THE BROKEN EYE

a dwelling for the visually impaired
THE BROKEN EYE

By William O. Hicks

A professional paper submitted in partial fulfillment of the requirements for the degree of Bachelor of Architecture.

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William O. Hicks
Date 2.9.94
This book is dedicated to Charles and Mary Ann. You have been there for me through it all, and I couldn’t have done it without your support. Dad, you have been my inspiration, although I wish it didn’t have to be that way. Mom, what can I say, you do it all and do it with style.

Thanks.
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Is architecture a form of built art that must be seen to be appreciated?

This thesis is an attempt to integrate a household for a couple in which one spouse is visually handicapped and the other is fully sighted. I want to explore how such an environment can be both functional and stimulating to both, without becoming sterile. Thus my challenge is to create stimulating architecture which is to be appreciated by someone who can not see, while at the same time not be obtrusive with the implementations so that the sighted person can also enjoy it. The way in which textures are used in wall and floor coverings give a space audio qualities that we sighted people don't always realize. Circulation, temperature and odor, when combined with enclosure, are things with which one can create a non-visual spatial experience. My aim will be to combine these qualities to create a space to be appreciated by both the visually impaired and the fully sighted.
Definition of Blindness

The legal definition of blindness is: Central visual acuity of 20/200 or less in the better eye, with corrected lenses; or central visual acuity of more than 20/200 if the peripheral field is restricted to a diameter of 20 degrees or less.

This means that a person is legally blind if he can identify only at 20 feet or less what a person with normal vision can identify at 200 feet, or if his field of vision is so restricted that he can see only a very small area at one time.

Legal blindness then does not necessarily mean total sightlessness. In fact, over 90% of the legally blind have some residual vision, and this remaining vision should be exploited to its greatest possible potential.¹

Basic Guidelines

An individual's vision may vary under differing circumstances and with different tasks, as vision depends upon the eye condition, the amount of lighting present, the distance of the object from the viewer, and the amount of visual discrimination needed.

Blind persons do not possess a sixth sense to compensate for their loss of vision. Also their remaining senses are no better than those of sighted individuals. The visually handicapped simply learn to better utilize their remaining senses since they have little or no vision on which to rely.²

Orientation and Mobility

Orientation and mobility involves the art and science of presenting to the blind or visually handicapped individual instruction and experience in those aids, methods, services, and skills which will enable the individual to move about his environment with confidence, safety, and purpose. The teaching of an awareness of relevant factors in an individual’s environment and of the use of the remaining senses, such as auditory, tactual, olfactory, kinesthetic, and temperature, to determine one's position in this environment and to use these factors for safe and purposeful travel.³

² ibid., pg 3.
³ ibid., pg 9.
The sun never knew how wonderful it was until it fell on a building.

-Louis Kahn

How does someone with little to no vision “see” their environment? Do they acquire a spatial sense of “place?” Do other senses create an image of size, texture, and enclosure? Is it possible to direct someone through a space by utilizing their non-visual senses? With manipulation of building materials, can circulation be enhanced by varying texture, odor, sound, and temperature? How can a space built to enhance a blind person's orientation and enjoyment, be stimulating to a sighted person? Should resale of the building be a factor in its specific design? In other words: Should the space be completely designed to hide the fact it is for a handicapped person?

A large portion of the visual input is redundant, with much more information than anyone is ever likely to pick up, and much of it can be sacrificed. For example, a cartoon can convey a great deal of information with a few simple lines. The perceptual process is constantly trying to find simplifying regularities and consistencies to detect and discard unwanted redundant stimuli which may overload input channels.\(^4\)

The process of seeing can be separated into three processes: A process of sensing, a process of selecting, and a process of perceiving.

Eyes collect a set of sensa (colored patches which form, so to say, the raw material of seeing), and the visual field is the totality of such sensa which may be acquired at any given moment. Collection is followed by selecting, a process in which a part of the visual field is discriminated, singled out from the rest. There is also a psychological basis for selection; for on an given occasion there is generally something in the visual field which is in our interest to discriminate more clearly than any other part of the field. The part of perceiving entails the recognition of the collected and selected sensum as the appearance of a physical object existing in the external world. It is important to remember that physical objects are not given as primary data. The external physical object makes its appearance only when we have discriminatively selected the sensum and used it to perceive with. It is our minds which interpret the sensum as the appearance of a physical object out in space.

Sensing is not the same as perceiving. 
The eyes and nervous system do the sensing, the mind does the perceiving.

To a person with poor vision it becomes interesting and necessary to utilize the little bit of visual input that is still left. The play of light and shadow, the interaction of lights on darks; the use of contrast to separate planes and space is the key to proper implementation of materials. Shadows that lay across a floor and caress a wall give the intersection of the two a place in the space of that room. The patterns that are created give a subtle quality of direction and texture as they become focal points in the room exposing the imperfections of the materials. Dirty glass becomes a canvas for the play of light streaking through a tree's branch, giving the transparent a solid quality. Combining these effects can give a place a true sense of space and understanding.

Architecture is the masterly, correct and magnificent play of masses brought together in light. Our eyes are made to see forms in light, light and shade reveal forms...\(^5\)

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Husband

The husband is 65 and he lost his sight due to glaucoma which was diabetes related. He is now legally blind but otherwise is healthy and in use of his other senses. His vision is rated at 20/200, which means his perception of an object 20 feet away is how one with healthy vision would perceive it at 200 feet. In relating it to someone with good vision, he says it is like looking through dirty smeared-up shop glasses. For this reason, he would like to see a fair amount of light reaching all rooms of the house as he does have a good perception of lights and shadow. He feels that each room should be easy to find and understand.

A formerly active hunter and outdoorsman, he purchased the site in 1975 and used it to camp on when in the state hunting and enjoying the natural splendor of the area. He loved the mountains of the area and always dreamed of living on his land but had a lucrative business and could not afford to move. Now that he is retired he and his wife would like to build on their land and live out their lives in Montana. He would like a building that reflects the environment, while at the same time not being just another log house. He would like it to be an environment he can freely move about but having an interesting path in which to do so.

Wife

At age 64, she is a healthy and alert woman with no health problems. Like her husband, she enjoys the mountains of Montana and often spends time riding horse in them with the neighborhood women while visiting. She likes the rustic houses in the nearby canyons and would like a house that blends into the site and has a quality of having being grown over.
Case One

Illinois Regional Library for the Blind, Chicago
Stanley Tigerman
Illinois Regional Library, Chicago

Fanciful and functional

Nory Miller

A library for the blind and physically disabled represents an inventive response by Stanley Tigerman to design problems of a social and formal nature.

Stanley Tigerman— enfant terrible of the Midwest— has had a career full of transitions. He has moved from Walter Netsch to Paul Rudolph to Harry Weese to Mies van der Rohe to Piet Mondrian, pop art, and Art Deco: from the utopian Instant City to concerned public housing, speculative private housing, and chic, kicky houses. He is now the seasoned guerrilla leader of a "there is more to life than less" movement in Chicago and that city's representative to contemporary symposiums on architecture.

Over the past two years or so, there has been a pronounced shift in his architecture. Lines that once were straight are now curved; black and white has become technicolor; and multiple inversions of perceptual logic have appeared. It is his particular brand of non-modernism, neither "white" nor "gray" really, nor even thoroughly "post." His own description is that he is making "architecture couched in humor, architecture that is fun. Humor, human," he says, "the words even work together."

The very best of these new buildings, and the only one completed, is the Illinois Regional Library for the Blind and Physically Handicapped and Community Library in Chicago, which opened in February. It is an ambitious design that manages to be particularly sensitive to the needs of its patrons, intelligently sited with provisions for expansion, under budget, and also Tigerman's current architectural manifesto.

Remarkably, all this takes place in a tight-budgeted ($1.9 million), tight-sited, tight-programmed government building, subject to a full range of OSHA regulations, in which Tigerman was the design consultant to the official architect, the City of Chicago's Bureau of Architecture (Jerome R. Butler Jr., City Architect).

The library serves three functions: it is the State of Illinois's distribution center (essentially a post office) for books and cassettes for the handicapped; Chicago's public library for the blind and those in wheelchairs; and a small branch library for its inner-city community. By the time Tigerman was hired, the program was set and a small triangular site on Chicago's Near West Side was purchased. Tigerman located the building on two sides of the triangle, left the third for grade-level parking, and left a one-bay-wide hole for future stack expansion. The last was accomplished by subdividing the library's two-story height into three levels of stacks, which were arranged to be split-level to the rest of the building.

Freestanding element and curved corner mark entry for parking.

Author: Nory Miller, formerly managing editor of Inland Architect in Chicago, has recently joined AIA Journal.
The value of flexible, universal space to design a totally specific, highly successful building around three basic principles: First, the plan is linear because a linear plan can be followed and memorized more easily without sight. Second, all furniture is built-in so it can be avoided. Third, everything is soft-cornered to reduce the hazard from collision. All of which allowed Tigerman to indulge his long-time adherence to meticulous detailing and his newfound fascination with curves.

The focus of the interior is an undulating circulation counter. It sweeps the entire length of the building from the entrance to the building to the entrance to the second floor. It is not only counter but handrail. In high, signaling with each dip and inner bend the presence of a staff person. The deepest dip signals the checkout desk. The third cutaway under the counter permits people in wheelchairs to move out of the circulation path. Upon entering, the first thing a blind person (or anyone else) comes to is a staffed control desk. Here he can be directed to the right to volunteer reading room to the lounge with plug-in monitors for cassettes, or to the Braille catalog and circulation counter beyond.

The card catalog is unique. Tigerman worked closely with the American Federation of the Blind in developing the catalog as well as on other design elements in the building. Behind the counter, stacks are closed. Since Braille books are organized in a special order.

On the second floor, Tigerman has woven—into the spaces not occupied by stacks—a community branch library and a variety of staff functions, interlocked like a curvilinear Chinese puzzle. It is full of Tigerman cranks such as a pre-school carpeted “environment” shot through with dark tunnels (in which only the blind children can read) and a tiny staff lounge. Scurried from the library to the right. To the rear of the library sits a counter cornered to the library. To the left, on the second floor, is a counter-cum-control desk. Here he practices, is just one more with stand, as he recently admitted. Just as one suspects, Tigerman drew the whole line first, liked it, and later reflected it in the plan and elevation of the circulation counter.

The form that was so pleasing to his eye is a familiar one—John Hejduk’s cloud cut-out in the Barbary House; Michael Graves’s celestial soffit: Ultimately late cubism, especially Matisse’s gouches.

Not surprisingly, the window has become the building’s logo, appearing as the shape of signs, on stationery, and the rest. For the window is not a symbol of something, but the equivalent of applied ornament, which is symbolic in its own way.

Significantly, though, the butt-glazed light motif is not applied but inserted, literally forcing the top of the solid concrete wall to bulge, and 4) a tilted table-top version of the adjacent corridor configuration. Architects, he says, “have been painting structure on elevations for years. I’ve painted circulation.”

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Illinois Regional Library

Community library has areas for pre-school (above, left), braille card catalogue (above, right), meeting room (below, left), area for children (below, right)
Poured concrete wall acts as a beam to span 165-ft-long butt-jointed window, elsewhere. Panels on exterior of building are baked enamel.

Visitors enter main door behind curved corner (left), inside, corridor for blind is edged by “tactile” service counter (below), counters curve in staff lounge (above).
A two-car garage in the shape of an automobile (above, right) will be parked on the lot (below) when completed.
Three-dimensional projections indicate several different elevations shown within the geometric configuration the building assumes on this triangular site. Even the rest of the building.

Similarly, the concrete wall leads one down a number of architectural paths only to bail out at the last minute. In the simplest sense, the wall is a response to context—recognition of a map, though unfavorable. Yet, by the building's abstraction, its lack of continuity with the surroundings, however grim, and its disconcerting scalelessness, as if one were driving up to a cardboard model. defeat any real melding.

Violating visual preconceptions

One is tempted to read the wall as facade, as the building's face, either in pre-modern terms or as Hejduk or practitioners of the so-called Philadelphia School have revived it. For one thing, Tigerman clearly distinguishes between walls here rather than treating the exterior as skin. He has introduced slots that proclaim the wall as a planar frontispiece, detaching it from the building and giving it a special significance, already implied by the different material, color, and window pattern.

However, this wall is not the front door, not the facade, not the entry. The entry is around the corner, contained within the red machine. It has an elaborately symbolic gateway, decked out with flag and signs, leading to an almost Palladian portal, somehow altogether appropriate as a sequential entrance to a linear plan. The concrete wall, screaming to be recognized, has been trumped, and is left a dangling participant, its role contradictory.

Contracted as well are basic propositions involving material. The juxtaposition of metal and concrete sets up an automatic focus on the contrasting nature of these materials. Yet the minimal fenestration of the quarter-inch metal panels gives them the appearance of extreme weight while the squiggling window denies the real weight of the concrete. Paint is then applied to all surfaces, perceptually reducing them to the uniform thickness of emulsion—yielding yet another reading.

The side of the building that looks taller is two stories; the shorter side is three.

The formality of the freestanding gateway is interrupted by a blue drainpipe whipping through it. The area of an office increases with the status of the staff member occupying it, but the number of windows decreases. None of them is placed for a view out to the street anyway.

The tyranny of gravity is overthrown by the wavy window but reinstated in bright yellow exposed cross braces.

The building is a series of contradictions, of paths begun but not followed. Assumptions undone but not replaced. Whatever is handy is gathered, whether it be the post-war modernism Tigerman brought up in the early modern and Beaux-Arts revivals popular now, or work by his contemporaries. Another movement will be explored here too—pop art—when the two-car garage in the shape of an automobile (see model photo) parked on the lot disappeared.

Tigerman plays the part of an imp under the influence of dadaists. But he is no dadaist himself. He is too serious about material things. He finishes about the sleekness of surfaces, the flushness of details, about minimalist colors and shapes. He is serious about hardware and serious when he lines the elevator—doors, walls and ceiling—in Perrell rubber tile. He is especially serious when he explains how he not only designed the building, not only executed the interiors, but also designed the special calendars and maps, and chose the wastebaskets, dish dryer, and even pencil cups.

This is Tristan Tzara, coming to you from the PlayBoy Mansion??

In the end, Tigerman is doing exactly what he says he is doing. He is having fun. While others carry on an architectural revolution, he is picking up the well and wounding from all sides and playing with them. The formal imperfections of his contemporaries, like canons of dead Masters, are just as much raw material for his conceptual metamorphosis.

In the end, there is an energetic, sophisticated, fun spirit and a thorough building. But there is not really any manifesto. While architecturally aware and attuned, Tigerman is and always has been apolitical.

Data

Project: Illinois Regional Library for the Blind and Physically Handicapped and the Community Library, Chicago

Architect: Stanley, Tigerman & Associates in association with the Bureau of Architecture, City of Chicago; Stanley, Tigerman, architect in charge of design; Jerome Butler, city architect; Robert E. Rapaport, associate in charge; Dan Zumberge, Richard Taransky, and Faldye Isatt, assistants

Programs: 32,000 sq ft public library for 411 blind; hands capped and non-handicapped people. Colors are bright for those with weak or fading vision, and to provide a pleasant atmosphere for the sighted. Spaces include volunteer reading room, preschool play area, children and young adult section, machine repair area, offices, small branch library, and second floor; Site: approx one acre near busy intersection southwest of Chicago Circle Campus of University of Illinois. Structural system: Steel frame on 25-ft square bay, with steel tenon cables and turnbuckles for lateral bracing. Poured concrete walls facing street acts as a beam to span the 156-ft long cut-through window.

Major materials: Steel, baked enamel panels, concrete, cement, (Building materials, p 134)

Mechanical system: Gas-liquid forced air heating, rooftop units with exposed ducts for heating and cooling.

Consultants: Wallace and Galland, Inc. (Building mecanica), James J. McNally, Inc. (Structural), General contractor: Biltmore, Inc.

Client: Chicago Public Library, City of Chicago

Cost: $1,450,000, bid-- $1,482,000 per sq ft

Photos: Philip Turner
Case Two

House Near New York for a Blind Man
Charles Moore and Richard B. Oliver
Extra sensory perceptions

Charles Moore and Richard B. Oliver design a house in the grand manner for a blind man and his sighted family, remarking that the way a house feels is just as important as the way it looks.

Not far from New York, a large, handsome house sits atop a knoll overlooking some of the most beautiful countryside in the eastern United States. This house is the latest installment in the continuing saga of the Great American Country House, a story that began some 250 years ago in Tidewater Virginia, with ensuing chapters written ever since all across our country. It is a country seat not far removed in spirit from our earliest grand houses were modeled. But this house is different from all its predecessors in one very important respect: its owner has never seen it. Or has he?

Charles Moore and Kent C. Bloomer, in their recently published book, Body, Memory, and Architecture (Yale University Press, 1977), have written: "The historic overemphasis on seeing as the primary sensual activity in architecture necessarily leads us away from our bodies. This results in an architectural model which is not only experientially imbalanced but in danger of being restrictive and exclusive—especially when we consider that all sensory activity is accompanied by a bodily reaction. Thus they define one of the most salient omissions and most pressing requirements in contemporary architecture: the need to design for all the senses. Perhaps the most glaring fallacy in much of the neo-P'atomc architecture of the past half century has been the dangerous belief that a humanly satisfying building need not take more into consideration than proportional perfection or compositional purity. Many such buildings have attained their diagrammatic climax much more effectively in two dimensions than they ever have in three, but a house for real people with real bodies must account for much more.

When Charles Moore and Richard B. Oliver were commissioned to design a house for a man who had lost his sight three years earlier, they found a unique opportunity to implement solutions to those neglected aspects of architectural design, and, in Moore's words, "to make something that could be felt as well as be seen." The architects did not approach the program with the genteel reticence, the euphemistic circumlocution, that turned the client and his wife away from several previously considered architects who could not even mention the inescapable fact of the client's blindness. But Moore and Oliver were not afraid to speak the unspeakable, mainly because the exigencies of the situation dovetailed quite neatly with concerns these architects have dealt with elsewhere. And so began one of the most inspiring architect-client relationships in recent history.

On his blindness

The first and most pressing problem the architects faced was how to make their plans "visible" to a man who cannot see. A partner in Charles Moore's Connecticut office had recently built a vacuum press, and it was immediately put to use in making three-dimensional plans, raised in those areas usually drawn in poché on a traditional plan. Therefore the client literally was able to let his fingers do the walking and from the very beginning could participate in the design process with an involvement unusual even in a sighted person. The client's main requirements were quite simple: he did not want his house to look like a home for a blind man, and he wanted its design to enhance the independence that he correctly understands to be a handicapped person's strongest desire, and, more often than not, his most humiliating deprivation. This is especially true in the case of this man, who remains active, agile, and attuned.

The client is a victim of a disease called retinitis pigmentosa, a rare congenital condition that causes irreversible degeneration of the retina and which is therefore unsuceptible to eye transplants. Once thought to afflict only the old (and therefore often misdiagnosed as an extreme result of the aging process), retinitis pigmentosa has just recently been recognized as an inherited condition. Though usually appearing only in middle age, the symptoms in this man's case began in his early 30s, and advanced with uncommon speed, within nine months of the onset of the disease, his sight was gone. But if you have tears to shed, forget it. Since he went blind this remarkable man has gone on to ski every slope at Aspen (though naturally he favors the runs with the fewest trees), and has been seen to wander off of an afternoon to pick fruit on his property, unaided, returning with arms full of peaches.

In their construction of an environment that would enhance and exploit the client's unimpaired sense of his body, the
House near New York

Pool pavilion (above) has solar collectors for heating and belvedere window for cooling. Living room (right) has indirect lighting, belvedere windows.

House he is. His increased dependence on his sense of hearing made the client especially eager to have discrete, aurally intelligible spaces in which to live, making it possible not only for him to gauge his own whereabouts, but also to be aware of the approaching presence of others. For instance, the sound of footsteps in a small, uncarpeted entry niche between tiled hallway and carpeted living room announces an arrival. Not all the compensatory considerations were quite so protective as all this sounds. Many others were conceived for sheer sensory delight, and would be welcomed by any sensually aware person, even if he could see—as indeed three-quarters of the inhabitants of this house can. Not one of the senses is forgotten. Since the blind live in a world of surfaces, great care was taken in the tactile qualities of the materials used here. Most visible—and possibly the only giveaway that a blind person lives here—is the gorgeously crafted mahogany railing that winds its way through the central orangery. It was on a stop at a small airport in western Pennsylvania that the owner and his wife simultaneously grasped a handrail and at once remarked on its singular pleasantness to the touch. Richard Oliver, who was responsible for most of the house’s thoughtfully conceived and exquisitely executed detailing, sent for copies of the working drawings of the airport’s prototype, and produced a close, albeit considerably more elegant, facsimile. Though blind, the client’s eyes are nonetheless peripherally light-sensitive, making the question of illumination an important one. Direct artificial light is painful to him, so as a result there is not a single exposed light bulb in this house (especially unusual in a work by Charles Moore, whose familiar rows of exposed light bulbs have become one of his most widely copied trademarks). Indirect lighting was used wherever possible, but the numerous inventive solutions never seem institutional nor are they even particularly noticeable. For those who can see, the house has a particularly restful visual aura, and though prompted here by dire necessity, the lightweight emphasizes yet another area wherein design for the handicapped has much to instruct in design for everyone else.

Music to his ears
A dazzling array of ceramic tile was used throughout (see P.A., March 1978, p. 96), not least of all because the client likes its cool, smooth surfaces, and its rich visual range (like so much else here) makes one realize that you don’t have to be blind to enjoy it. The most vivid tiles of all, in a loud Art Deco pattern called Ritz Bar (which, naturally, also can be found in the bar of the Ritz Hotel in Paris) line a craggy fountain sunk into a fissure in the floor of the orangery. The fountain is the image of a geode—that recurrent Moore motif—with the rich purples and greens of the tile bursting forth amidst the terra cotta paving. But the fountain delights another sense, too: metal tuning forks are embedded in the fountain and produce a pleasant tinkling sound as water splashes over them.

The free-form planting areas in the orangery (and in the conservatory, not far behind it) contain several varieties of fragrant plants such as lemon trees, providing an olfactory experience for what is undoubtedly the most neglected of all the senses in our deodorant-obsessed society. The house also has a brilliantly worked out natural ventilation system that obviates the use of the air conditioning system on all but the most oppressively hot summer days and also eliminates the annoying background noise and stale odors that conventional mechanical systems habitually produce. As a result, the owner, seated in his living room cooled by a ventilation window high above his head, actually can smell which way the wind is blowing by the fragrance it carries from the pine forest on one side of the property, or from the peach orchard on the other.

With a slight stretch of the imagination, then, it can be said that the architects have provided for all five senses: for if the fruit grown in the orangery can be eaten, then the sense of taste can be added to the senses of sight, touch, sound, and smell which are not only enhanced, but also imaginatively intermingled here. The staggering breadth of detail to which the architects addressed themselves makes this job a triumph of logistics as well. A set of “red books,” documenting every single specification and every last design decision were compiled and referred to at the design conferences (well over a hundred in all) between the architects and their clients. In that way, the potentially daunting range of issues in designing a house for a blind man could be approached methodically and thoroughly, the only rational answer to dealing with the number of things to be considered in this 12,000-square-foot house. One such unforeseen case in point was the installation of an electric eye in the house’s indoor swimming pool, activating small jets of hot water as the swimmer approaches the end of the pool, warning of an impending collision.

Vision for the future
Architecturally, this house is a superb achievement. This cluster of five slate-roofed pavilions has the unPtsable blend of ease and land-derived grandeur that makes it an inescapably American house. It marks the beginning, perhaps, of a new phase in Charles Moore’s career: this house has a greater sense of repose than any of his other houses since his own Onnada house of 1961, which in its general massing seems a more direct source than Stratford Hall; the colonial plantation house often invoked by Moore and others. Sensitive study (with the advice of Moore’s sometime partner, William Turnbull, who grew up on similar terrain) this house is as in touch with its surroundings as its master is with his.

Not for a moment did Moore and Oliver see this commission as anything less than (as the former has put it) “a chance to do something not in the narrow visual mold of the Modern Movement.” They and their patrons took the harsh realities of his blindness and seized the opportunity with the same sense of daring with which the client approaches every step in his life. As a result this man can see his house far more
House evokes numerous images, from 18th-Century manor houses to 1920s "Wall Street Pastoral."

South side of house (above and below) has triple-hung window leading from dining room to terrace, based on a similar design by Jefferson. Belvedere windows atop pavilions cool house naturally.

...and movement through the house. Blind people have well-known difficulty negotiating corners (or at least while preserving their dignity, since they often bump into them), so one of this house's major design themes came from the chamfering of rounding of most corners. That gentle modification eases him along the way inside the house, as does the other major circulation aid: the varying textures used underfoot to indicate one's position in the house.

See me, hear me, touch me

On the first floor, large, earth-colored Mexican quarry tiles are used in hallways and the kitchen, and the bumpy, handmade texture of the tiles gives the house's owner the feeling of unexpected adventure beneath his feet that he enjoys. Upstairs, wall-to-wall carpeting is used in the circulation areas, providing the sound reduction that the client demanded, his hearing having become, typically, more acute since the loss of his sight. In the rooms at both floors, the owner's wife vetoed the use of wall-to-wall carpet on aesthetic grounds, and accordingly, the oak-paned floors are covered with room-size oriental rugs, leaving the feel of the floor underfoot. The client can determine where in the

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completely than many of the rest of us can see our own house could well be an
historical turning point in the way architectural design is perceived, not as a function
of any one sense, but of all of them. Here are two talented architects and their equally
talented clients show us the way. Will we follow? [Martin Fier]

Data

Project: house near New York
Architects: Charles Moore and Richard B. Oliver
Program: a residence for a family of four, designed to accommodate the blindness of the
owner, appealing to his remaining senses, while also appealing visually to his sighted wife and
children and to visitors.
Site: 200-acre farm, close to a large urban area.
Structural system: wood-frame construction, box beams and trusses.
Mechanical system: natural ventilation system, colonial air conditioning, solar-heated hot water
and solar-heated swimming pool.
Major materials: cypress, cedar-cladboards, redwood boards, gypsum board, heathing, stone
and slate.
Consultants: Esher, Barber, mechanical. Schuep, & Zamecki, structural. Miloland &
Contractor: where at request of client.
Client: with the request of client.
Cost: with the request of client.
Photography: Norman McGrath.
Case Three

Auditorium and Music Building, Kentucky School for the Blind
Jasper Ward and Robert Kingsley
The new Auditorium and Music Building of the century-old Kentucky School for the Blind in Louisville demonstrates that it is possible to produce exciting design for the handicapped, even with limitations of budget and governmental regulations. Dedicated last October and already professionally recognized by a 1977 Kentucky Society of Architects Honor Award, the new music school is also the most notable example of contemporary architecture erected in Louisville in recent years.

Louisville has a rich and generally appreciated 19-Century architectural heritage, but new construction in Kentucky's largest city is characterized by conservatism, timidity, and a sort of déjà vu aspect, as the current styles of the East and West Coasts seem to appear here about a decade late. This all-too-common provincial myopia has caused the city to overlook the considerable talents of Jasper Ward and the young designers that he attracts to his office—easily the most avant-garde architectural firm in the region.

The unassuming exterior of the music building perhaps explains why Ward has been a prophet without honor in his own city. His existing buildings, and even his schemes for converting local grain elevators and a railroad bridge over the Ohio River into apartment blocks, tend to stress a combination of imagination and function at the expense of the sort of monumentality and egotism that capture the public's eye. Avoiding the temptation to upstage the all-too-boring institutional structures that dot the Kentucky School for the Blind campus, the terra cotta-colored brick of the new building blends sensitively with its neighbors.

The building's main façade is a flat brick

Author: William Morgan is an associate professor of fine arts at the University of Louisville
wall interrupted only by a colonnade. The simple, boxlike masses of the building are consciously plain, but the sharp edges created by the unarticulated corners give the feeling that the brick is not solid or weighty, but rather a thin skin stretched tautly across the building’s surface.

The simple device of the full-length colonnade—an ideogrammatic classical stoa—makes a respectful reference to the original School for the Blind, a monumental Greek Revival building erected in 1855 and, sadly, demolished a few years ago. The deep recesses of the colonnade, piercing the wall instead of projecting from it, give a sense of mystery. As one walks in front of it, the openings change in relationship to one another, resulting in a dynamism and a rhythm not unlike a musical scale. Because the students are trained to “feel” space and obstructions, the rhythmic and sound characteristics of this and other spaces have been consciously exploited. In some spaces carpet is used on walls, and acoustic drapery, acoustic glass, or metal reflecting panels are also used to achieve special acoustic individuality.

The factorylike—even severe—exterior is in direct contrast to, and serves as an appropriate functional container for the bright, multicolored interior. The use of color here, on elements such as exposed ductwork, is more than just another example of the “exposed pipe school” that has become such a design cliché, for all of the colors are basic to the architectural program of the building.

Color codes
Most of the kindergarten-through-12th-grade students are legally blind, but have some degree of vision. They not only respond to bright colors, but the colors also act as a guide to the building’s different functions.

Yellow identifies choral areas (including a 42-seat hall-classroom), while bright red is for exits, a lighter red is for the band room and instrument storage areas, and orange is for public spaces. A mixture of primary colors is employed for 16 practice cubicles and two piano practice rooms. Blue and green are reserved for heating and cooling pipes and ducts.

But the colors serve a far more important psychological role in establishing an air of brightness and exuberance. Orange, for example, is used in the main 300-seat recital hall where painted truss-work offsets the neutral-tone cinder-block walls. The intensity of the orange acoustical panels on the walls and ceiling subtly changes in relation to their distance from the stage.

The auditorium, which is used for theater and movie showings, as well as for recitals, is built in traditional concert-hall “double cube” configuration of 40’ x 40’ x 80’. Despite its size, the hall achieves an intimacy and respects the building’s scale by being set below the main floor level. Its excellent acoustics are assisted by floor
In both the chorus room (above, top and middle) and band room (directly above) vivid and contrasting colors are used to help the blind students, many of whom have some sight, move about the building more easily. The completely glass-enclosed corridor (too, left) acoustically separates the band/chorus wing from the auditorium (shown on following pages). The catwalk (left) running between the auditorium and its lobby leads to the third floor mechanical penthouse and to ceiling apparatus of auditorium.
In auditorium, bright orange wall and ceiling acoustical panels contrast with buff-colored brick.

Auditorium entry colonnade (above, below) creates visual/audio rhythm that helps guide students.

In auditorium, bright orange wall and ceiling acoustical panels contrast with buff-colored brick.

Auditorium entry colonnade (above, below) creates visual/audio rhythm that helps guide students.
Case Four

Life Learning Center for the Blind Retarded, Boston

Graham Gund
A projected learning center in an urban area offers some interesting solutions for a specialized program and clientele.

A building that is both contextual in terms of its adjustment to the configuration of the surrounding urban landscape and progressive in terms of its response to design guidelines for the blind is planned for a busy section of Boston. The approximately 13,500-sq-ft facility, in the Bay Village section of Boston, is a linear block that forms a strong wall on the narrow site (35' x 270') on Tremont St. Confronted with the difficulties of this site, cleared for a since-abandoned urban renewal project, architect Granam Gund organized the functions of the facility in a linear block. Thus, he was able to keep the street line while permitting the building to remain low in scale to fit in with the surrounding neighborhood of early 19th-century townhouses. For this reason, too, the building's entry façade is faced in brick, although the rear elevation, overlooking a garden, is faced in stucco. (The structure is simple and conventional: open-web steel joists span the 27-ft width on a 9'-10" system of structural bays; floors are concrete.)

The facility, a transitional home, is part of an evolving effort to de-institutionalize the living environment of the blind and train them to become self-sufficient enough to lead normal lives. Thus, for example, residential units are clustered with cooking and dining facilities to allow residents to accustom themselves to apartment-style living.

The living units, located on the second floor, are subdivided into private rooms that open onto semi-public living areas to encourage socializing while still permitting privacy. A linear corridor connects all these spaces, and forms the primary organizational element for the blind. A "greenhouse" bounding one side, plus colored glass panels in this south-facing wall (for those who cannot perceive colors), and tracking strips along a wall will permit those using the hall to differentiate the groupings of spaces while maintaining a basic point of reference. Openings and seating areas in the railway orient blind residents, and provide the possibility for different types of social interaction.

Communal rooms will have a change in ceiling heights so that the acoustics will change, further distinguishing different functions. Furniture, however, is designed to be stationary to reduce possibilities of accidents. At the same time, these considerations predominated in the design conceptualization. Gund had to be careful not to overdesign safety features since the program places high value on self-sufficiency for the residents.

The publicly oriented areas such as out-patient services, teaching and recreation rooms, plus administrative offices for the client, the Massachusetts Association for the Blind, are placed downstairs on the street level. A well-defined public entrance, however, is kept separate from the residents' entrance. All in all, the scheme seems as if it should succeed in its intention—creating a non-institutional setting that responds sympathetically to the goals of the program and sympathetically to the urban context. (Suzanne Steenens)
Case Five

The Bavinger House
Bruce Goff
251. 50.02, Bavinger house, near Norman, Oklahoma, plan of upper levels. 6. seating area; 7. storage; 8. sleeping area; 9. studio; 10. guest; 11. bridge.

252. 50.02, Bavinger house, near Norman, Oklahoma, section. 1. terrace; 3. pool; 4. dining area; 6. seating area; 7. storage; 8. sleeping area; 9. studio.
254. Bavinger house, near Norman, Oklahoma, view from stair into breakfast area.
Location
The project site is in the Lolo National Forest approximately thirty miles west of Missoula, Montana on the Clark Fork River. It is lot number four in the Ponderosa Pines development located four miles south-east of Alberton. This development consists of five and ten acre lots located on and around a flat area on the north side of a bend on the river.

The project property is bounded by a hobby ranch to the east, a single family house to the west, the access road to the north, the river and Cinderella Mountain to the south.

The site is not under civic zoning. The land slopes from the north to the south, being primarily flat with the largest grade near the bank of the river. All required utilities including a drain field are available towards the south end of the lot.
Analysis
Views into Site

A View From I-91
B From Local Access
C From Next Lot
D From Neighbor
E From River
F From Trail
G From Peak

Views into Site
Contours
Drainage
The sky is encased by the earth.
The earth is enclosed by the sky.

The rugged earth alters the water’s course.
The rushing water alters the earth’s shape.
The sky is blue because it contains water.
The river is blue because it contains sky.
The river is directed by the earth.
The earth is eroded by the river.
SPACIAL NEEDS
Public

Living Room
TV and lounging area for casual entertaining.  
150 ft$^2$

Dinning Room
Elegant dining room for entertaining guests and for family occasions.  
100ft$^2$

Rest Room
Serves public section of house; must have toilet, sink, and small closet for towels.  
50ft$^2$

Sitting/Reading Room with Fireplace
Library space with nice views. A place to withdraw to with guests for a cocktail or to reflect on the day.  
100ft$^2$

total public space: 400ft$^2$
Semi-Private

Kitchen
Must be easily navigated and not cluttered. A breakfast nook should be included.

150ft\(^2\)

Garage
Two car garage with room for bikes and other often-used equipment to be stored.

350ft\(^2\)

Guest Room
Room for a couple to stay for up to one week at a time. Adequate closet space is thus necessary, and it should be close to a bathroom.

100ft\(^2\)

Bath Room
Serves the guest room and must have a shower along with adequate storage for guest’s toiletries.

75ft\(^2\)

Storage
Storage for house things and also storage for lawn care items.

200ft\(^2\)

Mechanical room
A place for the HVAC unit plus the breaker box and utilities meters.

30ft\(^2\)

Mud/Laundry Room
A place for storage of winter coats and shoes which will include the washer and drier.

75ft\(^2\)

total semi-private: 980ft\(^2\)
Private

Master Bedroom
A comfortable and private place. A place in which the owners can withdraw and be completely isolated from the rest of the house. 175ft²

Master Bath
Must include a tub and shower which are easily navigated. Must be quiet place in which to relax. 100ft²

total private: 275ft²

total building: 1655ft²
DEVELOPMENT
Thoughts and Impressions
“Comfort is confused with the absence of sensation. The norm has become rooms maintained at constant temperature without any verticality or outlook to sunshine or breeze or discernible source of heat or center or, alas, meaning.”

- Le Corbusier

We as humans, try to decipher our surroundings constantly. We are incisively interpreting orientation, weather, and environment in an attempt to grasp the spirit of where we are. It is our perception of information that creates the emotional responses that are experienced. But not everyone perceives the world in the same way. It is a complex task of breaking objects into their properties and examining them, assembling them and understanding their design and intent. We do this by drawing on past experience, relating the properties of the object to things we know, but, this is subject to many variables. Cultural heritage is perhaps the largest and most controllable aspect of this. People from similar backgrounds will generally have similar opinions of the same object. In this respect we can manipulate certain building conventions to minimize misunderstandings. Now, if all preconceptions could be removed, we would experience our environment spontaneously, as animated and living, the way children do. But even children view their environment via emotional interpretations. Humans need to cling to an ordered system of interpreting things; if the order is removed, perception can acquire the character of defense rather than the collection of information. Should, then, architects conform to the culturally implied order of design, or distort the way in which things are viewed, thus causing a defensive thought process? Would it be bad to purposely cause a defensive stance by creating a new thought process, or would it lead to a new way to perceive our built environment and thus a new way to design it?
The concepts of geographical orientation is a pertinent one to us as architects. For we have to have a strong grasp of the environment we must look at what creates the spaces in which we design. If we consider the basic elements of organization to be proximity, continuity, and enclosure we could once again see the world through the eyes of a child. By simplifying the environment in which we design, we can then organize our concepts in a more solid manner.

People must always describe the activities of their life. In order to do this, they must have some way in which to communicate their relative location and the actions required in getting there. By defining the directions of travel, man has defined the space in which he exists. Christian Norberg-Shultz talks about the concept of place as having two elements, a center and a surrounding ring. If we consider this, we see that we can define travel as being out of the center in the outside ring. From this we can say that we go out of the place and we later come back into it. By defining space in such simplistic ways we have already created a place.

In architecture, we must also define the place (site) in which we design, within the space (context) it exists. By doing this we can provide a better environment in which people exist. This is done by establishing directions, both inside the built form and in the immediate area (site). This lends itself to establishing paths from the place into the outside ring. These paths help to define the place within the space it resides. These paths are usually created along directional lines marked by some religious or solar grid. These things are very important in that they have meaning to the inhabitants. By doing this they can easily describe their daily activities by relating them to their environment. This lends itself to a more comfortable space within they can exist, and establishes a center which can become a place. Architects must be sensitive to these things in order for our designs to be integrated with their environment and their inhabitants.
Mountains were therefore considered "centers"...a spot where one can pass from one cosmic zone to another. In other words, mountains are places within the comprehensive landscape, places which make the structure of being manifest. To the general ones already mentioned, we must add the hardness and permanence of stone as a building material. Rocks and stone have been given primary importance by many cultures because of their imperishableness.

- Christian Norberg-Shultz

In the tree heaven and earth are also united, not only in a spatial sense because the trees rise up from the ground, but because it grows and is "alive". Every year the tree reenacts the very process of creation, and to a primitive religious mind, the tree is the universe, and it is so because it reproduces it and sums it up...in general vegetation is the manifestation of living reality.

- Christian Norberg-Shultz
The marriage between heaven and earth forms the point of departure for the further differentiation of "things". The mountain, thus, belongs to the earth, but rises to the sky. It is "high", it is close to the heaven, it is a meeting place where the two basic elements come together.

- Christian Norberg-Shultz

Being on the earth implies to be under the sky. Although the sky is distant and intangible, it has concrete "properties", and a very important characterizing function. The effect of the sky is basically due to two factors. Firstly the constitution of the sky itself, that is, the quality of light and color, and the presence of characteristic clouds. Secondly its relationship to the ground, that is, how it appears, from below. In general we may say that the sky is as large as the space from which it is seen.

- Christian Norberg-Shultz

The sky is hardly experienced as a total hemisphere, but is narrowed in between the contours of trees and rocks, and is moreover continuously modified by clouds.

- Christian Norberg-Shultz
In the *Genesis*, God separates the dry land from the water after the creation of heaven and earth, light and darkness, and in other cosmogonies water is *the* primeval substance from which all forms come. The presence of water, thus, gives identity to the land...

- Christian Norberg-Shultz

The most primitive of the "sacred places" we know of constituted a microcosm: A landscape of stones, water, and trees.

- Mircea Eliade

I go down with the water and come up with the water. I follow it and forget myself. I survive because I don’t struggle against the water’s superior power.

- Chuang-Tse
“Glassmaking has long been known in the Orient, but the craft never developed as in the West. Great progress has been made, however, in the manufacture of pottery. Surely this has something to do with our national character. We do not dislike everything that shines, but we do prefer a pensive luster to a shallow brilliance, a murky light that, whether in a stone or an artifact, bespeaks a sheen of antiquity.”

Whether wood, stone or glass, the most beautiful is that which shows its true nature. Wood is full of grain, the very strands of fiber which gives it strength and beauty, and it would be a crime against the wood to smother it with paint. The truly attractive stone is that which shows the impurities within. As such, glass is made of sand and unless it is used to view through unobstructed, it should keep the character of that from which it comes.

“As a general matter we find it hard to be really at home with things that shine and glitter. The Westerner uses silver and steel and nickel tableware, and polishes it to a fine brilliance, but we object to the practice. While we do sometimes indeed use silver for teakettles, decanters, or sake cups, we prefer not to polish it. On the contrary, we begin to enjoy it only when the luster has worn off, when it has begun to take on a dark, smoky patina.”

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7 Ibid. pg. 10.
special room

"...the Japanese toilet truly is a place of spiritual repose. It always stands apart from the main building, at the end of a corridor, in a grove fragrant with leaves and moss. No words can describe that sensation as one sits in the dim light, basking in the faint glow reflected from the shoji, lost in meditation or gazing out at the garden. The novelist Natsume Soseki counted his morning trips to the toilet a great pleasure, "a physiological delight" he called it. And surely there could be no better place to savor this pleasure than a Japanese toilet where, surrounded by tranquil walls and finely grained wood, one looks out upon blue skies and green leaves."

The toilet is like the brain of the house. It is a place which collects sensory information and allows one to meditate and contemplate the day. It is set away from the main building, and in doing so, allows it to be separate from the smells and sounds of it. It should be in a garden with windows to allow sounds, smells, and filtered light to enter.

"As I have said there are certain prerequisites: a degree of dimness, absolute cleanliness, and quiet so complete one can hear the hum of a mosquito. And the toilet is the perfect place to listen to the chirping of insects or the song of the birds, to view the moon, or to enjoy any of those poignant moments that mark the change of the seasons."  

To furnish the toiled room one must take care to not give a sterile appearance. The over-use of harsh tile and linoleum which reflects sound and light should be avoided. Wood can be used to give a soft and subtle feeling and still be sanitary. This will complement the play of light, sound and smells which are apparent in the placement and design of this overlooked room.

"Were I able to have things my own way, I would much prefer fixtures - both men's and women's - made of wood. Wood finished in glistening black lacquer is the very best; but even unfinished wood, as it darkens and the grain grows more subtle with the years, acquires an inexplicable power to calm and soothe."  

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9 Ibid., pg. 4.
10 Ibid., pg. 6.
The Attached Floor

Emphasize concept of ground as firm & solid.

Stone - Packed Earth
The Detached Floor

The floor may either be raised physically above the ground or lie lightly on it.

Wood - Sand - Moss - Grass
The Open Floor

Glass Floor
A floor that opens downward
Log over pond

Mirror Floor
Perfect reflecting floor
Still water

Reflecting Floor
Indistinct mirror floor
Rippling water
The Layered Floor

Floor Plane in which the form, material & pattern convey depth.

Wet asphalt, paved in grass.
When thinking about the design of this building, I knew that the form was to be the driving force to create the spacial sensations that are needed. With this in mind I went out and found pieces of two dimensional modern art, overlaid trace paper, and combined interesting forms. After several of these tracings were complete I then began to pull possible design elements out of them. Combining these, I began to have unique forms with which to begin elevations and plans. I then created a few different schematic design possibilities.
Mobiles, Shadows, and Models
Once I had these ideas, I found them to be too static and boring. Although they were spacial and interesting they had poor volume and no real integrity. My next move was to take these designs and create mobiles from them and thus work with form following no ground plane. This enabled me to create interesting, highly three-dimensional forms. I then took these mobiles and photographed their shadows. The need for light to be implemented in this building was one of the design requirements, thus it seemed appropriate to create form by using shadows. These photographs were manipulated on the photocopier and then brought into model form. These study models were constantly changing and evoked interesting use of space from which the presentation model was then constructed.
TRANSITION

Hall Cues & Doors To Private Area

"East" (Left) (Light & Stairs) (Water)
The Broken Eye
This early version was then developed upon and brought to 1/5th scale. It was at this point that the plan of the building and the sections were becoming focused. The design needed to be more coherent in its forms and required a unifying element. The form of the human eye began to take shape and it was skewered by a thorn. Then it all began to click; the circulation, the place within the space of the site, the orientation. The pupil became the circulation center however, the manner in which to implement it was aloof until I stumbled upon Bruce Goff’s Bavinger House. The subtle way in which he separated the sleeping areas by a few steps gave me the idea to allow the circulation to be as climbing up a mountain.

As a path is traveled, the space changes: You traverse back and forth and the light comes from different directions, the ground changes, the smells change. I felt with changes in floorings at the different levels, along with spacial and lighting differences, orientation could be controlled even in a small area. I separated the private area by placing it upstairs with its own deck and spiral stair. This was done to allow the owners the luxury of withdrawing when guests are staying over and also to give them the best views up and down the river. The materials are stone, glazed and rough tile, wood, rusted steel, and glass. They are the embodiment of the rusted remains of loggers and miners and I feel that they fit into the environment quite well. The rustic, grounded building will become one with the earth over time and the vaulted roof lines will become a welcomed sight to passing motorists on the interstate to the north.
Fireplace Mantles Different
Strips of tile in the woods
Strips of light along baseboard/cove light
Windows complemented by hidden lights in sills
Entertainment system behind fireplace
Mullions: play of light & deck
Washes down walls
Beam revealed: structure exposed
Bench in woods
Smells
Sun filtering
Rushed cups
- Wood
- Stone
- Steel

San Francisco Exploratorium?
- "Tactile Gallery"

R e a l m  
Between Silence & Light (on Louis Kahn)
The Hidden Dimension: Edward T. Hall
Artsheim: The Art of Visual Perception
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