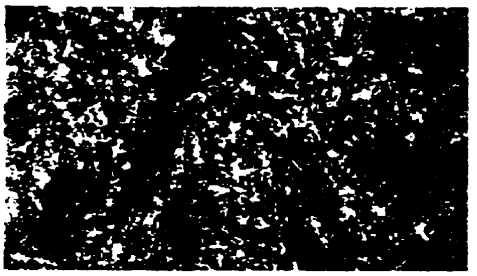

The Dichotomy of Weathering in the Cemetery:

An Investigation of Experiences and Expressions in Landscape Architecture

by Michael Henry Koski-Harja

A Practicum
submitted to the
Faculty of Graduate Studies
in Partial Fulfillment of the
Requirements for the Degree of

Master of Landscape Architecture

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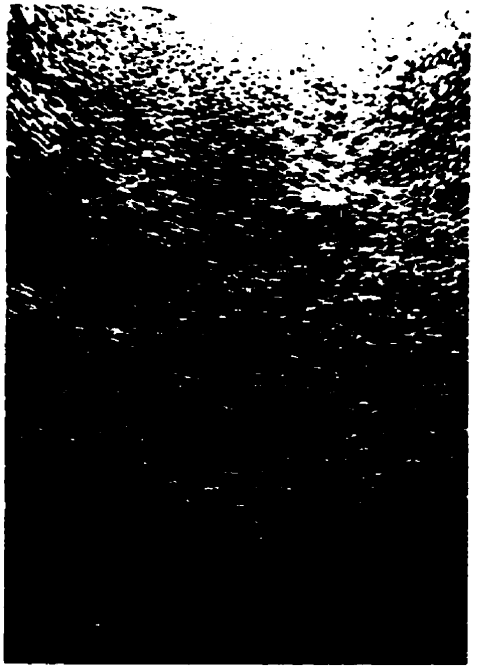

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THE DICHOTOMY OF WEATHERING IN THE CEMETERY:

AN INVESTIGATION OF EXPERIENCES AND EXPRESSIONS IN LANDSCAPE ARCHITECTURE

BY

MICHAEL HENRY KOSKI-HARJA

A Thesis/Practicum submitted to the Faculty of Graduate Studies of The University of Manitoba in partial fulfillment of the requirements of the degree of MASTER OF LANDSCAPE ARCHITECTURE

To my parents for their unwavering support

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Abstract

The process of weathering always influences landscapes. Although different objects will weather at different rates, all materials will eventually change over time. One cannot deny this physical reality in the built environment. However, perceptions of the effects of weathering may be varied and profound. The relationship between people and landscapes (both human built and natural) is a complex psychological event. As a topic of interest to landscape architects, the effects of physical weathering on the perception of outdoor places and objects are investigated in this practicum.

This investigation of the perception of weathering is focused on the cemetery. The study describes the conflicting perceptions of weathered forms in the cemetery from the perspective of two groups. One group is the bereaved who visit the cemetery to mourn or remember the dead. The second group of visitors is called the bystanders who visit the cemetery, not with the particular intent of mourning or remembering a person buried in the cemetery, but as a place of cultural interest or atmosphere. This dichotomy of perception in the cemetery is explored by extracting criticism and comment from literature on the subject of landscape architecture, cemeteries and weathering.

As a contemporary example, the case study of the Igualada Cemetery is used to describe the intentional allowance of weathering as an expressive quality in the design of a cemetery. An appreciation of weathering is found for both the bystanders and bereaved. At Igualada, the cemetery is designed as an expressive place for all visitors and the process of weathering is an integral part of that expression. The investigation uncovers a number of positive aspects of the process of weathering in the cemetery. The study concludes with a set of insights on possible new directions in the design of cemeteries and landscapes in general.

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Preamble

This study is an investigation of the relationships among a collection of topics centered around the process of weathering. The purpose of the study is to describe these relationships in order to better inform landscape architectural design. Theories are examined and new insights are described. A process of weaving the topics together is employed to arrive at a common ground among the subjects of weathering, perception, cemeteries and landscape architectural design. By introducing and describing the separate topics of weathering and perception, a foundation for the following discussion on cemeteries is laid. A case study of a particularly expressive cemetery design follows to further demonstrate the relationships of the previously described topics. Finally, insights are described as guides for landscape design as they apply to cemeteries, weathering and perception.

The target audience for such a study is the landscape architect. The analysis of theories and the subsequent insights are meant to aid in the process of designing landscapes that include an appreciation for the complex process of weathering. This study will be of interest to designers since they may use the following insights to better inform their design intents and applications. In order to sensitively design culturally significant places, it is important to understand such an integral part of the physical environment as weathering. How it affects, not only the physical object, but also people's psychological relationship with those objects, is of concern. By identifying the salient issues of the perception of weathering, an awareness of the opportunities of experiences and expressions is gained. These principles for weathering and landscape architectural theory can form ordering systems for design processes.

Methodology

This study is a descriptive practicum with some prescriptive conclusions. It describes the relationship between the fundamental subjects of weathering and

perception as they apply to the specific landscape of the cemetery. Yet, it is also prescriptive because the insights, which are gained from the exploration, lead to conclusions about the process of design as it accounts for weathering, perception and the context of cemeteries. An investigative methodology was followed to explore these subjects and to develop these insights. The study began with an investigation of the dichotomy of the perception of weathering, to define the research problem. A literature review was the means of identifying the salient points of the research question. These sources were analyzed for evidence by seeing how the process and conditions of weathering were described in general and specific contexts. In particular, articles and books about cemeteries and landscape design were consulted. In place of actually visiting the site and speaking with the designers, the main thrust was to find evidence of the perceptions of weathering, as read in the criticism of others.

The study is structured, first with the general definitions of the separate topics, and later the combination of these issues, to demonstrate how they affect the practice of landscape architecture. This is the structure because the study is really a woven tapestry of seemingly separate ideas that relate to one another under the design processes in landscape architecture. The final insights return to general issues involved with the process of weathering and the use of this understanding to create landscapes harmonious with natural processes while still maintaining a relevance to human needs and perceptions.

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1.0 Introduction

In the construction and manipulation of the built world, landscape architects play a role in the design of many types of outdoor environments. One such environment is the cemetery. Cemeteries are a special part of our environment. They are the final resting places for our dead. They are an inevitable part of the landscape. Equally inevitable are the forces of change in these landscapes. The forces of climate and human actions are instrumental in changing the physical character of those places that are built. In the cemetery, the forces of change can have a number of effects. The process of weathering can be perceived either as an undesired change or a desired change.

The purpose of this study is to describe the dichotomy of the differing perceptions of weathered form in the cemetery. In particular, the relationship between the somewhat opposing perceptions of the bereaved and the bystander is explored to reveal specific reactions to weathering. Issues such as perception, materiality and expression are used in this exploration of the practice of landscape architecture. By describing the conflict between the inevitable process of weathering and Canadian culture's general aversion to it, insights on the nature of weathering are gained as an integral aspect of a landscape design process. In the end, there are a number of insights into the role of weathering in the process of landscape architectural design. These are ordering principles for the design of landscapes, in particular, the cemetery.

Definitions

This first chapter introduces a number of definitions. These topics are the separate issues that are combined in the study to show the relationships that are pertinent to landscape architectural theory and design. At first, the

definitions may seem separate issues, but the relationships will become evident as the study narrows focus to the investigations of cemeteries. The first topic of examination is the practice of landscape architecture.

The study of weathering and cemeteries is directly related to the practice of landscape architecture. Landscape architecture involves the design and planning of our external built environment. It is the natural discipline from which to question the perception of weathering as a process which affects our environment. The following is a definition from the Canadian Society of Landscape Architects:

Figure 1

The multifaceted profession of Landscape Architecture requires practitioners to be skilled in planning, design and management. They can provide services such as environmental assessments, feasibility studies, land use policy development, and the preparation of plans for site rehabilitation, reclamation, heritage conservation, parks and open spaces, tourism and recreation facilities, habitat creation and urban and garden design. ...Landscape and garden design, the historical core of the profession, is concerned with the biophysical analysis of outdoor space for the design of residential, commercial, industrial, institutional and public areas. It includes detailed environmental and site analysis, development of design concepts, and the preparation of construction plans and drawings. These plans include the design and specification of landscape features, trees and plant materials. (from C.S.L.A. web-site copyrighted 1997)

In other words, landscape design involves the organization of spaces and objects to create places of human activity. Cemeteries are one type of place that landscape architects design and plan. They are places of cultural significance, which need sensitive design befitting their special status as spiritual and emotional places.

Figure 2

As a part of the design of the environment, landscape architects are interested in the material and formal qualities of objects. Since weathering is an inevitable part of the environment, it is a factor in the choice of materials and the layout and assembly of those materials into a designed landscape. Weathering affects both the physical and psychological qualities of these same materials, as any viewer perceives

them. Landscape architects work with these physical and psychological qualities of materials to express ideas in physical form to communicate with the people experiencing the landscape.

Figure 3

The second topic of examination is weathering. As a process in the landscape, weathering is the primary topic of this study. Weathering is both a process and a manifestation. It is a process of deterioration that affects all materials exposed to some force or combination of forces. Rain, wind and sunlight are among the elementals that cause weathering of materials. Humans also affect weathering through physical contact and use of objects. Meanwhile, weathering is also the physical manifestation of the same process, physical evidence like rust, rounded corners and water stains. More descriptive examples of this manifestation may include a cast iron post that appears to bleed with rust, or a copper plate panel that ages green with corrosion. From these latter examples, it is obvious that there is an addition of interpretation involved with one's reaction to the manifestation of weathering. Subsequently, weathering affects many different perceptions of such transformations of materials.

To navigate these perceived positive and negative effects, the topic of materiality is also introduced. Materiality is the relationship between people and the material objects of the environment. It is apparent that a number of levels of interpretation lie behind each individual's understanding of weathering and landscape architecture. In the ensuing investigation, other issues begin to emerge as important and varied. For example, the issues of value, aesthetics and interpretation are involved deeply within the attempted objective analysis of weathering as process and condition. To address these issues, the topic of materiality is investigated to identify the logical location of these intangible issues in the larger topic of weathering as it affects landscape architecture. The concept of materiality is the physical and mental process through which each person relates to materials. It is a combination of the physical and sensual response of our body and our mental understanding of those impressions, both conscious and subconscious. It includes both the understanding and the reaction to the environment. One place to find this relationship is in a place that people invest more emotion content than average, such as the cemetery.

Canadians have numerous, different funerary practices due to a cultural mosaic that forms Canadian society. This diversity of burial customs has lead to a variety of burial places (Sloane 1991, 1). However, the predominant form of

burial place is the cemetery, characterized by erect or flush grave markers and the remains of the deceased buried below the ground. Today, cemeteries have standardized plot and monument sizes and forms. The term 'memorial park' is now used to name the cemetery for the purpose of avoiding the morbid connotation of the word 'cemetery' (Sloane 1991, 2). Cemeteries are investigated as part of the analysis of weathering because of their significance as places of both secular and spiritual qualities. They are landscapes that hold a special emotional meaning for people. The burial and interment of the dead have specific importance to most cultures as a means of treating the dead and expressing remorse and grief at the loss of life. Consequently, the physical condition of these places is a sensitive issue. Upon close inspection, a cemetery is a good location for revealing different perceptions of the same process of weathering.

These definitions are only meant as an introduction to some of the topics of this study. They will be described in further detail in the following chapters and subsequently combined to demonstrate the relationships among people and landscapes.

Rationale

There are two motivations for a study on this topic. The primary focus is to clarify the general subject of weathering as a process affects human landscapes, in particular, the cemetery. This study will attempt to uncover previously unconsidered information and relationships among the topics of weathering, perception and the cemetery. By clarifying the subject of the cemetery as a place of conflicting perceptions, landscape architects can develop designs that utilize a keen understanding of weathering, material characteristics and public views. This can lead to rich, expressive places in our urban environment, if the process of weathering is found to have positive aesthetic merit. Making the understanding of the contemporary reaction to weathering explicit will hopefully aid the landscape architects in their search for relevant and successful designs.

Figure 4

The second motivation for this research is the exploration of a general philosophical approach to landscape design. The time has come for landscape architects to evaluate the notion of control over the physical constructions that they design. If change will indubitably occur then it is necessary to work within

the realm of change. One may fix the level of permanence desired and then leave the final "finishing" to the inevitable forces of the environment. By working with both durability and change, the initial intention of the designer may have greater success as an enduring or relevant message. It may also force the identification of what is desired as a absolutely unchanging aspect of a design and what is flexible to change.

Direction of the Study

The goal of this study is to discover the merits of weathering in the landscape by investigating the process in the context of the cemetery, as a physical element of the environment and as a perceptual quality. Weathering can have many different physical manifestations. Also, it can have symbolic and narrative qualities that make landscapes into places rich in meaning and possible interpretations. The product of this investigation is a set of insights that suggest a design process that includes weathering. The insights will reveal strategies for the inclusion of weathering as a process to create landscapes harmonious with this natural process.

Figure 5

The primary example of weathering in cemetery design is the analysis of Igualada Cemetery. This cemetery is of particular note because of its recent design and construction, as well as the designer's use of expression and analogy in the design. The design provides an example of the allowance and exploitation of the process of weathering that other designs ignore. Conclusions are synthesized from both the previous citations about weathering and the case study. In the end, weathering is described in a way that illustrates its complimentary effects on some of these landscape forms. These are the practical and theoretical results of the research question.

For this study, the primary focus is on the material aspects of landscape design and construction. Landscape objects are built to perform specific tasks. People experience and use these objects, such a fences and paved paths, or in the case of the cemetery, the grave markers. Moreover, the process and results of weathering can be an expressive part of a cemetery design, demonstrating abstract ideas such as life, death, mortality and nature. Because weathering is

found in all outdoor places, it is a cue of time and change. In landscape architecture, the use of expression through materials and forms is a means of communicating these abstract ideas in a physical world. Weathering can be described in a way that illustrates its complimentary effects on the landscape forms of the cemetery. Such a description can lead to a wider awareness of, and appreciation of, this inevitable process of material change.

2.0 Background

This study begins with the introduction and description of the relationship between weathering and landscape architectural features. The nature of weathering is described as both a process and an object. Weathering is identified as it appears in landscapes and landscape architectural features. Subsequently the practice of landscape architecture is outlined as it applies to the outdoor built environment. A discussion on the nature of materials and our perception of materials (materiality) follows. In particular the processes of weathering are the focus as they affect the landscapes. From these descriptions, one can understand some of the later perceptions of the effects on weathering on the built environment based on the theory of materiality, or in other words, the character of materials.

Weathering

Weathering is an inevitable aspect of the physical world. Environmental and human forces are constantly acting upon the physical world. Elements such as wind, rain, sunlight, and temperature all affect the material world that humans have constructed. Human activity and industrial processes directly or indirectly affect the objects people build. Consequently, landscape architectural features are an inescapable part of this built environment and the process of weathering. By necessity, these features are in the midst of elemental and human forces. Although the materials used in construction are varied, they are all affected in some way by change over time and the forces of weathering.

Weathering as Process

Weathering is perceived as both a process that affects change and the residue of that process as it is physically manifest. The actions of wind and rain are examples of the forces that actively affect material change. The smooth surfaces of old brick are examples of the results of such elemental forces. Both can be called weathering. The first part of the description of weathering deals with the process.

Weathering is fundamentally a process in time. It is an action of change. Weathering ranges across a number of scales of time and space. For example, what may seem unaffected by the elements may, in fact, be changing at a rate well beyond a person's daily or lifetime experience. For example, the slow erosion of granite has this resistant quality. Yet, the granite is still in a process of change. The impact of precipitation eventually wears the surface one-eighth of an inch in one thousand years. Meanwhile, other materials will twist, peel and crack from one day to the next. It is only a matter of time before all outdoor objects and places change due to the process of weathering.

> *...Imagine a cup of water falling off a table and breaking into pieces on the floor. If you take a film of this, you can easily tell whether it is being run forward or backward. If you run it backward you will see the pieces suddenly gather themselves together off the floor and jump back to form a whole cup on the table. You can tell that the film is being run backward because this kind of behavior is never observed in ordinary life. If it were, crockery manufacturers would go out of business.*
>
> *The explanation that is usually given as to why we don't see broken cups gathering themselves together off the floor and jumping back onto the table is that it is forbidden by the second law of thermodynamics. This says that in any closed system disorder, or entropy, always increases with time. In other words, it is a form of Murphy's law: Things always tend to go wrong! An intact cup on the table is a state of high order, but a broken cup on the floor is a disordered state.* (Hawking 1988, 144)

Stephen Hawking discusses the nature of time. *Time* is a progression of events inherent in the universe. As a dimension, time encompasses all "things" in our daily experience. No physical object escapes its influence. The previous quotation is a simple model of the universe because nothing in our built environment is a truly closed system. Yet it does explain the tendency of

materials to fall into disorder contrary to human actions to create order (i.e. build).

No matter how one views it, whether from the view of theoretical physics or a philosophical view of everyday experience, the process of change and its resultant *disorder* is undeniable. Entropy is the irreversible tendency of a system, including the universe, toward increasing disorder. Left to itself, the system will continue to increase its disorderly state (Hawking 1988, 102). Counterbalanced with this tendency of disorder is the action of life. Creation is the opposite of disorder. It is the other half of the description of change. For example, biotic reproduction is one such process that orders the physical materials of the universe. Another process is the activity of humans to build and modify the landscape. There is a human impulse to counteract this disorder by forming and building our local environment. Thus, we find the threshold of conflict between the built and the event of change. In this threshold, we find weathering.

Entropy and chaos are both current topics in scientific research. Chaos theory represents a field of study in the scientific community that investigates complex systems of behavior, which do not appear to follow an orderly pattern of activity. Such notions as non-linearity and fractal patterns are the languages of chaos. By understanding the levels of complexity in a set circumstance scientists are forced to accept the unpredictability of an process, be it the swirls of fluids in turbulence or, with my specific topic, the changing of material qualities under environmental forces (Gleick 1987). If one understands weathering as a complex system of physical behavior and forces, one must forget the notion of accounting for all the possible variables.

The issue of ruins can demonstrate not just the physical but also the psychological qualities of the effects of time on our built environment. Florence Hetzler in "Causality: Ruin Time and Ruins" remarks that ruins have their own time, place, space and lives. Ruin time exists as a much larger scale than that of the everyday; the time of the newly built, the time of built, the time of the ruination, the time of the ruin inhabited by plants and animals, the time of the whole cosmos as the ruin fades to nothing. In essence, "time is the intrinsic cause of a ruin as a ruin"(Hetzler 1988, 51). Further, it is time that unites the elements that make ruins, beyond the pace of human history, environmental time, biological time, geological time. The time scale has shifted. No longer are the participants locked into clicking watches and buzzing alarms. The complexity of a human's experience of time is revealed with these issues of

scale. It is not simply a linear progression that is metered and easily measured. Time is dynamic in human experience. It can be cyclical or random as well as sequential in our minds. Memory and mourning are experiences which combine the past the present and the future into the perceptions of the moment. Time involves not just the measurements of a clock, but also the remembered past and the anticipations of the future. The reaction of the physical environment to the passing of time is no less complicated. Ruins are only one example of landscape features that are weathered to a noticeable degree. But common to all these features is the progression of time. Time is the overall unifying element in all things built and weathered: the general, unavoidable bearer of change.

Manifestations of Weathering

Weathering is also an object. It is the resulting physical evidence of the process of environmental and human forces as they affect materials. Depending on the material, the manifestation of weathering will vary. The structure of the material, the finish of the surface and the magnitude of the force will all combine to cause an infinite variety of changes. Elemental forces combine to alter the appearance, form and nature of a material. The alteration can be a slight modification of appearance or a fundamental breakdown in form.

Figure 6

The manifestations of weathering are as varied as the materials and forces acting upon them. Rust, corrosion, stains, melting, erosion, patinas, rot, fading, peeling, all appear in the designed landscape. Evidence of cracking, disintegration, delamination, wearing, abrasion, discoloration, burning, dissolution, and warping are found in our everyday world. These manifestations can be also organic in nature such as rots, stains, mildews, or inorganic such as erosion, fragmentation, oxidation, or corrosion. The consequences of some decay range from impact on other materials (staining, sedimentation, and accelerated decay through chemical reaction) to structural failure of the decayed material itself. Although this is not a comprehensive listing of all the manifestations and agents of weathering, it may serve as an appropriate illustration of the physical process of weathering.

The manifestation of weathering is a function of the material composition of the object. Materials have different properties that distinguish them from one another. Surface finish and internal structure of the solid both

contribute to the material's reaction to the weathering forces acting upon it. The structure of a material will determine its qualities. Whether porous or dense, rigid or malleable, soft or hard, the forces acting upon the material must contend with the resistance to change. The chemical composition is fundamental to the nature of the material. How it is put together on a molecular scale will determine its characteristics on a human scale. Some stones such as granite and obsidian have very strong atomic structure. They are more durable under the stresses of the elements than other stones like limestone and marble. Both limestone and marble are porous and less solid than granite. They are susceptible to erosion and cracking because the chemical bonds are not as strong.

Similarly, the exterior finish will also affect the resistance. As the majority of weathering occurs on the surface of the material, heightened resistance to change is often added to materials such as hardening, smoothing or glazing. The relative texture of the material will also contribute to resistance (or susceptibility) to weathering. For example, if the texture of a material is coarse, it will be prone to weathering by impact caused by precipitation. It may also allow the deposition of sediments or retention of moisture in micro-locations on the surface. To return to the example of stones, some surfaces are smoothed to further resist the effects of erosion from precipitation.

As stated earlier, some materials weather faster or more easily than others. For example, untreated iron will rust within hours, while granite will barely show erosion over the space of one thousand years. The time of decay may be in scale with day to day life or it may be well beyond one's life span, and thus, not directly encountered by the individual. The nature of the decay may be beyond our normal spatial experience when it is too small a change to observe. The scientific principle of self-similarity addresses these issues of scale and different rates of change. Self-similarity refers to the fact that the complex relationship of material change occurs symmetrically across scale of different magnitudes (Gleick 1987, 103). For example, granite and limestone will both weather. However, there is a different scale of time applied to the length of the process. As previously stated, the granite will change very slowly due to it's greater durability while limestone is more prone to weathering due to it's porous material qualities. Another self-similarity is evident in the sizes of places. A material will weather on a microscopic level. A whole landscape will also weather, but at a much larger scale. The similarity is observed in the patterns formed by the agents of weather, the serpentine lines of erosion and the

rounding of edges. The patterns and effects are shared by both the ridges of limestone blocks and the forms of the range of mountains from which they came. The various manifestations and magnitudes of time and size must be considered when understanding the complexity of weathering as a process.

Agents of Weathering

Weathering would not occur if not for the action of physical forces. Generally, the forces acting upon materials can be divided into natural forces and human forces. For the most part, weathering is a naturally occurring process. It is an integral part of environmental processes such as the growth of vegetation, the flow of water and the movement of air (Hough 1995). It is an unavoidable aspect of the environment in which all people live. It is both an abiotic and a biotic process. Weathering can be a result of the activities of microorganisms digesting inanimate materials or it can be a result of inanimate forces affecting the surface of a material. As Simpson & Horrobin (1970) summarize in The Weathering and Performance of Building Materials, weathering is a combination of such interaction variables as surface geometry, orientation, detailing and exposure, with rainfall, solar radiation, and wind. Yet, this definition should also include the actions of biotic agents ranging from microorganism to birds and mammals in the change of material conditions. All these naturally occurring factors contribute to change objects and the environments they compose. Although human activities are also a part of the weathering of objects, the climatic forces natural forces will be discussed first.

Figure 7

Climatic forces are the primary agents of weathering. They are the omnipresent factors of the atmosphere with which all outdoor objects must contend. The actions of temperature, precipitation, wind and the combined action of all three will weather landscape architectural features. Temperature has the effect of expanding and contracting the material at the molecular level. The ambient air temperature is not the only agent of differential heating. Sunlight, adjacent materials and air currents may contribute to affect the immediate temperature of the material. Because of dimensional changes, a material may crack or deform. Also, one cannot forget the actions of chemical, ultra-violet radiation, and earth movement as climatic factors. Precipitation can dissolve particles of a material in a chemical reaction. Ultra-violet radiation from the sun can also chemically alter the composition, and therefore, the

strength or form of the materials. The movement of the earth due to frost heaving and other moisture related shifting can change a material's form on either the micro-scale or as a whole. By shifting the foundation of a wall, frost will cause cracking to occur.

Precipitation weathers a material by influence upon surfaces and depositing airborne sediments and chemicals. An extended period of rain may slowly weather the most resistant material. The chemical composition of the rain can contribute eroding or modifying a surface. Acidity in the solution can corrode limestone and sandstone, changing the material's internal adhesion. Even the simple moisture of pure water will contribute to a process of oxidation for many metals, changing the surface color and texture. Dissolved minerals in the rain may also be left as a residue on a surface after the rain has drained away or evaporated. Finally, the material eroded by the moisture or the minerals leached out of a material may travel down a surface, thus leaving a stain. Wind changes materials in conjunction with precipitation and temperature. The movement of air will increase the amount of impact of rain or it will significantly decrease the immediate temperature of a material surface.

Materials are also subject to the actions of humans, both intentional and accidental. As far as landscape architecture is concerned, features are designed and constructed primarily for human use. The features must react favorably to use, responding to wear and tear. In the course of use, landscape features are weathered by the impacts of friction, fragmentation and vandalism: all at the hands of humans. Walking and sitting may seem the most benign impact. However, even simple, low impact actions of people on landscape features will eventually weather a material's surface. The oil from an individual's hand, the abrasive action of shoes and clothing, the resting of other hard objects; all can eventually wear the hardest stone. Wood decking discolors and wears in the path most traveled. Bricks wear and corners round under the impact of shoes. Metal rails and benches discolor and corrode from the hands of pedestrians. How a material responds to these actions is a question of its properties.

Yet, these benign forces are not the only human causes of the manifestations of weathering. For example, the defacing of tombs and monuments in cemeteries is of particular note. At the Père Lachaise Cemetery, in Paris, the whole cemetery is filled with graffiti relating to the burial plot of musician Jim Morrison. Not only is graffiti wearing away the monuments, but the act of removing graffiti by sand-blasting the stone may do the most damage

of all. Deterioration because of human use is as inevitable as the elements for most landscape architectural features. Only the most precious, and therefore guarded, features can avoid this aspect of weathering. They have been removed from the forces of decay. Overall, the total process is one of weathering, smoothing the corners of monuments, and wearing away the details of these landscape objects.

In the environment, the elements almost never work alone on the weathering of materials. In combination, they can have a strong affect on even the most resilient materials. A combination of decreasing temperature and ambient moisture will create a frost condition where the moisture freezes, expands and exerts static force on the local area of the material. Results of frost action include cracking, flaking and shifting of the overall object. Acid rain is both a human and a climate compounded agent of weathering. It is a result of airborne chemicals trapped by the atmospheric moisture to form precipitation that acts as an acid to erode and dissolve materials. Human activity such as the burning of fossil fuels contributes to the airborne chemical dust. The normal climatic cycle of moisture and precipitation add the vehicle and medium for these corrosive chemicals.

Weathering is both a process and a manifestation. It has many effects on the material world. Its variety of materializations is as varied as the forces of change and the types of materials in the world. The myriad faces of weathering can only be sampled and not fully described. Its visual manifestation may be isolated to one particular object or a blanket of worn surfaces in a place. In all, its actions of change have bearing on the landscape.

Relationship to Landscape Architecture

Weathering is an integral part of the practice of landscape architecture. Landscape architects are responsible for shaping the outdoor environment to provide places and objects for human needs and environmental requirements. As such, landscape architects have appreciated the need to understand the environment in which they work. In the opening editorial to a special issue of *Landscape Journal* (regarding nature, form and meaning), Anne Whiston Spirn summaries the relationship between people and the land as well as the desire to change the environment.

> *The artful shaping of the landscape to serve human purposes at whatever scale, from the garden to the region, entails an understanding of the human and the natural worlds, in both an empirical and a*

> *metaphysical sense...The concern for nature that is at the core of landscape architecture yields a sense for temporal and spatial scales that distinguishes it from related fields. The landscape ... is continuous, linked to other distant landscapes by the movement of air, earth, water and living organisms, including humans. The landscape is also dynamic, evolving continually in time. Unless a landscape design is comprised of inert materials, it is thus never complete, but continues to change perceptibly month by month, year by year.* (Whiston Spirn 1988, ii)

Weathering and the other aspects of the natural world are at the heart of the materials and processes that a landscape architect uses in the shaping of the land. Recognition of the dynamic quality of the landscape is important in the choices made in designing places.

Since landscape architecture is the design and planning of the external built environment, the features that are part of the overall design can be many and varied. To manipulate the land and to provide for the activities of people, landscape architects create a number of conditions. Objects need to be placed to order movement, limit access or provide safety. Paved surfaces are laid, walls are positioned, and rails are erected, all to fulfill a necessary task. Wooden fences, masonry walls, and metal rails provide vertical barriers to movement. Field stone blocks, concrete pavers and asphalt guide the footsteps of pedestrian. Benches, tables, planters, arbors and fountains provide those specific functions as well as the visual interest to fill areas we like to frequent.

Figure 8

Due to their positioning in the path of human use and elemental forces, landscape features weather. Different materials will change in different ways over time. In the context of landscape features, the type, function and placement of the feature will also determine the amount and type of weathering incurred. The environment, the human use, the design and detailing of the feature and the workmanship of the construction of the feature will all determine the amount and nature of the weathering of the feature (Simpson & Horrobin 1970, 16). All combine to determine the level of performance necessary for durable landscape features. Paramount in the durability of the object is of course the material that is used.

There is a wide range of materials that are used in the construction of landscape architectural features. Among the organic materials are wood and wood products. Wood in this environment may be treated with anti-rot

chemicals or it may be left untreated, thus relying on its natural resistance to moisture and other biological agents of decay. Meanwhile, stone, metal and plastic materials may represent the inorganic materials. Concrete and brick are among the most common materials used in paving surfaces. Steel is used for the construction of structural frames. Plastics are readily apparent in prefabricated objects such as furnishings and signage.

Yet, the discussion on material does not end with a listing of each type. There are also the finishes and surface treatments to the materials. From galvanizing metals to painting wood, the treatments of the surfaces often preserve the material, and thus, to retard the effects of weathering. Paints and varnishes are examples of these. There are even treatments that can further strengthen a material's overall structure, not only its surface. They are all subject to the exterior elements; weather, temperature, and human interaction. No matter what the materials or finishes, they all change over time. From granite wearing at one-eighth of an inch every thousand years to paint peeling within a week, weathering is a process that cannot be denied.

This is by no means an exhaustive list of materials. It is, however, an indication of the possible choices that landscape architects and other designers must make. Each material has unique qualities. Some react well to the actions of the environment. Others do not respond so well to the forces of weathering. The point here is not to identify each material and its characteristics, but to note the breadth and variety of materials that are used in the construction of our built environment.

Perception and Materiality

There are other implications to this weathering process beyond the physical change of materials. As unavoidable as change is, so too are the human reactions to it. As humans, we all react to the environment in our midst. Whether intentionally formed or simply arrived at, the environment we navigate affects our perceptions. Physical qualities, social conventions and cultural beliefs all contribute to the perception of all manifestations of objects and spaces. In turn, our perceptions guide our actions in the environment. The changes that weathering causes in the built environment have implications both physical and mental. Although some changes are so minute as to not be noticed, those that are noted are sources of interpretation on the part of the observer. Specific to weathering and landscape architecture, experience as a whole forms an individual's interpretation of an object as good, bad, or without value.

Interpretation of the qualities of objects and spaces can best be understood through a general description of perception. Perception is a human's experience with the surrounding environment. Perception includes all ranges of sensory reception/reaction and mental interpretation needed to navigate the world of form and space. Specifically, evidence of weathering in the built environment evokes varied responses due to the infinite mixture of sensual, functional and abstract responses by each individual.

There is evidence for the inclusion of the topic of human perception and experience in the core of landscape architectural theory. James Corner states that the portrayal of meaning in the landscape forms and spaces that architects create is grounded in our experience of these same forms and materials, and thus, must be considered:

> *The landscape is therefore the* setting *of our lives, the sensual-intellectual perception of which constitutes meaning and value. By extension, things and places can be properly understood only through nearness and intimacy, through bodily participation. A theory and practice that simultaneously emerges from and engages in this realm of perception is therefore qualitatively different from the application of a priori conceptual orders...*(Corner 1991, 127).

The recognition of human experience is a better and reasonable guide to landscape designs, not only geometric ordering principles that do not relate to human scale, but also the inclusion of sensual connections with the physical world. Although numbers and geometry are primary tools for human ordering of the cosmos, contemporary hard edge abstractions lack the physical appeal of place, substituting intellectual complexity of form and composition.

Perception is neither solely a physical process nor a mental one. It is a combination of both, a complex layering of sensual and intellectual experiences. Interpretation, based on learned knowledge, is also applied to these experiences to fill out the understanding of an event, place or object. Perception guides our responses to the material world. People relate to, understand and assign value and meaning to objects by the means of perception. To describe the topic of perception and the application to landscape architecture, one example of a theory of perception is forwarded by Robert Thayer, in "Three Dimensions of the Technology in the American Landscape" (1992). The author discusses perception from the perspective of the impact of technology on our experience of the landscape. His description of perception can be applied to the discussion of weathering just as well.

Thayer puts forward the idea that meaning is in the mind of the observer, yet the observer acts as though meaning resides in the environment. For example, a person will see a sign as a physical object but in the mind, it is perceived that the object also has meaning. However, the sign does not actually hold any inherent meaning. That meaning is in the mind of the person who is looking at it, applying meaning to the visual image that is sensed (Thayer 1994, 105). The distinction is this: is an object inherently ugly because of some physical pattern or characteristic, or does it trigger a set of cultural beliefs in the observer? Obviously it may be partly both, a physical and a mental response to the object.

Thayer divides this theory of landscape experience into three general dimensions: perceptual; functional; and symbolic. The perceptual dimension is the experience of landscape as received by the human senses. Patterns of light and shadow, smells and texture are within his perceptual dimension of landscape experience. The second dimension is the functional level of experience. Landscapes recognized by their function or clear capacity for human use are identified in this dimension. For example, benches, bridges and automobiles are experienced by each observer as objects, present for a specific and clear purpose. Thayer's third dimension is the symbolic level of experience. Landscapes represent abstract concepts or values, not automatically expressed in their form, but experienced by people. Most forms of art are dependent upon this dimension as much as the other two dimensions.

To understand our common reactions to weathering, the symbolic aspect of perception is of particular note. Here we find the systems of value we apply to the condition of environments and objects. We find our learned, social response of disgust or delight in such things as ruins or other weathered objects. The accumulated learned experience of each person will inform the interpretation of an experience. By applying a set of values and beliefs to a physical and social experience, one may understand aspects of an object such as its origin, its potential for danger or its monetary worth. Such refined behavior seems to be solely the realm of humans. As our contemporary society becomes more complex through technology and economics, these abstract systems of understanding become more and more important in each person's relationship with the phenomenal world.

A closer look at Thayer's three dimensions is pertinent to the discussion of the perception of weathering. On a base level of reaction such as sensual experience, humans react to the physical aspects of an object. Diane

Ackerman, in A Natural History of the Senses catalogues the world of our sensory perceptions. This book can only begin to describe just how rich the world is to people, as sentient beings.

> *We like to think that we are finely evolved creatures, in suit-and-tie or pantyhose-and-chemise, who live many millennia and mental detours away from the cave, but that's not something our bodies are convinced of...we still perceive the world, in all its gushing beauty and terror, right on our pulses. There is no other way. ...[We] must try to understand the senses--how they evolved, how they can be extended, what their limits are, to which ones we have attached taboos, and what they can teach us about the ravishing world we have the privilege to inhabit.* (Ackerman 1990, xviii)

Our five senses give us a picture of the world, every waking moment, allowing us to interact with our environment. Without the senses, we are limited in our response to the world. We also experience the world in varying degrees of richness and intensity.

Weathering may indeed be an addition to the overall sensual experience of an object or place. By changing the material enough to form patterns of wear or other deterioration, weathering 'constructs' a finish. The qualities of weathered material stimulate our senses, the feel, and appearance of an eroded landscape feature may add richness to our immediate environment. This is obviously a beneficial aspect to our daily experience. The sensual qualities of materials are of concern here. Feelings, sounds, and appearances reveal the landscape feature to the individual. It is a connection between the human and the object. The location, size, orientation, and time of day affect a person's experience of an object. Other perceptions are received via the texture, pattern, color and form of the object. One relates to not only the implicit qualities of the object, but also to the effects that object may have on its surrounding space or other objects. A landscape feature may make the wind whistle or cast a shadow on a pathway. In the perception of weathering, a person reacts to the patterns of light and shadow playing across rough, worn surfaces. One sees and feels patterns of stain or erosion on surfaces. Individuals can smell or hear the material changing as water or wind wears away surfaces and corners. All such environmental qualities lead the conscious mind to experience the environment is this complex, sensual manner.

On the function level of perception, to follow Thayer's three dimensions, one's perception goes beyond the physical/sensual perception by

incorporating rational thought. In terms of weathering, the functional relationship between the individual and the object will provide such information as: is it still usable or is it broken? However, there are no higher thoughts about it such as attributing value to its condition or evoking any emotional response. At this level of perception, it is enough to identify the object and understand its functionality.

On the symbolic level, one finds the majority of the concerns related to weathering and landscape architecture. The set of understandings that people apply to their interpretation of objects often becomes the source of differing values and needs. The idea of the symbolic meaning of objects can be illustrated with the example of sacredness. The case of sacred objects can serve as a specific example of perceptual notions applied to objects. In The Sacred and the Profane, Mircea Eliade (1957) explains the transcendence of the natural world as it applies to the religious man. The example he uses to demonstrate how the world takes on more meaning than its base physical existence is as follows:

> *...a sacred stone is venerated because it is sacred, not because it is a stone; it is the sacrality* manifested through the mode of being of the stone *that reveals its true essence.* (Eliade 1957, 118)

The special meaning of these sacred objects is due to the special power invested in them by the person, not because of any inherent quality. It is totally on the part of the observer that the object exceeds its physical form to become more, a means of communication or metaphysical meaning.

It is here in the symbolic dimension of perception that the notions of value and interpretation of such processes as weathering reside. Simply stated, weathering can be experienced as either the deterioration of materials caused by the environment or it may be recognized that visual enhancement an object that occurs simultaneously with the compositional breakdown of the underlying materials (Simpson & Horrobin 1970, 2). The latter is a recognition of the extra meaning that is attached to the physical object that one experiences. It is evident that there is a complex interaction between object and observer with each experience.

In this way, Thayer identifies and organizes the complexity of human landscape experiences into three levels of experience. A person's enjoyment or dislike of a particular place is dependent on our reception of sensory information, learned ability to identify functional objects and aptitude for reasoning symbolic messages from objects and scenes. These three levels of

perception are only general in scope, by necessity. The three levels outlined are not mutually exclusive, either. Each affects the others in a combined interpretation of the phenomenal world.

Since perception is a complex collection of ideas associated with human senses, object functionality and symbolic meaning, some theories of perception have been described as they apply to the materials people use to shape the built environment. The notion of materiality is introduced since it describes the intangible characteristics of materials, how people react to them, the impressions they evoke, and the associated meanings that people attribute to them.

Materiality is the combined perception of material objects, accounting for the sensual, functional and symbolic qualities of the material and a person's comprehension of the character of the material. The idea of materiality lies in the realm between the physical reality of material and the individual aspects of perception of those same materials. Materiality accounts for more than the physical properties; it investigates the rich layers of meaning associated with the material. For instance, gold has more qualities beyond its yellowish metallic color and its malleability. It has cultural meanings of wealth, greed, and glamour. Although the actual material is valued for its scarcity, a golden color applied to another material can have a similar impression to the real thing. The same notion of impression is true for less glamorous materials like brick. The materiality of brick is more than its reddish brown color and differential coloration. It has more tangible qualities such as warmth in sunlight, worn edges that smooth over time, as well as cultural meanings of strength and mass, symbolic meanings of age and the validation of time.

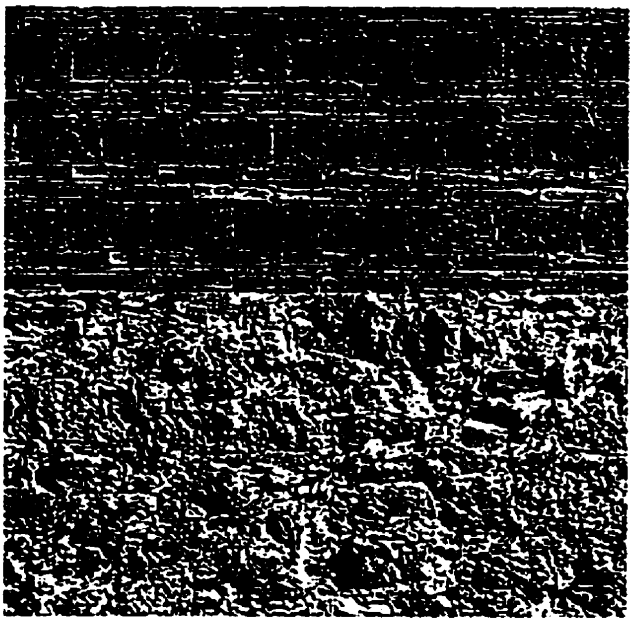


Figure 9

Materiality does not mean the material aspects of physical objects alone. Materiality is the physical description of the substance combined with the perceptual experience of the substance. Gernot Böhme has described the manifestation of materiality as the material's character, that is, its "atmospheric aura"(Böhme 1995, 39). It is a collection of physical and psychological attributes. For example, the perceptual qualities are quite different for gold than

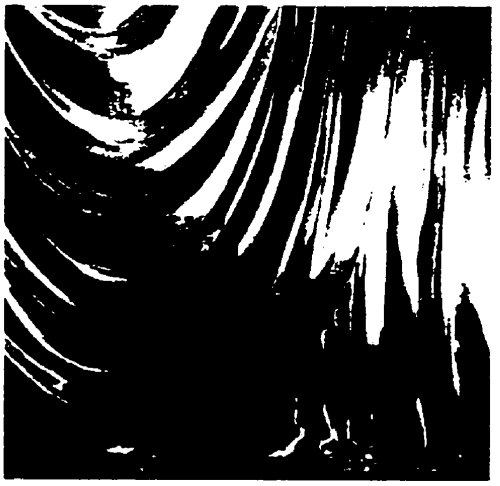
they are for bronze. Both may share many physical qualities, yet they are vastly different in the way that the observer reacts to either. Thus, one begins to understand the *character* of a material, its materiality.

Basically, materiality is understood as the properties and characteristics of the materials we use in landscape architecture—the physical qualities, the social effects, the cultural meanings, the symbolic content—all pertain to how materials are perceived and used. Humans have a strong connection to materials through experience and perception. Materials can add extra dimensions to the experience of an environment. This character is critical to one's understanding of a place. Consider the following remarks by Gerhard Auer:

> *Materials only remain subaltern as long as the observer of a work of architecture maintains enough distance between himself and his object. However, if he comes within hearing, smelling and touching distance, he is flooded with suggestions of spatial feeling, of uneasiness or of well-being. Here it is scarcely the forms which exert their influence, but the colors, sounds and lights, the warmth and the tactile sensations, thus creating that impression which we refer to as an atmosphere or mood. Perhaps, over the thousands of years of evolution which preceded civilization, the human body developed an intimate correspondence with the climate, plant and animal worlds (despite the distance to nature greatly lamented nowadays) which continues to dominate his inclinations and reactions. It is only possible to explain in this why he still tends to favor natural products and natural spaces for his nutrition, clothing and dwelling.* (Auer "Building Materials" 1995, 34)

Auer charts the human use of materials and the transformations that we have imposed on them to meet our needs. As a measure of this transformation, Auer suggests that the ways which we have used materials, and the messages that they hold as a result, can be categorized in the following manner (Auer "Building Materials" 1995). From the use of found objects, through processing and transformation of materials, to the manipulation, mutation and mixing materials, humans have managed to change physical matter to create new *artificial* products. These materials began to carry such messages of human ingenuity or arrogance. In essence, Auer describes how we have interacted with our material world. By using

Figure 10



materials, we have created extra cultural meanings that we now associate with specific materials. This is the essence of materiality; the collection of physical and psychological attributes associated with all that we experience.

Further to the sensing of the material, Böhme describes materials as having a synaesthetic quality, being able to project the effect of being warm, gentle, repellent, smooth, damp, obtrusive, or reserved (Böhme 1995, 40). This affects more than just sight, it affects a combination of the senses to create a constructed and learned impression, part physical stimuli and part memory and cultural sign or symbol. This is especially true to the contemporary design philosophies in the post-modern era. Once, in modernist ideology, the material was to remain inconspicuous, only reflecting the function it was put to serve. Now, the call is the opposite.

> *Materality is supposed to show itself, to come forward, to help shape the atmosphere in which we live.* (Böhme 1995, 37)

Materials have qualities beyond their physical characteristics. These extra qualities are the meanings, impressions and sensual qualities that people associate with materials in general as part of the act of perceiving them. Of course, different objects have different expressions of materiality based on their material composition and their condition. Concurrently, materials also have limitations that also guide one's understanding of their character. Qualities such as fragility or viscosity affect the perceptual nature of a material as much as durability. Such is the perceptual quality of weathering in terms of materiality. Weathering will add extra perceptual qualities to a material, changing a material's character because of change in physical condition or appearance.

Perceptions of Weathering

One may see the relationship between weathering, perception and landscape architecture in a discussion on meaning and form by James Corner. He talks specifically about the change that is inherent in the environment. Although he speaks generally about the larger landscape, it can be applied equally to the human scale materials:

> *As time passes, this marked landscape weathers, ever subject to the contingencies of nature. Other points of view are chosen as circumstances change and new ways of marking are overlaid upon the old, producing collagic and weathered overlays[,] ...provid[ing] loci*

for the remembrance, renewal, and transfiguration of a culture's relationship to the land. (Corner 1991, 129)

These same manifestations of weathering, the evidence of change in the environment, provide a connection between man and the world, the marking of time as it relates to our lives.

One dilemma immediately recognizable in the practice of landscape architecture is the pursuit of an ideal product or result. While the endeavor of design is fundamentally to achieve some goal, the finality of that goal is in question. Yet, a truly *final* product is never achieved, never possible in a real world situation. The reality of imperfection is only explained away by an unforeseen variable of 'someone else's' error. But this may not be a coincidental shortcoming. Perhaps, like the newest revolutions in science, the theory of chaos, the intentions of landscape architects should be revised to reveal the innate "realities" of construction and other external forces affecting the physical edification of the architectural idea.

Mohsen Mostafavi and David Leatherbarrow (1993) have recognized this dilemma in the practice of architecture. In On Weathering, the authors outline the general qualities of weathering as it affects buildings. They begin with this comment on weathering.

Finishing ends construction, weathering constructs finishes.

This assertion would seems to defy one of the most ancient commonplaces of architecture: buildings persist in time. Yet they do not. No building stands forever, eventually every one falls under the influence of the elements, and this end is known from the beginning. How, then, can one say weathering 'constructs' finishes when the action of the elements leads to the deterioration of the building? Weathering does not construct, it destroys. (Mostafavi & Leatherbarrow 1993, 5)

For the majority, this weathering is a negative occurrence as it detracts from the perceived ideal of the original form or architectural idea. The viewing of decay as a negative process can be traced back to the beginnings of modern architecture and the theories of the modernist in architecture, under the guidance of architects such as Le Corbusier (Mostafavi & Leatherbarrow 1993). It was Le Corbusier's contention that weathering and decay were unhealthy (personally and socially). The whitewash walls and clean forms were the true democracy in our built environments. To Le Corbusier, decay could be denied and rejected. This set of ideals has survived to influence architecture and cultural value to this day.

However, the building of landscape features is a process of compromise. Designs are always modified and updated from previous concepts and drawings. The construction is never perfect in execution. Materials are substituted and details are changed. The act of building has an ingrained quality that does not allow a conceived ideal to be achieved. The world is too complex with too many variables to be counted and accounted. Yet there is more to the impossibility of the ideal. As described earlier, the impact of time on all things physical has had philosophical implications in architecture. It can be argued that each architectural object has within itself its own undoing. Weathering as a process will change the material and the form as part of its life cycle. The act of building includes the seeds of its un-building. The properties and their decay are subversions of the ideal form as it is created and aged. The choice of materials will determine the nature of the change the objects and spaces will undergo after construction. Much as the idea cannot be truly realized, the materials will not remain static.

There is a fallacy of permanence to the objects and places humans build in the landscape. While things have a degree of durability, they also have aspects of ephemerality. Although there is a human impulse to counteract this disorder by creating order in the form of things built, it is a constant process of forming and un-forming. The process is tuned to human needs, some structures are only meant to last for days, like sandcastles, while other are meant to last generations, like bridges. Weathering resides in this threshold of conflict between the built and the process of change. While humans want to secure things in a disorderly universe, they can never be truly permanent. Such is the conflict of weathering and the personal reaction to it. There is an urge to halt weathering, to make things permanent, and to maintain things once they have weathered. In assessing the perception of weathering on landscape features, let us return to the issue of durability. Simpson and Horrobin define durability as the "quality of maintaining a satisfactory appearance and satisfactory performance of required functions"(Simpson & Horrobin 1970, 10). Under this definition, it is fair to state that as long as the visual appeal of the effects of weathering does not adversely impact upon the durability, the landscape feature can successfully perform its specific function. That is, as long as the weathering is visually acceptable, it can be accepted as an integral part of our experience of the landscape feature. A distinction is made between artifacts that are in use and those that are not. The latter are allowed to deteriorate more since their function is less about utility. Meanwhile the former are still in active use and the

function must be maintained. This notion of function, both physical and psychological appears later in the discussion on cemeteries where such things as headstones serve as both physical markers and emotional monuments.

Such theories of perception can further integrate the natural process of weathering into landscape architectural practice. Weathering can be viewed as an aspect of ecological design theories. It is an undeniable aspect of the environment and it changes landscapes and objects by its actions. As such, weathering is part of the overall system of environmental forces and ecological flows that shape the world. To demonstrate the inclusion of weathering in ecological design theory, the theory of creative aesthetics, as proposed by Jusuck Koh, is described. To form his theories of ecological aesthetics, Koh bases his work on the foundation that "an ecological theory of environmental design must be based on ordering principles in nature and on human perception and cognition."(Koh 1988, 180) Such theories would provide the basis for prescriptive principle of new designs that are responsive to both humans and environments. These theories of ecological aesthetics also can be used to organize specific theories of the expressive qualities of weathering.

Koh proposes a new theory of aesthetics because he sees an undesirable gap between aesthetic theory of the past century and environmental design theories of today. He proposes a move away from the aesthetics of the object (such as the appearance oriented aesthetics) to find a new aesthetic which considers the overall quality of the human experience of the object, not just the object itself. The overall experience includes the object as well as its environment as a total perception, not isolated mini-impressions of things, such as stand-alone artifacts. To relate this to weathering, it is not the appearance of weathering of a single object that is important; it is the weathering of that object in relation to the surrounding objects and environment. The contrast or congruency of the extent of the weathering is the main part of the perception, bearing meaning for the observer.

Creativity is at the heart of this new aesthetic. By focusing on creativity, Koh has a unifying concept to order his new theories. Creativity is closely related to both design and perception and aesthetics (Koh 1988, 179). Design is a creative process of finding new relationships between spaces, forms and materials. The perception of aesthetics is also creative in that perception relies on cognition and interpretation of the things sensed in the environment. Creativity describes both processes. The processes of nature can also be

described as creative (Koh 1988, 179). Organic evolution, ecosystem development and physical material change can be described as creative in the larger sense of the word. A raised level of order or a process leading to higher levels of diversity, complexity and stability can define creativity in both the human process and the natural process (of which humans are a part).

The reason for these theories is to guide the design process for environmental designers. The purpose was to help designers contend with the complexity of ecosystems compared to static and object oriented theory of aesthetics informing their design process. With this creative approach to ecology, the design process is open-ended, a series of chance happenings and accidents coupled with guiding principles or forces. It fits with the idea of flexible design; not being set on a fixed, linear process of design or a immaculate, static final object. The ecological theory of environmental design must be based on the ordering principles of nature and the human perception and cognition. The theory has three principles: inclusive unity, dynamic balance and complementarity (Koh 1988, 180). Weathering can be shown to be congruent with these three aesthetics principles. The first principle is inclusive unity.

Inclusive unity differs from the conventional aesthetic principle of unity. Visual unity is defined as one object's harmony, wholeness and integrity. Inclusive means that the surroundings are integral to the unity of an objects within the context (Koh 1988, 181). When there was a belief in absolute beauty, the ideal wholeness of an object was sought. Now, there is a better understanding of perception and personal interpretation, making an ideal or absolute beauty a fallacy. Inclusive unity is then the integrity of the system of forms working in process and context. The forms and the processes at work are inseparable. This means the unity relies on the collection of objects that make up the forms working in harmony. The system is an open system, able to exchange energy and matter, adapt to changes and continue to self-organize and evolve.

> *All creative systems, biological and psychological, are self-organized and self-organizing (i.e., developmental and evolutionary).* (Koh 1988, 182)

The unity of a place is the fitness of its response to its surroundings and the processes at work within that surrounding landscape. A design which is adaptable and responsive to processes such weathering can have inclusive unity as a place. The combination of natural change and the richness of the corresponding physical stimuli of change create a place, or atmosphere, that is

interactive among the human and other natural elements. Unity involves not just the visual appearance but also the harmonious use of the place by humans. As Koh explains, inclusive unity "denies the distance and duality between humans and nature, between order and disorder." (Koh 1988, 184) It encompasses all, the observer and the place are one aesthetic experience. Weathering can be seen as an agent of unity in that it applies a layer of wear over the place, affecting all the parts of a place, blending them all together in their response to the environmental and human forces.

The second principle of Koh's ecological/creative aesthetic is *dynamic balance*. Visual balance, as an aesthetic principle, used to be the quantitative equilibrium among physical or visual objects. This was a static representation of an unchanging (and unrealistic) system. Dynamic balance differs from this traditional aesthetic principle of balance because the forms are asymmetrically in process, in effect changing with an evolutionary equilibrium. Self-organizing systems have this ability to change and adapt in a dynamic balance due to the diversity of parts and open responses to forces without totally succumbing to disorder. The dynamic balance embraces both the practical ordering principles as well as the serendipitous (Koh 1988, 185). Like creativity, the dynamic balance of both practical and accidental merge to generate new forms and spaces (to synthesize). In this way, dynamic balance can account for a variety of perceptions, interpretations since these factors are unpredictable yet part of the overall experience nonetheless. The sense of apparent disorder lends freedom and spontaneity to the experience of a place (Koh 1988, 185). Weathering can create these impressions of dynamic balance when objects are fragmented, in a sense revealing processes of movement or action. The new form generated from the old because of elemental or human forces is a creative process since a new condition is reached. A new organization is revealed by this dynamic process.

Complementarity, Koh's third principle, is based on the idea of the indivisibility of objects and space, time and space, perception and cognition. Objects do not stand alone. They are always in context, always in the process of change, and in the language of deconstruction: the object is coupled with its own undoing. The primary example is the female and the male complementary relationship that is needed to create new life (Koh 1988, 186). They are separate objects but indivisible over time without each disappearing.

> *Creative solutions in architecture and landscape architecture usually work with nature rather than against it, letting nature and landscape complement humans and buildings.* (Koh 1988, 186)

This means that the objects of the system are neither mutually exclusive nor separable. A material will have its physical properties as well as the meanings we apply to it. For example, wood is an environmentally responsible material because it is renewable resource, but it also speaks to the observer about the need to use renewable resources. At once it is the material and the message. Both the idea and the physical object are complementary. The obvious application of this principle to weathering is that weathering is a natural process that will occur anyway. Those materials that gracefully weather not only show it as a physical process, but they also demonstrate weathering as a natural process. The complexity of the natural environment is revealed to the observer. In this way, it is complementary to the overall character of the place.

Weathering fits the principles of Koh's ecological aesthetic. The three principles follow natural processes to better inform environmental design. Weathering is one of these natural processes. As an approach to the design of landscapes, an ecological theory of aesthetics can help landscape architects better prepare and include the whole system of natural forces and flows into a successful landscape in harmony with human and natural environments.

Another, similar use of weathering as an ecological element can also be found in the theories of John Tillman Lyle. He has proposed an aesthetic and design process which embodies "the inner rhythms or processes of nature, [a] deeper concept of the nature of nature."(Lyle 1991, 38) Opposed to the superficial design solutions that only put ecological or other concepts in pictorial composition, Lyle believes landscape architects should show a greater understanding of ecological processes of all sorts, elemental and human alike. Ecosystems include both the natural elements of land, water, vegetable and animal, as well as our human patterns of activity and needs. A design that displays this understanding describes it and presents it for the observer's education. It is an action of giving visible expression to deep processes.

Lyle describes the design of landscape as falling into one of two categories. The first is the shallow form which only mimics or abstracts ecological order. The second is the design that reveals and uses ecological order in the design, along side and congruent to the aesthetic order. This should be the goal of designers if they want to develop ecologically deep landscapes. He cites the example of Isaacs Water Wall, by Michael Van Valkenburgh, in which copper plates are set in a wooden frame. Water is channeled through a series of openings to run down the copper panels. The copper oxidizes at different rates,

depending on each panel's textured or chemically cured finish. By changing the finish of sections of the panel, the full range of the natural process of oxidation is revealed in an aesthetic manner. The wooden frame is periodically painted different colours to compliment and contrast the oxidized copper. Such a visual foil demonstrates an understanding of an ecological process coupled with the human needs of aesthetic form.

> *In the process of design, we merge human creativity with the ongoing rhythm and harmonies of nature's evolving order.* (Lyle 1991, 40)

Lyle argues that this type of design process is a human ecology, one which harmoniously houses natural and human generated patterns, flows and structures. Instead of ecological order versus human order (or aesthetic order), we have a harmony. Weathering may be one of the processes and manifestations that can help to achieve this expression and character of place. Its better understanding in the built environment hinges on people's experiences and impressions of materials and perceptions of places.

Experience is a personal event. One relates to the world through combination of physical contact and mental exercise, involving the senses and memory. The manifestation of weathering is perceived as an event rich in both physical reality and mental reality. Simpson and Horrobin begin their investigation of the performance of building materials under the actions of weathering by first looking at weathering in general. Among the good examples that they find are character qualities that people seem to appreciate such as "mellowed brickwork, lichen-covered stonework, and silver-gray cedar boarding"(Simpson & Horrobin 1970, 1). All are examples of the patinous action of the natural climate on external surfaces. Obviously, there are other examples that can demonstrate different, and sometimes opposite views of the process of weathering. Closer examination of a specific place should offer specific reactions to weathering. The cemetery is a place of emotion and spiritual significance. The process of weathering is thus a sensitive aspect of this environment.

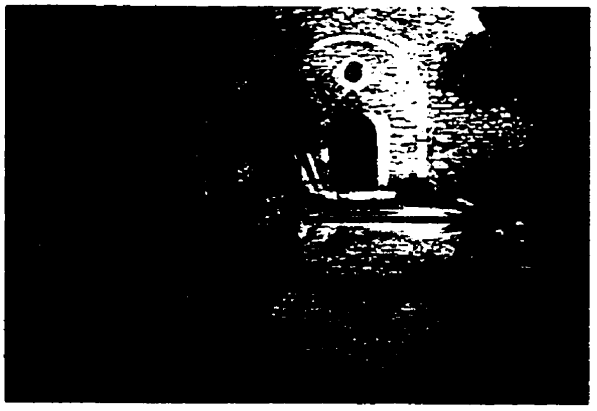


Figure 11

3.0 Cemeteries

In Memory of
James Hull Allan
Son of Captain Gabriel &
Mrs. Sarah Allan
He departed this life the
6th of August, 1793. Aged
15 Years, 3 Months & 21 Days
Young Friends regard this Solemn Truth,
Soon you may die like me in youth:
Death is a debt to nature due,
Which I have paid, and so must you.
(Howett 1977, 9)

This epitaph comes from a grave marker in Boston. In the few words of poetry, it manages to summarize the inevitable death of each person and the place of this cycle in nature. Like humans, all things physical have a life span. Sometimes the life of an object is a number of days, sometimes millennia.

As inevitable as weathering and material change are to the built world, death is as unavoidable to the human world. Death is even more poignant as a process since it affects all people in the span of a lifetime, while weathering may be slow, beyond the lives of generations. Regardless of the similarities or contrasts between weathering and death, the place where they combine is of special cultural significance. Cemeteries have special social or cultural meaning. Consequently, they are especially sensitive to material change. An investigation of the cemetery as a cultural landscape illustrates the complex, and sometimes, contradictory experiences of weathering. It is the context from which to view the dichotomy of the perceptions of weathering.

The Cemetery

Cemeteries hold special meaning for communities. Since prehistoric times, humans have had the need to commemorate the dead (Curl 1993). Special places were located or created to dispose of the bodily remains and to perform funerary rites. From the Egyptian pyramids to modern memorial parks, the places of the dead have changed to suit the needs of the times. Canadian cemeteries have been developed to accommodate the burial of the dead and the commemoration of this rite.

The cemetery type investigated in this study is that which is found in most of Canada. These cemeteries are the spacious types of burial grounds that fall under the description of memorial parks. For the most part, these cemeteries have plots located on a grid system (orthogonal and otherwise) with monuments indicating the names and dates of the interred deceased. The deceased are buried in caskets six feet below the ground level at each plot. The cemetery is divided into sections for the provision of roads, services and other landscape features such as streams, and outcrops (usually related to the topographic conditions of the site). Each occupied plot is marked with a monument in the form of an erect headstone of specified dimensions or a horizontal marker flush with the ground. Other landscape elements are usually included as part of the cemetery for a number of reasons. These reasons include visual interest, markers of sacred qualities of the burial ground and indications of services. The landscape elements may include fountains, artificial ponds, or clumps of landscaped vegetation. Also necessary in the cemetery are the buildings devoted to both the burial services and the interment of the deceased. Chapels, crematoria, mausolea, columbaria, offices and garages are all usually dispersed across the cemetery in their appropriate locations.

Figure 12

From church graveyards to public open space to the equivalent of sterile suburban developments, cemeteries have changed in their nature since the colonization of North America. In the post world war period a distinct change in cultural attitudes toward death occurred. Youth became the focus of contemporary culture, and its celebration now excludes death and the cemetery as parts of popular culture (Jackson & Vergara 1989, 118). Hence, cemeteries are no longer cared for by the bereaved, nor are they as frequently visited as they were at the height of the memorial park era.

Once used as open spaces and parks for recreation, the cemeteries now occupy little of our daily lives. Now they are exclusively the real estate of memorials to the dead. The majority of visitors are the bereaved who come in remembrance of the deceased. Few others visit the cemetery. The majority of contemporary cemeteries rarely attract the person seeking passive recreation. With increased incidents of vandalism and the public putting distance from the rites and places of death, the cemetery seems more marginalized than at any time in the modern era.

> *The public's tie to the cemetery has been loosened. Because death has become such a private ritual and a less frequent occurrence in everyday life, the cemetery no longer has cultural significance for much of society.* (Sloane 244)

Although the use of cemeteries has declined from earlier eras, cemeteries still play a necessary part in people's lives. Dieter Kienast points out that "the cemetery is thus less the realm of the dead than rather a memorial for the living."(Kienast 1990, 10) The cemetery, as a place for memorial, is pivotal as a means of reconciling beliefs and emotions about death. Cemeteries are the means of mentally appeasing the emotional loss of relatives and friends. The people that die affect the living through emotion and memory. How one chooses to address the subject of death is personal. In many, if not most cases, organized religion provides the guidance for human behavior around the event of death. Rituals and organized actions reflect the system of beliefs of each religion. As a means of coping with a death, these rituals enacted in the required spiritual places provide the living with a course of action to a mysterious and emotional event.

Figure 13

Associated Values

Contemporary cemeteries, or memorial parks, are studies in managed environments. In newer cemeteries, the grounds are well tended, the vegetation is well groomed and the monuments are well ordered. This appearance of the cemetery as an immaculate lawn, with standard size and shape polished granite memorials is a product of a number of factors. These factors include the sales of these headstones, maintenance and management concerns in the cemetery, local government and religions rules, and public attitudes (Buchanan 1989, 28). In addition, there are other aspects of visual consideration. Sculpture has become an integral part of the cemetery, adding to the atmosphere of place as well as the

Figure 14

marketability of plots. These art objects of both sacred and secular imagery become the visual focal points in the cemetery in place of the traditional erect grave markers, serving as the symbol for the cemetery. This further reinforces the notion of the park, as opposed to the burial ground.

Here is the location of a dichotomy. While the cemetery is meant to commemorate the dead, it is doomed to change, as all outdoor environments must under the process of weathering. What then is the perception of those who visit? Little room is left for the physical residue of weathering. When a process of weathering is acting on a landscape feature, the implications can range from a mild disinterest to disgust. For example, in the case of cemeteries, the context is a highly symbolic and meaningful place. Most people who visit the cemetery do not want to see the monuments diminished by time and weathering. In the cemetery, weathering takes on the role of destroyer of form and memory, not a welcome characteristic to the bereaved. Others visit cemeteries as places of interest and culture. To them, weathering may seem an integral part of the character of a place. The rate of change caused by weathering is an important aspect of these perceptions. The implications of slow and fast change, relative to human life spans are noted later in the discussion of each prime stakeholder's perspective.

The Stakeholders

In the discussion of weathering in the cemetery, the primary stakeholders are the four parties involved with the event of death: the soul, the corpse, the bereaved and the bystander (Fonseca 1996). Each party interacts intimately with the cemetery. The soul and the corpse are less active participants in the rituals of death. The soul is arguably intangible and non-spatial and thus is not directly interactive with the physical cemetery. The corpse is physical, yet confined in death to burial or interment in a container as body or ash. Hence, only the two remaining parties, the bereaved and the bystander, can physically experience the cemetery. When the issue is perception, it is possible that the interests of the soul and the corpse (spiritually and otherwise) are represented by the bereaved who are in the process of mourning. This, of course, is a matter of one's beliefs. It is also true that the bystanders were all once, or will be, the bereaved. They have sympathy with the

perceptions of the bereaved although they may not feel the same emotional connection as strongly as the bereaved. When the discussion is one of perceptions of the living, the focus is on these two groups as the primary users of the cemetery. In the cemetery, both the bereaved and the bystanders are confronted by the architectural character of the place. Subsequently, each group perceives the cemetery in specific ways.

The process of weathering inevitably affects all the physical elements of the cemetery in varying degrees. However, its perception is a matter of argument as to whether it is desired or scorned. Weathering may be seen as a possible enhancement of the cemetery environment. The process of change subtracts from the finish of the materials, but it also adds to the perceptual setting. This aging can be seen as either benign or tragic, depending upon the viewer (Mostafavi & Leatherbarrow 1993, 16). Both the bystander and the bereaved have different issues to consider in determining their reaction to the weathering in their midst.

The Bereaved

> *It has been said that death has replace sex as the great taboo of our society. Our vocabulary reflects our anxieties. We avoid using the words like 'remains' and 'disposal' of the dead and say that the dead have 'departed'...This avoidance of direct reference to death and the feeling that an interest in death and cemeteries is rather morbid has significantly repercussions for the management of cemeteries.* (Clegg 1989, 15-16)

Judging from contemporary views regarding death, there is no doubt why imagery or manifestations of weathering cannot be viewed as acceptable. The bereaved have a strong emotional and psychological connection with cemeteries. Their direct association with the deceased is their main purpose for visiting the cemetery. They are the majority of the visitors and are thus the prime stakeholders in the contemporary cemetery. Their stake in the cemetery is a factor of their wish to memorialize the dead, to link themselves with past ancestry and perhaps to reflect on their own mortality. It can even be said that they represent the other two players, the soul and the corpse, that are not interacting directly with the cemetery.

The memorial is an integral part of any cemetery. It is the grave marker for the location of the remains of the deceased. Yet, it is more than that. It is the physical and visual representation of the life and memory of that

individual. As a means of commemorating a past life, humans erect these objects to monumentalize the ideas and memories that person once represented in the flesh. Sam Weller summarizes this activity.

> *Many people want to erect a memorial to their loved ones. They want it to mark the place where the remains lie. They want to place floral tributes there. They want the monuments to be individual, more often than not conforming to the style of those around then but in some ways unique.* (Weller 1989, 11)

The monument represents the last remaining physical marker of the deceased. It only follows that the bereaved should desire the monument to stay in an immaculate condition in perpetuity. As preserved memory, the monument marks the existence of the deceased in past life as well as in living memory. The desire to commemorate is so strong as to find decay unacceptable. Should the monument weather, the implications are multiple for the bereaved.

As the last physical remains, the grave-marker to the deceased acts as a monument in every architectural sense. As J.B. Jackson describes in "The Necessity of Ruins", a monument is a reminder of something that is important, a reminder of an obligation incurred by a great figure or event (Jackson 1980, 91). It is venerated not as a work of art, nor as an antique, but as an echo from the remote past suddenly become present and actual. Thus, it is not reliant on aesthetic quality alone, only the power to remind or recall the specific. It is the context and the form that provide the power to remind or recall the specific. On the personal level, each burial monument holds the same power for the bereaved associated with it.

Take for example the grids of military graves common in most western cemeteries because of armed conflicts, specifically the world wars. The rows of veterans' graves, un-swayed by time (or corrected for the same effect) stand as timeless reminders against the horrors of war. By necessity, they must remain unblemished by time to symbolize the proud and valiant people in their brave struggles against their would-be oppressors. If weathering were allowed, the implications of remembrance are great. It would seem that the peace bought with the blood of soldiers was not worthy of notice, maintenance, or memory. Consequently, weathering must not visually compromise monuments. Monuments, often

Figure 15

markers of death such as tombs and cenotaphs, must remain undiminished despite their age. The aim of the monument is to project permanence. It preserves a memory or a message. Weathering may represent the inevitable transformation of form but the monument embodies a desire for eternal life. Weathering of the monument may be viewed as undesired as a result.

For the bereaved, there is also a desire to maintain continuity with the past. The erecting of burial monuments creates a physical history of lives of ancestors. The visual record is a datum for each living family member's own life. This type of marking of the continuum of ancestry is not limited to families. As a further example of the idea of monument, the collection of headstones may have cultural historic value to the visitor. The case of Boston's historic cemeteries is described in Elizabeth Shepard's article "Grave Issues: Restoring Boston's Historic Burying Grounds" (1996). In Boston, the burying grounds have great importance to the history of the region, as well as significance in the history of the United States as a nation. Many notable people are buried in these cemeteries. Recently a group has formed to control the management of these historic sites, to care for, and document, the grave markers. The intention remains to clean up the poorly maintained ground, to dispose of wild vegetation, stabilize and repair monuments and other features. In this case, the cemeteries are to stand as a historic message for generations of Americans. Here the collections of monuments represent not only individual lives but also special moments in history and the ideals of growing nation. The cemetery as a whole is a monument, stabilized and sanitized to stand well beyond its naturally weathered years.

The marking of graves can also be interpreted as a desire for a certain degree of immortality. This desire to commemorate in the same way as others in the cemetery is a ritual that most individuals will expect in their own time of death.

> *More than any place other than a house of God, a cemetery reminds us of the age-old quest for eternal life. Even before Christianity, humans found solace in the belief of an after-life, that is-in an eternity.*
> (Jackson & Vergara 1989, 71)

If weathering affects the visual integrity of the cemetery monument, it is perceived as an agent of destruction. The implications of this material mortality are obvious. It denotes neglect of the monument or the memory of the deceased. It is a sign of the mortality of the bereaved. These events would seem to exhibit the inevitability of death.

The reminder of mortality is a powerful aspect of the cemetery. Mortality is a fear for most people, and so is the associated decay that follows death. The body has historically been believed to be the house of the soul (Ragon 1983, 3). Any bodily decay, then, is a form of corruption of the soul. Today this translates to a need to embalm the body and other cleansing practices. It is reasonable to assume that the distaste for any diminishing of the memorial representing the deceased is a result of this house of the soul belief, either consciously or subconsciously on the part of the bereaved.

> *[Cemetery] siting outside city walls parallels the modern suppression of death. While the ancients feared the spiritual powers of the dead, the modern fear is more clinical in nature, reflecting an abhorrence of both the disease associated with overcrowded burial grounds and the insistent presence of death as an integral aspect of life.* (Constant 1994, 4)

Coupled with the dislike of visual decay, there is an aversion to dead bodies of any kind. Our present relatively hygienic environment holds no place for decay for the average person. It seems that the visual character of the cemetery should reinforce this fear of death for the bereaved.

Kenneth T. Jackson and Camilo José Vergara (1989) describe a scenario of marble monuments decaying in older cemeteries. Marble monuments were once sold with a promise of permanence but are now badly eroded, especially urban headstones that can erode as much as ten times the rate as rural.

> *Marble breaks down as a result of pollution and extreme temperature changes. Delicate carvings lose the lines that describe a face; shapes become distorted; the organic forms of figures are reduced to abstract geometric volumes. Photographs and colored glass windows fade, leaving blurred outlines and fragmented portraits. Most cemeteries do not accept responsibility for such deterioration. The family is only asked to repair a monument if its unstable condition poses a safety hazard. Often a damaged monument is simply removed.* (Jackson & Vergara 1989, 102)

For the headstone as the monument, the consequences are dire. To the bereaved, this occurrence is unacceptable. As a result of the desire for immortality, the monument is seen in a different light. Again, J.B. Jackson speaks of the monument's psychological power. He sees it as a guide to the future: it confers immortality on the dead or lost, and it guides actions for the future (Jackson

1979, 93). Without some form of immortality and the commemoration through monuments, one would lack the continuity of time or the individual's place in history.

For the bereaved, the process of weathering counters the desires to build and commemorate the dead with physical monuments. They associate with the cemetery and its monuments through living memory. As long as there is the direct relationship between the living and the dead, these emotional connections will be present in the cemetery. In the case of the bereaved and their perception of the cemetery, character of weathering is perceived as a negative, subtractive process. It takes away a standard dignity from the monument. It breeds a feeling of neglect and loss. In all, it has a strong impact on the perceptual reality of these places.

Figure 16

The relationship between the burial ground and the bereaved changes over time. Cemeteries age like people. The living memory that resides in each diminishes with age. The cemetery changes in function from one that is actively used for burials to one that is an open space environment that represents the event of death in spiritual and personal ways. On one end of this spectrum, a new memorial park will have flowers at the graves and funeral ceremonies on a regular basis. Meanwhile, a very old cemetery will have few places remaining for burial, if any. Here, the actual burial plots will be 'occupied' by people that the living do not remember in person. The perception of these older places is remarkably different because of the emotional separate between the bereaved and the bystander.

The Bystanders

For the bystander, the cemetery is a vastly different place than for the bereaved. It does not hold the same emotional contract of remembrance of the dead. It is still a place of the dead, but in a less personal way. The bystander views the qualities of the cemetery in a different light. People still visit the cemeteries for reasons of reflection, isolation, and passive recreation. They visit the cemetery as a place, not for a specific location of a person's remains, but for the purpose of visiting a place general spirituality. To these visitors, the process of weathering may hold different meanings, not necessarily those meanings of neglect and disrespect perceived by the bereaved.

The 'placeness' of the cemetery is of primary importance for the visitor who enters to reflect and contemplate. Placeness means the combined qualities of the place coupled with the atmosphere that those qualities create. New cemetery designs have recognized this desire for quality of place. Dieter Kienast has alluded to this phenomenon (Kienast 1990, 12). He has found that, increasingly, design competitions are awarding new designs that incorporate more aspects of 'placeness' than awarding designs that incorporate merely standard developments. Recognizing that the power and qualities of a cemetery are gaining in importance, new designs deviate from the recent past where the cemetery was hidden away and designed in an inexpressive and unobtrusive manner. The expressive qualities of weathering may yet have a place in the expression of cemeteries.

Weathering can create atmosphere in a place. It can layer the objects and spaces with the effects of time. But what is meant by atmosphere?

> *'Atmosphere' is a colloquial term, yet despite or perhaps because of the ambiguity of its usage, it is helpful to return to it again and again. We speak of the tense atmosphere of a meeting, the light-hearted atmosphere of a day, the gloomy atmosphere of a vault; we refer to the atmosphere of a city, a restaurant, a landscape. The notion of atmosphere always concerns a spatial sense of ambiance.* (Böhme 1998, 112)

Atmosphere is the way in which the place manifests itself, not the collection of its parts. It is the feeling evoked in the observer, something less tangible than intentional representations or metaphors of materials. It is the overall impression of the place, its presence.

In their exploration of the evolution of the American cemetery, Jackson and Vergara (1989) took some measures to describe the character of some of the cemeteries of particular interest and importance. Of note is their reading of Père Lachaise Cemetery in Paris.

Figure 17

Although Père Lachaise is well maintained, many of the century-old monuments are set awry, lettering has disappeared, and the metal doors and crosses have rusted. Nature has molded the geometries of the monuments so that they take on an almost organic shape. The former dirt roads are paved with cobblestones and lined with tall arching trees,

their huge trunks and branches echoing the shape of the mausoleums. Memorials, paths and vegetation seem to grow out of cement and merge together. Even in winter, the cemetery has a green patina from lichens growing on the monuments, from the evergreen cypresses and from the oxidation of bronze. The cemetery somehow has remained strong in character, a satisfying whole. (Jackson & Vergara 1989, 17)

Clearly, there is some interest in the cemetery by the bystander. Of interest are the forms and paths as they weather in a number of different ways. Père Lachaise is rich in atmosphere and character as a result. The previous quotation only goes a short distance in the explanation of the possible delight offered by weathering in the cemetery.

Such older cemeteries are places of cultural history. The visitors are immersed in the past. The dates engraved on the monuments are silent reminders of the time that has passed. A patina of age further enforces the character of age. In effect, weathering validates the ages on the monument. In this case, the time that has passed has decreased the relative numbers of the bereaved when compared to the numbers of the bystanders who visit these places. Thus, the function of the cemetery takes on a different focus, from a burial ground for mourning of the recently departed to the observance of a general and shared past. These places are congruent in the expression of time.

Yet, the expression of time is not the only character of interest in the cemetery. The delight of the mysterious may be another interest. The mood or atmosphere of a cemetery is a noteworthy part of the appeal. Weathering only adds to this atmosphere, smoothing and wearing the forms in a process of ruin. The nostalgic appeal of ruins is a repeated phenomenon in western culture. It is evident in the visual arts of the last few centuries (Dodge 1977 & Zucker 1968). The weathered ruin was used as a metaphor for many purposes, such as the signifier for death, history and other abstract notions. Ruin is within all things.

Figure 18

Each piece of communication, each text, each built form; all have an inherent aspect of ruin. Never can a text or object achieve a perfect communication of ideas. The communication is always translated or interpreted. Philosophers have investigated this phenomenon. Jacque Derrida explored the ruin of self-portraits. Mark Wigley explored the deconstruction of architecture. Many others have found and investigated ruin as an inherent part of all things humans create.

Robert Harbison makes a distinction between the ruin and the monument (Harbison 1994, 38). He sees monuments as focused on permanence. Monuments are to stay unblemished despite their age. Ruins on the other hand are meant to be returned to the earth, in their own time, due to cycle of decay and growth. Ruins may stand as monuments for a time, but then they will continue to decay without any preservation. In a way, it is the monument that is frozen time, while the ruin is destined to be solely a creature of time.

Another aspect of the appeal of weathering in the cemetery is the connection to time. The patina of age is a validation of time for those objects that have endured to the present. The romantic appreciation for aging is still inherent in our culture as positive value. Appreciation is attributed to the old because of the qualities of perseverance and durability (Mostafavi & Leatherbarrow 1993, 84). Weathering has worked as a validation for the age of an artifact. Time must pass in order for the feature to weather, effectively enhancing the age value despite any desires to deny mortality.

On a practical level, the revealing of time is powerful tool in the design of meaningful places. For example, Kevin Lynch and Gary Hack (1984) describe it as an integral part of any site plan.

> *The communication of a sense of time, however, is as important as the conveyance of spatial form, since time and space are the great dimensions within which we have our being. A good design saves evidence of the previous occupation of a place, especially such evidence as conveys intimate human use (a seat, a threshold) or evokes profound feelings (a cross, a grave, an ancient tree). Contrasting new with old, we feel the depth of time. Materials are chosen that will weather handsomely. How plantings will mature, grow, and decay, how structures will be destroyed and replaced, is part of the scheme. The place should be evocative of season and the time of day: the shift of light, the cycle of growth, the rhythm of activity. ... [I]t is this very rootedness in time that attaches us emotionally to any place.* (Lynch & Hack 1984, 174)

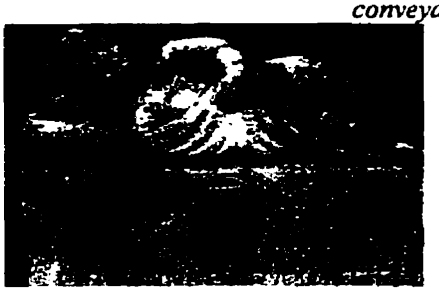


Figure 19

This excerpt is from where the authors speak about the sensed landscape and its materials. They discuss the qualities of places that designers respond to, and draw from, in their own designs. Such comments on time are gleaned from examining special places to identify why they are special.

In the cemetery specifically, headstones may be the true timepieces of landscape features. Since they are dated, they provide the most direct meter on the amount of weathering in a particular area. Studies have been conducted on such features in cemeteries in many countries to measure the effects of increasing pollution. The different materials used in a area will also weather at various rates, limestone and marble faster than granites and slates for example (Ollier 1974, 22). Moreover, they house the full range of weathering and our reaction to it. By representing the passage of time, as well as the effects of weathering, headstones fall within the threshold between our urge to build and the conflicting actions of the environment.

Weathering in the Cemetery

> *More than remembrance, the cemetery derives power from the intuitive belief that the dead persist, that they have not vanished altogether from our world, that they communicate with the living, that something of their life force resides where the body is buried or, to a lesser degree, where the ashes are deposited. Once this belief weakens, the cemetery loses its significance, becoming an unsettling and unwanted reminder of mortality.* (Jackson & Vergara 1989, 121)

This quotation summarizes the common perception of weathering in the cemetery. It is undesired by nearly all the bereaved. It is only the few bystanders that find merit in the imagery offered by decay, making it acceptable to the slimmest minority. In order for weathering to be appreciated, a time must elapse to remove the emotion and memories from the monument. Only when it is perceived on an impersonal basis, with the requisite mystery appeal, can the manifestation of decay be a powerful expression to the observer. This threshold of time is one aspect of what separates the bereaved from the bystander.

Figure 20

The allowance of weathering in the cemetery makes it an interesting place to stimulate contemplation for visitors in a reflective state of mind. Not only is it a place to commemorate the dead, but it is also a place to face the psychological ramifications of life and death. It only seems fitting that the cemetery should exhibit all the signs of a dialogue between the living and the dead. The images of life, death, and immortality should be amongst the strongest representations. An environment rich in imagery can provoke these thoughts. Where else but the

spiritual place of a cemetery would this seem appropriate. One must realize that every bystander was once, or will be, a bereaved. It is a dilemma for the designer, how to design for both the bereaved and the bystander.

Not all cemeteries are designed to accommodate maximized plot placement and generic memorials. Some cemeteries are designed with the extra intent of architectural expression. Catherine Howett points out the initial intentions of the designers of Mount Auburn Cemetery in Boston.

> *The first impulse had been to preserve the experience of wild nature at Mount Auburn, so city dwellers could meditate on the mysteries of cyclical change and death in a remote and somewhat primitive landscape.* (Howett 1997, 12)

This is an obvious attempt to reveal the *deep forms* that John Tillman Lyle (1991) has described. Howett advocates using ecological principles to reassess cemeteries and design practices. With a perceived increase in isolation from enriched environments, contemporary society may need more expressive places like cemeteries. Imagery, symbolism and metaphor are among the additional layers of information communicated by the architects through the material forms of the cemeteries. As Sam Weller explains in his article "Cemeteries—Designing for the Public", cemeteries in Britain are still important people places.

> *Parks and other open spaces are giving way to noisy and aggressive sports and pastimes leaving cemeteries to fulfil their role as havens for contemplation and edification as envisaged by the Victorians.* (Weller 1989, 10)

There is a need for places for individual reflection and mediation. Cemeteries provide these opportunities for the public. It is only natural to strengthen cemeteries with expressive qualities and character of place. The following case study will demonstrate the potential and application of expression in a cemetery design, with specific inclusion of weathering as a material, sensual quality and expression.

4.0 The Case Study: Igualada Cemetery

There is, near a small town in Catalonia, a cemetery by Carme Pinos and Enric Miralles.
One is never for a moment in doubt as to its intention.
It is a burial ground.
Yet it operates at a formal level quite outside of the ordinary.
Its language is complete, fresh, inventive.
There is a sense of control from car-park to tomb; one's eyes, one's feet are being given directions as to where to look, where to walk.
Yet one is barely conscious of being so directed.
It is remarkable.
In the words that pass between us, 'not bad.'
(Peter Smithson 1995, 16)

This is the second half of a poem written about the Igualada Cemetery designed by Enric Miralles and Carme Pinos. It is clear that there is much more to this cemetery than is usually designed. It has qualities for the visitors that are beyond the ordinary imagery and layout of a typical cemetery.

A cemetery is a place for both the bereaved and the bystander. As mentioned earlier in the discussion on cemeteries, the soul and the corpse, the two other stakeholders in the cemetery, are incorporated into the perceptions and actions of the bereaved. The cemetery should provide for the needs of the bereaved and the bystander, although these needs may be conflicting. The visual appearance of the cemetery must adhere to standards of cleanliness and order that are equal to any memorial. However, with weathering and vegetation

growth, the cemetery acquires a patina of age. Those that visit the cemetery for recreation or quiet reflection perceive this as character. The Igualada Cemetery is a cemetery that accounts for the necessity of memorial, while allowing for the expressive qualities of weathering.

This cemetery is an extraordinary example of expressive landscape architecture. It is a new cemetery near Barcelona, Spain, awarded as the winning entry in a design competition. Two architects, Enric Miralles and Carme Pinos, designed the cemetery to express a number of qualities. Among these qualities is the metaphorical expression through physical form and the intentional use of weathering as a complementary process. The quality of the forms and materials used as expression at Igualada are described in many contemporary periodicals and books by critics and other designers. The expressive qualities have sparked an interest in the design community.

Figure 21

Both the criticism of others and the actual comments of the designers reveal the ideas behind the use of materials and the layout of the cemetery. Of course, some of the comments are a matter of subjective interpretation. However, the desire here is not to prove the exact intent of the designers. One can never know the full intentions. Even the designers can't articulate all their intents in a specific design. Instead, the purpose of this analysis is to demonstrate that these means of expression, the use of materials and layout, are congruent with the process of weathering in the cemetery.

Description of Igualada Cemetery

The cemetery at Igualada near Barcelona, Spain is a new (and continuing) construction project. Enric Miralles and Carme Pinos combined to win the competition for the design of this new cemetery in 1985 (Curtis 1991, 6). It is still being constructed as the project expands and the site is further developed to the full extent of the original plan. The architects responded to the program that outlined the requirements such as niche burials and the location in an abandoned quarry of a dry riverbed (Werner 1992, 110). The result is a

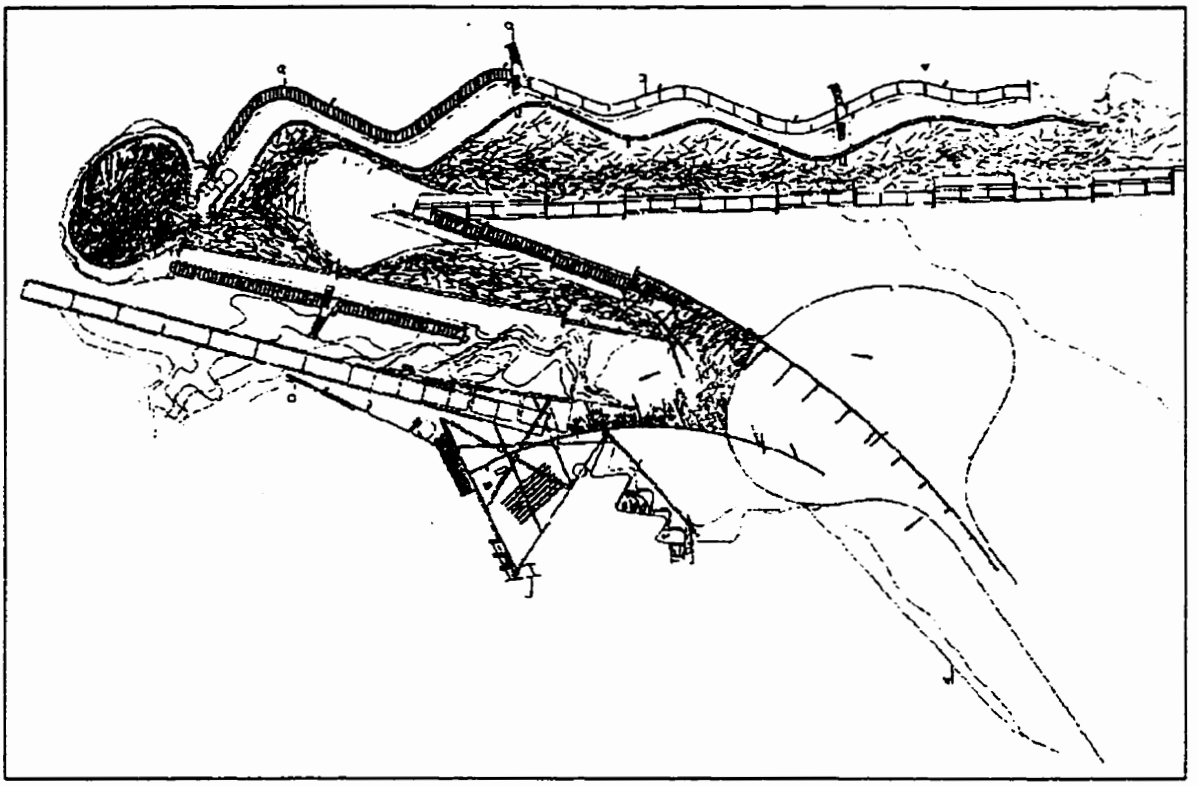


Figure 22

cemetery that is a passageway bordered by terraced burial niches, tree-lined and paved. The majority of the structures are constructed of modular sections of concrete to form the burial niches, the stairways and some of the retaining walls. The rest of the banks of the old river valley are retained by local rock and steel mesh retaining walls. Other details in the cemetery are made of iron and untreated steel, including the prominent gate features.

The visitor enters and descends into the cemetery along the paved passageway. The cemetery is physically imbedded within the site, the built walls and burial niches form a frame below the surrounding hills as one looks around. In his critical article about the works of Enric Miralles, Juan José Lahuerta (1996) paints a very imaginative and expressive picture of the new cemetery. The overall form and articulation of the elements creates the atmosphere of a narrative of the journey between life and death

> *Like shadows at dusk, the Igualada Cemetery is elongated. It looks like the remains of a fan, its thin, rusted, and bared ribs piled up against one of the walls of the amphitheater behind, ribs that threaten to infect the hand of anyone who would dare to pick then up, who would most certainly be scratched by the points...In this broken landscape, or in these times, the earth, dragged this way, held up this way, split in this fashion, becomes unbearable. This is the most terrible erotic*

landscape. It is death. Pointy teeth sprout from this cut, jagged stones, teeth with rusty devices. (Lahuerta 1996, 9)

Figure 23

Throughout his description of the character of the cemetery, Lahuerta uses ominous imagery to describe objects such as rusted ribs, splitting open of this crack, ribs broken and sinister crosses (Lahuerta 1996, 9). He describes materials and forms that really express to the observer notions about death and other emotional matters in the emotionally charged atmosphere of the cemetery. For example, his repeated use of the rust imagery makes the point of weathering as a tool of expression. It seems that the expressive nature of the cemetery's forms and materials evoked these impressions in the author.

Aspects of Expression

Igualada cemetery exhibits a number of interesting expressions in architecture form and material. The cemetery has a distinct expression of time (Lahuerta 1996, Zabalbeascoa 1996, Curtis 1991). Weathering plays an integral part in this expression. Yet, this process of change is not the only aspect of expression in the cemetery. The layout and the forms also express movement and a narrative of the journey of life. The apparent movement of the forms, the weathering of the materials and the narrative layout of the cemetery all are tied to the notion of the passage of time. The main vehicles of expression are the dynamic forms/patterns (movement), the materials qualities as they show imperfections/weathering (time, death, nature) and the overall form of the cemetery (the journey of life). The following is a description of these three main points.

Expression of Movement

The dynamic appearance and arrangement of the primary elements and the shapes of those elements shows a distinct language of form that expresses movement and change. Benedetta Tagliabue Miralles articulates this "complex temporal realities" of the cemetery and site in a catalogue of Enric Miralles'

projects (Tagliabue Miralles 1996, 52). As one of the expressions of time, the arrangement of the cemetery elements and forms of the elements themselves show a distinct aspect of movement. The forms express a dynamic quality. That is, they are in rhythmic patterns and angular shapes. The visual impression is one of unbalanced walls and shifting plains of concrete. Even the undulating walls affect the feeling of movement as one walks along the spaces.

Another aspect of the impression of movement is the seemingly disorderly arrangement of some of the elements. Part of Lahuerta's interpretation of the cemetery addresses the issue of chance. The seemingly random placement of the wooden sleepers in the paving of the main passage is a contradiction: apparent movement and chance placement frozen in concrete. The sleepers are a moment of time set profoundly permanent in the ground (Lahuerta 1996, 11). Just like the fluid forms of the concrete walls and niches, the constructed forms representing movement while being permanently fixed in place, a paradox. Like the gambler that strives to abolish chance but never succeeds, the architects cannot arrest change or totally represent chance or movement in concrete form. Only the expression is achieved, and this expression is an important characteristic of the cemetery.

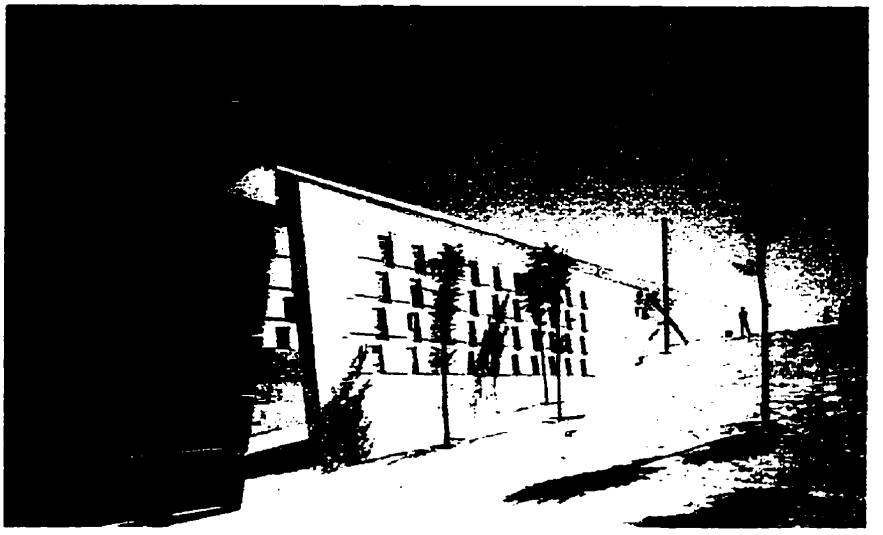


Figure 24

However, Lahuerta interprets the random placement of the planks in yet another way. He sees the contrast of the aleatory patterns as a foil to the ordered and rigidly formal procession of the funerary rituals (Lahuerta 1996, 12). I would add that the contrast of the random versus the ordered might indicate the distinction between what endures and what is malleable in the realm of ideas. A landscape of apparent movement, patterns, shifting planes and weathering materials is set against the order of the burial niches and the clear procession along the path of the cemetery. The forms and materials may indicate what is mortal and that which is immortal, the changing cycle of life and the memories of the beloved deceased respectively.

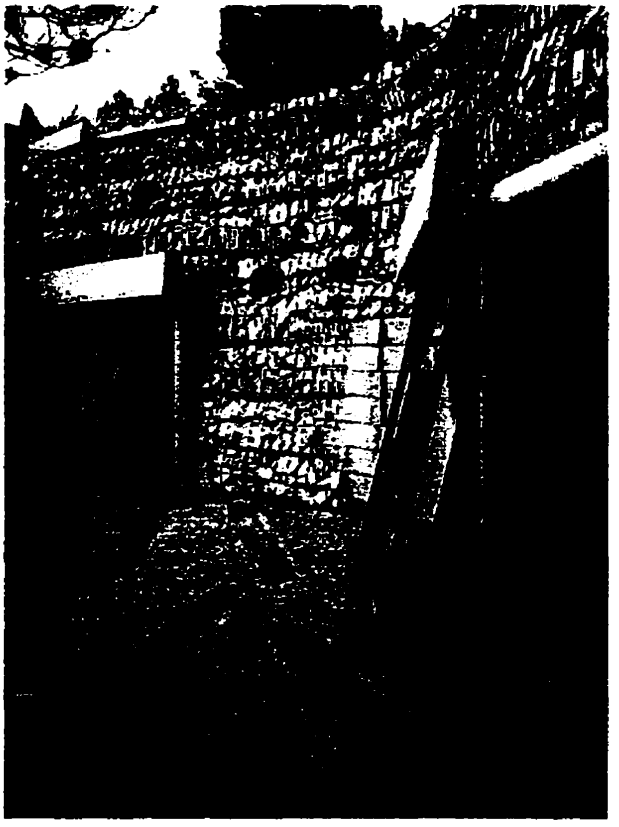
In these physical ways, the cemetery provides a text to be interpreted by the visitor. A language of shifting, moving and dynamic forms generates the impressions of movement. This architecture is designed "to appeal to the physical sense of movement."(Curtis 1991, 7) Human activity and perception are at the heart of the visitor's experience of the cemetery.

Expression of Change

The discussion of weathering is very much a discussion about the physical evidence of time. Many articles have been written about the qualities of the materials of the cemetery. The materials chosen for the construction of the cemetery demonstrate an affinity to change. Like the regular movements of the arms on a clock, the signs of weathering can be interpreted as the passage of time. At Igualada, the iron for the retaining wall mesh, the lamps, the commemoration plaques and the mausoleum doors is one specific use of materials. These objects will rust to reveal the notion of time in the cemetery.

The transformation of materials is at the very heart of the meaning imbued in the cemetery, implying that this place for the dead is in fact a living place, which is developing and changing, and which welcomes its usage as a place to which the living can come to visit, walk and contemplate. (Zabalbeascoa 1996, 20)

Figure 25



It is an expression of continuity, a reminder of the restorative and transformative qualities of the processes of nature. The weathering of the cast iron is a cue of time's passage and the visitor's place in that flow. Visitors enter and pass into the burial area "along with the visible layers of soil of the cemetery, the continually changing features of the planting, textures and materials that enhance the idea of transition (for example the rusting of lamps and weathering of concrete) -all of these in the Igualada Cemetery serve to relate the passing of time."(Zabalbeascoa 1996, 18) The overall cemetery expresses the passage of time and the process of change.

The design of the cemetery has been compared to the patterns of nature and natural processes. It shows schemes of order found in nature, in particular the cemetery reveals these random and not-so-random patterns.

> *Their attitude toward experience is poetic and intuitive: their architecture is affirmative, even restorative, vis a vis nature.* (Curtis 1991, 8)

The aspect of changing materials is the use of vegetation itself. It was the intention of the designers that the trees and other planting would be allowed to grow and in time to cover the cemetery (Zabalbeascoa 1996, 17). This will eventually soften the cemetery, truly merging it with the surrounding landscape. It was meant to challenge the notion of death as an end by showing an environment that undergoes cycles of growth and change. The cycle of natural processes would continue throughout the cemetery, with the inanimate features as well, being visual reminders that life is but a process, not a series of beginnings and endings. The visual cues will encourage the reflections of the visitors. The materials provide physical and subconscious clues for the observer about the nature of time, nature and both of these contributing to the event of death/process of life.

Perception of change arises from a person's interpretation of the weathered artifact. The comparison between the present and past condition (remembered or inferred) leads to a question: how did it arrive at its present condition? Some manifestations of weathering provide obvious clues; scars from collisions and impacts. Other manifestations are not so obvious. The reading of clues and the interpolation of events creates a dialogue between the inanimate form and the thoughtful viewer. In a cemetery, the people are more sensitive to the condition of their environment, due to the predominance of monuments. Such expressions of change lead to the next example of the dialogue or analogy of the journey of life as demonstrated in the cemetery.

Narrative of Life and Death

Analogy is the figurative relationship between two things that are similar in many, but not all, ways. It is an assumption that since they are apparently similar in some ways they may be similar in other ways. The physical representation of the spiritual journey of the soul is appropriately manifest in the Igualada Cemetery. Weathering may be a process of nature, but so is the process of life and death. The process from birth, to living, to grieving to living anew, to dying, to whatever remains after death is a progression of

events, mirrored by the physical character of the cemetery.

> *Miralles intended the cemetery to be closer to those still alive than to the dead, but with some kind of interplay between the dead and the living. Therefore the cemetery would display an acceptance of the cycles of life, to enable a link between the past, the present and the future.* (Zabalbeascoa 1996, 17)

A number of critics have interpreted the cemetery in this way. William Curtis describes the main alley of the burial niches on a path sloping into the main body of the cemetery. He calls the physical design of the site a metaphor for the journey of death, the descent into the earth as one enters and the trip back to the sky as one leaves (Curtis 1991, 7).

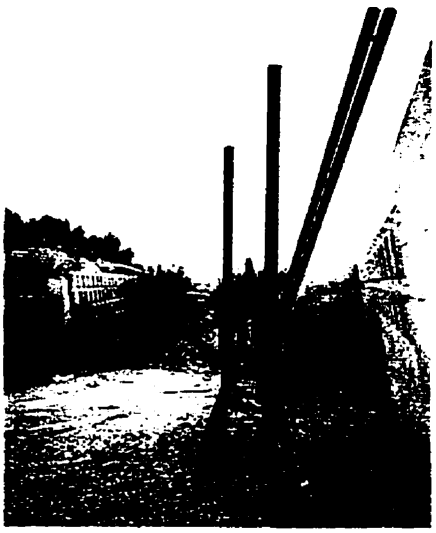


Figure 26

In another critic's interpretation, the harsh and brutal character of the cemetery caused by weathering and the angular forms can also be an expression of emotionally charged event of a death (Lahuerta 1996). Such corresponding imagery can be said to create a cathartic experience for the bereaved. The material expression leads to catharsis, the purification or relief of the emotions through the evidence of weathering and the visual reminder of the cycles of life.

> *[T]he cemetery was to be designed in the form of a path, a route which people could follow and which would itself be exposed to the elements. The dead buried here are neither neglected nor monumentalized. They simply occupy their place in the landscape, side by side along the path, allowing for others continually to enter the place.* (Zabalbeascoa 1996, 17)

Although such a shocking delivery may not be appropriate in some places, some kinds of death imagery can still assist the bereaved in their grieving process, validating their sadness and allowing for the emotional release needed for coping with death. While some may not feel the expression is appropriate to the grief of the bereaved, the architects and critics have found merit in this layer of meaning given physical form. The cemetery provides the text to be read, the expressions are the meanings in between the words, the author is both the designer and the forces of weathering and change. The message is the knowledge of life and death, immortality and mortality. The tone is not profane: it dwells beyond everyday life in the spiritual.

As Frank Werner summarizes the cemetery: "There are but few constructed complexes in this century which have provided 'analogous' three-

dimensional models for understanding the transitory nature of the past, the present and the future of all life."(Werner 1992, 113) The intended dialogue is made visual by the arrangement of the cemetery. Clearly, the use of materials and form also attributes to this multi-layered script that is the cemetery at Igualada.

Weathering in Igualada Cemetery

There is a keen sense of time, movement and change layered into the design and construction of the cemetery at Igualada. The materials and the intentions of the designers clearly include the process of weathering as an expressive tool to communication ideas of time, change, life and death. As Zabalbeascoa characterizes the design, the cemetery "emulates the path of life, both spatially and temporally."(Zabalbeascoa 1996, 14) A distinct narrative of the journey of life is communicated by the layout of the spaces and complimented by the transformation occurring in the materials. The cemetery design shows qualities of expression directly from the overall form, the forms of the features and the material execution of the construction. Material expression of ideas can be displayed in this way in a cemetery.

To draw a parallel to the use of expression in a cemetery, the Brion family tomb designed by Carlo Scarpa in San Vito, Italy incorporates ideas of the journey of life in the physical design. The choice of materials reflected both the process of change and the forms indicative of mourning, primarily with the choice of vegetation. In this case, the weeping and trailing forms of the different plants express a sorrowful atmosphere as they spread across, and hang from, the concrete walls. As Michael Stern concludes, this type of project is significant in the use of expression in funerary design.

> *The work is particularly important to the development of current landscape architectural theory because it illustrates the ability of a designer to draw from a wide range of sources and inspirations and yet express complex philosophic issues through imagery and symbolism rooted in common human experience.* (Stern 1994, 56)

As Stern has said of the Brion Tomb, the same is true of the cemetery at Igualada. Not only are the bodies of the dead housed in the cemetery, but also the memories and emotions of the visitors. The design of expressive places with the use of materials and forms to convey meaning is particularly strong in such a weighty atmosphere.

The written philosophies of Miralles himself confirm this intention of expressing the process of change and the effects of time. In his forward to the collected works (Tagliabue Miralles 1996) Miralles describes his philosophy of the design process. His approach to building shows an openness to external factors, factors outside and beyond the original ideas, factors which transform the project into a responsive construction that is concrete. It is concrete precisely because its real and material qualities lie far away from any ideal notion of final product. The project can never represent an ideal situation. It responds to changing conditions and factors, allowing for change with the constructed project. The cemetery fits into the surrounding landscape in an expressive way when the design is allowed to change with its environment. By leaving the final product open to change, the project is so much stronger in its 'place', its fit into the surrounding landscape.

> *Miralles's designs explore these very sites, establishing unusual, often oblique connections with the landscape and setting, while relating construction to nature in an aesthetic and responsive way. By allowing what might be considered by some a sacrifice of one's design talent, Miralles's works aim to penetrate nature itself.* (Zabalbeascoa 1996, 10)

From this 'letting go' of the final product, an act of denying idealism, Miralles places the cemetery in time and place while expressing the spiritual qualities of life and death as a natural process.

There are a number of qualities that weathering can express in a design for the cemetery. Although there are conflicting reactions to these expressions, the case study of the Igualada cemetery illustrates that it is possible to merge the perceptions of both the bereaved and the bystanders to create a spiritually strong atmosphere of place while working within the parameters of natural processes, primarily weathering. Igualada cemetery demonstrates that notions such as the inclusion of weathering into the intents of design can indeed lead to an expression of place complimentary to its surroundings.

> *At Igualada, the site becomes a place of interaction—architecture as a living art to which the user can personally and physically relate.*(Zabalbeascoa 1996, 24)

This intentional allowance of weathering in the cemetery creates a dialectic. That is, it brings together the two opposing perceptions of the bereaved and the bystanders in an attempt to resolve them. What at first seems a contradiction

evolves into a natural expression of landscape, nature and the analogy of the process of life. With the clever use of weathering as a tool of expression in design, Miralles and Pinos were able to integrate the inevitable process of change and the spiritual program of the cemetery to an acceptable medium.

The cemetery itself is a paradox. It must persist in time, yet stand apart from time's influence. Such is the dichotomy of the monument and the dichotomy of all landscape features. It is only a matter of resolving how one addresses the effects of weathering, not how it is denied. Although the preceding case study is a foreign context compared to Canadian cemeteries and its exact way of expression cannot be copied, the design demonstrates that it is possible to use expression in a cemetery. The cemetery changes as a physical place under the influence of weathering, just as it must adjust to the ratio of the bereaved compared to the bystanders. As the bereaved decrease with time, the cemetery also shows more manifestations of weathering. Perhaps there is a time in this cemetery's future when the bereaved are all gone, leaving the cemetery to the bystanders. It will become a ruin, a place of reflection and time.

5.0 Conclusion

> *When you have forded the river, when you have crossed the mountain pass, you suddenly find before you the city of Moriana, its alabaster gates transparent in the sunlight, its coral columns supporting pediments encrusted with serpentine, its villas all of glass like aquariums where the shadows of dancing girls with silvery scales swim beneath the medusa-shaped chandeliers. If this is not your first journey, you know that cities like this have an obverse: you have only to walk in a semicircle and you will come into view of Moriana's hidden face, an expanse of rusting sheet metal, sackcloth, planks bristling with spikes, pipes black with soot, piles of tins, blind walls with fading signs, frames of staved-in straw chairs, ropes good only for hanging oneself from a rotten beam.*
>
> *From one part to the other, the city seems to continue, in perspective, multiplying its repertory of images: but instead it has no thickness, it consists only of a face and an obverse, like a sheet of paper, with a figure on either side, which can neither be separated nor look at each other.* (Calvino 1974, 105)

This lyrical description is from Invisible Cities, by Italo Calvino. The book is a series of descriptions of cities discovered and later described by the explorer, Marco Polo. Each description is a verbal sketch of a place, revealing some characteristic of a city, showing an aspect that is fundamental to that place. Lyrical and atmospheric, each sketch is open to interpretation. In this particular example, Calvino may talk about the hidden face of Moriana that is, in effect, not so hidden after all. It is only an obvious backing to a briefly viewed surface.

Black soot and rust on metal are the inevitable additions to the more glamorous beginnings.

Such is the nature of weathering. It is a process that reveals two sides to an object, its making and its un-making. Weathering is a complex phenomenon. It encompasses both physical repercussions and perceptual impressions. It affects both material transformation and human cognition. In some places, the perceptual implications are profound. The cemetery, being an emotionally charged setting, is the site of conflicting views between the interpretation of weathering, whether it is abhorrent or attractive. As in the case study, the process of weathering can be an expressive and meaningful aspect to the environment of the cemetery. It can demonstrate abstract ideas such as life, death, mortality and nature. Because weathering is found in all outdoor places, it is a cue of time and change. In landscape architecture, the use of expression through materials and forms is a means of communicating these abstract ideas in a physical world. Weathering can be described in a way that illustrates its complementary effects on the landscape forms of the cemetery. Such a description can lead to a wider awareness of, and appreciation of, this inevitable process of material change.

Weathering can be the source of many positive perceptual qualities of the landscape. It is an integral and inevitable aspect of the environment, but it is also a source of expression and sensual interest. The character of a place may be a direct result of its physical ability to gracefully weather. The wearing of natural processes can cause the tempered character of an object or a place. Weathering can also express the nature of abstract ideas such as the passing of time, change, and the cycles of life. The way in which the weathering is manifest can be a symbol of life or death, ecology or mortality. Any number of qualities can be part of the landscape as an opportunity of weathering.

Weathering as Experience

The weathering of an object and its surroundings can be an opportunity of rich, sensual experience. Humans need sensual environments to enrich their experiences of place. There is also a need for interest and change in the environment, a revealing of the natural processes that shape the earth. Since humans are sensual being, they crave stimuli to their senses. Weathering of landscape features offers some extra stimuli for the senses. An example of the sensual qualities of weathered forms can be found in classical ruins. Michael

Baridon claims that ruins are important providers of sense impressions. Baridon remarks about an experience with a ruin to illustrate the relationship.

> *Their ragged outline and rough surface were palpably irregular. They displayed contrasting colors since their old stones were overgrown with ivy and variegated wall flowers; nor did they fail to strike the ear with the moaning of the wind.*. (Baridon 1985, 93)

His theory of sense impressions firmly plants ruins as a part of the fabric of our mental lives.

The loss of this sensual environment has been observed to have impoverished our experience in the world. Another proponent of incorporating sensual experience into the built environment is an architect, Juhani Pallasmaa (1994). He has remarked on the quality of the built environment and the effects it can have on the psyche.

> *The irrational fear in our cities grows out of the meaninglessness of the environment to our reason and its incomprehensibility to our senses. We are losing the primary causality in our sensory experience of the world.* (Pallasmaa 1994, 25)

Greater need and appreciation of the sensory environment are indeed desires for designers of all types. Natural processes that generate and deliver these sensual stimuli are important to the quality of landscapes. They provide the interest in places that humans crave. While weathering is only one process that adds sensual complexity to the environment, it is a critical contribution to the overall character of landscapes.

Michael Hough notes that the richness of an environment adds to the diversity of place that is an essential part of urban life. It is important for cities since "experientially, it implies interest, pleasure, stimulated senses and sensory enrichment" (Hough 1990, 9). Although landscape architects often concentrate on the vegetative aspect of change and growth, the issue of diversity of environments applies to the inanimate built aspects of landscape design as well. Although Hough speaks mainly of vegetation, he generally describes other natural process in the built fabric of the city. This extends to the weathering actions of the climate on the inorganic elements of the landscape. Ensuring the diversity of place is important in all its biological and social relevance. The present course of denying our connection with the decayed and worn, eliminates the interactive qualities of the human relationship to environment.

Another part of the experience of weathering is the psychological experience. One strong experience is the impressive experience of the ruin.

Weathering in the form of ruin can be one of the most expressive aspects of the aged built environment. A ruin is heavily influenced by weathering. It is also a symbol of a nostalgic relationship with the built environment. Weathering helps to create the appeal and interest of the ruin, in all its tangible and intangible ways. Rich textures and revealed patterns represent the sensual qualities. Mystery and continuity with the past are among the less tangible qualities. The ruin relies on its fragmented condition and its romantic appearance. Usually, ruins may be described as the popular and internationally renowned ruins of buildings from ancient civilizations like Greece or Egypt. Yet, they may also include the broken fragments of decrepit buildings freshly smoldering from a bomb blast or the remains of disused factories. From the remains of Greek temples to the fragmented churches of war-torn Bosnia, from derelict barns on the prairies to graffiti covered walls in inner city districts, ruins appear in many forms in many places. Nostalgia or curiosity in the ruin's previous existence is integral to the expressive quality of its form.

Figure 27

Primarily, it is this event of subtraction that adds to the aesthetic appeal of the ruin. Visual harmony, the "harmony of distress" from the irregularities and weathering have been a desired characteristic for artistic subjects and architectural elements over many periods (Dodge 1971, 3). As an element, this harmony has served well to mediate between the ruined geometric form of architecture and the living landscape in which it resides. The artistic inspiration of the ruins can also be traced to the infinite variety of textures and shapes that ruins provided to the artist.

Another integral part of the ruin is its mysterious expression. The thoughts that a fragmented piece of culture can evoke are varied in nature and strength. Paul Zucker's states in *Fascination of Decay* that "the past lies as much in the realm of imagination as does the future."(Zucker 1969, 9) In this way ruins provide the opportunity for question, reflection and wonder. The ambiguous ruin has a sense of mystery. As inspiration for artistic endeavors or as fuel for philosophical reflection, the ruin evokes those mental functions that cause us to wonder. Part of the wonder could be attributed to the necessity of separation from the viewer cause by time or the partial remains of the original.

The ruin works in direct opposition to monuments. Monuments represent permanence. Catherine Howett describes an example of cemeteries and monuments. In recent trends of landscape architecture in our de-sacralized, secular world landscape architects have managed "to obliterate any real or

symbolic suggestions of disorder, decay, or death, any hint of risk, vulnerability, or of mysteries beyond our understanding." (Howett 1977, 8) She describes the benefit of expressive qualities in designs. To further this argument, she cites the example of the Vietnam memorial as the most obvious and powerful example in recent landscape architectural history. The power of this simple wall lies in the complexity of its message, its ambiguous form and context of its location. This wall, incised in the earth speaks to the visitor on many levels of perceptual experience, physically and psychologically. It is exceptional because it is different from the majority of war monuments that are erect and proud. It expresses potentially discomforting symbolism with its subtle, earthbound composition, expressing potential misgivings about that war effort. Such expression adds mystery and vulnerability to the standard imagery of most monuments. The benefits of expression are both to reveal the positive and negative aspects of culture, to allow the observer their opportunity to interpret the message in their own way.

However, not all objects need permanence. Only those true monuments need the durable qualities that resist the process of weathering. Acceptance and inclusion of weathering can be an integral and valuable aspect of our built environment. Anthony Lawlor (1994) in The Temple in the House, gives the example of a mason forming a wall to show how the craftsman can impart messages in the creating of a brick wall from the bricks and mortar material. He tells the bricks how to behave and how to react to one another. But more occurs beyond the initial construction.

> *When the wall is completed, information continues to be added: the sun washes over the brick day after day, year after year, fading the colour; rain and wind smooth it grain by grain; maybe ivy grows up the wall, leaving viny traces; children climb along the top, making a chip here and there. Layer upon layer of information gives the wall a character all its own.* (Lawlor 1994, 5)

Not only is weathering sensually appealing, it is meaningful on a mental level. It can communicate directly to a person's understanding of the environment. This leads to the opportunity of weathering as an expressive part of the environment.

Weathering as Expression

Weathering is an agent for the communication of more than sensory interest. It can be the vehicle for ideas as well, a tool of expression. It can

evoke response in a number of ways. Weathering may help to create a narrative or describe a metaphor by communicate ideas in a physical form, adding a layer of meaning to an otherwise sterile environment. As described in the case study of Igualada Cemetery, the weathering of the iron doors, lamps, and wall mesh represent natural forces that cause the changes as well as the inevitable cycles of life and nature. By revealing the process of natural change, this weathering offers a representation of its abstract qualities. The rust visually reminds the visitor of the mortality of all things physical. It stands as a visual check against beliefs of immortality for anything but the soul.

Figure 28

Yet, the expression of weathering need not be spiritual. Richard Murphy (1995), in his introduction to the work of Carlo Scarpa, takes a moment to describe the Venetian vernacular that involves a strong degree of weathering. He proceeds to describe the nature of the palazzos along the canals and the state of their facades. The weathered surface is of particular interest. The plastered surfaces are in a constant state of decay, under the influence of the wind, rain, pollution and seawater. Its dynamic state brings about a layering effect on the building facades.

...no sooner has a new layer been applied than almost instantly its lower edge is under attack so that often successive layers of eroded stucco can be seen on the same facade. (Murphy 1995, 7)

The sharp opposition of new and old, the sharp edges of the stucco contrasting the organic patterns of stain and erosion are an integral part of the vernacular. This is precisely the visual and aesthetic interest of weathering. The cycle of decay is the narrative of the struggle between the human works and nature's response. From a once smooth surface to a pitted and exposed under-layer, weathering is the key component of the place, revealing the effects of time on the environment.

Figure 29

The expression used in cemeteries is particularly sensitive, as demonstrated in the previous chapters. However, there is a psychological place for weathering in the cemetery.

The overwhelming emphasis in American cemeteries is on hopeful images which exclude death and decay. A few jarring depictions of death have found a place in our cemeteries, and in their exceptionality, they exert an intense attraction. (Jackson & Vergara 1989, 84)

Arguably, the authors were referring to the bystander and not the bereaved as the interested parties. By representing the processes of nature and human spiritual beliefs, the use of weathering in the intentional design of landscape is a valid

expression. If weathering is used as a metaphorical expression, it may only communicate to the observer if it is interpreted as a planned circumstance. The appearance of weathering should never be a shock or surprise to the observer. A subtle expression can be less intimidating and hopefully more acceptable since it is not forcing the judgment of the observer. It may simply add to the atmosphere of the place, leaving impressions on a subconscious level.

Concessions to Other Perceptions

When a person sees something that is broken, or not in the condition that it once was, that person can interpret what caused the change. Was it a preventable change? If so, how preventable was it? This is the place of memory. Memory allows someone to see an object and remember its past condition and compare that image that is present. The comparison between the different conditions is an act of interpretation that leads to a reaction. If it was an unavoidable change, how does one perceive its value? Is it a good change? Sometimes people attribute value to a change based on what they believe caused it, thus deciding it is acceptable or not. This is the difference between the gentle and violent effects of change. It is what the manifestation of weathering represents in the mind of the viewer that is important.

For example, an appropriate way to describe the use of weathering in the Igualada cemetery is by characterizing the manifestations as gentle effects. These manifestations truly represent the process of change but they do not compromise the integrity of the objects, nor do they hinder their functions. Weathering is consistent with all the elements. They can be perceived as intentional effects, desired as meaningful, not accidental. The opportunities of weathering are centered on the ability of an object to compliment, and to be unified with, its surroundings. Zabalbeascoa interprets the cemetery as a place waiting for the surrounding landscape to change the built parts of the cemetery.

> *The life cycles of this transformation are reflected in the project, since it is precisely life itself that makes the cemetery 'die'. With time and weather inevitably intervening in the work, covering and eroding it, allowing it to become part of the landscape,...*(Zabalbeascoa 1996, 19)

Weathering is part of the natural processes of change, yet it is also a part of how people relate to their environment, how they understand their world. When places 'fit' the landscape, a harmony of place is created. This fits with the original intention of the rural cemetery, such as Mount Auburn cemetery in Boston. The initial intentions of the designers were to place the cemetery into

the rural landscape to "comfort the bereaved in the knowledge that their dear one's remains were part of nature's cycle of decay and renewal." (Walter 1993, 43)

However, the trend seems to be skewed in recent times. The burial may still be in a rural setting, but the evidence of decay and nature's cycles are removed and replaced by a manicured landscape. Cemeteries that do not exhibit any signs of weathering are replacing older cemeteries as desired places for the interment of the dead. The control over the processes of nature is a factor in these desires by the public. This follows the American relationship with nature as Leo Marx has characterized as the machine in the landscape (as summarized by Walter 1993). It is the best of both worlds, a desire for wilderness with the comforts and security of technology. Yet, it is a contradiction, exposure to nature without infringement of nature.

If weathering is perceived as unnecessary, visually distressing or preventable, it may be unacceptable. However poetic or spiritual the evocation of the process of weathering, it must be realized that not all people have the patience for such expression. This was previously illustrated by the example of the bereaved and the intolerance to change in the material form of the monument. By the standard of urban decay and derelict land in the western cities, it must be remembered that North America does not share the same respect for the old and dilapidated that Europeans might for their aged buildings and landscapes. Here, weathering is the messenger of bad news, standing as witnesses to a past that still stirring with persistent emotions (Vergara 1994, 19). Any decay or deterioration of form becomes an embodiment of our guilt, anger and despair. Camilo José Vergara reminds one of the realities of the large ghetto areas of the cities. He describes a landscape of devastation where street lights are destroyed like trees in a storm, "jagged aluminum stumps left embedded in cement". Trees grow from the roofs of abandoned buildings; sidewalks and parking lots are more grass and shrubs than cracked concrete.

Another counterpoint to the use of weathering in the cemetery as an expressive design intention is demonstrated by Tom Nugent (1991). He presents a new cemetery design. It is a Memorial Park with flush grave markers in a pastoral setting. It is barely recognizable to a passerby as a burial ground. Minimization of hard surfacing is coupled with reducing imagery of grave sites as design determinants. Although the designer states in the article that cemeteries are for the living, he does not say what exactly the living need in a cemetery. This may be a matter of some debate. However, it is still true that the

bereaved need a cemetery. If people need contact with death and the commemoration of the dead, this place barely allows it. It turns the burial and memorial into a secret that is embarrassingly hidden from view, sunk into the grasses or placed behind grassy berms. The designers have purposefully disguised the cemetery as a passive recreation park, with ornamental plantings, preserved wilderness areas and connections to existing nature trails. In an attempt to escape the stigma of a 'burial ground' they have created a park that is not quite a park, a cemetery that is not quite a cemetery. Corpses are still buried here, yet the commemoration of the dead is denied, the experience of the cemetery and the funerary monument are lost to the bereaved.

Despite these concessions, weathering can be the source of many positive qualities of cemeteries and other landscapes. It is an integral and inevitable aspect of the environment, but it is also a source of expression and sensual interest. The character of a place may be a direct result of its physical ability to gracefully weather. The wearing of natural processes can cause this tempered character of an object or a place. Any number of abstract qualities can be part of the landscape as a result of weathering as well. It can be the vehicle for ideas as well.

> *The memories are deposited in the fissures of the tombs, the vegetation fills the empty spaces of the embankment, and the shadows begin to act as a clock.* (Tagliabue Miralles 1996, 52)

Weathering can be a tool of expression, adding a layer of meaning to an otherwise voiceless environment. As described in the case study of Igualada cemetery, weathered objects and spaces represent the natural forces that cause the change as well as the inevitable cycles of life and nature. By revealing the process of natural change, this weathering offers a representation of its abstract qualities.

Nothing is perfect and weathering is inevitable in even the most earnest attempts at realizing and maintaining architectural form. One should look at weathering as a naturally occuring process without any inherently bad qualities.

> *The mouth kisses, the mouth spits; no one mistakes the saliva of the first for the second. Similarly, there is nothing necessarily impure about dirt* (Mostafavi & Leatherbarrow 1993, 109)

The qualities of a material or object have aesthetic appeal because they not only endured the effects of weathering, but they do so gracefully. The example of the brick is one such timely material. It maintains its structural function and general form under the processes of weathering. However, it does change. Its

appearance is softened by erosion. As a function of its internal structure, the layers beneath the surface are similar in texture and hue to the original. In the pattern of courses, the brick wall or object may gracefully weather, not losing any function or form but still revealing the active agents of weathering as natural process. This is called character by many. The places that display this character do so because the forces of change generally change all similar objects of an area at the same rate, thus, the notion of a patina of age covering a place.

Landscape Architectural Theory and Weathering

The understanding of the process of weathering is important to the practice of landscape architecture. It is important because of both its physical and perception effects on the built environment. Placing this understanding within the context of contemporary theories of landscape architectural design may better inform the landscape architects in the designs that they created. The character of places such as parks, urban plazas, and cemeteries will be richer to human perception as a result.

> *Landscape architecture has always stood in a privileged position in society, creating symbolic settings for cultural ritual and discourse. As the great mediator between nature and culture, landscape architecture has a profound role to play in the reconstitution of meaning and value in our relations with the Earth. The poetics of human dwelling, the very consciousness of humanity, might once again become the central focus of attention for landscape architectural theory. By its nature, this insight is primarily grounded in perception and cannot exist outside the* a priori *of the human body and its engagement with the world. Landscape architectural theory ought therefore to find its basis in the realm of perception and the phenomenological, the essential origins of existential meaning.* (Corner 1990, 77)

Landscape architects are involved in adding meaning to the environment through the projects they oversee. Landscape theory is important in determining how to better manipulate the built environment. In those places of cultural or personal significance, the metaphors and messages inlaid into the built fabric are more communicative if they are strong and meaningful to people.

The reasons for fitting this process of change into landscape theory is to be in better tune with the landscape itself. Examples of this need for connection with the perceptual environment are many. Explaining these connections to the

nature is in the tradition of architectural theory as demonstrated by this quotation by Anthony Lawlor, in The Temple in the House.

> *Our industrial, materialistic view of architecture and nature is fragmented because we try to freeze the fluid actions of the environment in discrete frames. We attempt to stop the stream of living. Buildings routinely ignore the constant fluctuations in climate that surround them. They maintain constant levels of temperature and illumination by using polluting systems for heating, cooling, and lighting. Cut off from the local nuances of weather and terrain, this approach separates human life from the harmonious processes of nature.* (Lawlor 1995, 204)

Figure 30

He tries to show that architecture does not need to be this way; that it can be in harmony with the natural systems of our world. A separation from the flows, cycles and processes of nature, the human body and the mind is not an enriching experience. People need more from the environments that they live in everyday. Maybe the consideration of weathering evokes different feelings in each person, but it does serve as a reminder of natural processes. It reminds a person about the mortality of all things in the cycle of life.

Weathering fits into a theoretical approach to landscape architecture in two ways. One is the identification of graceful weathering and how this adds to the richness of the perceptual environment. As such, it is a possible means of expression in a communicative design that incorporates impressions, atmosphere and metaphor to appeal to anyone experiencing a place. It also follows that the expression may communicate an appreciation and understanding of flexibility. This second theoretical approach to landscape architecture affirms a knowledge and incorporation of natural process and ephemerality into designs.

Graceful Weathering

Focusing on the gentle, graceful effects of weathering can help to reveal their aesthetic merit. This, in turn can inform the designer on a wide range of decision-making processes in design. An appreciation for weathering can aid in the choice of materials for a project. It can also influence the choice of forms and the nature of their exposure to the forces of change that are the agents of weathering. By including an understanding of weathering in the

design process, a meaningful design that expresses notions of ecology and change can be achieved.

Weathering can be a visually appealing and mentally stimulating part of the landscape if the materials accept, and are graced by, this process of change. What makes one material better than another for its weathering characteristics? E.B. White (1967) offers an explanation in his study of the appearance of buildings in London.

> *It is a well known, if inexplicable fact that the eye will tolerate 'imperfections' in the surface of certain materials and not in others. In many hand-wrought things (of which old timber beams, old masonry of stone or brickwork, tiled, slated or stone roofs are familiar), irregularities of shape, color and texture are part of the beauty these materials had initially and developed still further with time. Not so with materials which have thin, applied finishes and which are, or appear to be, machine-made.* (White 1967, 2)

The fact that some materials seem to accept the 'finish' applied by weathering seems to be a function of a material's inherent structure or its origin as associated to human construction. He goes on to explain that the materials that have a consistent composition throughout its form can tolerate weathering in an elegant fashion. A specific example is the weathering of brick. Bricks can acquire a patina of accumulations or wear and still have a formal qualities or general surface appearance. With this example in mind, the design of landscapes should allow for such inevitable changes to the qualities of a material. In order to exploit the patinization of objects and spaces a degree of control must be relinquished. One way of letting go of the eventual character of a changeable landscape is to deny the desire for the unattainable ideal goal of a 'final product'. All landscapes are in the process of change, from the moment they are beginning construction to many years after use. A landscape is never static, never 'completed'. It is always susceptible to transformation.

Figure 31

How does one begin to mediate between this desire for an ideal product and the reality of indeterminate results of change? By designing places, landscape architects attempt to bring a conception into the world of reality, so it can be seen, felt, and experienced by others. This landscape that begins as an image has a certain shape, form and size. To bring it into the world, it must be created from materials already being experienced and felt. In between the stage of the well considered idea and the final product a complex series of

circumstances can occur to create a gap between the intended product and the actual finished construct. There are also forces that affect change after the final acts of construction. There is an inevitable condition of indeterminacy and chance in even the most strictly planned constructions. Better understanding of the possibility of change can greatly aid in the eventual construction of a landscape project by being forewarned. Taking the appropriate measures to account for such processes as weathering can not only moderate any undesired effects, but it may also lead to clever manipulations of those results of weathering. If change has not been fully considered, the original idea behind the design is lost and the product will not be what was intended.

The phrase 'graceful weathering' implies a judgement on the part of the observer. Generally, as long as the objects and spaces maintain an integrity of form and function, any weathering can still within the parameters of what is perceived as acceptable. This means the gentle effects of weathering such as worn edges and mild discoloration of surfaces. Harsh or violent manifestations of weathering can be distressing. These include destruction of form and loss of the visual integrity of and object's function. Thus, it is important for the designer to reflect on the possible perceptions that may take place in a given context. For example, the analysis of the stakeholders of the cemetery revealed a dilemma of perceptions based on the desires and beliefs of two different groups. As such, the perceptions of weathered materials were different depending on the group to which the observer roughly belongs.

Being Flexible

Being flexible in the design process means planning for and accepting change in the landscape. An understanding of weathering applied to the choice of materials that will change allows the opportunities for expression in form and place. By revealing the nature of some materials, both the ephemeral qualities and the durable qualities of an object may express ideas to the person who experiences the place. The ephemeral qualities are congruent with the notions of ruin that have been discussed in this study. Meanwhile, the notion of the monument is congruent with the issue of durability. Both are opposing ideas, yet they are always part of the same landscape. Weathering changes these landscapes on the side of the ephemeral, eroding durability.

Ephemerality is a contemporary issue in landscape architectural discourse. The pace of change in our environment and society seems to be quickening. Dunham-Jones (1997) investigates the changing cultural landscape

of our post-industrial world. She finds an architecture no longer suited to a mobile economy. As finances and workers move about more easily than ever before, the durable places we create are jeopardized with obsolescence. The places lack the flexibility to adapt to the over-riding economic cycles moving people and money from one place to another. It is an era of temporary contracts executed in a permanently fixed built environment. The dilemma that confronts the easy reaction to change is the great life-span of natural and built areas that change by a different clock. As people move, or land is sold, a landscape is incapable of easy turn-over or reconstruction. It must develop in its own time or risk losing its critical mass and diversity. Here lies the difference between a built environment for human needs and a built environment that includes both human and the other biota. Landscapes cannot be treated like buildings. The architecture has more at stake in the landscape. Natural, biotic, climatic processes determine the time frame of change, not fickle human preference or economic whim.

> *We need to wrestle with the question of how architecture—traditionally conceived of as an enduring artifact—might better respond to the culture of the temporary contract.*(Dunham-Jones 1997, 11)

We have taken for granted the durability of the things we build and the spaces we construct. We have assumed that the permanence of a landscape has been a desirable goal. Our designs are built and it is assumed that this is the way they will remain over time. Due consideration is usually not given to ephemerality. The changeable nature of a designed landscape has not been assumed in the 'final' design. What emerges from our post-industrial status, as described by Ellen Dunham-Jones, is a need for designs which respond to ephemerality and change, respond to different user-needs as they arise and then disappear. Design will have a life-span or an adaptability. After all, according to Dunham Jones, "life-cycles are squeezing down." (Dunham-Jones 1997, 9)

How does the issue of ephemerality affect the design and planning of cemeteries? One can imagine a future for any cemetery when there are no more burials and the bereaved have past many generations from the last interred corpse. Only the bystanders remain to appreciate the place. There is a marked shift in perspective when this occurs. The perceptions of such processes as weathering are more acceptable, as noted in the earlier analysis of cemeteries. Highgate Cemetery in London is one such place. The cemetery no longer has burial services and is now a tourist destination above all other functions. It has become a ruin. It will be viewed as we now view the other burial places of the

distant past such as North American native burial sites or the Egyptian funerary pyramids and temples.

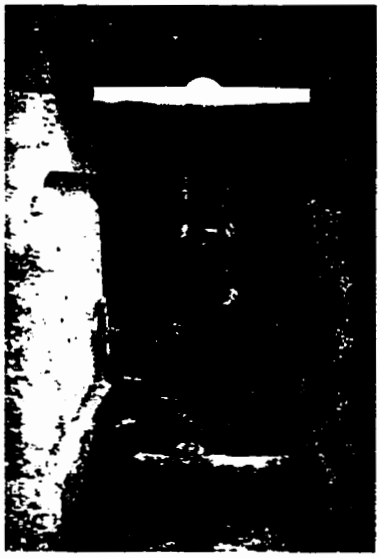


Figure 32

Meanwhile, there are more than the practical maintenance benefits of accepting weathering. Expression of abstract ideas or narrative can be a beneficial result of the actions of weathering. The use of weathering as means of expression is reliant on the ability of the product to communicate to other's perceptions, such as the bystander. Understanding both perception and theories of materiality will lead to a better ability to design with symbolic expression and abstract messages. Landscape architects are mindful of this ability and often use this understanding to make designs communicate in less direct or tangible ways. The artistry of design communicates on the different levels of perception. An example that follows the topic of weathering is Emscher Park in Duisburg, Germany. Here, the expression is demonstrated by an abstract dialogue between the old and new forms of its landscape, the old and new functions and materials of the park. Ever increasingly, people are considering different landscapes for recreation. They are opening up from the traditional notions of gardens and parks in the Romantic, pastoral styles. This project is a reclaimed industrial area turned into a park. It is a prime example of the use of decayed built fabric for new purposes, without the stigma of past perceptions of weathering. The park uses the derelict industrial character to its best advantage, to create a new experience that is appealing in a recreation setting. The central goal was to adapt the old structures into the new applications of the park, to reuse the material in new ways. As Michael Spens writes in Landscape Transformed, "there is a clearly evident dialogue between decay and the intentional demolition of old industrial substance, which form the basis of this project."(Spens 1996, 55) In a sense, they are borrowing from the past. There is the appeal of climbing over the masses of concrete and metal, adventure in the industrial ruins. This example of contemporary landscape architectural attempts to integrate with older built fabric, and also to reclaim derelict sites. It was realized that there was some appeal to this industrial landscape--a ruinous quality generated by the derelict machinery and hulking structures which are silenced and benign.

Figure 33

Regardless of the context, weathering, in all its actions and manifestations is a process that cannot be denied. At the very least it should be

understood and harmonized with the designed landscape. At best, it can form an integral element of the design, displaying a full complement of material character and symbolic meaning. Since it is a part of our world, landscape architects should make an effort to understand how they can *let go* of the final product's finishing, without *letting go* the original intention or the power of the place that is created. This is another dilemma, the planning for serendipity. Just like the planned "random" patterns of the wooden ties of the Igualada cemetery paving, the planning of chance is an oxymoron. However, it is not an impossibility. By designing a flexibile strategy, as opposed to a inflexible concretization, the designer can make opportunity for change to occur, even if the nature of that change is not predicted.

If a designer understands weathering as a complex system of physical behavior and forces, he/she must abandon the deterministic approach to controlling the total outcome of a constructed landscape. The design does not only have to accept weathering, it can also exploit it. It can be used to express any number of ideas, emotions or metaphors. The sorrowful form of rusting metal can look like tears or blood running down a surface. The worn corners of stones and bricks can display age and settlement within the visual harmony of a place. All the expressions previously described are possible if the process of weathering is accounted in an informed design process, choosing and positioning materials in interesting and knowledgeable ways. Even if the weathering is not included explicitly as a design parameter, the allowance for its wearing effects can eventually change a space so that it gracefully merges with its surrounding landscape, taking on the adjacent characteristics that the local climate has already affected. Landscapes are not things to build once and then ignore. There are processes always in play, changing character and form. A landscape design should be a flexible strategy focused around the installed features of any construction, a plan for post-construction maintenance, additions, subtractions and transformations to suite those changes.

Direction for Future Study

Understanding the process of weathering, its manifestations and the perceptions of humans in various contexts can lead to better design of landscape features. Theories of landscape architectural practice should respond to the previous insights. Based on our perception of the world, people are sensual beings. The material and real qualities of our designed features should speak to the perceptual being within each of person. In addition, it should respond to the

inevitable forces of environment, climate and time. As James Corner says about these theoretical exercises, "we look to theory to provide a foundation, a shared basis and purpose for the practice and performance of the discipline" (Corner, 61). By providing structure and principles for the design activities of landscape architects, these theories guide the ultimate construction of our built environments.

How can one better understand and integrate the seemingly infinite variety of manifestations of weathering into the design our environments? Catherine Howett makes the point of how our designs should impact the world and how landscape architects should shape new designs.

> *The Domain of aesthetics must come to be seen as coextensive with the ecosphere, rather than narrowed to its traditional applications in art criticism, so that aesthetic values may no longer be isolated from ecological ones. Thus every work of landscape architecture, whatever its scale, ought first of all to be responsive to the whole range of interactive systems--soils and geology, climate and hydrology, vegetation and wildlife, and the human community--that come into play on a given site and will be affected by its design. In the measure that the forms of the designed landscape artfully express and celebrate that responsiveness, their beauty will be discovered.* (Howett 1987, 7)

Here is the case for the appreciation of the complexity of the aesthetics of weathering. Howett ties the three issues of ecology, signs and perception into a combined theory of landscape form. There is an opportunity (and necessity) to formulate a sound theory of landscape expression which includes the appreciation of weather as a manifestation and a process. Further critical discussion can inform the public about the beauty and merits of weathering as a physical process and possible source of expression and character in our built environment.

Concurrently, there remains a need to fully document existing landscape designs that demonstrate the expressive use of the process of weathering, to reveal natural processes or simply generate visual aesthetic effects. Interviews with the designers could reveal more philosophies and theories about designing with natural processes like weathering in mind. Such a study would educate other designers on specific issues of the inclusion of weathering in the design process.

Final Comments

First as a curiosity and then as inquiry, the search for an understanding of the perception of weathering in landscape architecture has led to the development of these insights. The goal of this study was to discover the merits of weathering in the landscape by investigating the process as a whole, as a theoretical element of the world and as a perceptual quality. A diversity of sensual and expressive qualities was discovered. The manifestations of weathering were found to have symbolic and narrative qualities, to change environments into places rich in meaning and possible interpretations. The result of the investigation was a set of insights that suggest a design process that includes weathering. The insights about graceful weathering and flexible design can create landscapes harmonious with natural processes while still maintaining an integrity of function and form. These places may be congruent with the forces of weathering while remaining accessible to the human users. The perceptions of weathering surround us. They leave us with impressions. For me, they provoked thought, reflection on the building and design that landscape architects do in the environment. Weathering can be a valuable, explicit part of this process of design.

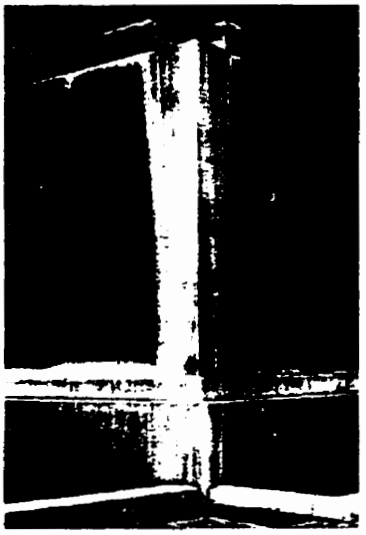


Figure 34

The expression designed into the landscapes that we build is an important part of our relationship with the built environment. It is a means of communication or provocation, transmitting stimuli to the observers of the landscape. As content to the communication, the natural processes of the world should be represented in the intended messages. Weathering is one range of natural processes in the landscape. It only follows that the expression of weathering is an important aspect of our built environment and a clue to the passage of time and change in the world. It can express honest material transformation, revealing change literally to the observer. It can provoke thought or discussion on how we view such changes.

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IMAGE EVALUATION
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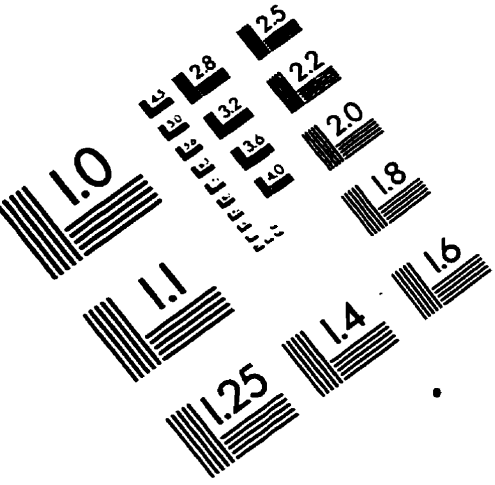

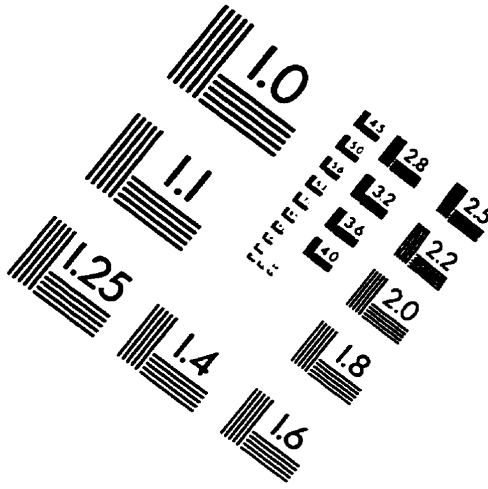

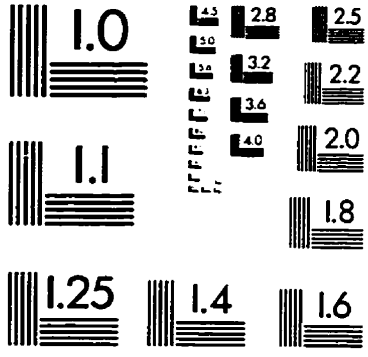

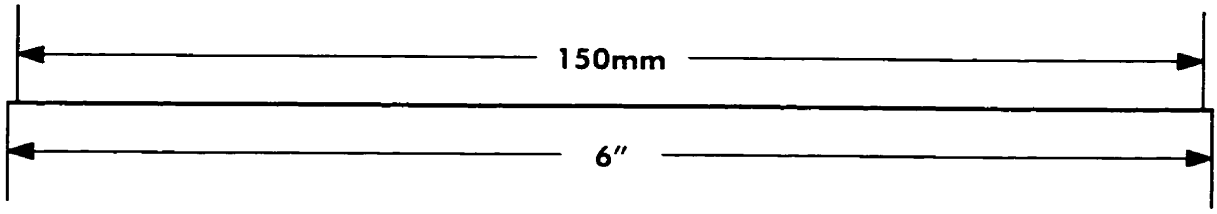

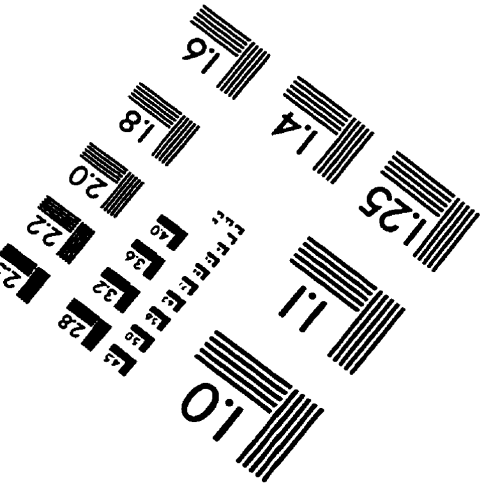

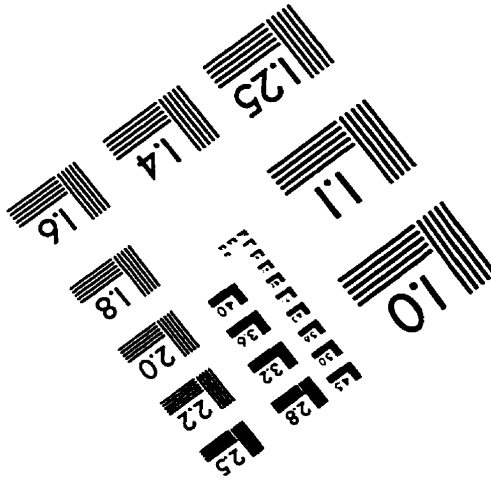

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