SURFACES

by
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To my parents, Ernest and Sara,

and Deborah Ann Beardsley

My inspiration

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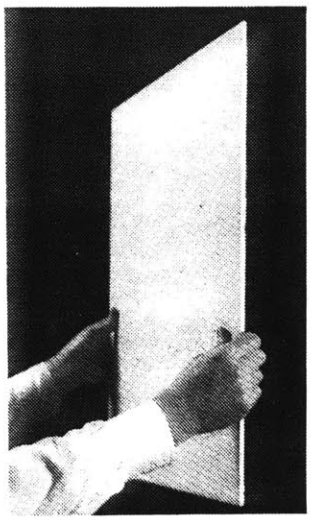

ABSTRACT

Surfaces is a collection of four individual essays which focus on the characteristics and tactile qualities of surfaces within a variety of perceived landscapes. Each essay concentrates on a unique surface theme and purpose; each essay offers observations and speculations with regard to surface qualities; and each essay is grounded in case studies which accentuate these surface qualities. Although the four individual essays stand alone in their theme and message, the consideration of all four essays yields a greater understanding of the concept of "surface" as a single entity. Conclusions and observations are reinforced through an analysis of building materials, photography and media, fashion, city form, and historic preservation.

Among the themes investigated in this thesis are: the "Communication" of surface image (the influence of high-technology photo-media upon our surface values and expectations - allowing us total control over any scene, material, or message); the "Permanence" and production of surfaces (the need for modern materials to retain their surface qualities, regardless of age, wear, or environmental abuse - and our changing expectations of these surfaces); surface "Veneer" (the tendency for all materials to become increasingly thin "veneers" as a result of modern surface fabrication processes); and surface "Preservation" (our increasing awareness of the cultural value of historic surfaces - and the inconsistancies of our existing preservation philosophies).

The intention of this thesis is to observe changes in our perceptions and expectations of our physical environment - and hypothesize the relationship between these expectations and the materials and methods used to create the built environment. As technological innovations create new forms of surface expression, there is a corresponding change in our expectations and perceptions of the physical environment. This thesis will investigate the implictations and repercussions of these changing expectations, and speculate their influence upon the future of surface - in a world which places increasing value in surface rather than substance.

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b y

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C o m m u n i c a t i o n:

Surface Image

"For (Oliver Wendall) Holmes, photography signaled the beginning of a time when the "image would become more important than the object itself, and would in fact make the object disposable."[1]

Throughout history, man has placed a great deal of importance on surface image - from the adornment of our bodies to the visual quality of the built environment. Surfaces communicate to us information about our heritage, our culture, and our values. By investigating surfaces we can gain insight into these cultural and social values. More importantly, we can observe changes which have occurred in our expectations and awareness of surfaces; changes which are representative of our changing values about ourselves and our built environment.

Surfaces are among the most important of all communications devices. Surfaces are, by definition, the outermost portions of any object which occupies space. By nature of their inherent visibility, surfaces have come to represent the very essence of the objects they encompass. Surfaces reveal and convey information, making them essential to the process of visual communication: the transmission of information and ideas with the use of symbols. Surfaces communicate social information as well as personal or community identity. Surfaces give us insight into cultural values; including our modesty or immodesty, roles, status (including signals of power, prestige, and age), social class, political values, religious persuasion, community interests and attitudes, and collective behavior and taste. Society has the need to communicate, communication needs symbols. The symbols we view are the surfaces of the world around us. Essential for the communication of societal values through surface is the process of perception.

Perception can be defined as the process of taking in data through our senses and transmitting that data to the brain. Once there, this information is selected, identified, and given significance through organization and interpretation. The process of perception is an unconscious process, as well as being nearly instantaneous. However, no two people

perceive anything in precisely the same way. Each person's perception is influenced by an infinite number of variables which make perception unique to that person (such as past experiences, settings, and physical sensory equiptment). Although these perceptions differ, perception is chiefly responsible for all of our behavior:

"We believe or perceive, therefore we act or behave. We will distort any incongruous stimuli to make them conform to our expectations. And we behave in ways to make our perceptions more consistant."[2]

We see what we expect and want to see. We do this by selecting certain data to perceive and other data to dismiss. Perception is a selective process. Keeping this in mind, it would be reasonable to assume that not only do we perceive according to our expectations, but we also create environments and images to be consistant with our expectations. Society creates and strengthens our expectations - and we focus our attention in an effort to perceive these specific visual messages. What we do and how we act is irreversibly tied to us and our image of the world. We believe in the images that we see; what we see are surfaces. More importantly, we believe or choose to believe that the surfaces we view are images of reality; whether they be photographs, natural landscapes, or the built environment itself.

There are many types of surfaces which influence our expectations and perceptions. Clothing, for example, are powerful surface symbols. Like any type of surface symbol, clothing communicates a great deal of information to us; it is an expression of our personality, our values, and our status within a given culture. Authors throughout history have argued that clothing - in many ways - is more important than the individuals who wear it. Mark Twain, in 1905 writes:

"...clothes do not merely make the man, clothes *are* the man...without them he is a cipher, a vacancy, a nobody, a nothing.....There is no power without clothes. It is the power that governs the human race. Strip its chiefs to the skin, and no state could be governed; naked officials could exercise no authority; they would look (and be) like everyone else - commonplace, inconsequential. A policeman in plain clothes is one man; in a uniform he is ten. Clothes and title are the most potent thing, the most formidable influence, in the earth. They move the human race to willing and spontaneous respect for the judge, the general, the admiral, the bishop, the ambassador, the frivolous earl, the idiot duke, the sultan, the king, the emperor. No great title is efficient without clothes to support it."[3]

Indeed, the power of clothing as a mode of visual communication is understood by cultures throughout history. Clothing is also a type of surface adornment - applied to the body for the purpose of ornament as well as protecting us from the elements.

In addition to clothing, the surface of the body itself has been subjected an intense level of scrutiny and expectation. The human body primarily communicates visual information through its surface, which is subjected to its own method of ornament or surface symbolism. Society and advertising has taught us to become extremely sensitive about our visual appearance: the look of our hair, our skin, our hygiene, etc: our bodily surface. The adornment and manipulation of our bodily surfaces provides others with visual cues regarding our morality, our religious persuasion, our interests, our economic status, our social position, and our creativity. With so much emphasis being placed upon the appearance of bodily surfaces, it is little wonder we have become a culture which is obsessed with appearance of as influenced by the adornment and symbolism of bodily surface. As a result of our cultural preoccupation with surface manipulation, an increasing degree of scrutiny is placed upon our personal image. Beauty is only skin deep; but our society is obsessed with the appearance of this skin.

Surface has become our most important criterion of our sensibility. While it is true that man has always placed a greal deal of importance upon visual appearance throughout history, modern technology has allowed visual images to become more sophisticated, refined, and valuable to us than ever before. As a result of these technological refinements in surface production and media, we have become more sensitive to the subtle meanings of surfaces:

"The wealth of information and visual images is enormous.....(because of this) we ourselves are far more acutely aware of the subtle meanings of contemporary fashion."[4]

Mass media and manufacturing processes have made surface images more readily available to the public than ever before possible - almost instantaneously. The more powerful the media used to convey these surface images, the more powerful and convincing the message that may be transmitted. For example, television - among the most powerful forms of visual media - has played an immeasurable role in the shaping of the surface values and expectations of our society:

"Television (has) permeated the national consciousness and changed the way we view(ed) our world, our art, our homes, and ourselves."[5]

Aided by advertising, photography, and visual media, an inordinate amount of time and energy is channeled into the surface appearance of both ourselves and our built environment. Unfortunately, this preoccupation with surface appearance has not brought along with it an increasing concern for the substance of our existance. "Looking," it seems, has become more important to our culture than "being." While we have always been concerned with the appearance of the individual and the built environment, the

emphasis or focus we place upon visual appearance has increased dramatically with the advent of mass communication. New visual media have stimulated a new awareness and scrutiny of surfaces - whether they be bodily surfaces, landscape surfaces, or the surface of the built environment.

We also place an increasing trust in the images conveyed by media. The images recorded by media are in fact the surfaces of the world around us. Therefore, a strong relationship exists between the images captured by media and the surfaces of the environment. Interestingly, we rarely question the validity or accuracy of the visual images conveyed by photo-images and media. When we view a photograph or a film, we take for granted that the images we are viewing are accurate depictions of the real world. Although we understand that we are not viewing reality itself, we assume that the representation of reality conveyed to us in visual images is faithful to the appearance of reality. Ironically, the visual images depicted and sold to us through media tend to stray further and further from reality. In addition to being, by definition, an abstraction of reality, these photo-images are routinely altered, enhanced, or modified from their original appearance. The level of sophistication possible with new photo-technology is so great that it is fast becoming impossible to distinguish images which have been altered from those which have not. Therefore, our understanding of the surfaces captured by photo-images is becoming obscured as well. Because of the increasingly refined level of image alterations which occur, we are in danger of losing our ability distinguish reality from illusion. More amazingly, we consider these enhanced images to be depictions of reality. Sontag discusses our cultural understanding of photo-media in the following passage from *On Photography* :

"...reality has come to seem more and more like what we are shown by cameras. It is common now for people to insist about their experience of a violent event in which they

were caught up - a plane crash, a shootout, a terrorist bombing - that "it seemed like a movie." This is said, other descriptions seeming insignificant, in order to explain how real it was."[6]

Photography (and other photo-media techniques) are among the most influential forms of visual communication today. Photography, the process of rendering optical images on photosensitive surfaces, is (in a manner of speaking) the creation of two-dimensional surfaces which depict three-dimensional realities. Photography allows us to "fix" the landscape in time and space more precisely than might ever be achieved by other methods of visual documentation, such as painting or sketching. Photography, however, is more than merely a "document" or an interpretation of reality, as Sontag comments:

"...a photograph is not only an image (as a painting is an image), an interpretation of the real; it is also a trace, something directly stenciled off the real, like a footprint or a death mask....No one takes an easel painting to be in any sense co-substantial with its subject; it only represents or refers. But a photograph is not only like its subject, a homage to the subject. It is part of, an extension of that subject; and a potent means of aquiring it, of gaining control over it."[7]

The photograph is more than merely a depiction of surfaces; it is an also an extension of the surface images it captures, as well as being an entirely new type of surface and reality itself.

In many ways, the information communicated to us in photographs create and shape the values of our culture. We perceive images created by visual media and subsequently alter our own expectations and values regarding surfaces. Photography, by nature of its ability to capture the image of one surface on another surface, further reinforces the importance of surface qualities. Advertisers use photography as a tool to

fuel our desires to acquire a particular "image" (and therefore, "product") to fulfill the expectations which both our society and the media peddle to us. Photographers and advertisers exploit such issues as class, financial status, and hygiene (among others) in an effort to compell us into purchasing goods. The effectiveness of the product is determined by the image which is apparent in the surface of the product:

"The spectator - buyer is meant to envy herself as she will become if she buys the product. She is meant to imagine herself transformed by the product into an object of envy for others, an envy which will then justify her loving herself....the publicity image steals her love of herself as she is, and offers it back to her for the price of the product."[8]

Photographic images have become, in fact, the predominant method in which surface values are communicated to our culture today. Because of our growing cultural dependence on photo-images as a means to convey surface image and value, there exists an inseparable link between photographic images and the surfaces of the built environment. Much of what we learn about our world is the result of the photographic images in which we indulge. This is particularly true of architectural photography, which is instrumental in the communication of surface image in reference to the built environment. Photography also has assumed an increasing role in the manufacturing of modern building materials, particularly in the fabrication of finish veneers. Photography gives us the ability to capture precise surface images of natural materials and apply them over any type of surface we desire. The control and flexibility offered by photographic images only increases our desire to exploit the images they capture of the built environment.

Because photography plays an important role in creating or modifying our perceptual expectations of modern architecture and materials, it is necessary to address some of the more critical concerns raised by the process of photography. By analyzing the

influence of modern photography, we can observe important changes which have resulted in our values and expectations with regard to built surfaces; and realize that our behavior and our actions are indisputably tied to the image of the world which we perceive.

Architectural Photography

It is certainly an understatement to state that photography and photo-media plays an immeasurable role in the realm of architectural education, design, and marketing. Most of our knowledge of architectural surfaces and historic structures, in fact, is acquired through the viewing of photographs. Architectural photography in books and magazines are the most influential means of communicating ideas and spaces to the design community. It is important to keep in mind, however, that photographs of the built environment can not only distort the image of reality, but tend to create their own reality. This is primarily due to the fact that cameras and camera lenses depict architecture and the landscape quite differently than the eye actually sees it.

If we were to compare the human eye to the camera lens, we would find that a 50mm lens gives the closest visual approximation of the subject to that of the human eye. Regardless, 50mm lenses still present us with images which could never be seen in quite the same way with the normal human eye. Camera lenses, with their increasing sophistication and refinement, do not allow for the irregularities and imperfections which are common to the human eye. Also, lenses tend to distort spatial qualities, such as depth of field, focal length, and peripheral vision. Therefore, all photographs depict a reality which is different than the eye actually sees. Photographs are not only abstractions of reality; they are another type of reality. Yet we believe these images to be as the eye actually sees, although they in fact are far different. They are images which could never be seen, except through the eye of the lense.

The desire of most architectural and design photographers is to capture the "completeness" of the design intent and form. Therefore, architectural photographers frequently employ the use of wide angle, "fish eye," and zoom lenses to capture more "comprehensive" photographic images. Interior architecture also demands the use of wide angle lenses to adequately capture the panorama and spaciousness of architectural interiors. As a result, a large majority of the photo-images we hold as being accurate depictions of reality are actually further abstractions of reality. When we rely on these visual images as a source of education and as standard for spatial excellence, we place ourselves in the unenviable position of allowing these alternate realities to become the desired goal or standard of excellence for our culture. The goals designers are setting for themselves are unattainable in the natural world. We can only acheive these standards of excellence with the further use of photographic documentation. More importantly, we are becoming a culture which can only be satisfied by the standard of excellence which is possible only through photographic images.

Photographic lenses create images of form and space which could never exist in precisely the same way in reality. The difference between the photographic image and the appearance of real surfaces is striking, but rarely perceived; largely because we rarely compare the two simultaneously. We are lead to believe that the appearance of reality will be exactly the same as the photograph shows it to be. When we look at photographic images, it never even crosses our minds to question whether reality has been properly represented in the image. It is true that we understand the photographic image to be something different than reality itself. However, we never look at photographs and think to ourselves: "the images I am seeing have been modified or abstracted." We accept the validity of the photograph - we believe that the images shown are a faithful representation of reality. This can be attributed to the longstanding belief that "the camera never lies." When we visit a building or site we have come to learn about through photographic images, however, we find the appearance of reality to be far different than the

photographic image, which we believed to be a faithful depiction of reality. This can be explained in several ways.

Sontag wrote that "photographic images tend to subtract feeling from something we experience at first hand and the feelings they do arouse are, largely, not those we have in real life."[9] We perceive qualities of reality depicted in photographs far differently from the way in which we perceive reality itself. Sontag attributes the emotional drama or impact experienced when viewing photographs to the disturbing contrast between the photographic image and the context in which the image is viewed. The image of the photograph creates an inherent discontinuity with its immediate viewing context. The drama of the photograph exploits the contrast which exists between the photographic image and our place in reality at the moment of viewing. The "option of viewing" afforded to the viewer of reality is also not available to the observer of the photograph. When viewing reality, we possess the ability to divert our attention from images which are disturbing (or offensive) to us. When viewing a photograph, we are immediately thrust into a context which rips us away from the context of our previous reality. Photographic images exploit our vunerability to unfamiliar events. The emotion evoked in the viewing of the photograph is more stirring and dramatic than when viewing the identical context in reality. This is due to the radical contrast which exists between the context of reality and the context of the photograph. Berger, in discussing the emotional impact of war photographs, writes:

"We are seized by them (photographs).....We try to emerge from the moment of the photograph back into our lives. As we do so, the contrast is such that the resumption of our lives appears to be a hopelessly inadequate response to what we have just seen."[10]

While photographs of architectural surfaces and spaces are certainly of a less gruesome nature than photographs of war, the effect is no less dramatic. Architectural

photography - perhaps the most powerful influence in our architectural education and training - accentuates the drama and detail of built surfaces in a manner which cannot be achieved in through the personal viewing of architecture. Lenses depict the captured images with greater detail than the human eye is capable. Camera lenses distort viewing angles and depth of field, enhancing the visual complexity of the building's spatial and planar qualities. Photographs "fix" the details of these surfaces for eternity, allowing details which were once "fleeting" and left to our memory to be permanently etched into the photograph for our endless reflection and contemplation. With the use of time exposures, photographs can emphasize qualities of light and shadow which can never exist in the natural world. The technology of the camera has allowed us the ability to create any image of the built environment we wish to create. We now possess unlimited control over photographic images, and thus we possess unlimited control over the depiction of surfaces - of which the photograph is an extension. With each increasing level of control we aquire, we are also afforded greater opportunities to alter the appearance of reality (which has become the more common intent than the depiction of reality itself). More importantly, modern photographic retouching techniques are becoming more prevalent (and more critical) to the creation of successful architectural images; thus widening the gap between true-to-life surfaces and photographic images of these surfaces.

The creation of photographic illusion was not always the primary intention of architectural photography, however. When photography was in its infancy in the middle of the nineteenth century, the purpose of the photographic image was far different from current photographic intentions. Peter Henry Emerson, in his book *Naturalistic Photography For Students Of The Art* (1889), gives an impassioned plea to all students of photography regarding the proper intentions of the photograph:

"Our contention is that a picture should be a translation of a scene as seen by the human eye."[11]

In Emerson's book, he repeatedly stresses the need for photographs to be taken with extreme care given to the accurate portrayal of a scene. In Emerson's day, the "accuracy" of a photo-image was defined as being "as the eye sees it." This notion applies not only to image qualities such as light, shadow, and color; this also applies to depth of field, focal angle, sharpness, and brilliancy. Emerson also encouraged his contemporaries to make allowances in their photographs for the physical shortcomings of the eyes of the observer:

".....a picture should not be quite as sharply focused in any part, for then it becomes false; it should be made *as sharp as the eye sees it and no sharper* , for it should be remembered the eye does not see things as sharply as the photographic lense, for the eye has faults such as dispersion, spherical aberration, astigmatism, aerial turbidity, blind spot, and beyond twenty feet it does not adjust perfectly for the different planes. All of these slight imperfections make the eye's visions more imperfect than the optician's lense.....even the principle object (of the photo) must not be perfectly sharp as the optician's lens will make it."[12]

The most important notion of Emerson's values were that photographic images should possess the same qualities and visual characteristics as if these scenes were being observed by the human eye. "Successful" photographers were those who were honest in their intentions of the photographic representation of a scene. This included knowing when to restrain oneself from capturing the seductive detail which photographic lenses made possible. This was particularly difficult in Emerson's time because photographic technology had recently made an extraordinary level of detail possible, and both scientists and researchers were eager to take this technology to greater heights. Increasingly refined lenses made possible the depiction of images which were sharper than could ever be seen by the human eye. In short, photographs captured surface image in a manner which was

not possible by ordinary human sight. Emerson viewed this event not as a boon to hobbyists of photography, but as a deceitful lie; a deliberate attempt to misrepresent reality. To Emerson and other loyal photographers of this era, this was the highest form of distortion and trickery:

".....when the most doubly patented distorting lenses were made to meet their (scientists) demands, they, with imperturbable self-confidence, presented a sharp, untrue photograph, insisting upon its truth. "A truer picture," said they, "than drawing;" "truer than the eye sees," someone said. In short their picture was absolutely perfect. When a lense giving a brilliant picture, with all the details and shadows sharp, and the planes equally sharp, was at last produced, the scientists were *in excelsis* . But, alas! they proved themselves as unscientific as they were inartistic! Had they but taken their simplest form of lense and used it as a magnifying-glass, they would have seen immediately that all was not right, and instead of clamouring for the lies of "depth of focus," "wide angle," "brilliancy," and the other hydra-heads of vulgarity, they might have set to and made the lense which was required. It was but a simple thing that was required."[13]

"Brilliancy," "depth of focus," and "wide angle" manipulations of the image were considered (by "honest" photographers) to be the ultimate in pictoral vulgarity. The predominant goal of photographers in the mid-nineteeth century was the depiction of scenes and surfaces exactly as the eye would see them.

These nineteenth century photographers, however, could never have achieved their desired goals. As I have already discussed, photographs - regardless of the painstaking care given to the faithful depiction of images - can never depict surfaces in precisely the same way that the human eye sees. Photographs inherently abstract reality, creating their own reality. Therefore, these early photographers had set goals for themselves which were physically unattainable, although they did not realize this to be so. But their

intentions, however, were quite noble. They placed, above all else, the importance of capturing faithful surface images in their recordings of reality. The photographers of this age actually believed they could be successful in their quest to faithfully capture the image of reality in their photographs. Because their intentions were noble, they can never be accused of attempting to deceive the viewer with their photographic images - they actually believed this could be accomplished. Although this goal could never be accomplished, their intentions, as I have noted, were honorable; and thus their actions were quite excusable.

In the world of modern photography, the intention of photographers is to produce an image which is sharper, bolder, more colorful, and more detailed than ever before, even moreso than reality itself. This mandates the creation of images which possess visual qualities having little in common with the appearance of surfaces as perceived by the human eye. In fact, the distain and irreverence for the "dishonest" images created in Emerson's era have been replaced in the modern era by the acceptance and desire for images which are willingly "enhanced" or made "truer than life." Modifying images through photographic processes is today looked upon as being not only a commonly accepted practice, but a desired process as well. This is evident the workings of the most simple electronic cameras of today:

"AF (Auto Focus) auxillary light allows you to take.....razor sharp, perfectly exposed pictures.....even in complete darkness, thanks to the AF auxillary light.....Another EOS exclusive (the Depth-of-Field AE Mode) provides precise control over the area of sharpness. Lets you keep foreground and backround sharp, or blur away distracting surroundings."[14]

Notice that not only are extraordinarily crisp photo-images the goal of modern photographers, but the ability of the camera to edit and enhance these visual images is

considered to be of great value to the camera consumer. This cultural affinity for images "truer than the eye sees" has created an increasing demand for the creation and display of "perfect" visual images. In addition, we are fast becoming a culture which can only be satisfied by images of such flawlessness that only enhancements of surface images can satisfy our visual expectations. Ironically, these increasingly refined and detailed images (produced and modified by technology), have distanced themselves further and further from what the eye actually sees. These images do not occur "in nature." Rather, they are their own type of reality - created by the relentless precision and control made possible by new technology. These images are therefore only answerable to themselves.

What ultimately distinguishes modern photographers from photographers of earlier eras are their intentions with regard to the depiction of visual images. While photographers of the past gave careful attention to the faithful depiction of surface images, modern photographers make little or no attempt to depict images in a manner consistant with reality. Rather, modern photographers deliberately attempt to enhance or modify their photographs to fulfill society's every whim. It is true that neither era of photographers were able to document the landscape precisely as the eye sees. But photographers of eras past did not understand this; they believed it was possible to faithfully depict reality in their photographic images. Modern photographers, however, know better. They realize that the images they capture with their cameras are something far different than what the eye sees. In fact, they purposely go to great lengths modify or enhance these images, in an effort to exploit desirable visual qualities which cannot possibly be seen by the human eye. Their function is to create fantasy. Where nineteenth century photographers might be accused of mere ignorance, modern photographers knowingly attempting to deceive their viewers.

With the aid of new photographic technology, modern photographers are succeeding in their attempts. We not longer possess the ability to distinguish between enhanced qualities of the photograph and the surface qualities of surfaces of reality. As a

result, our understanding of surfaces - of which photographs are an extension - have also become blurred. This is important because an increasing amount of the knowledge and value we place in surfaces is acquired through the examination of photographic images.

Aerial Photography

As in architectural photography, aerial photography has exerted its powerful influence upon our surface values and expectations. Beginning in the mid-nineteenth century and continuing to the present, aerial photography has helped to create a new understanding of the world around us:

"The airborne - and now the spaceborne - camera has brought to all mankind a new conception and understanding of the universe. It is the best means we have for measuring the planets, observing the inaccessible, making the invisible visible and immensity perceptible. It makes the miracle of flight tangible; what is seen from a point in space is held forever, for our study and contemplation."[15]

As I mentioned earlier, new media will necessitate a new understanding of the built environment. The first successful photographic plate taken from above was captured in 1858 by the French photographer Gaspard Felix Tournachon ("Nadar") during a balloon flight over Paris. By the 1880s, automated cameras mounted inside of balloons made aerial photography a common event. With the development of aircraft soon after the turn of the twentieth century, cameras quickly found themselves used for both military and peacetime purposes. Airplanes had the ability to be flown quickly, with great accuracy, at specific heights, and at steady speeds. When combined with automatic cameras, airplanes made it possible to capture overlapping photographic images in rapid succession, allowing the speedy recording of information. This information gave us insight into surface

qualities of the landscape: contours, vegetation, drainage, development potential, etc. - all with an accuracy nearly equal to land-based surveys. Aerial photography allowed us to record and document the landscape - without having to actually set foot upon it.

Before the creation of aerial photography, the only opportunity to view the landscape from above was by either climbing to the top of a hill or the top of a high building (of which there were few in the mid-1800s). Aerial photography allowed us to "step back" from the ground and perceive the panorama of a greater landscape. In terms of

Aerial Photograph of Boston Public Gardens and Boston Common (EVD)

city form and design, the perception of the landscape (as a unified and comprehensive "surface") is critical when one considers the events which follow the inception of aerial photography. In 1909 - shortly after aerial photography had become commonplace (and people began to understand the surface of the earth as it appeared from above) - the first Master of City Planning degree program in the U.S. was initiated at Harvard University. The design and perception of cities has expanded from the perspective of the individual at ground level to the perception of the landscape "from above." The new emphasis in city design and perception was city planning, with the emphasis being given to the "plan" view

("from above"). The notion of "surface of the earth" had became evident as aerial photography made these images commonplace. With the influence of aerial photography fueling our perceptions and expectations of the surface of the landscape, we would soon witness the creation of the first school of City and Regional Planning (Harvard, 1923); the first school of Planning and Urban Studies (M.I.T., 1935); and the creation of the Harvard GSD in 1936. At precisely the same moment when technology allowed us the ability to perceive the earth's surface from above, we see a resulting shift in the perceptual emphasis of the design community to the design of built form as viewed from above.

What effect did these perceptual changes have upon our understanding of architectural and urban form? With an increasing emphasis being given to city planning, we find ourselves concentrating more on the surface image of the landscape as viewed from above. Aerial photography has allowed us unprecedented control over the appearance and documentation of the earth's surface. Surveys, site plans, and floor plans have always been considered (legally and professionally) the most important drawings used in the construction of buildings and urban environments. All of these documents place the viewer at a level far above the building or landscape. Architectural models (an integral element in architectural presentations) allow the viewer to view the building or landscape from the same vantage point as aerial photography would - "from the heavens." Architectural plans and models allow the student, teacher, designer, builder, and owners to view their creations from the same vantage point as the "gods" would: from above.

A certain power is transmitted to the viewer when one perceives the landscape from the eyes of God. Has aerial photography replaced the eye of God? Berger writes:

"Has the culture of capitalism telescoped God into photography? The transformation would not be as surprising as it may first seem....The omnipresence of cameras persuasively suggests that time consists of interesting events, events worth photographing...It surveys us like God, and it surveys for us."[16]

The omnipresent nature of aerial photography has also lead to the further "schematization" of the landscape - when urban designers give more careful consideration to designs in terms of their plan organization, the heirarchy of the plans of respective buildings, and the relationship of these individual plans to the overall design intent. We perceive the surface of the earth as a grand, orderly "plan:" something which must be carefully designed and controlled. As a result of the influence of aerial photography, our understanding of large-scale design has been correspondingly altered.

One of the potentially damaging effects of aerial photography is the resulting preoccupation our society has with the seductive power of the aerial plan view. Today, as a result of the influence of aerial photography, a greater importance has been given to the built environment as viewed from above - with a diminishing concern given to individuals and events at ground level. Today, we are less likely to disrupt the "sanctity" and power of the urban design scheme to accomodate peculiarities at ground level. The reasons behind this are two-fold. First, we place an increasing importance in the relationship of the building plan to its location with the larger design context. Secondly, we simply spend more time designing buildings and urban environments from above. Architects and urban designers, in designing their schemes from above, give greater attention and credence to the appearance of the site plan. Since urban design (as architectural design) is primarily undertaken from a point-of-view far above the building site, the success of a design scheme frequently trivializes events or details at the ground level. In the design process, point-of-view is as important to the complexity of the finished product as any other design consideration.

As a result of the influence of aerial photography upon our perceptions and expectations, there has been a diminishing consideration for the individuals who interact with the built environment at ground level. When perceived from above, people become incidental or trivial in comparison to the permanence and solidity of built form. *In*habitants are located far below omniscient architectural and urban designers, who distance

themselves far above the irregularity of the ground surface. In a way, the comprehensive perception of the landscape surface from above has allowed us to "edit" unwanted or insignificant elements at ground level, by nature of our distance and detachment. Among these insignificant elements are the inhabitants of the built environment themselves. Aerial awareness has, in a sense, not only given us a new understanding and control over the landscape, but has also allowed us to "edit out" the individual from the image of the city. As designers, we draw upon these images for knowledge; and we believe them to be real and desirable. Their influence upon our perception and creation of future built form is undeniable. We believe and perceive, therefore we act or behave.

Far removed from the vantage point of designers "in the heavens," inhabitants are reduced to a level of insignificance - as are all other undesirable qualities which occur at ground level: homelessness, decay, ugliness, pollution, etc. From the vantage point of the gods, the harsh realities of the decaying environment (and its inhabitants) are trivialized, even made tolerable. Aerial photography, while serving to heighten our understanding of a greater comprehensive landscape, has also devalued our sensitivity and coarsened our understanding of events at the micro-level; at the expense of the inhabitants themselves.

Retouched Images

We have become so critical of surface images created by photography that we now find ourselves going to great lengths to create perfectly flawless surfaces. One example of this can be found in the advertising industry - particularly in the area of commercial photography. Catalogs, advertisements, magazines, newspapers, and other forms of commercial photography offer visions of perfection to us, which become our role models for our personal appearance and for the appearance of the built environment. It is important to remember that the images of surfaces created by commercial photography are

An image retouched to remove all flaws.

the product of highly-coordinated industrial processes, created under the direction of highly-trained artists and designers. Even after these images have been "enhanced" with high-technology photographic equipment, blemishes or unwanted features can later removed with the skills of a touch-up artist, or with the use of computer-imaging techniques:

"...almost every photograph you see for a national advertiser these days has been worked on by a retoucher to some degree. Its very, very rare that an art director will go directly from the chrome (negative), the original native source. Somewhere along the line the photo retoucher's hand is applied. Fundamentally, our job is to correct the basic deficiencies in the original photograph or, in effect, to improve upon the appearance of reality."[17]

Retouching is not a new concept. Pictures have been retouched since the earliest days of photography in the nineteenth century. What has changed is the level of sophistication which is possible in the retouching of photographic images. Today's technology is so highly advanced that it is not only easier to retouch photographs than ever before, but it is also becoming impossible to detect these changes. We believe that the photo-images we view are accurate depictions of reality. On the contrary; these images are actually a form of visual illusion; not depictions of reality, but an extention of reality.

From conception to the execution, the photographic image is distanced further and further from the appearance of reality. More importantly, reality seems no longer to be sufficient in satisfying our expectations of visual surfaces and scenes. Photographs are retouched to remove all surface "flaws" (which incidently removes all elements of surface diversity, spontaneity, and imperfection). The goal of photographers is to present a photographic image in which all the surfaces shown (buildings, objects, and people themselves) are without flaw. Photographs are particularly effective in achieveing these

illusions because of an old cultural belief which suggests that "the camera does not lie." In truth, photographs (and photographic media such as film and video) are among the most powerful vehicles of surface abstraction at our disposal today.

Retouching images has become an accepted practice in all forms of photography, particularly architectural photography. Photographs are enhanced to appear more detailed, more vibrant, and more colorful. The images are retouched to eliminate elements which are considered to be detrimental to the visual image of the building. For example, it is quite common today for photographs of architectural interiors to be retouched so that all "visually-intrusive" elements are removed. One example of this is sprinkler heads. It is common for retouchers to remove sprinkler heads from architectural photographs because sprinkler heads are perceived (by the architectural community) to be a "visual nuisance" rather than a positive architectural feature. Architects do not want viewers of the photograph to realize that such utilitarian and purely functional devices are found in the supposedly "artistically transcendent" surfaces and spaces created by architects. Constrained by building and fire codes, however, architects grudgingly locate sprinklers in highly-public spaces such as formal lobbies and corridors. Photographic retouching, however, allows the architect to remove these unwanted elements from photographic images - the same images which are ultimately made available to the public in architectural magazines. Because a great deal of our knowledge and memory of architecture is acquired through photography, most people will be fooled into believing that the retouched image is an accurate depiction of reality. Photographs are used by architects to verify, particularly to the design community, that the rich, marble-covered lobbies of our modern office towers have not been "devalued" by the inclusion of sprinkler heads in the finished ceiling of the lobby. Architects - influenced by these photographic images - will go to great lengths to physically remove or hide these elements from highly-visual spaces, knowing full well people will be able to see them (not only in person, but in future photographs). If architects cannot avoid the use of such unwanted elements, their final recourse is to

remove these elements by retouching photographs of the space. It is not important to the architect that photographic retouching is a form of visual deception. All that matters is that the photographs convey an image which corresponds to the values and ideals of the modern architectural community. Modern aesthetic values dictate that architectural surfaces be without "flaws;" of which sprinkler heads are classified as being visually undesirable. Among many other types of "flaws" are emergency signage, heating vents, surface cracks, garbage, signs of surface wear or use, etc.

When observers previously familiar with architectural photographs of a building visit the artifact for the first time, they are often surprised to find that many of the aesthetically undesirable elements clearly evident in reality are missing from photographs of the building. It is disorienting for architectural students to visit great architectural landmarks for the first time (such as LeCorbusier's Carpenter Center for the Arts, for example) and find the building (and its surroundings) to be littered with garbage, marred by stains due to aging or neglect, or experiencing surface cracks or color fading due to age and environmental stresses. This is particularly disturbing, because we believe that the surfaces of these buildings and environments are flawless, mainly because the photographic images of these surfaces are flawless. These photo-images of surface have been manipulated to hide undesirable features from us. We have been fooled by photo-images into believing these surfaces are frozen in time: ageless, flawless, and pristine. Because we believe in the flawlessness of these surfaces, we are "taken back" by imperfections which exist in reality. Photographic abstraction has allowed us to set physically unattainable standards for the surfaces of the built environment. The selectivity and control of the photographic image has allowed us to edited-out all unwanted or undesirable surface characteristics, ie: characteristics which detract from the intended architectural image. This is cause for great concern. We are no longer appeased by the appearance of reality. More importantly, the definition of "undesirable visual elements"

has been expanded in recent years to include another critical element of the landscape: people themselves.

Glance through every architectural and interior design magazine in the industry today. Every advertisement, editorial, visual commentary, or building analysis will have

Typical photograph of an architectural interior: without litter, sprinkler heads, or people. © Steve Rosenthal, 1988

one essential element missing from the photographic image: human beings. The only occasion in architectural photography where human activity is captured and celebrated is when buildings are photographed from a great distance away. This is because human activity is necessary in order to simulate an image of "success," "energy," and "vitality." Photographs from distant views never show the faces of the people within the scene. Every attempt is made to render the inhabitants "faceless," as if their identity is unimportant. Whenever the faces of people in the photograph are shown, they are made either too small to be perceived, or they are carefully "blurred" (or retouched) to appear actively "in motion" (supposedly as a result of the activity created by the architecture). The blurred faces and bodies of the people within the frame allow observers of the photograph to view the architecture through the ghostly images of the people themselves - as if the people did not actually exist. People in these scenes are not only incidental to the architecture, but they also detract from the "purity" of the architectural image intended by the designer (not unlike unwanted sprinkler heads). The architecture appears to be the only physical element in the photograph which displays any sort of "permanence" or "solidity." Any intrusion upon this image, whether by unwanted objects, symbols of wear, or by people themselves, degrades the purity of this image and therefore weakens the design intent. Stewart Ewen comments on the nature of modern architectural photography:

".....rooms or living spaces...are devoid of people, devoid of the evidence that people have been there...there is no significant action outside the frame. These forbidding environments, literally "disembodied," become models for the home as it *should* look. Against such austere shrines, the merest evidence of human life becomes a certain sign of disarray."[18]

The message is clear: the purpose of the architectural photograph is the preservation (or creation) of the design image, in its purest sense. This involves the

flawless simulation of surfaces which comprise these images. The reality from which the photographic image is derived is of lesser importance than the photographic image itself (this is true in all forms of photography, from architectural photography to fashion photography). Using modern technology, we are systematically editing all undesirable elements out of the picture, including ourselves. The removal of all evidence of human habitation, I am inclined to believe, would be the most desirable condition for most architects today. A world freed from the harsh and impure realities of age, time, wear, and people themselves; a world of pure, untouched, uninhabited architectural icons. Pure, controlled surface; this has become the dream of architects in the modern age.

The influence of technology on the visual image is even more apparent when we analyze computerized digital retouching. Digitalization involves converting visual images (or sounds) into numeric values - just as a computer turns information into bits and bytes; in contrast to "analog" recordings (photographs, movies, phone machines, handwriting, printing, copy machines, etc.), which involve the recording of an image or message onto some sort of tape, film, or surface. The shortcoming of analog recordings is that the process is "physical" one, involving equipment which relies upon needles, tape heads, photo-image drums, film, etc. Any analog process, as a result, is subject to wear, degradation, error, and inconsistancy. In addition, the process of copying and transmitting analog information further degrades the quality of the image or sound; ie: further "generations" of the recording will result in a loss of clarity. With the computerization and digitalization of visual and audio information, however, inconsistancy and error is eliminated. Digital recording processes convert visual images or sounds into a numeric values, which can then be stored, copied, transmitted, or edited simply by manipulating or transmitting numeric codes. Because the digital process does not rely on a physical recording medium or process, there is absolutely no loss of image or sound quality in the recording or transmission of the message. There can be no "error;" digital images or sounds are exact duplications of the original information:

"Digital is a noise-free medium, and it can error-correct.....I can see no reason for anyone to work in the analog domain anymore - sound, film, video. *All* transmission will be digital."[19]

If we were to play a phonograph record to an individual who had become accustomed to the digital sound of a CD, the person would immediately recognize the inferior nature of the sound quality - so attuned we have become to increasing refinements in message clarity. It is also possible to edit or modify digital sounds into whatever form we wish, simply by adjusting the numbers and/or the order of their sequence. We find ourselves with total control over digital sound; and can modify, improve, or edit whatever quality of that sound we wish to. The implications of this revolution in audio technology are not important to this thesis. What is important is what will happen when digital technology revolutionizes the recording and transmission of visual images, such as in television, movies, printed media, and most importantly, photography; and the impact these changes might have upon the surface values of our culture.

For many years now, digital technology has been used in the reproduction of photographs which appear in newspapers and magazines. When advertisers change the value and/or the sequence of an image's digital signals, there is no way for the viewer to know if this has occurred:

"Nearly every AP (Associated Press) picture you see in the newspapers is digital. So are all the photos in *Time* and *USA Today*, for the same reason: so they can be sent by satellite to distant printers for far quicker distribution than used to be possible. How much do these publications fiddle with their pictures? There's no way to tell.....digital retouching could be made absolutely undetectable - as opposed to analog retouching (dodging, airbrushing, etc.), which you can almost always see if you look very carefully.

If you have a picture represented by a discrete set of numbers, and you change some of the numbers, you may not be able to tell that that was not a natural image."[20]

Computers can also introduce "random-ness" to the retouched image with the use of fractals, which hide any suspicious visual redundancies. Since the pixels of computer image are smaller than the grain found in photographic film, there is no limit to the degree of detail which can be enhanced or edited from a computer-retouched photo. Digital images (photos, slides, etc.) can be crafted by anyone who is able to afford a small home computer. Technology is making digital retouching available to anyone - simply, cheaply, and easily.

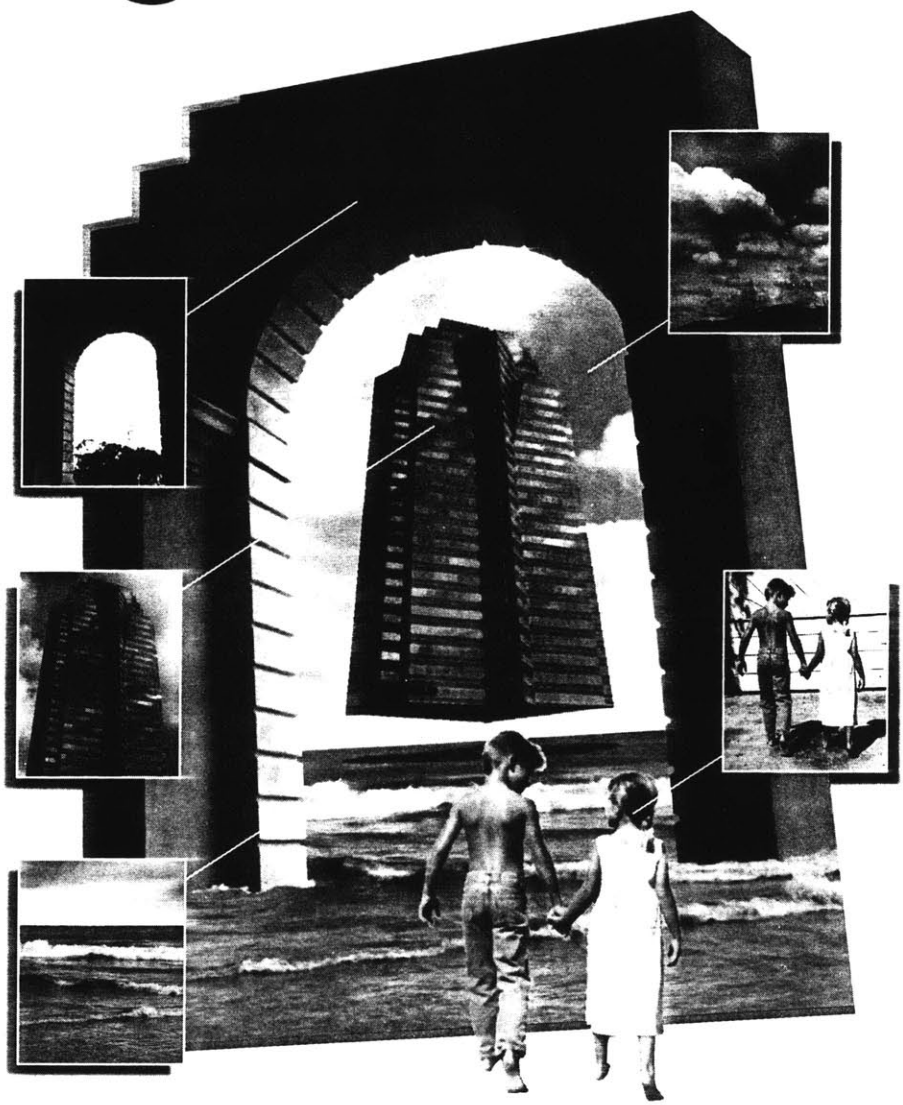
Computer technology will soon make available the first digital cameras. The difference between the digital camera and today's "analog" cameras is that analog cameras use mechanical processes and recording mediums (such as mechanical shutters and photographic film), while digital cameras of the near future will become portable computer scanners:

"Basically, (digital technology) is going to make cameras into computer peripherals. You'll play with the images in the computer, sequence them and store them, make albums, do all of your retouch stuff.....One could envision photographing 'the family' before the Arc de Triomphe, wherein the results include no cars circling Place de l'E´toile, and no other tourists in the scene."[21]

Consider the political implications of this new technology. Throughout their brief history, photographs have assumed a great deal of political importance. "Photographs of missiles in Cuba, of Oswald smiling with a gun, of burning monks in Vietnam, of a burning reactor in Russia, of a nuclear weapons factory in Israel."[22] We will soon (if we have not already) lose the ability to distinguish images taken from reality from images

which have never existed in reality. Politically, photo-retouching could become an increasingly powerful terrorist weapon - and we will not be able to disprove the photo-

Develop your ideas in Digital Darkroom



Five individual photographic images digitally-mixed to create a new image.

graphic image which is shown. Trust in visual images - and thus the surfaces which they are an extension - will soon become a notion of our past.

Digital imaging will make it possible, for example, to create new versions of classic films. It will be possible to edit Orson Wells out from a movie such as *Citizen Kane* and replace him with Tom Cruise, through a digital process. Or instead, we can take images of ourselves and insert them into an existing movie, animating the image with the use of the computer. With digital images, it will become possible to create any conceivable scene, with any actor, performing any lines, at any time in history, in any setting we can imagine. It will soon become virtually impossible for anyone to know precisely what is real and what is not real about a photographic image anymore. And the potential for disaster and misuse is, not surprisingly, increasing:

"What happens if CBS has one of these machines (a digital imaging device) that can generate real-time animation of photographic quality? You could look at two TVs - one's got a picture of Ronald Reagan shaking hands with Gorbachev, and the other set has a picture of Ronald Reagan punching Gorbachev in the nose, and you can't tell them apart. One's on videotape and one was synthesized on a computer....What's going to happen to electronic news gathering when the validating function of videotape no longer exists? Television will no longer be a verification medium. Who's going to control that?...How do we put governors on these fantasy systems so that people don't fantasize the wrong things?"[23]

Digital retouching is already common in all forms of print media. Witness the following items, as noted in a recent issue of the *Boston Globe:*

- Through electronic retouching, National Geographic slightly moved one of the Great Pyramids at Giza to fit the shape of its vertical cover a few years ago;

- An editor at the Ashbury Park Press, the third largest newspaper in New Jersey, removed a man from the middle of a news photo and filled the space by "cloning" part of an adjoining wall;
- The Orange County Register, which won a Pulitzer Prize for its photo coverage of the 1984 Summer Olympics, changed the color of the Los Angeles sky in every one of its outdoor Olympics photos to a smog-free shade of blue;
- Popular Science spliced an airplane from one photo onto the backround of another aerial photo on one if its covers.[24]

The 1980s are fast becoming the last decade in which visual images can be considered evidence of anything. Stewart Brand gives us a sample of a testimony which might become commonplace in our courtrooms as a result of this revolution in computerized digital retouching:

"Your honor, we cannot accept this photograph in evidence. While it proports to show my client in a hotel bedroom with a woman not his wife, there is no way to prove the photograph is real. As we know, the craft of digital retouching has advanced to the point where the "photograph" can represent anything whatever. It could show my client in bed with Your Honor.....The photograph *could* be a fake, no one could prove it isn't; therefore it cannot be admitted in evidence.....Photography has no place in this or any other courtroom. For that matter, neither does film, videotape, or audiotape, in the case the plaintiff plans to introduce in evidence other media susceptible to digital retouching.

• Some lawyer, any day now"[25]

This scenario is particularly alarming for the simple fact that we, as a culture, place an enormous value and trust in the images we view in magazines and in tele-media. Much of our values and expectations of surfaces is created and fueled by visual media. This is

particularly true for interior designers, graphic designers, fashion designers, and of course, architects: designers of the built environment.

Materials: Enhanced Surface Image

Modern photography plays an increasing role in the manufacturing of modern building materials. Photography has become an invaluable tool in the simulation of traditional building materials; particularly in the depiction of wood or stone in the fabrication of finish veneers. Modern photography allows us to capture precise visual images of natural materials and apply them over any surface we desire. Veneers manufactured in recent memory have not taken full advantage of the limitless control and flexibility offered by photographic images. Most veneers manufactured today are understood to be a simulation of the original material. With a greater emphasis being given to the photographic representation of surfaces, however, this understanding is becoming increasingly blurred.

Modern veneers employing photographic images are becoming more sophisticated with each passing day. What is most important about these veneers, of course, is their surface. With the increasing level of image control available through modern photography, it is possible to create images which are visually identical to actual surfaces an every conceivable way: color, pattern, hue, tone, etc. When combined with sophisticated manufacturing techniques, photographic images may be impregnated with textures which precisely simulate the original surface textures of the material being depicted. Technology now allows us the opportunity to create photographic simulations of surface which are, in both appearance and texture, identical to the surfaces which they are derive their image. With the use of more advanced digital photo-image techniques, we can exercise absolute control over these new surfaces, altering them in any imaginable fashion. Yet as is the

case with photographs of any other type of surface image, there exists the same potential for photographic misrepresentation and misuse.

It is conceivable that in the near future, people will find themselves within built environments where the all surfaces they view are simulations of other surfaces. The marriage of surface to photographic images, once only suggested in the photographing of surfaces, has now come full circle: images are actually becoming the surfaces of the built environment itself; complete with a similar propensity towards illusion and deception. With the integration of photography and building materials, photographs are becoming the surface of the world around us, in the same way that building surfaces have become photographs themselves. In a manner of speaking, the photograph has become self-perpetuating: the camera captures images which shape our values and understanding of the environment; subsequently, we apply these images over the surfaces of the environment itself. What we do and how we act is irreversibly tied to these images of the world; even if these surface images are that of the photograph.

We are substituting for natural materials the only surfaces which can satisfy our changing values of surface: photographic images themselves. Photography more than merely captures the image of reality; it also creates a different type reality. It is a reality, however, answerable only to itself. With the built environment unable to live up to the standards of excellence depicted in photographic images, our response has been to apply these photographic images over the surfaces of the world around us. Photo-images have become our "great escape." With technology allowing us to manipulate these images in any imaginable fashion, these alterations are becoming indistinguishable from images of reality. By placing greater importance in these images of reality as opposed to the natural world itself, we are in danger of severing any connection which may yet remain between ourselves and the natural materials. In the end, however, it may not even matter; because reality - through the influence of photography - is itself becoming a photograph.

P e r m a n e n c e:

Production of Surface

"The properties of a building material are of ultimate importance for the adherence of paints, glues, seals, and dirt and also for the resistance to wear of the material.....knowledge of the nature and chemical resistance of the skin (surface) is indispensable."[1]

In today's world, we measure the quality of materials and surfaces by their ability to withstand aging and wear. In effect, the permanence of surface qualities now represents the quality of the material itself. The beauty of modern materials is no longer anything more than skin deep, but this skin has become more important to us than ever before. With advertising, media, and social preconceptions fueling our aesthetic values and expectations, it is imperative that these surfaces remain perfect forever, as if "frozen in time."

In the past, the "permanence" of built surfaces referred not only to the performance *charactistics* of materials themselves, but also to the *character* of the building or material as perceived by the individual. Today, the "permanence" of our built environment refers only to the performance characteristics of materials, and not the character of materials themselves.

Throughout the history of construction, man has always demonstrated a special awareness and concern for materials which are both durable and "permanent:" possessing the ability to withstand the forces of both man and nature. The durability and "appearance-retentiveness" of surfaces is not a new concern; we have always been cogniscent of these factors in the construction of our landmarks, buildings, and shelters. What has changed, however, is the technology which is used to fabricate modern building materials. With modern fabrication techniques, we can now create materials (and urban environments) which are more efficient, more economical, more pliable, easier to clean, more impervious, and more resistive to wear or change. In short, materials today are more

durable than ever before in our history, utilizing an "economy of means" which, even one hundred years ago, would have been considered unattainable.

In the same way our understanding of materials in the nineteenth century, for example, were based upon our ability to manufacture materials created in that era, so we now must have a correspondingly new understanding (or "value system") with regard to modern-day materials. Advances in modern fabrication techniques have given us a new understanding of the nature of building materials. They have also changed the aesthetic quality of the built environment. Modern fabrication techniques have not only heightened the performance and durability of our physical environment, they have also heightened our awareness of such. This increasing visual awareness applies to all environments and surfaces, regardless of their location within the built landscape. While it is true that surfaces employed in exterior locations are designed with different criteria from surfaces which are used indoors, we have come to expect the same qualities of each: the ability of the material to retain its visual surface quality. We have come to expect that the built environment will remain, in essense, more permanent - as if frozen in time.

This increasing degree of permanence, due to the influence of technology, can be illustrated when considering even the most "mundane" of building materials. Consider wall-to-wall carpeting. Although this surfacing method is, in fact, "ancient," technology has replaced the traditional materials used to manufacture carpeting with entirely different substances. Even so, the appearance of modern carpets is perceived to be the same as the original product. Technology, by nature if its control and capacity for illusion, has "fooled" us into believeing that modern carpeting is true to the nature of the more traditional idea of carpet. A careful examination of carpeting will reveal a great deal about not only the construction and durability of carpet itself, but also will give us insight into the nature of all modern building materials - and the standards we (as a society) place upon permanence of surfaces within the built environment.

It is necessary to begin our analysis with the most fundamental component of wall-to-wall carpeting: the carpet fiber. The fibers of the carpet form its finished surface; therefore, the performance of any carpet product is primarily a function its fiber system. The fiber is the part of the carpet that is walked on, spilled on, and has mail carts and chairs constantly rolled over it, and is yet required to remain aesthetically pleasing. The durability of carpeting depends upon the proper fiber being manufactured into the appropriate construction of yarn. When considering the durability of a carpet fiber, manufacturers must take into account the structure and dye methods used for the fiber. The life expectancy and appearance retention of the carpet surface are the most important qualities for the selection of carpet (which, as we will see, is also true for every other building material).

Among the many factors which must be considered in the fabrication of carpet fibers (and therefore the surface of carpeting) are: (1) the raw material used to construct the carpet fiber; (2) the structural characteristics of the fiber itself (height, diameter, shape, etc.); (3) the dye method used to give the fiber its color; and (4) additional surface treatments for the preservation of visual integrity.

Raw Materials

The raw material used in the fabrication of most modern carpet fibers is nylon - a synthetic, high-strength, resilient polymer. Developed and named in 1938 by the E.I. duPont de Nemours & Co., Inc., nylon became the predominant fiber for residential and commercial carpeting in the early 1960s; primarily due to its superior tensile strength and durability. In the last 30 years, the manufacturing processes used to create nylon fibers have been modified and perfected to allow the fiber to perform more efficiently. The synthesis of this material illustrates the degree of surface control which has been attained in what would appear to be a common, ordinary surface material.

From a base of coal or oil, "cyclohexane" is made, which in turn yields "caprolactum" - a derivative of carbon.[2] When caprolactum is superheated, it produces the polymer which we call nylon, which is then fashioned into pure white nylon chips. From these nylon chips, every type of nylon carpet fiber is manufactured through a process of heating and extrusion. After being heated to a temperature of approximately 220°C, the pure white nylon chips are melted into a molten solution, which is then extruded through a "shower-head" type of device known as a "spinnerette." The spinerette has microscopic openings which create the shape of the nylon fiber. Spinnnerettes are regulated and monitored by sophisticated, computer-controlled machines which assure unmatched uniformity. Once these fibers are formed, they can be either stretched, textured, or bulked into a wide variety of shapes, densities and configurations, each with unique structural and aesthetic qualities. What is important to consider, however, is the degree of control which technology allows in the fabrication of these raw materials, and the impact of this technology upon the performance, appearance retention, and durability of the surface produced. This will become more evident as we consider issues of more direct aesthetic significance - such as dyeing techniques and the introduction of color into the carpet fibers themselves.

Before I proceed further, it is important to understand the step-by-step proceedure used for manufacturing carpeting. As I previously discussed, pure white nylon chips are superheated into a molten state and extruded through spinnerettes into the desired fiber "shape." This fiber is then either stretched, textured, or bulked into *continuous filaments* or cut into *staple* yarns (short strands). Once this process is complete, the fiber can then be sold to independant carpet manufacturers, who then (with the aid of computer-controlled spinning machines) spin this raw fiber into *yarn* . Yarn can best be defined as a "bundle" of inter-woven fibers. With the use of computerized *tufting* machines, yarn is then either tufted or *bonded* (with the use of adhesives) to a backing structure, commonly known as the *primary backing*.

Once the yarn bundles have been attached to a primary backing structure, a *secondary backing structure* (used for dimensional stability) is attached to the primary backing with the use of high-strength adhesives. When this has been accomplished, a finished carpet (exclusive of its dyeing) is ready for sale.

Structural Integrity

Again, referring to the case study of carpeting as a guide, we can speculate the influence of the "structure" of the carpet surface upon surface performance qualities such as durability and appearance retention; which, I am arguing, have become a preoccupation in the design of modern built surfaces today.

From an engineering point of view, the physical characteristics of the carpet fiber has an important effect upon the ultimate performance, durability, and appearance retention of the carpet's surface. Although at first it may not appear so, there exists an extraordinary complexity in the design and fabrication of the ordinary carpet fiber.

Depending upon end-use requirements, specific types of carpet fibers may be designed to perform a specific task. Carpet fibers typically have a very tight molecular structure for greater resistance to stains, wear, and abrasion. The exterior surface of the fiber is fabricated with a very hard shell, which allows greater resistance to soiling, superior resilience, and better height-retention. In addition, fibers can be chemically treated to dissipate static electricity, resist odors caused by bacterial action, fight mildew, and kill unwanted microorganisms. In short, fibers are manufactured to be more uniform and permanent.

When designing a carpet fiber, there are several criteria which are of significance with regard to the performance of the carpet: (1) the surface "area" of the fiber; (2) the "texture" of the fiber's surface; (3) the relative "hardness" of the surface area of the fiber;

and (4) the "slenderness ratio" (structural potential) of the fiber. Each of these characteristics plays an important role in the ultimate durability of the carpet.

When one considers the surface "area" of a fiber, it becomes clear that a fundamental relationship exists directly between the amount of exposed fiber surface area and the amount of dirt or staining which may adhere itself to the carpet. If fibers have a greater surface area, the potential for the staining of that fiber is increased. Conversely, if the surface area of the fiber is kept to a minimum, there would be less opportunity for dirt to adhere to the carpet fiber's surface. This relationship, in the carpet industry, is referred to as the "denier-per-filament:" the lower the surface area of the fiber (and thus the more optimum condition), the *heavier* denier-per-filament; the higher the surface area of the fiber (and thus the greater potential for soiling), the *lighter* the denier-per-filament. This is an important relationship to manufacturers in the carpet industry. Distributors frequently emphasize the importance of denier-per-filament in reference to the value and performance of the carpet. The desire for all individuals involved in the design, fabrication, selling, and purchasing of carpet fiber is superior surface performance and durability, ie: permanence. This common goal is greatly influenced by the amount of surface area which is present in the carpet fiber.

Just as important to the soiling potential of the fiber is its surface "texture." It stands to reason that smoother fiber surfaces will offer greater durability, because dirt and foreign matter will be less likely to cling to a smooth surface than they will to a coarse or uneven surface. The reverse is also true - the more coarse and uneven the surface of the fiber, the more likely that foreign matter will find a location in which to "grab hold." As such, carpet manufacturers are careful to create fibers which have the maximum in surface uniformity and smoothness. This will allow the carpet to maintain its appearance and luster over a longer periods of time (here again - surface permanence).

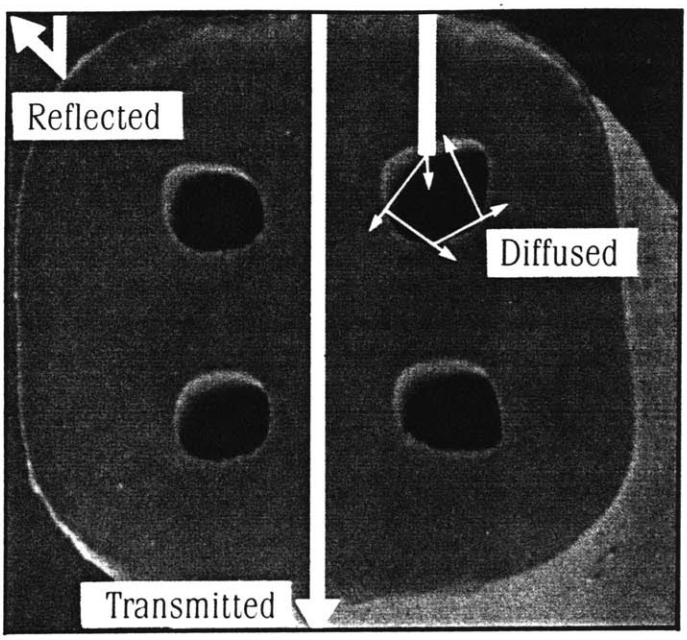
"Hardness" is also a variable in the carpet fiber equation. It stands to reason that the harder the nylon fiber, the more difficult it would be for dirt to penetrate the surface of

the fiber. Similarly, the "softer" or more "pliable" the surface of the fiber, the more likely dirt or foreign matter will penetrate the carpet fiber. In the carpet industry, carpets are classified into either of two fiber-hardness catagories:

1. "Type 6" fiber: excellent fiber hardness, with the potential for easy dyeing and maximum color potential;
2. "Type 6.6" fiber: (12% harder than type "6" fiber): more difficult to dye than type"6" yarn, but also more difficult to stain, wear-out, or experience color fading as a result of abrasive cleaning agents or environmental forces (ex.: sunlight).

Type 6.6 fiber is more readily "marketed" and more easily sold by carpet manufacturers. This is because type 6.6 fiber has, built within itself, the characteristics and capabilities which have become the driving force behind the fabrication of modern-day materials: a greater potential for appearance retention. Type 6.6 fiber offers exceptional performance, superior "colorfastness," and most importantly - is far more durable than type 6 fiber. This being the case, the number of carpet manufacturers who incorporate type 6.6 fibers into their products is growing. Carpet manufacturers which employ type 6.6 fibers guarantee their users a more permanent surface aesthetic.

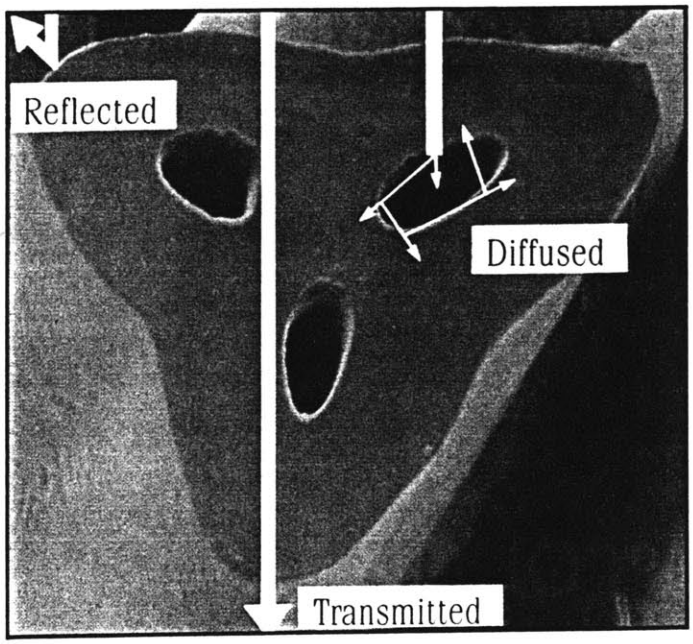
Lastly, nylon carpet fibers are extruded through spinerettes with varying cross sectional configurations. These variations in cross-section allow for inproved structural stability, decreased fiber surface area, and maximum light diffusion. Most nylon fibers are manufactured in either of two cross-sectional shapes: as a delta-shaped three-sided strand with three internal hollow voids; or in the shape of a square with four internal hollow voids (see p. 50). These inner voids diffuse or deflect light in much the same way that sound is deflected when it strikes interior surfaces of a room (such as walls or furniture). As light strikes the fiber and penetrates the outer layer, it passes throught the fiber until it



Reduced surface area technology
(heavier denier per filament) means fibers have less surface area to which dirt can adhere, for optimum soiling characteristics.

Hollow filament technology
allows each fiber to reflect and diffuse light to hide soil.

- DuPont-certified staple constructions of ANTRON PRECEDENT utilize the industry's first 3-void, delta-shaped, hollow filament nylon fiber.



encounters an inner void. The diffusion of the light within the fiberous strand helps to hide the effects of soil, which accumulates on the surface of the fiber. Hiding the effects of surface soiling will give the illusion of superior appearance retention. As previously discussed, appearance retention is becoming a preoccupation with all surfaces within the built environment.

With a basic knowledge of carpet fibers and their physical characteristics, we will now look at carpet yarns - which, of course, are bundles of fibers spun together and tufted (or bonded) into finished carpet.

Yarns

It is necessary to define the three basic types of yarn construction, in order that we may better understand the structural analysis of carpet yarns which is to follow. The

three basic types of yarn construction are:

1. "Cut" piles: Carpet yarns which, in elevation, stand vertically-upright, not unlike a structural column;
2. "Loop" piles: Carpet yarns with both of its ends securely fastened to the carpet's primary backing;
3. "Cut-and-Loop" piles: Carpet yarns which have a combination of both types of yarns in their cross section.

Each of the three basic types of yarn constructions listed above has different aesthetic and structural capabilities and characteristics. In addition to the yarn constructions listed above, there are also exists slight variations of each. For example, loop piles - in addition to having the upper "tips" of their loops manufactured at the same height, (thus a uniform texture), may also be tufted with "multi-height loops" (creating a coarse or textured surface). In cut-and-loop piles, it is possible to vary the height of either the cut pile yarns or the loop pile yarns, thus allowing a wide range of textures and patterns. For our purposes, I will confine my analysis to the three basic catagories of carpet construction listed above.

It is also necessary to define technical terminology associated with carpet construction:

1. Pile height: Refers to the height of the finished yarns, exclusive of the backing materials (measured in inches);
2. Yarn diameter: The diameter of the "column" (yarn);
3. Face yarns: Yarns which penetrate beyond the primary backing and are exposed to the naked eye (surface yarns);

4. Face weight: The weight of the face yarns (surface) in one square yard of carpeting (measured in ounces);

5. Rows-per-inch: The number of vertical rows, in elevation, in one inch of carpeting - as measured perpendicular to the direction of the tufting.

In the structural design of columns, engineers are concerned with the load bearing ability of the column. If one were to imagine an upright carpet yarn as a type of "structural column" which must resist vertical loads, one could visualize similarities between the design of a column and the design of a carpet yarn. For example: if we were to analyze a cut pile yarn (a single, vertical strand) in terms of its structural capabilities, we would find that relationships exist between the five physical properties which are listed above. For example, if we compared the relationship between a carpet with a pile height 0.25" and a yarn diameter of 0.06" (fig. A) to a carpet with the thicker yarn diameter (0.15") and a shorter pile height (say, 0.18" - fig. B), we can conclude that the second yarn system will be a much more durable yarn system; because the relationship of the column diameter to the height of the column (or the slenderness ratio) is much smaller than in the first yarn system. The first yarn strand will demonstrate a greater tendency to "overturn" or to "crush," because the column has a greater relative "slenderness" than the second yarn system (and therefore is not as sturdy or durable a yarn system). If the yarn "overturns" or "crushes," the aesthetic effect which results is known as "pooling" or "watermarking". Pooling, (the result of improper yarn orientation), destroys the smooth, even surface appearance which is the desired aesthetic, and instead creates varying patterns of light and dark yarns which

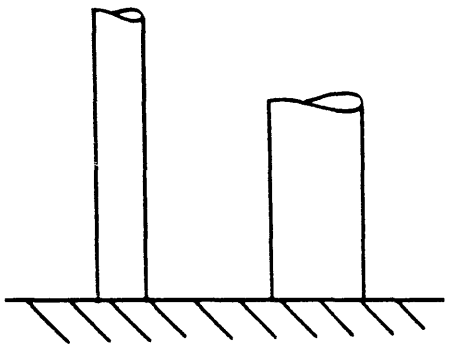


Fig. A **Fig. B**

resemble a liquid stain on the carpet. Therefore, carpet yarns are tufted with particular attention given to the relationship between the yarn's slenderness and its pile height.

Pooling can also be prevented in several other ways. One way is to pack rows yarns very close together, so that adjacent yarns will provide lateral stability for each other (not unlike cross-bridging used in structural frames). Decreasing the distance between adjacent rows of yarn fibers is an effective way to increase the structural integrity of a carpet. Another way to prevent pooling is to "cable" or "inter-weave" yarns together into a column (fig. C) made up of multiple yarn strands (as opposed to the standard single-column yarn strand - fig. D). Not only do multiple strands add lateral reinforcement to the column, but they also serve to widen the column's cross-sectional area; providing a more sturdy base with which to anchor the column or yarn strand. In effect, this adds to the carpet's face weight (surface), which, depending on other physical relationships, will usually add to the durability and appearance retention of the carpet.

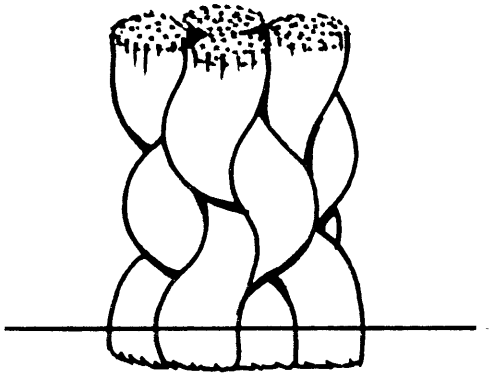


Fig. C

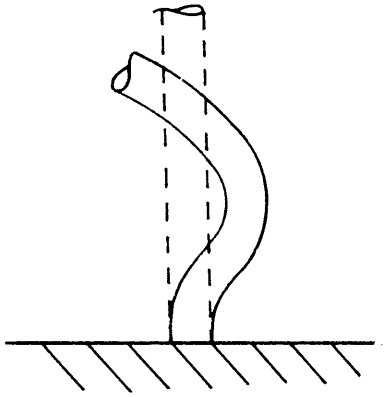


Fig. D

The structural principles which I have discussed are similar whether we are discussing cut piles, loop piles, or cut-and-loop piles. However, since the physical configuration of the yarn fiber in loop piles and cut-and-loop piles is fundamentally different, performance and appearance retention of each construction will correspondingly be different. Cut piles, with only one anchorage at its base, will not be as structurally sound as a loop pile carpet - with two anchorages for the same yarn strand. Loop piles,

however, are not as "monolithic" in appearance as cut piles. This is because with cut piles, the surface of the yarn is a flat "tip" or end, which is a good receptor for colors and dyes. The exposed end of a loop pile, however, is the upper portion if a curved "arch", and therefore light (and color) is diffused due to yarn curvature. It is possible, however, to combine the structural benefits of loop pile yarns and the aesthetic benefits of cut pile yarns by tufting a carpet with a combination of both types of yarn construction. The end result - cut-and-loop piles - allows designers the opportunity to create aesthetically attractive and uniform carpet surfaces with the luxury of structurally sound carpet yarn systems. In other words, appearance retention and surface durability.

Dyeing Techniques

Perhaps the most significant factor in the successful performance of carpeting is the manner in which color is applied to the individual surface fibers. To the uninformed individual, it would probably seem to be a fairly trivial and straightfoward technique. On the contrary, introducing colors (and patterns) to a carpet is a complex and highly-variable process. The implications of various dyeing methods (both physically and culturally - in terms of our visual expectations) are representative of the profound influence which technology has exerted upon the manufacturing and understanding of all surface materials.

In an effort to be concise, I will only address the six primary techniques for dyeing carpets, keeping in mind that other more unorthodox methods do exist (but tend to become minor variations of the dyeing techniques which I will discuss in this analysis): (1) "solution" dyeing; (2) "stock" dyeing; (3) "yarn" dyeing; (4) "space" dyeing; (5) "piece" dyeing; and (6) "overprinting." The key to understanding each dye method lies in the understanding of the carpet manufacturing process. The only technical distinction between each of the dyeing methods listed above is the time during the fabrication process in which colors are introduced into the material or finished carpet. These differences, however,

have important implications when one considers the durability and appearance retention "potential" of carpeting.

The dye method which occurs earliest during the fabrication process is solution dyeing. Solution dyeing is probably the most durable and reliable dye method used to dye carpet fibers today. As the pure white nylon chips are melted into molten nylon, color pigment chips are also heated into a molten state. These pigments are homogeniously blended with the liquid nylon polymer, with the resulting mixture then sent through spinnerettes and fashioned into carpet fibers. What is most important to understand about solution dyeing is that color is added to the nylon before it is extruded into fibers. As a result, the pigments permeate the entire fiber evenly, locking in the hue and creating colored fibers of exceptional depth, clarity, and tone. If one were to imagine cutting a cross-section of a typical yarn fiber and examining it under a microscope, they would find the inner regions of the fiber are the identical in color to the surface regions of the fiber. Solution-dyed carpets have their colors locked in, which means their color cannot be washed away, rubbed-off, or fade as a result of years of sunlight exposure. In short, solution dyed yarn surfaces have permanent color. Solution dyeing also eliminates color variation from dye lot to dye lot, which maximizes the ability of manufacturers to match their colors, regardless of the size of the installation. At present, the number of colors which may be used to create nylon solution dyed fibers is approximately 250 colors, depending on the manufacturer who is supplying the base fiber.

The implications of this continuing trend toward appearance-retentive surfaces is important when one considers future expectations of our culture. Given products of this durability and "permanence," our culture will come to expect that the built environment will maintain its original appearance, never showing signs of aging or wear - even when subjected to physical abuse or environmental forces. We can expect surfaces to be uniform, maintain their appearance, and become, in a sense, "ageless" and "permanent."

Stock dyeing is another reliable and durable dye process. In stock dyeing, however, instead of dyeing the molten polymer which is later fashioned into nylon fiber, the molten polymer is **first** extruded into fiber and **then** dyed. To simplify - solution dyeing colors a fiber from the inside to the outside, while stock dyeing colors a fiber from the outside to the inside. Although stock-dyed fibers are not quite as thoroughly dyed as solution-dyed fibers, stock-dyeing allows an almost unlimited color palette from which to choose from. While the number of colors which can be successfully solution dyed is limited (due to chemical reactions at high temperatures), just about any imaginable color can be applied to a fiber's surface using a stock-dyeing process. Stock dyeing allows an extraordinarily large dye lot (supply of dye) to be created, thus insuring color uniformity in even the largest of installations. Therefore, stock dyeing allows the designer the opportunity create an infinite number of surface colors and patterns; colors which are almost guaranteed to be uniform in hue, tone, and shade. Stock dyeing allows ultimate aesthetic design freedom and control over the surface of both residential and commercial carpeting.

Yarn dyeing is quite similar to stock dyeing. In yarn dyeing, the white nylon fiber is first spun into yarn, and then the dye is added. Like stock dyeing, there is an almost unlimited color palette from which to choose from, along with comparable dye-lot uniformity. As documented by independant testing result, little difference exists between the quality of the dye penetration between yarn dyeing and stock dyeing. The major advantage of yarn dyed fibers is that carpet manufacturers can purchase pre-dyed yarns from yarn producers and begin tufting their carpets immediately, without having to spin their own fibers into yarns.

Space dyeing is actually a variation of yarn dyeing. The difference between space and yarn dyeing is that in space dyeing, each individual yarn is dyed more than one color on the same single strand - as opposed to a monochromatic yarn-dyed single strand. This, in addition to the advantages of yarn dyeing, allows greater color and pattern flexibility.

With the use of computer-controlled dyeing equipment, technological precision and surface uniformity is virtually assured.

Piece dyeing is yet another variation of the yarn dyeing method. First, the carpet is manufactured all the way to the finished, tufted product - in white, undyed nylon. Dyes are then injected with computer-regulated jets of compressed air and pigment. Because the potential for fiber permeation by the pigment is not quite as thorough as solution dyeing, piece dyeing is not as popular or effective a method of carpet dyeing. However, improvements in dye technologies will soon allow piece dyeing to achieve comparable performance and durability to that of other dye methods, such as solution dyeing.

The final dye method I will address is known as "overprinting." Overprinting occurs when an previously-tufted and dyed carpet is overprinted with a pattern or design - like a type of "overlay". Because carpet dyeing equipment is computer-controlled and monitored, designers may create any surface pattern, design, graphic, or logo conceivable and have the design dyed into carpet. The potential for design control and customization is virtually unlimited; just about any surface pattern one can imagine can be achieved through dye-injection processes. Add digital technology to this process and you now have the ability to control the surface qualities of the carpet strand-by-strand. Although the permeability of the pigment into the carpet fibers is not quite as thorough as in solution dyeing, the technology has improved immeasurably in the past decade. I am certain that dyeing technology in the near future will allow unlimited aesthetic design flexibility (in terms of surface color and pattern) with equal durability and appearance retention.

To summarize, dyeing processes - perhaps the most critical feature in the performance and durability of the carpet - have become so highly-refined and effective that physical and visual qualities of carpet surfaces (such as color and pattern) are becoming more and more permanent. Improving dyeing techniques allow designers and manufacturers unlimited control and flexibility over the visible surface of carpeting, including the colors and patterns are applied. As we shall soon see, the same control and

flexibility available in the manufacturing of carpeting is also prevalent in the fabrication of all modern building materials.

Visual "Integrity"

In addition to carpeting's physical characteristics, it is possible to chemically treat the surface of carpeting to improve its resistance to soiling, staining, sunlight, micro-bacteria, odors, and static electricity. Every major carpet manufacturer producing carpet today chemically treats the surface their carpet in one fashion or another. These chemical treatments are usually in the form of a flouro-chemical additives, which are applied to the surface of the carpet after it has been fabricated. These additives not only help to resist soiling, but they can also dramatically reduce the need for cleaning the carpet. This allows the carpet to maintain a new-looking appearance far longer than untreated carpet. These chemically treated carpets resist an extraordinary number of potentially damaging forces, as demonstrated in the following quotes:

"PermaColor™ (yarns) assures against (stains) such as coffee, red wine, oily salad dressings....prolonged exposure to sunlight, adverse atmospheric conditions...foot traffic, food or medical spills...(and) chlorine bleach....Scotchgard™ Protector..(helps) make cleaning easier and faster.....High Performance Characteristics: stain resistance, abrasion resistance, colorfastness, resistance to bacteria, appearance retention, impervious to harsh cleaners.....Common Stains Resisted: beer, berry stains, blood, butter, carbon black, catsup, chewing gum, chocolate, coffee, cola drinks, crayon, egg, furniture polish, grape juice, gravy, ink, iron rust, linseed oil, lipstick, milk, mucilage, mustard, nail polish, oil, paint, rubber cement, shoe polish, tea, urine, vomit, watercolors, wine..."[3]

"..resists soil build-up and releases soil easily during cleaning.....repells spills...immediately dissipates static build-up...unprecedented colorfastness...unequalled long-term appearance retention."[4]

"....will not stretch or shrink...is effective against both gram-negative and gram-positive bacteria, mold, mildew, fungi, and the odors they produce....(an increased) resistance to rolling traffic...(and an increasing) long-term appearance retention of the carpet surface."[5]

In short, the surface of carpeting is becoming resistive to just about any type of environmental factor one might imagine. Carpeting is also manufactured to be resistant to product failures such as edge ravel, loss of carpet fiber, delamination of backings, dimensional stability, color fading, flammability, smoke generation, and a multitude of other types of product failures - assuring its appearance retention for decades.

These increasingly sophisticated carpet fabrication techniques and treatments have allowed carpet to become - down to its most fundamental element - more resistive to dirt, decay, the environment, bacteria, and other external contaminants than ever before in history. Beyond these technological and physical advances, the improvement in the performance and durability of carpeting has helped to raise our awareness of the appearance of the built environment:

".....many of our more recent buildings are intented as clean compositions.....on which uncontrolled runs of dirt immediately look out of place."[6]

As surface materials (such as carpeting) are manufactured with an increasing emphasis being given to their appearance over time, (colorfastness, cleanability, aesthetic uniformity, resistance to environmental abuse, etc.) we will come to expect that the built

environment will look new for many years. Materials will be expected to retain their color, maintain their aesthetic uniformity, and be more resistant to dirt and environmental abuse. The bottom line is simply this: we are becoming a society which places an increasing value and emphasis on the ability of surface materials to retain their appearance over time - ie: to become more permanent. Materials are being designed to remove all evidence of aging, wear, or human influence. The durability of surfaces has become a critical preoccupation in the fabrication (and understanding) of building materials in the modern age.

Universal Expectations

This analysis of carpeting is not intended to allow the reader of this thesis to become an independant carpet consultant. Rather, it was an attempt to analyze a fairly common building material and to discuss the implications of modern fabrication processes upon the surface qualities of such a material. The ultimate intention of the analysis is to suggest that a material's "permanence" has become a preoccupation in the design of all surface materials today, regardless of the material in question. There is very little difference between the criteria which influence the fabrication of carpeting from the criteria which influence the fabrication of any other building material, as we shall see.

All surface materials manufactured today - ceramic tile, wood, stone, paint, metals, glass, sealants, masonry, or any other building material - are subjected to the same rigorous scrutiny (in terms of durability and appearance retention) that carpeting is. We place an unarguable value in the ability of all materials to retain their appearance - to withstand decay, wear, and environmental abuse. In essence, the prevailing notion is that surfacing materials should appear as though they are "eternal" - forever new, forever untouched, forever unaltered. Materials are manufactured to be impervious - resistive to the environment, resistive to aging, and resistive to people. Materials should appear as if they have been "frozen" in time and space. Technology has allowed materials to be crafted

with the appearance of "ancient" materials (such as carpeting) with the use of entirely different materials. We have come to accept these "substitutions" as identical to their predecessors; when, in reality, they are something entirely different.

The next case study is not only a set of common surfacing materials, but, in fact, a room or environment. This environment has come to represent - both literally and symbolically - the embodiment of our social, cultural, and built form expectations with regard to the permanence of surfaces: the ordinary bathroom.

Bathroom Surfaces

If we give careful consideration to the surfaces and function of the ordinary bathroom, it will become clear that the issues of durability and appearance retention, which we have already discussed, are more than merely the underlying principles behind the design and fabrication of all surfaces which comprise the bathroom. These qualities are also the underlying aesthetic motivations for the "permanence" of another type of surface: the human body.

The performance and durability of surface materials is never more critically apparent than in the design and construction of the ordinary bathroom. Every element contained within the bathroom environment is designed to resist the extraordinary wear, moisture, and abrasion which is a common feature of the typical bathroom. Yet the technology which is evident in the surfaces of the bathroom are no more sophisticated than the technology in any other room in contemporary buildings. With the careful examination of the elements common to all bathrooms (walls and floors, plumbing fixtures and enclosures, cabinets and vanities, and mirrors), we will discover that the criteria which influenced the design of carpeting - appearance retention, aesthetic integrity, and surface durability - are also evident in the design and manufacture of every element within the ordinary bathroom.

Walls And Floors

"When a building material is in contact with contaminants, the nature of the surface of the material is of great importance for the adhesion and conspicuousness of the contaminants. Moreover, the capillar system of the outer layer (surface) has important implications for water absorption and for the capillary condensation of water vapour."[7]

Bathroom surfaces are closely scrutinized with regard to their physical durability and aesthetic integrity. This concern can be attributed to the unusual "environmental" conditons which are prevalent inside the average bathroom on any given day - and the potential for surface damage as a the result of their influence. Various forms of moisture (from steam to running water) regularly come in contact with every exposed interior surface. In addition, temperatures within the bathroom experience fluctuations from extreme heat to extreme cold, causing sub-standard materials to crack and warp due to repeated expansions and contractions. Therefore, every surface material chosen for the bathroom must be designed to resist frequent changes in temperature, as well as a variety of forms of moisture and condensation.

The predominant surface material used in the construction of bathrooms is tile. Tile is commonly used to finish surfaces of walls, floors, counter tops, and bathtub surrounds. Almost all tiles manufactured today are fabricated from a base material of clay. One of tile's major advantages is its impervious, glass-like ("vitrified") outer shell. This vitrified surface is a most desirable quality for a material which is subjected to the environmental forces present in the ordinary bathroom. Vitrified surfaces are exceptionally smooth, which encourages water "run-off" and also prevents water from penetrating the exterior surface of the tile. As a result of tile's vitrified surface, it is an ideal material for the moist environment of the bathroom.

Most bathroom tile is a type of ceramic tile. Ceramics are any form of hard, heat-resistant and corrosion-resistant materials which are made by firing clays or other minerals. Porcelain tile, another popular surfacing material, is a "silicate glass" (containing silicon) which is fired on metal - also known as "vitreous enamel." In either case, the principle behind the fabrication of the material is to create an outer "skin" or surface which is smooth and inpenetrable.

Tiles have been in existance for hundreds of years. However, modern technology allows us to create the appearance of earlier tiles with newer, more durable materials. The surface glaze and body of most ceramic tile products are applied during the firing of the material; creating a solid, homogenious material whose glaze can never be chipped. Through-body color is highly resistant to abrasion, allowing tile unequalled appearance retention. Grouts and caulkings (used in conjunction with ceramic tile) are also non-porous and through-color, allowing tile surfaces to maintain their seal even under the stress of standing water and moisture.

Tiles are manufactured in just about every conceivable surface color, pattern, shape, style, and finish (textured, glazed, etc.). American Olean (one of the largest distributors of ceramic tile in the U.S.) manufacturers more than 20 standard styles of tile, in 22 standard textures, 25 sizes, 50 standard colors of grout, and 296 colors - to say nothing of its ability to create custom tiles. This design flexibility, combined with the tile's structural and aesthetic integrity, allows designers to create any surface effect conceivable. These surfaces are also more likely to remain intact, as a result of the technological innovations which are employed in the tile manufacturing process. According to American Olean test data, its tile is "....impervious, with an absorption of less than 0.5%....(their tiles) are also scratch resistant, stainproof, dentproof, slip resistant, and frostproof."[8] Therefore, it is likely we will expect tile to retain its appearance, regardless of external forces. Technology has allowed tile a new level of permanence; subsequently heightening our awareness and visual expectations of the built environment. As a response our

heightened awareness of the aesthetic characteristics of tile, national tile fabrication and testing standards have been established, which insure that tile products will be manufactured within structural and aesthetic performance guidelines.

On the rare occasion where tile is not used as a wall or floor surface in bathrooms, synthetic materials are substituted, such as fiberglass, acrylics, or high-impact plastics. As is the case with ceramic tile, sophisticated and highly-controlled fabrication processes allow manufacturers to create materials with exceptional strength and through-color. In the event their surfaces are scratched or chipped, there will be no resulting loss of color or finish:

"Swan Tile,™ a totally unique alternative to ceramic tile....(is made possible) through a technologically advanced tooling system and a fiberglass compound FMC-2000....Fiberglass (provides) long life and good looks, with molded-in color to allow for a surface which is both scratch and chip resistant...no grout or mildew problems...not subject to cracking...identical cosmetic appearance and feel of expensive grade ceramic tiles."[9]

The permanence of ceramic tile and synthetic materials are among the main reasons why these materials have become the industry standard for all modern bathroom walls and floors. Durability as the motivation for the selection of building materials, as we have seen in carpeting, is a growing preoccupation within our society. Although the situations in which carpeting and tile (or synthetic materials) are somewhat dissimilar, the motivation behind their selection is, in fact, identical: surfaces should be durable and retain their appearance and integrity - regardless of wear, age, the elements, or other externalities.

Plumbing Fixtures And Enclosures

"Each Aquarius™ unit (acrylic tubs and showers) is produced with quality and styling unsurpassed in the industry today. Whether its our luxurious whirlpools or our classic tubs and showers, Aquarius means all the features you look for - tough, scratch resistant, easy to clean - molded into beautifully sculptured one-piece designs in a wide variety of decorator colors."[10]

"Swan Tile™ Showerstall system panels carry a 20-year limited warranty....(they) are scratch and chip resistant...overlapping water-resistant seams...never needs regrouting...fiberglass durabilty and strength."[11]

Plumbing fixtures and enclosures (such as showers, tubs, toilets, and sinks) are also subject to the same scrutiny (in terms of durability and appearance retention) as wall and floor finishes (or carpeting, for that matter). Toilets, tubs, and lavoratories are manufactured from porcelain or glass, and demonstrate the same surface permanence as ceramic tile does. This includes resisting staining, water penetration, and abrasion, as well as allowing for easy cleaning. Newer fixture basins and enclosures (in the case of showers and lavoratories) are manufactured with a variety of synthetic materials, such as acrylics, plastics, and epoxy-resin based materials - such as Corian®. Corian is a non-porous material used for countertops, sinks, vanities, tub and shower surrounds, windowsills, and mouldings. Corian® is representative of an entire family of epoxy-resin based materials in vogue today. Surface scratches to Corian® are removed by rubbing its surface with a fine sandpaper, which does not inflict any damage upon the surface finish. Cigarette burns, as well, can be rubbed off with ordinary abrasive cleansers. "With a smooth, continuous surface that eliminates hard-to-clean, dirt-catching crevices, Corian®.....provides an extra measure of impact and stain resistance not normally found

in (traditional) materials....(such as laminates or cultured marble)."[12] Among Corian's many perceived advantages, we find several which have become familiar to us from our earlier analysis: "...no change in color stability.....no loss of pattern.....no visible change in surface resistance....no change in resistance when subjected to high temperatures....no stains after cleaning....no fracturing due to impact....no measureable water absorption...."[13] Appearance retention and surface durability are the primary aesthetic concerns: surfaces must always appear new.

Most faucets, valves, and controls are made from either chrome, stainless metals, or plastics. The cleanability and moisture-repellent properties of these materials are the key to their appropriateness in the bathroom environment. The main reason for the selection of these materials is their ability to withstand the environmental and habitational abuse. Their attraction is their permanence.

Cabinets And Vanities

Cabinets and lavoratory vanities are subjected to similar abuse, and therefore the same rigorous scrutiny, as every other bathroom component. Most new cabinetry is made from either of four materials: treated wood, laminates, metals, or synthetics. We have already discussed the merits of synthetic materials (such as Corian®) in the fabrication of lavoratories; similar constraints and expectations apply with use of synthetics for cabinetry and vanities: "The molded one-piece construction of Corian® vanity tops....offers a unique combination of long-lasting beauty and easy care....the smooth surface and molded-in sink resist scratch and impact damage and, at the same time, eliminate hard-to-clean crevices that catch dirt."[14] Synthetic resins may also be applied as a sealant or surface treatment over wood cabinets: "...all exterior surfaces are finished with a new synthetic resin developed exclusively for Kitchen Kompact™. Cured by a radiant heat process, this unique catalyzed finish is extremely resistant to household chemicals, water,

alcoholic beverages, mild acids - even nail polish - and has excellent wear resistance. Cabinet exteriors, as well as the naturally light interiors, are protected with a one-coat sealer and a top coat."[15]

Wood cabinetry is also common to modern bathrooms today, particularly when the wood surface has been treated or sealed in a thorough fashion. This can be accomplished in several ways. Quite often, interiors of wood cabinetry are laminated with a reverse-printed vinyl, which not only protects the wood-grain pattern of the base material, but also eliminates the need for shelf liners, protecting against the harmful effects of standing water, spilled foods, and household chemicals. These surfaces are durable and easy to clean, thus insuring the appearance retention of the cabinet interiors. Cabinet interiors can also be sealed with varnishes, which help to protect surfaces from physical abuse while allowing the inherent aesthetic beauty of the material to remain visible. Laminates are also effective and durable cabinet finishes, due to their strength and propensity for cleanliness. The exteriors of most wood cabinets are usually given furniture-quality surface finishes with a combination of sanding, varnishing, staining (or some other type of high-technology process). An example of this can be found in Merillat Cabinets™, where "...(cabinets are treated with) a conversion varnish that is electrostatically bonded to the wood. This gives cabinets an expensive look and feel while providing protection from moisture, spills, scratching, and aging."[16] "High quality" cabinets are in fact cabinets which can best withstand the forces which degrade or damage their surfaces: changes in temperature, moisture, chemicals, food, and ultimately people themselves. In the past, "quality" was associated with a material's tactile qualities, its craftsmanship, and its history, as well as its surface durability. Today, the universal definition of "quality" is based upon a material's performance or "permanence," which is primarily a function of its surface.

Laminates - thin surface veneers of plastic or wood laminated to a backing sheet - create a durable and washable surface which can withstand the environmental rigors of the

bathroom. Plastic laminates are very popular for several reasons. First, they are relatively inexpensive to manufacture, install, and repair. Secondly, they come in a wide variety of colors and materials (or "depictions" of materials) which are satisfactory alternatives to more expensive natural materials. Thirdly, their inherently lightweight structure allows them to be incorporated in an unlimited number of applications (also permitting the structural materials of the cabinet to be manufactured with lesser-grade materials, resulting in significant cost savings). Lastly, laminates are durable, retaining their appearance for many years. As I have argued, appearance retention is an growing concern with our increasingly surface-critical society: "Formitex™ contemporary style cabinets are available in an array of woodgrain and solid colors....High-pressure decorative laminate cabinetry is the most carefree and durable you can buy, virtually impervious to moisture, scratches, scuffs, and stains....so easy to care for, you simply wipe clean."[17] It seems that materials must, at the exclusion of all else, possess the ability to retain their original appearance (just as we, as individuals, have been stigmatized into retaining and preserving our own personal appearance).

Metals are also a popular cabinet surface material. Metals can be either exposed (such as brass, chrome, or stainless steel) or they can be painted over with a variety of chip and scratch-resistant paints, such as baked enamel. Brass, bronze, and polished chrome cabinets are specified for their unique surface qualities and status-appeal as well as their extraordinary durability. Stainless steel is a common metal in cabinetry and vanities, particularly due to its ability to withstand abrasion, scratching, and rusting (as well as a propensity towards easy care and cleaning). Painted metals are understandibly popular for reasons of cost or availability. It is the durability of painted metals, however, which have established them as a viable and popular surface material in the construction of bathroom cabinetry.

Mirrors

Lastly, we have the bathroom mirror. Since bathroom mirrors are made of glass, their durability is unquestionable - glass being one of the most non-porous surfaces available today. Surface smoothness - a quality evident in glass - is a necessary feature in the design of materials which are found in moisture-rich environments such as the bathroom. Glass is easy to clean, and can be manufactured in just about any shape or dimension which we desire. Glass mirrors can be a hanging element, or they can function as a finish surface over cabinetry or closets. Quite often glass mirrors are used in conjunction with other materials to create decorative cabinetry. Mirrors are frequently fabricated as beveled two, three, or four-unit cabinet doors, which "wrap around" the individual - enabling them to look upon all sides of their image in the mirror simultaneously. Lighting fixtures are often incorporated into the mirror (or located in close proximity to the mirror) to allow the user proper lighting while viewing. When mirrors are used as a veneer over cabinetry, mirrored doors can be constructed "frameless" (glass from edge-to-edge, uninterrupted by metal or plastic trim). When used in conjunction with concealed hinges and hardware, mirrors appear to "float" in thin air, allowing the viewer an unimpeded and "seamless" reflection (or image) of themselves. Mirrors are one of the most important elements contained in the bathroom environment - not because they serve a necessary biological function (such as fulfilled by the sink or toilet), but because they fulfill a stronger psychological need: they reveal to us our bodily surface - our personal appearance.

Permanence: Personal Expectations

The images reflected by mirrors are, in fact, the very reason why the bathroom has become so valuable to our culture. Bathrooms are the instrument by which our own

appearance is made "real" to us. Mirrors present us with the image of our bodily surface; images which, of course, rarely live up to the images of bodily perfection depicted by advertising and media. Mirrors exploit our deepest desires, and reveal to us our most hidden anxieties. Influenced by advertising and media, mirrors ultimately reinforce our insecurities, forcing us to place greater importance and scrutiny on bodily surface image. It is in the bathroom where we bathe ourselves daily, style our hair, dress ourselves, scent our bodies, apply our make-up, and where we attempt to satisfy media and culturally-influenced personal surface values. The bathroom has appropriately become one of the most critical environments of our homes and buildings - due to our increasing preoccupation with permanence on a personal level, as well as on an environmental level.

Body image has great significance to most modern Americans because our society emphasizes surface beauty, appearance retention, and personal "enhancement." Unfortunately, we are creating an aesthetic ideal which is beyond the ability for most people to attain - and virtually impossible for most people to maintain: "In our culture the media bombard us daily with the aesthetic ideal for the (female) body.....This ideal includes the following: (1) thin, with no fatty deposits; (2) firm torso, legs, buttocks, underchin, and neck; (3) long legs and neck; (4) long fingernails; (5) large, erect breasts; (6) thick, wavy hair; (7) perfectly straight white teeth with no obvious spaces between them; (8) perfect skin without wrinkles, pimples, scars, stretch marks, or even pores; (9) skin that is taunt and does not sag; (10) rosy cheeks; (11) arched eyebrows that end above the ends of the eyes; (12) no visible body hair. Half of our list is impossible for most women to attain and impossible for any woman to maintain. This ideal induces insecurity by making it virtually impossible for any contemporary woman, no matter how psychologicallly secure she may be, to not have a wide-ranging and deep-ranging horror of several of her own physical attributes."[18]

Our preoccupation with the image and permanence of "bodily surfaces" has lead to the creation of a multitude of "body-enhancement" techniques, such as facelifts, body-

waxing treatments, facial treatments, cosmetics, cosmetic surgery, nail sculpturing, hair styling, hair replacement, body sculpturing, artificial tanning, and so on. Each of these surface treatments is dependant upon technology: surgical proceedures, machinery used for body enhancement, products applied to the body surface, etc. These treatments are used to enhance the durability or "permanance" of the body, not unlike treatments which are applied to the surface of building materials. Cosmetics, for example, are a fine example of products which are used to enhance the physical image. With the aid of technological refinement, cosmetics enable our bodily surfaces to project the appearance of permanence and agelessness. The influence of technology in cosmetics production can be illustrated in an examination of waterproof makeup. Although makeup has been used by women (and men) for centuries, technology has provided a new twist. Makeup can be manufactured today so that it is waterproof. This is an important development in cosmetics, because the implications of waterproof makeup are striking - particularly with regard to our expectations of the bodily image. Advertisements for dyed eyelashes (taken from an unidentified manufacturer in Cosmopolitan magazine) give us insight into several of these implications:

"These dark, look-at-me-lashes are dyed, so eyes look perfect, even the first thing in the morning (no more sneaking off to the bathroom!) ...or after a swim...."

Several interesting notions are revealed in this brief advertisement. First, the eyelashes are artificial - manufactured (through technology) with permanent color and durability (implied). Second, the bathroom is referred to as a place of "sanctuary;" as if absolutely essential in the presentation and maintenance of the acceptable bodily image, ie: our natural appearance is not worthy to be viewed by others. Therefore, we must "sneak off" to the bathroom without someone seeing us. Thirdly, the image which this product brings to women allows them to retain a desirable appearance, regardless of the forces

which threaten to destroy that image. These potentially damaging forces include natural activities (such as sleeping) or environmental forces (such as water-showers, beaches, rain, etc.). Our goal is the creation of an "ageless" bodily image: an image unaffected by the time or environment (not unlike any other surface material). Lastly, the desired image which is marketed to the public is dependant upon technology to exist. The "natural" condition or image is no longer satisfactory.

In order for this image of "bodily permanence" to exist, an impervious and permanent "membrane" must be applied over ourselves (and over the built environment as well). The same criteria and expectations which we apply to the built environment are, not suprisingly, the same criteria which we apply to ourselves. Conversely, the anxiety and paranoia which we demonstrate toward our personal appearance is becoming evident in the built environment which we create. The natural state of surfaces is no longer acceptable to our society. With the aid of technology, a new image of permanence has become accessible to us; and we are using this newfound control to fix materials in time and space - permanently.

This is not to say that preceeding cultures cared any less about their visual appearance; obviously this is not so. What has changed significantly is the technology which we possess to create and maintain these surfaces. In each case study which we have examined - carpeting, bathrooms, and the human body, the factor most responsible for the increasing control we exercise over all surfaces is the influence of technology. We now possess the ability to wrap an impervious, permanent "membrane" over all surfaces; a membrane over which we have total control. The sealants, coatings, laminates, varnishes, bacteria treatments, cosmetics, veneers, and all other surface treatments we apply to surfaces have resulted in environments which are ageless and permanently encased. Moreover, we have come to view this unchanging quality as a natural feature of the environment. We believe such surfaces to be authentic to their predecessors, but in fact they are quite different. This "membrane of technology" has divorced us from contact with

natural materials, textures, and the aging process. The surface of the built environment is no longer answerable to time, wear, or aging. Even more importantly, we expect this to be so. We are becoming increasingly dissatisfied with surfaces which are not permanent and ageless. In an effort to preserve the original appearance of the visible world, we find ourselves desperately wrapping technology over all surfaces - from our buildings to our bodies. The end result of this preoccupation is that the quality of modern materials today refers only to their ability to retain their original appearance.

The patina of a copper-clad bay window (EVD)

In the past, people held an appreciation for surfaces which showed their "experience" or age. Deformations or imperfections brought about by wear or the environment were looked upon as a natural occurance. The thinning white hair of an elderly gentleman was symbolic of a wisdom and and knowledge which is only attainable when one experiences the challenges and tribulations of life. The patina of copper roofing on an old building symbolizes the many "battles" which have been waged upon the building by nature. The patina - worn by the building like a crown - is a symbol of its permanence, durability and "soundness." The worn wooden steps of an old New England church remind us of the many people who congregated there in years past. The simplicity of their lifestyles and the values they

held important were recorded as evidence in the surfaces of their environment. These expressions of "wear" - made clear to us by the surface of these objects - were understood to be a natural part of the aging process, inherent to the materials (and people) upon which they left their mark. The wear shown on these surfaces was evidence of their quality. Wear was considered to be an entirely natural feature. Surfaces which showed their wear and age acquired an irreplaceable value to the people and to the community, who understood these imperfections to be a symbol of the maturity and the irreplaceable heritage of the built environment. Surfaces which show us evidence of their wear and age communicate to us a unique character; a character which cannot be mechanically fabricated into a new material. These surfaces tell us about their place in time and space. These surfaces are uniquely authentic, and therefore give us a sense of our history, our cultural heritage, and the built environment in which we live.

Today, we measure the quality of materials by their ability to withstand aging and wear. Surfaces which do show their aging or their wear are looked upon as having diminished in quality. In effect, the quality of the "surface" now represents the quality of the object or material. In the rare event we wish to express wear or distress in the surface of materials, we build these qualities in from the start, and then permanently fix these qualities into the material - as if they have been frozen in time. Further wear and distress to the material will result in a reduction in quality of the material. The beauty of modern materials is no longer anything more than skin deep, but this skin has become more important to us than ever before. With advertising, media, and social expectations fueling our aesthetic values and insecurities, it is imperative that these surfaces remain perfect forever.

Interestingly, the proliferation, availability, and reduced cost of modern surfacing materials (created by improvements in fabrication technology) have conversely allowed surfaces to become more temporary than ever before in history. Materials (even traditionally expensive or ponderous materials such as marble or granite) have been

rendered common or temporary as a result of the production efficiency of the machine. Technology has removed the notion of material "rarity" from our built environment. For example, the removal or destruction of authentic, hand-crafted marble columns would be considered offensive to us. These materials have acquired a historical significance and rarity as a result the craftsmanship and labor required to create them. We recognize the perserverance required to fashion their image. Therefore, we make every conceivable attempt to preserve these elements. It is becoming less important, however, to preserve modern materials (such as thin marble veneers) - because they can be efficiently and cheaply replaced or modified. In addition, western cultures no longer make any attempt to recycle or repair new surfaces which show their age or wear; we simply replace them with new surfaces - made readily available by modern technology. The proliferation and availibility of materials, as influenced by technology, has in turn devalued the importance of building materials. In doing so, technology has increased the likelyhood of change on the larger scale - rendering materials and the built environment to be less permanent. We grow tired of the appearance of materials long before these materials actually "wear out." Although surfacing materials retain their surface appearance for longer periods of time, they are removed and replaced by our western "throw-away" society more rapidly than ever before.

In the past, the "permanence" of a building or material referred not only to the performance charactistics of materials themselves, but also to the character and integrity of materials as perceived by the individual. The awesome presence of ancient marble temples possess an undeniable aura of solidity and permanence, regardless of the fact that these materials showed their age and wear over time. Today, the "permanence" of our built environment refers only to characteristics of materials, and not the character of materials or the built environment itself.

V e n e e r:

Thinning of Surface

"It is important that you honor the material that you use.....You must honor and glorify (the brick) instead of short-changing it and giving it an inferior job to do in which it loses its character, as, for example, when you use it as an infill material.....The beauty of what you create comes if you honor the material for what it is. Never use it in a subsidiary way..."[1]

• Louis Kahn

"In 1859 (Oliver Wendall) Holmes had written that "every conceivable object" would soon "scale off its surface for us." Like animals in a trophy hunt, all manners of "Nature and Art" would be hunted down "for their skins," with the carcasses left to rot. To a large extent, this describes the practices of the style industry today."[2]

Surfaces have always been, throughout the history of architecture and urban design, an element of visual expression. Surfaces, by nature of their visibility, are among the most important elements of the built environment because of the information they convey. Surfaces also represent the aesthetic values and expectations of the society which creates - them by nature of their detailing, their opulence, their perceived status, or their assumed cultural value. Surfaces possess distinctive tactile qualities: textures, details, and patterns. All of these relationships and qualities are important when one considers the value surface materials.

It was possible, in days gone by, to identify and comprehend construction methods and levels of craftsmanship which were used to fashion buildings, through an analysis of a building's surfaces. The craftsmanship necessary in the construction of gothic stone churches of the thirteenth and fourteenth centuries, for example, was evident in the surfaces which the viewer perceived. The viewer of these churches understood that the materials employed in these gothic churches were not only painstakingly hand-crafted by talented artisans, but were also responsive to the structural capabilities and

characteristics of its materials. These structures relied upon both the structural and aesthetic qualities of the surface materials - working together "in harmony" - to fashion the images which were created. In short, buildings were expressions of materiality which remained consistant with the inherent structural characteristics of the materials which fashioned the building's image.

This is not to say, however, that surface materials have never been used purely for their aesthetic qualities. Quite the contrary; materials have been used throughout history to depict an image which evokes drama or elicits wonder. When constructing the famous Colosseum in Rome, the ancient Romans were among the first to use the Classic Orders of architecture as purely decorative elements - superimposing them over the perimeter of the exterior arcades. The use of these orders by the Romans contrasted sharply with the use of the orders as practiced by the ancient Greeks, who always used the orders to perform structural as well as decorative tasks. However, the pilasters crafted by the Romans, although defying the intended use of the classic orders, were ultimately fashioned with the same materials and construction methods as were the "true" classic orders. There was little difference in the fabrication methods or raw materials used in either of the two types of orders. The key difference between the two were the "roles" they were created to perform: one being both structural and aesthetic, the other merely as applied decoration.

Until the mid-to-late nineteenth century, materials had always been manufactured to perform these two interrelated functions. Neither function could be accomplished independently of the other; surface materials (in both interior and exterior applications) also served a structural function. These materials supported not only the live loads which were imposed upon the building (rain, snow, people, or furniture) but also their own dead loads. As a result of the co-dependence between a material's appearance and its structural characteristics, builders and architects were forced to consider both qualities when employing these materials. The inherent structural qualities of these materials defined their

structural limitations and applicability. In addition, the structural integrity of the building was dependant upon the each material performing a structural function (including the so-called "decorative" materials - such as decorative arches creating openings in masonry walls). Even the ornamental use of the classic orders by the Romans had to be carefully considered from a structural viewpoint, because the inherent weight and mass the stone contributed greatly to the loading which the structure needed to resist. The materials had to at least be cabable of supporting their own loads - there were no steel frames to aid in the carrying of the structural loads. In short, a "symbiosis" existed between the structural qualities of materials (including "surface" materials) and the aesthetic qualities of the material, even if the purpose of the material was that of decoration.

It is also important to keep in mind that most materials - even those employed as late as the mid-nineteenth century - were fabricated to express the structural qualities inherent to the material. Wood, for example, was used with particular attention being given to its structural capabilities, as well as its aesthetic qualities. Materials were rarely manufactured to be employed exclusively as a "composite" or "veneer" material. Although "ornamental" materials have existed throughout history, their use demanded consideration be given to the ability of the material to perform a structural role - albeit, at times, a minimal one.

The notion of materials performing both a structural and aesthetic function holds true even for building facades. Although it was common to apply neoclassic facades to masonry wall surfaces in the eighteenth century, the walls still were considered "load-bearing:" walls providing structural support for the building. Although these walls were commonly used as a type of decorative motif, these motifs still brought to bear their structural qualities. In designing buildings with these decorative walls, architects and builders were required to combine their knowledge of engineering and decoration simultaneously. Ornament performed a structural role, even if the only loads supported were their own.

Several buildings of the nineteenth century, however, changed the way architects and builders constructed (and more importantly, conceptualized) their buildings. Among these buildings, the Crystal Palace by Sir Joseph Paxton in 1851 and the Wainwright Building by in 1890 stand out as having greatly influenced the future of architectural materials and surfaces. It is important to remember that physical and conceptual changes in building construction (as demonstrated by these two structures) were directly influenced by emerging technologies now available as a result of innovations and refinements to existing fabrication processes, particularly in the fabrication of iron and steel beams.

The Crystal Palace was certainly one of the most influential buildings of the nineteenth century - not only in Britain, but throughout the world. The Crystal Palace was designed as an exhibition hall for the Great Exhibition of 1851. Constructed in what was known as the "Victorian technology" style, the structure was particularly noted for its cast iron structural frame and its elaborate (and extensive) glazing system. While this structure was not the first English structure to incorporate iron-framed structural componentry, (witness the Coal Exchange Building in 1846 by Bunning or the King's Cross Station by Cubitt in 1850), the Crystal Palace is perhaps history's finest example of the Victorian technology style. Crucial to the concept of the Crystal Palace was the notion that the building's structural system (the cast iron frame) and the "closure" or "surface" of the building (the glazing) could, in fact, become two entirely separate entities. Moreover, this structural system could appear to transcend physics itself. Its structural expression was far-removed from the massive and "weighty" Roman and Greek buildings which preceeded it. These earlier structures derived presence and power from the sense of "abundant materiality" which they evoked through their materials and surfaces. With modern iron and steel frames now providing structural support for buildings, the sense of "permanence" and "materiality" which characterized buildings of earlier eras was now replaced by structures and surfaces which aspired to "weightlessness" and "insubstantiality."

Surfaces of the built environment have always retained a definitive importance with regard to our expectations of the landscape. It is true that buildings of past eras also aspired to expressions of light and weightlessness. Gothic cathedrals, for example, exploited the visual qualities of openness and light - as did the Crystal Palace. Yet the surfacing materials of Gothic cathedrals were still bound, by earthly physics, to perform structural roles as well as visual roles. Structural systems did not yet exist which would relieve these surfaces from their structural responsibilities. With iron-framed buildings such as the Crystal Palace, the responsibility of surface materials to perform both structural and visual roles was no longer mutually required. These iron-framed structural systems trivialized notions such as "abundant surface materiality" and "permanence" and replaced them with notions of surface "weightlessness" and "immateriality." Later in the modern era, Walter Gropius, one of the major proponents of "immaterial" surfaces (such as glass), predicted that the "...sparkling insubstantiality (of glass)...(would lead to a)....growing preponderance of voids over solids."[3]. Arthur Pulos, writing about the Crystal Palace in *American Design Ethic*, suggested that the building required its observers to define a new structure of meaning. He claimed the Crystal Palace was "...light, airy, and almost fairy-tail like in its proportions.....the building appeared to be held up by the force of an idea."[4] Stewart Ewen, while arguing the connection between the appreciation of abstract values in economic wealth and increasingly abstract values emerging in architecture (in *All Consuming Images*), recognizes the inpending insubstantiality of future surfaces as influenced by the Crystal Palace when he writes:

"Seemingly without mass, the visual power of the Crystal Palace was a resonating break with a system of value rooted in concrete materiality, a forceful statement representing a culture that measured worth, more and more, in the imaginary and transmissible idiom of exchange and speculation."[5]

Two important implications in this on-going evolution in the design and construction buildings of structural-framed buildings (such as the Crystal Palace) are: (1) the surface materials - which became the predominant feature of the building (such as glazing) - were no longer responsible for supporting significant structural loads (requiring a new understanding of materials and surfaces); and (2) materials were now segregated into either of two catagories: materials which performed exclusively structural functions and materials which performed exclusively aesthetic functions. Taken further, materials were now looked upon as possessing two entirely different characteristics - qualities which could be totally independant from one another: a structural qualities and aesthetic or surface qualities. If a material was pleasing to the eye but could not support the structural loads incurred by the building, a structural system could be employed (using new technologies) which would allow these materials to be used strictly as a "surface" - nothing more. Other materials and systems could now be used to perform structural roles. In essence, the "structural frame" (the culmination of a long-evolving construction process) allowed the creation of buildings that were "mostly surface" - as opposed to earlier buildings which were "mostly structure."

Viewers of the built environment could no longer look at a structure and know precisely if the surface materials were, in fact, the materials which maintained the structural integrity of the building. In short, the separation of a building or material's surface from its structure had a profound and far-reaching impact upon not only the relative "applicability" of the materials (where and how they might be incorporated), but also upon the values and understanding of people who interacted with these artifacts. A critical "point of reference" had been stripped away from the observer of the built environment. Materials, as previously understood, were becoming less answerable to environmental forces, such as gravity. A trust which once existed in man's understanding of built surfaces had now been threatened. We can no longer be certain that exposed surfaces are, in fact, responsible for giving a building its volumetric integrity.

Structural frames were also instrumental in creating "finish" materials - more appropriately referred to as "veneers." A veneer is described in the New American Dictionary as having the character trait of "...concealing (something common or crude) with an attractive but superficial appearance; to gloss over."[6]. The important notions here (architecturally speaking) are at least two-fold. First, "veneers" are used to conceal or "gloss over" another material, implying a certain "surface deceptiveness" (in terms of intent). Secondly, veneers must be "applied" over another material (presumably a structural material); implying that the surface qualities of structural materials are inappropriate to perform aesthetic functions. Implicit in both descriptions is the notion that a "veneer" is something which is superficial. "Superficiality" is also defined in the New American Dictionary as "...being concerned with or comprehending only what is apparent or obvious; shallow; trivial, insignificant.....apparent rather than actual or substantial."[7] The implication here is that as materials become "veneers" or finish surfaces (and thus "superficial"), our exclusive preoccupation with surfaces will involve concern over materials which have become more "shallow", more trivial, and more insignificant. In fact, the surface of the built environment has become its substance, risking further material devaluation by the culture which inhabits it.

Whether or not the Crystal Palace - a truly significant structure in nineteenth-century architecture - is a "deceptive" structure is immaterial to this thesis. What is significant is the resulting shift in our comprehension and construction of buildings which follow the Crystal Palace, and the influenced of its technological innovations. One building so influenced was the Wainwright Building in St. Louis - constructed in 1890 and designed by Adler and Sullivan.

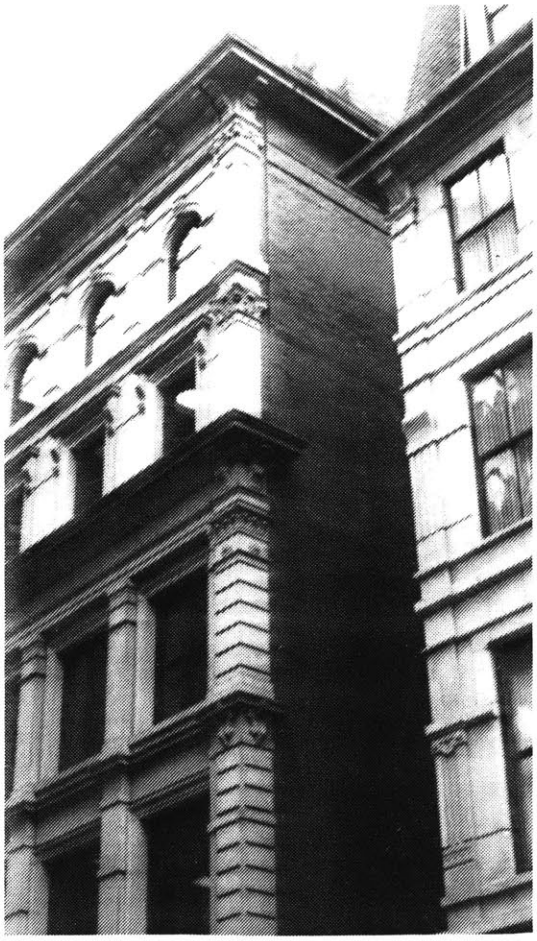
The Wainwright Building is significant because it was one of the first "skyscrapers" which addressed the relationship between a building's structural frame and the veneers used to craft its surface image. A ten-story building with a steel structural frame, the Wainwright building is particularly noted for the use of exterior materials in a

primarily a decorative and non-structural fashion (in addition to merely providing enclosure). The vertical structural columns of the building are expressed in a series of regularly-spaced exterior brick piers, separated by windows and recessed, non-structural metal spandrel panels. While the exterior materials chosen for the building (glass, metal, and brick) were obviously chosen with consideration being given to their weatherability and wear over time, these materials served no significant structural function, and were merely applied over a structural frame. The role of the brick in the Wainwright Building was closer to that of "decoration" than that of "structure." The building, while appearing to be constructed of a regularly-spaced series of brick piers, was actually a ridged steel frame, to which other materials were attached. The brick veneer used in the Wainwright Building is no more than a "decorative membrane" - an enclosure secured to a structural frame.

It is difficult, however, to distinguish the Wainwright Building from a building which has been constructed of solid brick or masonry. This is primarily due to the fact that the exterior surfaces used in each type of structure are true bricks, each inherently capable of supporting structural loads. It is often difficult to distinguish the differences between a building which employs materials for both structural and aesthetic purposes and a building which uses materials strictly as a veneer. Even so, one might classify a steel-framed building with a brick veneer as a "simulation" of a brick building, and not as a brick building in the truest sense of the definition. Taken further, the function of brick veneers is to deceive the viewer into believing that the building is, in fact, a solid brick building, and not a brick-veneered building. Technology has allowed us to control and manipulate the built environment to the point where its surfaces - the most essential elements in the communication of image and emotion - can be made to simulate any material or surface we wish.

As architects and builders used structural frames and surface veneers more frequently, interesting changes began to occur in the process of design and construction.

Up until the middle-nineteenth century, architects were required to give equal emphasis to the structural system of a building as well as its surface appearance. While this is true to a certain extent today, architects now place a greater emphasis on the appearance of a building, rather than its structural composition. Today, engineers are responsible for insuring the structural integrity of a building. With the separation of a building's structure from its surfaces, the function of the architect and the engineer have become more and more separate. The task of the architect is to create a particular "look" or "image," and the engineer's task is to design the building's structural system. In a way, their responsibilities are often at odds with one another - each grappling to perform individual tasks which were once indivisible responsibilities of the surface materials being used. The growing separation between the responsibilities of the architect and the responsibilities of the engineer can be directly attributed to the creation of the structural frame. Because walls no longer played a structural role, they evolved into decorative "curtains" ("curtain walls") which could be hung from the structural frame.



Facade as decorative ornament (EVD)

What is interesting to note is that as walls began to lose their structural significance, their decorative importance did not suffer a similar devaluation. In fact, their exclusive use as a type of ornament only increased. More attention could be focused on the importance of a material's aesthetic qualities because less attention need now be spent on a material's structural qualities. Structural frames took upon themselves the

entire responsibility for maintaining the building's structural integrity. It did not take long for architects and engineers to realize that a relationship existed between the weight of the surfaces and the complexity and cost of the frame itself. It became in the best interests of builders, architects, and owners to keep the structural frame as simple and as efficient as possible. Intelligent design and efficient planning aided in this effort, as did increasingly efficient high-strength building materials. Refined structural materials and systems allowed longer spans and narrower structural cross-sectional areas, reducing construction costs while increasing the structural capacity of the building.

Ultimately, however, more significant improvements to the structural potential of the building frame were found in the refinement of the building cladding system: the building's surface veneers. By lightening the loads which the building frame was required to resist, the frame could then also be made lighter, saving raw material. This material savings also simplified fabrication, delivery, and erection - reducing the cost of construction dramatically. Less material now meant less cost and greater construction efficiency. Value was now placed upon reducing the weight of the surface materials which were applied to the structural frame. This was most effectively accomplished by "thinning" all surface materials to their most minimal dimension. The thinning nature of building materials has had a profound impact upon how we design, create, interact, and place value in our built environment.

Veneers are surfaces which conceal other surfaces. These veneers, therefore, deal with issues apparent rather than substantial. In contrast to materials of earlier ages, whose application necessitated consideration of their structural and aesthetic qualities, veneers may be considered (for all intents and purposes) independant of the building structure. By nature, the intent of these surfaces is to conceal, deceive, or simulate. In examples such the Colosseum in Rome and the Wainwright building in St. Louis, the deceptive nature of these veneers is more difficult to distinguish. This is due to the fact that these veneers are used in a manner which is almost imperceptibly modified from the "authentic" or more

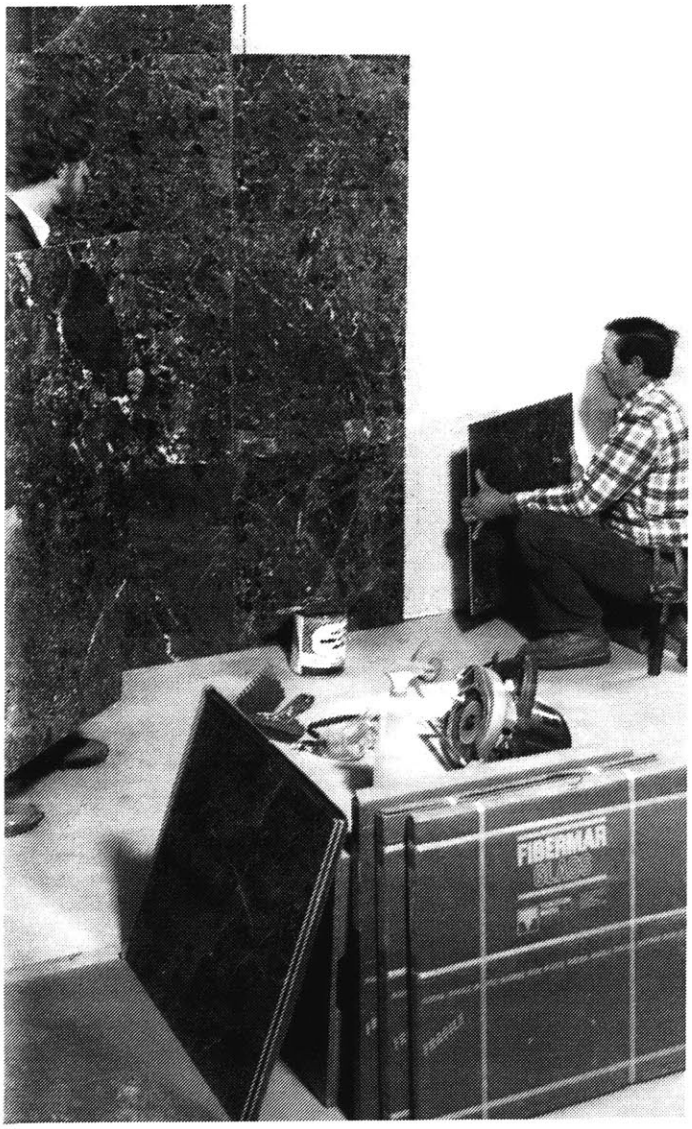
traditional condition. Without significant modification to the appearance of the finished structure, the materials used as surface veneers in each structure could have, without great difficulty, been used as the building's structural materials. Regardless, these ornamental surfaces defied the intention and purpose of their surface predecessors, which not only necessitated but celebrated the expression of a material's structural qualities as well as its aesthetic qualities. The growing deceptiveness of modern materials, however, is further confirmed in situations where materials - originally possessing ponderous weight and mass - have subsequently been "thinned;" are now used in situations which would not be possible without additional structural framing or reinforcement. The structural frame and the subsequent thinning of surfaces has allowed materials to be used in applications which are not technically possible if these materials are used in their natural, unenhanced state (this includes interior surface materials as well as exterior surface materials). An illustration of this may be found in the examination of one such material: marble.

Marble is a building material which has been used throughout history, primarily because of the natural beauty of the material and the strength which we have come to associate with this natural stone. Greek and Roman temples employed marbles for many centuries. Some of the finest buildings ever constructed in recorded history have been constructed with marble, which usually was cut into massive slabs or blocks capable of supporting substantial compression loads.

Marble is quarried from natural quarries around the world in the form of huge slabs. However, like every other material employed today, marble is used primarily as a veneer material. This can be attributed to the high cost of the marble and the ponderous weight of marble slabs - which must be supported by the building's structural frame. If quarried slabs were used in today's modern buildings, the structural frames which support these slabs would have to become prohibitively massive in order to support them. It therefore becomes necessary to slice marble into thin sheets, which is accomplished by "gang saws:" a series of steel blades set in a parallel frame which move backward and

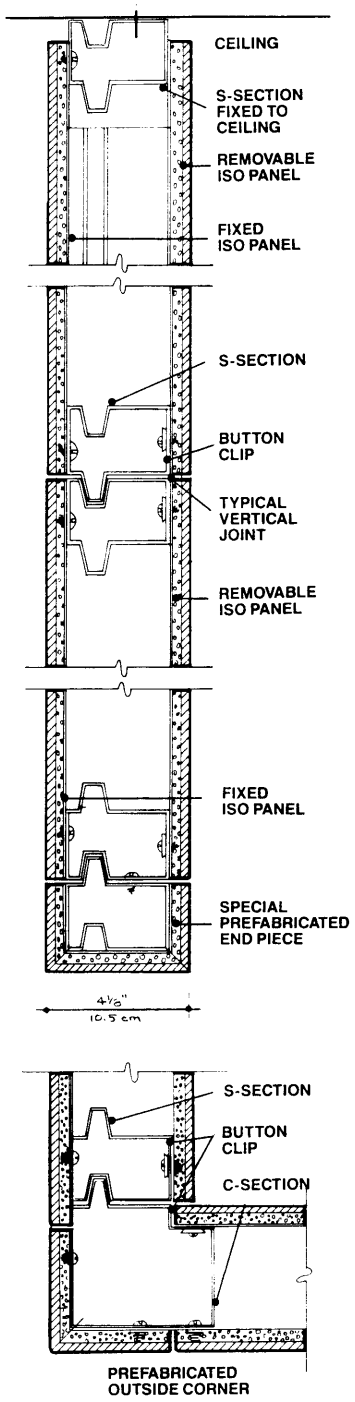
foward. Most blades used to cut stone today are diamond-tipped blades, which allow for precise and reliable cuts, even through densest stone material.

Most marble manufactured today is fabricated into one of seven distinct thicknesses: (1) greater than five centimeters (or >2"); (2) Five-centimeter stone, (or 2"); (3) Four-centimeter stone (1-1/2"); (4) Three-centimeter stone (1-1/4"); (5) Two-and-one-half centimeter stone (or 7/8"); (6) Two-centimeter stone (or 3/4"); and (7) Marble tiles (less than 2 centimeters, or 1/4" - 1/2"). Most marble veneer used in modern buildings is in the range of 2-3 cm, or in the growing catagory of marble tiles. Marble which is greater than 5 cm (2") is also known as "cubic stock." Cubic stock is extremely expensive and heavy - and modestly, if not rarely, used in today's veneer-oriented buildings.



Carpenters installing marble tile with adhesive

Most marble installations today involve the construction of a rigid sub-structure, to which the veneer sheets are then attached. Because structural responsibilities have been removed from the marble by the sub-frames, it is no longer necessary to use ponderous and expensive marble slabs. As



Detail: demountable marble partition © Marble Technics, Ltd. 1989

stated earlier, it is the interest of all parties involved in the erection of these materials to reduce the amount of material the structural frame must be forced carry. This is best accomplished by reducing the cross-sectional area of surface materials to their most minimal dimension. In the case of marble, this dimension may be as thin as 1-2," or as thin as 1/4" in the case of marble tiles. The result of our ability to fabricate materials of this slenderness is a proliferation of marble-veneer buildings whose surface material is extremely thin - no more than 1-1/2" - 2" thick. In the case of marble tiles (which are commonly 1/4" thick), marble is now used in locations which, only century ago, were technically unfeasible. Marble tile is applied over the residential tubs and vanities of middle-income residents, on walls and floors of modest commercial and retail establishments, in the private offices of business executives in high-rise offices, and on the walls of high-rise elevator cabs. Before the use of structural frames, marble was a material possessing great weight, strength, and perceived economic status. In today's world, marble is exclusively used as a superficial veneer, and can be found on any surface one might imagine. In the words of architect Kenneth Walker, FAIA: "....marble has become the linoleum of the 1980s."[8]

Today's marble sheets are precisely trimmed and sliced by highly-controlled computerized saws, and held in place with concealed structural frames (not unlike a

stageset). The ability for marble to be manufactured into thin veneers has ultimately allowed the material to defy the natural structural characteristics inherent within the material itself. Marble can now - by virtue of its light weight, flexibility, and thinness - be used in situations which were impossible when used in ages past. In effect, the thinness of materials such as marble in the modern era forces us to reconsider the nature of our built environment, with regard to both time and space. Materials such as marble veneers seem to defy gravity; they are no longer grounded in earthly physics. The ever-thinning nature of historically massive materials has "changed the rules" with regard to our understanding of surfaces. The influence of modern fabrication and structural technology and upon traditionally ponderous materials has been to release these materials from their physical and structural responsibilites - and liberate their use from the bonds of their inherent natural qualities. Unfortunately, one of the ill-effects of this "liberation" has been the trivialization of nearly every vantage point of sensibility and understanding which we once relied upon in our comprehension of the built environment. It is difficult to bring the same understanding of materials and their nature to bear in an environment where all of the "ground rules" have been altered.

Modern fabrication technology has also allowed materials to be manufactured such that the inherent deficiencies of these surfaces may now be compensated for through the use of structural "enhancements." Let us return to the case study of marble. Because marble is formed by natural geologic processes, a great many surface variations and structural "faults" commonly exist. These "faults" may be defined as geological flaws, lines of separation, or "veining." Quite often, the marbles which possess the highest number of "faults" or "veining" are the marbles with are selected for highly-visible areas. This is because the natural surface variations and veining are particularly rich in character - and aesthetically quite pleasing. Because these highly-veined marbles possess a great many "irregularities," however, their structural integrity and uniformity may, at times, become questionable. These "faults" or imperfections are subsequently weakened by the

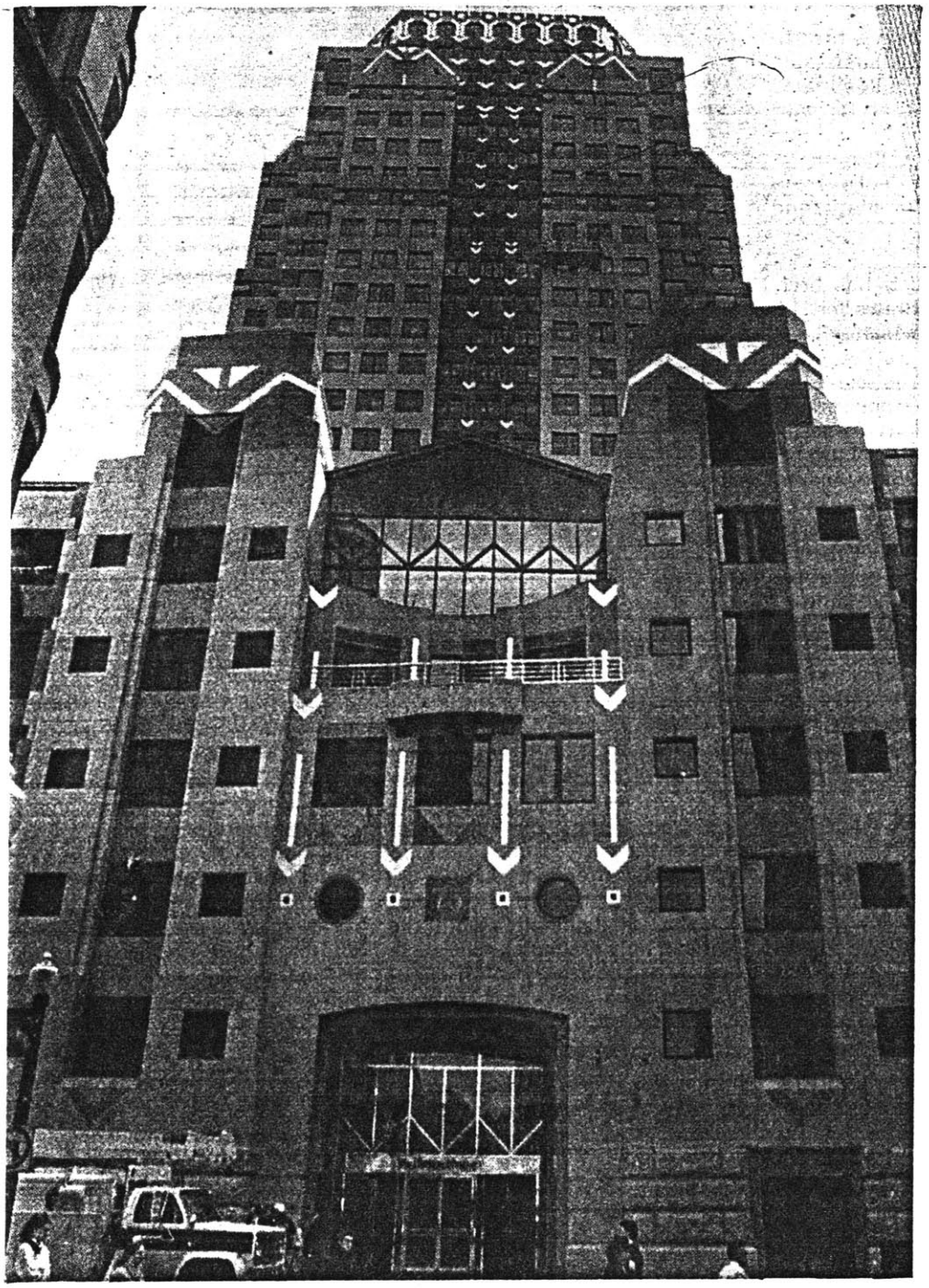
slicing of marble thinner than ever before. When a stone such as marble - with elaborate cross-veining and many natural irregularities - is cut into four foot-by-seven foot sheets (with a thickness of less than two inches, for example), it becomes necessary to reinforce these sheets in order to insure their physical integrity. In the past, the thickness of the slabs themselves insured their structural integrity. Today, with an increasing emphasis placed on the "thinning" of such materials, it becomes necessary to use alternate methods of reinforcement.

Large sheets of marble may be reinforced in several ways. First, structural framing members supporting their load may be stiffened or allow for the more frequent fastening of the veneer by mechanical means (such as with screws, dowels, brackets, or bolts). Another method of enhancing the structural integrity of the panel is to use stiffening "boards" or reinforcing members, which are mechanically attached to the concealed face of the veneer panel. Lastly, marble veneers may be reinforced with the use of a stone liner, which is typically a mesh reinforcement, such as fiberglass. In every situation, an effort is made to reinforce the structural integrity of a material which, in its naturally-occuring state, would be inadequate to perform to the same structural role (given the physical constraints and thinning dimension of the material). The structural "enhancement" of the marble veneer may also be described as a type of "deception," because the material (in its natural state) does not possess the structural integrity needed to maintain the form and dimensions in which they are being fabricated. In short, these veneers are structurally inadequate for the role in which they are being asked to assume. By enhancing the structural integrity of these materials (through means inconsistant with the natural qualities of the material) we are, in effect, deceiving the viewer; who believes the surfaces presented to him are not only naturally aesthetically pleasing, but also naturally structurally sound. The viewer places a trust in the surfaces he sees; that the qualities which are revealed to the eye are faithful to the structural nature of the material. This is not necessarily the case, however. No attempt is made to reveal to the viewer the methods of

reinforcing used in the the construction of these veneers. On the contrary, great efforts are made to insure that these structural "enhancements" are hidden and concealed from the eyes of the viewer. If the enhancement of the material were to become known to the viewer, the perceived surface quality would be destroyed, devaluing the learned integrity of the material. It would be disorienting for most viewers to find out that the massive marble walls which they marvel at in the lobbies of their office towers are, in actuality, one-and-one-half inch sheets (or less) of thinly sliced, reinforced material:

"I had previously observed that the fronts of stone or marble (dirt-colored stone and...streaked marble) were mere facings...forming an outward coating to the...walls of brick! Indeed everything here is done as if no man had any faith in the stability of things - as if each and all were engaged in a rough and rumble scramble, and recklessly grabbed at whatever chance threw his way. The general taste is barbarous; and the exceptions...are but servile imitations, or exact fac-similies, of European dwellings."[9]

Stone temples in ancient Rome derived much of their presence and sense of permanence from the fact that viewers of these temples understood them to be solid stone. The great weight and mass of these temples (which were laboriously shaped, honed and polished by craftsmen and artisans) played a key role in the understanding and aesthetic value which was placed in these structures. Today, we are being lead to believe that comtemporary structures are finely-crafted artifacts of ponderous, natural stone. Instead, these surfaces are simply lightweight "curtains" of stone which decorate cold steel frames - a masquerade of superficiality rather than a statement of substantiality. These stone surfaces are, in essense, "images" of stone buildings. As such, questions must be raised with regard to their value and authenticity. In the case of ever-thinning veneer materials, we see a level of inauthenticity which had only been alluded to in buildings such as the Wainwright Building.



75 State Street: The surface "image" of a stone building - without its substance.

Today, modern structures encased in veneers of surface images are becoming the rule rather than the exception in our built environment. These buildings and materials have

lost their presence in time and space. Their uniqueness and reliance upon their physical properties has been stripped away from them by modern fabrication and construction processes. When discussing the new 75 State Street tower in downtown Boston by Graham Gund and Adrian Smith of SOM, Peter Forbes - president of the Boston Society of Architects, commented:

"I think its the most vulgar building I've ever seen. Its architects have used rich materials like gold and granite in such a way as to make them look like plastic. They've tried to substitute costly materials for good architecture."[10]

The trend toward thinner building materials is not limited, however, to gold and granite. This trend applies to virtually all of our modern building materials. The increasing value of thinner surfacing materials has left few exceptions to this ideal:

"The thickness of Wolverine sidings reflects optimum performance in a premium product...(Wolverine sidings are) an extraordinary 0.055 inch thick for unheard of strength and durability..."[11]

"GL Marble, a 1/4" thin veneer of real marble reinforced with a fiberglass backing, is a remarkable and versatile new product....it can easily be installed, like tile, on walls and floors with thin-set adhesives over any level surface."[12]

"Corian® sheet products are available in three popular thicknesses. One-quarter-inch sheet is recommended for vertical wall applications, such as tub surrounds and shower walls. One-half and three-quarter-inch sheets are available for countertops, vanity tops, and partitions."[13]

"(Satinglo® glazed ceramic mosaics are).....modular 2" by 2" in size with a cushion edge, only 1/4" thick."[14]

"An answer to the common quarry tile: Genesis® porcelain tile....only 5/16" thin - 20% thinner than quarry tile, yet 27% stronger than natural granite."[15]

As veneers have become thinner in cross-section, they have been divorced from the physical constraints which once bound them. Having been relieved of their structural burdens, veneers are applied to surfaces and contexts which were not possible in age of naturally-occurring materials. Among the physical constraints which have been made trivial are gravity, cost, and context. The removal of these constraints has created a built environment which demands new methods of interpretation. We may no longer apply the same values to modern built form as we did to buildings of years gone by. Our basic instincts and sensibilities concerning the built environment are being challenged by new rules which govern the creation of modern surfaces. An old saying states: "I'll believe it when I see it." With modern built environment, (an environment which thrives upon simulation and depiction), we can no longer have faith that the images we are viewing are authentic - or in other words: "I'll see it when I believe it."

The conflict between "authentic" building materials and "simulated" building materials becomes even more volatile when veneer materials are manufactured from synthetic materials in an effort to depict or simulate natural surface materials. Using one material to simulate another material is not a new concept. This practice has been magnified, however, with the creation of the structural frame. Thinner veneers have allowed surface materials to masquerade as other materials; partially due to the lack of structural responsibility which the veneer enjoys. Veneers can therefore be constructed of lightweight "shells" which serve a purely aesthetic function. This method of surface

depiction is could more appropriately be labled surface "illusion," as argued by Egon Friedell in 1954:

"It is the era of a universal and deliberate swindling in the use of materials. Whitewashed tin masquerades as marble, paper mache´ as rosewood, plaster as gleaming alabaster, glass as costly onyx...."[16]

The trend of using one material (usually synthetic) to depict or simulate another material (usually a "natural" material) has escalated today to include every conceivable surface material, both exterior and interior. In every case, modern technology and improved fabrication processes have been the most powerful influence in the production and maintanence of these materials:

"The embossed surface of Wood Traces® (ceramic tile) provides a rich wood grain appearance on a semi-vitreous body composed of shale and fire clays."[17]

"Kentile® Terrazzo (vinyl tile).....will give your clients all the beauties and long-lasting qualities of a terazzo floor without the expense and bother of an involved installation."[18]

"The carpentry work required to create beaded wood panels makes them prohibitively expensive for most applications. But now the same look is available as part of the Restoration® line of premium vinyl building products. Not only can you get authentic appearance for porch ceilings, soffits, curved surfaces, and wainscoting, but also the long-lasting benefits of vinyl construction....The craftsman-like details that have distinguished some of the classic architectural forms of all time have been updated for today in durable, easy-care vinyl."[19]

Notice several interesting features of the last quote. First of all, we again see the influence of modern technology in the creation of these depictions or simulations which attempt to deceive their viewers. Secondly, an interesting notion is suggested within the paragraph itself. Notice in the third sentence. The advertisement boasts: "Not only can you get *authentic appearance* for....." This is perhaps the most critical claim in this entire essay, because it gets right to the heart of the issue of modern-day "authenticity." In the past, the "authenticity" of buildings and materials referred not only to the "look" of the building or material, but also to the way these materials were prepared and they method by which they were assembled. Simply put, "authenticity" referred to the means as well as the ends. Today, "authenticity" has been given a new definition (perhaps its very essence): the "look" of the finished material. This may have nothing at all to do with the material which is being depicted, or the methods which were used to fashion its surface image. The disjunction between a material's surface and structure (which became most obvious when the structural frame created the building veneer) was a pivotal event in the history and future of our built environment. Our subsequent preoccupation with the concealment or simulation of surfaces has served to divorce us from the physical and tactile qualities of the natural materials which once comprised the built environment.

The "art" of using materials, such as paint, to depict other surface materials has existed for many centuries. Known as "faux" (and pronounced "foe"), this word is derived from the French word meaning "false." As one might expect, faux is enjoying a vogue these days. With the use of faux, one can depict any material one desires - on any surface imaginable. One can even depict a type of wood grain or marble surface which does not exist in reality. Artists have the ability to create faux marbles, granites, woods, glazing, metals, murals, or even faux environments, complete with landscapes and people. It is true that wall murals and paintings created by Renaissance artists also tried to animate surfaces by depicting scenes or materials as realistically as possible. The major difference between wall murals of past centuries and the faux depictions of today is that

wall murals of the past were clearly understood by the viewer as being a painting, and not an extension of reality. No matter how realistic the images painted by Renaissance artists, there was never an attempt made to literally deceive their viewers into thinking that these surface images were "real" objects or environments. The scenes which depicted in these ancient murals were not a literal extension of the buildings on which they appeared. Instead, these murals usually depicted a scene from history, a public figure, a "god" or "gods," or a fictitious legend. These murals are understood to be individual expressions of art, and they make no attempt to deceive their observer into believing they were anything else.

Faux murals and depictions today, however, have quite a different intention. Faux is a deliberate attempt make the viewer believe that what he is seeing is in fact another type of material or surface. The realization that faux depictions are not "real" materials only serves to lessen their value. Although we accept these materials as being a new type of surface, we hold no lasting value or reverence for them. We would not think twice of demolishing a faux-marble column during a renovation; the faux image has little lasting value to us. An authentic marble column, however, would evoke a far different response from us; a desire to preserve, to restore, or to relocate. This is because people understand that the visual image of the material is not the only criteria for the assessment of its value. Significant value is also given to the material's heritage, its history, and its craftsmanship; qualities which are apparent to us in the tactile as well as the visual characteristics of the material. Robert Campbell, in discussing 75 State Street, comments:

"Inspired by the famous gold decoration on Art Deco masterpieces of the past, it (75 State Street) lacks one crucial quality: a sense of craft. It might as well be paint. All of 75 State's exterior is like that, resembling adhesive veneers more than solidly-built architecture."[20]

With modern technology, we possess the ability to create faithful images of these authentic materials. We understand these images, however, to be reproductions or faux images of the original; and as such they will never hold the same value for our culture. Berger writes:

"In the age of ....reproduction.....meaning becomes transmittable: that is to say it becomes information of a sort, and, like all information, it is either put to use or ignored; information carries no special authority within itself."[21]

Faux depictions, on the other hand, might be considered among the most sophisticated of all veneers, because they have attained the most minimal "thinness" possible in the physical world: two-dimensionality. It is as if the veneer or surface of our modern buildings have become so thin a "membrane" they have ceased to exist as three-dimensional in form. Taking this notion one step further is the next impending generation of surface faux: photography-based veneers.

Surfaces have become not unlike a "photograph;" for in reality, the use of photography in the fabrication of surface veneers is becoming more widespread and sophisticated than ever before in our history. Photography is employed in the fabrication of a variety of modern veneers, particularly in the realm of laminates. For years, laminates used in cabinet making have used photographic processes to depict other materials, such as wood or stone. For many years, the images created have been relatively crude, diminishing the effectiveness of the deception. Today, however, technological advances in photography are allowing us to enhance and reproduce these images to such a refined degree that it is quickly becoming difficult to determine whether these images are photographs or authentic materials. By embossing surface texture over these photographs, it is becoming increasingly difficult to distinguish photographic veneers from authentic materials on the basis of surface texture. With our increasing technological ability to create

photographic veneer, we can also simulate surface shading and textural shadow with unprecedented photographic clarity. A fine example of this can be seen in the photographic reproduction of paintings.

Using a combination of large format instant photography and state-of-the-art digital image processing, it is possible to photographically reproduce every crack, brush stroke and every thread of the surface of a painting in precise color, entirely faithful to the original painting. The technique for reproducing life-sized paintings through photography was developed in 1976 by Dr. Edwin Land, the founder of Polaroid. Each replica is made from a negative which is the same size as the original painting, insuring a high level of detail. The most important feature of this process is the precision with which these images are scanned and measured, and the accuracy of the final replica in relation to the original:

"To accomplish this, each original artwork is photographed individually with a special photographic calibration target requiring nearly 2,000 separate color measurements....(which are) then digitally scanned into a computer where each image is divided into 24 million individual picture elements, each with separated red, green, and blue value.....By using such a large piece of film, one is able to retain almost 500 times the amount of detail contained in a 35mm negative.....since the photographic process is repeated in the making of each and every reproduction, quality and accuracy are assured."[22]

"Although the photographic surface is two dimensional, even art experts cannot believe the replica's precise visual rendering of the impasto texture in the paintings."[23]

This process has been used (in 1982 and 1983) by Vatican Museums in order to bring the best possible reproductions of their unmovable or fragile artworks to universities and art schools around the world. Because there is no reusable negative used in this

process (the light-sensitive material used in the negative is expended after each print), each photographic replica is made directly from the original work of art. Polaroid, because of this replication process, considers this reproduction an original piece of artwork in its own right. In fact, a "certificate of authenticity" is provided with each museum replica:

"Each replica is provided with a signed certificate of authenticity from the Polaroid Museum Replica Collection. This document helps to assure you of the value of your investment and clearly indicates the work as a museum quality Replica exclusively from Polaroid."[24]

Of course, all this certificate of authenticity validates is the fact that the photograph itself is authentic; not that the photograph is an authentic work of art. In fact, the photographic reproduction is something less than the original, because the reproduction of any surface loses the presence in time and space possessed by the original surface. In his classic essay "The Work of Art in the Age of Mechanical Reproduction," Walter Benjamin maintained that when a painting or other work of art is reproduced, the painting loses "...its authenticity...its testimony to the history which it has experienced...its traditional value within a given cultural heritage."[25] The reproduction is less sacred than the original, therefore it loses its original meaning. If this technology is applied to the fabrication of building materials and veneers, the result is much the same. Using photographic processes to simulate building materials - no matter how sophisticated the surface image may be - is something less than using the authentic material. The technology used in the fabrication of modern veneers, while giving us remarkably high-quality reproductions of materials and surfaces, have also divorced us from the nature of real materials and textures. We are creating a built environment which is becoming increasingly separated from its history, its heritage, and even from reality itself. What is more important is that we accept these reproductions or simulations as being authentic. Deception has become our reality -

inauthenticity has become our authenticity. The true value of our built environment lies not in the creation of "authentic" artifacts but in the creation of effective simulations of materials and buildings.

With the aid of technology, the distinction between real surfaces and simulated surfaces is becoming increasingly ambiguous. We have the ability to so precisely recreate any material or surface with new technology that we will someday no longer be able to distinguish between reality and simulation (and we may not even care to do so). The "veneer" or depiction of surfaces have become so widely accepted in our society that we believe them to be, in fact, authentic surfaces. Technology has refined and honed the essential aesthetic qualities of our environment into ever-thinning veneers which are applied to surfaces without apology. As the surface of our environment grows thinner, we inversely place greater value in the fabrication of surface illusion. We have become dependant upon the illusion of our surfaces - surfaces increasingly insubstantial and superficial. We apply veneers to our buildings, to our possessions, and to ourselves. When we look beyond the surface of the built environment, we will find that the superficiality and deception evident in our built landscapes are merely reflections of our own changing values and priorities.

In much the same way that sophisticated new technologies have allowed the photograph to be used as a building material, we find similar technologies transforming and thinning building materials into photographic images themselves; complete with the same visual qualites, the same seductions, and the same capabilities for misuse and misrepresentation. The physical world is taking on the qualities of the photograph, in much the same way that the photograph is taking on the qualities of the world itself.

P r e s e r v a t i o n:

Surface Value

"Throughout the age of Haussmann and Baudelaire, and well into the twentieth century, (the celebration of urban vitality, diversity, and fullness of life)...crystalized around the street, which emerged as a primary symbol of modern life. From the small-town "Main Street" to the metropolitan "Great White Way" and Dream Street," the street was experienced as the medium in which the totality of modern material and spiritual forces could meet, clash, interfuse and work out their ultimate meanings and fates."[1]

"The street is really a room by agreement.....The walls that flank the room are the buildings that are on it."[2]

Up until the post-World War One era, the street and the surfaces which formed the street were considered among the most critical elements of the built environment. The relationship between street and building surfaces of the city and the people who interacted with them was one of intimacy and mutual understanding; each making a vital contribution to the reality of the city. The street was the center of urban life; all activity revolved around the street and the walls which formed it. Jane Jacobs understood the relationship of subtleties which existed in these delicate environments:

"Under the seeming disorder of the old city is a marvelous order for maintaining the safety of the streets and the freedom of the city. It is a complex order. Its essence is intricacy of sidewalk use, bringing with it a constant succession of eyes. This order is all composed of movement and change, and although it is life, not art, we may fancifully call it the art form of the city, and liken it to dance."[3]

People worked, lived, and played along these streets. People also established relationships and understandings of the buildings and surfaces which comprised the street; from the texture and and intricacy of street and sidewalk surfaces to the sensitive

articulations of building surfaces and facades. To the present-day observer, streets of the nineteenth and early twentieth centuries might appear haphazardously planned and entirely lacking of order and organization. In reality, these street and wall surfaces were part of a more intricate and complex order. They possessed a character and material quality which were instrumental to the vitality and livelyhood of the street itself. Moreover, the meaning and importance of these surfaces were understood - both consciously and subconsciously - by the people who inhabited these environments.

Jacobs frequently alludes to many delicate relationships which exist in these street environments. Implicit in her writings is the notion that the street's built surfaces play a critical role in this activity. Jacobs frequently questions the insensitivity of modern architects and developers, and their failure to recognize that urban form plays an instrumental role in the creation of these intimate relationships between the city's inhabitants and the city's surfaces. These relationships include relationships of scale, materials, detail, age, and tradition. The character and vitality of the street owes as much to the surfaces which comprise the street as it does to the people who inhabit these streets.

The nature of the surface elements of older cities (such as the bricks, individual panes of glass, wood trims, awnings, light fixtures, etc.), possessed a scale and "understandibility" which allowed inhabitants of the city to establish personal relationships and understandings with these surfaces. Street "walls" were sensitively crafted with materials and and a level of detail which evoked a sense of material honesty, integrity, and human scale. Street walls themselves were subdivided into individual and often randomly-sized storefronts or shops. Sidewalk surfaces were often constructed with individual bricks laid in random patterns, which responded to the geometries of the winding, narrow streets which characterized American cities of the eighteenth through early twentieth centuries. These streets and sidewalks were direct descendants of the pastures and dirt roads which preceeded modern street surfaces. Individual glass panes in storefronts were separated by delicately crafted wood mullions, which encouraged a personal

understanding of human scale and sensitivity. The simplicity and sensitivity of street and building surfaces possessed a scale and texture reminiscent of private homes and apartments themselves. The street was a type of room, created and inspired by the surfaces which formed it. These surfaces acquired a significance which was consciously and subconsciously understood by its inhabitants. It was a personal and intimate understanding.

Developers and architects of the post-World War One era, however, turned their backs on the romance of the street when they introduced their great modern visions to cities. Designers and developers gave little significance to the intimacy of the street and its surfaces, opting instead for the purity and abstract appeal of the machine-inspired curtain wall. When surface, rather than structure, became the predominant form of material expression, buildings came to be seen as objects; objects in which the surface assumed the primary visual importance. The understanding of a building as an individually-significant form of material expression in turn necessitated their separation from other structures, therefore destroying the concept of the street-wall. As previously discussed, the creation of surface veneers also strained the relationship which existed directly between people and the built environment. New surface values emerged, influenced by increasingly-refined manufacturing processes. Materials were designed to retain their surface qualities, regardless of aging or environmental abuse - straining our understanding of materials as an artifact grounded in time and space.

Modern designers and developers also gave an increasing importance to the accomodation of the automobile when designing the form and surfaces of the city. Streets were organized to allow for the speed of the car, becoming wider and more linear in nature. In their quest to accomodate the automobile, planners and designers severed the sensitive relationship between the city's people and the materiality and scale of the street's surfaces. Modern architects fancied visions of glass towers in vast open plazas or park-

like settings. Buiding surfaces, aided by new technology and steel structural frames, became more rational and "scaleless" in their construction and organization.

As men returned from the war overseas - and both the construction industry and the population boomed, the image of the skyscaper became the driving force behind modern architecture. Streets and their intricate surfaces were forsaken for the purity and the rational presentation of orderly, modern building forms and surfaces:

"Much of Boston's development in the 1960s and 1970s was designed in the International Style of architecture, with its emphasis on steel and glass. The results were often ornament-less, monolithic structures that seem to be almost monuments to themselves."[4]

New streets and automobile suburbs emerged; transportation speed and efficiency increased in importance. The "death of the street" became the rallying cry for modern architects and designers.

In the twenty five years following the death of the street, massive waves of reconstruction and redevelopment took place. Large swaths of property in densely-populated ethnic city-centers were cleared to make room for orderly, rational modern structures. The intimacy which once existed between the street surfaces and the city's inhabitants existed no longer. Modern architecture, in addition to accomodating and celebrating the automobile, abstracted and distorted the form and function of the "street-wall" itself. The "death of the street" necessarily implied the "death of the street-wall," as previously understood. This was indeed the case in most American cities in the years directly following World War Two, continuing until the late 1960s.

Designers and developers of the 1950s and 1960s failed to realize the important relationships which existed between the surfaces of the street environment and the people who lived there. Designers only could see decaying and disorderly urban relics, void of

order, rationality, or importance. In an effort to bring order and efficiency to the city, developers destroyed the sensitive urban ecology which once existed by removing many of these old structures and neighborhoods. Architects and planners replaced these antiquated street surfaces with modern surfaces and detailing, which offered little in the way of character, charm, human scale, or vitality. New surfaces void of detail or interest replaced the ornate and rich facades which once existed. Buildings and streets were rationally subdivided into regular, orderly parcels, removing the sense of spontaneity and diversity which was once an important feature of pre-modern street surfaces. Marshall Berman describes the changes which occurred in cities in the years following World War Two:

"For twenty years, streets everywhere were at best passively abandoned and often (as in the Bronx) actively destroyed....within the space of a generation, the street, which had always served to express dynamic and progressive modernity, now came to symbolize everything dingy, disorderly, sluggish, stagnant, worn-out, obsolete - everything that the dynamism and progress of modernity were supposed to leave behind."[5]

A fine example of modernist insensitivity toward the urban streetscape can be witnessed in the construction of Boston City Hall, designed by architects Kallmann, McKinnell, and Knowles in 1969. J.C. Palmes, in Sir Bannister Fletcher's "A History Of Modern Architecture," writes of the new city hall:

"...a stark impressive trapazoid of exposed concrete and brick, apparently doorless and therefore open to the public by night and day. It is an architectural extension of the huge brick-paved City Square and the *piece de resistance* of a new civic center, which has given space and a measure of unity to a district badly in need of regeneration..."[6]

The "doorless" nature of the structure might also be perceived as the lack of an invitation to the people of the city, which is probably a more accurate assessment of this imposing and impersonal concrete structure. In any case, Palmes fails to note that in order to make room for this vast plaza and new City Hall building, hundreds of acres of sensitively-crafted buildings and many winding streets (dating from the mid-to-late nineteenth century) had to be cleared away. Entire neighborhoods were erased from the map in one sweeping gesture, along with all of the history, heritage, and diversity which characterized their physical form. Neighborhood residents suddenly found themselves without homes, without a remnant of history, and without an urban heritage. The painful wounds created by these urban "renewal" projects could not be healed with smooth new paving or orderly brick plazas. Citizens of these neighborhoods were now forced to re-evaluate their urban values, and establish priorities with regard to the preservation of built surfaces. Public concern with regard to the preservation of surfaces lead to important changes concerning the restoration and revitalization of public surfaces - not only in Boston, but in all older American cities as well.

The antiquated street and its walls were abandoned for the precision, order, and permanence of modern streets and surfaces. Technology allowed designers and builders the opportunity to create materials and surfaces more durable and efficient than ever before. Materials were now manufactured to retain their appearance for longer periods of time - with an economy of means never before acheived. But the modern street surfaces which replaced their antiquated predecessors could not recreate the intimacy and sensitivity which had been finely woven into these earlier streetscapes. Most American city-goers, as a result of the influence of modern materials and new design priorities, began to demonstrate a growing indifference toward the street environment. The dynamism and vitality which once existed in street environments were replaced by the impersonality and machine-like precision of modern built surfaces. Inhabitants of the street had nothing with which to "endear them" to the modern environment. The stark image of perfection and

order created by modern architects through technology excluded the individual from this image. Street walls no longer responded to human scale and diversity. These surfaces and materials - created by highly-coordinated manufacturing processes - reflected the precision and abstract nature of their production. Handcrafted surfaces of the past made evident to the viewer the labor, dedication, and sacrifice required to fashion their form and surface image. Finely-crafted stone and brick street surfaces were understood by the city-goer as being the culmination of a laborious and painstaking process; a commitment of spirit and will which overcame the crudeness of the finished image. With modern machine-fabrication techniques, there no longer existed this intimate and personal relationship between man and the built environment. The "hand of man" had been removed from all evidence of his existance in the surface of the built environment. The modern surfaces manufactured by machines were understood to be the product of the machine, and therefore evoked no sympathy, no reverence, no history, and no emotion. People relate to the product of the machine in the same way in which they react to the machine itself - with impersonality and indifference.

In the late 1960s and early 1970s, streets and their surfaces regained a portion of their lost importance to the city and to the design community. This can primarily be attributed to the desire to recapture the intimacy and character which had eluded cities or had been taken away from cities during the reign of modern developers and architects. Through community realization and concensus, the street and its surfaces were again acknowledged as being vital to the creation of vibrant and intimate urban environments. The emerging architectural trend which recognized the importance of the relationship between man with his urban heritage became known as "Post-Modernism," which overtly recalled the imagery of earlier architecture through the reintroduction of traditional architectural elements and the use of "familiar" building surfaces (such as richly-mullioned glass, unit masonry, and rusticated stone). Architects, trying to find an architectural vocabulary which celebrated and responded to the heritage and history of cities, placed a

greater emphasis on context-responsive architecture: architecture which derived presence and importance from the relationship of new architectural elements and surfaces with their existing neighbors. More importantly, the street was again recognized as a zone of critical importance to the vitality and sensitivity of the city fabric. Greater attention was placed in the materials, forms, and details which recalled earlier traditions and values of city form - a trend which continues to this day. The activity and vitality of the street environment (as experienced through its surfaces) has once again become the center of our understanding of American cities.

The city of Boston is blessed with a rich architectural history and tradition. A great deal of America's early history centers around events which took place within the Boston area. The close association enjoyed by Bostonians with America's early history and traditions has resulted in a more informed and educated society with regard to its urban history and traditions. Because of the scale, history, and "managibility" of the city, Bostonians have aquired a thorough and unique understanding of its physical characteristics, and their relative importance to the individuals who interact with them. In the minds of most Bostonians it is critical to preserve the richness, vitality, and values which helped create their unique urban heritage.

In earlier decades, the relationship between Bostonians and their physical environment was one of intimacy and sensitivity. As previously mentioned, the street and its surfaces were undeniably instrumental and deeply rooted in the lifestyles of the people who inhabited the city. Fundamental relationships of materials, scale, and detail existed between the streets and street-walls of the city and its people. Although threatened by rampant growth and development during several key periods in its history, Boston retained much of the scale and charm which characterized its early heritage. This is primarily due to the perserverance and tenacity of many concerned Bostonians, who recognized the delicate relationship between the city's historic artifacts and its value to its people. The strong relationship which existed between the city's people and its buildings

(street-walls) has endured. In fact, the Boston Redevelopment Authority has established guidelines for new developments which specifically address the relationship between streetscapes and their inhabitants:

- New developments must hold the streetline and reinforce this wall that defines the public realm;
- New buildings should be compatible with the scale and the materials of traditional Boston buildings;
- The ground level should consist of active retail uses, with as many doorways as possible;
- New cornice lines should match the predominant cornice lines in the area;
- New office towers should have setbacks, or a podium effect, which not only reduces the likelyhood of "canyonization," but also reduces the strong wind downdrafts caused by towers on the streets below.[7]

In spite of these new development guidelines, however, modern development (in both scale and execution) continues to threaten the very essence of Boston's urban heritage; which might be simply defined as the relationship between Bostonians and the street (or street-walls) which they inhabit. As the stresses of our expanding market economy and new technology continue to exert their influence on the built environment, this delicate relationship is becoming increasingly strained. In order to deal with these stresses, measures have been undertaken to preserve physical characteristics of the built environment which are considered critical - most of which are aimed at the preservation building surfaces (and, as we shall see, little else).

Up until the late 1950s, the tallest building in the Boston skyline was the Custom House tower near Long Wharf. With the construction of the Prudential Center complex, the long-depressed construction market in Boston suddenly experienced a much needed

surge in urban growth. As developers and tourists began to take an investment interest in the Boston area, development growth began a long upward climb, which has continued up to the present day. By the mid-1970s, investors and developers recognized the potential for growth which existed in the once-stagnant Boston economy. Development boomed.

Due to Boston's important role in early American history, a great deal of preparation and attention was focused on the approaching Bicentennial celebration of 1976. This attention reinforced the growing perception that Boston was a "city on the rise" - ripe for growth in the tourism market as well as in more permanent development markets. The attraction and potential of the revitalized Boston ecomony encouraged investors to build new structures and to rehabilitate older ones. One of the most influential rehabilitation projects in Boston during the mid-1970s was the revitalization of Quincy Market, which had a profound effect on future rehabilitation projects in Boston and indeed throughout the country.

Long since left to decay, Quincy Market once functioned as a bustling center for goods and commerce. Recognizing the development potential for the old Market buildings, the team of architect Benjamin Thompson and the developer the Rouse Corporation transformed the decaying "shells" of the old market buildings into efficient economic engines. After converting and subdividing the market buildings into smaller, trendy shops, the Quincy Market revitalization was completed in time for the Bicentennial celebration, and proved to be a rousing success. Quincy Market has long since established itself as among the most profitable rehabilitation ventures in the city's history, as well as stimulating activity and vitality in an area of the city which, until recently, lacked any such activity or interest.

The Quincy Market rehabilitation also demonstrated that a successful economic and architectural development could be created by converting or revitalizing existing buildings - particularly those possessing historic significance. The success of development projects were no longer contingient upon the clearing away of countless acres of existing buildings

and neighborhoods (as witnessed in earlier "urban renewal" projects). The Quincy Market rehabilitation made clear to everyone, from the design community to concerned citizens, that older buildings possessed more than merely a valuable economic potential. These buildings, if handled with care and sensitivity, could be rehabilitated in such a way that the building's historic elements need not be destroyed to create profitable redevelopments. The city's older buildings and districts were now free to become valuable economic resources while still retaining the historic surfaces which were vital to the heritage and culture of the city:

"Through a ...heightened awareness of the built environment, which is part an off-shoot of the Bicentennial...people started demanding buildings that were better designed and conscious of their (history and) context."[8]

Just prior the development boom of the mid-1970s, a growing concern for historic buildings and districts was becoming evident. Historic buildings and surfaces were among the most important reasons for the newfound growth in tourism and redevelopment experienced in the mid-1970s. According to the Boston Landmarks Commission, Boston's historic buildings are "...the best testament to (the city's) character; they are, after all, a direct reflection of her culture, society, style, scale and needs over the past three hundred years."[9] Following successful rehabilitation projects such as Quincy Market, historic buildings and surfaces could now also be considered an economic "boon:" a resource which attracted greater numbers of tourists and developers to the Boston region. The success of projects such as Quincy Market alerted developers to the plentiful resource available in the form of these historic structures. In the same way our national consciousness had been raised with regard to the historic importance of the built environment, the consciousness of Bostonians too, had been heightened to a new level of urban awareness.

A trend which began in the 1950s, escalated in the 1960s, and continues to increase in importance to this day is the preservation and restoration of historic buildings and districts. As a direct result of the lessons learned during the modernist era, architects, planners, and the general population have directed their energies toward the preservation of buildings and spaces which possess a perceived historic value. Typically, these buildings and spaces are valued for their history, materials, methods of construction, age, use, or their role within a larger historic district. Today we find a growing number of buildings earning historic status, often to such a large scale that entire neighborhoods or regions are designated as historic districts. In most of America's older cities, many types of historic districts presently exist. New York City, for example, has implemented guidelines which preserve use districts as well as physically-significant districts. Historic districts such as the Theater District, Greenwich Village, SOHO, Little Italy, Chinatown, and many others restrict future redevelopment, and establish stringient guidelines which preserve the functional and physical characteristics of these districts. In Boston, the Boston Landmarks Commission, established in 1975, is largely responsible for the preservation of historic buildings, while historic districts restrict development in neighborhoods which possess unique significance. There are currently forty-nine landmarks buildings and sites in Boston, and seven historic districts.[10] In total, there are approximately fifteen-thousand historic properties which are protected from demolition; and through an extensive design review process, are also protected from exterior changes which could detract from their architectural beauty and historic integrity.[11]

Guidelines ridgedly restrict the demolition or replacement of the exterior surfaces of their district buildings. Renovations must be performed in a way such that exterior surfaces be returned (as closely as possible) to their original condition or appearance. For example, the Architectural Guidelines for the Historic Beacon Hill District stipulate:

"Owners contemplating changes to the exterior of any building within the Historic Beacon Hill District should be aware that no alteration will be approved that is inappropriate to the historical character, architectural design, and materials of the building or its setting....No new openings in facades shall be allowed, and no changes shall be made to existing window and door openings (unless they involve the restoration of original features)....In the event that replacement of existing materials or features is necessary, the new materials shall match the materials being replaced in composition, design, color, texture, and other visible qualities...."[12]

In Back Bay, similar guidelines and restrictions exist with regard to the preservation and rehabilitation of exterior surfaces:

"...All plans for demolition or new construction or for exterior alteration or repair of existing buildings, as well as all proposals concerning the erection of signs, awnings, and other features...must be submitted to the Back Bay Architectural Commission for review and approval.[13].....(Facade changes)...are not generally allowed except as specified in these guidelines. The covering or removal of original facade elements (columns, pilasters, fenestration, arches, lintels, decorative elements) is generally discouraged[14].....remodeling of existing storefronts is allowed provided that...it is compatible with the overall architectural character of the building."[15]

The guidelines for the renovation and restoration of buildings within these districts are extensive and explicit. Every possible exterior surface feature within the district is closely regulated, including masonry (repair, cleaning, repointing, refacing, and painting), entrances (porches, doors, front steps, awnings, and canopies), windows (oriels, storm windows, and shutters), ironwork (fences, handrails, balconies, and fire escapes), roofs (dormers, penthouses, cornices, gutters, and downspouts), signage, exterior lighting,

utility equipment, and landscaping.[16] These district guidelines - however explicit with regard to scale, materials, ornament, historic qualities, etc. - only address the preservation of the exterior street-walls of these districts. These guidelines make no reference to the interior surfaces of these buildings. According to the Back Bay Architectural District guidelines, (established in 1966 and amended in the 1974), the renovation of buildings within historic districts are:

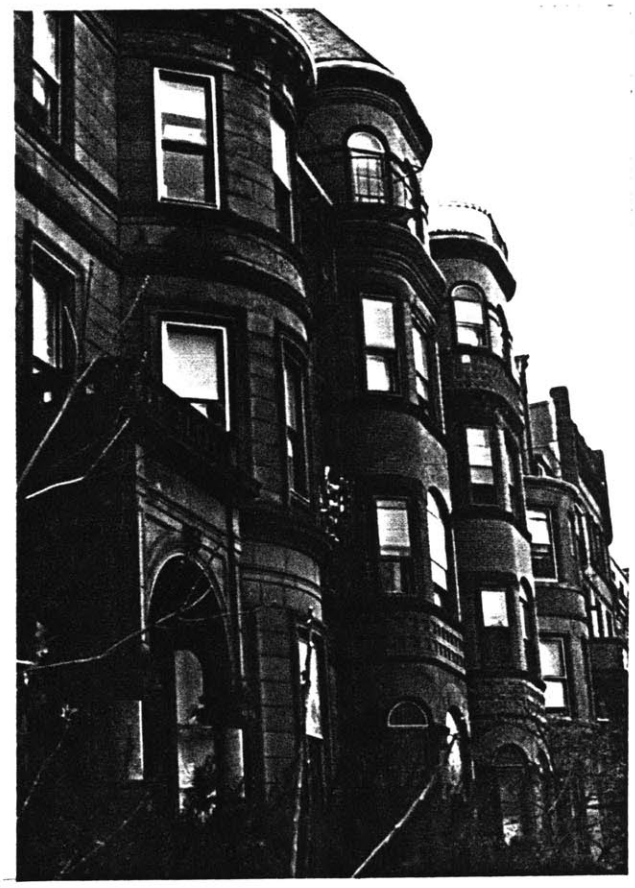
"...subject to design review of physical changes to the building exterior in accordance with standards and criteria adopted as part of the legislation. The use or treatment of the interior, however, is not affected."[17]

Interestingly, it has become important to us to preserve only the exterior surfaces of our historic structures, while excluding the interiors of these buildings. It is as if the building facades or "public" surfaces are the only architectural elements which retain any measure of importance or historic significance. These exterior surfaces have grown so important to our society, however, that any proposed changes to them are subject to intense review and scrutiny by a multitude of public agencies, government bodies, and community groups.

Because a great deal of new urban development takes place in and around these historic buildings and districts (and because more of these buildings and districts are being designated), controversial and emotional development battles rage throughout the nation's older cities. Boston, an architecturally-conservative New England city with a rich urban heritage, is a fine example of a market-driven development environment where conflict rages daily between developers, architects, and resident communities, who valiantly attempt to preserve the last vestiges of their urban history. The results of these conflicts have not only resulted in a new public understanding of cities, but have also made

strikingly clear the changing values and expectations of designers, planners, and city residents toward the historic buildings and surfaces of our cities today.

With the rise in apartment rents and condominium mortgages in historic neighborhoods such as Back Bay, it has become in the owner's best interest to renovate the interiors of their brownstone walk-ups. Brownstones with clean and modern interiors command far greater rents and sale prices than brownstones which have not been renovated. In addition, interior renovation of these brownstones - unlike their exterior counterparts - usually do not involve the Boston Redevelopment Authority, community groups, review committees, zoning boards, and all of the other obstacles which can interfere with the modification of these interiors. As a result, a large majority of the structures we view within these historic districts have been completely gutted and refinished with new interior surfaces. These interior surfaces are usually of an entirely different architectural vocabulary from the exterior surfaces of the buildings (which, by regulation, must remain visibly "unaltered").



Commonwealth Avenue Brownstones: "frozen" in time. (EVD)

If we walk along streets such as Commonwealth Avenue, Marlborough Street, Beacon Street, or Newbury Street in the Back Bay, the exterior surfaces of the buildings today are quite similar to their appearance of 80-100 years ago, if not earlier. Upon entering any of these structures, however, we would discover a variety of modern interior

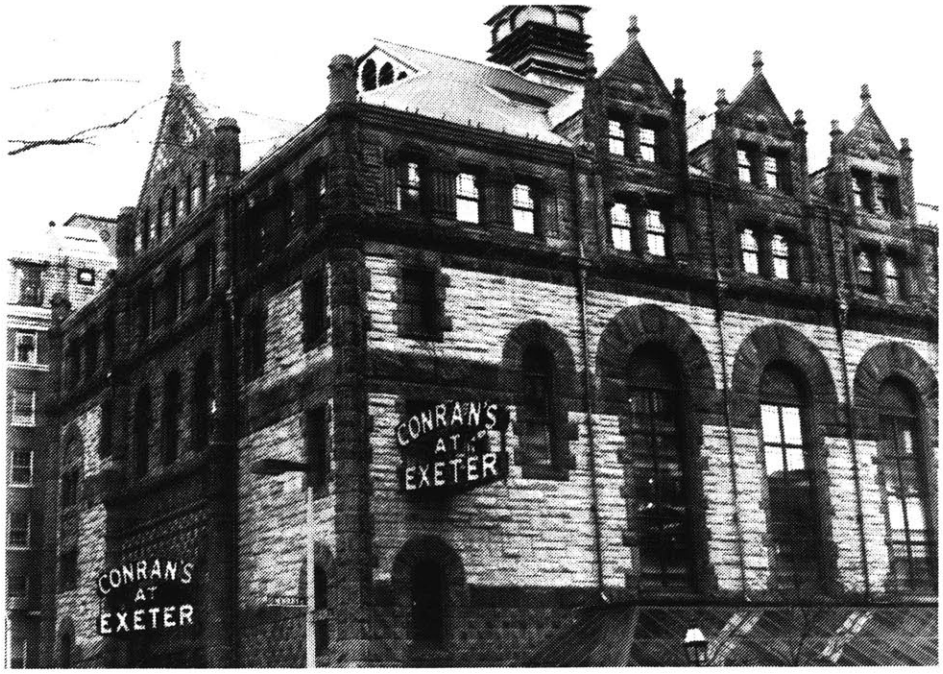
surface expressions: floor-to-ceiling glass, marble-tiled bathrooms, plastic-laminate counters and cabinetry, wall-to-wall carpeting, etc. We have therefore made a distinction between the value of interior (or private) surfaces of the built environment and the value of exterior (or public) surfaces. This distinction is partially due to the western belief that the inside surfaces of our buildings are private property - and owners have the right to do as we wish with these private surfaces. On the other hand, we also believe that the outer surfaces of our older buildings - the "public" surfaces - possess historical importance; and should therefore be preserved for the benefit of the community. Yet are these exterior surfaces not also private property, regardless of their "visibility"? A majority of these historic structures (and their exterior surfaces) are privately owned, and fall within the property boundaries of the private sector. Why is it, then, that we believe it is the right of the community to restrict our unalienable right to improve or redevelop these exterior surfaces, regardless of their value to the community? If we accept the community's right to restrict modifications to exterior surfaces - even those which fall within private property - why it is not within the rights of the community to restrict the modification of interior surfaces? Can we not interpret the restriction of our exterior development rights as the "taking away" of rights inherent to the ownership of private property? If communities *do* possess the right to preserve building elements understood as possessing historical significance, why are these restrictions not applicable to the building's interior surfaces? Surely, it can be argued that the interiors of historic structures are as vital to the building's historic value as the exterior surfaces are, simply by nature of the original design and material intent. The relationship and design intent which existed between a historic building's interior and exterior surfaces can never be quite as "unified" and cohesive after their interior surfaces have been renovated contrary to their original condition. No matter how sensitively and masterfully designed, any modification to a historic building, whether interior or exterior, will diminish the original design intent (and therefore create a new design intent). The preservation of a building's exterior "shell" - at the expense of the

building's interior surfaces - only devalues the historic importance and intent of the building as a unified "whole." Taken further, the preservation of only the exterior surfaces of a historic structure further dramatizes this devaluation by rendering the building's exterior surface as a type of "stageset" (or, more importantly, a "cartoon").

In much the same way it has become important to us to preserve and adorn the exterior surfaces of both ourselves and our possessions (in order to evoke public recognition and avoid public ridicule), so has it become with regard to the preservation of historic buildings. It is less important that these buildings be preserved or restored in their entirety, according to their original design intent. It has become important to preserve only the more visible surfaces of these buildings: the exterior "public" surfaces, which we believe possess historic significance. The inconsistancies which exist in the preservation of a building's exterior surfaces - at the expense of their interior surfaces - can partially be attributed to our society's growing preoccupation with superficial qualities of the built environment: surface "image." While it has become increasingly important to preserve the historic image of the built environment, the interior surfaces of these buildings have become historically insignificant, and may therefore be modified or discarded at will. The illogic and inconsistancy of this approach toward historic preservation is actually quite understandable when one considers the shift in our society's values and expectations with regard to surface appearance. We place greater value in surface presentation for the appeasement of social expectations, but rarely look beyond these surfaces to question their diminishing substance. When we designate a building as historic, we concern ourselves only with the preservation of its most visible and recognizable features: its exterior facade, or surface image. Like the thin wrappings we apply over our products and ourselves, the surface of the built environment has become a type of merchandise; a product whose exterior packaging sells to us the image revealed by its surface. We place an increasing value in the messages conveyed by these surfaces; yet their images are merely superficial. This is particularly evident when we analyze the intent of historic preservation.

There are innumerable examples of buildings within historic districts which have undergone extensive interior remodeling while their exterior surfaces are preserved in their entirety. One such example is the Conran's furniture store on Exeter and Newbury Streets in Back Bay, which has experienced several dramatic interior renovations during its 105-year history. Regardless of the interior changes which have occurred, however, the exterior surface (facade) remains remarkably faithful to its original state.

The building was built for the Working Union of Progressive Spiritualists in 1884 (by Marcellus Ayer, owner of State Street Dry Goods) and given the name of the First Spiritualist Temple. Designed by architects H.W. Hartwell and W.C. Richardson in the



Conran's at Exeter Street - formerly the First Spiritualist Temple and the Exeter Street Theater: the facade remains the same. (EVD)

style of H.H. Richardson, the original function of the building was to provide a center for the study and contemplation of supernatural and psychic forces, through rituals known as "seances" or "trance lectures."[18] The structure of the building is a conventional system of load-bearing outer walls with interior cast iron columns. When looking closely at the

building facade along the Exeter Street elevation (directly above the Conran's marquee), letters carved into the century-old granite clearly spell the words "First Spiritualist Temple." The exterior facade is characterized by polychromatic, heavily-rusticated Braggville granite and Longmeadow freestone, with deeply inset window openings, elaborate corner detailing, and intricate stone cornices.[19] From 1885 until 1914 the Temple functioned according to its original design.

In 1913, due to financial pressures, the main assembly hall was remodeled to allow the public to view motion pictures at a cost. The building was aptly rededicated as the "Exeter Street Theater," and it remained so for 71 years. The interior remodeling involved the removal of the original organ and the construction of a large curved balcony, a projection booth, and ticket booths near the entrance of the building.[20] The exterior of the building, however, was left unaltered. Apparently, the interior surfaces of the temple had not aquired the same level of historic significance as did the outside. Obviously, a distinction existed between the public or exterior surfaces of the structure and the private or interior surfaces of the structure. Although the Back Bay District was not legislated a historic district until 1966, the historic and cultural value of the building's exterior was understood. The building has since been listed on the National Register of Historic Places, and is protected - by federal regulation - from future modification to the building's exterior surface. Why these concerns and regulations did not include the building's interior surfaces are, even today, largely an unanswered question.

In 1973, after audiences for theater performances dwindled, the Exeter Theater was sold to developer Neil St. John Raymond, a cattleman.[21] The Raymond Cattle Company hired the architectural firm of CBT to renovate the theater, and to add a restaurant and bar on the southern face of the building. Although the addition of the bar and restaurant necessitated the addition of a glass shed, this addition did not alter the entrance or the main hall itself; and in truth did little to alter the overall appearance of the historic facade. As a result, these modifications were permitted. The granite and sandstone

facade, along with all windows and doors, were retained and restored to their original condition. The interior, however, was again torn down and remodeled.

Finally , in 1985, the Exeter Theater closed its doors. The building was again renovated, this time into a houseware store known as Conran's. The conversion to Conran's involved the removal of a substantial portion of the building's interior, while the exterior, for the most part, remained untouched. All windows of the building were replaced with new windows of identical shape, appearance, and color; and the theater marquee was refurbished. The original theater signs (erected when the temple was converted to a theater) were replaced with signs of the same style as the original, with the new signs reading as "Conran's At Exeter," in lieu of the original "Exeter St. Theater" signs.[22] In addition, a copper cupola - original to the building - was restored to its original condition.[23] With the exception of the new signage over the theater marquee and the glass shed addition of 1973, the exterior image of the building as seen today is, for all intents and purposes, identical to the exterior of the building as it appeared 105 years ago.

Why the interiors of the building were not considered as historically "significant" as the outside surfaces of the structure is a mystery. Both the original inside and outside surfaces were crafted in the same era, with the same technology, according to the same design principles and intent. If we define successful architectural design to be the seamless integration of all elements of a building, the relationship between the building's interior and exterior surfaces must certainly be included in this definition. This being the case, the "tearing away" of a critical element of the original structure (such as the building's interior surfaces) can only weaken this seamless relationship and intent, creating instead a relationship of contrast and inconsistancy. The disjunction between a building's preserved exterior surfaces and its remodeled interior surfaces must therefore necessitate a new definition of the phrase "historic structures." Because structures modified in this manner are no longer faithful to their original design intent, they lose many of the physical

characteristics and intricate relationships which are instrumental to their definition as historic structures.

A new definition and understanding of the phrase "historic structures" is not the case as it exists today, however. We still define these recycled buildings as "historically preserved," even when half of their original surfaces have been removed (possibly several times). Preserving a building's outer shell intact while gutting its innards transforms and devalues the "historic" exterior surface to the level of a stageset; a facade fragilely support-

The Berkeley Building - Boston, Massachusetts: "Stageset" preservation. Notice the lattice-type staging on top of the roof, holding the street-wall surface in place - like a "billboard." (EVD)

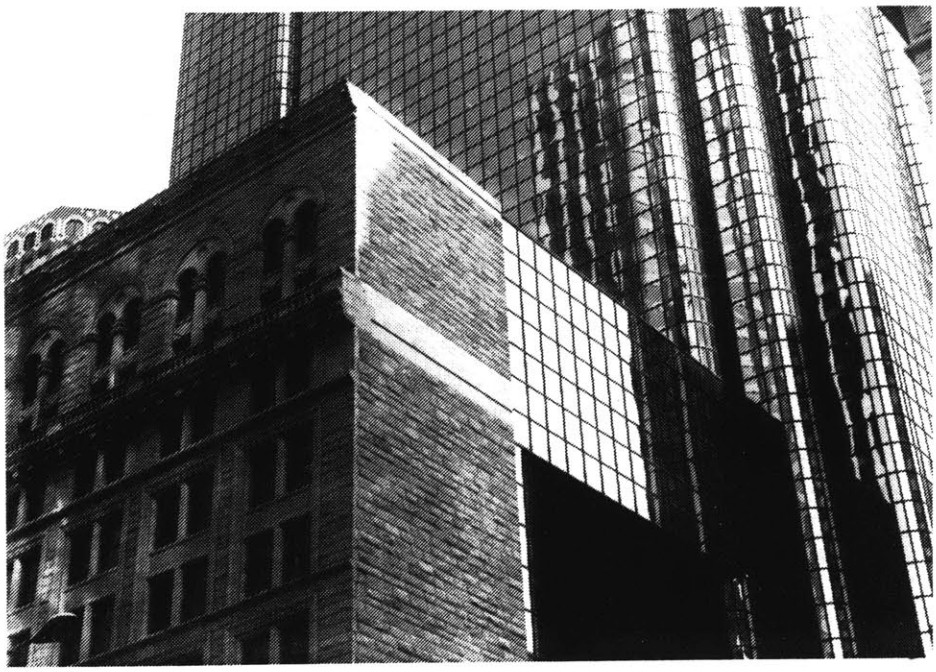
ed by the historic illusion of its surface image. Interestingly, we rarely contemplate this disjunction, primarily because we have grown accustomed to the same scenario in all of our historic districts (particularly in districts such as Back Bay or Beacon Hill). District guidelines only restrict the redevelopment of exterior surfaces; as a result, interior surface renovation is a commonly-accepted practice.

In much the same way the steel frame allowed building skins to become a veneer independant of its interior spaces, so too has our preoccupation with the exterior

preservation of surface separated our exterior environments from their more private interior surfaces within. The end result, however, is similar: the fragmentation of the built environment into exterior surfaces (surfaces for public presentation and recognition) and interior surfaces (surfaces of unlimited expression); each mutually-independant of one another. While some might argue this approach allows building owners individuality and freedom of expression while preserving our historic urban settings, the ultimate result of this approach is the tainting of our historic artifacts - and the subsequent fragmentation of the interior and exterior surfaces of the built environment.

The preoccupation with exterior surface preservation in cities such as Boston has also resulted in an entirely new form of architectural expression, which might be referred to as the "collision building." A collision building can best be described as the abrupt intersection or collision of a new building (or addition) on top of, within, or behind an existing exterior facade (a facade preserved due to its historic significance). Collision buildings occur most frequently in downtown districts of older cities. This is usually due to the obsolescence of early twentieth-century zoning codes, which regulated the dimensions, proportions, and density of office and commercial structures. In many cases, zoning codes have been modified (due to market demand and improvements in construction technology) to allow new development greater height and density within these downtown districts. Most zoning density codes and restrictions written in the early twentieth century are obsolete in today's world of modern development. When early-twentieth century buildings are protected as a result of their historic status, modern developers have little choice but to retain historic features - the building facades - and "butt" their new buildings into these older structures, creating the "collision building."

When collision buildings first became prominent in the 1970s, little effort was given by developers or architects to "mimic" the style or materials of these existing structures. In fact, architectural fashion of the 1970s frequently exploited the contrast between the two opposing styles, colliding modern glass towers into mid-rise neoclassic



53 State Street (Exchange Place) - Boston, MA: Collision of the old and the new. (EVD)

masonry structures. As a result, there are many buildings in downtown American cities which appear as though two separate buildings - each from a different era - have collided into one another. Boston is home to a variety of these collision buildings, among the more memorable being 53 State Street (Exchange Place) and the Boston Public Library.

With the growing disillusionment of the design community and the general population with modernist "glass boxes," however, there has been a resulting shift in the architectural style of new towers. Modern architects and developers are designing their new buildings to resemble more traditional architectural structures. This is usually accomplished with the use of "solid" materials (such as stone), more intricate detailing, and the use of classical forms (such as those found in late-nineteenth century/early-twentieth century buildings). Even with this approach toward the design of collision buildings, these additions rarely achieve the level of detail and intricacy found in their nineteenth-century predecessors. Buildings of today are designed with different materials and construction methods than buildings of ages past. More importantly, the criteria which

shape these new structures are far different than existed in earlier years (more intricate financing techniques, evolving design philosophies, greater community involvement in architectural issues, etc.). As a result, modern structures rarely achieve the complexity and detail of their predecessors, no matter how diligiently the attempt by architects and developers. As greater numbers of structures are designated as being worthy of preservation, combined with increasingly dense modern development, it appears likely that collision buildings will become a more common feature in older American cities. While new facades which mimic their older neighborhors certainly diminish the contrast between the two, it is understood that these structures are products of different eras, created by generations with differing traditions, values, and priorities.

The evolution of modern architecture towards more traditional and contextural design has not diminished our preoccupation for historic surfaces. On the contrary, we place an increasing importance in their preservation - to the point of desperation and near-paranoia. When development battle-lines are drawn, preservationists defend their urban artifacts "to the death," as if the very soul of their city was threatened by the removal of these surfaces. Because of our increasing paranoia with regard to historic surface preservation, our culture has gone to great lengths - almost laughable lengths - to preserve these surfaces. One such example of this "preserve-at-all-costs" attitude is evident in the renovation of the Kennedy Store in downtown Boston.

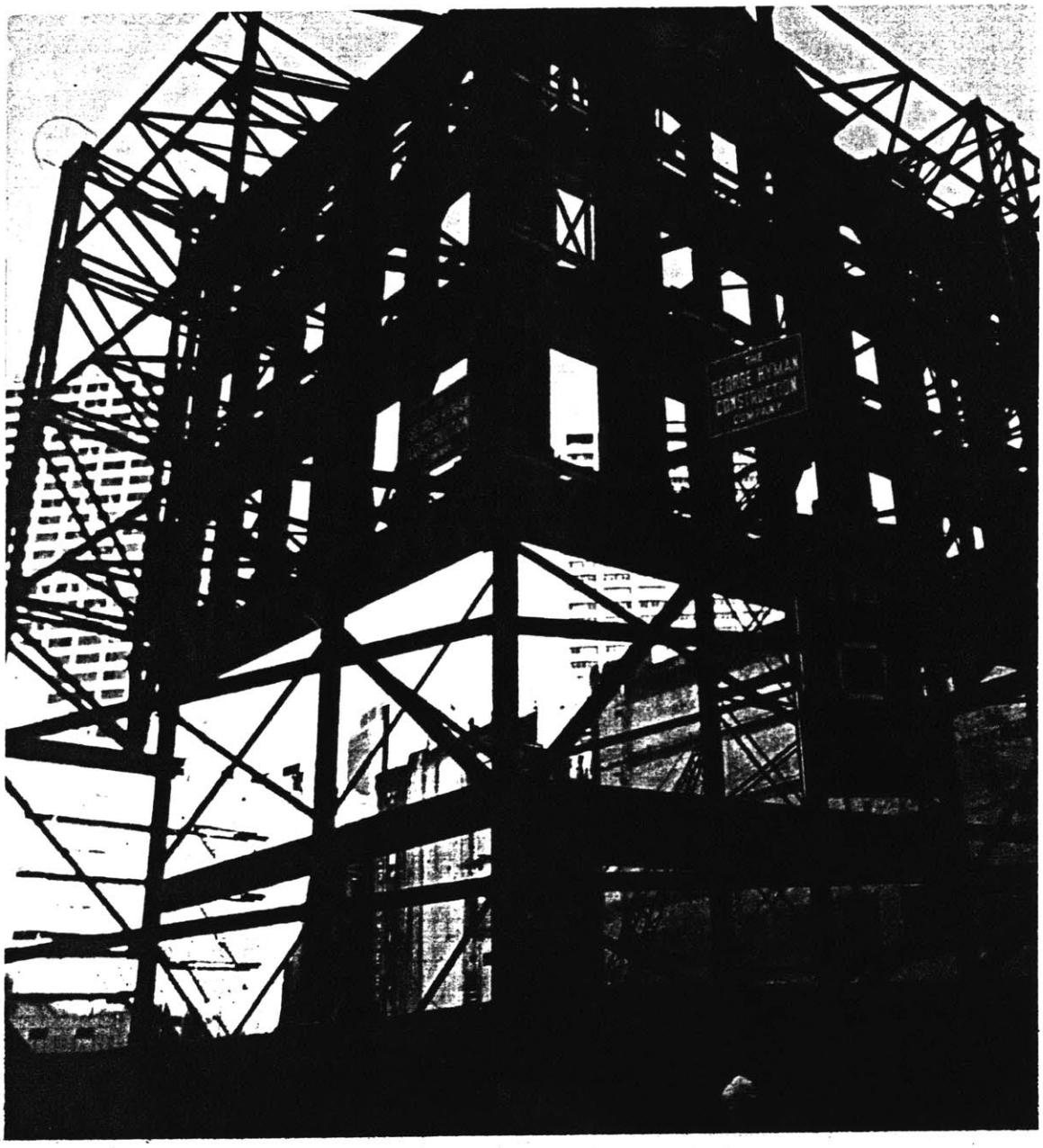
The Kennedy Store was a five story brick and timber structure located between Hawley and Summer Streets in downtown Boston. Designed by architects W.R. Emerson and C. Fehmer in 1873, this load-bearing exterior facade is perhaps the most outstanding and still-surviving example of the Panel Brick Style of building. Bainbridge Bunting, in his 1967 analysis of Back Bay housing, attributes Panel Brick designers with exploring the nature and use of the brick material itself for the power of the building's architectural expression.[24] The Kennedy Store is significant because it is also "...a fine example of an extraordinary craftsmanship of a type no longer practiced..."[25] The exterior facade is

The Kennedy Store: Original 1873 facade in the Brick-Panel Style. (EVD)

characterized by patterns of geometric shapes, and lively contrasts of light and shadow created by the use of brick and deeply recessed windows. After several changes in ownership and tenancy throughout its history, the Kennedy Store closed its local operation in 1980.

In late 1984, construction began on an $86-million tower addition to the Kennedy Store by the Dallas-based developer the Lincoln Property Co. The proposal included a 21-story tower, faced with Texas red granite and light bronze windows with green spandrel panels. The tower, designed by Boston architects Hoskins Scott Taylor in partnership with architect Harwood K. Smith and Partners of Dallas, was designed to minimize its apparent bulk with the use of numerous building setbacks, as well as the use of traditional scaling elements. The developer, upon purchasing the property, intended to completely tear down the "defunct" century-old department store. Preservationists, however, wanted to restore and repair the building, and sued the owners and developers of the project for the right to preserve the building intact. After a long and bitter struggle, preservationists failed in their attempt have the building designated as an historic landmark, which would have preserved the original building intact. Instead, an unusual solution was developed by the Boston Landmarks Commission. The new tower and sub-

grade transit development would continue as planned. However, the developers were required to maintain the original 1873 features of the Kennedy Store: its upper three stories on Summer Street and 35 feet of exterior facade on Hawley Street. The ground and second floors of the Kennedy Building however, were demolished, because they were not



The Kennedy Store renovation: Preservation of the upper three stories of the 1873 facade.

a part of the original 1873 facade. The first two floors of the store had to be rebuilt by the developer in a manner consistant with the guidelines then established by the Boston Landmarks Commission. The developers were required to be retain the upper three stories of the Kennedy Store (the original 1873 facade) in its existing location and condition.

In order to accomplish this, the developers erected a complicated latticework of steel bracing and scaffholding which held the upper three stories of the facade in "mid-air," while construction continued around this airborn facade. This unorthodox process of facade preservation cost the Lincoln Co. "...an additional $2-million in design, legal, and construction fees."[26] The delicacy of dismantling the surrounding structure around the old masonry facade nearly doubled the normal demolition time, and subsequently added nearly three months to the construction time. Pauline Chase Harrell, chairwoman of the Boston Landmarks Commission and key player in the compromise, stated:

"In some ways, its been a ridiculous process for a small amount of retention....What we were trying to do was keep some semblance of the presence of the old on the street."[27]

To historic preservationists, the integration of the new tower with the old facade is an example of what they call "facadism:" combining portions of older historic buildings with modern buildings. Groups such as the Boston Preservation Alliance immediately made it clear to city officials that "...facadism is unacceptable...as a way to preserve architecturally historic buildings in Boston."[28] Lincoln's regional office head, John B. Hynes 3rd, placed as much blame concerning the complexity of this solution on the Boston Landmarks Commission and the Boston Redevelopment Authority:

"(the development) is as much a product of the BLC and the BRA as it is of Lincoln Property Co. and the architects hired by us to put a development proposal together.....We have gone through 12 different designs, and were involved in numerous public hearings and meetings with the city designers and the Boston Landmarks Commission before a design was approved."[29]

Former Boston Redevelopment Authority director Edward Logue, discussing the proposal, called it "...the cruxifiction of the Kennedy's building," and referred to the incident as "...an example of what happens these days when development meets historic preservation."[30] Lawrence Bluestone, then co-chairman of the Boston Society of Architects' urban design committee, commented:

"What you got was a true compromise, which means that nobody likes it...it doesn't meet anybody's wishes."[31]

When completed, the finished project is not as "visually-radical" an urban intervention as once imagined. Even so, important questions must be raised as a result of the severity and complexity of this conflict. What is the value of saving only the exterior shell of a structure? Have we grown so insensitive to the subtlties of the built environment and our urban heritage as to allow exterior surfaces to become the only qualities of our existance worthy of historic preservation? How much of a structure must be salvaged in order to preserve its historic character and importance? At what point do these bastardizations of historic buildings trivialize the character and importance of the original structure?

Sadly, we have become a culture which believes the historic importance of our built environment - to the exclusion of all else - lies solely in the thin packaging which constitutes a building's outermost surface. The delicate relationships which once existed

between all facets of the built environment, including both interior and exterior surfaces, are no longer evident in today's buildings - which knowingly and willingly sever the ties between their interior and exterior surfaces. We belong to a culture whose values have been reduced to that of the superficial; we only concern ourselves the surface image of the environment, while little concern is given to the substance of that environment.

Our preoccupation with the surface image of the built environment (and our growing indifference towards its"substance") strongly coincide with our changing values with regard to our personal appearance, as well. As I have repeatedly stated, our actions are irreversibly tied to our image of the world and ourselves. Not surprisingly, similar values which we hold true the preservation of built surfaces are also evident in our values regarding the preservation of bodily surfaces. A good example of this phenomenon may be witnessed in a study of Boston's Newbury Street - which is a microcosm of our changing values and attitudes towards the preservation of both the built environment and the preservation of our own bodily surfaces.

The main retail portion of Newbury Street - among the most popular and profitable retail streets in Boston - occurs in the eight city blocks between Arlington Street and Massachusetts Avenue. Newbury Street lies within the historic Back Bay district, whose development guidelines restrict and control exterior facade modifications, but do nothing to regulate interior renovation. The combination of exterior development guidelines, marketable, exterior surface images, and attractive, contemporary interiors has allowed Newbury Street to become a working model of the paradox which exists between interior and exterior surface values. Interior built surfaces range from glass to marble, polished bronze and brass to stainless steel, and from expensive woods to high-gloss plastics and laminates. As argued in the case studies for the Exeter Theater and the Kennedy Store, Newbury Street's brownstones are a clear illustration of the inconsistancies which exist in our understanding of historic importance, which is actually an indivisible quality of both

Aerial Photograph of Newbury Street, Boston - Notice the thinning nature of the facades which fashion the surface image of the individual structures. Image is only skin-deep. (EVD)

the interior and exterior surfaces of a building, as well as the craftsmanship and methods of cconstruction used to fashion these images.

In addition to preserving the exterior of surfaces of these buildings, the very function of the stores which comprise Newbury Street is the glorification of exterior surfaces -particularly those of the human body itself. The message of these shops, in both form and function, is clear: preserve all exterior surfaces - at any cost. Newbury Street is home to shops which perpetuate, even heighten, our awareness of the importance of surface preservation and image. Like a giant microscope, Newbury Street focuses our attention toward acquiring ideal surface images; ie: those images made fashionable and desirable by cultural values, advertising, and media. We are therefore compelled to relieve our anxieties and insecurities by acquiring, preserving, and improving the appearance of all surfaces.

While traversing the length of Newbury Street, I engaged in a crude survey of shops which occur behind these preserved, exterior facades. The results of this survey illuminate our changing social values and expectations with regard to surface appearance - and our increasing desire for their perfection and preservation. At the time of this writing, Newbury Street's eight blocks consist of approximately: 7 laundrymats or tailors; 13 camera or video rental stores; 16 realty stores; 25 antique or collectibles shops; 40 art and design related shops (galleries, framers, etc.); 50+ "body improvement" shops; 80 clothing stores; and 70+ shops of various uses (food, etc.). It is important to keep in mind that the original function of Newbury Street was residential in nature, not commercial or retail. While occasional modifications to exterior surfaces and extensive interior renovations have indeed occurred, the "look" of Newbury Street's buildings, nonetheless, remains remarkably faithful to their appearance as it existed 80-100 years ago. Newbury Street brownstones - as was the case with the Exeter Street Theater and the Kennedy Store - are further examples of historic preservation in the most superficial sense. More importantly, the majority of these shops, in one fashion or another, reinforce the increasing value we place upon surface preservation and appearance (particularly with regard to bodily surface).

For example, laundrymats and tailors allow us the means to adequately clean and properly alter our clothing, whose surface image and importance is dictated by social expectations, fashion magazines and media. Laundrymats perpetuate the notion of "permanent bodily cleanliness," by allowing us the opportunity to wear clean clothes at all times. By providing this commodity, society has come to expect that our clothes will remain clean and properly tailored; ie: that our appearance will be perfect and permanent. Socially speaking, we are under enormous pressure to maintain a certain level of surface cleanliness in the public realm. This image is further reinforced by the resources provided by laundymats and dry-cleaning establishments.

Similarly, video and camera stores reinforce our dependancy on the surface image by allowing us to capture and preserve images of ourselves and the built environment forever - as if "frozen in time." In the case of realty offices, much of the market appeal of neighborhoods (such as the Back Bay) is based upon the surface image of the existing buildings. For the most part, the interiors of most Back Bay brownstones are similar: high ceilings, lofts, bay windows, brick walls, wood mouldings, etc. The key difference (assuming comparable cost and cleanliness) between one-bedroom apartments in different buildings is the image and appeal of their exterior facade - which is interpreted by our society as being the very character of the building. Antique and collectibles shops florish; primarily due to our growing desire to preserve valuable artifacts from our past (not unlike the intentions served in the historic preservation of buildings). Art and design shops encourage and heighten our awareness of visual communication, symbols, and design; and emphasize our desire to design and control visual (surface) image.

Clothing is the chief export of Newbury Street - and not merely clothing for the underpriviledged. The clothing sold in shops along Newbury Street is geared toward the upper-to-middle income buyer, with an emphasis given to high-fashion and avante-garde style (the value of such reinforced by media and fashion advertising). This type of clothing is more closely related to frivolous or ornamental clothing, rather than clothing purchased for ordinary, everyday wear. The primary reason for purchasing this type of clothing is to acquire an acceptable and fashionable surface image; which, when viewed by the public, validates our image as fashionable and sophisticated members of our modern society. In all of the various types of shops listed above, regardless of their function, the common denominator is the importance of surface image.

"Body improvement" shops are also common to Newbury Street. By the term "body improvement" I am referring to shops whose function is to physically preserve the youthful surface image the body. Examples of shops of this nature are weight-loss clinics, hair salons, skin-care parlors, electrolysis labs, tanning parlors, body-sculpturing salons,

cosmetics outlets, nail-sculpturing parlors, body-waxing salons, facial-treatment centers, and tinting salons - of which there exist more than 50 of these shops in the eight retail blocks comprising Newbury Street. These shops exist to satisfy our increasing need to preserve and improve the image of bodily surface. They play upon our personal anxieties regarding bodily image. They inform us that our natural appearance - revealed by its surface - is unacceptable for public display; ie: bodily image must be improved and preserved. Yet in order satisfy these increasingly stringient standards of natural appearance, it has become necessary to employ artificial means.

Bodily appearance, as with the appearance of all things, is a function of its surface. With high-technology body-improvement salons (such as those found on Newbury Street), we are physically "retouching" our natural bodily surfaces - not unlike the images we retouch in photographs and advertising. Ironically, the surfaces of our bodies themselves are becoming the equivalent of the retouched images captured by photographs. Our ability to alter bodily surface has rendered its appearance more "permanent" - or at least allowed us to create the illusion of permanence and agelessness. When our skin becomes wrinkled with age, we surgically lift the skin to restore firmness and smoothness its surface. When our hair turns to grey or is lost with age, we dye or transplant our hair to recapture the image of youth and agelessness. We are placing an increasing importance on perfectly preserved bodily images; and technology is allowing us the control to acheive these desires (not unlike our similar need to control and preserve built surfaces).

Although the adornment and preservation of bodily surfaces has existed throughout man's history, the intent of modern processes is somewhat different than in ages past. In earlier days, alterations to the bodily surface were understood by the viewer as having occurred. For example, when aristocrats applied hairpieces and wigs to the surface of their heads, people understood the decorative intent of these wigs. In addition, the technology used to fashion these surface images was relatively crude when compared

to today's technology. When viewing aristocrats who wore these hairpieces, observers understood that a wig was being worn. The intent of these surface modifications were more deeply rooted in ornament rather than deception or misrepresentation.

Today, the intention of enhancements to bodily surfaces is to make the viewer believe that these images are natural - that bodily surfaces have **not** been "retouched." With today's sophisticated technology, we have the ability to modify bodily surfaces without letting viewers know that modifications have occurred (not unlike the digital retouching of photographs). When we surgically lift the wrinkled surface of our skin or transplant hair onto our bald heads, we do so with the intention of keeping these modifications confidential. Although we place an inordinate amount of time modifying our bodily image, we go to great lengths to hide this information from the general public (not unlike the manner in which we seamlessly preserve a building's outermost shell - while at the same time extensively modifying its inner substance).

In essence, our society is using technology to remove all evidence of aging, wear, or environmental abuse from every existing surface - from our bodies to the built environment. In doing so, we are further separating ourselves from the realities of nature, space, and time. We are placing greater importance in the preservation of the surface of reality. Yet by employing artificial means to acheive this end, we have not preserved reality; we have instead created a new reality. We apply technology to our buildings, our possessions, and our bodies in an effort to retain the natural image of our heritage and our youthful vigor. But natural appearance of surfaces, we have been lead to believe, is no longer socially acceptible - only enhanced image of these surfaces are desirable. We are affixing a thin, impervious, "membrane" of technology over all surfaces of the world. The sealants, coatings, laminates, varnishes, bacteria treatments, cosmetics, photographs, surgeries, and veneers which we employ have allowed us to perfectly freeze the surface of the world in time. When we document the surface of the landscape in our photographs and in our films, we remove any remaining flaws from these images - in an attempt to satisfy

our visually-sophisticated (and increasingly paranoid) society. But regardless of how clever the image technology may create, it must always remain an *image*, and not the substance, of reality.

Yet, despite the best efforts of man and technology, we do age; and our buildings and our bodies will all eventually turn to dust. By attempting to preserve surfaces, we are deny our own aging, mortality, and place within an organic and evolving world. By denying and obliterating the existance of this maturation and evolution of surfaces, we also deny ourselves valuable opportunities to learn from the natural world - and build character in the recognition and acceptance of the passing of time. Instead, we choose to substitute different realities for the reality of the natural world. In doing so, we render these new realities as less sacred than reality itself. Our new reality is losing its traditional value within time and space; we are creating a world increasingly separated from its heritage, its history, and its people. We are creating a new reality which is time-less, people-less, and environment-less.

If we look beyond the surface of the environment, we will find that our growing preoccupation with the surface of reality is merely a reflection of our own changing values and priorities. By continuing our trend of indifference toward natural materials and the natural world, we have regretably chosen to ignore the substance of our reality. The visibility and immediacy of surface image has, at the expense of all other considerations, become our most important criterion of sensibility; and our actions are inevitably tied to this image. In the long run, however, it is often the things which are not readily apparent which are, in the end, substantial and meaningful.

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Biographical Notes

Ernest Vincent DeMaio was born in Brooklyn, New York on August 7, 1964, where he lived 16 years. After expressing interest in several careers beginning with the letter "A" (Astronomy, Archeology, Astronautics, Art, etc.), the author decided to pursue a career in Architecture. He received his Bachelor of Architecture Magna Cum Laude from the New York Institute of Technology in Old Westbury, New York in June of 1986. His Bachelor's thesis, entitled "A Movement To Peace: A Home For A Cultural Olympics" involved the design of an Olympic Village on the Greek island of Zakinthos with design team partner Clay B. Smook. The project included a mid-semester journey to the distant site on Zakinthos, as well as a visit to the site of the first ancient games (in Olympia) and the first modern Olympics (in Athens). The author also received several academic honors, including enrollment in the Nu Epsilon Tau Honor Society, appointment as Honor Student Teacher of Architectural Design, and the Dean's Award for Excellence in Architectural Design upon graduation.

Believing in a balance between academics and practice, the author has worked for the past eight years with several engineering and architectural offices. Throughout all seven years of his architectural schooling, the author has retained part-time positions (greater than twenty hours-per-week) while enrolled as a full-time student. Currently, the author is employed with the Boston architectural firm of Goody Clancy and Associates, where his responsibilities include interior design, materials research and selection, and construction administration. Mr. DeMaio has also received several design awards for residential construction in New York City, including two awards from the Staten Island Chamber of Commerce for design excellence (both interior and exterior) for an addition to a private residence. In the coming years the author intends to open a private architectural practice, in addition to pursuing an increasing interest in the teaching and writing of architecture-related topics.