

An Overview of Light and Lighting in Historic Structures That House Collections

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Setting appropriate goals for lighting collections housed in historic structures and finding suitable methods to achieve them are difficult because light and lighting serve multiple purposes in such settings.

Providing lighting for historic structures operating as museums is a more complex task than control of other environmental factors, such as temperature, relative humidity, or air pollution. This is not a technical issue but a conceptual one. The control of relative humidity and temperature to benefit both structure and collection may be very complex technically, but the goal, to promote preservation, is clear. Light, aside from its role in deterioration, plays two additional roles in exhibition spaces. One is to aid in the viewing of collections and interiors. The other is as an aspect of interpretation: to convey to viewers the original appearance of the light inside the historic building and to interpret the living conditions of its inhabitants. Authentic discomfort due to uncontrolled temperature and relative humidity has not been of comparable interest to professionals as an interpretive tool.

Light as an Instrument of Deterioration

Conservators working with historic structures have been quite successful in promoting practices that protect collections and room surfaces from the damaging effects of light. Typical strategies include covering window openings with synthetic films that filter out ultraviolet light and partially block a certain percentage of visible light as well. Roller shades, film materials applied directly to window glass, and sheet materials like Plexiglas® hung against or screwed into window frames have all been used for this purpose. Another common strategy is to investigate and reuse original equipment designed to control light and temperature. Exterior shutters and blinds can be renovated for use or replicated so that the same elements serve as both protective and interpretive tools.

Conservators have been particularly successful in making custodians aware of the harmful effects of ultraviolet light, with the occasional unfortunate consequence that some staff believe that ultraviolet light is the only harmful portion of the spectrum and that its removal gives them license to raise the level of visible light as high as they wish. Professionals need to be aware of this common misconception so that it is not perpetuated.

Another important protective strategy is to restrict the duration of exposure, as well as the intensity. Measures not historically appropriate, such as blackout shades or Fome-cor window inserts, can be used to keep virtually all natural light out of interiors when a building is not open to the public. It has been estimated that, even in an institution open to the public six days a week from ten to five, approximately one-third of the light exposure occurs when the institution is closed to the public. Therefore, by excluding light completely from interiors when a building is closed, the deterioration caused by light can be reduced by at least one-third. Obviously, if the public viewing hours are shorter, the reduction of light deterioration could be even greater. In buildings where visitors are guided by docents, lights can be turned on only when a room is actually being visited. The strategy of protecting collections by reducing the duration of exposure produces substantial results and is probably underused.

Light as a Necessity for Viewing

The second role that light plays is that of making exhibits viewable. This does not refer only to the physical fact that vision requires light. The way in which light is handled, including its direction-

ality and distribution, color and intensity, has enormous influence on the appearance of objects. Light should be seen as an aspect of interpretation of both the object and the building.

The viewing of objects within a space is both aided and hindered by the filtration of visible light from windows. When visitors stand in the doorways of rooms and look past furnishings directly into windows, the contrast and glare make viewing difficult. For this reason, blocking a certain amount of light coming through windows is beneficial to viewers in reducing glare and allowing their eyes to adjust to lower light levels. On the other hand, light levels can become so low that visitors simply cannot see very well, particularly colors and details of design.

Overall low levels of illumination make adaptation a critical issue. Visitors entering dark spaces directly from outdoors are unable to see well until their eyes adjust to lower levels. After their eyes adapt, however, even a quick glance at a bright source or surface will reverse the adaptation. Therefore, careful planning is necessary to provide an initial transition space for visitors and to eliminate bright areas between darker rooms.

Several successful strategies have been adopted to deal with the lighting of collections once daylight is filtered. One is the reuse of existing period or reproduction fixtures.¹ This often involves wiring gaslights or fixtures that originally held candles. Early electric fixtures are often also rewired, partly for safety reasons. Several types of lamps are available that mimic the appearance of gaslights or candles, but most do not attempt to imitate the movement of the flame in the original.

As a complication, it is currently considered good practice to leave existing systems in place rather than to remove and discard them, in order to preserve the history of the technology of the structure. This may be impossible when old electric fixtures are rewired, but if original wiring is removed, it should be documented carefully and samples should be kept.

Another strategy for lighting interiors without relying entirely on daylight is to place new fixtures like those housing

low-voltage spotlights or fiber-optic systems in places where they cannot be seen by visitors. This is sometimes done in order to highlight particularly important or beautiful objects. This type of lighting requires that curatorial personnel make decisions about the desired appearance of objects. How important is it to see surface textures, for example, or to see silhouettes clearly? How much should individual objects stand out from their backgrounds?

Dark rooms with spotlighting on individual objects, as opposed to an overall wash of light, can make rooms look more like museum galleries than living spaces. Many visitors respond to the difference in some way, even though they might not be aware of it. On the other hand, since it is important to keep total light exposure to a minimum, it may seem pointless to augment light on flat wall surfaces. Balancing these two factors requires a flexible system and careful attention to detail.

Fiber-optic systems are particularly appealing in historic structures because they are extremely energy-efficient, because the heat generated is remote from the objects, and because changing lamps at a central location is easier and less prone to mistakes than relamping many separate fixtures. Fiber-optic systems are not as commonly used in the U.S. as in Europe, but they are becoming more popular.

Light as an Interpretive Element

Interpretation of the original use and appearance of a building is the third role that light plays in a historic structure, but it has not received the attention that has been given to light's other uses.² While electrified historic fixtures may seem authentic, the original fixtures would seldom have been used during the day. It was well into the twentieth century before energy was cheap enough that much artificial light was used in the daytime. Activities that required bright light were carried on outdoors, if possible, or next to windows.³ Light fixtures were not numerous or efficient enough to light whole spaces, and artificial light was undoubtedly limited to task lighting. On the other hand, when a room was not occupied, shutters or shades

would have been used to keep sunlight away from light-sensitive textiles and other furnishings.

These aspects of interpretation create a paradox for those planning lighting for a historic structure open to the public. Task lighting is simply inappropriate for visitors who want to see a whole room at a glance and be able to inspect individual objects in detail. As interested as visitors are in learning about authentic aspects of life in the buildings they visit, most do not appreciate shuffling around in the dark.

Another difficulty in using light interpretively relates to the psychological aspects of light. The constant shifts of natural light, the play of candlelight, and the combination of warmth and light from fireplaces convey powerful messages. Visible rays of light falling on particular objects also evoke strong emotions. These instinctual human responses make it easier for visitors to personalize the daily human experiences of the past. This is an important function of historic houses and sets them apart from art museums, which tend to focus on the accomplishments and possessions of extraordinary individuals. Rigid control of light from outside and the banning of real candles and lit fireplaces, as understandable as they are, can take some of the richness out of the interpretation of historic sites.

In other words, the requirements of responsible custodianship and attempts to allow visitors easy viewing of what they have come to see can jeopardize the authenticity of the interpretation of the building and weaken a visitor's personal response. The solution to these paradoxes may lie in rethinking the ways that lighting can contribute to the interpretation of a site.

In the daytime, rooms would have been lit by direct sunlight and by sunlight reflected off room surfaces, not from incandescent lamps usually used in museums, which have a lower color temperature. When the levels of incoming daylight are reduced, it may be appropriate to approximate the color temperature of daylight so that, even though the window is not bright, the rest of the room appears sunlit.

Computer- and remote-controlled systems make it possible for building

lights to have at least two different "scenes," one that optimizes viewing of interiors and the other that is more "authentic." A possible third scene could reproduce authentic dusk or nighttime conditions, using original or reproduction fixtures, possibly with some additional lighting at a matching color temperature. The visitor might enter a room at the "authentic" daytime setting, with relatively low light levels, and after viewing this scene, a docent (or automatic control) could switch to a "viewing" scene, where individual objects are more clearly visible. As the sun sets, the scene could again be switched to the night scene.

The Decision-Making Process

The three aspects of light described here create serious complexities in planning lighting for historic structures, as they represent fundamentally conflicting goals. The decision-making process and the execution of a lighting scheme, therefore, require sustained participation by a range of professionals working as a team.⁴ Conservators can speak to the needs and susceptibilities of collection

materials. Lighting designers should know about the availability and use of a wide range of fixtures and their maintenance. Engineers and architects may be needed to design electrical delivery systems and review life-safety issues. Curatorial personnel contribute their knowledge of collections and the results of historical research, while interpreters speak to the needs and interests of visitors. Historic-preservation professionals should be able to apply current professional standards, including the New Orleans Charter (which appears in this issue) and should be familiar with a variety of other projects. If new systems are to be installed, the facilities manager and other in-house personnel need to participate in planning to ensure the safety of the building and its collections while work is being done. These individuals must work as a team to hammer out solutions that will be affordable, feasible for the institution, and effective.

Those involved in a lighting project must consider the importance of lighting to the interpretation of a site, as well as to viewing conditions and preservation. The provision of lighting systems that fulfill all three aspects is difficult both

technically and conceptually. Much more work is needed to provide practitioners of historic preservation with the tools that will serve the needs of both the public and the collections.

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Notes

1. The search for appropriate reproduction fixtures has been aided by such publications as Roger W. Moss, *Lighting for Historic Buildings* (New York: John Wiley and Sons, 1988).
2. Architects and designers are often keenly aware of these issues in other types of projects. See, for example, Derek Phillips, *Lighting Historic Buildings* (New York: McGraw Hill, 1997).
3. See, for example, Jack Larkin, *The Reshaping of Everyday Life 1790-1840* (New York: Harper & Row, 1988).
4. P. Himmelstein and B. Appelbaum, "The Process of Compromise: A Team Approach to Conservation Environments," *APT Bulletin* 27 (1996):8-11.

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