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The Care and Maintenance of Stained Glass

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Windows are so integral a feature of architecture that we are inclined to accept them without question as part of the structure implying permanency. If they function perfectly in the ever-changing light, we are hardly aware of the fact that they are compositions of fragile glass and pliable metal. We take them for granted without realizing that they had to be carefully designed and thought out for their particular function and location.

Indeed this is as it should be, for this handmaid of architecture should take its place quietly in the architectural household. Here we have an interesting paradox, for while distinguished windows do not force themselves on one's attention, but rather retire modestly to the background, they are actually the most prominent feature of an interior in that they are the very source of illumination, and deal in terms of direct transmitted light rather than in borrowed illumination from opaque surfaces.

As a matter of fact when we think of the amount of wonderful old glass that remains to us from the heights of the twelfth and thirteenth centuries, it is amazing to realize how durable these fragile materials actually have been. The natural elements were not the cause of as much destruction as the acts of man, wars and religious upheavals. It is hard to imagine Nature destroying ancient masterpieces in color and light at the rate accomplished by Cromwell as he stood on the tallest ladder with his pike-staff, "rattling down proud Becket's glassy bones".

However, glass is not the permanent uniform material that we often think. It is made in many different compositions. There is on record one shipment of glass bottles, traveling by sailing vessel, that deteriorated beyond the point of usefulness during a stormy voyage.

The mediaeval masterpieces have corroded and have acquired a patina that has

greatly impaired their structural quality while, in many cases, increasing their beauty. Windows of York Minster were so thin that, in order to preserve them, every piece had to be removed and releaded between protective ~~pieces~~ layers of clear glass.

Most of the old masterpieces have been repaired and releaded many times, and in fact it is safe to say that the windows of Sainte Chapelle in Paris must have looked very different when they were first ~~placed~~ installed.

However, these changes took place over periods of hundreds of years, and we have few buildings in our own land in which the windows need yet to be considered in these long term proportions.

In spite of their amazing durability, there are many things that can happen to our own windows that neglect will only aggravate. The question is often asked, "Should we clean our windows and if so, how?" Simple leaded windows of clear glass should be scrupulously cleaned and polished, but, as a rule, more elaborate stained glass windows need no cleaning. They become weather stained on the outside, but successive rains generally hold this to a minimum. They acquire a certain amount of dust and dirt on the inside, but generally not enough to interfere with their appearance. However, if they are subjected to unusual deposits of grime from heating systems, or if they are located in communities that are unusually dusty or smoky, it may be advisable to clean them.

A well made stained glass window may be cleaned by the same methods used in cleaning any other kind of glass. It can be washed with soap and water, brushed, or vacuum-cleaned. A little ammonia in the water often helps, but one should avoid strong soaps or acids. As in cleaning any window, one must avoid pressures that would break the glass.

If the window is well made, any painted pattern or texture on the inner surface of the glass will not be affected by reasonable treatment. This painted work is accomplished with mineral pigments that are fired into the surface of the glass and is therefore vitreous.

The coloring material is in the body of the glass itself and is not altered by any surface application. Strong solutions applied to the glass might impair the cement that fills all crevices between the glass and lead, serving to keep the window weather-tight.

This cement hardens at exposed points, but should remain pliable under the leads. However, if inferior cement is used, it may harden and become brittle throughout its composition, pulling away from the glass or lead and sometimes falling out as the glass vibrates in the wind. Driving rain will find its way through crevices where the cement has ~~fallen out.~~ crumbled away.

One can often detect dried and missing cement by tapping the face of the window with the finger tips. If the glass is not firm, it will rattle slightly. Sometimes the glass craftsman can rub new cement or putty under the flanges of the lead while the window is in place, but as a general thing, it is necessary to remove the window, dig out the dried cement, and recement it in a horizontal position.

Sometimes moisture will come in through the framework above the window and run down the glass surfaces. The window is then accused of leaking, and the glassman mistakenly held to blame. The true source of leakage can often be determined by playing a spray from a hose on the outside of the window, avoiding the surrounding frame.

Often problems of condensation are encountered, especially in large areas of glass. Quick temperature changes in damp atmospheres will cause moisture to be precipitated and to run down to the sill. Condensation gutters are often provided at the base of the window to take care of this condition. They take the form of small metal troughs with "weep-holes" through the lower leads of the window to the outside, to carry away excessive amounts of water.

Protection glass reduces the amount of condensation. However, the advisability of protection glass is often a difficult question. The irregular pattern and textures

of lead and glass surfaces harmonize beautifully with their architectural surroundings, and it is regrettable to cover them with great sheets of glass that catch the reflected glare from the sky, or to cage them in wire screens.

Well-made windows are weather-proof, and under normal conditions should need no exterior protection, but if a window faces a play-yard, or if there are any other unusual risks, protection may become necessary. Heavy clear glass, or one of the lightly-textured commercial glasses offers the best solution. It should be placed a little away from the leaded glass, and its divisions should correspond to principal divisions in the leaded work. No doubt there is some saving of heat in this double glazing.

Wire screens often cast their pattern on the leaded windows, especially in direct sunlight. They also reduce the amount of illumination to the window. If screening must be used, it should be placed well away from the window, and the mesh should be as unobtrusive as possible.

The metal ventilators, often used in windows, are a vulnerable point to keep in mind, for they are sometimes subject to considerable rough treatment. When they are opened or closed violently, the glass receives a severe shock, and breakage often results. They are sometimes allowed to rust, and get out of working order. They, as well as any surrounding wooden frames should be kept well painted and repaired. At best, ventilators never improve the appearance of windows. Modern ventilation and air-conditioning systems often eliminate this condition.

Perhaps one of the most bothersome problems related to stained glass windows results from the fact that lead is not a static metal, but is inclined to warp under quick changes of temperature. This leads to bulging and sagging in windows unless they are well barred at intervals of about nine to twelve inches. Many windows have been made without sufficient barring support, and over a period of years their surfaces become very irregular. In some cases the lead and glass actually separate, leaving crevices and creating conditions so serious that there is danger of the glass falling

out of the window.

Sometimes reinforcing bars are not sufficiently well soldered and wired to the glass surfaces, and they break away, leaving the window with little support. In mild cases, the warpage may not go far and may not cause serious difficulty for many years, but if the glass has pulled away from the supporting bars and is in a precarious condition, the windows should be removed and flattened on the bench. Sometimes this can be done under heat; at other times portions of the glass and lead must be removed to get the window back into shape. Additional reinforcing bars should be provided when the glass is straightened, cemented, and reinstalled. If the windows are quite old, it may be found that the lead has lost its "virtue", and the window will need releading. Thin flanges of lead exposed to the window will eventually lose resilience and become brittle.

Cracked and broken pieces of glass are sometimes hard to replace, although they may not present as much difficulty as might seem at first glance. If the original designer of the window is still available, he should be able to supply replacement pieces from clear descriptions of their location, size, and pattern. He may still have the drawings and patterns from which the windows were made, and a photograph of the window may be available. This will be a great help in designating the position of broken pieces and in making the repairs. Of course, pieces involving intricate painted detail will require more time and expense than simple patterns. Some colors and textures in old windows, especially those of the type known as opalescent glass may not be obtainable, and other tones may have to be substituted. Opalescent glass is characterized by a milky, semi-opaque quality, with the color showing on the surface in contrast to the so-called antique glass in which the color is apparent only in transmitted light.

This catalogue of calamities that can befall stained glass may appear ominous,

and implies an alarming degree of instability that is not at all characteristic of the medium. As a matter of fact, very few of the conditions suggested will probably ever be encountered in any one group of windows. But Nature and man are always at work, and windows continue to be at the mercy of the light they receive.

There are minor botherations that may present themselves, such as ivy on surrounding walls. It is lovely and picturesque, but exploring vines should be watched to make sure that they do not creep over the windows, seeking support in irregularities of glass and lead.

Neighboring trees and bushes have a way of growing up and casting unexpected shadows. We are sometimes surprised, especially in thickly settled communities, to find that a building erected in the immediate neighborhood has completely altered the appearance of some favorite window.

But, with reasonable care, it will be found that most stained glass windows are built to well withstand "the battering siege of wreckful days".