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Metaphors in the Design Studio

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The study of metaphor provides valuable insights into the workings of thought and understanding. This article addresses the important question of what the study of metaphor has to say about the design process and design teaching. We include the findings of a series of studies involving architectural design students who were asked to report on their own design experience and that of colleagues in the context of specific projects. Our conclusions are that (1) there is a close relationship between design and metaphor that provides insights into effective design education; (2) metaphor operates through privilege, directing concern and the identification of difference; and (3) design involves the generation of action within a collaborative environment in which there is the free play of enabling metaphors.

A GROWING BODY OF WORK ASSERTS THE PRIMACY of metaphor in understanding. This literature comes out of several philosophical and cultural movements that seek to displace objectivist concepts of thought and understanding. In design, objectivism is well represented by the design methods movement, which still operates in the design studio in residual form through the language of analysis and objectivity—with appeal to objective criteria, rules, program, and method. It can be shown that the “countermovement” of subjectivism is a party to the same distinctions that give rise to objectivism.¹ Talk of subjectivity and intuition as guiding design (either in opposition to or in balance with objectivity) is simply a variation on the objectivist theme. Objectivism is a powerful and privileged source of metaphors in design teaching. In this article, we show how the study of metaphor itself presents a different perspective on design than that afforded by objectivism (or subjectivism). It also offers the basis for a critique of objectivism. The study of metaphor opens up the possibility of exploring new understandings of design.

What is metaphor? In appealing to

metaphor in an account of understanding, we are entering into a subtheme of post-objectivist thought that recognizes the importance and ubiquity of rhetoric (how we argue and understand a case) and the primacy of rhetoric over logic. According to Hans-Georg Gadamer, rhetoric is “unlimited.”² Even the pursuit of scientific understanding comes within its ambit: “There can be no doubt . . . about the fundamental function of rhetoric within social life. But one may go further, in view of the ubiquity of rhetoric, to defend the primordial claims of rhetoric over against modern science, remembering that all science that would wish to be of practical usefulness at all is dependent on it.”³ The study of rhetoric considers the strategies by which we persuade. It includes conventions, systems of legitimation, the authority of the speaker (or writer), the authority of sources, the nature of the community in which the discourse is taking place, the situation of the writer and the reader.⁴

An appeal to metaphor as a part of the study of rhetoric involves an appeal to a tradition of thought dating back to antiquity, but also an appeal to common experience. The notion of metaphor also figures in the reflections of certain branches of psychology and cognitive science: A frame of reference, a schema, paradigm, gestalt, or model each build on the metaphor theme.⁵

To speak metaphorically is simply to relate two things (or entities) through the copula *is* or the preposition *as*—a house *is* a machine; I see the drawing *as* an overlapping square and circle; that man *is* a beast; design *is* state space search; I see the floor plan *as* a flow diagram. The importance of metaphor in understanding the operations of language cannot be overemphasized. Writers such as Paul Ricoeur argue that the operations of metaphor permeate our very being.⁶ All statements in language are

metaphorical, from the “primitive” act of pointing to an object to profound utterances in science or poetry.⁷

A summary of how metaphor operates is provided by Adrian Snodgrass and Richard Coyne.⁸ What happens when we juxtapose two terms through the verb *is*? Metaphor is not something that is to be explained in terms of substitution—stating something figuratively that could just as readily have been said literally.⁹ (In fact, the whole idea of a literal statement is under question.) In describing what is taking place in a vivid metaphor such as “society is a sea,”¹⁰ both terms *society* and *sea* are given meaning by their relationship in the particular context of the sentence. Both society and the sea are seen in a particular way through their juxtaposition. It is not merely a case of seeing the unfamiliar in terms of the familiar. Neither is the relationship established through lists of commonalities—what features does society have in common with the sea?—as though we could list these features and tick off the common ones. The power of the particular metaphor lies in its use in a particular context of understanding.

Neither can metaphor be explained in terms of the operations of logic. To presume the reduction of metaphor to logic is in turn to generate contradictions. To assert that one thing is another is also to assert that the thing is *not* the other (society *is* a sea and society is *not* a sea). Seen in terms of logic, metaphor seems to trade in contradiction.

It follows that metaphors are not merely linguistic ornamentation,¹¹ but they imbue the entire working of language. Juxtaposing design and state-space-search (as in “design *is* state space search”) is as much a metaphor as juxtaposing society and sea. Scientific models are metaphors, and metaphor is in play as scientists make observations.¹²

If metaphor is ubiquitous and its workings can happily be taken for granted, what is the advantage of studying metaphor? Metaphors carry entailments. In so doing, they reveal and conceal. Seeing one thing as another reveals something about the thing: a problem to be solved, an action to be undertaken, a scenario to be acted out. To see design as state-space-search may entail setting goals, defining the design space, establishing decision points, ordering actions. (The precise nature of the entailments depends on context and understanding.) Thus, metaphors are implicated in an understanding of actions and consequences. Metaphors also conceal. As long as we are articulating goals, we may momentarily leave to one side understandings wrought through other metaphors: the fluidity of design, the role of social interaction, caprice. Metaphors also entail privilege. Not all metaphors are equal for a particular situation. It is acceptable for the metaphor of design as state-space-search to prevail in the context of certain kinds of design research, but less so in most design studios.

The greatest privileging occurs when certain metaphors are so taken for granted that they are not generally seen as metaphors. This is the realm of "literal language": the "things" that make their appearance as the terms of a metaphor—society, sea, house, machine, design, search, analysis, situation. If the grasp of metaphor is slippery,¹³ then the quest for literal language is totally elusive. Objective, analytical talk in design is simply an appeal to certain highly privileged metaphors. To say, "Let's analyze the problem," is to see design as problem solving. There are entailments: There is a problem to be overcome, and it can be broken into parts. Thus, a study of the metaphors we use is informative as a means of revealing "hid-

den entailments," of exposing that which is taken for granted.

Of course, to study metaphor is never to break out of the system. All statements about metaphor are metaphorical. That a metaphor is the juxtaposition of two ideas is a metaphor. The efficacy of this kind of study lies in whether it enhances our understanding. Does it inform design studio practice?

Tests of the thesis that the study of metaphor can inform design studio practice were carried out over a series of informal studies in design studio practice and formal group interviews. The first study was part of the usual studio syllabus. Third-year undergraduate architecture students were engaged in a four-week intensive design program that involved working in groups to design a performing arts museum and documenting the process as a report, or "story of the design." Many of the student comments appearing later in this article were gathered from these reports. The second study was set up outside the studio syllabus and involved volunteer students designing to different styles of program (brief) that represented different "metaphorical orientations." This study tested the thesis (presented later) that romanticism and objectivism occupy major roles as guiding metaphors in the design process. The third study involved evaluation sessions ("crits") in which volunteer students explained completed projects to peers and then to teaching staff. This study concluded with a round table discussion in which various propositions about metaphors in design teaching were discussed with students. This study tested how students respond to the idea that metaphor helps to explain the dynamics and power relations of the design studio. Participants in all but the first study were tape-recorded, observed, and questioned with

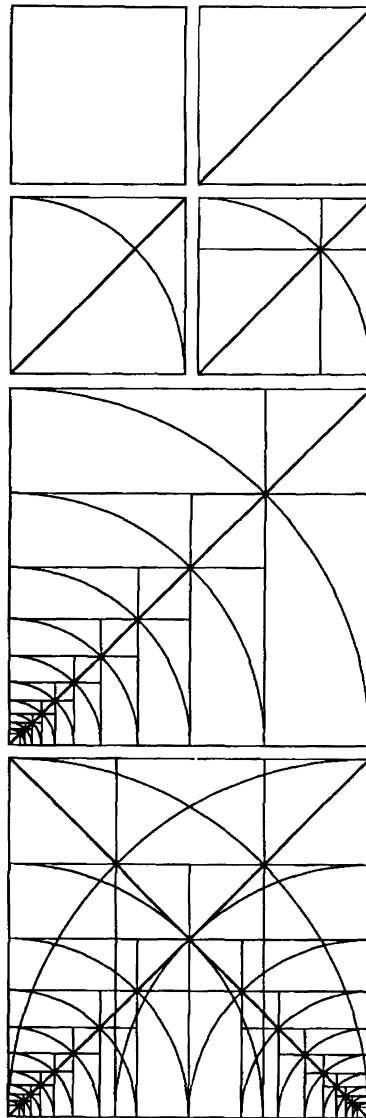
considerable intensity and were remunerated for their pains. The purposes of the study were made clear to the participants in all but the first study, which began with entirely pedagogical objectives but fortuitously fitted into the objectives of the study.¹⁴ The findings are an interpretation of what students wrote and said about their own designing and the designing of others, what they said in presenting their work and answering criticism, what teachers said in the context of evaluation, and what students think of our preoccupations with metaphor and design pedagogy. There is no pretense at rigorous discourse analysis in this study. The research paradigm was that of seeing the subjects as coinvestigators, disclosing our agendas, and inviting responses to our findings. Such a study is always an open project. The findings are presented here with illustrations from the studies, where appropriate.

Metaphors and Design

What does an understanding of metaphor reveal about design? Among the range of metaphors through which we can construct an understanding of design is that of design as generating action within a play of metaphors (a view consistent with Donald Schön and G. Wiggins: "kinds of seeing").¹⁵ The designer sees the design as particular things during its development. The entailments of these "metaphoric projections" prompt actions that change the design situation and our understanding. This play of metaphors is evident even in the case of geometric manipulation—pattern making as a rudimentary design activity. As we draw, we see the configuration of marks on the drawing board or computer screen as triangles, squares, circles, diamonds.¹⁶ The things we see entail problems or actions.

Our experience with a drawing of a square may be such that it entails the drawing of axes, diagonals, arcs, the articulation of edges and corners. As we act according to various entailments, new shapes and figures emerge. There are new metaphorical projections and new actions. We cannot help ourselves. The drawing of a diagonal line through the square may reveal triangles, the recollection of a motif, a spatial ordering, or the quadrant of a circle: to be completed by scribing an arc from one corner of the square to another with the diagonal as an extended radius. If we are trained in the techniques of geometric proportioning, the resulting figure may entail certain procedures, further ways of seeing,¹⁷ such that the intersection of the arc and the diagonal are identified as generators of further geometries (Figure 1). (These activities are never merely procedures or the implementing of formal rules—formal rules being the product of experience recontextualized into the rarefied and unchanging context of logic or number.) Our experience is constantly bringing metaphorical projections to bear on the current situation. Our experience is constantly undergoing transformation in the light of the current, changing situation. Of course, even when playing with geometry, the process is never entirely geometrical. Shapes are never merely just shapes, but also sunbursts, leaves, rays, clouds, tokens, wings, crystals, windowpanes, walls, symbols, reminders of shapes previously encountered, previous design experiences, and precedents. Each metaphor brings with it new entailments and new actions.

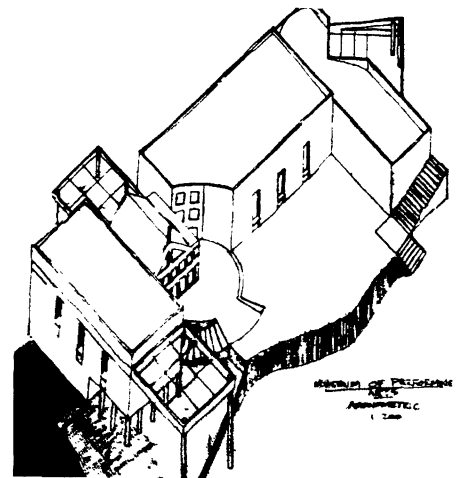
In this account, an appreciation of the metaphors and what they entail is entirely situational. What a particular designer sees and what these entail at a particular moment arise from the changing experience of the designer interacting with the situation (a process that can also be de-



1. Development of a geometric figure explained through the workings of metaphor.

scribed as “hermeneutical”¹⁸). Every step in the design process is a gathering of innumerable factors—experience, the technologies we are working with, the materials of the situation.¹⁹ The process is tacit. We simply act in a situation.

This metaphor play is evident not



2. Interpretation of an architectural drawing can be explained in terms of metaphor.

only in pattern making, but also in the design of artifacts such as buildings. To see a configuration of lines on paper as walls and rooms is to make a metaphoric projection (Figure 1). To manipulate spaces so that they flow better or balance one another or open out onto a view is to see elements of the design in terms of metaphors of fluid, weight, and vision (or something similar) and to act through their entailments. The play of metaphors also impinges on how we see the users of the design, the site, the program, the educational situation, the drawing technologies: the users as spectators, players, actors; the site as a constraint, generator, force; the program as a problem statement, constraint, guide; the educational setting as a game, adventure, experiment, battle; the drawing technologies as tools, measures, extensions, embodiments. The design process itself may be seen as a journey, a logical progression, a search, a problem, or a dialogue.

What is the role of discussion and reflection? Within this metaphor of design as metaphor play, we can see the acts of re-

flection and dialogue, which may accompany the design process, as impelling the progress of the design in various ways. Within this framework of design as metaphor play, reflection and dialogue bring about the development of the design through

1. the articulation of metaphors and their entailments within the current design situation
2. the identification of the metaphors through which certain tacitly generated design actions make sense
3. the critical questioning of the appropriateness of particular metaphors for the current situation
4. the comparison of metaphors
5. the interpretation of what certain metaphors entail in the situation
6. the restatement of an understanding of the situation in terms of different metaphors

Reflection that involves a restatement of the problem can be seen as a shift in metaphor. When one participant in the design process says, "The problem is how do we best organize the forms?" and another says, "Shouldn't we consider how people will use the spaces?" different metaphors of the artifact and of the design process are being presented. Highly consequential metaphor shifts frequently become the cause of major shifts in the focus of design dialogue.²⁰

How are designers driven from one metaphoric orientation to another? The entailments of privilege empower the design process. To speak of design as metaphor play is to invoke metaphors of fluidity, game playing, dialogue, and freedom. However, metaphor play is not unconstrained. The power of particular metaphors lies in the complex web of relations in which particular metaphors have use.²¹ Certain metaphors are favored over others (for particular situations) by virtue

of our historical situation, the norms of our practice as professionals, the conventions of the design studio, and the personal preoccupations of teachers and colleagues.

In the study we conducted, it was possible to identify various patterns to this privileging. These patterns simply reflect the thinking of a particular design community at a particular time. These patterns came to light in different dialogic settings, mainly through personal reporting on the experience of designing or watching someone else design or presenting justifications in a design crit, responding to criticism, and reflecting on the design process in group discussions.

The rest of this article marshals evidence from the studies for the centrality of metaphor in design. We highlight the nature of the privileging of metaphors, how the metaphors provide a focus for concern, and how metaphors operate through the identification of difference.

Metaphors of Romanticism and Objectivism

Romantic metaphors trade in the themes of the romantic movement: subjectivity, the importance of the individual, imagination, and emotion. The artifact is commonly seen as a work of art.²² The design task is commonly seen as a personal journey, an exercise in self-expression and self-discovery.²³ Reports on design experience involve reflections on one's state of mind and how one felt about the design—part of the entailment of design as a product of the self. Evidence of the presence of this metaphoric orientation comes through in the reports by students on the design of a performing arts museum:

*I think widely and wildly in my head.
. . . I can, however, picture clearly*

space, scale, light, texture, and form in my mind. Why don't my drawings match my mind pictures? . . . Add a measure of hyperactivity and a sense of ultimate fear and absolute excitement and thrill, and that is my state at the beginning of a design project.

Romantic metaphors seem to trade in chaos, freedom, and excitement. Evidence of a romantic orientation could also be seen as a product of the nature of the reporting. The students fall naturally into the mode of the diarist, having been briefed in first year to maintain a log book. This willingness to disclose insights about oneself was less evident in public presentation and the justification of design decisions, though presentations commonly took the form of a personal narrative. The reports also provide evidence of the designer's dependence on "inspiration":

An idea about fenestration "popped" into my head.

Designer B adopted a stream-of-consciousness approach.

It follows that design is essentially a private matter:

*This is a very public building. . . .
Creativity is a very private act.*

Students seemed well aware of the tensions inherent within the romantic orientation. Any levity in the reporting generally focused around romantic metaphors.

Thus the criticism of our fellows was hard to accept. Couldn't these plebs recognize an inspired design when they saw one?

Objectivist metaphors, on the other

hand, trade in objectivity, detachment, logic and analysis. The metaphor is of design as a logical procedure, and entails notions of method:

My very first explorations were written—taking stock, sorting out the brief, listing qualities and terms of reference—basically setting parameters.

I then established priorities for different spaces to get light, sun, and noise to try and get a hold on the physical requirements.

My initial responses to the design brief were to look at the relationships and connection points of the buildings to the surrounding buildings and access ways.

An objectivist orientation features prominently in reflections on the evaluation process:

It is not obvious what are the criteria of the profession, the public, and ourselves [for good architecture]. If we knew what the criteria were, then we could produce good buildings purposefully.

Both romantic and objectivist orientations were usually evident in the one report. Design discourse seemed to involve appeal to both metaphor regimes and playing one off against the other as a basis for comparison between styles of working:

Jennifer works and reworks the design—constantly testing, adding, and reworking the design; always methodical, one step after another—unlike my own style of leaping all over the page and physically wandering around.

The romantic/objectivist metaphor also appears as a means of justifying one approach against another:

But who is to say that buildings designed in such a fashion [that is, fairly slapdash] need necessarily be any worse than products of a rigorously logical procedure?

The dichotomy is also evident in conflicts about models of the design process and correlations with personal experience:

The creative process remains shrouded in mystery. . . . We have difficulty even creating a model of it. Somehow we need to bypass the words and get closer to the internal experience of the designer. If we don't know what it is, how can we teach or learn it?

The power of these metaphor regimes appears to lie in the fact that they are both firmly accepted. They are entrenched as part of the discursive practice of architectural design.²⁴ As long as they serve as a focus for concern, they will continue to promote discussion and serve to structure design discourse.

Privileged Precedents

An appeal to precedent is clearly a form of metaphorical projection. It is to see this situation as another situation, as in the use of legal precedent. In the case of architecture, precedent is also an appeal to exemplars. Architectural culture privileges certain buildings over others:

My first reaction to the word museum was to think of precedents, such as the Guggenheim.

There are various entailments of such projections:

The word [Guggenheim] conjured im-

ages of free forms, expressive and exciting architecture.

In hindsight Gehry's design [Frank Gehry's furniture museum] probably offered a solution to the difficulties we faced with the complexities of our design.

Different design studio classes place varying emphasis on the importance of precedent.²⁵ In this particular class, students were actively encouraged to consider precedent with the justification that all design proceeds within a cultural and historical context. Bringing precedent to the fore was an important means of “testing the prejudices” of prevailing architectural culture, a view consistent with the metaphor embraced by the design teachers of designing as hermeneutical.²⁶

Metaphors of Legitimation

Discourse about design can be seen as an attempt to legitimate what is being done. There are various metaphors through which legitimation is presented as justification of the design during presentation and as a grounding for subsequent actions during the design process itself. The metaphor is commonly that of the design process as the construction of an edifice or building (“You need a base to work from”) or design as a journey. Entailments of the metaphor of design as a journey are direction, purpose, and progress. It is common to find in the designers' reports justifications for the direction the design is taking:

We explored the idea of theater—what were its meanings and associations? We were hoping that these things would give us a sense of direction and provide a basic concept.

However, legitimation was commonly expressed in negative terms as establishing an adversary—fabricating credible design inhibitors. This security in identifying an adversary passes responsibility to someone or something else so that the designer is less responsible for the potential failure of the project. It was common to find reports at various stages that something was holding the design back. For one student, the unusual and contrived nature of one of the studio programs (observing another designer) provided a useful inhibitor:

Both Jenny and I felt stressed by the thought of creating a design now. . . . I think this was due to both of us feeling inadequate to perform on the spot without thinking and researching about the scheme first.

Sometimes the design inhibition came from within:

Perhaps if we had spent more time on exploration early on, the process would have been easier later on.

The metaphors are again of design as a journey or, as in the previous quotation, design as a performance that can be inhibited by a kind of stage fright.²⁷

Metaphors of the Group

One of the projects involved group work, and students were encouraged to report on how the group was functioning. It was common to identify the state of the group with the state of the design. The metaphor of strength and unity applied to the group carried over to the assessment of the design:

We were all very proud of our product. It was not a compromise, yet it seemed

to us to be a strong and unified design. In general we felt that our design was better than any of us could have done alone. It was certainly bolder than we would have done alone.

We worked together well as a group, and the design went well. It is impossible to tell which condition created the other.

Such positive responses typically traded in metaphors of the group as greater than its parts, a source of power and confidence. Some saw the group as a well-functioning machine:

This was a very positive session, each person firing off the other.

Reports of unhappy group experiences featured metaphors of fragmentation and irreconcilable difference:

The conflict arose from frustration, tiredness, and an unwillingness to participate in all aspects of the design. Let's face it, no one is at their best under pressure, with no sleep and working with people whose aesthetic tastes, design styles, and levels of commitment are different from our own. However, this situation could quite conceivably occur in "the real world of architecture."

In some cases, there was a suspicion that the group may have been deluding itself. It may have been a victim of "group think":

Still, we were pleased. Was this a bad sign? People who think they have a good design often don't.

George Lakoff and Mark Johnson address the role of metaphor in group dynamics at some length.²⁸ The metaphors of

argument as war, journey, container, and building are evident through such ideas as standing ground, defense, coming from different positions, presenting content, and demolishing an argument.

The Parti

Metaphor play is evident in design in the privileging of the *parti*, an appeal to an overriding concept, a diagram, a generating concept.²⁹ The *parti* is itself a metaphoric projection: I see the design as a tent (Figure 3) or a circular form with radiating courtyards. The rhetoric of the *parti* also fits within a privileged romantic/objectivist metaphoric orientation, which favors origins, cohesion, generation, the independence of ideas, and ordering principles:

She placed a diagram that was her main concept on the side so she could always refer to it. She also came back to earlier sketches and embellished on her ideas, which seemed to give her a little more direction.

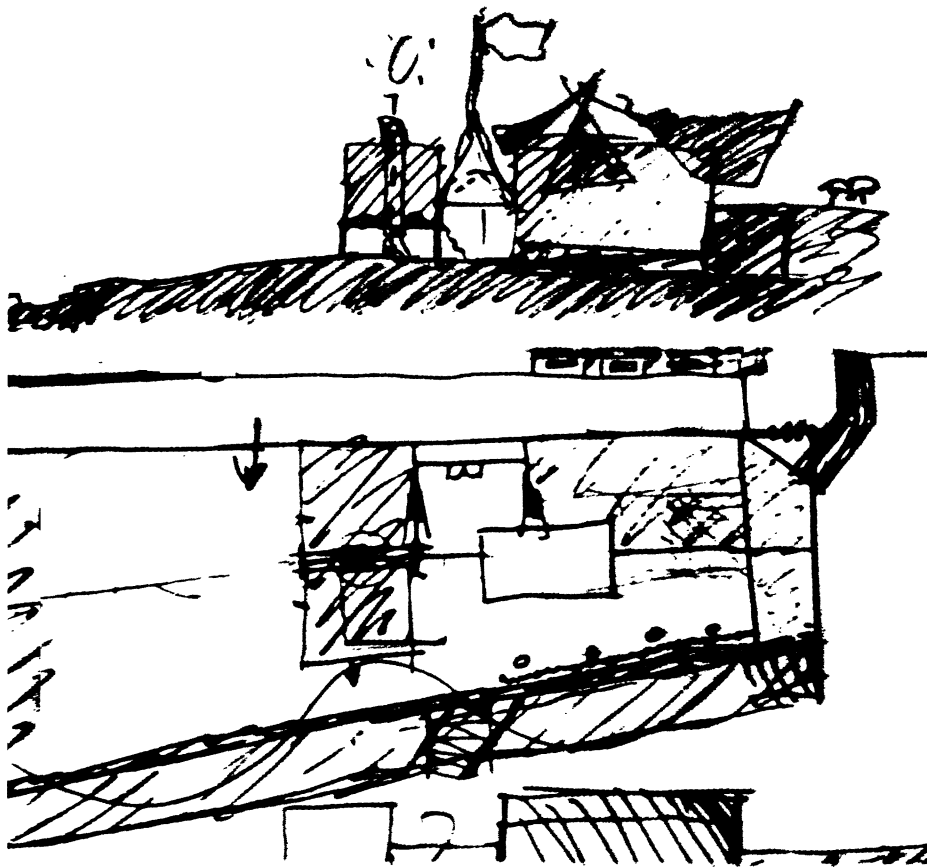
Part of design discourse is to identify the source of the originating idea:

I identified three themes—storage, exhibition, and transit—and began to explore the latter, which became a generator of form.

In graphical terms the boundaries are defined as well as the environmental infringements. . . . The building is sited on plan as an extension of access points. Axes are strongly delineated.

The *parti* emerges and is refined during designing:

The possibility of a circular building



3. Student sketch engaging the entailments of the tent metaphor.

emerges. A tentlike structure is imagined. We try to find out how this shape could relate to the site.

The idea of a spiraling ramp as a key to circulation emerged: a ribbon curling through the building. The building also began to take on a free-form shape in response to the ribbon and to the noise problem.

I was also preoccupied with the courtyard as an important part of the design, forming up the courtyard by wrapping the building round it and vice versa.

The *parti* can also serve as a design inhibitor.

The circular building has slowed us down. Having made the design decision to “go round,” we felt committed to it. How do we work out circulation and surrounding spaces? We struggled and struggled.

The adoption of a new *parti* represented a major discontinuity in the design development and was a cause for celebration or regret. One report illustrated “the dying moments of the unproductive circle.”

The *parti* also provided a focus for discussion. It was commonly something

other than the building being designed. It was a means of structuring discussion about the design with others. The *parti* was something that could be explained in a single sentence and a simple diagram. It was something that often figured for the first time in the presentation of the work to others. It was sometimes part of design justification, but not part of design action. The identification of a *parti* was considered “politically” important to some students because its presence demonstrated to the teachers that the design had coherence or “wholeness”:

Tutors ask, “What does it all hinge on?” Wholeness. It’s great praise of a piece of work to say that it has “wholeness.”

Absent Metaphors

It is also revealing to note the metaphors that were absent from the design discourses under study. The metaphors of architectural design did not involve talk of evidence or judgment. There was no painstaking sifting of factors that led one to a series of considered design decisions (as in making legal judgments), nor was there a language of crisis, as though the design would right some injustice or correct some imbalance or some pathological state of affairs. Nor was there a hypothesis to be proven or a set of data to be correlated (as in laboratory practice). These are not the prevalent metaphors of architectural design discourse, but notably there was no talk of economy, the inevitability of a design choice on the basis of economic considerations, what the market will bear, the design as fitting within a market niche—the dominant metaphors of many with whom architects deal in practice.

More peculiar to the emphases, and lack of emphases, of the school of the par-

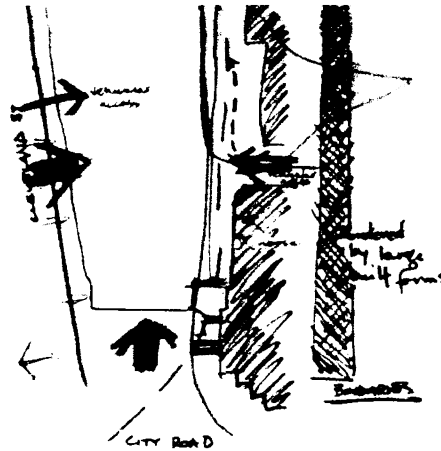
ticipating students, there was no reference to creating a “sense of place” (the metaphors of genius loci and essences). These absences reflect the preoccupations of the school and may be expected to vary between schools and design classes.

In common with most schools, the designed artifact was not seen by the students as something inconspicuous, something that barely impinges on the perceptions of the users or that is to be merely used. It was generally assumed that architecture is imposing, presenting messages, conveying meaning, influencing lifestyles, or shaping a community. Architectural design was thought to have significant “impact.” This orientation came through more strongly in public presentation than in personal reports of design experience:

Wherever you are in Pyrmont you could look back and see where you live [in the proposed housing scheme], and that will establish your identity.

Architectural artifacts are to be the subject of critical discourse, unlike the engineering design of roads or drains, the landscaping of a park, or the design of a better stepladder. The entailments of the metaphors that imbue architectural design culture inject a sense of importance into the design process, unmistakably a power that impels design.

The metaphors of the design crit were those of defense and validation and involved appeals to higher authorities of reason and good taste. There was a distinct absence of metaphors that entail vulnerability. Every question has an answer. There are reasons for every “why?” The crit was rarely seen as dialogic. The metaphor of the clientele and the designer as coinvestigators was mostly absent.

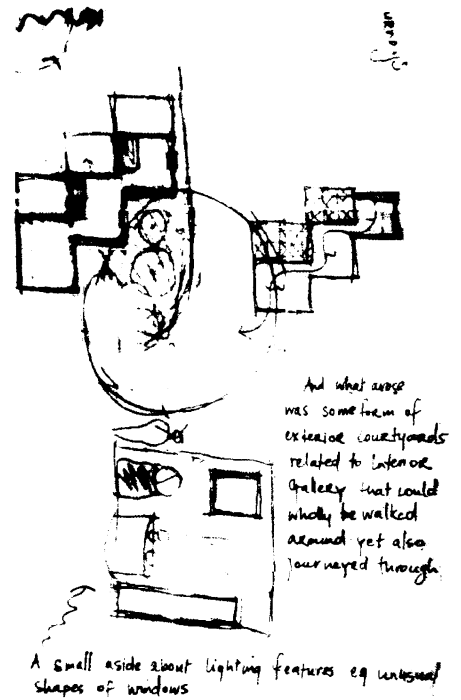


4. Example of the parti, or organizing diagram, produced by a student in the study.

Concern and Difference

How is the privileging role of metaphors evident? The role of metaphor in providing a focus for concern in a particular design situation can be readily identified from the reports by designers. In Schön’s terms, metaphors are implicated in the setting of problems.³⁰ A tentlike structure is imagined, and there is the problem of relating this to the site. A free-form building entails the problem of roofing. Circular-plan buildings entail problems of effective circulation and flexibility. These concerns commonly appeared as problems in the reporting, possibly because it transpired that the designer was led into a difficult situation that was ultimately without resolution. The course of action and the metaphor had to be abandoned.

However, the setting of problems also appears implicitly in the reporting, usually as a resolution. In a scheme that clearly saw the museum as a theater, the “wings” constituted a focus for concern—part of the problem setting of the moment:



5. Discovering the entailments of an architectural metaphor.

An open staircase from the forecourt could be set up between the north and south wings of the museum, providing a more direct link between the two areas.

As long as the museum is a theater, then there are wings, stage, and fly tower to be accommodated. If the design is seen as a series of access points on a diagram, then they need to be manipulated as elements. One report by a student observer showed the designer discovering the entailments of this metaphor:

In graphical terms the boundaries are defined as well as the environmental infringements. Even at this stage it is evident that strong emphasis has been placed on access.

The accompanying design sketch showed large arrows located on a plan diagram (Figure 4). Another student saw the design in different terms—as something to be journeyed through—and this yielded a different focus of concern and a different outcome (Figure 5):

And what arose was some form of exterior courtyards related to interior gallery that could wholly be walked around yet also journeyed through.

This design development relied heavily on the powerful architectural metaphor of the building as mediation between inside and outside space:

My investigations on this part of the sheet include site planning, building form and its relationship to the site, as well as some ideas for using direct and indirect light to illuminate gallery and museum spaces. I also thought of external spaces and how they could possibly be included as part of both exterior and building spaces.

The outcome was a concern with fenestration and lighting.

Metaphors serve as a focus of concern. From the range of problems students set themselves, it is apparent that problems do not exist as “objective” entities independent of a point of view—independent of a metaphoric orientation. It is also apparent that while in the thick of designing, certain problems assume overpowering status—such is the revealing and concealing nature of metaphors.

The privileging role of metaphors is also revealed through the identification of difference. It is apparent that designing as metaphor play does not so much entail the search for commonality and agreement be-

tween metaphors, but the opposite. From the reports by designers it is apparent that metaphors empower the design process through the revelation of difference.³¹ This is evident in three ways.

First, there is the “clash of metaphors.” Designer A sees the design as one thing, and designer B sees it as another. Such difference may so cloud the design process that there is lack of communication. Those for whom designing is form making may simply be unable to relate to those for whom design is a gathering of community concerns. Where there is goodwill, the process may result in persuasion, a negotiation of what constitutes the entailments of the various metaphors in play, the synthesis of a set of new metaphorical orientations, or simply an agreement to differ—an acceptance of the alien in the other person’s outlook—itself an enabling and revealing process.³² From discussions with students it appears that one of the roles of the tutors and jurors is to enter the process with new metaphors. A multistory housing development overlooking a park becomes “eyes in the sky.” A design group that had seen its design in one way heard it described by a critic as “a noisy hot sculpture court and a building which covered behind a wall.”

Second, there is a “clash of interpretations” about what a particular metaphor entails. It is apparent that designers pick up on and explore the entailments of a colleague’s metaphors. One student remarked on how her talk about her design as a castle had been “misinterpreted.” Whereas she saw it in terms of shelter, offering enclosure and sustaining, the critic picked up on the entailment of a castle as a fortress. Due to the resounding effect of this fairly obvious entailment, the metaphor became a liability for the student’s case about her design.

Third, and more significant, each revelation of what the design *is* is at the same time a disclosure of what the design *is not*. In seeing the drawing as a building, we are also seeing that the drawing is not the building. Thus, we can move the elements around, destroy a wall, change the shape, turn walls back into lines. We can also see the design as something else—a machine, a center of activity, a symbol. The design is not the Guggenheim museum, so we can claim it as our own, and the ramp does not need to be helical. Design is not a journey, so we can violate the journey entailments, start again at any point, and be in several places at once. The design is not the design team, so its resolution is sometimes less important than reasserting group cohesion over a cup of coffee. The building is not a tent, so we can make it permanent, make it thermally efficient, give it concrete walls. The design is not a courtyard with a building wrapped around it, so we can make the courtyard project through the building and allow some functions of the building to intrude into the courtyard. The structural system is not a regular grid, so we can substitute fabric for structure, imply structure where it is not, and work out how to locate certain building elements where there is least support from the structural system. The housing development is not a means of establishing the identity of the residents, so we can make it look like a container terminal and exaggerate the scale. Design is not metaphor play. Thus, we can talk about design in terms of the literal, the objective, the absolute.³³ It is in the negativity of metaphor that scope for the imagination lies.

In all this it should be apparent that successful and imaginative design does not rely simply on the novel juxtaposition of metaphors (castle and tent) or the projection of unlikely metaphors into familiar

situations (housing as container terminal), as is suggested by certain “creativity exercises.” Design as metaphor play works by the subtle play of privilege and difference. It does not suggest a “new method” for design.

Consequences for Design Education

What are the consequences of these observations for design education? Alerting students to the phenomenon of metaphor use in the context of the studio itself has value.³⁴ Reflection on the metaphoric nature of our understanding can be seen as an appropriate response to “breakdown”—in which the design is not progressing well, the group is not functioning, the criticisms seem unjust, the design is judged to be poor.³⁵ In these cases, it is helpful to objectify the design and our language of reflection. The designers may ask, “Could it be that the metaphors through which we understand our current situation are leading us in directions that are proving unproductive?” Talk of metaphor may play a role in softening the assertions of certain participants that the problems they see are “fundamental”—disabling the force of objectivism. Talk of metaphor also encourages us to explore the hidden entailments of our metaphors, to reveal the hidden assumptions in that which we regard as obvious.³⁶

An understanding of metaphor also provides insights into design practice and thereby guides the nature of the projects set in the studio. The power of metaphors to define problem regimes and to prompt action suggests a particular approach to design practice. The practitioner does not come to a situation with fixed, predefined problem statements, but rather undertakes an investigation and engages in dialogue through which appropriate metaphors emerge. These metaphors are arrived at by

both the practitioner and the client in the specific situation. Problems are presented and addressed through such exchanges and collaborations. The metaphoric view points to design as a diverse and richly collaborative activity.

The greatest value in an understanding of metaphor is in the insights it provides for design teachers in understanding their own practices. Metaphors present themselves through the accumulation of experience, dialogue, and reflection (dialogue and reflection being particular forms of experience). Design teaching involves organizing situations that furnish students with experiences through which helpful metaphors emerge. Design education therefore provides an initiation into ways of working and thinking. In the terms presented in this article, the design studio is an initiation into the metaphor use (discursive practices) of a community—it is hoped, a set of conflicting and critical design communities. In this light, it is appropriate that the design studio is a forum for diversity—not a vague academic pluralism—but a setting in which there is a diverse range of commitments through which the entailments of metaphors can be explored and challenged.

How can an understanding of metaphor use inform the development of an interesting and challenging studio program? This can be illustrated by a program we developed after the study described here. This program (for second- and third-year undergraduate students) explored the role of privileging and difference in metaphor brought to light through an analysis of oppositions.³⁷ Students were required to explore oppositions inherent in the design of domestic architecture, to bring those oppositions to light, to challenge them, and to redesign an existing building by reversing, challenging, and subverting some of

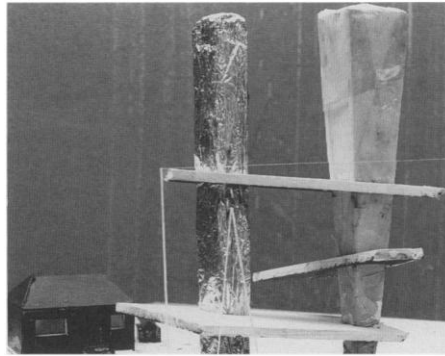
the major oppositions built into it and largely taken for granted. The studio, therefore, not only highlighted some of the metaphors designers use, but also brought to light the way metaphors structure our designing. It also demonstrated to us the power afforded to the imagination when designers appropriate difference implicit in metaphor use—looking at what *is not* as well as what *is*.

There were many reversals in the program, all of which sparked critical discussion among the students. For example, one of the reversals was to begin the studio process with a consideration of drawing (rather than designing), bringing the interactive nature of drawing and designing to the fore and recognizing the embeddedness of the *parti* in drawing practice. Students were asked at the outset to study presentation styles evident in the architectural literature, particularly those that highlighted the ambiguity of opposites (the mixing of metaphors). Later on, they would use that style, or a variation on it, for the presentation of the final design. This also enabled a consideration of the privileged nature of certain design precedents as metaphors.

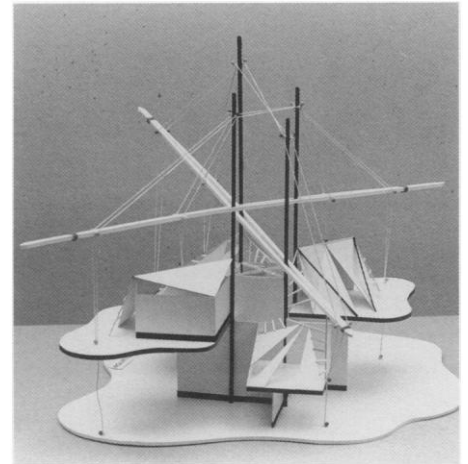
Students were required at various stages to present their work to the group. On several occasions the work was presented not by its author, but by a fellow student, to whom the scheme had already been explained. In one situation, a drawing presentation was explained to the authors by the audience, who had to interpret and discuss what the presentation was about. This brought to light the nature and role of interpretation itself, challenging the notion of authorial intent and momentarily disengaging the players in the situation from romantic metaphors. It also revealed surprising new insights (through the “clash of metaphors”) to the designers about their own work and ways of thinking.

The discussion of oppositions within the existing house designs readily focused on the obvious—such as front and back, upstairs and downstairs, public and private—showing how there is a privileging in each case and how this privileging may have changed historically. The discussion also brought out the play between such oppositions and raised the question of what would happen if the privileging were reversed, the opposition were reversed, or the opposition were dissolved. This also involved a consideration of how the privileging comes through in language and in our drawing and designing practices.

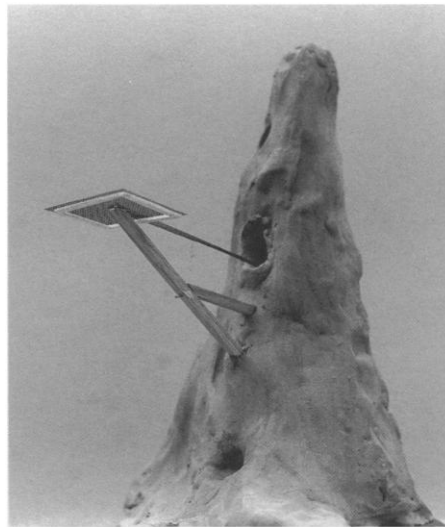
The new designs generated by the students (taken to sketch design stage only) were highly revealing and varied (Figures 6 to 10). They included reversing the location of traditionally public and private functions in the house; treating services as sculptures in the center of an open-plan dwelling space; reversing certain modernist preoccupations by extricating (as far as possible) the form from the function of the house; locating the traditionally female parts of the house to a place of privilege; transferring the notion of house into the public transport system (so that commuters live as nomads); relocating a Frank Lloyd Wright prairie house *under* a prairie; and deliberately “misreading” a floor plan so that a water tank becomes a fireplace, courtyards become rooms, walls appear as water channels, and the north arrow appears as a garden structure. It became apparent that to reverse an established opposition or to challenge an accepted metaphor does not result in chaos or caprice. For example, it was apparent that to locate bathroom facilities in the public part of a house, as opposed to the private, does not result in an absurdity, but in a different and innovative kind of house, a new set of design challenges, and



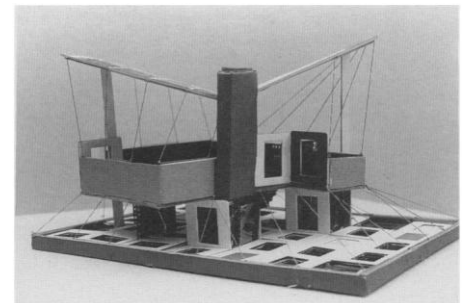
6. A play on the metaphor of form and function.



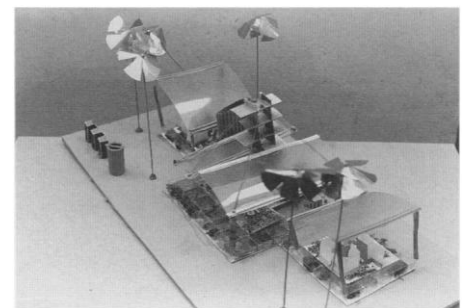
8. A house for looking up rather than through horizontal apertures.



7. An exploration into subterranean dwelling.



9. The house as media.



10. Reinterpreting the drawing conventions of a traditional house.

even new ways of living. The studio program confirmed the power of metaphor and how an understanding of its involvement with difference can be appropriated in the formulation of a valuable educational program.

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Notes

1. See Richard Rorty for an elaboration of this theme and the identification of subjectivism with romanticism. Rorty describes the tension between objectivism and subjectivism, romanticism and moralism, and idealism and realism as “seesaw” battles from which we need to be extricated. Richard Rorty, *Contingency, Irony and Solidarity* (Cambridge: Cambridge University Press, 1989), pp. 10–11. This theme is also developed by Richard Bernstein, *Beyond Objectivism and Relativism* (Oxford: Basil Blackwell, 1983). See also Richard Coyne and Adrian Snodgrass, “Is Designing Mysterious? Challenging the Dual Knowledge Thesis,” *Design Studies* 12/3 (1991): 124–31.
2. Hans-Georg Gadamer, *Philosophical Hermeneutics*, trans. David E. Linge (Berkeley: University of California Press, 1976).
3. *Ibid.*, p. 24.
4. Jean-Francois Lyotard, *The Postmodern Condition: A Report on Knowledge* (Manchester: Manchester University Press, 1986).
5. See Marvin Minsky, “A Framework for Representing Knowledge,” in Patrick H. Winston, ed., *The Psychology of Computer Vision* (New York: McGraw-Hill, 1975), pp. 211–77; D.E. Rumelhart and J.L. McClelland, eds., *Parallel Distributed Processing: Explorations in the Microstructure of Cognition, vol. 1, Foundations* (Cambridge, MA: MIT Press, 1987); and Roger C. Schank, *Explanation Patterns: Understanding Mechanically and Creatively* (Hillsdale, NJ: Lawrence Erlbaum, 1986).
6. Paul Ricoeur, *The Rule of Metaphor*, trans.

R. Czerny, K. McLaughlin, and J. Costello (London: Routledge and Kegan Paul, 1977).

7. Martin Heidegger indirectly provides an indication of the central place of metaphor. Although he does not mention “metaphor” explicitly in *Being and Time*, Heidegger argues for the resurrection of interest in the verb *to be*—the *sum* (“I am”) of Descartes’s foundational proposition *cogito ergo sum* (“I think therefore I am”). Ontology is the study of this very phenomenon of “being,” which touches the core of our “existence” in the world. The study of metaphor therefore appears to be central to ontology (the philosophy of existence or being). See Martin Heidegger, *Being and Time*, trans. J. Macquarrie and E. Robinson (Oxford: Basil Blackwell, 1962); and Hubert L. Dreyfus, *Being-in-the-World: A Commentary on Heidegger’s Being and Time, Division I* (Cambridge, MA: MIT Press, 1990).

8. Adrian Snodgrass and Richard Coyne, “Models, Metaphors and the Hermeneutics of Designing,” *Design Issues* 9 1 (1992): 56–74.

9. Max Black, “More about Metaphor,” in Andrew Ortony, ed., *Metaphor and Thought* (Cambridge: Cambridge University Press, 1979), pp. 19–43 (p. 28).

10. *Ibid.*, p. 28.

11. George Lakoff and Mark Johnson, *Metaphors We Live By* (Chicago: University of Chicago Press, 1980).

12. Snodgrass and Coyne, “Models, Metaphors and the Hermeneutics of Designing.”

13. Ricoeur, *The Rule of Metaphor*, p. 18.

14. The study also calls on the considerable experience of the authors in design studio teaching and in the teaching of computer graphics through the use of computer-aided design.

15. Donald Schön and G. Wiggins, “Kinds of Seeing and Their Functions in Designing,” *Design Studies* 13/2 (1992): 135–56.

16. The theme of perception as “seeing as” is developed by Heidegger, *Being and Time*; Ludwig Wittgenstein, *Philosophical Investigations* (Oxford: Basil Blackwell, 1953); Marcel Merleau-Ponty, *Phenomenology of Perception* (London: Routledge and Kegan Paul, 1962); and Nelson Goodman, *Ways of Worldmaking* (Hassocks, England: Harvester Press, 1978). It is developed in the context of design by Rudolph Arnheim, *Visual Thinking* (Berkeley: University of California Press, 1969); and Schön and Wiggins, “Kinds of Seeing and Their Functions in Designing.”

17. Schön and Wiggins, “Kinds of Seeing and Their Functions in Designing.”

18. See Snodgrass and Coyne, “Models, Metaphors and the Hermeneutics of Designing.”

19. Schön and Wiggins, “Kinds of Seeing and Their Functions in Designing.”

20. Schön gives the example of the change in understanding and possibilities brought about by seeing a paintbrush as a pump rather than simply a means of bringing paint into contact with a surface. Donald Schön, *Displacement of Concepts* (London: Tavistock, 1963).

21. Oblique reference to metaphor and power is provided by Michel Foucault. Foucault is concerned with discursive practices. It could be said that metaphors have a vital part to play in such practices. Foucault does not discuss metaphor explicitly but provides a vivid example of the metaphor of blood manifested in the mechanisms of social power, more lately replaced by the metaphor of sex. A discussion of Foucault’s arguments on power would take us too far from the current issue of the design studio. See Michel Foucault, “What Is an Author?” in J. Harari, ed., *Textual Strategies: Perspectives in Post-Structuralist Criticism* (London: Methuen, 1980), pp. 141–60; and Michel Foucault, *The History of Sexuality*, vol. 1 (London: Allen Lane, 1979).

22. See Richard Coyne, “Inconspicuous Architecture,” *Conference Proceedings of Gadamer, Action and Reason* (Sydney: Faculty of Architecture, University of Sydney), pp. 62–70.

23. Richard Coyne and Adrian Snodgrass, “Cooperation and Individualism in Design,” *Environment and Planning B*, 20 (1993):163–74.

24. And yet they are irreconcilable. See Coyne and Snodgrass, “Is Designing Mysterious?”

25. Typical of the disdain for precedent in the design methods movement is the comment by J. Christopher Jones that designers should avoid falling back on the authority of past styles. See J. Christopher Jones, *Design Methods, Seeds of Human Futures* (London: Wiley, 1970).

26. See Snodgrass and Coyne, “Models, Metaphors and the Hermeneutics of Designing.”

27. Following on from the group work, several professional designers were brought in to design to the same brief in front of the class. They each prefaced their attempts with a variation around the theme that design is not a spectator sport, presumably a pejorative characterization of the task they were expected to “perform.” In this, design appears to be unique among professional activities. It is expected to be private. Contrast this with the unlikelihood of the same comment from a jurist invited to adjudicate in a moot court or a clinician offering a diagnosis of a patient in front of a group of medical students.

28. See Lakoff and Johnson, *Metaphors We Live By*. See also Coyne and Snodgrass, “Cooperation and Individualism in Design.”

29. See Jane Darke, "The Primary Generator of the Design Process," *Design Studies* 1/1 (1979): 36–44.

30. See Schön and Wiggins, "Kinds of Seeing and Their Functions in Designing"; and Donald Schön, "Generative Metaphor: A Perspective on Problem-Setting in Social Policy," in Andrew Ortony, ed., *Metaphor and Thought* (Cambridge: Cambridge University Press, 1979), pp. 254–83.

31. The theme of difference is developed at length by Foucault. Contrary to expectations, the establishment of a norm (in our case, the prevalent metaphorical orientation of a group) produces a means of establishing difference: "The power of normalization . . . individualizes by making it possible to measure gaps, to determine levels, to fix specialities . . . all the shading of individual difference." Michel Foucault, *The Foucault Reader: An Introduction to Foucault's Thought*, ed. P. Rabinow (London: Penguin, 1984), pp. 196–197.

32. See Adrian Snodgrass, "Asian Studies and the Fusion of Horizons," *Asian Studies Review* 9/2 (1992): 81–94.

33. Which could be tantamount to saying that design is *absolutely* metaphorical.

34. The value of the study of metaphor use in areas such as history and theory or theory and method is taken for granted here.

35. Breakdown is described by Heidegger as the experience through which objects emerge from a background of "circumspective awareness." See Heidegger, *Being and Time*. "Breakdown" is also taken up in the context of design by Terry Winograd and Fernando Flores, *Understanding Computers and*

Cognition: A New Foundation for Design (Reading, MA: Addison Wesley, 1986).

36. There is danger in "metaphor talk" in the design studio if it leads to the conclusion, "Well, it's all just metaphors. I have my metaphors, you have yours." As reported by one of the participants of the study,

But problems arise when you see everything as a metaphor. It wipes out all the differences between metaphors and their use.

Here metaphor becomes a variation on the theme of relativism—a conclusion to which one is drawn readily when the idea is not given careful consideration, particularly where objectivism provides the dominant metaphor. Metaphors are never *just* metaphors. The discussion of privileging shows us that we can never simply break free from particular metaphoric orientations, and it is in the nature of our involvement in a task to see the problems we are dealing with as having foundational status. Fish offers an explanation of this "turn" in the postobjectivist argument: "The professional . . . who 'speaks' in the name of essences that transcend the institution and provide a vantage point for its critique is not acting out a contradiction, but simply acting in the only way human beings can." (Stanley Fish, *Doing What Comes Naturally: Change, Rhetoric, and the Practice of Theory in Literary and Legal Studies* [Durham, NC: Duke University Press, 1989], p. 246.) To identify sets of beliefs about design as metaphoric is not in itself to offer a critique. It is merely the starting point from which to establish the nature of the privileging in the particular case. The study of particular metaphors will always relate to particular situations, assessed through interpretation and judg-

ment. The study of metaphor leads us to the specific rather than the universal.

In this light, there is much to be said for the design studio as a place for the discussion of "the problems at hand" as they present themselves (rather than a place for "meta discourse" about metaphor): How do I realize my mind pictures? What are the priorities for light and circulation? What does the Guggenheim have to offer? Why is the group not functioning? What is my guiding idea? How do I handle the courtyard?

Where metaphor talk was introduced into the various dialogic settings of the studies, its reception suggested a threat to the designer's autonomy. Initially, talk of metaphor suggested to students that there was something to their discussions they were not aware of. We were probing their subconscious and claiming superior knowledge, as if to say, "Your discourse is informed by factors that your discourse cannot comprehend, but my discourse can comprehend." This response would be expected of any "new" ideas about design that were not part of the generally accepted style of discourse in the studio.

37. This challenging of the status of entrenched oppositions was also informed by radical, "deconstructive" pedagogy outlined by S. Figel, *The Postmodern University: Essays on the Deconstruction of the Humanities* (Toronto: ECW, 1988); and Gregory Ulmer, "Applied Grammatology: Textshop for Post(e)pedagogy," in G.D. Atkins and M.L. Johnson, eds., *Writing and Reading Differently: Deconstruction and the Teaching of Composition and Literature* (Lawrence, KS: University Press of Kansas, 1985), pp. 38–64.