



Museum Lighting in the Second Decade of the 21st Century

Kevan Shaw

September 2010

We are in an unprecedented era of change. As museum professionals whose task it is to preserve, protect and display our heritage, change is something we normally do our best to avoid. We now have to take this in our stride as lighting is at the forefront in this period of transformation. Not only are we confronted by new and different lighting technologies, we are under pressure to reduce energy usage - resulting in many of the lighting tools we are familiar with likely to be legislated out of existence. With respect to conservation, we are now required to consider total exposure over time rather than just the simple illuminance on objects.

We are subject to a constant barrage of marketing that suggests new technologies in lighting can solve our dilemmas. Suitable LED technology has been promised for more than ten years; however we still await the delivery of museum standard LED fittings. The LED luminaires that do deliver similar light quantities and quality to the now predominant low voltage tungsten halogen lamp show remarkably little improvement in energy efficiency. What are we to do? Should we compromise on colour rendering and achieve energy savings? We may not have the authority to choose for very long. Following the European ban on incandescent lamps, reflector lamps are next on the target list. The low voltage tungsten halogen lamps that we frequently use are unlikely to be phased out for many years; however that time will definitely come. In the meantime we are being offered too many unsuitable LED replacement lamps that just cannot meet the light output, beam control and colour rendering of the low voltage tungsten halogen lamp. I have had to write several advisory letters to clients who are being pressured by electricians to change to LED substitutes without any consideration of the lighting quality required.

With regards to conservation the new approach to light exposure is both long overdue and very welcome. The importance of understanding that there is no safe level of light is imperative. Exhibiting any artefact equates to its suffering and degradation. Managing collections must include a responsible knowledge of the expected exhibition life. Museum and exhibition design should not rely on the curators and museum directors to address these issues. The V&A published their approach to such issues back in 2004 and are now reassessing other display requirements for temperature and humidity. This research will allow them to target lower energy usage in their buildings, whilst maintaining their exhibition collections on display for as long as possible, with a managed rate of deterioration.

Management is key when it comes to looking into the future of lighting design and technology. It is necessary to consider the long-term view, rather than the short term that has dominated previous designs. As we are driven towards new lighting technologies we have to look carefully at the implications. An example of this is LEDs: they need to be in fittings specifically designed for them; they will last longer than the light sources we are more familiar with; therefore we will experience some economies in maintenance and also potentially in energy use. They are not maintenance free. LED fittings will need cleaning otherwise the light output will drop faster than expected. Cleaning light fittings is usually

forgotten and only takes place when lamps are changed, if at all. Cleaning will also be important to make sure the mechanics of the cooling arrangements are working proficiently as LEDs fail quickly if they overheat. LED fittings are and will remain significantly more expensive than the luminaires we are used to. LEDs are inherently more complex; they should be more mechanically and electrically robust if they are to provide the working life required to pay back the increased capital cost. They will become more difficult to manage in temporary exhibition galleries where frequent changes to the lighting are required. At present we have had the luxury of less expensive interchangeable reflector lamps that can be easily swapped making a gallery change around relatively simple. LED fittings tend to provide a single beam distribution. Therefore many additional fittings will be required to provide flexibility, or changeable lens or reflector systems will need to be used, resulting in many spare lenses or reflectors being purchased and stored carefully.

Showcase lighting has yet to experience great changes. The familiar fibre optic systems are still the best option in most situations. There does need to be some consideration given to the light source end of the fibre. In the future we will need to replace the low voltage tungsten halogen solutions. LEDs are not an ideal alternative, as they will not provide efficient optical coupling with the fibre ends as they are currently made. Metal halide light sources tend to have poor colour rendering and are often just too bright for sensitive objects. They also are less than ideal at emitting light into the fibre bundles and are not that efficient as a result.

So how do we improve our conservation and energy consumption? The main tool we have is lighting controls. Basically a light that is switched off or dimmed to minimum output is using a relatively small amount of energy and is causing minimal degradation of the lit object. We need to consider more systems that respond to visitor presence, but in a subtle way. The rather obvious switch on when the visitor approaches is not the only way to do this. Letting the visitor choose to switch on lights in a case is a good possibility; sequencing lights in a display or in a case can also be used not only to save energy but as part of the interpretation. Placing sensors so they activate lighting before the visitor approaches an object or enters a space is also possible. None of this is new but it is all becoming easier and less costly as the technology becomes more widespread. To get the best results for objects it does become necessary to monitor the actual exposure over time, again a new burden on curatorial staff; however one that must be considered.

While the Chinese might use “may you live in interesting times” as a curse, I relish the challenges put before me when lighting museums and exhibitions. The challenges of providing good visual access, whilst ensuring the long-term survival of sensitive objects are stimulating, and the rewards of bringing objects to life during the final focus sessions in museums are second to none.

Kevan Shaw MSLL, PLDA, IALD

Kevan Shaw is Design Director of KSLD, Director of Sustainability for PLDA and Chairman of the committee re-writing the CIBSE/SLL LG8, Museum and Gallery Lighting to be published at the end of this year.