted without a full appreciation of these uncertainties. Museum lighting solutions go through changes apparently driven by technology and legislation, but are also subject to the same influences that drive fashions in clothing and hairstyle. There is no simple solution to the balance between the demands of the conservator and the needs of the viewer. Moreover, even when all the immediate needs of objects, visitors and budget are taken into account, the lifetime of the solution is limited. No matter how good a gallery display looks now, it will go out of fashion.

Although masquerading behind an academic format, this paper expresses a personal view making frequent use of first person pronouns.

KEYWORDS Preventive conservation; Risk management; Uncertainty; Fashion; Wicked problem

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1. Introduction

Twenty years ago, I attended a meeting near Lisbon. One of the participants announced the intention to start a Masters-level course in preventive conservation. Someone in the audience retorted that there would be nothing left to teach after the first week. Here are two very different views of the same thing. Either, preventive conservation is so simple and straightforward that you can teach all there is to know in one week. Or, preventive conservation is a subject worthy of reflection and research, suited to postgraduate study. Twenty years ago, my personal opinion was probably nearer to the first view, but in the intervening years I have become increasingly aware of the uncertainties associated with science in general and conservation science in particular. Whereas I used to oversimplify things, I now favour admitting that things can be complicated. I know that the unexpected can happen and I realise that fashion, as a driving force for change, adds to complexity and unpredictability.

2. Fashion

We are probably all aware of fashions in conservation. I remember when conservation materials such as Paraloid B-72 and Klucel G became the products of choice, rapidly becoming ubiquitous and used in all situations, whether appropriate or not. They are still available, but no self-respecting student would admit to using them these days when there are newer products with more exciting names available. Cradling, lining and re-lining have all been popular ways of treating paintings. They were over-used in the past because they became part of the unquestioning zeitgeist; they were the thing to do. Preventive conservation, despite a name that suggests thoughtful caution, has been subject to fashion: 50%RH ± 5% started out as 55% ± 5%. Now the Bizot recommendation of 40-60%RH is becoming popular in some quarters (Burmester and Eibl, 2012). The arbitrary figure of 50 lux as a lighting standard started as a recommended maximum illuminance and then became a recommended minimum. Now that total light dose is used to ration display parameters (National Trust) there is little need to specify a maximum or minimum.

If you believe that preventive conservation is firmly based in accepted science, you might argue that these changes are not due to the whims of fashion but are evidence of progress brought about by increased understanding. But if you consider the enthusiasm with which some changes are adopted and the vehemence with which others can be resisted, it is obviously not a simple matter of rational decision-making. We can learn something by studying trends in clothing and other aspects of personal appearance that can stimulate discrimination and ridicule.

Take facial hair. In recent years, beards were mostly restricted to men deemed to be old and wise, if somewhat scruffy. The recent ‘hipster’ fashion means that young and well-dressed males now sport luxuriant beards. Even the police in London are bearded (look up ‘Hipster cop’ on a image search engine). The beard/no beard fashion cycle seems to have a period of several decades. The point is that it is cyclic; what was quite acceptable becomes unacceptable and then reverts to acceptability. People develop extreme views about differences that have little or no effect on the important things in life. The thing to remember is that constant change is not the same as progress.

Take clothing. I can remember wearing flared trousers and thinking I was cool. Styles like Hippie, Mod, Punk, and Goth are easily distinguished one from another and you can easily put a date to their heyday. It is not hard to put these dates in chronological order. They all look ‘dated’. But an acknowledged time sequence is not a sign of progress. The drivers of change are:

- Competition for attention.
- A desire for change.
- The need to be different.
- And yet be *in* with the *in-crowd.*

These are needs expressed from the point of view of the fashion victim. In addition, there is always someone who, for their own monetary gain, is driving the victims feeling of inadequacy. Gallery and exhibition designs are subject to the same forces.

Museum lighting goes through changes that are supposedly driven by:

- New technology.
- Economy (sometimes disguised as ‘sustainability’).
- Legislation.

But like other fashions, even with necessary or desirable influences such as sustainability or legislation, there is always someone in the background who can make money by driving the change.

3. Integrated risk management

For the ‘Lights On’ conference I was asked to talk about ‘Integrated Risk Management’. This was an expression I had not heard before, and at that time neither had Wikipedia. I had heard of integrated management in the expression ‘Integrated Pest Management’ (IPM) though I was never sure that the people who practised it knew what it was that had been integrated. I knew the meaning of ‘risk’ because I was granted a sabbatical year in which to study and write a book about it (Ashley-Smith, 1999a). I knew the meaning of ‘management’ because for twenty-five years I was paid to manage the conservation department in a large museum.

That was a long enough time to observe changing fashions in management. Styles of management could favour development and delegation, or concentrate more on economy and control. The terms used to describe management activities tend to change faster than the activities themselves. The introduction of a new phrase does not always mean a clearer definition of the appropriate way to think or act. Even the word 'management' means different things in different situations. No matter how dictatorial your management style, you would not manage your staff in the way that you 'manage' pests.

The word 'integrated' means different things in different situations.

It can mean:

- All departments in an institution are aware and involved.
- All stakeholders are consulted (and listened to).
- More than a piecemeal tactical approach to individual threats.
- A strategic view, maximizing benefits and minimizing the downside.
- Following all the steps: eg identification, prevention, control
- Looking at interactions and synergies.

Integration recognises that a solution to one problem may increase risk from other hazards.

4. Fashions in risk

Concepts of risk do not stand still. In the two groundbreaking books on collections risk (Ashley-Smith 1999a, Waller 2003) Rob Waller and I both adhere to the principle that risk is proportional to <u>loss</u> in value. That is to say risk is all about <u>bad</u> things happening. However, in his excellent book about misunderstandings in the study of risk, Terje Aven says it is a misconception that risk relates to negative consequences only (Aven, 2010, p.93). This is in line with the International Standards Organisation definition of risk: risk is the effect of uncertainty on objectives. The definition goes on to say that an effect is a deviation from the expected - positive and/or negative (ISO, 2009). If you believe that risk is a single entity that can be calculated by multiplying the probability of an event by the severity of the consequence:

Risk = Probability x Consequence

it is obvious that the mathematics do not care whether the outcomes are good or bad. Whatever answer you get, positive or negative, it is still the 'risk'. But perhaps it's wrong to combine the two factors in a single concept.

In the early 1990s Silvio Funtowicz and Jerome Ravetz considered that risk assessment was dependent on the uncertainties inherent in the system under consideration and the magnitude of what was at stake (Funtowitz and Ravetz, 1993). Their approach moves away from the idea of an objective quantification of risk toward a discourse that recognises differences of opinion. They propose that where the outcomes of events are very important to the participants (strong value commitments) and where the behaviour of a system is uncertain, then consensual science (where everyone agrees to agree) is not applicable. A more holistic appreciation of the relationship between human stakeholders and the physical system is appropriate. Where both decision stakes and systems uncertainty are high then 'post-normal science' is the appropriate means of discourse. The name distinguishes this new science from the traditional 'normal science' as defined by Thomas Kuhn (Kuhn, 1962).

What you learn on the one week course in preventive conservation is not likely to be helpful in the real world, where the uncertainties are not negligible and, rightly or wrongly, people invest a great deal of subjective value in heritage decision outcomes.

In research areas that interest me post-normal science has come and gone in a cyclic fashion over the past 25 years. The expression was first proposed between 1990 and 1993, I discussed it in my book in 1999, and it appeared in a publication on climate change ten years later (Hulme, 2009, p.79) and now it may be on the verge of fresh popularity. In June 2015 Frederick Grinnell proposed a rethink of the approach to assessing risk, saying that the 'post-normal science' framework could make risk-based regulation more efficient. (Nature, 2015)

5. Uncertainty

Real progress is driven by new inventions and new understanding. The influence of fashion is to add unrelated pressures to the rational process. This increases the uncertainty about the way individuals and institutions will react to proposed change.

However, below this level of uncertainty is the basic problem of the unpredictability of chemical and physical processes. In preventive conservation, you want your advice and actions to lead to known desirable outcomes. In the real world, you cannot always accurately predict what the outcome will be.

For me, the 'gold standard' of unpredictability has always been the observation reported on the IIC congress in Ottawa (Gryzywacz and Tennent, 1994). A photograph in the conference preprints shows" Two shells of the same species stored in the same drawer. Only one is affected by Byne's disease." That is to say that although the two apparently identical shells were subjected to the same levels of temperature, humidity and volatile organic acids from storage materials, only one of them reacted. Although the difference in behaviour may be explained by small chemical differences between the two shells, this does not ease the burden on the preventive conservator. Prediction is not possible unless every shell is analysed.

When it comes to damage by light it is possible to find examples of similar levels of unpredictability. Paintings that were similar to start with, and which you would expect to react with the environment in similar ways, have faded at different rates and now look very different. The rate of fading caused by the chemical degradation of indigo in some seventeenth century paintings turns out to be dependent on physical factors such as particle size and layer structure (Hendriks, M. Van Eikema Hommes and Levy Van Halm, 1998). Only a thorough technical examination of a painting would allow a prediction. Even this might not be accurate because there are so many variables to consider.

6. Uncertainties in predicting light damage

The three obvious participants in the museum lighting scenario are the light source, the object and the viewer. Their nature, needs and susceptibilities each contribute to damage to objects caused by light. When it comes to predicting light damage a fourth, less obvious, factor is the environment. Levels of humidity and pollutants affect the rate of fading.

The relevant variables in the source are intensity, spectral power distribution and the duration of exposure. The variables in object vulnerability are the materials and manner of construction of the object, as well as its position and orientation relative to the source. If we take the needs of the viewer seriously we may have to add to the amount of damage by increasing the intensity of illuminance. Older people need stronger lighting to see the details and colours that younger people see. Scholars and conservators may need stronger light to discern diagnostic surface features (Michalski, 1997).

The uncertainties that we need to be aware of can be considered under the same headings. Unless we take careful records, we will not know the levels of temperature, humidity and pollution that the object is subject to. Even if we start taking readings now, we will not know much about the environments with which the object has interacted during its lifetime. The intensity and spectral power distribution of a light source change as it grows older. If there is any contribution by natural daylight to the overall illumination there will be large variations in the intensity, spectrum and duration of exposure, depending on the seasons and the weather. The unknowns in the object may be in the original materials and construction. But there may be further uncertainties due to the poorly recorded history of exposure to light, pollutants and conservators.

The viewer is one of the people who will assess damage. Different people will have different definitions of what constitutes damage. The viewer's familiarity with the collections and with signs of change will be important in determining whether damage has actually taken place. The viewer's ability to detect changes in surface colour and texture are critical factors. Scientific measurements may be used instead of the viewer's eyes to detect change. Instrumentation is subject to many uncertainties (to be discussed in the section on microfading) but there will always be the need for human interpretation. Measured change does not always correlate with perceived damage (Ashley-Smith, 2013; Strlic, 2013)

7. Fashions in museum lighting policies

Museum lighting policies usually rely on the ability to categorise objects by their sensitivity. Broad categories are defined using words such as permanent, durable or sensitive or by specifying groupings bounded by reference to international blue wool (BW) standards e.g. BW 3-4. Once the object has been categorized, a combination of intensity and duration of illumination can be specified that will lead to a estimated rate of fading. The fashions vary in the number and description of categories, in the recommended light intensities and in the method of determining an acceptable rate of damage. Further fashionable distinctions can be made based on the value (significance) of the object and the degree of precaution implicit in the recommended regimes.

The V&A lighting policy was developed around the year 2000 and published as a work in progress (Ashley-Smith et al, 1999b, 2002). It had a brief period of popularity around the world (Tait et al. 2000). But soon it was found to be too precautionary and not discriminating enough. The National Museum of Australia published a new policy that overcame some of these difficulties and added the refinement of two bands of object significance, ‘high’ and ‘average’ (Ford and Smith, 2011). But even this improvement could not avoid some subjective uncertainty, recommending specified ranges of light intensity while advising that lighting should be “as low as possible consistent with good display”.

8. Microfading

The latest fashion accessory to complement your museum lighting policy is the microfader. The logic is compelling. If you actually measure the rate of fading of a selected spot on your object at a known light intensity, you can exactly place the susceptibility of your object in a tightly defined category. The microfader uses a very high intensity light concentrated on a very small area. The result is no longer a vague "probably between BW 2 and 4" but a scientific certainty "exactly BW3"! A few (hundred) measurements and you have the makings of a meaningful lighting policy based on the actual properties of real objects in your collection.

The discussion that follows is based on the work of Bruce Ford (Microfading website) but in the interests of balance and impartiality it should be noticed that other microfading systems are available. It should also be noted that I have no practical experience of the technique. Bruce Ford on the Art & Archival-Microfading website is seen wearing a T-shirt with the slogan "Microfaders: We may be small but we are very, very bright". If I had a website and a T-shirt, the slogan would read "it's never that simple".

Ford is very upfront, if not over the top, in discussing the costs and benefits:

"While there is no doubt that the approach will initially be more time consuming and difficult than enforcing rules, the up-front cost will be far outweighed by the long-term benefits to the museum and its public in terms of improved access, better-looking exhibitions, more fulfilling collaboration between curators and conservators, more targeted conservation interventions, and value for money."

Microfading is described as "a semi-quantitative risk assessment tool rather than predictive". I'm not sure that there can be a risk assessment (estimate of the effects of events that have not yet happened) without some element of prediction. One of the exemplary reports on the website states:

"the microfading results indicate: 4 years of UV free exposure 8 hours a day at 80 lux would be sufficient to cause 1 Just Noticeable Fade (JNF) and it would take approximately 120 years (30 JNF's) to destroy it completely".

This is surely a prediction.

9. Sources of uncertainty in microfading.

The sources of uncertainty relate to the light source; the nature of the object being studied and the interpretation of the results.

The spectrum and intensity of the light source will fade over time as it ages. The UV-free Xenon light source spectrum may not be directly comparable with actual display lighting conditions. The object related uncertainties relate to surface topography and sample homogeneity. The technique is much better on flat even surfaces such as prints rather than the uneven topography of textiles. The sample spot is very small and the number of test measurements must be limited, which might lead to non-representative results with heterogeneous subjects.

The uncertainties of interpretation of the measurements involve the problems of reciprocity failure and the limits of valid extrapolation. The accelerated light testing of materials for conservation use, and most museum lighting policies, assume the reciprocity principle. The same amount of damage will occur from a bright light for a short exposure and dim light for a long exposure. In the days when photographers selected shutter speed and aperture size on their cameras this principle was well understood. However, as Bruce Ford says:

“the relationship between what is observed at very high test intensities and what is likely to occur in a particular instance on display is uncertain.“

Microfading relies on the assumption that it is valid to extrapolate from the small amount of change induced during the test to the effect of much greater light doses. This assumes that the algebraic nature of the dose-response curve is fully understood. The microfading curves are described as predicting “a more or less exponentially declining rate with continued exposure”. Presumably, if the curve is assumed to be exponential, the prediction by extrapolation will be “more or less” accurate.

10. The wicked problem

Does it matter if it’s all very uncertain? Surely all you have to do is follow the precautionary principle and err on the side of caution.

It depends which side you are on. If you want as many living people to get the maximum benefit of looking at your object, you may need a lot of light. Erring on the side of caution would mean ensuring maximum enjoyment and avoiding visitor complaints by keeping things bright. If you see yourself as protector of the object, you don’t want too much light to fall on it. Erring on the side of caution means turning the levels down. If you want people not yet born to get some benefit, you may be able to shine a little less light. But there is no point in greatly reducing levels if you want current viewers to gain something from their museum experience. Low light levels could lead to object damage without any compensating benefit.

The lighting dilemma is a typical example of what is known as a 'wicked' problem. The term was coined in the early 1970s (Rittel and Webber, 1973). The characteristics that make a problem wicked are:

- The solution depends on how the problem is framed
- Stakeholders have radically different world views and different frames
- The constraints and the resources change over time.
- The problem is never solved definitively.
- Optimal is meaningless

The third point about constraints and resources is relevant to the current museum lighting situation, as legislation adds constraints to lighting choices (withdrawal of incandescent bulbs). And while museum funding has always been precarious, it is probably worse now than it has been for a long time (Museums Association, 2015).

The concept of 'optimal' is meaningless if no-one is happy with a compromise. These days museums seem to favour heroic leadership in their senior management rather than consensual democracy. The modern museum director is likely to favour a large and happy present-day audience as a sign of success. Whatever the director concludes is the optimal solution, will certainly be considered sub-optimal by cautious colleagues such as curators and conservators.

There are thought to be three possible approaches to solving wicked problems, each with its own limitations (Roberts, 2000). Firstly, there is the 'authoritative' approach where an expert (or a director) declares what is best. But experts may not actually have a broad enough perspective. Secondly, a 'competitive' approach could be tried where different options are pitted against one another. But an adversarial approach may create an unhappy confrontational environment in which knowledge sharing is discouraged. Needless to say, the third approach is 'collaborative'. Communication and collaboration are the constantly promoted and rarely followed maxims of the management consultant. All stakeholders are engaged in seeking the best solution for everyone. Typically, this approach involves numerous meetings (and flipcharts); which may be why an authoritative approach is often resorted to.

An optimal lighting decision should balance the needs and desires of all those allowed an opinion and who variously promote the causes of preservation, access, interpretation, showcase design, gallery design, lighting design, sustainability and budget. If you study changes in the appearance of museum galleries over time you can see that the views of different people dominate at different times in history. Sometimes the simple whim of a curator wishing to return a gallery to a historically accurate former state can overrule the interests of several stakeholder groups (V&A website).

11. Gallery fashion

Even if, at one point in time, all stakeholders do agree that the new gallery looks beautiful and that all the compromises are worth it, it can't last. Just as fashions in clothes can be dated, because they look 'dated', so it is with gallery and exhibition design. Galleries that do not use the latest technology in lighting or showcase construction are deemed to be 'tired' and must be refitted as soon as money allows. Remember that fashions can change in cyclically or sequentially while continuing to fulfil an unchanging basic purpose. In the case of clothes this purpose is to cover the body, in the case of galleries it is to display objects. New technologies allow changes in display appearance, for instance fibre optic cables make it easy to direct light onto an object from many more angles than just straight down. But it is questionable whether this radically alters the basic relationship between viewer and object.

12. Conclusion

It is undeniable that preventive conservation, as a part of a risk management strategy, should be included in the training of any museum professional. It is certain that there has been progress in the knowledge that supports preventive conservation (Ashley-Smith, 2015). Further technical research is needed to reduce scientific uncertainty. Further social, psychological and historical research is needed to understand why some attitudes just seem right today but will appear old-fashioned and therefore wrong tomorrow, even though their validity is unchanged. So you need more than a week to understand the problems and possible solutions. And it is valid to treat preventive conservation as a postgraduate research topic. But it is wrong to teach conservation without mentioning the uncertainties. It is wrong to think that the unpredictable human element can be tamed or eradicated. You should always remember that:

- Everything is subject to fashion and uncertainty.
- Uncertainty cannot be eliminated.
- Fashion means change, but change may not mean progress.
- The optimal solution may not please you.

And just when you think that everything has been settled, you realise that everything is subject to fashion…

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