DINERSIONS VOLUME TEN



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Journal of the College of Architecture + Urban Planning at the University of Michigan

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MAKING WAVES: MAYA LIN'S WAVE FIELD

With three major monuments to her credit, Maya Lin once remarked that she felt pigeonholed as the designer of memorials.¹ Her most well-known work, the Vietnam Veterans Memorial in Washington D.C., was designed as a project for a course in funerary architecture when she was a 21-year-old senior at Yale University. Her first major commission after earning her Master's degree from Yale was the Civil Rights Memorial for the Southern Poverty Law Center in Montgomery, Alabama; and some years later, she designed the Women's Table, a memorial to the history of women at her alma mater. There is a broad range of commissions in the sculptor/architect's portfolio, however, which readily dispels any claim of typecasting. Maya Lin's projects include TOPO, a play on topography and giant topiaries, with landscape architect Henry Arnold; Groundswell, an installation for the Wexner Center for the Arts in Columbus, Ohio; the Museum for African Art in New York; Eclipsed Time, a clock for New York's Penn Station; the Weber Residence, with architect William Bialoski; and, most recently, the Wave Field, an 8000 ft2 earth sculpture dedicated on October 6, 1995 at the College of Engineering at the University of Michigan.²

The Wave Field, in fact, may be substantial proof that Maya Lin has outgrown the confining distinction of monument maker. At the dedication ceremony, Ms. Lin's brief speech and the remarks made by others revealed that the Wave Field is itself a memorial-her fourth. But this fact is secondary to the strong physical presence of the sculpture. The Wave Field is significant, she explained, because "it ties together all my previous work-Aligning Reeds, the Vietnam Veterans Memorial, TOPO, Groundswell, and the water tables.3 The Wave Field is not 3 The Civil Rights Memorial and a culmination, but a satisfying clarification of where I have been going and what has taken me there. I am finding my own voice." Maya Lin's Vietnam Veterans Memorial, Civil Rights Memorial, and Women's Table, rely on elements of text which she integrates perfectly with their physical form, and this text is fundamental to the meaning and power of these monuments. In the Wave Field, however, text is absent, and in this, her most recent memorial, expression is communicated purely through form.

Tresna Lim is a recent Graduate of the College of Architecture + Urban Planning.

¹ Charles Gandee, "The Other Side of Maya Lin," Vogue 185, April 1995.

² All quotes of Maya Lin were recorded at this dedication ceremony.

the Women's Table.

Figure 1. Dedication performance of The Dance for the Wave Field, choreographed and directed by Peter Sparling.

Figure 2. An overview of the Wave Field.

Wave Field photographs copyright 1995, Cheri Smith.



TRESNA LIM

The Wave Field was commissioned in memory of François-Xavier Bagnoud, a former student at the University of Michigan. Already an accomplished pilot upon entering college, Bagnoud earned his degree in aerospace engineering before returning to Switzerland to join his father in a private Alpine rescue and flying company. In 1986, at the age of 25, Bagmoud lost his life while piloting a rescue mission in the deserts of West Africa. Friends and family established the Association François-Xavier Bagnoud, an international foundation continuing Bagnoud's dedication to helping others. Their US Foundation recently dedicated a new aerospace building at the University of Michigan in Bagmoud's name and commissioned Maya Lin to create a sculpture to complete the complex. "What I am intrigued by," Ms. Lin explained at the dedication ceremony, "[are] things in nature that are, to me, art; that are just so beautiful: whether a glacial shift pattern, erosion in sand, or a simple water wave." The idea for the form of the Wave Field came from a rare book on fluid motion that she had come upon while researching aerodynamics in search of inspiration.4 A photograph of a highly regular wave pattern which had been induced on a pool of water caught her eye. "It's usually a very quick instant where I know this is the direction the piece is going to take, and that's how the Wave Field really got started. But that's only one side of it, and that's the much more science-based side." She feared that because of the strong reference to fluid motion and aerodynamics, many people would miss the poetic intentions of her sculpture.

"I think art is somewhat magical," Ms. Lin says, "because you might not know what you're looking for before you find it, and yet something in your search will blend into the piece." When Maya first heard about Bagnoud and saw some photographs of him, she was reminded of Antoine de Saint-Exupéry's *The Little Prince (figure 4)*. The classic tale ends with an excerpt which Ms. Lin read at the dedication ceremony and "a very beautiful line drawing of two curvatures of the earth coming together,... in a way very similar to an abstracted version of the *Wave Field*:

⁴ Milton Van Dyke, An Album of Fluid Motion (Stanford: Parabolic Press, 1981), p. 191.





6

This is to me the loveliest and saddest landscape in the world. It is the same on the preceding page, but I have drawn it again to press it on your memory. It is here that the Little Prince appeared on earth and disappeared. Look carefully so that you will be sure to recognize it in case you travel some day to the African desert. And if you should come upon the spot, please do not hurry on. Wait for a time exactly under the star. Then, if a little man should appear who laughs, who has golden hair and refuses to answer questions, you will know who he is. If this should happen, please comfort me. Send me word that he has come back.³

"I know," Lin says, "that somehow, deep, deep in my subconscious, this passage was always there, and it really did lead to the *Wave Field*."



Figure 4.

Excerpt and illustration from The Little Prince by Antoine de Saint-Excupéry, copyright 1943 and renewed 1971 by Harcourt Brace and Company, reprinted by permission of the publisher, pp. 96-97.

With the Vietnam Veterans Memorial, Lin established an ideology that the purpose of a memorial is not always to celebrate a person or an act, but to be a vehicle for remembering pain, to come to terms with it, and eventually to heal. The Wave Field thus mourns the tragedy of Bagnoud's death in silent swellings of earth which recall the ancient burial mounds in Lin's native Ohio. The image of death, however, is abated by the growth of grass which celebrates life and the cyclical process of returning to the earth.

For Maya Lin, sculpture is like poetry and architecture like prose. Both are equally important to her and mutually influence each other. Lin's architecture is often sculptural, revealing the presence of the hand, while much of her sculpture is architectural in that it is habitable, and relies on the human presence to be complete. Having let the grass of the *Wave Field* grow untrammeled for a year, Lin remarked that it was good to finally see people inside it. Lin invited people to enjoy the sculpture as a place to study, relax, and experience the contours of the waves in a way that is not possible in water. Furthermore, moving occupants in the *Wave Field* underscore the solidity of the waves despite the paradoxical impression of fluidity.

Though Lin says that she tends to re-invent herself with every project so that one work will not take the form of another, there are many common themes within the body of her work. The *Wave Field*, for example, has a formal affinity to her sculpture *Groundswell*, a roof garden landscape of recycled safety glass at the Wexner Center, and her decided manipulation of the ground harks back to the boldness of her interventions at the *Vietnam Veterans Memorial*. One characteristic of Lin's work is that it tends to be very site specific, "and by that it's not just the physical site, but the cultural site." The fluid motion reference, then, is particularly apt given its context among buildings of aerodynamic study. And the context of the narrative surrounding Bagnoud comes subtly into play intertwining itself into Lin's form. In terms of the physical context orthogonal walls and buildings bound the *Wave Field* on three sides, but the diagonal lines of the wavefronts on the quad activate the otherwise unremarkable space. Lin also designed the rest of the landscaping including a meandering path around the sculpture which mediates between the hard-edged surroundings and the plastic forms of the waves and invites people to view the sculpture from all angles.



While the world within the surrounding buildings may be one of scientific precision, the *Wave Field* and its spaces are more loosely governed by intuition and perception. "...if you look at the piece from above, what appears to be a regular grid is not a grid at all," Lin explains. "If you made it something regular, rigorously repetitive, it would have just fallen flat—as the original study models fell flat. Everything about the *Wave Field's* composition changes because to achieve fluidity you have to do it so that what appears to be repetitive is completely a trick of the eye ... the grid exists only as an assumption in the viewer's mind, and fluidity is achieved by the varying of this datum—the grid."⁵

The Wave Field is a clear expression of Maya Lin's consistent fascination—artistic and scientific—with earth and water, geology, topography, landscape, light, fluidity, and transformation. In the Wave Field, liquid becomes solid—the nature of motion is inverted. According to Lin, the Wave Field "expresses my desire to completely integrate a work with its site. It reveals the connectedness of art to landscape, and landscape as art." So we see that it is futile, in Ms. Lin's work, to try to determine the line where one ends and the other begins. She formally expresses this in the Wave Field by blurring the relationship of a sculpture and its base. Likewise, Lin herself refuses to draw a line between the disciplines of sculpture and architecture. For Maya Lin, both are interconnected—and the play between the two in her work is as kinetic as the works themselves.



⁵ Conversation with the author, October 6, 1995.

SILENT COLLISIONS MORPHOSIS



Silent Collisions, shown at the University of Michigan to mark the opening of the 1995/96 academic year, maps the transformation of a design from a competition winning idea through its development and eventual precision of its constructional detail. That same mapping marks out new ground for the design process as well as revealing unexpected and tantalizing views of an educational facility.

THE LANDA RESIDENCE

PROJECT FACTS:

Location: Manhattan Beach, CA. Site Characteristics: 30' x 90' single family lot.

Context: Residential homes, two blocks from the beach.

Zoning constraints: 30' height limit, 3' side setbacks, 5' front/rear setbacks.

Program: 683 ft² addition including master bedroom, library, bath, 576 ft² garage, and 1050 ft² remodel of existing house.

Construction systems: Steel moment frame, 2x6 wood stud walls, sheet metal, and prefabricated light weight concrete board cladding.

Schedule: Completed March, 1995.

CONCEPT:

The boundaries of this space are greater than that of the site, implying an occupation of the adjacent—in other words, a work too big for its space. This proposal is a continuation of our concerns for old and new; hybrid space (simultaneous organizations), the vertical (sky/earth) boundaries, surface/volume relationships, and the idiosyncratic influences of the found condition as impulses for a new urbanism.

The existing pitched roof is removed, creating a plinth from which an intervention emerges. A dialogue is created between a fragmented wall in the form of a truncated cone and a series of splayed rectilinear walls and volumes. The center-point of the curved wall is shifted from the axis of the site, alluding to a larger urban realm beyond the property. The splayed walls hover above the first story with the exception of one which folds to become the main entrance. The curved and splayed walls intersect and penetrate, creating voids which allow natural light and ventilation into the interior volumes. An open steel shelving wall bisects the structure, demarcating the centerline of the curved wall and dividing the studio from the stair and bedroom above. The stair is conceived as a hybrid tower incorporating fragments of foundation, heating equipment, structure, and storage space, while expanding at the third floor to engage the bedroom loft. The interplay between volumes and surfaces is accentuated by a simple palette of materials including sheet metal, pre-cast concrete panels, perforated metal, and plywood.

Several issues were raised by this project: why would an architect invest so much time on a small project of minimal urban significance; is there any purpose or justification for this activity which may be an obsessive object fixation somewhat connected to the excesses of recent decades; and does this type of activity conflict with the social, political, and humanistic imperatives of our discipline?

Currently in this country there is little interest or ability to investigate work at a medium or larger scale. Small projects (even at 700 ft²) become vehicles for "research." Our conceptual interest in this project has become the basis for a social housing project we are initiating in Vienna, which expands on the idea of extending peripheral relationships into connective devices for public activities.

Second, it allows us to produce a "total work" within a less inhibited environment. The self-evaluation obtained through this process is crucial, allowing us to clarify and define the issues which become apparent within a more autonomous condition of architectural practice. While we do not believe that an autonomous process and architecture are mutually inclusive, we do see it as a necessary condition for the private and more contemplative component of our work.













DIAMOND RANCH HIGH SCHOOL

Design Architects: Morphosis, Santa Monica, California Principal: Thom Mayne, AIA Project Architect: John A. Enright Project Team: Cameron Crockett David Grant Janice Shimizu Patrick Tighe

Executive Architects RTA Blurock

Costa Mesa, California

Director:

Engineering Firm: Ove Arup & Partners, California Alan Locke

Landscape Architect: Fong & Associates, Inc.



PROJECT FACTS:

Location: Diamond Bar, California.

Site: 72 Acres of grass-covered rolling terrain. Slopes vary from 1:1 to 5:1 with a total relief across the site of 380 feet.

Surroundings: Natural Landscape of Riparian Oaks and native grasses. The site overlooks the city of Pomona.

Zoning Constraints: 2:1 maximum cut/fill slopes. It was required that all cut and fill be equal.

Client: Pomona Unified School District.

Program: 150,000 ft² total which includes 50 classrooms/labs, gymnasium, library, cafeteria, administration, and parking for 770 automobiles.

Construction Systems: Steel braced frame, concrete decking, cast-in-place retaining walls, steel decking for roofs, galvanized sheet metal roof and walls, exposed concrete, aluminum windows, and painted gypsum board interior walls.

Funding: \$140.00/ft²

ALC: NOT

Schedule: Building in progress.







THE SITE (CONCEIVED AS ARCHITECTURE)

The total site consists of seventy-two acres, of which thirty-six are usable (twenty-five acres are used for various play fields). It is our intention that the "building becomes site" and that the "site becomes building," illustrating the integration of nature and the environment.

One of the major focal points of the scheme is an honorific stairway (reminiscent of the *Metropolitan Museum of Art* in New York City) that allows movement from the main school areas to the roof terrace and football field above, while creating a student amphitheater. This element also serves as outdoor seating for the performing arts classroom—its exterior walls lifting and transforming this drama space to a stage.

The majority of the play fields (2 soccer, 2 touch football, 2 baseball, 8 tennis courts, 6 basketball courts, and 4 volleyball courts) are located to the north and west of the site. A pedestrian walkway connects the fields to the school and creates a natural slope for the viewing of baseball games. The primary football field is embedded into the hill at the south of the site to take advantage of the hillside and create an economical seating area. The gymnasium to the east mimics the hillside with a pitched roof which undulates with the terrain. The parking areas are a formal extension of the gymnasium, fanning outward and stepping up the hillside to provide a balanced location for both the school and stadium field.

CONCEPT (LEARNING PARK)

Our proposal focuses on three major areas: the complex's conceptual stance towards the site environment, social groupings, and educational flexibility. The first represents our desire to take advantage of the natural beauty of the site by integrating the play fields and the buildings into the surrounding hillside. The second goal was intended to create a dynamic built environment which would foster maximum social interaction between students, teachers, administration, and the community. Finally, our proposal attempts to facilitate a flexible teaching environment that allows a solid foundation of core curriculum for grades 9-10 and offers the opportunity for students to focus on specific program majors in grades 11-12.



THE SCHOOL (CONCEIVED WITH NATURE)

From the major access road to the east, one is greeted by a curved wall which connotes entry. The administration building, which is conceived as an extension of the entry sequence, is a gateway and control point to the school. The first floor contains general administrative activities with student services above. Past the administration building, the school opens up to form a "pedestrian street." This pedestrian system is the primary connecting link of the school interlinking all academic, ancillary and support, and social and meeting spaces. The library, adjacent to the administration, is located on two floors with individual computer study cubicles above which forms an "information bridge" formally connecting the north and south buildings of the school.

The gymnasium, located adjacent to the entry, controls the access from the parking to the stadium field above and is centrally located for access/egress to and from the lower fields. The entire back wall of the gymnasium (dining facilities and grades 11-12 academic building) is a repetitive "buttress retaining wall." These buttresses penetrate through the roof terrace plane offering the opportunity to support shading devices and flexible seating for the stadium.

The main dining facilities adjacent to the gymnasium are open to natural sunlight and ventilation, and are organized around a large two-story volume. Its location is appropriate to its use with access to a north facing court along the main "pedestrian street" and the terrace above. Possibly the most compelling public gathering space will be this roof top terrace at the level of the football stadium which offers a panoramic view of the school, the playing fields, and the city beyond.

THE TEACHING ENVIRONMENT (INTIMATE FLEXIBILITY)

The 9-10 grade clusters are located to the north side of the "pedestrian street." These are conceived as small "schools within the school" and are articulated by separate two-story buildings which creating a total of six clusters. Each cluster has its own outdoor gathering space, teacher's workroom and guidance area, with the classrooms wrapping around the center creating outdoor areas between with views of the valley beyond. The classrooms are equipped with movable partitions which allow flexibility and expansion. Although the clusters are separate entities, they open up to the pedestrian street and are arranged in a split-level configuration maximizing access with stairs and ramps. An open space is left to the east for future expansion.

The bulk of the classrooms for grades 11-12 are positioned to the south of the street and are arranged around open-air courtyards. The majority of the core curriculum classrooms are grouped around two courtyards on the second level, with shared computer labs and teacher workroom's integrated around these cores. The more specific curriculum areas (industrial technology, home economics, business, etc.) and the student center are located on the first floor with direct access to the pedestrian street. The amphitheater forms a link to the east with the performing arts labs and dining facilities, and its roof acts as another student gathering/outdoor area. The building uses a series of repetitive "buttress walls" to facilitate an economical retaining system.





Until recently, I mas convinced that the computer, as a design tool, bad little relevance to our work. For the last twenty years I have sporadically monitored its progression with various architectural offices in different parts of the world, and this confirmed my instinct that computer technology was promoting an ever increasing standardization while mesmerizing its proponents steeped in an ideal of architecture as the optimization of technology. There were several events that confirmed my suspicions, such as an AtA panel discussion focused solely on productive efficiency, downsizing personnel, and on the "obvious fact" that epu's do not get sick (not true, of course, some of the nastiest viruses being of the virtual variety). However, it mas becoming apparent that many of the conceptual issues of our work were parallel to the logic inherent in computer "thinking"—the specifics of layering, juxtaposition, mapping, and various strategies to resolve interconnections. During this last year, computer technology has initiated and supported a shift in our thinking from 2D to 3D, and challenged the dominance of planimetric conceptualization to a more dynamic method. It is a tool which greatly assists us with the issues of simultaneity which might be seen as the consistently singular issue of the 20th Century. Architectural drawings have always functioned as analytical devices allowing us to conceive, visualize, and revise our work as a synthesis, mapping the various forces that form it. Traditionally, these drawings (plan, elevation, section) consolidate and synthesize enormous amounts of information into a coherent simulacrum allowing the architect to make informed decisions on how to proceed. The computer is a tool that accelerates this observation, assessment, and discernment process giving us a more comprehensive understanding of ever more complex constructs. In this way, I see it as a microscope or a telescope. Drawings are still more important for their implicit, instinctual information (what you cannot name—wh

-Thom Mayn

Our office is currently composed of eleven Macintosh PowerPC stations, one Pentium, and a dedicated workgroup server. Rather than compromise either modeling, drafting, or rendering by subscribing wholly to one all-encompassing software package, our method diversifies task-specific programs. One of the most significant benefits derived from the integration of computer technology in the design studio is the ability to create both presentation material and construction documents out of the same epigenetic material, i.e., the 3D model. We operate primarily on the Macintosh platform, utilizing Form•Z by Anto•des•sys and PowerDraw by Engineered Software for the majority of our CAD documents. The 3D model is the initial departure point of the design process. A continual refinement of the 3D model both informs the design and brings another level of precision and coherence to the project. At a certain point in the design development, 2D DXF files are exported out of Form•Z and brought into PowerDraw for manipulation of line weight, notes, and formatting. We use 3D Studio to create photorealistic images (snapsbots, really) and to render objects selectively. Graphic presentations are developed primarily using Adobe PhotoShop and QuarkXPress.

-Cameron Crockett

A CONVERSATION WITH NINA LIBESKIND

LESLIE VAN DUZER

Leslie Van Duzer: I first met you in 1991 when you and Daniel had come to Prague to open an exchibition. After Daniel presented his opening remarks, a crowd of people formed around him. I remember very well seeing you standing quiethy off to one side with your small daughter and thinking at that moment: this women is clearly half the force. You have since described your relationship to Daniel as yin and yang. Would you elaborate on your partnership?

Nina Libeskind: I used the term yin and yang some years ago and it's fumny that you should mention it again now. Just today I was riding in a cab with Daniel to a meeting and I was laughing about how it was possible that two people so completely opposite could get along. Some people have said this was the trick, but I'm not sure. All I know is that I have formed a certain kind of relationship with Daniel's work, and he with mine, which is certainly a complementary one. I am not somebody interested in architecture per se; I am not an architect. I have worked in politics all my life with certain political and ethical ideas. Daniel's own work, which has been uniquely architectural, and I think uniquely creative, has taken on certain tones and understandings of politics. I think that is what has made it work. It is not a brake-accelerator relationship, but much more of a cooperative and responsive one. I think we both feel fortunate. I have listened to Daniel speak many, many times and I always learn something, not because he is my husband, but because I am quite interested in his ideas and how he develops them in a very particular way. Initially when we started collaborating, I had no idea how it would work because I had never worked in an architect's office. But because the issues and the ideas Daniel works with are quite provocative-usually quite radical-and profound, deeply profound in terms of re-examining and redefining the issues he is concerned with, I have found my own interests evolving with his. I have learned an enormous amount about myself and about the kinds of ideas that he has been exploring, I think he feels similarly towards my contribution to his work.

You mentioned that you worked in politics all your life.

Well, they used to say that I was fed politics with my pabulum and that was probably the case. My father was an immigrant from Poland. He was a Polish Jew born in a shtetl. He was one of the founders of the New Democratic Party, the left-wing, moderate, social democratic party of Canada. He became leader of the Federal Party and a member of Parliament. My brother Stephen was the leader of the Ontario Party and a member of the Provincial Legislature, my sister Janet, who is my twin, became President of the Ontario Party, and my brother Michael, who is four years older, was Secretary General of the Party. So, all of us were involved. Actually, at the age of six, I worked on my first

This article consists of excerpts from an interview conducted via telephone between Nina Libeskind, in Berlin, and Leslie Van Duzer, in Ann Arbor, February 19, 1996.

Photographs, courtesy Studio Libeskind.



election campaign in very tough, straightforward, electoral politics. I was intensely interested, to the exclusion of school, and by the time I was fourteen or fifteen I think I could be called a seasoned politician. While I was at the university, I worked with the Quakers in British Columbia bringing out draft dodgers and deserters during the Vietnam War. I worked straight through until I married Daniel. Because Daniel moved so often, I always had the opportunity-and the very good fortune-to have many different kinds of jobs, all of which had something to do with my own interests in politics. I was the Director of the Anti-Apartheid Festival in Toronto with Bishop Tutu in 1985-86, I worked for an open-door agency which had more than a 1000 employees as a Senior Training Officer and Deputy Director in London in the 1970's, and I worked for a Congressman in the United States doing his constituency caseload. I worked for the National Endowment for the Humanities and I worked as a labor arbitrator in Canada negotiating contracts and grievances for the workers. I did union organizing, I did research for books. I have to say, moving from country to country and having all those jobs enabled me to be absolutely a jack-of-all-trades and a master of none. But it did give me an extremely comfortable feeling knowing that I was using my own beliefs and my own ideas about politics and the betterment of society, no matter where I was, in a meaningful way. One is not always that fortunate; sometimes one has to do things which are not quite as interesting. When I was a management consultant for MacKenzie and Co. it had to be the exact opposite of anything else I had ever done in my life, but I wanted to do it for that reason. I worked on the CNN pilot program Grossfire when I was in Toronto for Warner Bros./CBS and I realized I would never be a journalist! I did jobs that were diametrically opposed to what I had experienced in politics because I had to learn something else beyond what I knew. I've always been extremely lucky that I either fell into these different jobs, or applied for them and got them, and then had the opportunity to explore my ideas in many different contexts.

Having moved so many times, how would you define home?

I would define home as where I'm sitting around the table with my children and my husband. Wherever that is. Sometimes it's not even a table; sometimes it's a sheet on the floor doubling as a tablecloth because our furniture is never there. I don't have an enormous hungering for a space or a place. For me home is really where the books are, the children are, the music is. It is where our lives evolve. I think the kids have been absolutely stupendous in following this path. It doesn't matter to me where I am, it just matters who's there with me. Figure 1. Jewish Museum with the Berlin Museum; interior of void showing bridges.



Just to paint the full picture, you have been married nearly 27 years, you have three kids, and you have moved with Daniel and the family 14 times, not counting the three-month or six-month moves.

That's right, those short moves are just blips on the screen.

Since you and Daniel began collaborating with each other ten years ago in Milan, you have worked both in the United States and in Europe. What are the differences in the cultural climates and how do they effect your work?

I think for both of us the difference has never been more apparent than this last year when we went back to Los Angeles. We hadn't lived in the United States since 1985. We found it to be an extremely different country ten years hence. What I find the most disturbing is the exclusion of cultural or public discourse from one's own architectural work. Even though there are extremely talented and intelligent and creative architects working in the United States, there doesn't seem to be any interest in including them in the public realm or debate. The only reason that an architect gets put into the newspaper is because of an award or because of a scandal, but there is no public dialogue. That's quite different than what we've experienced in Europe. If one is fortunate, and I think Daniel has been, the issues that he talks about as an architect are issues which are discussed on the front pages of the newspaper. Whether they include his name or not, they are issues about public space, about density of people, about culture, about the use of public buildings. These architectural and urban issues just don't get discussed in the normal discourse of the communications world or in the political world of America. Just to give you an example: for three days there have been front page articles in the culture section of the biggest newspaper in Berlin (the equivalent to the New York Times) on the concept of Daniel's museum. They will have three or four more, totaling seven or eight, full length articles half the page of the newspaper talking about what kind of concept should be followed. The articles are not about the building, but about the actual concept of how to house the collection. Now, this would be unheard of in America. A museum would be opened, then discussed as either a great museum or a poor museum, the collection would be a great collection or a poor collection, the installation would be talked about in terms of how good it is or how bad it is. But a discussion before the museum even opens about how it should be used and in what way it should benefit the city, those kinds of questions are simply not asked in the United States. Well, one may say, there are other questions asked in America, and that may be. There are certainly great strengths in America in terms of the competitive nature of the market economy. But in terms of the kind of work that Daniel and I are doing and are interested in doing in city planning and urban design and architectural work, these issues are not discussed in the public realm in America and they are discussed here. That makes Europe an extremely interesting place to work.

Figure 2. Jewish Museum with the Berlin Museum; construction site.



What projects do you currently have in the office?

There is the Berlin Museum, the construction of which will be final within the next eight months. It should open in about a year if the Senate has the money. Then we are going into construction in August on the Felix Nussbaum Museum in Osnabrück, which is a small painting museum. Daniel won a competition for the Bremen Philharmonic and we're just now doing calculations and working with the people who are behind this to find funding for the project. The city doesn't seem to have the money to build it, but there is an investor who seems pretty interested, so it looks like that will go ahead. Then we have two urban design projects, one of which is going to be entering the city planning codes; Daniel did a master plan for the second one which was on the edge of Berlin in the former American military war games area. It will have 8000 units of housing. We will be invited to the competition for the actual architecture within the next couple of months. Then we are doing a small pavilion in Japan for the city of Ouzo, a competition for a small community center in West Germany, and an invited competition for the new Foreign Ministry in Berlin, which we will absolutely not win, but it is nice to be given the opportunity to do a Foreign Ministry in a different way. We have just been invited to do a very interesting competition-one of eight architects selected and the only non-English firm-for an extension to the Victoria and Albert Museum. Unfortunately none of these competitions pay any money, so we are always in the hilarious position of either having to win them or to get a prize in order to subsidize us. We are not yet in that rarefied zone of having developers come up to us with actual commissions. But the issues involved are always extremely interesting, so no complaints. It's busy, we have between twenty and twenty-five people in the office at all times, and it's a lot of fun.

How is the office structured?

We work in teams. There is, of course, a team for the Berlin Museum and there is a team for the Museum in Osnabrück. There are a few who handle the urban design projects. Then we have what we call the "Dream Team" or the "Fantasy Room," and that's the competition room. At no time are people from the Berlin Museum or the Osnabrück museum or the urban design schemes excluded from the Dream Team; we try very often to amalgamate the different teams. But clearly when a building is under construction, one has a very different kind of deadline and very different kinds of materials are needed. We produce an enormous number of models in different kinds of materials for both the competitions and the construction works. Figure 3. Felix Nussbaum Museum, Osnabrück; competition model.



What is your role in the office?

I handle the management and some of the administration. I do all the hiring, not because I'm an architect, but because I have a pretty good idea of who would enjoy working in this office and what their skill level has to be. They have to be lively and intelligent to make it. I do a lot of writing and editing, and of course, I do the politics of the projects. I've become more involved with the actual architectural creativity of it, meaning that I'm much more interested and more knowledgeable when I look at something now. I still can't tell a section from an elevation, but I do have the capacity to actually say, "You know, maybe we should develop this idea." But I don't push that too much, because that isn't my forté. I have a lot to learn from the people in the office. I just hope that I'm helping them to get the job done. It is an extremely responsible office. My idea has always been that we work hard and we play hard. That means that when people finish the job they're doing and they take off on a vacation, nobody checks whether it is "due" them or not-it's simply understood. Of course, you can't have the whole office gone at once, but nobody punches a clock and nobody gets paid for overtime. People come in at 11:00 and work until 4:00 in the morning, or they come in at 2:00 and work until 6:00 in the morning, or they come in at 9:00 and work until midnight, but they know they have to get the job done and then they can take their time off.

What kind of presence does Daniel have in the office?

He's a very hands-on person. If he is working on the construction projects, he's working on every single detail. And it's not just a matter of checking the details, he's actually proposing ideas which people will then work up either in drawn form or threedimensional form. With competitions he spends a lot of time discussing the idea or the concept, because for him the form is not the issue; it has to have a meaning from within. I think that's the uniqueness of what he does. He always begins the project by identifying what is unique from within the project, and then the actual presentation and the resolution of the design are all in one package. So it's not that you have the idea, you work it up and then you figure out how to present it; the presentation and the gene of the idea are built up together. I think that is quite an unusual way of working, creatively and conceptually.

Daniel is often out of town for various speaking and teaching engagements. Does that create a problem for the office?

Sure, it's not that wonderful. Although it is very good to have distance from one's work, this is a forced distance. Very often he has more ideas than anyone could possibly put

Figure 4. Musicon Bremen, Concert Hall competition; competition model, 1995



together in a day, so sometimes the office will say, "Nina, can you make sure that Daniel takes a rest for a day so that we can put some of this down on paper and build it in three-dimensions." He tries hard not to be away for more than two or three days at a time, or at most a week, because there is a lot to do and because he is so fully involved. Because none of these solutions are taken out of the third drawer or peeled off another project. That means that it's harder for people to learn or to figure out how to develop something without Daniel constantly being involved.

Previously you have personally expressed a desire to do something in the public realm in Berlin.

Well, that shows you how competent I am! I have dreams like everyone else. I am beginning for the first time to take German lessons because I would like to think that in a year and a half I might be able to do something in the actual political realm of Berlin, and then I would certainly need the language. Daniel is not excited about this possibility; he really enjoys working together, and I'm very flattered that he does. It's not that I don't enjoy it, it's just that sometimes I have this yearning to do purely political work. This may just be fanciful; maybe I will find that I really don't want to do that at all after I have learned German. It still remains a goal, but not a compulsive one. I don't view it as something that I'm missing in my life, but I'd like to add it to my life, so I'll see if it works.

Do you and Daniel have any ideas about doing something together in the cultural arena outside of the normal scope of the office?

In terms of doing something together, we thought about starting a school or starting something involving film. We talked about it very seriously for this year and then we thought that maybe we should wait another year until we have more time. It is obviously partly a matter of time; one has to do this in a serious way. One doesn't just want to use one's name as flypaper; that is not what either of us are interested in. Now that we've been back in Berlin for awhile, there are people who are beginning to talk to us again about film and architecture, and dance and architecture. That could really be a lot of fun.

I wonder if you and Daniel ever take a vacation?

Absolutely. I actually instituted a new thing in the office about four years ago. I actually lock the office for two weeks over Christmas because I discovered that no one was taking vacation. I strongly believe that one can't work hard without taking time off to rejuvenate. I try to get Daniel to take time off and I'm pretty strict about it, so it usually works. He may have 10-12 days at Christmas and we'll just stay home, or we'll go away for a week in May and then we'll take a month off during the summer. He is by no means a Figure 5. Musicon Bremen, Concert Hall competition; detail model, 1995.



workaholic; he is wonderful about that. He is absolutely able to fully enjoy a vacation. I think he is quite appreciative when that time is carved out for him. Daniel's perfectly happy to listen to music and to read and not to think about work at all...and that's good.

And you?

I don't need it as much. I'm not that type of person. So I'm quite able to keep in touch with the office on a regular basis and make sure that everything is going okay. I don't have the kind of intensity of creativity that needs that kind of rejuvenation. I'm quite a different person.

Given your extensive traveling and frequent moves, more often than not you must find yourself in the position of the outsider, with all the associated advantages and disadvantages. What does that role give you and what does it take?

Being the outsider is something you have to have an attitude about. You are quite right, most places I have lived in my life I have felt an outsider, either because I have come from Canada to the United States, or because I have come to countries where English is not the language spoken and I am a total linguistic idiot. I have really been an outsider because I can't speak or read Italian and I can't speak or read German. One of the great advantages of being an outsider is being able to get a perspective on oneself, never mind the society you're looking at. To have a rainbow array of different societies forces you to look at your own self and your own values and to respond to the differences. I have learned the most amazing things about myself, and about the places I have lived. I can feel fairly confident that the differences between Italy and Germany, and Germany and California, and New York and Helsinki are really staggering. I think one has to be willing to be open to those differences and not to look for the perennial turkey sandwich or for an expatriate community wherever one goes. We have never moved into an American community or a Canadian community abroad; we've really just dropped into the society. That means that the children are constantly shifted from one school to another, but so far it seems to have worked to their advantage and not disadvantage. There are some real disadvantages. You lose an incredible amount of money because no one ever moves you; it's financially a disaster. And you always have to find a new apartment and set up a new household and it's all on your own. But you gain a certain strength from that. That's part of how the family has remained so close. You sometimes lose contact with friends that you wish you didn't, and you lose friends that wish that you hadn't, but for the most part I have viewed it as a very positive thing. Now, I am closer to fifty than I am to anything else and perhaps I'm going to feel differently in another five or six years. But right now I have absolutely no desire for a house with a backyard and a dog. I feel much happier challenging myself in these different societies.

Figure 6. Jewish Museum with the Berlin Museum; exhibition space interior.



THE TRAGIC CHOICE BETWEEN ARCHITECTURAL AND FINE ART DRAWING

MELISSA HARRIS

Drawing is the language of visual thought. Although not the exclusive domain of any profession or discipline, drawing from life has the unique ability, through its own process, to lead the architect through mediations between two and three dimensional worlds. As a teaching architect I am preoccupied with two re-emerging themes: how drawing relates to general education and, more personally, how the condition of simultaneity shapes my pictorial analysis. The importance and immediacy of these ideas were brought into focus by two questions I was recently asked. The first-"How are we going to sell another image of the River Rouge Plant to University of Michigan President Duderstadt?"-came in response to a series of drawings of Detroit's industrial landscape, which I undertook as a Summer project. The second question came from a doctor in Santa Fe who looked perplexed when I told him that I taught drawing to architecture students. "Why," he wondered, "would an architect need to know how to draw freehand today?" I interpreted his use of the word today as equating electronic fluency with the capacity to both think and function graphically. Both questions were asked by nonarchitects and yet each represents a common perception that drawing the world around us is no longer relevant.

The current direction in architectural education, which emphasizes fluency in electronic media, poses an increasing risk to students too easily liberated and seduced by computer generated images. A curriculum which requires a regular, disciplined schedule of freehand drawing exposes students to aspects of the design process crucial to the development of fluency in the translation and generation of mental images. It also promotes the ability to develop economical methods of conveying divergent types of information and, most important, encourage empathy for others who may someday occupy our imagined places. The liberating, intoxicating capabilities of our latest electronic technology threaten to further reduce the paucity of architects who draw regularly. There is no substitute for the observational scrutiny that drawing demands.

Consider the ease with which one could create a cube and render it in most computer programs. Once a square is drafted in plan, heights are assigned and the wire frame is extruded. An implied light source, surface treatment, and the illusion of depth are simply quick selections from the menu. Now consider what was lost in the physical struggle to feel the volumetric quality and to create the illusion of weight and

Figure 1 (previous page). Meltdown at Blast Furnace C, The River Rouge Plant in Detroit. 11" x 14" oil pastel on paper, July 17, 1995.

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materiality in order to imply a back side which cannot be seen. It is precisely this straggle that builds within us the capacity for envisioning. What I challenge here is not the power of the computer but the erroneous assumption of the expendability of direct engagement with a subject through one's own body as a translating device.

One might argue that the unprecedented three-dimensional understanding manifest in the work of Frank Lloyd Wright stemmed from something as deceptively simple as the capacity to produce the illusion of volume on a two dimensional surface. Drawing a wood block by defining its form, not simply its associated surfaces, may inspire a detail like the pier at *Unity Temple*. As Allen Brooks has observed, trim does not lie on one face as rectilinear decoration but wraps the corner uniting two surfaces into a threedimensional form.¹ Or one might also argue that without the painted studies in overlapping and interpenetrating contours in isometric projections, Le Corbusier may not have found the plastic forms we see in his architecture.²

Drawing is our means to continual conscious learning and discovery. Perhaps Walter Pater best conveys the timeless urgency to maximize our short experience of life in his conclusion to The Renaissance.

Every moment some form grows perfect in hand or face; some tone on the hills or the sea is choicer than the rest; some mood of passion or insight or intellectual excitement is investstibly real and attractive for ns.,—for that moment only. Not the fauit of experience, but experience itself, is the end. A counted number of pulses only is given to us of a variegated, dramatic life. How may we see in them all that is to be seen in them by the finest senses?³ Figure 2. Unloading coal at the Detroit Lime Company. $12^{\prime\prime\prime} \times 6^{\prime\prime}$, oil and acrylic paint on plywood, June 14, 1995.

¹Allen Brooks, Writings on Wright (Cambridge: MIT Press, 1981), p. 182.

² Richard Ingensol, Le Corbusier: A Marriage of Contours (New York: Princeton Architectural Press, 1990), p. 10.

³ Walter Pater, *The Renaissance* (New York: The Macmillan Company, 1904), p. 249. I look to drawing for a way to accomplish just that—a process toward enhanced critical vision and heightened sensation. What I have realized during the last few years of writing about my drawing, is that my drawings are both ends and means; a fact which has posed its own set of contradictions. The architect in me strives to extract spatial suggestion, but the artist in me sees them as an end, providing specific revelations and often seeding the ground for future discovery. Only if the drawing is considered an end will it reach its fullest potential as a suggestive force. Architects do not need to be fine artists, but they must have creative vision, and sensitivity to the world that is our textbook.

I also argue for drawing as a means of keeping ourselves honest. The focused concentration that drawing requires slows us down, allowing us to notice things that may otherwise escape our attention, and demands that we come to some personal position with respect to that subject. We see things in relation to others. Drawing, for me, stimulates an understanding of the interaction between people and places. So the answer to the question *why draw?* has more to do with the cultivation of an attitude than the desire to achieve a particular look.

The second theme, as I called it, is actually more of an aspiration-an attempt to wed structural information with the sensory, felt aspects of a place. Simultaneity, a condition in which two or more things are present at the same time, is inherently rich and evocative. The defining nature of a work of art or architecture comes through when it possesses this characteristic of imparting new readings with each encounter: we are intrigued by its fluid identity. But accumulation and cumulative effect are very different. In the former, layers of information are simply stacked, one without regard for the next. When these layers of thought interact, a transcendence occurs. The technique, the color, the medium, and the subject, are not read individually, but collectively as a synthesized whole. Drawing from life reminds us that more-more angles, more change, more complexity, more layers-is not necessarily what fosters a resonance between buildings and people.

The simultaneous presence of both the physical and the ephemeral brings an architect's most significant issues to the fore. I call my drawings which struggle with this dilemma *experiential diagrams*. They often rely upon the linguistic conventions of orthographic projection to address structural characteristics. Selection and expressive manipulation of my medium are the primary formal devices for suggesting a sensation. Diagramming is typically defined by the separation of layers of information for clarity and communication. *Experiential diagramming* finds its origins in this definition, but then departs. The freer technique of oil pastel and paint enables a synthesis of these layers into a single image.





RIVER ROUGE

The images of Detroit's industrial landscape always began with on-site drawing. For six weeks I spent mornings at the River Rouge Plant where steel is produced. The precision of form, sequentially logical and componentially related, is animated by people. From the parking lot they are little green blobs that emerge periodically, rhythmically giving breath. The physical and mental presence of human rhythm weaves an alternating pattern into the line of production.

The aging blast furnaces contradict their archaic appearance. Wearing a uniform patina of weathered reddish brown, they frame a sea of asphalt—old guards kept on as a concession to the time they have served. But as the day progresses, the stiffness of rusted joints are diffused by pillows of emerging steam and smoke. The plant is alive, pumping through age old veins its lifeblood of molten steel. Figure 3. River Rouge Steel Plant. 14" x 17" oil on paper, June 21, 1995.



Figure 4. Blast Furnace C Detail, 19" x 24", oil paint on paper, August 12, 1995.

> In subsequent off site studies, the conceptual readings begin to direct the images. Factual forms convert to color and texture as the place is left behind. The sliver of space where the specks of human life scrape the molten steel into trains waiting below is compressed by the cacophony of forms above.

> Understanding the effect of physical form or space on the human experience is something we can never "know" in the sense of empirical data and scientific method. We can, however, refine our own awareness of personal experience. As teachers we are shaping this environment most directly by the affect we have upon the formation of student values, not the particular things they will build, another unknown. Transmission of knowledge and preparation for employment is important. But the cultivation of curiosity,



Figure 5. Blast Furnace abstraction, 11" x 14", graphite on paper, August 18, 1995.

> self-guided search, and empathy reach more deeply than any single skill ensuring automatic usefulness in a professional setting. In the end, people form the most critical aspects of our environment, not the places themselves. It is not the ability of my students to become outstanding designers that concerns me most. It is who they are as people and how they see themselves among others in their capacity to perceive and to converse. Drawing leads to self-knowledge. Without self-knowledge, nothing significant happens; no voice is heard, no method is formed. The hand holding the pencil draws simultaneously on the paper one sees and on the paper within that is never seen. Images accumulate through the eyes and through the finger tips, and mental images are the genesis of all we build.

disty pressure


ALBERT KAHN'S GREAT SOVIET VENTURE AS ARCHITECT OF THE FIRST FIVE-YEAR PLAN, 1929-1932

ANATOLE SENKEVITCH, JR.

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Figure 1.

Figure 2.

The Stalin Tractor Plant in

Cheliabinsk. Nighttime view

Ford Motor Company Rouge Plant Main Power House, Dearborn, Michigan.

All Images courtesy Albert Kahn Associates, Detroit, Michigan unless otherwise noted.

during opening day festival. From USSR in Construction, no. 8, August 1932. In the course of a long and illustrious career, Albert Kahn helped to create a new industrial architecture and make factory design a legitimate and compelling domain of architectural practice. Although Kahn regarded his non-industrial work to be the most significant, it is his pioneering contribution to the design and development of modern factories that had the greatest impact not omly in the United States, but also in the Soviet Union during the period of the First Five-Year Plan (1929-1932). It is with Kahn's little-known but quite significant Soviet venture as architect of the First Five-Year Plan that this article is concerned.

Kahn's Ford River Rouge plants in Dearborn, Michigan (1917-1939), brilliantly transforming the American industrial factory from a multi-story, small-span building to a single-story, large-span structure that spread out over many acres and was lit through a skylit saw-tooth roof, caused Kahn's reputation to spread rapidly in America. His firm was chosen to design the mammoth mass-production plants that made the Detroit automobile industry one of the wonders of the world; in addition, he also designed plants for many other manufacturing enterprises. By 1929 the volume of work in his office had grown to more than a million dollars per week. Kahn was well on his way to becoming the most famous and successful of U.S. industrial architects.

Kahn's factory designs for the River Rouge complex were widely admired by European modernists as exemplary paradigm of the New Architecture.¹ At the same time, Kahn's industrial plants had also captivated Soviet industrial planners for introducing the conveyor assembly line method of mass production on one level and developing a corresponding single-story, large-span factory building type distinguished by its great technical innovation, utmost simplicity, rational and economical construction, functional efficiency, and a striking expressive aspect, one that subsequently had inspired French critic Michel Ragon to refer to Kahn's factories as "cathedrals of the twentieth century."² The Soviets were also taken with Kahn's developed capacity to facilitate the rapid construction of these plants through a streamlined design and construction process.³



European modernists' approving reaction to Kahn's work, see Federico Bucci, *Albert Kahn: Architect of Ford,* trans. Carmen DiCinque (New York: Princeton Architectural Press, 1993), pp. 166-172.

¹ For an overview of the

² Michel Ragon, O souremennoi arkhitekture [Concerning Modern Architecture], trans. Zh. S. Rosenbaum (Moscow: Gosstroiizdat, 1963), p. 29.

³ For references to individual Soviet projects by Kahn's firm see: V. L. Gofman, Fabrichnozavodskaia arkhitektura [Factory and Plant Architecture], 2 vols. (Leningrad: Kubuch, 1932); L. A. Serk, Promyshlennaia arkhitektura [Industria] Architecture] 2 vols. (Moscow-Leningrad: Onti, 1935); and Spravochnik proektirovshchika promyshlennykh predpriiatii: Arkhitektura promyshlennykh zdanii [Handbook for the Designer of Industrial Facilities: The Architecture of Industrial Buildings], ed. A. S. Fisenko, Vol. 1, Pt. 2 (Moscow-Leningrad: Onti, 1935).



KAHN'S FIRST SOVIET COMMISSION: THE STALINGRAD TRACTOR PLANT

In 1929, one of the more extraordinary commissions ever given an architect unexpectedly came Kahn's way when a group of engineers from the Soviet Union, accompanied by representatives of the Amtorg Trading Corporation, the Soviet Union's trade representative in the United States, came to his office in Detroit with an order for a large \$40 million tractor plant in Stalingrad (until 1925, Tsaritsyn; since 1961, known as Volgograd); they also brought with them an outline of a program that projected an additional two billion dollars worth of buildings. The Stalingrad tractor plant, located in the Lower Volga region of the country, was to be the first of its kind, and at the time the largest to be built in the Soviet Union.⁴

Work on designing the plant began in March 1929, when a delegation of Soviet engineers arrived at Kahn's office in Detroit to prepare the designs for the factory under Kahn's direction. It fell to Kahn's firm to assemble key construction personnel in this country, organize the design and construction forces there, assemble such material as was available in the Soviet Union, order and receive other material from the United States, and get the job done. The structural steel for the Stalingrad plant was manufactured by the Bethlehem Steel Company and transported from Philadelphia by ship across the Atlantic to the Mediterranean, then to the Black Sea, and finally via the Volga to Stalingrad.

The Stalingrad plant, designed to produce 40,000 tractors annually, comprised an assembly building more than 1,300 feet long and 300 feet wide, a foundry building about 700 feet by 450 feet, and a forge shop 500 feet by 450 feet.⁵ In addition, the complex also included a power plant and a number of apartment houses for workers. The tractor plant was the first in the Soviet Union to employ standardized construction and longitudinal sawtooth skylights. Moreover, the extensive use of glass walls yielded a striking effect reminiscent of a painter's studio—a rather unusual aspect in the Soviet industrial landscape. Construction work was completed in about six months' time, bettering the most rapid performance in the United States.

4 On the Stalingrad Plant, see "The Stalingrad Tractor Plant," Economic Review of the Soviet Union, 5 (April 1, 1930), pp. 134-135; "Conditions in the Stalingrad Tractor Plant," Economic Review of the Soviet Union, 5 (October 15, 1930), pp. 411-412. See also A. L. Drabkin, "American Architects and Engineers in Russia," Pencil Points, 11 (March 1930), pp. 435-440. Mention of the Stalingrad Plant is also made in "Recent Industrial Achievements," Economic Review of the Soviet Union, 5 (Angust 1, 1930), pp. 311-315; and C. M. Peter, "Observations on Automotive Industry," Economic Review of the Soviet Union, 7 Jar mary 1, 1932), pp. 6-9.

⁵ Albert Kahn, "An American Engineering Firm in the USSF," *Economic Review of the Soviet Union*, 6 (January 15, 1931), pp. 41. See also "The Stalingrad Tractor Plant," *Economic Review of the Soviet Union*, 5 (April 1, 1930), pp.134-135.



Figure 3 (previous page). The Dzerzhinsky Tractor Plant, in Stalingrad. From USSR in Construction, no. 10-11, 1930. Figure 4. Tractor Chassis on the conveyor of the assembly plant of the Dzerzhinsky Tractor Plant, Stalingrad. From USSR in Construction, no. 10-11, 1930.



OFFER TO BECOME CONSULTING ARCHITECT FOR THE FIRST FIVE-YEAR PLAN

The results at Stalingrad earned Kahn wide acclaim in the Soviet Union and led to his being offered an unprecedented contract by Amtorg to become consulting architect to the Soviet Union for the purpose of helping the country mobilize its industrial capacity as set forth in the First Five-Year Plan.

Given the general American distrust of the Soviet Union, it was not a simple matter to accept Amtorg's offer of a commission to help the Soviet government with its tremendous industrial expansion. Kahn recalled the agonizing process in a conversation with Detroit columnist Malcolm Bingay:

I was somewhat hesitant about accepting such a task. First, I knew little or nothing about the Russian government, and the people behind it. Second, the United States had refused to recognize that government. Third, there was bitter feeling against Communists among the people with whom I had to do business. Fourth, the enemies of my people echoed what the Nazis were saying and accused the Jews of fostering Communism. I wondered what would be said if I took the job. And yet the challenge fascinated me. Deep down in my beart I believed that the Russian people—regardless of their form of government—were entitled to help after all their generations of suffering under the czars. The more I thought about it the more I became convinced it was the right thing to do. I said yes.⁶

The prospect of engaging the Kahn firm to become the consulting architects for the First Five-Year Plan had surfaced in 1926 when the Amtorg Trading Corporation began to recruit the Ford Motor Company to enlist its help in creating a Soviet tractor industry. From 1920 to 1926, the Soviet Union had purchased more than 24,000 Fordson tractors for agricultural production. Then early in 1926 the Soviet authorities sought to persuade Ford to build a tractor factory in the Soviet Union. At first cool to the idea, Ford finally agreed. In May 1929, the Ford Motor Company signed a contract with Amtorg. Its provisions were an integral part of Soviet strategy for implementing Stalin's First Five-Year Plan: Ford agreed to furnish detailed drawings and specifications for a complete factory, for which Kahn was the chief source and facilitator. In addition, Ford also gave the Soviets full rights to make and use Ford machinery, inventions and technical advances. Russian engineers were to acquire practical training in Ford's American plants, as well as in Kahn's office. The Ford Motor Company, in turn, would send its own engineers and foremen to the Soviet Union to help in the planning and operation of the new works.⁷

The First Five-Year Plan sought to accomplish the country's massive industrialization and collectivization of agriculture in the shortest possible time. Most of the investment went into heavy industry, aimed at building up the industrial strength of the Soviet Union to equal that of the United States and the capitalist West. Whole new branches of industry, including the chemical, automobile, agricultural, machinery, aviation, machine tool, and

Figure 5.

The signing of the contract which gave Albert Kahn Associates control over the design of State factories for the next five years. From left, front: Albert Kahn, Saul G. Bron (President of Amtorg); rear: N. Oilkowski (Soviet official), Moritz Kahn (negotiated the contract), and J. Michaels (Soviet official).

⁶ From a conversation between Malcolm W. Bingay and Albert Kahn, quoted in Bingay, *Detroit Is My Own Home Town* (New York: Bobbs-Merrill, 1946), p. 308.

⁷ Allan Nevins and Frank E. Hill, "The Russia Adventures," Appendix I in their Fard: Expansion and Challenger 1915-1933, vol. 2 (New York: Scribner's 1957), pp. 673-684.

⁸ For a discussion of the First Five-Year Plan, see Elisha M. Friedman, Russia in Transition: A Business Man's Appraisal (New York: Viking, 1932). For a detailed examination of Magnitogorsk, albeit without any mention of Kahn's involvement, see Stephen Kotkin, Magnetic Mountain: Stalinism as a Civilization (Berkeley: University of California Press, 1995). See also "Magnetogorsk [sic]," USSR in Construction, no. 9 (1930), pp. 14-16.

electrical, were created from slight beginnings or even from scratch. Over fifteen hundred new factories and gigantic industrial complexes were built, exemplified by Magnitostroi in the Urals and Kuznetskstroi in western Siberia, began to take shape. Entire cities arose in the wilderness. Magnitogorsk, for example, in a few years acquired a population of a quarter of a million people.⁸

Figure 6.

Loading "Stalinets" diesel tractors onto railcars in the assembly plant of the Stalin Tractor Factory, Cheliabinsk. During the First Five-Year Plan the Soviets turned to the outright purchase and transfer of foreign-designed and manufactured plants. Foreign experts set these plants into operation and then turned them over to Soviet managers, engineers, and workers. U.S. manufacturers, industrial architects, and engineering construction and consulting firms played leading roles in this massive transfer of technology.⁹ Henry Ford and Albert Kahn assumed a central role in this development. ⁹ Thomas P. Hughes, American Genesis: A Century of Invention and Technological Enthusiasm, 1870-1970 (New York: Viking, 1989), pp. 251, 254. Cf. Anthony C. Sutton, Western Technology and Soviet Economic Development, 1917-1930 (Stanford: Stanford University Press, 1968), pp. 345-347.



FORD AND THE SOVIET ECONOMIC AND CULTURAL CONTEXTS

It would be difficult to conceive of two economic philosophies more sharply opposed than those of Henry Ford and Lenin or Stalin. Yet these quintessential figures of Capitalism and Communism achieved a certain working relationship that propelled both Ford's and Kahn's Soviet ventures. Henry Ford was ready to help promote the industrial advancement of the Soviet Union as a contribution to world peace and prosperity. The Soviet leaders, in turn, seeing in the Ford methods of mass production the epitome of everything their country most needed, were eager for his machines, procedures, and engineers. At the same time, Ford's social philosophy of mass production and mass consumption fired as much enthusiasm in the Soviet authorities as did the layout and machinery of his River Rouge plant. The Soviet context, American means of production could help lead the way to a socialist future. Unlike capitalism, moreover, socialism would not be burdened by political and economic contradictions that constrained the full development of modern production technology.

By 1928, when the Soviets inaugurated the First Five-Year Plan, Henry Ford had become a Soviet folk-hero of production. A cult grew up around the methods and even the person of Ford. By 1925 the Russian translation of his autobiography of 1922, My Life and Work, had enjoyed several printings in the Soviet Union.¹⁰ He was read with a zeal usually reserved for Marxist classics. Ford's achievements conjured up a vision of humming factories supplying an abundance of consumer goods to once-oppressed workers and peasants, thereby facilitating their becoming wholeheartedly committed citizens of a communist society. The concepts that Ford and his associates devised and implemented at the River Rouge plant enthralled Soviet planners, managers and engineers.¹¹ Not least, they appealed to Soviet architects as well. ¹⁰ Henry Ford with Samuel Crowther, My Life and Work (New York: Doubleday, Page & Co, 1923); Russian trans. by V. A. Zorgenfrei: Moia zhizn', moi dostizheniia [My Life, My Achievements] (Moscow: Izdvo "Vremia," 1924.

¹¹ Hughes, American Genesis, pp. 269-271.



Figure 7. Ford Motor Company Rouge Plant, Dearborn, Michigan.



Figure 8. Rendering of the Stalin Tractor Plant, Cheliabinsk USSR.

THE IMPACT OF FORD'S AND KAHN'S IDEAS IN SOVIET ARCHITECTURE

Ford's ideas regarding the efficient accommodation and distribution of the functional requirements of production and Albert Kahn's amplification of them in his factory designs were embraced by the Constructivist movement, one of two avant-garde tendencies in Soviet architecture in the 1920s, as a paradigm for their "functional method" of design. The Constructivist group, which had emerged in 1923 in opposition to the other avant-garde tendency, the Rationalist movement, sought to convey the social meaning of new socialist building types through the convincing use of singularly functional architectural forms. These intentions were transformed into a distinctly Constructivist theory of architecture in the writings of Moisei Ginzburg, the movement's chief theorist.

In his book Style and Epoch (1924), Ginzburg analyzed the evolution of those constructive new forms which he deemed capable of generating the style of the new revolutionary epoch.12 According to Ginzburg, the Russian Revolution had supplied the vital wherewithal not only for transforming society in the egalitarian image of socialist principles, but also for creating a new "constructive" phase of architectural development that would fulfill the aims and ideals of the proletariat as the new ruling class in the new socialist phase of the industrial age. The new style of architecture emerging out of this "constructive" phase would both embody and facilitate the "mechanization of life," by which Ginzburg had in mind the civilizing force of the machine. By acting to mechanize the productive forces of society, the machine had supplied a powerful technical and organizational base for modern architecture. Too, it had advanced the status of the proletariat as the vanguard of a new socio-economic order, thereby projecting human labor as the prime content of the new socialist society, the unifying symbol of its existence. This placed a premium on solving all the building types associated with the concept of labor, including workers' housing, the factory and work place, as well as places for workers' rest and recreation. Given that these facilities were destined to become the prime symbols of the new revolutionary epoch-as the temple had been for ancient Greece, the cathedral for the Gothic world, and the palace for the Renaissance-the new building types created to accommodate them would invariably become the decisive elements of the revolutionary new style.

¹² Moisei Ia. Ginzburg, *Stil['] i* epoleba (Moscow: Gosizdat, 1924); Eng. trans. *Style and Epoch*, trans. and ed. Anatole Senkevitch, Jr. (Cambridge, Massachusetts: MIT Press, 1982). Ginzburg maintained that America's latest industrial complexes, encompassing the ubiquitous Buffalo grain elevators and especially the Ford River Rouge Plant in Dearborn, Michigan, represented compelling paradigms for such a style. They were compelling because, in Ginzburg's words, they embodied "a genuine monumentality and a purely modern dynamism of that monumentality...creating the characteristic pathos of a mechanized town."¹³ Above all, these industrial complexes manifested an exemplary integration of the latest scientific and technical principles of industrial production, thereby embodying a rational new design process that was readily applicable to the new architecture.

In response to an acceleration of building activity in the mid-nineteen-twenties as a result of the infusion of foreign capital through the New Economic Policy, Ginzburg and the Constructivists acted to concretize their approach to architectural design by formulating what they termed the "functional method." Driven by the Constructivist desire to fulfill the new productive and human needs of a socialist society, this method was rooted in the belief that modern Soviet architecture had to appropriate the latest scientific and technical principles of production in order to achieve efficiency and economy in both design and construction.

Ginzburg conceived of the functional method as a rational problem-solving approach: the architectural problem had to be solved rationally by identifying the unknowns and analyzing the programmatic requirements of the problem as a basis for deriving the most effective means for its purposeful solution. Paramount among the unknowns to be identified and analyzed were the living, working, and recreational needs of the working class as the new social consumer of architecture; these needs had to be investigated and the means devised for their purposeful fulfillment. The development of each solution entailed differentiating, or separating, all of the activities involved by grouping them according to compatible functions—an operation the Constructivists termed "functional differentiation."

In his 1927 article entitled "The Innate Aim of Modern Architecture," Ginzburg extolled Henry Ford's conception of factory design as a quintessential paradigm for the functional method.¹⁴ Ford's approach, adapting Frederick W. Taylor's principles of scientific management to the efficient organization of building functions, had stressed the careful design of the entire production process, encompassing the functional distribution of machines and work spaces, to accommodate the mass production of standardized objects along a moving assembly line. To Ginzburg, Ford's approach epitomized the crucial role of a strict scientific accounting of organizational principles in accommodating the production process in modern industrial design. Ford's description of his approach in his autobiography, *My Life and Work*, which Ginzburg quoted approvingly in his article, underscored the absolute need to maximize systematically the use of every square foot of work space in order to keep work in constant and efficient motion. Equating economy of space with economy of means, and so with maximum efficiency, Ford writes, as quoted by Ginzburg:

Our machines are placed very close together—every extra foot of space, of course, means a certain increase in production costs, as well as additional transportation costs that arise when the machines are moved even six inches farther apart than is necessary—thus becoming a burden to the consumer. For each operation we measure the exact amount of space that a worker needs; be must not be cramped, of course—that would be waste. But if be himself and his machine take up more space than is necessary, that too is waste. This is why our machines are placed closer together than in any other factory in the world. To an inexperienced person they may seem to be piled up right on top of one another; however, they are arranged according to a [scientific] system that gives each worker the space be requires, but as far as possible, not one square inch and, of course, not a square foot more than [is necessary].¹⁵ 13 Ibid., pp. 132-133.

¹⁴ Ginzburg, "Tselevaia ustanovka v sovremennoi arkhitekture" [The Innate Putpose of Modern Architecture], *S.A./ Sovremennaia* arkhitektura, no. 1 (1927), p. 4.

15 Ibid.



Figure 9. The Glass Plant at the Ford River Ronge Complex, 1917. Significantly, this very same approach had been advanced by Henry Ford and adapted by Albert Kahn to the design of Ford's Highland Park and River Rouge plants. "The modern factory principle for which the world gives me credit," Kahn confessed to Malcolm Bingay, "came from Henry Ford." Recalling his pioneering design of the River Rouge plants, wherein Ford had asked him to abandon their earlier Highland Park multi-story scheme in order to develop a one-story solution for accommodating the assembly line method of production, Kahn conceded: "All I ever did was to take his [Ford's] instinctive hunch and reduce it to a working formula—and it has been working ever since."¹⁶

In his lectures on industrial architecture, Kahn characterized that "working formula" as one which "has presented new opportunities for creative work" by encompassing "a straightforward attack of the problem, a direct solution generally applied, avoidance of unnecessary ornament, simplicity and proper respect for cost of maintenance, mak[ing] for a type which, though strictly utilitarian and functional, has distinct architectural merit."

Amplifying the formula in terms that resonate in Ginzburg's writings, Kahn maintained that an analysis of the client's needs had to form the basis for the solution of the architectural problem and "be translated into a workable, practical whole." Doing so entailed familiarizing oneself with the various processes of the work to be accommodated. The gist of the matter, however, was a methodical approach to the design process itself:

There must be a study of the of the flow of materials to develop a scheme simple and direct for the transportation and bandling of materials without the need for crossing or retracing of production. For some processes, multiple-story buildings are preferable; for others, one story top-lighted structures serve best; again; others require a combination of both. ... There is absolutely no occasion for dark interiors. If the plan adopted necessitates such, then the plan is not right. Nor is it right if it be complex, difficult to read, or follow. A plan not straight-forward and direct, is wrong on general principles...There are usually many solutions possible. Only careful investigation will determine the most advantageous scheme.¹⁷

¹⁶ Bingay, Detroit Is My Own Home Town, p. 306.

¹⁷ Kahn, "Industrial
Architecture," Weekly Bulletin of the Michigan Society of Architects,
13 (November 7, 1939), p. 8. In a 1918 article, Kahn professed those attributes which not only endeared him to the major automobile manufacturers in Detroit, but which likewise made him a compelling collaborator for the Soviet authorities charged with carrying out the provisions of the First Five-Year Plan. The ideal industrial architect, Kahn observed, rhetorically addressing prospective clients in an autobiographical vein, was not "the artistic superman, the ardent idealist who soars in the skies, discourses on beauty of design and everything else but practical requirements." Rather, it was "the man who would suggest a practical, commonsense layout to meet your requirements, the man who would look at the problem from your own standpoint, who would place himself, as it were, in your shoes, and strive to solve the problem with and for you."¹⁸ Not least, Kahn concluded, "You would seek an organization composed of men competent and qualified to handle the project in its various phases of plan, design and engineering, both structural and mechanical."

¹⁸ Albert Kahn, "The Architect In Industrial Building," *Modern Building*, 5 (May-June 1918), p. 15.



Figure 10. West elevation of the Forge Shop, Stalin Tractor Plant, Cheliabinsk. Just as Ford's concepts of factory layout had sparked Kahn's innovative design of the Rouge plants, so too, Ford's innovative notions of organizing and streamlining the work of various engineers and technical experts provoked Kahn to reorganize the way his own office operated. As his work with Ford and his associates had intensified in the course of designing the Highland Park and Rouge plants, Kahn realized that the solution of highly complex problems encompassing factory design required that key technical specialists other than architects be integrated into the decision-making process from the outset rather than be called in to perform only after the key decisions had been made. According to Kahn:

No one designer will have all the technical knowledge required for this type of work; hence, to serve the best interests of his client, he will surround himself with a group of men—architectural draftsmen, process engineers, structural, electrical, power, sanitary, heating, ventilating, and air-conditioning engineers. His staff will embody specification writers, field superintendents, cost accountants, expediters and job managers. The coöperation of the members of such a staff in one organization, under one roof, and under the guidance of one principal, produces efficient buildings, economically and expeditiously constructed.¹⁹

Kahn thus transformed the design process itself from an individual to a comprehensive team effort by combining and integrating related areas of expertise in much the same way as Ford's new factory had managed systematically to combine skills and materials efficiently to mass-produce automobiles and other heavy machinery. In addition, a standardized production mode was strictly followed so that a project in its various stages could flow through the office as smoothly as a product flows through a well-designed factory.

Although Kahn's approach was widely admired and emulated in Soviet industrial design circles, Andrei Burov, an erstwhile member of the Constructivist movement who had been sent to Albert Kahn's office in 1930 to discuss plans for the Cheliabinsk tractor factory, cast snide aspersions on the corporate method practiced in Kahn's office: ¹⁹ Albert Kahn, "Industrial & Commercial Buildings," introduction to his *Industrial* and *Commercial Buildings* (Detroit: Albert Kahn, Inc., 1936), p. 3.



Figure 11. Aerial Perspective of the Molotov Anto Works, Nizhni Novgorod. From USSR in Construction, no. 1 (January 1932)

> Their approach to architecture is quite tedious. Instead of architects they have a vast office. It is a "business" ... [As regards] how they design, one gets the impression that one person executes the esquisse; another, the plan; a third person, the façade; a fourth, the interiors; the fifth, sixth, seventh the umpteenth—works on the electrical, structural, water supply, sewage, ventilation, refrigeration systems, etc. The person signing the project is the owner of the office, who has no connection to any of this. What emerges is an American work of art.²⁰

> That it was Kahn, however, and not, say, the Constructivists whose services were solicited by the Soviet government speaks of the fact that no architect or group of architects in the Soviet Union were deemed equal to the task of organizing a construction program of such magnitude. The failure of Ginzburg and the Constructivists to develop sufficiently concrete proposals—or actual building experience—for planning the revitalization of industrial building types on a large scale or to gain any significant practical experience in building industrial facilities that were appropriate to the resources of the beleaguered Soviet state effectively removed them from any serious consideration. Too, the endless theoretical disputes to which Ginzburg and the Constructivists had succumbed in their polemical struggle with the Rationalist movement and the "Proletarian" group VOPRA, among others, induced the Soviet authorities to circumvent such factional issues and to invite the more pragmatic and extraordinarily experienced Albert Kahn to apply his normative method of planning and production to the task, for which he was singularly qualified that of realizing the industrial building program projected by the First Five-Year Plan.

The formal agreement between Albert Kahn, Inc., and the Amtorg Trading Corporation designating the Kahn firm as consulting architects to the Soviet Union was concluded im February 1930; it was negotiated by Albert's brother Moritz Kahn, vice-president of the firm, and signed by Albert Kahn and Saul G. Bron, President of Amtorg. The \$2 billion Soviet design project was two and one-half times greater than all the U.S. business handled by the firm from its founding in 1933 to 1939.

²⁰ Andrei K. Burov, Andrei Konstantinovich Burov: Pis'ma. Dnevniki. Besedy s aspirantami. Suzhdonia sovremennikov [Andrei Konstantinovich Burov. Letters. Dairies. Conversations with Graduate Students. The Assessments of His Contemporaries], comp. R. G. Burova and O. I. Rzhekhina (Moscow: Iskusstvo, 1980), p. 35.



Figure 12. Interior view of the Forge Shop. Stalin Tractor Plant, Cheliabinsk. From USSR in Construction, no. 8 (August, 1932).

At first the work was done in the Detroit office, but Moritz Kahn was soon sent to Moscow with a staff of 25 architects and engineers from the firm to organize a design bureau to prepare plans for the numerous light and heavy industrial plants projected by Gosplan, the State Planning Committee, for the First Five-Year Plan. The bureau, which became Gosproyektstroy (State Design Construction Trust), was directed by the head of the Building Commission of the Supreme Council of the National Economy (Vesenkha). George K. Scrymgeor, Kahn's chief engineer in the USSR and the only American on the National Technical Council, was the chief of Gosproyektstroy and chairmam of the Vesenkha Building Commission.

In May 1931 Moritz Kahn described the scope of the Moscow bureau after its first year of operation:

The Gosproyektstroy is only a year old. Formerly our office in Detroit, employing 400 to 500 architects, engineers, and draftsmen in normal times, ranked as the largest in the world. Gosproyektstroy has just under 600 in its Moscow office, with another 150 to arrive soon, and about 60 students in addition. Its Leningrad office has 300 employees and its Kharkov branch 100.²¹

In part, the move to create the Moscow design bureau represented a more expedient means for carrying out a very large volume of work. But it also suited the purposes of the Soviet regime, as the objective was only partly the design of the plants themselves. Organizational and design skills, techniques, and experience were also to be passed on to the Russian architectural and engineering professions. Days were given over to an on-thejob training program in actual factory design. In the evening, classes were given by the Kahn staff. ²¹ Moritz Kahn, "Work of Soviet Construction Designing Board," *Economic Review of the Soviet* Union, 5 (July 15, 1931), p. 331. Probably no organization has ever had a more severe test of its flexibility, competence, and efficiency. Not only did the plants have to be designed in a hurry, but machinery had to be selected and ordered, process layouts had to be prepared, and the very tools and materials required to build the plants had to be bought in America and shipped to Russia. Kahn recalled: "The problem of adjusting our regular practice to their requirements was indeed an interesting and sometimes a difficult one. Many materials we consider standard here are not to be had in Russia, which necessitated much study to meet existing conditions."²² Added to that were the problems experienced by Kahn's Moscow staff, which had to cope with "incomplete process lay-outs [being] presented and often changed, then the difficulties with the language ... the arguments, the conferences necessary to prove their points, and the opposition on the part of at least some of the Russian assistants." Nevertheless, Kahn concluded, "our men's loyalty and their earnest endeavor to produce results at all costs is winning out. Gradually, the opposition is disappearing and with the better understanding of what is required, things are working themselves out."²³

Among the numerous designs produced by the Kahn firm were those for the steel factories and foundries of Upper Tagil, Kuznetsk, Kamenskoi, Kolonana, and Sormovo; the automobile factory in Moscow; the airplane plants in Kramatorsk and Tomsk; the chemical plant in Kalinin; and the three colossal tractor factories at Stalingrad, Cheliabinsk, and Kharkov. Most of the plants designed and begun in 1929-1932 were truly gigantic in size.

The tractor plant in Cheliabinsk, spread over a territory of more than 2,471 acres and encompassing some 1,780,000 square feet of floor area, was much larger than the one in Stalingrad.²⁴ Situated 1,100 miles east of Moscow on the Trans-Siberian Railway at the base of the Ural Mountains near the border of European Russia and Siberia, Cheliabinsk was projected for development as a new industrial city. The complex, a mammoth affair of 100-foot spans and 40-foot heights, was designed for the mass production of 60 horsepower catespillar-type tractors, with an annual output of 40,000 units. It was placed under construction on July 20, 1930, and went into operation on May 15, 1933.

The dimensions of the Cheliabinsk plants are impressive. The assembly building, was the largest in the world in respect to floor area, covering some 26 acres. Approximately 1,476 feet long and 633 feet wide, it contained over 1,000 lathes and machines of special design. The foundry building, also the largest in the world, was 771 feet long and 633 feet wide, had 9 casting conveyors, 149 molding machines, 4 dome-furnaces and 84 transporters stretching over the length of the building. The forge shop, measuring 672 feet by 423 feet, was designed for a daily production capacity of 400 tons of stamped products. A 3.75 mile-long underground tunnel stretched across the entire plant site, running from shop to shop.

²² Albert Kahn, "An American Engineering Firm in the USSR," p. 41.

23 Ibid.





²⁴ "413-The 'CTZ' (Chelyabinsk Tractor Plant)," USSR in Construction, no. 8 (August 1933): The entire issue is devoted to coverage of the Cheliabinsk plant.

Figure 13. View of Cheliabinsk Fractor Plant, showing esplanades in between buildings.



Although the basic parti of the Cheliabinsk complex derived from the Ford Rouge work, it obtained a more developed sense of ensemble here. The buildings were sited in such a way as to create intervening park-like esplanades of foliage and shrubbery. The grandiose plant buildings were flooded with light streaming though glass windows that extended from a height of $6\frac{1}{2}$ feet above ground level and reached up to the very roof, which consisted of continuous rows of saw-tooth skylights projecting their distinctive profiles onto the gables.

Kahn's Cheliabinsk factory was, on the whole, well received by his Soviet colleagues. They found much to admire in the ensemble's demonstration of Kahn's capacity to achieve a compositional unity and expressive image for large-scale industrial building. Comparing the Cheliabinsk tractor factory to the Ford Rouge plant, L. Serk maintained that: "The architectural appeal of these buildings consists in the marked clarity of the purely engineering solution, the harmony of the applied articulations, and the expressive rhythm of the compositionally pristime standardized elements."²⁵ Vladimir Myslin noted that a "reciprocal relationship is obtained here from the repetitive character of an infinite but easily perceived quantity of various kinds of elements," while the façades, "designed in a spare American manner to provide a direct reflection of the building's profile," enhancing the clarity of the composition.²⁶ Anatoli Fisenko praised Kahn's capacity to create factories that are appropriate both in conception and execution and "that would be handsome not only on the outside, but on the inside as well."²⁷

CONCLUSION

In March 1932 the term of Kahn's contract was allowed to expire without being renewed despite negotiations in Moscow in which Albert Kahn personally took part. The reason given at the time for the failure to renew Kahn's contract stemmed from the new Soviet policy to cease making payments in dollars, or foreign currency, and instead to make payments in rubles, which were not negotiable outside the Soviet Union; this was a condition that neither Kahn nor most other Westerners could accept.²⁸ Although there may well be some validity to that explanation, one can scarcely overlook the likelihood that Kahn's Soviet venture ultimately fell victim to the Soviet regime's ensuing repudiation of all exiting architectural tendencies, including those which had engendered the very "functional method" that Kahn's work embodied and which the Soviet Constructivists had promulgated and embraced. To that should also be added the factor of the emerging Stalinist policy, which gathered momentum in the mid-1930s, of rejecting Western associations in general and American ones in particular.

In April 1932, the Soviet regime issued a decree dissolving all literary and artistic groups that had existed in the various spheres of cultural activity, including architecture. They were replaced in July 1932 by a single organization in each cultural sphere—in architecture, the Union of Soviet Architects—for the purpose of upholding and promoting the party line and banishing all activities not consonant with that line and with the emerging doctrine of Socialist Realism. Kahn's critical design method and his being an American would have placed in considerable doubt his continued usefulness to a Soviet regime grown anxious to free itself from the enormous ballast of the massive transfer of American technology, materials, and expertise.

Although few in Russia or the United States and Europe today are aware of the shortlived but productive Soviet phase of Kahn's prolific practice, its legacy is both stunning and undeniable. By the time Kahn's Moscow operation was dissolved and the staff sent home after March 1932, Kahn had built some 531 factories in the Soviet Union; those very factories were the ones which equipped the Soviet army with tanks and materiel for its ferocious battles against Nazi Germany in World War II. Too, over 4,000 Soviet personnel had participated in the training program mounted in Kahn's office. ²⁵ L. A. Serk, *Pronzyshlennaia* arkhitektura, vol. 1 (Moscow-Lenlngrad, 1935), pp. 250-251.

²⁶ Vladimir A. Myslin, "Arkhitektura proizvodstvennykh tsekhov" [The Architecture of Production Shops], *Problemy* arkhitektwry, vol. 1, Bk. 2 (1936), pp. 36-79.

²⁷ Anatoli S. Fisenko, "Inter'er promyshlennykh zdanii," *Arkbitektura SSSR*, mo. 2 (1935), pp. 51-54.

²⁸ "Kahn Breaks with Soviet. Contract Fails of Renewal Due to Disagreement Over Money Payment," New York Times, Saturday, March 26, 1932. Cf. "Architect Off for Russia to Renew Firm's Contract. Albert Kahn Believes Soviet Will Grant New Business," Detroit Free Press, Friday (March 4, 1932). The work Kahn's office undertook in the Soviet Union proved to be a substantial part of the firm's output during the lean years of the Great Depression. As automobile production fell from its high in 1929 to its low in 1932, no one was interested in building new factories. Hildebrand notes that "Kahn's industrial practice would have languished if his reputation had not brought to him in April of 1929 an amazing commission from the Soviet Union."²⁹

Kahn's Soviet experience may also have served to broaden and enrich his firm's conception of industrial architecture. Kisyanenko suggests that the Kahn group's constant exposure to debates in Soviet architectural circles regarding the civic, cultural and ideological significance of industrial facilities facilitated Kahn's growing recognition of industrial architecture as a significant civic and cultural phenomenon of its time. As a result, he writes, "the industrial architecture produced by Kahn's firm began more assuredly to manifest attributes that caused utilitarian factory buildings to resonate with a substantial civic and cultural aspect—an elegance and artistic perfection of new forms, a clarity and compositional coherence of basic constructions."³⁰

Not least, Kahn's pedagogical legacy lived on in the ensuing instructional activities undertaken by his former collaborators (Anatoli Fisenko and others) in the Industrial Architecture Department of the Moscow Architectural Institute, as well as in the reproductions of drawings of Kahn's buildings which the same department had assembled in album hand-outs. Kisyamenko notes that the subsequent impact of Kahn's method is also discernible in a series of designs, ranging from lightweight, standardized one-story industrial plants to meat combines in Moscow and Leningrad, as well as in the work of Promstroiproekt.³¹

Victor A. Vesnin, President of the Academy of Architecture of the USSR, affirmed the Detroit architect's enormous contribution to Soviet architecture and industrial design in a telegram sent to Mrs. Kahn at the time of the architect's death in 1942: "Mr. Albert Kahn," Vesnin affirmed in his telegram, "rendeted us great service in designing a number of large plants and helped us to assimilate the American experience in the sphere of the building industry."³²



³⁰ I. Kasiianenko, "Ispol'zovanie amerikanskogo opyta v period stanovleniia sovetskogo promyshlemogo zodchestva" [The Utilization of American Experience During the Period of the Formation of Soviet Industrial Archinecture], in Vzaimodeistvie kul'tur SSSR i SShA XVIII-XX vv., ed. O. E. Tuganova (Moscow: Nauka, 1987), p.121.

31 Ibid.

³² V. A. Vesnin, "Telegram to Mrs. Albert Kahn," reprod. in "Albert Kahn Associates Built Russian Defenses," Weekly Bulletin of the Michigan Society of Architects, 17 (March 30, 1943), p. 191.

Figure 14. Interior view of the newly completed Dzerzhinsky Tractor Plant, Stalingrad.





BUILDING WITHIN A BUILDING

LESLIE STEIN

Building within a building is a concept that substantiates how history has influenced the definition of architectural precedents. This continual building upon the advancement of our predecessors is analogous to an individual architect's development. Defined as a light enclosure sheltering inner buildings, building within a building creates a world within a world and offers many benefits as an energy efficient system, and as an interactive humanistic environment. Technological advances in building materials, construction methods, computer analysis, and environmental concerns such as the reduction of energy consumption, direct many of today's designs. The integration of site conditions, characteristics of materials, system of assembly, and programmatic requirements with multidisciplinary concerns involved in the design and construction process creates a unified solution.

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The Gothic Cathedral and the tunn-of-the-century Exhibition Halls are two examples that demonstrate how the the refinement of building materials and structural systems have been fundamental to the development of this concept of *building within a building*. Before the eleventh century, the wide span of a nave was covered by a light timber roof and was susceptible to frequent and disastrous fires. With increased confidence and initiative during the eleventh century, the timber roof was replaced with stone by using the barrel vault, and resulted in forms characteristic of the Romanesque church. With this heavy construction, only a limited amount of light was able to penetrate the massive structural walls supporting the barrel vaults, and small windows were achievable at best.

In the twelfth and thirteenth centuries, Gothic Cathedrals that glorified structural expression were characterized by three structural innovations: the intersecting ribbed vault, the pointed arch, and the flying buttresses which achieved illuminescence within the interior like no previous building type. The intersecting rib simplified the construction of the vault, the pointed arch solved the geometric difficulty inherent in the rib vaults by exerting less thrust than a semicircular arch of the same span, and the flying buttress stabilized the walls while allowing light to penetrate into the interior. On the exterior the buttressing, expressed as a forrest of taut and freestanding forms, provided a permanent scaffolding reminiscent of the "modern" space frame by holding the opposing forces in equilibrium.

Just as the development of increasingly sophisticated structures built in stone created large open spaces, the technological advances of the Second Industrial Revolution introduced new structural materials such as plate glass and steel. These inventions economized the use of materials by reducing the mass of the components and increasing the transparency of the wall. The combination of iron and glass characterized a number of buildings of the nineteenth century. Mass manufacturing techniques encouraged the standardization of repetitive structural elements introducing new design possibilities. The methods of construction and material fabrication became a faster and more economical process. The modular layout of buildings such as factories, conservatories, railway stations, and exhibition halls reminiscent of the medieval bay system enclose an expansive open volume and signify the economy of standardization and construction. The forces directed on the structural elements were concentrated within an articulated skeleton of structural elements whose form was determined, to a large extent, by its function.

The proposal for the *Crystal Palace* in London, designed by the gardener Joseph Paxton (1850-1851) in conjunction with the engineer-contractors Fox and Henderson, resulted in the creation of a giant greenhouse. Constructed of iron, wood framework, and glass, the *Crystal Palace* provided a large enclosed volume, with generous daylighting. Trees were contained within the building to increase the sense of an exterior environment. The creation of pre-fabrication methods enabled the *Crystal Palace* to be built in six months. Within this large envelope, a series of small 'buildings' were constructed to accommodate the exhibits for the 1851 Great Exhibition. Following this impressive project, numerous iron and glass exhibition buildings were built throughout the end the nineteenth century and into the rwentieth century.



Saint-Pierre de Beauvais, France.



Notre Dame de Reims, France.



Crystal Palace, London, England, Joseph Paxton.

With the utilization of structural iron and steel, exterior walls transformed into transparent skins, the mass of structural elements reduced significantly, and former arduous construction methods were abandoned. The evolution of the transparent skin supported by structure introduces a freedom in the interior volume for independent building structures; a technological catalyst to the progression of the concept of building within a building.

This concept of building within a building is a merger of two already existing systems and can further be defined as structurally independent buildings within an enclosed volume of space with an outer skin functioning as a protective layer from the weather. As we are told by Félibien, building within a building is a solution that was once explored in the past. Describing the Halles of Paris, he writes of how two building types are combined-a large enclosure with two "detached" buildings inside.1

It is this concept of building within a building that formed a basis for study, research, and design investigation in graduate school studios. Three different projects were designed for three sites in Ann Arbor, Michigan. Together, these projects developed a design process that builds upon itself through the incorporation of research, the collaboration of experts, and the gradual refinement of ideas. The impact of construction on the environment and its users is of utmost importance in the design of these projects. Solutions were generated in response to a number of environmental concerns, primarily the reduction of building energy consumption. The large volumes of space can be utilized in ways that our early architectural predecessors were not able to explore. Stimulated today by concerns of energy efficiency, as well as economy of materials and construction, the large volume serves a new purpose.

The exploration of design problems by some of today's leading architectural firms-Foster Associates, Renzo Piano, Jourda & Perraudin to name a few, have inspired experimentation in architecture. These projects indicate an integrative approach to design not unlike the development of the Gothic Cathedrals and Exhibition Halls. The work of Jourda & Perraudin Architects is best summarized in the winning competition entry for an education center designed in 1992 for the Minister of the Interior of the Nordrhein-Westfalen region of Germany. In 1994, the architects and engineers of this project carried out a detailed study of the climactic effects of the glass envelope that was reported in the JOULE 2 document, "A Micro-Climactic Envelope." This project, the Fortbildungsakademie, responded to a number of concerns related to the protection of the environment such as reducing energy consumption, using "ecological" materials, recycling rainwater, and decontaminating soil. Currently in the detail design, Fortbildungsakademie inspired the first of three studio project investigations.



FORTBILDUNGSAKADEMIE

Fortbildungsakademie, Germany, Jourda and Perraudin, Architects.

Analysis of the climate conditions are now wereforgement of the secondary envelope for Fortbildungseksdemis involved several computer programs including RODM, ARFLO, SIREROY 2, developed by Ore Arup & Partners, Research & Development, and RADIANCE, developed by the Lighting Systems Research Group at the Lawren Berkeley Laboratory, California, ROOM was used to Benetary Laboratory, California, KOOM was used predict environmental conditions within a single sp AIRFLO, a Computational Fluid Dynamics (CFD) of was used to solve mathematical equations represent fluid flow, ENERGY 2 was used to predict the en-consumption of systems installed within buildi onsumption of systems installed ssentially, a dynamic thermal mo thermal zone or room may be represented. was used for the analysis and graphical sin both natural and artificial lighting. The results of the analysis, as stated in the JOULE 2 : "A Micro Climact Envelope" are summarized below.

The perameters of an optimi analysis are the following:

- Height 15 meters - Ventilation: 5% ope

Single glazing

Roof shape not significant (for climactic reasons Roof shading - 80% of roof area; internal sci cessary in summer, not winte

Facade shading - external shading to mfort in perin

ma - Ein

nce of t The climactic performa influence on the inner but

The envelope acts as a climate m

 The envelope acts as a climates (i.e. provid climate in the Winter months)
 Reduced energy consumption of the inner heating and fresh air supply of 25-30% sav Equivalent reduction in associated CO2 p ted CO2 product 17-24%.

on from wind in Winter the inner buildings. ad perception of com Protection from values of the inner Increased perc wind chill factor.

 Control oftemperatures within the envelope in s by the use of a number of devices including stack effect ventilation, solar shading, water ev cooling and vegetation. These can limit the temps too a meximum of 2 degrees Celsive greater than e temperatures in the central (and least ventilated) perimeter zones. • The risk of condensation can be minimize d by dra • The risk of condensation can be minimize d by dra

Summary of the report on the Fortbildungsakademie project, Germany, described in the JOULE 2 report, "A Micro-Climatic Envelope" for the Directorate of General Science, Research, and Development; Jourda and Perraudin coördinators.

1 Nikolaus Pevsner, A History of

Princeton University Press, 1976).

Building Types (Princeton:





ENVIRONMENTAL EDUCATION CENTER Fall 1994, Professor Brian Carter, Studio Critic

The design of the *Environmental Education Center* in Ann Arbor began with the investigation of site and climate. The site is located between a busy road and the Nichols Arboreturm, with dense tree growth occupying adjacent land sloping down into a natural glen. Like most of the Midwest region of the United States, it is exposed to extreme seasonal changes in temperature. According to the 1989 ASHRAE Handbook Fundamentals, the Design Dry Bulb temperature in the winter is 1 degree Fahrenheit for 99 percent frequency (99 percent of the time, the temperature is 1 degree Fahrenheit or warmer). In the summer, the Design Wet Bulb temperature is 89 degrees Fahrenheit for 2.5 percent frequency.

Based on the *Psychometric Chart* and Victor Olgay's *Bioclimatic Chart*, the dominating weather conditions of each month were plotted.² Plotting this information on the *Bioclimatic Chart* shows the relationship between the climate of each month and the comfort zone. This relationship indicates the nature of corrective measures necessary to restore the feeling of comfort during any period outside the comfort zone. Wind pattern data acquired from ASHRAE showed that prevailing summer wind comes from the Southwest, and the prevailing winter wind comes from the Northwest.³

The Environmental Education Center provided a total of 6,000 ft² with an exhibition space, bookstore, cafe, gallery, library, meeting room, offices, and two residences for researchers. The client's decision to add a greenhouse resulted in the total building becoming a greenhouse. It was this design decision that initiated a study of the building as an overall energy efficient system. The greenhouse can be used as a space for plants and botanical study and as a primary envelope, enclosing smaller independent pavilions that house the meeting room, bookstore, and library.

² Victor Olgay, Design With Climate (Princeton: Princeton University Press), pp. 19-26.

³ ASHRAE, 1989 ASHRAE Handbook Fundamentals (Atlanta: American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc., 1989).



NORTHWEST ELEVATION



The potential benefits of buildings within a glass enclosure were explored using the advanced computer program *Intelligent Building Energy Design Optimization* (IBEDO), developed by Professor Ali Malkawi. This program made it possible to utilize artificial intelligence techniques to locate potential opportunities and to improve overall thermal performance. The glass enclosure and the independent pavilions were analyzed by exploring different materials and glazing systems to optimize the thermal performance of the materials. This research concluded that enclosing the smallest pavilions within the greenhouse not only reduced the need for mechanical systems, but created the potential for the use of passive systems. Relatively small design changes made it possible to utilize



Building Within A Building



the passive potential of the building as an energy efficient system. For example, the greenhouse enclosure height was increased to provide a zone for hot air to collect. This air could then be released at the peaks of the vaults, minimizing summer heat gain in the pavilions.

The results refined initial ideas of *building within a building*. This research, as well as the continuing investigation of precedents, provided the foundation that shaped two subsequent projects.



DIMENSIONS VOLUME TEN 57



INTERNATIONAL INSTITUTE Winter 1995, Professor Annette LeCuyer, Studio Critic

The International Institute at the University of Michigan, approximately 100,000 ft² of cultural facilities, administrative, seminar, conference spaces, and living accommodation for both faculty and scholars, was designed for a site located at the heart of the university campus. Bounded by existing buildings and a main road through campus, the site was on a primary pedestrian route that linked the campus and an existing natural history museum. This project provided an opportunity to explore the concept of *building within a building* at a much larger scale.

The design was developed to create an oasis in which landscape and architecture were interdependent. The glass superstructure provides a generous amount of space for accommodating mixed uses on a single site. The scale of the superstructure relates to the scale of the surrounding campus buildings, yet makes space available for more intimate structures. The buildings within the glass structure are organized as linear blocks that house the five main programmatic functions of the facility: international centers, educational facilities, library, performance hall, and residential accommodation.



ENTRY FLOOR PLAN

- 1. entrance
- 2. International Centers
- administrative/reception 3. educational facilities
- 4. library
- 5. performance hall
- 6. residential accommodation



⁴ D.K.D., "Stock in trade," *Architectural Record*, September 1989, pp. 80-83. The structural system of the International Institute was developed from the economical structural system used for the *B3 Building* at Stockley Park, London, designed by Foster Associates (1989). The advantage of this Y-frame system was that the large steel sections could be prefabricated and erected on site in a matter of days.⁴

The concept of a secondary glass envelope, enclosing a volume that surrounds independent buildings, produces a number of benefits. The volume enclosed by the glass envelope acts as a thermal buffer. In winter, the climate in the thermal buffer zone transforms to a warmer climate than Michigan, and is analogous to what Jourda & Perraudin call "climactic shift." In the summer, solar gains can be reduced using natural "stack effect" ventilation, solar shading, water evaporation cooling, and vegetation. The transitional space between the envelope and the inner building also becomes a place protected from direct external weather conditions where visitors can move in and out of the inner buildings comfortably.

The methods and materials used for the construction of the inner buildings can be simplified by the protection that the glass enclosure provides from external climate conditions such as wind, rain, and snow. Protection from wind in the winter can also decrease the effective U-values of the inner buildings' exterior layers.



B3 Building, Stockley Park, London, England, Foster Associates, (photo by Christopher Grech).





THE CENTER FOR ENVIRONMENTAL ENGINEERING AND SCIENCE Fall 1995, Professor Annette LeCuyer, Studio Critic

The Center for Environmental Engineering and Science was sited on the North Campus of the University of Michigan and totaled approximately 100,000 ft² of space predominantly used for research laboratories. The laboratories required forty percent of the total area to be dedicated to mechanical equipment. An enormous amount of energy is consumed in a building of this type, due to the nature of the research that is performed within the building. The laboratories require continuous fresh air supply and temperature control for research.

The required mechanical units were located in a zone along the north wall of the building behind the laboratories. The offices and meeting rooms were located on an independent structure adjacent to the laboratories. The separation of the laboratories and the office and meeting spaces provide alternative locations for faculty and researchers. It also separates the functions of office spaces and laboratory spaces and recognizes their different mechanical demands. Laboratory spaces that are highly serviced were grouped together. The offices and meeting spaces, with lower mechanical needs, were also grouped together and separated from the laboratory zone. The offices and meeting spaces have a greater tolerance to the fluctuation of temperature within the glass enclosure.

The glass enclosure provides protection from the extreme weather conditions in the winter and summer and provides an environment where visitors can interact freely. Similar systems in all three projects were designed to keep the building warm in the winter and cool in the summer. The linear chimmey above the mechanical zone of the north wall exhausts air from the laboratories and ventilates the entire glass enclosed volume, relying on natural "stack effect" ventilation. Sun shading devices on the exterior of the glass enclosure and on the inner buildings, water evaporation cooling, and vegetation help reduce summer heat gains.

The design for *Kansai International Airport*, Osaka, Japan (1994) by Renzo Piano, integrates structure, space, skin, and services to achieve greater structural efficiency and entrainment of conditioned air.⁵ The adoption of a geometry that allows repetition of components reflects the achievements of our predecessors, such as Joseph Paxton's *Crystal Palace*. The project benefits from standardization and repetition of structural elements. Utilizing a modular structural system to enclose otherwise independent buildings unifies the buildings within a large volume of space, transforming the whole into an overall energy efficient system.

⁵ Peter Buchanan, "Ahead of the Curve," *Architecture*, January 1995, pp. 97-103.





Kansai International Airport, O.saka, Japan, Renze Piano.



The concept of *building within a building* has evolved from the innovations established through historic precedent. It is one solution, in a climate like Michigan's, where programmatic functions, structural systems, mechanical servicing, materials, and methods of construction are integrated in an effort to improve the overall energy performance of a building without compromising the design intent.

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FRED AND GINGER: FRANK GEHRY STEPS OUT IN PRAGUE

MEGHAN WALSH

Prague may be a museum that celebrates the architectural innovations of its past, but there is limited enthusiasm for its contemporary collection which is nearly non-existent. Most people, foreign and native, are scornful of modern artistic invention within Prague's architectural fabric. It is no surprise, then, that the city's newest addition, a collaboration of Vladimir Milunič and Frank O. Gehry, is the subject of much criticism.

The cumulative dissenting opinion of the "Fred-and-Ginger building," called *tančinsky dům* (the dancing building) by Czechs, is perhaps best summed up in the words of a *babička* who recently passed the half-built structure, "*To je špatné*!" (It's terrible!).

The effect of communism on architecture was to divorce it from art, stifling its spirit of invention. The sweeping changes that have taken place since the revolution, however, have yet to be reflected in the field of architecture. They reject the utilitarian look of the regime years, but that does not necessarily mean that Czechs are anxious to jump into unknown territory. In countries such as this one, buildings are often the most tangible anchors to cultural heritage and sense of place. The past is celebrated and used as a model for the future, which creates public resistance to contemporary alternatives.

Meghan Walsh is a graduate student in architecture at the University of Michigan. She has studied architecture in Prague through the College of Architecture and Urban Planning's Study-Abroad Program. She has also worked in the office of the Fuz: Group, Prague.

This article was previously published in the Journal of the International Institute, University of Michigan, January 1996.

Photograph Courtesy, the office of Frank O. Gebry.



Under communism, architects worked in large state firms of up to 800 people and were responsible for the massive developments of concrete-panel housing blocks that line the edges of the city. Emphasis was on efficiency, ease of construction, and economy; neither aesthetics nor individuality were important. Though today's smaller firms stress innovation and personal vision, most clients are either interested in renovation or indifferent to aesthetics as long as their buildings are functional and cheap.

In the face of this sensibility Czech architect Milunič and Frank Gehry are unveiling the Fred-and-Ginger building, rife with architectural invention and individualism. The original idea to build on the corner of Resslova and Rašinovo Nabřeží came from Václav Havel, who was Milunič's neighbor. He encouraged Milunič to design a cultural center that would be an extension of the cultural zone which begins further up the river in the area of Charles University and includes *Charles Bridge* and the *National Theater*.

When the Dutch insurance company National-Nederlanden commissioned Milunič for the project, it was under the condition that he choose an architect of international fame with whom to collaborate. Milunič chose Gehry because his original idea showed some similarities to Gehry-esque forms. It was Gehry who introduced the Fred and Ginger metaphor to the scheme. The two towers look as if they are dancing cheek to cheek with Fred swinging a curvaceous Ginger around the corner. Gehry's work often emerges from humorous metaphors and benign Freudian associations, and this building has a bit of both. One massive column for Fred, which extends to the highest point of the structure, complements the main entrance where people pass through a revolving door beneath Ginger's glass "skirt."

In his original design, Milunič saw the building as representing the revolution as a Czech Joan of Arc, bursting forth out of a shell-like façade. As in the actual building, there was a great deal of interplay between the vertical axis and the slightly tilted one. What Gehry added was a second tower and the anthropomorphic curves, bulges, and twists that evolved into the dancing couple from his Hollywood homeland.

Often associated with Deconstructivism, Gehry's architecture does not fit snugly into this category. In the May issue of *Progressive Architecture* he was classified as a pioneer of the Santa Monica school which has some visual similarities to Deconstructivism, but is not as deeply rooted in literature and philosophy. That his work is linked to a specific place, as opposed to a more global movement, may explain why the building seems out of place in Prague. Gehry emerged as a prominent architectural figure because of his work in Los Angeles and other parts of southern California—a completely different context than Prague. One aspect of Hollywood that Prague is now thirsty for, however, is a celebration of individuality, which produces movie stars and famous architects.

Milunič's part in the design is visible in the few but significant moves to help the structure fit into the meighborhood. The ratio of window openings to solid surface coördinates with the two adjacent buildings, and the line on top of the first floor (American second floor) links the two neighboring buildings. As it wraps around the corner of Resslova to Rašinovo Nabřeží, the line of its first floor "steps down" to correspond with the higher and lower lines of its neighbors. In addition, Milunič recognized the need for a tower to help balance the larger group of buildings between the Jiráskuv and Palackého bridges (The two buildings that make up the second block on Rašinovo Nabřeží between these bridges each have towers, and the third will serve as a visual counterpart). The second tower added by Gehry was more of a whimsical, sculptural gesture than a decisive, formal move.

The boldest and least contextual stroke is Gehry's idea to locate Ginger's legs seven meters out from the line of the existing buildings along Resslova. Milunic justified the move by saying that "Prague has a tradition of being a circuitous and winding city where you never know what will be around the corner. It does not share the sublime qualities of the *Champs Elysées* in Paris with vistas extending to infinity. The projection into the street goes along with this tradition." He added that it was a fight to get approval by the city. He describes the effect of the protruding base as being "a funnel for cars," and acknowledges that this intersection is already quite dangerous. From a pedestrian standpoint, he said, the approach to the building is quite hostile; his idea for a pedestrian tunnel to link the building to the lower boardwalk was rejected due to lack of funds.

It is somewhat ironic that Gehry, an American, is involved in a project for this site. The building that preceded it was destroyed on February 14, 1945 by a stray American bomb supposedly headed for Dresden. One view is that this collaboration is a peaceful reparation. Another is that the building is the second American bomb to be dropped on the same site.



Figure 2. Vladimir Milunić, Preliminary sketch, (drawing courtesy Mr. Milunić).



EL MALECÓN, HAVANA

HELMUT SCHRAMM

WITH HANNES PFAU, ASTRID PIBER, PETRA GEMEINBOCK, LORENZ SPRINGER-LEDERER, AND MICHAEL ZINNER

The design studio Havana, Cuba was the first of a series (followed by New York and Buenos Aires) created by Professor Jan Turnovsky while chairman of the Institute of Housing (Technical University of Vienna). Spurned by an awareness of our ever-shrinking world, it was the intention of the studios to learn the rules, systems, and characteristics of foreign cities, and attempt to understand their histories and cultures.

Havana is very different from Europe, and for Europeans very intriguing. There was no particular site defined for the design studio, except for the one-and-a-half mile-long zone of the *Malecón*, where the town borders the sea. The act of designing and building demands consideration for different climates, materials, and social background. Excursions to existing low-cost housing projects, the building department, and the material testing department of the University of Havana, as well as discussions with architects, preservationists, and local residents helped the students to learn about the peculiarities of Havana.

Figure 1. The Malecón, Havana; arial view. Helmut Schramm is an Associate Professor of Architecture at the Technical School, Vienna. Mr. Schramm was a visiting professor at the University of Michigan for the fall term, 1995.



PROJECT: HANNES PFAU, ASTRID PIBER, AND MICHAEL ZINNER

The urban character of the site in front of the hospital (formerly the national bank) is a discordant array of different spaces and scales which disrupts the continuity of the Malecón.

In this urban project, the proposal of an extension of the existing block system through the adaptation of a modern structure transforms the void along the Malecón into a smaller, much denser living environment re-activating and re-defining the strip.

Analysis of views along the Malecón indicated the existance of a second street paralell to the coast. The resulting intervention is not a solid block structure but rather two differentiated independent buildings. The structure of the building was driven by the region's high humidity; consequently, a simple yet elegant "skeleton system" was devised in order to provide each prefabricated apartment with an open space between the living cells in order to facilitate passive cooling.





PROJECT:

PETRA BEMELNBOCK AND LORENZ SPRINGER-LEDERER

Over the span of one-hundred years, the sea inundated the town of Malecón by one city block. In order to protect the buildings which sat along the coast, it was decided that an empty strip should be built to act as a barrier between the rising sea and the city. Between 1900 and 1930, the economic situation in Cuba was such that the empty strip could be built and developed into facilities for entertainment, offices, and apartment complexes.



The main idea of this project was to design a new strip with modern technologies. The Malecón is a lively area and a place for gathering and fishing. The new building-or better the strip-is now a system of very thin columns encouraging social interaction.

There is a walkway, a space for public buildings such as cafes, restaurants, information and residential spaces. These facilities were actualized through a structure system reminiscent of an airplane.

SPATIAL AGGRAVATION

JILL FORTUNA

space (spâs): 1. the three-dimensional field of everyday experience or its infinite extension. 2. a period or interval of time.

Irrefutably, space exists. How this commodity transcends, or is transcended, to yield or *fabricate* form is questionable. Time, while enveloping space, risks lack of simultaneously enveloping the transcendence.



Jill Fortuna is a recent graduate of the College of Architecture + Urban Planning.

Multiple exposure photographs: layer investigations.

My interest lies in the mapping of space through methods derived not from predetermined program or constraints, but through a continual, experiential, and recorded process. Thus, the space created extends from a conscious commitment to a registration of underlying spatial implications. The site selected is nested in the niche created by the intersection of the Fisher Freeway and the Lodge Freeway, northwest of downtown. Detroit houses the site since this city simultaneously houses a myriad of spaces waiting, as this site is waiting, to be articulated for their inherent properties rather than contentions associated with the "broken city."

disclosure (dis'-cloz'er) 1. to expose to view. 2. to make known; divulge

A city. The city. Detroit. Space. Masked by seemingly inescapable negative contentions, one must be able to uncover and expose *embedded* spatial Detroit. Disclosure is necessary.



Site Model: highway, site, and the city beyond.

Disclosure began with a series of multiple exposure photographs simulating the embedded layers of the city. These photographs spawned reactionary impulses to spatial Detroit, but more importantly to the site itself. The text became not buildings and concrete freeway but physical and phenomenological forces fighting against one another to make a mark on the void created between them. An understanding of the site at a perceptual level emerged: one of a grounded earth with the fabricated layers of the city hovering above it.

perception (per-sep'shen): 1. to become aware of through the senses. 2. to achieve understanding of



Overlapping cones of vision related to movement on highway ramps.

Initially, the central focus centered on perceived movement taking place in and around the site. The Fisher and Lodge freeways provide high speed movement, while the surrounding perimeter of inner-city streets encourage slower speeds. Together the two create edges and a resulting void. The edges define movement referential to a focus point within the site itself. When traveling at a typical highway speed of sixty-five miles per hour, the effective cone of vision from the vehicle to a fixed focal point encompasses approximately 40°. As speed increases, the cone of detailed vision narrows, and the cross-sectional view experiences an overlapping cone of vision occurring at every 10° interval. Thus, a mapping of movement related to a series of projected cones of vision and subsequent overlap within that series is represented on the ramp flanking the northeast edge of the site. Structural and spatial materialization of this system within the site begins to articulate the importance of piercing and inhabiting the ground layer.

Spatial Aggravation


View of the Lodge Freeway - its edges define boundary and control the view of the borizon.

Perception of physical presence begins to absorb, edit, and saturate the site. A jagged horizon created by the city begins to impose itself upon the void of the site. This unnatural edge existing between collapsed depth and height forces its way into the site creating tension between itself and the previous registration of movement. The tension impinges a relationship upon the two systems which must be critically aggravated in order to understand its relativity to the site.

180°. The horizon reappears in the form of a habitat of movement. The mass of the freeway becomes stagnant and lends itself to solidity. Horizon cuts into the earth and becomes ground. Figuratively, two planes juxtaposed in proximity to the controlling view of the freeway become literal within the site itself. The planes begin to define horizon and ground and *demand* attention; their edges are impermeable and threateningly unrelenting.

frame (fram): to construct, build, design or draw up 2. to arrange or adjust for a purpose 3. something composed of parts fitted and jointed together 4. to enclose

> Relative awareness. Collected information informs construction. Horizon? Ground? *Framework*



Perceived spatial systems materialized in the site. Overlapping ramp series. Collapsed horizons.

Perceptual and spatial systems become the framework for final construction. How they interact will ultimately define the edges, the views, and the awareness of experience within. The interplay of parts becoming a whole is imperative to the delineation of final form. An analysis of the perceived systems aims to bring relationships and subtleties to the surface.

Spatial Aggravation

process (pros es'): 1. a series of steps, actions, or operations used to bring about a desired result 2. a series of changes by which something passes from one condition to another

> A Building. The transcendence. The product of the delay.





Proposed building plan/form. Interactive Technology Center with suspended theater, informational "web," classrooms and gallery.

Three dimensionality emerges, but the actual "building" has not. Parts remain parts; systems have not yet found their interrelationships. Individually perceived systems *begin* to delineate form; *final* product is pending. What has manifested is an understanding of process. Linearity is not always desirable or possible. Critical thought and a consciousness of personal sensibilities is a necessity. Process demands focus—a point of reference to constantly aggravate thought.

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Thomas Hendricks and Daniel Wildberger, Case-study Drawing: Inland Revenue Building, Michael Hopkins and Partners; Annette LeCayer, Studio Critic; John Pringle Visiting Critic. John Pringle is the President of the Architectural Association, London. He is also an architect and partner in the firm of Michael Hopkins and Partners, London. While with the firm, he has been responsible for the design of the Mound Stand at Lords Cricket Ground and Bracken House in London, the Glyndebourne Opera House, and numerous other noted projects. He is currently working on the the design of the New Parliamentary Building at Westminster. In 1994, the practice received the Royal Gold Medal for its contribution to architecture.

Mr. Pringle was a Visiting Critic and Guest Lecturer at the College of Architecture + Urban Planning in October 1995. During that visit, he was interviewed by the staff of Dimensions.

Dennis B. Smith is a graduate student in the College of Architecture + Urban Planning.

Paul Warner is a dual-digree graduate student at the University of Michigan in Architecture and Civil Engineering.

PRACTICING A MULTIDISCIPLINARY ARCHITECTURE: A DISCUSSION WITH JOHN PRINGLE AND JANE WERNICK

DENNIS B. SMITH AND PAUL WARNER

PART 1: JOHN PRINGLE

Mr. Pringle, can you talk about the relationship between architects and engineers in your experience?

There is a distinct tradition in a certain sector of British architecture where engineering is very important. Part of the influence came from America, from the work of Charles and Ray Eames, Craig Ellwood and the Case Study Houses—somehow everyone assumed there was amazing control over engineering and how the engineering *was* the architecture. Now, it's quite puzzling to come here and find that the tradition really hasn't carried on, and somehow we developed a way of working with engineers which we assumed was going on in America, but possibly never was. It's an interesting thesis that the whole aesthetic of paring down the architecture—of stripping back the layers that are conventionally on buildings and exposing a very refined, beautifully designed structural frame—as well as using environmental engineering as an integral part of the building *requires* working with engineers from the very early stages of a project. In Britain, part of that collaborative spirit has come from a few very enlightened engineers such as Ove Arup, Ted Happold, Tony Hunt, Mark Whitby, and Frank Newby. We find that when we staff up at the beginning of a project with that type of engineer—even before we have thought up any ideas at all—they become as much a part of the design conversations as the architects.

When I studied at the Architectural Association, practicing engineers worked with students on their projects. It was helpful for the engineers as well, because their education is incredibly focused and they aren't taught about design at all. Being able to sit down with someone in the same way you would to work on a real project, you are able to learn as much as from any number of lectures. I remember going to these engineers with my weird projects in my second year at the AA. They would put aside their work on the Sydney Opera House or something to look at my drawing. I'd ask, "How do I make this building work? What do I do?" The engineer started from his very pragmatic background, but he didn't have to worry about whether it would *really* stand up, so he let his mind wander. Those discussions became a very important bit of our education. Architectural education was very unstructured at that time. Students were left to get an education from wherever they wanted. It wasn't about teaching people, it was about *learning*. But the environment was such that there were all these resources around—engineers and scientists—so one could go out and *get* an education from various places. Students from the AA, therefore, as practitioners were able to continue the dialogue with engineer: that was started early in their training.

At the University of Michigan, there has been an increasing number of students enrolling in the dual Architecture/ Civil Engineering Master's degree program. Do you think that there is a way to foster collaboration between engineering and architecture students? Would that be the key to developing more of a design sense in engineers and more of an engineering sense in architects?

Well, yes, I am appalled at how bad an engineer's education usually is in terms of design. There is a fantastic Victorian engineering tradition where Stevenson, Paxton, and Brunel were major designers as well as engineers, and had a real flair for design. Today, many people coming out of engineering school don't have any design sense, because their education is just a mathematical exercise. I've seen a number of attempts to develop joint courses, but in the end the results are often rather disappointing. In the end, the people who are really interested in architecture carry on being architects and the ones who are interested in engineering carry on being engineers. But it is still important to expose engineers to an architectural culture and architects to an engineering culture. There are a few individuals who have been both an engineer and an architect, such as Santiago Calatrava and Owen Williams, but more often you are either an architect or an engineer. Both are much richer, however, for having an interaction with the other discipline.



Some believe that education should prepare students for an entry level position in architecture, while others feel that the education system is a place for fostering independent thinking—that it is, in a sense, a refuge from practical concerns. Did the AA create that type of refuge during the time that you attended?

When I attended the AA, most of the tutors were practicing architects. Today that is much less common. After World War II, architects worked mainly on public sector projects which seemed to have schedules that were less stringent than projects today. As such, many eminent architects could spend a couple of days per week teaching. Because the top practices seemed to be concentrated in London, the AA and other London schools benefited from a pool of architects who were willing to teach. As a result of the enormous boom in the building industry during the 1980's, architects became terribly busy and there was no way they could practice and remain involved in teaching. A greater separation has developed between academic and practicing architects. It is unfortunate, because that dialogue allows practitioners to be exposed to the thoughts and philosophy coming out of the architecture schools, and at the same time allows architecture schools to be exposed to the people who are creating the environment of today. It is, however, important for schools to retain a distance from practice, because they set the agenda for what the ideals of architecture should be in the future. Architecture schools have this mad vision of the world of the future, and that vision needs to be seen by practitioners. Being the President of the AA for the last two years as well as a graduate, I'm obviously prejudiced toward the AA model where there are no tenured professors; everyone is on a one year contract. If they stop performing they are out, so none of them can depend on the AA for a lifelong career.

So the AA instructors also maintain practices?

Traditionally that was the case. In recent years it has become very difficult to maintain a practice and teach, so faculty often maintain positions at other schools as well. It is important that architecture doesn't become too theoretical, too abstract, and too removed from its *raison d'être*, which is to create buildings. For me, the ideal of architecture is that school is taught by practicing architects who haven't passed their shelf life. Another feature of the AA which is unique in the UK is the ongoing dialogue with its alumni. We're continuing the lifelong debate through lectures, so people in practice can remain in touch with the ideas of the school. It becomes a continuing education throughout your architectural career. In other English universities, graduation is the last people hear of school. American universities are much better at maintaining contact with their alumni. Architectural education is something that should continue throughout your career.

Should this education take place within an academic environment, or in practice?

I think, ideally, one wouldn't draw the distinction between the academic and the practicing environment. If you are in practice you should still be going to lectures on architecture and hearing eminent architects speak. What worries me is how separate and how disconnected the environment of the academics often becomes, in assuming that research and writing books is a measure of your ability to teach. Good architectural education is more about the quality of teaching rather than other academic activities.



In some programs, subjects tend to become very focused in order to study them in depth. Is a technical focus necessary to a good architectural education?

Well, I think that the most important thing in school is a design education. Design is a strange hybrid mixture of things. How to think in order to make good design is what schools need to concentrate on, not teaching how buildings stand up or how to keep the weather out. Schools have to foster the imagination that can make things come alive.

Do your designers do the working drawings and write the specifications, or do you have people dedicated to specific tasks?

For us it's really important that everyone does everything. Good architects are people who do everything. It's important that everyone does the boring bits of a project as well as the interesting bits. We tend to split our projects up into packages, such as partitions or cladding. On large buildings, each architect takes a couple of packages at the early stages of the project, and then follows those packages through completion on site. So they were there when the idea was being formed, and they can still remember that initial concept when they are doing the details, and when they are arguing with the contractor on site. They know what the spirit of the design was at the beginning and it carries all the way through. I am strongly opposed to organizations in which the art department does the design, and technicians work it up, because the technicians can't really understand the philosophy of the design if they are not involved. It's important that the high-flown idea at the beginning has some reflection in every nut, bolt and rivet that eventually holds the building together.

But even the high-flown ideas are affected by previous experiences of taking a design from initial concept through the building process...

That's right; it's important that we get feedback from people working on the project. You learn from the unexpected things that happen in executing buildings. I remember a job with concrete that resulted in a very mottled surface. It wasn't what we wanted for that project, so we had to demolish those walls three times before the builder got it right. But there was something really interesting in that mottled concrete, so we used it on another project where it had some relevance. I think it's really important that architects keep building their own designs in order to understand the building process. When people build the things they have designed, they develop an eye for how a bit connects to the whole. I'm firmly against compartmentalizing architecture. I think you need to slice it through all those stages so that everyone is involved in all the bits of the building.

Do you think European regulatory agencies tend to be fairly accepting of innovation, or do they look to stay with tried and tested methods?

Things have gotten better. Originally regulations were prescriptive, but now there are ways of proving the performance of different solutions which regulatory agencies will accept. That's another reason why the engineer has become so important. Specialists can prove through scientific methods that it isn't necessary in certain situations to have a wall of a prescribed thickness to control the spread of fire. By analyzing the type of fire likely to occur in the building, it is possible to prove that the steel won't reach temperatures sufficient to cause failure. Engineers have responded with a high level of expertise, utilizing techniques such as computational fluid dynamics to model these natural phenomenon.

In the US, architects have increasingly shed many of the responsibilities they once had, presumably to minimize the risk of litigation. Has a similar trend occurred in Britain?

Very much so. It's sad because it stifles innovation. People are very conscious of their legal responsibilities and architects have shed many of them. I think the real danger is that more and more consultants are now on the scene and the architect's authority has diminished. Once upon a time the architect was the sole contact with the client. The client would say "I want a building," and would go to an architect because they like his buildings, and the architect would manage the whole process. Nowadays, clients first hire a project manager who helps them select an architect; so the first person involved is concerned with management, not design. The criteria for selecting an architect is less about good design and more about how to minimize the risk for the client. When you go to meetings more people are around the table than ever before-client representatives, engineers, project managers, lawyers, and construction managers. There may be a dozen people sitting around the table at a meeting with the client, all saying their bit. The architect is just one weedy voice asking "What about design?" Design seems a really unimportant thing in that context because everyone else has terrifying things to say about how the building will not only be late, it will also cost too much. You can find lots of reasons for not doing something, but it is very difficult to find good reasons for doing a design. So design has become much less important. That's all that really comes from architects abdicating their responsibility. Architects are told to concentrate on design while other people manage the process. But you can't do that as an architect, because the way you execute your designs is by having control over the means of procurement and the means of delivering the building. Unless you have that control, you loose your ability to realize your design. A lot of people think that architects can just be brilliant designers, but I think architecture is about how to make buildings happen.



Buckminster Palace Ticket Booth, Michael Hopkins and Partners.

PRACTICING A MULTIDISCIPLINARY ARCHITECTURE: A DISCUSSION WITH JOHN PRINGLE AND JANE WERNICK

PART 2: JANE M. WERNICK

Ms. Wernick, John Pringle discussed the relationship between architecture schools in London and Ove Arup and Partners.

There are quite a few engineers at our office who are interested in teaching, but are too busy to teach a traditional course. We have developed a relationship with some of the schools where individual students come to our office to meet with one of our engineers. It allows our engineers to teach, and exposes students to the way we work with practicing architects. We try to work with architecture students in the same way that we would with practicing architects on the concept stage of a project. It's important for students to develop an attitude that engineering can contribute to all phases of a project. I'm also interested in developing an intuitive understanding of structures in architecture students. It's more important that they learn how entire structures behave—how gravity loads are translated through the structure to the earth or how wind loads affect the structure rather than how to calculate moment and shear forces in beams. My engineering education was like following a recipe. I went through the calculations to get an answer, but I never really understood how structures acted as a whole. Architects need to understand structural concepts so they can apply them to design.

Was architecture discussed in your engineering education?

There was no such word as "architecture" in engineering school. Typical civil engineering education is almost entirely applied mathematics, and almost no design. Structural engineering programs are usually part of the civil engineering department, so exposure to building design is minimal. Projects which could have been good design exercises were focused on applying formulas instead of developing design strategies. I was given an assignment to design a footbridge, but it had to use reinforced concrete beams. It turned into an exercise in sizing beams instead of developing a design idea. I encourage our younger engineers to meet with architecture students to develop their own design abilities.

Would it be beneficial for engineering and architecture students to collaborate?

It would be brilliant to have a team studio project. Even though the team members are inexperienced, some important lessons could be learned from collaboration. It would expose the students to issues which will become important during their career, and allow them to develop a sensitivity to the issues facing other disciplines. As a structural engineer, it is much more interesting to be involved in the original concept, and then work with that concept until it will stand up.



Jane M. Wernick is currently an Associate Director of Ove Arup and Partners, Engineers, London. Prior to her current position in the firm she was the Principal in Charge of OAP, Los Angeles. A few of the numerous projects she has been involved with include: the Cardiff Opera House, with Zaha Hadid; Rome Concert Hall, with Renzo Piano Building Workshop; Stanstead Airport Terminal Building feasibility and scheme design, with Sir Norman Foster Associates; Linn Products, exposed steel structure, with Richard Rogers Partnership; and Roccomas, glazed, tubular steel structures, with Frei Otto.

Ms. Wernick was a Visiting Critic and Guest Lecturer at the College of Architecture + Urban Planning in October 1995. During that visit, she was interviewed for Dimensions Ten by Dennis B. Smith and Paul Warner.

Millennium Wheel proposal, London; Ove Arup and Partners, Engineers.



ON FRAMING: MAKING THE 2 BY [2x 2,4,6,8,10] WALL CHRISTIAN UNVERZAGT



In October 1994, I was commissioned to construct a model for Professor Kent Kleinman. The 2 by [2x2,4,6,8,10] Wall, or "The Wall" as is was affectionately known, became a 4-month study in making.

A fragment from Prof. Kleinman's work on the singlefamily house, *The Wall* is 12 feet long and symmetrical about its long axis, with two 2x10s at its center and two 2x2s at each end.¹ The remaining studs (the 2x4s, 2x6s, and 2x8s) locate themselves within the wall's form rather than on a module or by a convention; they slip until they can slide no further.

The 2 by [2x2,4,6,8,10] model is 15 inches long and constructed of basswood, walnut, liquid latex, and cotton string. Its size was selected after a series of initial studies, both drawn and modeled, informed its construction. While it is a model of a wall within a house, the fragment is also its own construction and investigation at full-scale. It is both signifier and signified. For this reason, modeling techniques and conventions (i.e., adhesives, scoring, and other "tricks") were not used in its making. ¹ Kent Kleinman, "The Analogous House," *Dimensions*, volume 6, 1992.

Christian Unverzagt has a Bachelor of Science from the College of Architecture + Urban Planning. He has designed several books for the College among them the 1995 Wallenberg Lecture by Daniel Libeskind and a book of the work of RoTo Architects. He was the Co-Managing Editor of Dimensions 8.

The case pictured below is the work of David Huizenga, a recent graduate of the College.



A DRAWING FOR WORKING

A drawing was made that investigated the size and relationship of each member. Information from this drawing—the depth of the verticils, the span of the horizontals, and the reach of the bracing—was transferred to the blade of the saw and the eventual form by manipulating the positioning of the gate.



A BASE FOR CONSTRUCTION

The base for construction was made by transferring the location and depth of the studs to two 16" long 2x4s. Bolted together the 2x4s create a ground; pulled apart, a base and a jig. To mass produce the horizontal members and assure consistent alignment a template was constructed on the face of the base. By projecting the plan of the wall onto the face of the 2x4, the base accurately transferred the plan into an elevation. At this moment authority switched from the drawn to the modeled; the drawing ceased to be used to construct or erect the structure.



THE SKIN

The skin, a filter separating one body from another, responds to changes in the day and year. The skin is the product of the deliberate build-up of liquid latex. The process required five applications which were set six hours apart. The latex build-up cured for 24 hours before it was harvested.

TWO WINDOWS

The geometry of the windows is based on the trajectory of a view. The independence of this system with the 2 by framing is recognized when the window supports are attached to the studs. Warped in space, the windows were constructed autonomously and inserted between the vertical framing members.







A BASE FOR VIEWING

The finished product is grounded in a base for viewing. Constructed of laminated walnut strata, the base was excavated via instructions from the construction base and infilled to support the wall. The elevation of this new base reveals the plan of the wall. Discarded is the by-product that recorded its construction.





A VIEW

The latex, stretched over pegs and tied with string,

is a continuous surface with its only violations occurring at the windows. The larger window's two lids have been rolled up and tied back to cautiously reveal a view. The smaller window, positioned snugly between two studs with its skin cut away, is exposing an umprotected view.



1995-1996 SANDERS FELLOW PROFILE

LAURA AUERBACH

THRESHOLDS

Sanders Fellow for the 1995-1996 academic year. She holds a Bachelor of Fine Arts degree from Cornell University, and a Master of Architecture degree from Yale University. She was the project designer for the work here described, which took place during ber employment at Weintraub and Di Domenico Architects, New York City, New York.

Laura J. Auerbach is the

The belief that architecture, landscape architecture, and art in the public realm exist as separate activities bounded by differences in scale, purpose, concept, and method is less a reality than a construct of the modern mind. As designers of public space we share concerns for site specificity, memory, and a phenomenology of place, bringing about a renewed interest in the intersection of our disciplines. As spatial designers we are dealing with a relationship to movement and temporal duration. In examining the concept of disciplinary boundaries I became interested in what exists between things and what exists between things and our bodies—the liminal space.

DUALITY

As designers in the public realm we are constantly exploring the dualism of the observer and the observed, and all the analogous dualisms of individual and collectivity, time and eternity, temporal and cyclical, body and space. I now find myself in the process of investigating the relationship between the corporeal and the tectonic, and expanding my understanding of how space evolves through inhabitation and collaborative movement.

TEMPORAL

Architecture contains real and abstract dimensions, such as time, which are manifest through the body and spatial movement. Ambiguities exist in space, and the way we move changes how we understand space. The space-time dimension is the connective tissue between body movement and spatial composition, between dance choreography and architecture. "Dance and architecture can both be seen as shaping movement. Both use formal and physical principles of spatial design; plane volume, solid, void, weight, and texture, as well as gravity, momentum, and inertia." Movement is inseparable from space. Meaning emerges from the active process of engaging material, medium, body, and situation. The living being had no need of eyes when there was nothing remaining out side him to be seen, nor of ears when there was no surrounding atmosphere to be breathed...it was not necessary to bestow upon him hands, nor had he any need of feet...and he was made to move within his own limits, revolving in a circle.

-Plato

When we move in the open, in unlimited space, the dance becomes correspondingly untrammeled, exuberant, Dionysiac-and rightly so. When we move in a room, we are necessarily under the "spell of the room," a part of the same, enveloped and held captive by it; a "space dance" results, integrating space and body into an indissoluble unity. -Oskar Schlemmer

It is even possible that in earlier than human times, dancing and architecture may have been the result of the same impulse. The nest of birds is the chief early form of building, and the nest may first have arisen as a result of the ecstatic dance of birds.

-Havelock Ellis





This project is an exploration of the relationship between body movement and spatial composition, in the form of a tiered urban park which occupies the sliver of a railroad cut perpendicular to the East River in Queens, New York. The neighborhood wanted a place for active recreation including basketball, handball, and a children's play area as well as a gathering place for the elderly. An urban green on the corner creates a gateway to the non-traditional curvilinear layout of the court spaces, and is marked by a series of stainless steel shade structures which stitch the urban fabric to the water's edge.







1995-1996 OBERDICK FELLOW PROFILE

YASSER EL GABRY

The projects illustrated here are an attempt to highlight ongoing interests in architecture. A fascination with existing structures as building sites in themselves was initially fostered by circumstance. Refurbishment/remodeling was one of the few strains of architecture to flourish in response to the economic recession of the mid 1980's. Many architectural projects, hypothetical or implemented, rose to the challenge of the compounded urban decline, producing schemes which intervened, hybridized, and sutured existing buildings, stretching their program beyond the mundane scope of a re-fit. Despite the gradual upturn in development, the urban fabric of our contemporary cities still presents a legacy of edifices representative of every typology which no longer fulfill their intended roles. These present a vast resource for architects to cultivate, and are loaded with unique contextual and constructional conundrums, engendering possibilities for establishing a legible evolution of the city as opportunities arise.

Technology, to me, is a crucial ingredient in the expression, visualization, and production of architecture. It is as integral as any social, cultural, or political factor is to an architectural problem. Technology's role is manifold; building technology, information technology, computerized visualization, and formal generation techniques are not advancing in unison, but they are constantly modifying one another. Developing critical standpoints which address the role of technology beyond pragmatism or fetishism is essential in such an environment.

The work shown here is representative of endeavors outside of practice, and was developed in parallel with team efforts on built projects with a heavy involvement in detail design development.

Yasser el Gabry is the Oberdick Fellow for the 1995-1996 Academic Year. He is an architect registered in the United Kingdom and has a diverse range of practical experience having worked for, amongst others, Troughton McAslan, where he was responsible for CAD management; Sir Norman Foster and Partners, both in Hong Kong and London; and most recently RMJM, also in London. He is a graduate of the University of Manchester and the University of Westminster, London.



Photovoltaic brise-soleil supply power for refrigeration units in this high-level supermarket. The proposal assempts to introduce the social interplay of the market place to high-rise apartment blocks in Paris's 13e Arrondissment. Through removal of existing building fabric and the insertion of modular box beams and lightweight skin, the structure is slung between two blocks, borrowing from each structurally and infecting programatically.



STEALTH BULLDOG-TECHNOLOGY TRANSFER from a series by el Gabry, Haward, Knight, Levinson.

A half day charrette produced this somewhat cynical critique of techno-fetishism. Visual coding systems redolent of the cutting edge of technology (in this case military aircraft) are superimposed over the banal (a domestic dog) ridiculing the bizarre notion that superficial application of "technology" can legitimize a design solution.



NEW MACHINERY FOR VIEWING THE ROYAL SOAP OPERA

Competition entry for the firsedamaged Royal Palace of Windsor Castle

Through systematic historical analysis of the existing fabric of Windsor Castle the proposal breaches the preservationist status quo and continues the evolution of the edifice to an extreme. A series of subtractions and accretions transform the residential quarters (thus disqualifying the entry from the competition) into a proposal which counters voyeurism with surveillance and attempts to readdress the role of the Royal Family and the nature of the fortness in contemporary England.



MAKING ROOM FOR FEMININITY: A REDESIGN OF OUR ARCHITECTURAL SYSTEM

In 1902, Julia Morgan became the first woman to earn a certificate in architecture from the prestigious École des Beaux-Arts in Paris. By emerging, with measured success, from a system established on and permeated with male culture, she boldly cracked the door open for women to enter architectural careers. Today there is a distinct and visible effort to increase the number of women in our profession. The general raising of consciousness, a commendable effect of this impetus, has brought us to the point where forging positions for women in traditionally male-dominated careers has become a priority in architectural education as well as practice. However, while other fields in recent years have pushed feminism to new depths and implications of ideological potential—most notably fields in the liberal arts—the architectural profession has been content with relegating feminism to the science of counting numbers.

Within architecture, the word *feminist* is often diluted to be understood as one who advocates—or menely assents to—the addition of women to the field. This unchallenged conception and single-mindedness of vision is dangerous, and threatens to undermine the validity and strength of women's presence in and influence on the profession. Feminist conviction and interpretation, confined as it is by the restraints we architects place upon it, has become rather one-dimensional, failing to cognitively recognize or incorporate a more comprehensive view of women's culture and roles. The most blatant manifestation of this, I believe, is the ideological divorce of two concepts: *feminism* and *feminine*.

The word feminine has come to describe a woman who subscribes to a conception of gender roles which is classified as traditional and often perceived as backward. "When women are described as acting like men in this society, definite images of assertiveness come to mind. Femininity carries with it other specific symbols from appropriate colors to wear to a method of walking and talking."¹ Women who choose manners of dress, demeanor, conversation, or life-work that can be described as feminine are considered weaker women, and are ideologically or literally excluded from the feminist agenda. Within architecture especially, women who desire to succeed, or simply to be taken seriously, learn quickly to eradicate any traces of things feminine from their work and personhood.

The devaluation of characteristics traditionally described as feminine is a condition which calls for critical exploration. The limitation of feminism coupled with a paranoia of femininity bespeak the fundamental values to which we subscribe. In advocating merely the accrual of women in the field, the profession continues to violate the essence of women by treating us as a commodity rather than valuing femininity enough to fully embrace and incorporate women's persona into the profession.

In order to have any sustainable affect on the consideration of women's issues in design, it is necessary for feminist efforts within architecture to make room for a more inclusive evaluation of traditional roles. It is easy to conceive of and blueprint ways in which we as women can break into a male-dominated profession by trying to fit into roles designed for men. To call for ways in which we as women can break into the system while maintaining characteristics unique to women's culture necessitates redesign of the system. Amy Potter is a recent graduate of the College of Architecture + Urban Planning.

¹ Jacqueline Leavitt, "Introducing Gender in Architectural Studios," Voices in Architectural Education (New York: Bergin & Garvey, 1991), p. 232.

AMY POTTER



Julia Morgan in Paris. Photograph courtesy of Special Collections, California Polytechnic University.

During one of my first—and most insightfully ingénue—exposures to the workings of an architecture firm, I recorded the following in my journal: "As I watched these two women in the coming weeks, I saw them distance themselves from the others in the firm. Certainly they were both intelligent, diligent, capable. But from whence came this coldness, the sharpness that seemed to undermine so many conversations? Did it come from years of trying to fit into the 'man's world' of architecture? Is there no respect to be found for a woman who is gracious, soft-spoken, and nurturing? Is there no room for femininity in the profession?"

In her dissertation An Undergraduate Voice in Architectural Education, Laura Willenbrock reflects on her experience noting that "[o]ther questions were raised: Was gender an issue in the studio? Are women's voices different than men's in design? It was suggested that women and men think differently. Assuming this is true, male professors might impose their cognitive style on the work of female students in desk critiques, for example. Does patriarchal or sexist language disempower women students in the presentation of their projects in a review? Are female professors treated as equals by their male peers? I, along with other women in the department, had begun to see [that] the way students learned to design and consider history was restricted by a system that ignored female contribution and perpetuated male domination."²

In a recent article, Abby Bussel begins to unravel these issues. Among several propositions cited, Bussel recommends that the American Institute of Architects draft a policy statement on women's issues in the architectural profession, which would include actions such as the recognition of different models of leadership.³ In other words, it endorses recognizing the fact that men and women develop and respond to different leadership structures. Bussel places greatest emphasis on the structure of architecture schools and curricula, which are most influential because they are often the model for subsequent inherited behavior in the workplace. "Like women practitioners, women students often feel isolated, assume they have to exceed a higher threshold than men, and believe men 'look the part' regardless of ability. A related problem is the jury system, where a more explicit grading system would decrease inequitable practices."⁴

Within our system of architectural education, it is essential to consider that women have different operative habits, norms, and preferences in interpersonal dialogue which manifest themselves in project presentation. Women often gain insight through interactive conversation while men tend to operate under a system based on argumentative persuasion. Bussel proposes that design studio may be uncomfortable for women because its structure "privileges persuasion over dialogue."⁵ Under this system, women are forced to work and learn in a manner that is not only unnatural, but unfruitful.

The crucial weakness in the fabric of our working conception of feminism within architecture is that it merely advocates making room for women in the profession rather then calling for redesign of the system and its internal structures to accommodate women. While Ms. Bussel addresses system redesign, she fails to present a case for this overhaul. Male-dominated professions should be open to women not on the condition that women fit into men's roles, but on the virtue that women have the ability to bring new dimensions, understandings, and operational procedures to the profession. Women are an advantage to the architectural profession because they bring an entirely different cognizance and experience of place to the drawing board.

The only photograph I have ever seen of Julia Morgan presents her in startling contrast to the mental image I had conjured of her. The photograph does not picture her dressed in trousers in a studio at a drafting table. She is shown in a dress with an apron at the kitchen table, in a traditional woman's role. This image of such a progressive woman is a challenge to us as women and to the design profession as a whole. Morgan should be able to speak entirely and simultaneously of things both *feminine* and *architectural*. We must actively call for ways in which "traditional" women's culture can be incorporated and valued as an asset in the process of creating architecture. We must *make room for femininity*. ² Laura Willenbrock, "An Undergraduate Voice in Architectural Education," *Voices in Architectural Education*, p. 100.

³ Abby Bussel, "Leveling the Playing Field," *Progressive Architecture Val.* 11, November 1995, p. 86.

4 Ibid.

5 Ibid.

MUNICIPAL COLUMBARIUM RANDALL OTT



Venice faces a burial crisis. For centuries, the bodies of the city's dead have been placed on the small island of San Michelle, located just a ten-minute boat ride from Venice proper. This tiny "Island of the Dead" has reached a state of intense over-crowding, and any further enlargement would threaten to impinge upon essential shipping channels. Furthermore, because high ground water conditions make below ground interment an impossibility on the marshy island of the Venetian lagoon, all human remains must be placed in large, costly, above-ground mausoleums-sometimes containing caskets stacked five or six in height. Many families are being forced to seek burial in Mestre, Venice's sprawling urban suburb on the mainland terra firma.

Such conditions have led to an increased use of cremation and columbarium burial, even among the deeply Catholic, traditional older families of Venice. Niche interment has become a way of maintaining some of the poetry of the specially chosen Venetian way of life-a way of not only living upon the waves, but of dying and being laid to rest upon those waves as well. Municipal authorities have responded to these new conditions with a program for several small, satellite columbariums to be located on some of the outlying minor islands, now deserted, that dot the periphery of the lagoon. This program is the inspiration for the following theoretical project for a Municipal Columbarium on the abandoned island of Madonna del Monte.

Randall Ott is currently an Assistant Professor at the University of Arizona College of Architecture. He was awarded a 1996 National ASCA Design Award for the Municipal Columbarium project and presented the work at the ASCA National Conference in March. Mr. Ott was the 1984-1985 Muschenheim Fellow at the University of Michigan College of Architecture + Urban Planning.

Isola Madonna del Monte is a miniscule island of very minor importance in the history of the Venetian Republic. Located in the outer reaches of the lagoon, it was first occupied in medieval times as a nans' convent, and then as a dwelling place for a few hermits. In the late nineteenth and early twentieth centuries, a powder magazine was built on a small sandbar adjacent to the main island. A major explosion ruined this magazine, as well as seriously damaging the nearby, deserted convent buildings. The area is totally abandoned today, given over to the seaguills and scrubby undergrowth. A profound sense of horizontality overwhelms the area, with the long low body of the church—which never had a bell tower—and the horizon line as the only spatial markers. The feeling of isolation is near complete.



Connected to Venice proper by the regular boat route to the outlying island settlements of Murano, Burano, and Torcello, the island of Madonna del Monte has potentially easy access and occupies an important visual position in the lagoon. These characteristics make it ideal as a site for one of the new municipal columbariums. Foundation conditions on the marshy island of the lagoon are extremely difficult, and the driving of new piles is exorbitantly expensive. Therefore, the old foundations of the ruined powder magazine on the sandbar are to be substantially reused for the columbarium, establishing the placement of the structure, its orientation, and general size. The program was set at 10,000 niches and includes small, possibly outdoor funerary chapel where mourners could gather for brief interment rites.





Approach to the building is only by water, then up an arcuated flight of stone steps. The visitor is immediately confronted by a small, circular, covered space that serves as a modest chancel area for the central square of trees—the intentionally disordered bosque which will function as the outdoor chapel zone where mourners will assemble. The drum form is closed to view on approach, and one must first move around it to enter the central square. The stone paving disappears upon entry, and the visitor steps down onto the gravel in the midst of the trees. From there, movement to either side gives access to the narrow slots of niches.

A cross section of the central zone shows the differing heights of the beams crossing over the "trees" that support the trellis. This section also shows the chapel opening out to the grove. The trellis continues into the niche zones, where the urns will be installed. The cross section in the niche zone shows one of the gaps between the walls, with the brief step down again into the gravel as one passes from layer to layer.



While in Venice, I undertook a study of Venetian palace façades which followed closely in the footsteps of Peter Eisenman's seminal studies of this type. These façades show a complicated fusion of translations and symmetrical rotations. Patterns slide and invert effortlessly across the facades, alternately reinforcing and defying the existence of any one single axis.



The characteristic that is so apparent in the facades of Venice was brought in a somewhat less visible way to the new columbarium through its use in the plan—the central array of columns rotating to each side to mark the positions of voids within the niche walls that allow the visitor to pass from slot to slot at randomly spaced positions. A step down onto gravel recurs at each of these gaps in the wall, reminding visitors that as they pass from layer to layer, they are treading on ground that—if reflected back to the central square—represents the position of one of the trees.



Trees, especially large mature trees, are a rarity in the man-made, mostly paved environs of the Venetian lagoon. Vegetation, where it occurs, is often limited to small, private gardens, locked behind high brick walls in the crowded, warren-like inner precincts of the medieval city of Venice.

For the average Venetian, then, a tree in a public place becomes something akin to an object of veneration, often providing the only natural relief to be found within the hard confines of the city. Carefully positioned and tended, often with its opening in the pavement trimmed with marble or some other precious stone, a tree such as this becomes one of the most important objects within the urban fabric.

The death of one of these old, familiar, and deeply remembered trees in a small neighborhood plaza or courtyard of Venice has a significance for all the local inhabitants that far transcends the mere loss of welcome shade. With the death of such a tree, a symbol of nature—of life itself—has disappeared from view, and everyone who is given to remembering knows that it cannot be recovered in its full maturity for many, many years. These realities have led to the selection of the cut tree as a particularly Venetian emblem for the new Municipal Columbarium.



These white forms are obsessively bleached and dry in character, like huge, strange vertebrae uncovered and displayed by an astonished humanity who can only wonder at what this creature may have once been and what little of it now remains. Sir Thomas Browne, thinking of cremation, wrote in *Hydriataphia*:

How the bulk of man should sink into so few pounds of bone and ashes may seem strange to anyone who considers not the body's constitution, and how slender a mass will remain upon an open and urging fire of the carnal composition.







The drum is more than simply a rude circle of stones. Such hedge monuments, even when not actual tombs, have long called to mind associations with death. Here, each block becomes a proto-tree form, their backsides joining to make a continuous curve, some of them with a single truncated branch reaching inward to the center of the space. With this they gesture toward a small table upon which the cremation urn will be placed while the last ceremonies, just before taking the urn to its final position in the niche walls. Especially if interment rites occur early or late in the day, light will rake across this chapel, through the irregular gaps of between these proto-trees, illuminating the crevices between the stones.





Given the widely differing sizes of families or burial societies in Venice, every columbarium must accommodate niches appropriate for holding various numbers of urns. The need for at least several different sizes of niches can greatly complicate the fundamentally repetitive nature of the columbarium's walls. Typically, this need is handled through providing niches of varying depths, allowing the walls to have a uniform cellular division on their exposed faces.

Even this customary solution, though, is far from ideal as the facing plates of the deepest and largest niches must be crowded with as many as a dozen inscribed names.



A different, less conventional approach to this difficult problem was applied in the new columbarium at Madonna del Monte. Niche walls of uniform depth were divided into cells of varying width. Instead of clustering the niches into groupings of different sizes, all the niches were interspersed together in a randomly staggered pattern, giving an overall homogeneous quality to the walls, yet making them each vibrate with a subtle, constantly varying pattern. Three different size niches are provided, housing either two, five, or twelve urns. The very tightly spaced walls, making narrow channels of space inside the columbarium, were inspired by the long corridors of catacombs. From these underground, roughly hewn spaces also came the inspiration for using subtle curves to make irregularities along the surfaces of the walls.



The final result was a series of long, slot-like spaces lined with curving face plates, an echo at a much reduced scale of the play of the arcuated beams in the central square. Relatively homogeneous in appearance, the walls nonetheless vibrate with a subtle, constantly varying pattern. Rather than frozen repetition as a metaphor of death, an undulant vivacity as a metaphor of continuing life through memory—was created. The elevation and long section of the columbarium both show the basic, tripartite composition of the building. In these views, the overall arrangement and structural rationale of the arcuated beams that stretch from tree-form to tree-form in the center of the building become clearer. These beams, which support an unrelentingly repetitive trellis of wood covering the entire building, rise to differing heights. depending on the varying span from column to column.

Each beam takes the physical form of a slightly parabolic curve derived from the moment diagram that results from the superimposition of a uniformly distributed load upon a simple span. These curving beams give a subtly undulating profile to the roofscape of the project—an effect that would be clearly visible from the low, raking views that a visitor would have when arriving by boat from across the lagoon.





Lastly, the trellis forming the top surface of this box exists to break the sun, not really due to the sun's intensity in the lagoon but as a way to create a pattern of light that can fall over the gestural organic forms within. It is hoped that the visitor, from the moment of approach, will see these chalky white, oddly anthropomorphic shapes being harshly striated with stripes of black, making a space where shades of grey seem somehow out of place a sober reflection on the pivotal moment that separates life from death.



Calvin = HobbES, possible worlds, AND THE ARCHITECTONIC IMAGINATION

I USED TO HATE WRITING ASSIGNMENTS, BUT NOW I ENJOY THEM. WITH A LITTLE PRACTICE, THE DYNAMICS OF INTERBEING I REALIZED THAT THE WRITING CAN BE AN INTIMIDATING AND IMPENETRABLE FOG! PURPOSE OF WRITING IS AND MONOLOGICAL IMPERATIVES TO INFLATE WEAK IDEAS, OBSCURE POOR REASONING, IN DICK AND JANE : A STUDY IN PSYCHIC TRANSRELATIONAL AND INHIBIT CLARITY. WANT TO SEE MY BOOK GENDER MODES REPORT ACADEMIA HERE I COME

Like the hermit crab which makes its house in shells which it borrows, architectural discourse often appears to borrow material from other disciplines and "inhabits" it as its own. Examples of this tendency come quickly to mind and, without commentary, some can quickly be cited. Bernard Tschumi's *Parc de la Villette* borrows from the realm of cinema both for some of its theoretical reasoning as well as for its physical forms. Also, in borrowing notions from Michel Foucault, Mr. Tschumi attempts with the *Villette* to address the issue of madness as a reality of urban life at the end of the twentieth-century.¹ Peter Eisenman has drawn from the fields of computer science, genetics, and electronics for his theory making.² In the roof of the *Columbus Convention Center*, he tries to make manifest his notion of a railroad yard. And, of course, the whole linguistic field has been so grafted on to architectural-theoretical discourse that, to the uninitiated, linguistic terms may come across as *the* basis for architectural theory itself: text, phoneme, syntax, "reading," are all linguistic terms which are ubiquitous in today's architectural theoretical circles.

Why is this so? In this paper, I wish to isolate and delineate architectural thinking and posit it as a specific kind of thinking which is necessarily used in other disciplines, but which is only fully utilized in architecture. I call this type of thinking the architectonic imagination. In other words, I will argue that it is not architecture which borrows from other arenas because it is devoid of its own theoretical "housing," but rather that the "house" of architecture is so large, by dint of the universal presence of the architectonic imagination, that it is the other disciplines which are necessarily doing the borrowing. The title of this paper outlines the steps I will take to outline my argument. First, I will tefer to a popular cartoon strip as a means of delineating differences between the architectonic imagination and other forms of thinking. I will next address the notion of possible worlds versus the actual world in relation to the reality of imagination in general and to the architectonic imagination in particular. In this section, I will refer to some of Umberto Eco's work on possible worlds and extend it by applying it to the consideration of the nature of knowing in various fields of inquiry.3 Finally, and by way of conclusion, I will address the architectonic imagination itself, and set it forth as the essential element which distinguishes architectural theory from other modes of theorizing. In other words, I will argue that the architectonic imagination is the unique signature of architectural theory and exists as the enabling root of the theory of the theory of architecture.

¹ Bernard Tschumi, *Cinegramme* Folie: Le Parc de la Villette (New York: Princeton Architectural Press, 1987), pp. 12, 16-17. As for Foucault, I am referring to his work on mental illness and madness in *Maladie mental et* personnalite (1954) and Histoire de la folie a l'age classique (Madness and Civilization), 1961.

² I am thinking in particular of Mr. Eisenman's lecture Visions Unfolding: Architecture in the Age of Electronic Media, presented at the University of Michigan, 19 November 1991, although his propensity to "borrow" material from other disciplines is quite characteristic of much of his theoretical work.

³ I will be referring mostly to Umberto Eco, "Small Worlds," *The Limits of Interpretation.* (Bloomington and Indianapolis: Indiana University Press, 1994), pp. 64-82.

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CALVIN AND HOBBES4

In Calvin's world, the tiger (Hobbes) to the tot (Calvin) is a living, breathing, "real" thing. Of course, in the world of the cartoon, the tiger is a real thing—it is Calvin's stuffed animal—but this "real" of the tiger in the world of the cartoon is not the real of the tiger for Calvin. For Calvin, the tiger is *really* real; that is, Hobbes lives, breathes, walks and talks with Calvin. In short, Hobbes is Calvin's soul mate in life. The tiger, therefore, for Calvin, is a projection of Calvin's imagination and it is this imagination which makes his experience of Hobbes the underlying reality of what it is. Now, for the others of Calvin's world—say, his ever-befuddled parents—*their* reality is that Hobbes is merely Calvin's stuffed toy, and no more. This difference in how an object (Hobbes) is represented to two given subjects (Calvin and his parents—or all others in the cartoon for that matter) represents the main tension which drives the story line. *Figure 1* illustrates this state of affairs.



⁴ Calvin and Hobbes is the creation of Bill Watterson. The other level of the Calvin and Hobbes discourse, the fact that the two are namesakes of two quite significant thinkers in history, the Christian theologian John Calvin (1509-1564) and the British philosopher Thomas Hobbes (1588-1679), I am not going to address here.

Figure 1.

Here, Calvin's actual world (the world of the cartoon) is represented by the horizontal line w_a . This is the world of Calvin's parents. In this fictitious actual world, tigers do not talk, just like they do not talk in our actual world W_A (see *figure 2* below). But in the world of Calvin's imagination stuffed tigers, at least Hobbes, do talk. This fictitious possible world is represented by the diagonal line w_p . The goal of Calvin's imagination is the injection of the talking tiger of his imagination into his actual world so that, for Calvin, w_p and w_a are functionally the same. This action is represented by the dotted vertical arrow in the diagram. And it is at the completion of this actual the cartoon is given to us. In other words, for us, the cartoon is simultaneously a presentation of w_a and w_p .

For us, the tension is doubled; given our privileged status of not being in Calvin's world at all, or a part of the world of the cartoon strip, we know the whole thing is merely a representation of the *cartoonist's* (Mr. Watterson's) imagination. We could read the cartoon, or perhaps not even read it at all but rather dismiss it as a mere point of interest for children, and know in our inner knowledge that the whole thing is, after all, not *real*. But if we do take time to familiarize ourselves with the cartoon, we would immediately come to some conclusions, the foremost of which is that Calvin's parents' reality is, for us, the *real* reality. This is because we *know* that Hobbes is only a stuffed animal. How do we know this? Suffice it for now to say that we just know (I will explain later). Calvin's parents are in fact right. Calvin is in fact wrong. Now of course, the moment we come to this conclusion, the trick on us has already been played. The fact of the matter is, we are wrong: Hobbes is not even a stuffed animal. Hobbes is merely a cartoon—a figment of the cartoonist's imagination given to us as lines printed on newsprint. And cartoons are not "real" in the sense of *real* real. And Calvin and his parents do not "exist"—they are merely, also, pictures on newsprint. So the newsprint collapses the two worlds, Calvin's and the cartoon's, into one, and it sits rolled up, in the actual world, on our stoop, at 6 AM, if the newspaper boy is on time.

But this is a cliff we never think twice before jumping off of: the operation of any comic strip, nay, of any fiction, of any book, of any literature, of any text, of any work of art, of life as-such, is that the diaphanous film which separates "real" from "imagined" or "represented" is immediately multi-layered. In the realm of the imagination, these many layers are also multi-penetrable. Our imagination is able to step in and out of the various possible worlds given to us by means of the plethora of world-generating vehicles (such as the cartoon strip) around us every day. The business of advertising, for example, revolves around the hope that you and I will be duped into thinking that a new car, a new deodorant, a new brand of beer, a new whatever, would be the key to ushering us into a new realm. And we often fall for the bait. Furthermore, internally, our imagination is constantly deployed in generating possible worlds, with the goal that some of those possible worlds would materialize and become part of our actual experience. Indeed, the role of the imagination seems to be to project some condition which does not excist in the actual world and then to either, first, position that condition into an actual world context or, second, to transport the person doing the imagining into the context of that non-existent condition. Of course, this last sentence is only a theoretical statement for sake of analysis. The situation is a little more complicated in practice. Take the Calvin and Hobbes cartoon. Calvin's world and the world of the cartoon (we have already determined that these are two different possible worlds; in Calvin's world the tiger is real real, while in the world of the cartoon the tiger is only real in the sense that it is a real stuffed animal ...) are, for us, both imagined worlds in the second sense of what the imagination is doing: it transports us, the people doing the imagining, into the possible worlds of Calvin and the cartoon with no prospect of ever bringing this imagined condition into the context of the actual world. Simply put, in a million years we will never meet Hobbes on the street to shake his paw, either as a talking tiger or as a stuffed animal. In the actual world, we will always only meet Hobbes as newsprint. But this is the complication: we do meet Hobbes, Calvin, and his parents as newsprint, and the newsprint is part of our actual world. In other words, Calvin's world



Figure 2.
and the world of his cartoon does exist in our world in some form—as newsprint. Someone's imagination has installed Calvin into the context of the actual world and, insofar as this is true, that imagination has succeeded in the first sense of the function of imagination: that of taking a non-existent realm and injecting it into the actual world. This state of affairs could now be diagrammed as in *figure 2*.

Here, the cartoonist's world (our actual world) is represented by W_A . The imaginary universe of Calvin and Hobbes is given as shown at the terminus of the diagonal line W_P . We note that it is simply a re-iteration of *figure 1*, now placed in the context of the larger situation of our experience. In this larger context, we note that the w_a of the cartoon is parallel to our actual world W_A . The workings of the comic strip depend on this, for we take our experiences in the actual world and assume that the fictitious actual world of the cartoon largely parallels ours—even though there are no explicit assurances to that effect. This is the reason why we assume that Calvin's parents' assumption that Hobbes is only a stuffed animal to be the right one. They are, after all, "realistic" people. The new vertical action, the extended dotted arrow, now represents the cartoonist's (our) action of receiving the imagined world(s) into our actual world in the form of pictures on newsprint.

We could now posit the following question: Is this kind of imagination which brings the Calvin and Hobbes cartoon to us in the form of newsprint an architectonic imagination? It is to some extent, but not fully so, as I will attempt to show. The architectonic imagination is the complete imaginative process by which a possible world is brought into the actual world in such a fashion that there no longer exists a membrane, a film, which separates the one from the other. In the case of the cartoon, the newsprint represents a film, a barrier, by which the cartoon's world and the actual world would (could) never be fully integrated, even though the one exists in the other. The cartoon is an annexation to the actual world, not an integration. The frames of the cartoon strip are portals through which our imagination could view, and hence penetrate, into its realm. The frames themselves are part of our actual world, but the view they provide us is still only a possible world, and will always be only a possible world. Furthermore, the collapse of Calvin's world and the cartoon's world into one by the newsprint renders the whole project a two dimensional project when viewed within the context of the actual world. To put it another way, unlike in the case of the comic strip, a fully architectonic imagination is able to bring a possible world-vision multi-dimensionally into the dimensions of the actual world, so that the dimensions of the two worlds are the same, are integrated together, and so much so that it renders further imagination of that world unnecessary.

ACTUAL AND POSSIBLE WORLDS, AND THE SIGNATURE OF A FIELD OF INQUIRY.

Up to now I have used the terms possible world and actual world without precise definition. Let me cite here Eco's definitions for these terms, since I will continue to build upon them for the rest of this paper. Eco defines a *possible world* as:

...a series of... descriptions that readers are supposed to interpret as referring to a possible state of affairs where if p is true then non-p is false... This state of affairs is made up of individuals endowed with properties... Possible worlds can be viewed either as 'real' states of affairs or as cultural constructs, matter of stipulation or semiotic products...⁵

In other words, he is defining in technical terms an imaginary world. In his work he allows for a much larger scope of imaginary worlds—worlds in which p could possibly be both true as well as not true. There is, after all, nothing to stop the imagination. Also, the actual content of the vehicle which describes the possible world (say, again, the cartoon strip) must be distinguished from all possible content within the possible world once that world

⁵ Eco, "Small Worlds," p. 66. Note: Mr. Eco's complete definition is much longer and I have here extracted only what is pertinent to this discussion. is set up. In other words, in Calvin's mind an Africa may exist, even though a specific Calvin and Hobbes cartoon (or all of the Calvin and Hobbes cartoons, for that matter) does not require the mention of that Africa, etc. As another example, consider the popular television series *Star Trek* Because the possible universe of *Star Trek* has been set up, we assume that there are infinite worlds for the crew of the *Enterprise* to explore, even though we could count very quickly how many total (actual) shows exist.⁶ As for the actual world, Eco defines it as follows:

The so-called actual world... is the world as described by the Encyclopedia Britannica or Time magazine (a world in which Napoleon died on St. Helena, two plus two equals four, it is impossible to be the father of oneself, and Sherlock Holmes never existed—if not as a fictional character)...⁷

In other words, contrary to the popular post-structuralist claims of unlimited semiosis and the infinite play of meaning, Eco is arguing for a rock-bottom, non-philosophic, every-day reality in which it is possible to construct some kind of understanding of an objective existence. This reality is, in its mundane way, *dependable*: tomorrow, I will be one day older than I am now, no matter what the post-structuralists say, and if I want to visit the *Taj Mabal* I need to make some concrete plans to get there (i.e., there is not here).

Having accepted this distinction between possible worlds and the actual world, this observation could be made: the activity of every discipline of knowledge is to, in some way, engage with possible worlds in an attempt to bring them, in some fashion or form, into the actual world. This yields three further observations:

1. How and to what degree each discipline accomplishes the action of intersecting a possible world with the actual world constitutes its distinctive *signature* as a field of inquiry. We have already seen how a cartoon strip does this: the possible world(s) of the cartoon strip intersect the actual world in the form of a two dimensional picture on newsprint. This may be said to be the signature of the field of inquiry of the comic strip. Other fields—painting, economics, history (very interesting here), philosophy, the sciences, architecture, etc., all have different signatures and, of course, considerations of their signatures would no doubt be slightly more involved than the signature of a comic strip. But the principle is the same.

2. However, the vertical action *ITSELF* (I am referring to the vertical arrow of the diagrams above) of bringing a possible world into intersection, in some form, with the actual world is *ITSELF* a signature of the architectonic imagination. We therefore must separate the *ITSELF* of the architectonic imaginative process, which is a universal reality, from the specific and categorized activities of the disciplines which utilize some form of it to bring about their various sectarian goals.

3. Only in architecture itself as a field of inquiry does the architectonic imagination *ITSELF* attain to full scope and force. The field of architecture is analogous to a cleared highway on which a conceived possible world W_P could fully run, by means of the architectonic imagination, to intersect the actual world W_A and fully integrate with it, so much so that, as already noted, there is no longer a mediating wall between the two upon the completion of the action.

The architectonic imagination, then, in its broadest sense, may be considered to be any cognitive attempt to bring a non-material possible world into the materiality of the actual world. It is the activity of *siting*, with all of the connotations of placing in the actual

6 Eco's term for the explicit content is the linear text manifestation-the sentence by sentence description which is sufficient to "create" the possible world. His point is that once the possible world is created, there exists for that world a complete encyclopedia of information which need not be mentioned in the linear text manifestation-just like for our life in the actual world, a complete encyclopedia of knowledge of our world is not necessary (indeed is impossible) to live in it. Ibid., pp. 66-67.

7 Ibid., p. 67.

world, of locating in the actual world, of structuring in the actual world, of the intelligent coalescing of materials for a specific purpose in the actual world, which such a word represents. *Sitting*, as *the* activity of the architectonic imagination, is therefore much greater in scope than the physical placement of a building on the land—although this form of sitting, this activity of architecture proper, is immediately the personification of the larger activity as well as a metaphor of it.

In this light, we could now see why disciplines outside of architecture proper must involve themselves with the architectonic imagination, to some degree, in order to attain to their sectarian goals. The accountant, for example, when s/he performs an economic procedure of auditing or balancing a company's books, must structure, must correlate, must identify functions and adjacencies between abstract values, and so forth, in order to site a certain kind of completed construction within the materiality of the actual world. As far as this goes, it is an expression of the architectonic imagination. The final construction is a set of numbers on paper, in the actual world, which point to a condition of either financial health or un-health for the company in question, in the actual world. Before such a construction is complete, the accountant has a sense of the steps involved to reach the completed shape of the construction. This constitutes the WP. But when the completed construction emerges, it has intersected the WA. But here the architectonic imagination is not fully consummated in that the final figures on paper, much like the comic strip, are still portals to a condition, not the condition itself instantiated in materiality. This is because in the sectarian realm of accounting, the "condition itself," by the nature of the case, is something which could never be instantiated in materiality.

In the physical sciences, say chemistry or physics, the goal is to understand the workings of the actual world (universe) WA. The scientist sets forth a hypothesis which purports to explain and/or predict a certain behavior of an aspect of the WA. This hypothesis is a kind of WP, and the question at hand is whether this WP, could be brought to intersect the W_A in such a way that a (seemingly) perfect match emerges with the behavior in the actual world it is trying to explain or predict. In other words, could the scientist eliminate the barrier, the film, between the two worlds? If he could, then his hypothesis, for the moment, could be said to "work." But if some previously unexpected behavior of the object of study emerges to render the hypothesis unworkable, then, in Popperian terms, the hypothesis has been falsified, and its status as a part of the W_A comes under serious doubt.8 Now, if a proposed Wp seems to fit with a behavior within the WA over time, what emerges is Kuhn's notion of the dominant paradigm, the added social condition in which the majority of a scientific community works to promote the explicationsometimes to the detriment of the actual truth.9 But this we need not further develop on here. Our task is to delineate the role of the architectonic imagination in this. For the physical sciences, the distinguishing signature of any WP is that it is in fact proposed as an a priori part of the WA to begin with. Any successful integration of the two, therefore, is not so much an integration as it is an unearthing, or an uncovering, of a deeper layer of the actual universe. For example, the behavior we now know as $E=mc^2$, insofar as we currently accept it as a match to that behavior, existed before Einstein uncovered it. Any Wp within the physical sciences must therefore demonstrate the pre-existence of the possible world (as already a part of the actual world) it purports to explain. This is a fundamental difference between the physical sciences and the arts, where a posited possible world need not have a correlation to a pre-existent set of behaviors within the actual world. Such a reality explains why there is necessarily stricter boundaries for the scientific activity of matching a W_P with the W_A . But as far as the architectonic imagination is concerned, there are close similarities between the sciences and the arts.

⁸ Karl Popper, "Falsificationism Versus Conventionalism," *Popper Selections*, ed. David Miller (Princeton: Princeton University Press, 1985), p. 150.

⁹ Thomas Kuhn, The Structure of Scientific Revolutions (Chicago: University of Chicago Press, 2nd ed., 1970), pp. 48-9, also the Postscript, pp. 174-210. Again, the scientist in his/her work must structure, must correlate functions and adjacencies, must do all of the *architectonic* work which deploys a host of physical tools and abstract signs towards the end of uttering a simple statement, in the actual world, about the actual world. He must, in short, do the work of siting. But the mathematical sign, in the end, is the signature of the scientific enterprise. $E=mc^2$, for example, captures a behavior of the actual world, but it always only captures it in mathematical signs. The actual behavior, just like the "condition itself" of the financial world, could not be "captured." The converse of this statement is also true, and it gets us closer to the essence of architecture: Whenever a set of scientific signs is materially instantiated in the behavior it explains or predicts, what emerges is a kind of architecture. For example, the rocket ship is an instantiation of many scientific signs. The bridge is architecture, of a kind. And so forth.

Let us briefly consider painting. The painter's vision always intersects with the real world in the material form of the canvas, that is, of the painting itself. Once this portal has been accepted as the signature of painting, the portal itself could open up to many possible worlds. Heidegger, for example, in analyzing Van Gogh's painting of a pair of peasant shoes, notes that "the painting spoke... in the nearness of the work we were suddenly somewhere else than we usually tend to be...⁷¹⁰ Heidegger argues that painting "sets up a world" and that this setting up reveals (or unconceals) a dialogue, or a strife, between that world and the given-ness of the earth. Hence the oldmess, the worn-ness, the equipmental nature of the shoes as shown in the painting. In his words:

Truth happens in Van Gogb's painting. This does not mean that something at hand is correctly portrayed, but rather that in the revelation of the equipmental being of the shoes beings as a whole world and earth in their counterplay—attain to unconcealment.¹¹

Painting has the potential of opening up to us a possible world which is actually another portion of our world, a portion of it which we are not in, or perhaps could never be in due to the passage of time or the distances of space. Also, because of the power of the painter as creator, a painting could offer us a view of such a possible world as an *idealized* expression of a slice of the actual world, in a form which the actual world could never hope to attain to in practicality. (Hence the motto of Renaissance art: not as the world is, but as it should be...). In any case, what comes to us is a heightening of our understanding of existence, what Gadamer calls the magnification of being,¹² and what Heidegger means by truth being set to work or, simply, by unconcealment. One critique of Heidegger's Origin of the Work of Art may be that it works better with representative painting than with abstract works. What about a Cy Twombly? What about a Jackson Pollock? How abstract works represent unconcealment in Heideggerian terms must be further explored. However, we could see how the architectonic imagination, here determined as that prozess by which any W_P is birthed, in some form, into the actual material world, must be



Figure 3.

¹⁰ Martin Heidegger, "Origin of the Work of Art," *Basic Writings*, ed. David Krell. (San Francisco: Harper/ Collins, 1977, 1993), pp. 143-212. See p. 161.

11 Ibid., p. 180.

¹² Hans-George Gadamer, *Truth and Method* (New York: Crosstoad), pp. 130-36. involved in both representative and abstract painting because it is necessarily blind to the essential needs of organization, of method, of structure, of form, and so forth, which both approaches require as a pre-requisite to expression.

CONCLUSION: THE ARCHITECTONIC IMAGINATION

In the final analysis, architecture itself is the only instantiation of the architectonic imagination in its fullest expression. With the built forms and environments which architecture gives us, and which indeed is architecture, the initial possible world-vision of the architect could actually be birthed into the actual world in such a way that the shape of the actual world is actually altered. The dotted vertical arrow of the previous diagrams must, when considering the architectonic imagination as exercised in architecture, become a solid arrow, as shown in *figure 3*.

In architecture, the process of siting comes into full maturity, and once a possible world is sited, it is given to the actual world in such a way that it becomes continuous with the multi-dimensionality which is existence. When the siting is complete, there is no more barrier, no more newsprint, no more canvas, no series of abstract signs, no "condition itself" which remains once-removed from basic non-philosophic, every-day experience. Rather than a painting heightening being through our contemplation of the possible world it gives us, architecture has the potential of heightening being within the very context of the everywhere-present. Of course, the danger of this is that it could also demote and devalue existence as well. Architecture is the material world which we know, and it is the architectonic imagination which is the enabling vehicle for its emergence.

All of this forces an expansion of the practical scope covered by the word "architecture." Consider furniture design, or the design of place settings and silverware. Consider even the toy "cubes" in fashion a few years ago, which could be twisted and turned for hours before various colors could be matched on each face. It is not surprising that architects are often engaged in the production of these items-of-the-real-world. Insofar as these objects permit the action of being brought into the real world as real-world objects, their ontology does not stop at a mere two-dimensional picture, or as a mental construction limited to signs or numbers for expression. They crash right into material reality and, just like buildings, *become* material reality. They therefore are complete instantiations of the architectonic imagination and, in this light, they underline the fact that other forms of thinking which find their ultimate expression limited to paper or sign are incomplete metaphors of the architectonic imagination.

So stated, let us return to the beginning and reconsider who is borrowing material from whom. In this paper I have posited the architectonic imagination as a universal reality which permeates all categories of existence in the world we know. All disciplines seek to interact with the real world by *siting*, in the manner defined above, and in doing so, those disciplines are actually practicing an architectural exercise. It is not architecture which is doing the borrowing.

A discussion such as this brings to the foreground the deeper theoretical question of what constitutes, at bottom, the architectural experience? And what is the theory which must be in place to explain this experience? Present dissemination of architectural theory, by means of the studio, by books, by lectures, and by the buildings themselves perhaps center too much on buildings-as-such. Insofar as this goes, it provides us with a theory of architecture, yes, but does not open up a gateway into a consideration of the *theory* of the theory of architecture. It is only at this deeper level of theory, I believe, that a theory of

architecture could find its roots and come fully into its own. At the surface level, the level which is common today, the level which is presently fatigued of trading in linguistic currency and looking for something else to carry it along, we will always appear to be borrowing from other arenas. There will always be the noise of what is new, of what is in fashion in the marketplace of ideas. But at the deeper level, at the level of a theory of theory, we discover a kind of subterranean conceptual (perhaps pre-conceptual) network, a "tranquil world of laws" to use Hegel's term,13 in which we discover the architectonic imagination as a kind of universal enabling root which gives conceptual and structural sustenance to all of the disciplines on the surface. Such a journey to this deeper level of theory is necessarily a philosophical journey, and ever since Plato we could see traces of the architectonic in the philosophical method.14 Wigley, for example, has noted the necessity within philosophical discourse to use architectonic terminology to convey its arguments. He cites mainly Heidegger, who "...often directly and indirectly addresses the way in which philosophy repeatedly and insistently describes itself as a kind of architecture ... "15 For example, he cites Heidegger's description of language as a "house" and elaborates on Heidegger's "architectural rhetoric out of the traditional architectural metaphor with which philosophy institutes itself ... "16 He continues:

The figure of architecture is therefore not simply one figure among the others that (philosophy) chooses to employ... from the beginning philosophy has represented itself as a source, storehouse, and arbitrator of order. This representation would not be possible without the architectural figure... Philosophical discourse is more indebted to this architectural figure than it could ever say...¹⁷

This indebtedness which Wigley argues for is indeed the architectonic imagination. In other words (and Wigley does not do this explicitly in his text), what we must insist for is not a priority of philosophy-as-such over architecture, even though, in terms of sheer output, the tradition of philosophy could produce much more evidence of the fruit of its labors than architectural theory. Rather, we must insist that the enabling root of all of that fruit is in fact something architectonic. And so what is needed is not merely a curious taking note of all of the architectural metaphors which dwell in philosophy, but rather a full fledged philosophy of architecture which sets forth the architectonic imagination as a universal reality, with no apologies to anyone. ¹³ G.W.F. Hegel, *Phenomenology* of *Spirit*, 1807, translated by A. V. Miller (Oxford: Oxford University Press, 1977), sections 142-165.

¹⁴ I am thinking of Plato's famous analogy of the cave in *Republic VII*.

¹⁵ Mark Wigley, *The Architecture* of *Deconstruction* (Cambridge, Mass. and London: MIT Press, 1993), p. 8. Wigley does this in connection, of course, with Deconstruction. I am not suggesting that philosophy's connection with the architectonic imagination needs this added requirement.

16 Ibid., pp. 97-98.

17 Ibid., p. 9.

EXTENSION OF THE PRADO NATIONAL MUSEUM, MADRID, SPAIN

TEAM DHAHM

DONN PEREZ HELMUT RAINER ALEXANDER SEITLINGER HINA N. JAMELLE MARTIN GLEISS

Studio Critic: Andrew Zago, Visiting Professor of Architecture.



Composite of Site Shadows

Team DHAHM is an international coalition of Architecture Students. Martin Gleiss, Alexander Seitlinger, and Helmut Rainer were visiting students at the CAUP from the Technical University in Vienna, Austria for the Fall of 1995. Hina Jamelle and Donn Perez, who currently attend the College, are students from Karachi, Pakistan and Barquisimeto, Venezuela respectively.



Perspective through Temporary Exhibition (previous page).

Diagram of Site Shadows Over the Course of a Year.



PROGRAM:

The Prado Museum in Madrid is one of the world's premiere art collections. Considered a painters museum, it houses the finest examples of work by Velazquez, El Greco, Goya, Titian, Brueghel, and Hieronymus Bosch—including Bosch's Garden of Earthly Delight. Goya's black paintings, and Velazquez's Las Meninas.

The art museum, as an institution, has changed radically in the last thirty years. curatorial support and administration now typically occupy as much space as the exhibits. As with many collections housed in older buildings, the *Prado* has given many galleries over to support functions and placed important works in storage. The Trustees of the *Prado* seek a new infrastructure for the Museum. The competition asks for a complete reorganization of the Museum's facilities (the main building and two nearby buildings), new structures to house support functions, and an extensive system of circulation including a new entrance.

This studio considers the museum an institution for the transformation of consciousness through the public engagement with art. It seeks to make the museum a conduit for transforming experiences that, like paintings, affirm the priority of space and actuality over object. The studio will work in three media formats: computer models, physical models, and sketches.

PROPOSAL:

Two concurrent ideas formed the main basis for the solution, and were both embedded in the urban context of the competition: First, a study of shadows across the site in time documented the site's literal "movement" or "breathing" over a year. These inherent compositions revealed a series of dynamic relationships in a field of choreographed movements between the *Prado* and existing buildings. The main emphasis of the design was that the paths of two million visitors be choreographed through their movement between buildings, and the manner in which the museum could unfold back into the larger context of Madrid.

The solution thus embodies an urban approach—an unfolding of the historic grids of the city of Madrid onto the site of the *Prado* as a means of combining museum and city life. What evolves from this unfolding is a set of inter-relationships that reveal themselves in the internal logic of a field of fragments on the site. The logic continues to unfold through the formal relationships of the public and private activities, and the flexibility of the program's fragments embedded within the field.



Site Proposal, Prado National Museum, Madrid







Basement Plan

Ground Floor Plan

Aerial View





Office Basement Plan





Typical Office Plan



Site Section Through Office Building



Cloisters Basement Plan

Cloisters Ground Floor Plan

Cloisters First Floor Plan



E

INCOLUMN DECK





CERTAINTY OF CONTEXT

I define the theme of my work as deriving from the *certainty of context*. To explain how I arrive at conclusions in my thought and practice, I am going to explicate a set of theoretical issues and show by practical example the way in which these concerns intersect with the practice of architecture. My focus in time is 1988 to 1995 and the locale is specifically addressed to those that have dominated the social, political, economic, and aesthetic debates in South Africa during the last ten years.

My view is that Post-Modernism, as broadly defined in its South African manifestation, has been a sign of the rootlessness and uncertainty of the South African spirit as expressed in architecture. It is a trivialization of culture; it cannot be the search back into history (assuming that at its best Post-Modernism does this). It does not reflect our history but it certainly reflects our uncertainty. The conspicuous self-regarding sense of the facade in Post-Modernism is our most compelling cue to its complete lack of a certainty of context—the facade as a veneer for the chaos has arisen from the uncertainty.

There is a hotel, for example, in Boputhatswana that was built for a South African entrepreneur which has made an enormous profit. It is a theme hotel called *The Last City*. It is all about the creation of a myth; that there was once a lost tribe who disappeared a couple of hundred years ago. Ten years ago, at a fictitious archeological dig, this culture was unearthed and *The Last City* was built reflecting this culture. It is a transparent lie, but people believe it—they drive out in their cars every weekend from Johannesburg and other places to go to *The Lost City* to see this building which is about a lost tribe that never existed. In ten or fifteen years time it is quite possible that this myth—this lie—will become the *truth* and this lost tribe will become a reality. That is the state of culture today in South Africa. That is the nature of this void that I speak of. This represents the extraordinary capacity that people in South Africa have, in cultural terms and also in unconscious terms, to absorb the modern workd; to reconfigure and translate it in very rich and unusual ways.

How does this understanding of the chaos of present systems of meaning in architecture relate to my sense of the *certainty of context* as the only counterbalance to the disorder and confusion? I want to introduce two terms that form the theoretical justification for my argument. Deconstruction as a practice teaches us that we engage with meaning diacritically, and that meaning in the world as we understand it is not constructed neutrally. In deconstruction there is the notion that any system of meaning is organized hierarchically; that is to say there is a primary, main or positive term, and a secondary, lesser or allegedly devalued term.

The way in which we think about these things is referred to as a naturalized discourse things naturally seem to be a certain way because for a very long time they have been that way. I give a concrete example: in apartheid ideology, white was seen as the main or controlling term, and black was the lesser or secondary term. The naturalized discourse of

Jo Noero is an architect from Johannesburg who has been actively working with communities in Soweto and other townships in South Africa to design and develop a range of community facilities. His work, which includes educational buildings, community centers, and recreational facilities has been widely published and exhibited both in South Africa and Europe. In 1993 he was awarded the internationally recognized Erskine Fellowship for his contribution to design and community development.

The following article is based on excerpts from the Martin Luther King Lecture which Mr. Noero delivered at the College on January 17, 1996.

Edited by Kemba Mazloomian.

JO NOERO



South African apartheid tells us that whites are in control and blacks are controlled and subservient. If we follow through the arguments developed by Freud, for example, in explaining the relationship of madness to sanity in western culture, we see clearly that the lesser or under-valued term controls the major or positive term. Freud argued that sanity is defined negatively in that it can be explained only as a function of madness—we do not have any definition of sanity other than to say that it is not madness. It is defined diacritically.

The Population Registration Act in South Africa categorizes anyone doubted to be white, as black. Thus, the condition of whiteness is megative and not positive; to be white is to be not black; whiteness is defined diactrically, that is, negatively or oppositionally in relation to blackness. De-constructive practice, in explaining how meaning is constructed, tells us a truth about the social condition of existence in apartheid South Africa. I wish to use this understanding to explain my topic—*the certainty of context.* The major or controlling term of the period from 1982 to 1992 in South African architecture has been the Post-Modern style. Even in South Africa, Post-Modernism should have passed the point of no return and the ubiquity of the style in so many renovations on suburban plots bears testimony to this. So either at its height or collapse into the self-regarding joke that is has become, Post-Modernism is the defining style in South African architecture during this period.

My contention is that the apparently lesser, or subordinate term that is hidden from view is chaos, in its original meaning of *abyus* or *chasm*. This is an architecture that is hollow at the core because it has no context, whether social, political, aesthetic, or other. In speaking of the recognition of context I do not mean derivative regionalism or pseudo-African architecture; I mean two things: first, the recognition of the entire context of life in South Africa over the last ten years. The unspoken term in the equation is the structural instability of this culture, whilst the spoken one is the obsession with control and law and order. This means that most South Africans need to be and are alienated from the culture in which we live. The second context is that of the building itself as building its own recognition of itself—its understanding of its own formal frame of reference. I would like to elaborate on this frame of reference. In the past, theories of architectural aesthetics have tended to concentrate not so much on the form of appreciation as on the nature of its object. Rather than say what architectural appreciation is, there is an attempt to describe what is appreciated in buildings. As a result of its abstract, impersonal, and functional qualities, architecture stands apart from the other arts and requires very different attitudes, hot only for its creation but also for its enjoyment and pleasures.



For these reasons many theories of aesthetics have failed to provide architectural absolutes. Architecture is unique and very different from the other arts. It cannot be compared with them in attempting to formulate a theory of aesthetics. In support of this view I would like to consider music and the notion that music and architecture are fundamentally similar. Architecture has been described as frozen music and it is clear that music does provide a rich vocabulary with which to express our delight in buildings. Buildings certainly are admired for their harmonious proportions and their melodic lines. However, such a notion can hardly aim to give a general explanation of the enjoyment of architecture.

Architectural aesthetics go far deeper than mere harmony or sensuality (thereby banishing to the realms of the absurd the theories of Ruskin, Alberti, and others). How could use of the musical analogy predict a harmony that is, in essence, visual and dependent on the many points of view of a building in space? A building's harmony is essentially ar external surface treatment. Architectural enjoyment is governed by what we see, and our sense of beauty in architectural forms cannot be divorced from our conception of a building and the function it fulfills. It is according to this conception that we see buildings.

I believe that the properties of architecture can be identified by defining the differences that exist between architecture and the other arts. Taken further, I believe that the value of architecture as distinct from the other arts can be defined best by those differences. These differences, which are fundamental and implicit in any building, are described as:

Function

Buildings are places where people live, work, and worship, and certain forms are imposed upon them from the very outset by the needs they are required to fulfill. Whilst it is possible to compose a piece of music or to paint without intending that the work be listened to or looked at and thus appreciated, it is not possible to design a building without explicitly intending that it be seen. In other words, no work of music or painting has features which, because of the function of the art, are unavoidable. Only in architecture does this condition exist.

Location

Buildings are important features of the environment and cannot be reproduced willfully without serious implications. The effect of most buildings depends upon its location, either because it is an ingenious solution to problems of space, or because it is built in a striking position which is essential to its impact.

Tech nique

Whit is possible in architecture is determined by the extent of human competence. Technical changes and innovations generally are initiated independently of any alteration in artistic consciousness. The natural evolution of style is cast aside or interrupted by discoveries that generally have no aesthetic origin or aim.

"Publicness"

Architecture is public. It takes up space either by crushing out of existence what has gone before, or by attempting to blend or harmonize with what is existing. It is, in this sense, the most political of all art forms: it imposes a vision of man or woman and his/her purposes on those who experience it, independent of choice.

Structural articulation

Architecture must obey the laws of gravity. No work of architecture can be conceived independent of structure.

The central question now becomes: how do you find a definition of architecture within this framework? The answer, of course, is that you cannot. You have to step outside the equation, outside the whole disequilibrium of the paradigm, and say that one's areas of reference does not accommodate anything and that one's culture is hollow at the core. I say this for reasons that others may dismiss as political, but my conviction is that unless we can find a place where our context gains certainty, both as architects and as citizens, our architecture is doomed to the reductive trickery that I have outlined.

The City of Johannesburg was formed 100 years ago and now has a population between 4.5 million and 6 million. It started as a mining town when gold was discovered at the end of the 19th century. The gold runs in an east-west axis through the city. The disintegration of the grid indicates where the main gold dig runs. You can physically read it in the city form because at that point people were mining forty to fifty meters below the ground and it was impossible to build anything more than two to three story buildings on the ground above it. The city naturally divided about that east-west axis. To the north the formal city developed and to the south was the informal city. You will see many similarities between buildings built in Johannesburg at the turn of the century and North American buildings of the same period. Johannesburg was originally a canvas tent city. Four years later it was converted into a corrugated iron town then it became a masonry town, and in the nineteen-sixties and seventies it was converted into a concrete town. If one takes downtown Johannesburg and does an archeological slice down the main road which is Russus Street, you will see four layers of buildings. The city center has been rebuilt four times in the last one-hundred years. It is a city that looks like any other city in the world except for the fact that South African cities were considerably affected by both apartheid and strict land use, mono-use planning, and segregation. Our downtowns really don't have anyone living in them. They are single places where people-even poor people-go to work and travel enormous distances to get back home everyday.



One of the few areas of Johannesburg where people actually live in the city is in the *Hillsborough Complex* which is primarily vertical apartment buildings and very low cost accommodation. The most predominant form of residential accommodation is the tribal township accommodation built by the South African government to accommodate black people. They were kept under very strict control and never given any rights over the properties nor allowed to own them. They were simply temporary sojourners and the law stated that they were not residents in these areas; they were citizens of the so-called homelands or tribal lands from which they came.

The most predominant form of housing production in South Africa at this time is informal house construction—people staking out a piece of ground for themselves and building their own houses out of very cheap second-hand materials such as corrugated sheeting. This is the kind of form that is now the organic form. There is a lot of interest from architects and planners as to the process that gives rise to this living settlement. The feeling is that it is much more cost effective—it does not cost the State a thing because the people are doing it for themselves, and in many areas there are certain qualities that emerge that are almost impossible to achieve in formally planned settlements. The estimates are that ninety-five to minety-seven percent of all the housing built in South Africa in the last six to seven years has been built by people in this fashion. It is clearly the most dominant form of housing production in the country at this time.

There is a great deal of sophistication that is starting to emerge in these areas. Entrepreneurs are prefabricating housing elements and selling them on the road side. On their way home, people buy these components as they can afford them—putting them on top of taxis and taking them to the plot that they live on—and over time, try to accumulate enough of these prefabricated panels to build a house. If you talk about prefabrication, and the infatuation architects have had with prefabrication, this is the most sophisticated example that I've seen. It is, in effect, supermarket prefabrication. You can purchase what you want: a complete wall with one window, one with a door and a window, and you can acquire your house over a period of time.



We have completed a series of projects recently which illustrate a way of working that has enabled us to address these issues. Some of the notions which have informed our work, and which give an idea of the context that we have chosen to work with are:

Resourcefulness

I define this as achieving the maximum ends with the minimum means. In this concept lies the notion of real economy—not the false economy with which we constantly are bombarded, and which is simply related to profit and nothing else. Implicit in the understanding of real economy is the rejection of cheap or low cost buildings. A resourceful building is neither cheap nor expensive; it is resourceful.

The need for quality buildings

This develops from a rejection of the notion that there are two worlds in South Africa the First and Third worlds—and is a repudiation of the assumption that the one is superior to the other. In technological terms this means a rejection of the belief that when we build for the poor we must employ so-called Third World technologies. In my view this simply reinforces the cycle of technological poverty and dependence. In the townships we must build buildings of the same integrity that we build elsewhere. The capacity, imagination, and creativity of township residents are no different from that of people living in urban centers. Building projects must be designed creatively to engage the enthusiasm and creativity of people and to enable not only fine buildings to emerge, but to stimulate the development of a tradition of fine building, rich in all the necessary skills to face the twenty-first century with confidence.

Technological transfer

In several buildings structural frames of steel were chosen and infilled with a variety of different materials, ranging from concrete block to plywood. This system serves two main purposes: first, since the majority of workers on site were semi-skilled, the precision of the steel frame required an equivalent precision from those people involved in on-site construction. This process, therefore, not only generated opportunities for income generation, but due to its precise nature resulted in the upgrading of the building skills of those people working on site. Second, this process mirrored in principle the systems employed by people involved in self-help housing in adjoining squatter settlements. However, the processes employed in the building seek to upgrade the existing systems in these settlements in ways that can teach people the latent potential in the systems they have developed. In this sense, the technological systems employed serve both a pedagogic as well as developmental purpose.

Didactic Purpose

To many people who will be using these buildings, architecture is a foreign concept. Underpinning the detailed designs lies the principle that the nature of construction, the way in which the buildings are assembled and how the structure is supported, should be made apparent. In this way it is hoped that people can engage consciously with the building not at the level of abstraction, but at the level of material use, jointing, structure, and so on. Hence, the buildings become understandable by revealing the way in which they have been made. We hope this would also serve a pedagogic purpose in that the buildings can also teach people, in an easy and accessible way, how buildings are constructed.

The House Nxumalo is a small house for a medical doctor who lives in Alexandra township. She is a community health doctor-an amazing woman who lives and works in Alexandra and wanted us to build a house for her there. We hit upon this idea of saying "well look, people are building shacks really inventively, and if you're going to talk about the emergence of an urban culture, then it's going to grow from the bottom up and maybe what we have to do is start looking at the shack settlements and seeing what is happening there, not only as representing extreme poverty, but also as representing hope and representing the beginnings of some kind of authentic urban culture." So we decided to take the technology-take the structural system and the use of materials that the shack dwellers were using, and make it into a formal architectural piece to demonstrate to these people on the ground that the systems they were using were legitimate, could be upgraded, and could be made into something much more than they were at the time; that they were not things which should be abandoned once they had more money or once they wanted to build a formal house. So the House Nxumalo was an attempt to do thatto reveal to people the potential they had in their own hands to be able to take that technology and really develop it.

It became a very simple house. Another thing that happened in this house that you will see in a lot of other work is the attempt to make it transparent. On the side elevation of the house we tried to reveal the spatial configuration of the inside. In making transparent the spatial system, we hoped to break down that mystique that architects get into; also, the way in which the house is built is revealed clearly in all sorts of ways. We tried to pick up on the materials that are now ubiquitous in the townships. These are, for example, Toyota packing cases. Toyota has a yard down the way. When the packing cases no longer have any use, they chuck them away and the township dwellers use them. There are whole sections of Alexandra township which are called 'Little Tokyo.' They use them very inventively; we picked that idea up, but we sanded down the panels and treated them with a marine varnish. We were trying to show people that the material worked well when used in its raw condition and could be even better if it is treated. We've actually found that people are now starting to follow that line.

In the *House Nxumalo* there is a preoccupation with sun, light, and using the advantages of a savannah climate to try to make comfortable inside spaces. The other thing we were involved in with this house is how to make the detailing into more than what it is normally used as. For example, a balustrade is much more than a balustrade. It is also a filter for the light above, and a structural member which helps to break the span of the roof member in half. So what was a balustrade now also becomes a structural member and a light filter which is, I think, what being resourceful is all about.





COMPUTER STATION

JASON YOUNG

As computers are becoming more fully integrated into our culture, many schools of architecture are making curricular commitments to the use of the computer as a design tool. The University of Michigan College of Architecture and Urban Planning has made such a commitment through the commission of a dedicated studio space for computer integrated design. Programmatically, the project called for an environment to support a network of sixteen *Macintosh PowerPC*s, two laser printers, and a high resolution scanner. There was a desire to have the computer station serve as a precedent for thoughtful, well considered, and precisely built, architecture. Our strategy was to respond to these objectives by defining a position relative to the potential of the project.

Recognizing that the computer displaces the physical labor involved in architectural production (models will no longer be made with plaster, wood, and metal but will be generated electronically within the rubric of *Form-Z*), we sought to ensure the understanding of this labor in the project by positing the computer station as a convention of its own construction. We felt that this position was not only appropriate but necessary given that the computer station would be situated within the open plan of the design studios. We thought that the computer station should act as a catalyst for a responsible and thorough examination of the material bias of architectural production.

The thin operational surface of the screen would, therefore, be suspended in and supported by a thick, material, constructed environment.

Operating in accord to this strategy, we attempted to project a relatively simple and efficient scheme that would achieve its rich complexity through the nature of how it was made. Having both the commission to design and the contract to build the computer station, we were able to control the quality of craft and the level of constructional innovation. We used only standard, available, and inexpensive materials. The necessity of "poor" materials, along with our interest in having the computer station be understood through the process of its construction, prompted us to pay close attention to the relationship between the final work and its constructional logic. Every construction detail is exposed and readable.

The computer station operates analogous to the manner in which a Bar Code operates. While the language of a Bar Code is not externally universal, it is legible via the internal logic of its structure. It is this that ensures the operational status of the Bar Code. The varying thickness of lines withstanding, the computer station asserts its own materiality through a legible demonstration of its internal order.



Jason Young is an adjunct assistant professor of architecture at the College of Architecture + Urban Planning at the University of Michigan. The work illustrated is a product of his design practice, The Architecture Farm, Ann Arbor, Michigan. Young obtained a MArch from Rice University, and a BSArch from the Georgia Institute of Technology.

Photographs: Balthzar Korab, Joe Meppelink, and, Jason Young.

Project team: Bryan Brown, Matt MacDonagh-Dumler, David Johnson, and Jason Young.































KINGSWOOD SCHOOL CRANBROOK: A SPACE FOR WOMEN

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The quality of a work of architecture is often based on the building's appropriateness to the intended user group. This is generally accepted whether or not the building functions according to the specifications laid out by the client. For instance, a tall office building is seen as effective when it successfully accommodates its tenants in the most efficient manner. This is a Modernist view which gives the term function a programmatic definition. An analysis of a work of architecture based solely on its utilitatian function can be misleading and fail to grasp the architect's full intentions for the project. What must also be investigated are the symbolic and psychological functions that suggest the building's role in society at large and the way in which it reinforces this role. In many projects, the building's utility is often accommodated but is never considered by the architect to be its prime generator of space and form.

These symbolic and psychological functions are precisely the issues that Eliel Saarinen was dealing with while designing the Cranbrook Educational Community in Bloomfield Hills, Michigan during the first half of the twentieth century. The Kingswood School for Girls (1931) was designed by Saarinen with the active participation of his wife, son, and daughter and serves as a direct counterpoint to the earlier Cranbrook School for Boys (1927). The design of Kingswood serves to promote a specific gender role for women within society. In the siting of the building, its essential form as well as in the development of the interior spaces, Saarinen and his family orchestrated a building complex that strengthens the relationship between women and nature, fosters nurturing relationships with other women, and leads to individual self-reflection. This is in striking contrast to Cranbrook, which focuses on the fraternal development of its student body where individual relationships are sacrificed for the sake of the larger brotherhood.

The Kingswood School is far removed from the rest of the Cranbrook Community. Located to the northeast of the main complex, it is separated from the School for Boys, the Academy of Art, and the Cranbrook House and Gardens by Kingswood Lake.



Figure 1. The Kingswood School; Leaded glass at Entry.

Figure 2. View from southwest. (Photo by the author).

All photos courtesy from the slide collection of the University of Michigan Art and Architecture Library, unless otherwise noted. This siting allows for the isolation of the Girls' School that begins to reinforce the idea of woman's inherent relationship to nature. Earth has always been given a female persomification due to her fertile landscape. Women have, in turn, always been associated with the purity of unadulterated nature. As a reflection of this, the Kingswood complex focuses on the lake, which serves as the generator of its plan. Rather than turning inward upon itself as at Cranbrook, the School for Girls positions itself on the site by conforming to the curves of the shoreline. The building mass seems to exist as a series of ebbs and tides that reflects the natural cycle of the shore. The result is that the dynamic and usable exterior spaces are bounded by both natural and man-made features, thus intensifying the special relationship shared between woman and nature. These spaces are also intentionally left untouched and located on what, at first glance, seems to be the rear of the building. This treatment reinforces the sense of isolation and brings the user in touch with the natural world.

This connection to nature is also reinforced by the form of the building itself. In comparison to Cranbrook, the massing of the building is much simpler. It is anchored to its site by a series of manipulations that are reminiscent of Frank Lloyd Wright's Prairie Style houses designed during the first decade of the twentieth century. The tan variegated brick of the building makes it appear as if it is rising out of the site. This is reinforced by the fenestration of the first floor whose sill is located at ground level, implying that the interior spaces are located deep within the site itself. The broad projecting eaves of the copper roof, with its rich patina, spread out over the landscape and increase the strong sense of the horizontal plane. By limiting the main mass of the building to two to three stories Saarinen created a building that hovers over the site. This impression is greatly increased by the horizontal bands of windows that are placed just below the eaves of the roofs, and by the horizontal sill courses that wrap the entire building, clearly distinguishing each floor from the other. In the few vertical features found in the building, Saarinen has provided a sense of balance to the overall composition. The vertical entry mass is counteracted by the aforementioned horizontal band of windows. The telescoping chimneys, which serve as anchors for the wings of the building, diminish in plan as they move upward. This reinforces the notion that they are rooted to the landscape by relating to the organic growth America: The Cranbrook Vision, of a tree which diminishes in height as it moves upward. This telescoping motif is seen throughout the building, giving shape to columns, brick panels, leaded windows, rugs, and other design elements.1

¹ David G. DeLong, "Eliel Saarinen and the Cranbrook Tradition in Architecture and Urban Design," Design in 1925-1950, (New York: Harry N. Abrams, Inc., Publishers, 1988) pp. 59-60.



Figure 3. Entry facade, view from northwest.

Kingswood School Cranbrook

Saarinen stressed the relationship of woman to nature by placing Kingswood in contrast to the earlier design of Cranbrook. Where Kingswood lies low to the ground and even seems to rise from it, the buildings at Cranbrook are posited as objects on the site. Cranbrook emphasizes that architecture is a man-made object where the designer is in total control of the environment. Kingswood, in contrast, celebrates the idea that architecture is only a part of a larger environment and that its aim is to reinforce the beauty that already exists on the site. To reinforce this preëxisting beauty, Saarinen intentionally allowed the distinction between the building and the landscape to become blurred in an effort to create a total environment in which Kingswood is seen not as a building, but as a place.

Figure 4. Cranbrook School for Boys: Dining Hall and Courtyard, View from northwest. In addition to enhancing the relationship between woman and nature, the design of Kingswood promotes the development of the individual through personal introspection. In its rustic setting, the School for Girls removes the woman from the distractions of the urban setting and promotes self-reflection. Cranbrook, on the other hand, provides a sense of community and advocates a fraternal development among brothers. The buildings themselves act as a wall, where the focus is on the large, open courtyard. This is in keeping with the tradition of English collegiate complexes. At Cranbrook, Saarinen was still exploring the use of the medieval monastery as a model for his designs. This is similar to the planning of the University of Michigan Law Quadrangle by York & Sawyer (1924-1933).² The courtyard is clearly the emphasis in the design of Cranbrook and the buildings act almost as secondary elements. The siting of the Kingswood School does not allow for this type of large, open space. Instead, it provides a few small, internalized courtyards that enhance the notion of individual reflection or conversations between very small groups of women.

These internalized courtyards cannot be accessed by means of a straightforward path. The user must pass under a covered portico or actually move through the building, often experiencing the changing of levels in both the floor and ceiling, in order to experience these spaces. This, in conjunction with the broad eaves of the roof, helps to reinforce a sense of privacy and security that cannot be found in the unprotected, open space of Cranbrook. In these small courts, Saarinen developed a way in which it was possible to bring the experience of the exterior environment into the interior of the building. The observer is pulled deep into the building; a phenomenon that does not occur at Cranbrook as it is a complex composed of many buildings with their own individual entries.



Figure 5. View from southeast into courtyard.



² Saarinen came to the United States shortly after 1922 and was associated with The University of Michigan soon after his arrival. It seems likely that he would have been aware of the early plans for the Law Quadrangle complex and might have been influenced by them. According to DeLong, Kingswood marks the beginning of a transitional phase in Saarinen's design work in which the majority of his historical references were to a more recent past. It is also interesting to note the shift in Saarinen's presentation techniques, which moved from deeply shaded graphite to lighter watercolor and colored pencil technique's. DeLong, "Eliel Saarinen ; and the Cranbrook Tradition," Design in America: The Cranbrook Vision, 1925-1950, p. 56.

The sculpture program at Kingswood is vital to the development of the complex as an integrated place, as opposed to a mere building. Designed by Carl Milles, the sculptures are considered an indispensable way in which Saarinen emphasized the woman/nature relationship, as well as the special relationship that occurs between two women. Located within the courtyards and on the shore of the lake, the sculptures have developed a deep green patina that links them visually to the mass of the building. Their subject matter focuses on two basic themes: the playfulness of women and the nurturing instincts inherent in all women. In both instances, a stress is made on the relationships that occur between two women, as well as the introspection that is a natural result of these special relationships. Dancing Girls, placed at the shore of the lake emphasizes the playfulness that women can engage in within the natural environment. In the gymnasium courtyard, a sculpture focuses on the nurturing relationship that occurs between an older sister and her much younger sibling (this serves as a substitute for the typical iconography of a mother and child). The sculpture found in the entry facade courtyard addresses the self-reflection which is seen as an essential aspect of the development of a woman's emotional well-being. The locations of these sculptures are crucial in allowing the women using these spaces to engage in a more fruitful self-reflection. The gentle subject matter can be seen in direct opposition to the more assertive and active sculpture program at Cranbrook completed by Geza Maroti, where the focus is on historic symbolism and allusion, as well as on the athletic competition between men.3 The role that sculpture plays at Cranbrook seems somewhat tangential to the development of fraternal relationships and does not encourage the introspection that is so vitally a part of the sculptural program at Kingswood.

³ Many of the stone decorative motifs for doorways, niches, and pillars possess symbolic allusions to fields of study, historic personages, and personifications of famous cities of the past. One relief panel, designed by David Evans, immortalizes the football team of the school. Joan Marter, "Sculpture and Painting," *Design in America: The Cranbrook Vision*, 1925-1950, p. 238.

⁴ DeLong, "Eliel Saarinen and the Cranbrook Tradition," Design in America: The Cranbrook Vision, 1925-1950, p. 59.



When placed in comparison with Cranbrook, the building materials utilized at Kingswood help to reinforce that it is a space designed specifically for women. Where the red brick, stone ornamental detailing, and slate roofs of Cranbrook convey a sense of strength and massiveness, the warm tan brick at Kingswood is much gentler.4 This gentility is reinforced by the use of green detail bricks which match the green patina of the copper roof. This colored brick is used in conjunction with unique brick arrangements and patterns to provide the majority of the ornamental detailing, which consists of variations on fewer themes than can be seen at Cranbrook. This use of brick as both structure and ornament blurs the Modernist distinction between the necessary and the unnecessary. In doing so, Saarinen created a fully integrated, organic form that must be seen in its entirety to be understood. Stone is incorporated into the design of Kingswood, but remains predominantly a tectonic material. Rather than being used for ornamental detailing as at Cranbrook, stone is utilized where columnar supports are necessary for covered porticoes. The entry façade porticoes are significant in that their columnar supports repeat the organic tapering found in the telescoping chimneys. Here they become more literal and take on a plant-like form, an element that Saarinen had experimented with at Cranbrook as an ornamental feature. At Kingswood the contrast between stone and brick is lessened as the stone matches the lightest shade of the tan brick found in the variegated walls.



Figure 6. View from east into courtyard; Sculpture: Diarna, Carl Milles, 1928, bronze.

Figure 7. Dancing Girls, Carl Milles, 1917, bronze, 84 inches. As discussed previously, a major emphasis in the design of Kingswood is an intentional blurring between the interior environment and that of the exterior. The leaded glass window that calls attention to the main point of entry allows for views to the interior that intentionally distort the images beyond. This allows for the programmatic distinctions to become less clear, and thus makes it possible for one space to bleed into another. The transitional space of the covered portico also helps in making the transition between interior and exterior smoother and less harsh by providing a partial sense of shelter before fully entering the building. The use of a covered portico occurs sparingly at Cranbrook, where there is an ambiguity as to what constitutes the official entry into the interior of the complex. This, combined with the harsh visual transition between interior and exterior, makes the interiors seem private almost to the point of being exclusionary.

In Kingswood the development of the interior spaces is vital to the creation of a total work of art. Saarinen, with the help of his family, was able to create a complex in which the site, the exterior of the building, and the interior spaces are all interdependent upon one another.⁵ The design of the interior spaces is as important as the building's relationship to nature, as its internal development is representative of the act of self-reflection that this complex encourages.

In the initial stages of planning, Saarinen incorporated designs for "carpeting, curtains, furnishing materials, and hangings" that were to be integral to the overall design of the school. Upon entering the main hall of Kingswood, the relationship of parts to the whole becomes immediately apparent. The leaded glass window at the entry uses the telescoping motif found in both the chimneys and the portico columns. Geometric motifs which are found in the carpets that cover the entry floor, the hall leading west to the library, and the Headmistress' Office all repeat elements that can be found throughout the building in its leaded windows, wood paneling, and other architectural details.⁶

⁵ Saarinen's wife, Loja, designed the fabrics, carpets, and draperies; his daughter, Pipsan, designed the interiors of the dining hall and auditorium; his son, Eero, designed the furniture. Kathryn Bishop Eckert, Ed., *Buildings of Michigan*, (New York: Oxford University Press, 1993), p. 167.

⁶ The carpet for the Study Hall Lobby, which shows various scenes from the Cranbrook Campus, was designed by Maja Wirde; Christa C. Mayer Thurman, "Textiles," *Design in America: The Cranbrook Vision, 1925-1950*, pp. 181, 183.



Figure 8. Main Lobby.

This sense of integration was carried throughout the building, and allows individual spaces to spill into each other. By using broad openings to connect the major interior spaces, it is clear that Saarinen did not intend for rooms to be perceived as compartmentalized spaces. Rather, the goal was to provide large, open transitions from one room to the next. This sense of openness fosters investigation by encouraging the user to move deeper and deeper into the building. A clear example of this bleeding of space occurs in the detailing of the stair in the entry hall. Rather than closing the stair off from view, a large opening is cut into the wall that allows the viewer to observe the procession to the second level and, in fact, encourages the viewer to actively participate in this experience. Another emphasis on the bleeding of one space into another occurs at the entry into the Auditorium which was designed by Saarinen's daughter, Pipsan Swanson. Although the programmatic requirements call for the space to be physically closed off, Saarinen and Swanson used leaded glass to create a screen that gives the viewer the impression that the spaces flow into one another. Once inside the Auditorium, the wood paneling of the hall continues into the Auditorium through the use of a high wainscoting that dissolves into a delicate wall treatment of ivory, silver leaf, and grey. The light color palette accommodates the small clerestory leaded windows by allowing for a higher reflectiveness in the space. The amber and green leaded windows also help in softening the daylight as it filters into the space. The ceiling is articulated with silver leaf decoration and large, circular aluminum lighting fixtures to increase the reflectiveness within the space.7

The most striking interior comparison between Cranbrook and Kingswood can be found in the two dining halls. Saarinen took the "church" form of the medieval monastery and transformed it into the dining hall at Cranbrook, in much the same way that York & Sawyer had conceived the library of the Law Quadrangle at The University of Michigan.





Figure 9. Stair in Front Hall.





Figure 10. Auditorium. Photo by the author.

Figure 11. Study Hall Lobby. He followed the basic scheme for a church interior, but eliminated the use of aisle spaces flanking the central nave. Saarinen made reference to aisles through the use of hanging chandeliers that visually mark the separation between the main barrel vaulted space and the minor flat roofed portions running along each side of it. In the Cranbrook dining hall, the pews are replaced with long tables which seat approximately ten to twelve students. Once again, Saarinen focused on group relationships rather than those that would develop between individuals. Replacing the altar along the longitudinal axis is a large, five-bay leaded window on the west end wall that directs the eye to the exterior courtyard, which is ultimately the main focus of the School for Boys.

The dining hall at Kingswood is given a greater level of attention than its counterpart at Cranbrook. This can be attributed to the fact that at Kingswood the interrelationship of the interior spaces is of prime consideration in order to create a complex that fosters the psychological and emotional development of women. In the Cranbrook dining hall Saarinen relied solely upon the interior volume and natural and artificial lighting to establish the merits of the space. In her design for the Kingswood dining hall, Pipsan Swanson, used a full range of design elements to provide a striking interior space. As opposed to the high, barrel-vaulted volume of the Cranbrook hall, the one at Kingswood is kept low with only a gentle vault to the ceiling. This creates a comforting proportion that is more in keeping with the scale of those using the space. As opposed to the pewlike arrangement of Cranbrook, the circular Kingswood dining tables seat five and thus provide a more intimate setting. This allows for the development of more personal relationships amongst the diners.

While the basic scheme remains the same (a vaulted nave-like space flanked on each side by flat-roofed sections reminiscent of aisles), the Kingswood space is accentuated by a more complex lighting system. Large windows at the lower level on the north and south walls provide general lighting for the room, while clerestory leaded glass windows douse the space with gently colored light. Artificial light is directed up toward the vault to provide unique angular patterns of light and shade. As in the Auditorium, Swanson continued her use of color to link the major spaces together. Here the walls are a sandfinished plaster in tones of warm, flat grey and the wainscot is oak with a silver grey finish. Tables and chairs are constructed of silver grey birch with vermilion painted details and upholstery. The draperies continue the color palette established by the furnishings. The focal point for the space is a tapestry designed by Saarinen and his wife Loja, entitled *Festival of the May Queen.*⁸ The heart of the space remains within the space itself, unlike at Cranbrook where the eye is forced outside of the hall. In addition, the focus remains on the woman, both in the ixonography of the tapestry as well as in the conception that the technique is a decorative art and is thus in the realm of "women's crafts."

In the design of the Kingswood School for Girls, the Saarinen family was not simply concerned with the building's programmatic requirements as an educational facility. The intriguing aspect of the project was its role as a school specifically designed for girls. While this did not drastically affect the types of spaces that were to be created, it did raise questions as to how the built environment could play an active role in the emotional and psychological development of the female gender. The building took on a social function far removed the utilitation notion of school and strove in every detail to promote a particular gender role for the woman in American society that stressed her inherent relationship with nature, her nurturing relationship for those around her, and her propensity for introspective thought. ⁸ Miller, "Interior Design and Furniture," Design in America: The Cranbrook Vision, 1925-1950, pp. 96-97.



Figure 12. Cranbrook School for Boys: Dining Hall, view towards East.

Figure 13. Kingswood Dining Hall; Tapestry: Festival of the May Queen, Eliel and Loja Saarinen, 1932.





THERAPEUTIC URBANISM

The collage technique, that art of reassembling fragments of preexisting images in such a way as to form a new image, is the most important innovation in the art of this century. Charles Simic

The Detroit affiliate of the National Broadcasting Company has recently undergone a period of change. The established station affiliate was purchased by a rival network and a new station was acquired. The new affiliate and the condition of its facilities were grossly inadequate. The construction of a new apparatus for broadcasting the news both televisually and through radio transmission will be the point of departure for assembling an architecture.

Jason Young, Studio Critic

detroit

investigating the city on an urban and local immediate tangible level searching to develop a mode of framing comprehension for the city constructing a logic inherent to issues of culture site context a nourishingly cryptic method of investigating

framing the view the image the city the understanding forcing a new response through careful editing exposing framing



JENIFER BURKE





The fantastic is the inalienable property of the untutored, the oppressed, the insane, the anarchic, and the amateur, at the moment when these feel the apocalyptic hug of contraries.

Parker Tyler "Americana Fantastica"



site casts one to four.

the concept of the city is reconstructed the decaying form of the city is taken as landscape ground imbedded within this notion of ground are inherent issues social historical economical cultural the built in the city is the other the incidental the minor architecture of the city

mapping the site x-raying the city an act that penetrates the flesh ground exposes the skeleton built the prosthetic the pin the brace that supports the body

by investigating the re.mapping of the city (new) densities are located 5 slices are staked out for further analysis investigation each of the 5 illustrates a different character of the re.mapping site castings develop the spatial qualities of each zone different relations of attachment emergence are located the negative space of the zones becomes figural figured

notions of emergence and dependency are central to the program matic development of each zone






The common place is miraculous if rightly seen, if recognized. Charles Simic

People who look for symbolic meaning fail to grasp the inherent poetry and mystery of the images.

Rene Magritte

the generic parasite created as an analogy to the site castings the base denominator of the built in the city endowed with certain characteristics of opacity space density rejuvenation that elaborate on qualities of all zones through the migratory nature of the parasite the figural spatial luminous qualities constantly shifting adapting to the immediacy of the host exposing the demands and influence of site zone



generic parasite model

notions of present space and program inform and supplement the relations inherent in the site casts



plan zone one to four.



The disorder of the city is sacred. All things are interrelated. As above, so below. We are fragments of an unutterable whole. Meaning is always in search of itself. Charles Simic

the format of television is slicing flashing cutting repeating it frames a space of fragments it suppresses real time supplants it with a manufactured time of fabricated density both preserves the space of events the speed of events constructed once broadcast this space speed motion cannot be altered exists where when an event occurs activation of time

detroit

saturday moming in the absence of regular linear movement time space every movement defiance of the stillness magnifies into an event news

printed media fail to respond to the fragmented nature of the present in the city time space movement no longer continuous the present in the city

the city meets the television broadcast

electronically monitored mobile live prerecorded

all distinct in space speed reaction time monitoring is done perpetually capturing the immediacy of the most minute movements mobile chases movement makes news through its own activity existence live seeks to resemble represent movement as immediate prerecorded simulates a narrative of movement outside the present time

in reaction to conjunction with the redefined motion of the city the architecture fractures only the episodic remains



zone one borizontal section.



zone one vertical elevation.



connection detail.

program

offices 2 conference rooms

the parasite is

the site cast is heavily embedded

very reliant on the host

the new built carves into

still clings to the image

the greatest resistance

to the fracture suppresses

of the traditional carnouflage

the existing ground

gains strength to begin to emerge

1 displays

public restrooms

reception lobby

- 2 libraries
- a marketing think tank
- a gallery for moving images

slice 1

each piece takes up a different position in relation to the ground offices suppress the most gallery exhibits the strength acceptance to emerge from the ground

You don't make art, you find it. You accept everything as its material.

Charles Simic

DIMENSIONS VOLUME TEN 145



DETROIT'S MICHIGAN

On August 23, 1926, as the world mourned the death of big screen legend Rudolph Valentino, Detroit paid its own tribute to Hollywood with the grand opening of the Michigan Theater. The seven-story, 4000-plus seat auditorium, built as an appendage to a 13-story office tower, was at the time of its construction the largest theater among a growing collection in Detroit's downtown entertainment district. The theater's resplendent and eclectic interiors, alternately referred to in the press as "the French Baroque style" and "Italian Renaissance," dazzled the public and reduced the press to effusive romanticism. "It is beyond the human dreams of loveliness. Entering it, you pass into another world. Your spirit rises and soars along the climbing pillars and mirrored walls that ascend five stories to the dome ceiling of the great lobby. It becomes gay and light under the spell of the warm coloring that plays across the heavily carved and ornamented walls as myriads of unseen lights steal out from mysteriously hidden coves to illuminate the interior with romantic sundown colors."¹

The Michigan Theater was one of many theaters built in Detroit between the First World War and the Great Depression to capitalize on the public's desire for escape. While the movies had always served to dislocate the spectator, these grand atmospheric palaces extended the world of illusion to the physical spaces in which the films were screened. The experience of going to the movies became an embodied, 3-dimensional fantasy that

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¹ Detroit Free Press, 1926.









began at the threshold of the theater and did not dissolve when the lights went up. The great movie-palace impresario, Marcus Loew proclaimed: "We sell tickets to theaters, not movies." With five shows daily, the Michigan Theater alone transported over 20,000 people a day from the brute realities of a Midwestern industrial city to a world of the exotic "other." Since this "other" was itself largely the product of a filmic imagination, accurate historical replication was never the issue. The Michigan Theater mimicked 17th century France, albeit with Greek statuary and a Roman chariot. The Fox on Woodward Avenue, with its "Exotic Siamese Byzantine" interiors complete with ancient Indian Temple and Samurai warriors, carried its public deep into a fabricated Far East. For those wishing to visit Spain, the Gem was the place. For a trip to Italy, it was the Grand Circus on Broadway.

After the Second World War, with the advent of television and the great migration to the suburbs, the downtown theater audience dwindled significantly. The last great attraction of the large urban theaters—a monopoly on screening first-run films—was legally dismantled in the mid-1970's. Without an audience, one by one the theaters were forced to close their doors. Various efforts were made to find viable programs that could breathe new life into these massive relics. While some retained their ornate interiors and were converted into sanctuaries, concert halls, and B-grade movie houses, others were gutted to maximize on their sheer interior volume. In some cases real estate pressures and the enormous financial burden of maintaining such oversized dinosaurs brought forth the wrecking ball.

In 1967, the Michigan Theater was closed and slated for demolition. Last ditch efforts successfully postponed its destruction for over eight years while a string of optimistic entrepreneurs tried to find a new use for the building. A porno theater, a supper club, and a rock concert hall all failed to revitalize the old theater and in 1975 it was finally abandoned.



Two years later a proposal was made to raze the theater to provide a parking lot for the abutting office tower. The idea was not without irony, for the Michigan Theater was built on the site of Henry Ford's first workshop, the birthplace of the automobile. The historic workshop had been summarily consumed in the process of urban development and, by the logic of capital, the theater was to be be consumed by the next fiscal imperative. But the theater and the tower were found to be structurally inter-dependent, thus jamming a process of commodification that was frighteningly summed up by the building's current owner who proposed that in the future, architects should be required to design buildings with removable columns and that a fund should be set aside at the time of construction to cover the expense of demolition. A fluke of engineering required that the theater would remain, a stubborn witness to the fate of Detroit.



Unable to remove the theater completely, the consulting engineer recommended appropriating the shell of the building for a secure, indoor garage. While the press referred to the proposal as "unthinkable," the idea was curiously apt the requirements for the new parking structure corresponded well with the existing configuration of the theater. The main entry, once funnelling thousands of people into the foyer daily, was wide enough to allow for in-and-out automobile access. The long foyer with its sweeping stair was easily adapted to accommodate the approach to the curving parking ramp. The 140 by 200 foot auditorium provided enough area to house the required 160 cars on three levels. The demolition of the theater's interior and subsequent construction within was executed with expediency: a hole was ripped into the flank of the auditorium to make way for the wrecking ball and the interior was cleared as required for the erection of a simple steel and concrete parking structure.





One is struck by the crudity of the formal work. The marks of brute force are visible everywhere: sheared beams, amputated balconies, severed electrical lines, air ducts that dangle open-ended in space, the ragged plaster camopy, and the shredded curtain. Rather than a work of architecture with the attendant conceit of completion and stasis, the effect is one of demolition in progress, with the attendant sense of transition. We seem to be confronted by "work" as a verb rather than "work" as a noun. Herein lies part of the legitimate fascination of this interior; namely, the exposure of the mechanics and techniques of architectural fabrication. It is the same fascination that draws spectators to construction sites and demolition sites and ruins alike. Both the brute tectonics of the building's anatomy and the thin lining that once marked the limit of experience are revealed in a single glance. While still clinging to the interiors of its past, the Michigan Theater now offers up the padding and voids that are the architect's means of shaping space.

This condition is rare in a building; in a sense it is an illegitimate state. In conventional architectural production, this condition corresponds more closely to that of the section drawing, for the section focuses on the creative gap—however large or small—between the thin veneer of experienced surface and the underlying construction required to produce this surface. Sectioning, whether executed with a draftman's pencil or a contractor's wrecking ball, is revelatory precisely because it is transgressive; the section fascinates because it violates perceptual boundaries.



Paradoxically, while fundamental to the production of architecture, the section is antithetical to the actual experience of architecture. What is most uncanny, and what constitutes a most unsettling assault on architectural sensibilities in general, is the fact that the violated condition of the theater was not accidental. Contrary to appearances, this is not a ruin, a construction, or a demolition in process. The results were intended and projected and are indeed rational. This interior was remodeled "as specified."²

The architectural treatment of the Michigan Theater is therefore not merely careless, it is anti-architectural. In the current economic and cultural landscape of Detroit, thorough destruction—itself an act of optimism and vision and investment—is as rare as thorough construction. Ad hoc dismantling and ad hoc construction have become the dominant modes of forming and inhabiting the city. This does not mean that the city or the buildings are defunce. What has expired is the comprehensive plan, the ordered utransition, completeness—in other words, the traditional modalities of the architectural project. ² Engineer's Progress Report, July 1977.













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