Metaphor, Ethos and Environmentally Responsive Design

BROOK MULLER
University of Oregon

"All values must remain vulnerable, and those that do not are dead." – Gaston Bachelard (1)

"In metaphor one has...a stratification of meaning, in which an incongruity of sense on one level produces an influx of significance on the other." -Clifford Geertz (2)

Prevailing sentiments and beliefs – the ethos of design culture and culture at large - precondition an architect's basic understanding of the design "problem" under investigation. Such conceptualizations determine manners of working – the concerns, inspirations and procedures given priority. How architects work determines what they consequently realize. If architects are contributing to environmental degradation by designing buildings that are inefficient and unhealthy, and if there is a pressing need to advance more life enhancing and sustaining practices, perhaps the problems architects recognize as in need of solving deserve reexamination and inventive (re)expression. Novel descriptions may both encourage greater environmental response and illuminate evolving contemporary ethos.

This paper explores metaphors as one potentially transformative means by which designers come to understand and describe the works they undertake. The architectural design process is presumed an endeavor of great intellectual complexity, and metaphor as a 'condensation of meaning' is examined for its capacity to contend with such complexity. This paper discusses the process by which architects "respatialize" metaphors, how novel metaphorical insights have affected thought and practice in the past, and in our era of environmental crises how new categories of metaphor are reshaping and expanding our visions. The paper concludes by examining what makes "green" metaphors effective and how awareness of such characteristics might enable designers to devise new schemas that speak to current circumstances.

Metaphor, Design Thinking and Design Culture (3)

"In all aspects of life...we define our reality in terms of metaphors and then proceed to act on the basis of the metaphors. We draw inferences, set goals, make commitments, and execute plans, all on the basis of how we in part structure our experience, consciously and unconsciously, by means of metaphor." – George Lakoff and Mark Johnson. (4)

"Metaphor is not suspended from natural reality, but that in opening up meaning on the imaginative side it also opens up towards a dimension of reality that does not coincide with what ordinary language envisages under the name of natural reality." -Paul Ricoeur (5)

As Lakoff and Johnson have so powerfully demonstrated, metaphors are not simply imaginative flourishes but are essential to the way humans think, describe reality and act, offering a "systematicity that allows us to comprehend one aspect of a concept in terms of another." (6) A metaphor is commonly based on our *embodied condition*, serving as "as a vehicle for understanding ... only by virtue of its experiential basis." (7) Thus with metaphor "we typically conceptualize the non physical in terms of the physical – that is, we conceptualize the less clearly delineated in terms of the more clearly delineated." (8)

While we "borrow" expressions in one domain to describe concepts in a metaphorically defined domain, not all characteristics we associate with the source domain transfer, rather only those that are resonant and illuminating (however unexpectedly). Lakoff and Johnson describe the characteristics that do transfer as constituting a coherent network of entailments. Given that the metaphorical domain is typically abstract and highly complex, the metaphor and network of entailments associated with it will not "speak" exhaustively towards the concept under consideration but will rather highlight certain aspects (of the metaphorical domain) while obscuring others. The very power of the metaphor lies in this simultaneous illumination of certain meanings and concealment of others, a condition that is significant to architectural thinking as we shall see.

David Abram suggests, "all truly meaningful speech is inherently creative, using established words in ways they have never quite been used before, and thus altering, ever so slightly, the entire webwork of the language." (9) Nowhere is such meaningfully creative alteration more evident than in the introduction of new metaphors:

"If a new metaphor enters the conceptual system that we base our actions on, it will alter that conceptual system and the perceptions and actions that the system gives rise to. Much of cultural change arises from the introduction of new metaphorical concepts and the loss of old ones." (10)

In architecture, evaluation in preliminary design phases often centers around whether a conceptual organizational "idea" makes explicit those aspects of the project deemed critically important while at the same time accommodating - although not necessarily

highlighting - a host of other concerns. As G.Z. Brown explains, "building design is a creative process based on iteration: one begins by responding to a situation with an abstract idea. Then one objectifies the idea, by proposing a trial design, evaluates it, redesigns it, develops it, reevaluates it, and so on." (11) Striving for coherence given a density of conditions and requirements (legal, practical, political, aesthetic, economic, topographic) is central to this undertaking. Because of their ability to help us cohere and prioritize such conditions, metaphors function as effective tools in this process. A metaphor may suggest itself to a design team member in the conceptual design phase, revealing for all engaged an insight about the specific nature of the problem and perhaps larger aspirations for what architecture can be. In subsequent design stages, additional metaphors may call attention to certain emergent traces of coordinated assemblage, of parts of the project or with the project as a whole, helping a team arrive at and share an appropriately interpretable vision that guides future action.

While Lakoff and Johnson contend, "most of our fundamental concepts are organized in terms of one or more spatialization metaphors," the architect working with metaphor performs an act of "respatialization." (12) Louis Kahn's famous dictum for the Phillips Exeter Library in New Hampshire, "taking a book and bringing it to the light" provides a wonderfully elaborated example of such a process. A conceptual notion (how we gain knowledge) originates in embodied experience (vision made possible by the presence of light, such that light enabling vision = knowledge). (13) Kahn projects this construct back upon the physical realm through patterns of spatio-luminous organization "embodied" in The Library:
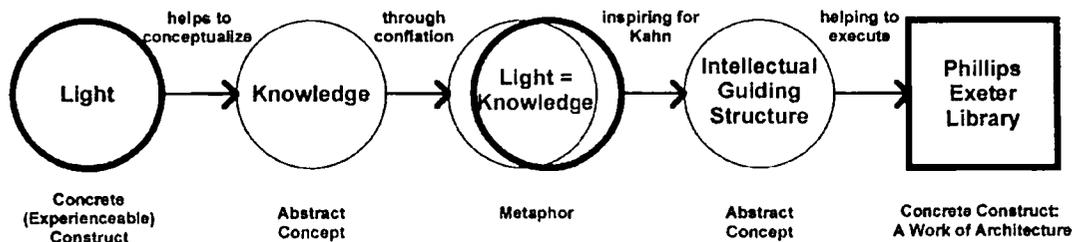

Figure 1. The role of metaphor in Louis Kahn's design for the Phillips Exeter Library (1969)

Certain metaphors are 'transformative,' they arise unexpectedly, reverberate throughout design culture and change how architects see their work. When for example Le Corbusier proclaimed, "the house is a machine for living in," he not only captured the exuberance felt toward industrialization in the 1920's but also directed a primary line of inquiry amongst architects for the remainder of the twentieth century. Through the use of this particular metaphor, Le Corbusier both unapologetically acknowledged a reality – the architect's increasing involvement with industrial modes of production - and also directed action towards the further fulfillment of such reality.
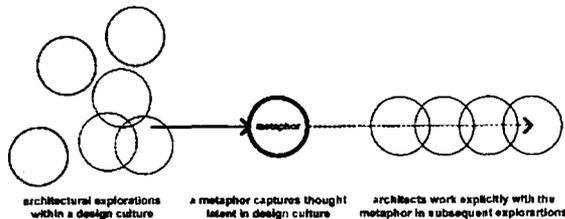

Figure 2. "Crystallization" of intention in design culture as a result of a transformative metaphor

For a new metaphor to have such influence, it must, like all metaphors "provide coherent structure, highlighting some things and hiding others" through a coherent set of entailments. (14) The entailments that make the metaphor *"the house is a machine for living in"* not only possible but powerful in transforming our thinking about the nature of the house and how one goes about designing a house include such notions as:

- A house is rationally organized

- We appreciate a house for its spare elegance and utility

- A house is comprised of a coherent, interdependent set of parts

- A house is the result of industrial manufacturing processes

- A house is made from machine-like materials

- A house is self-contained, "complete" (independent of its environment)

With Le Corbusier's cleanly ordered, taut-skinned early residential work, raised on *pilotis* and detached from earthly concerns,

these mechanistic qualities are highlighted, concretizing a more encompassing modernist project of the dichotomization of culture and nature. Critics of modernism have subsequently disclosed those attributes obscured by such an understanding; Bruno Latour, for example, suggests that where modernism's theoretical constitution categorizes nature as the domain of science and culture as the domain of politics, powerfully entangled, barely articulated networks of nature/culture hybrids proliferate in unanticipated and troubling ways;

"They are going to be able to make nature intervene at every point in the fabrication of their societies while they go right on attributing to nature its radical transcendence; they are going to be able to become the only actors in their own political destiny while they go right on making their society hold together by mobilizing nature." (15)

For Latour, once we make explicit the proliferation of nature/culture hybrids concealed by a machine metaphor, accept the complicated linkages and admit our inability to comprehend them fully, we tend to be more sensitive in our interactions with our environment. As we will see in the remainder of this essay, this entanglement of nature cultures is manifest in a new constellation of metaphors informing "green" architectural approaches.

"Constellation" (or perhaps "braids": interconnected strands of thought) speaks of the multiplicity of metaphorical notions in operation by contemporary environmentally concerned architects. Van der Rijn Architects seek to maximize those times when a building can "sail," that is, exist in "open-mode" and allow prevailing breezes to provide cooling and ventilation, such as with the remodel of Draper Hall at Berea College in Kentucky. (16) Client "sailors" are provided instructions on how to rig the ship (how to configure windows and shades) during those times when the building is sailing. Similarly, the passive design expert John Reynolds promotes a "switch-rich" approach towards detailing, such that inhabitants are able to make countless adjustments to architectural elements in response to changing ambient conditions. The Australian architects Glenn Murcutt and Richard Leplastrier envision their roles as "designing encampments" and "furnishing
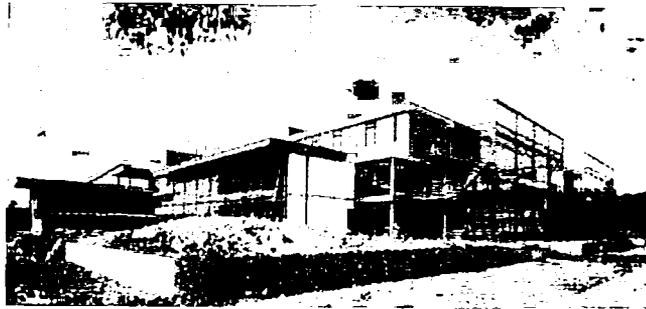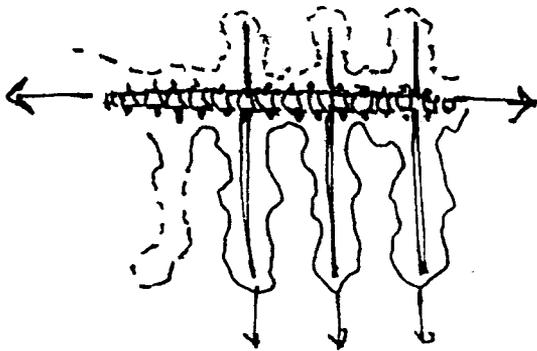
Figures 3 & 4. IBN Nature Research Institute, Wageningen, The Netherlands (Behnisch & Partner, 1996) diagram "Organizational Spine/Adaptable Limbs" and exterior view of west and south facades

outdoor rooms," while Michael Singer and Blackbird Architects view a work of architecture as not only *in* but *as* a landscape. With the IBN (Dutch) Institute for Nature Research in Wageningen, the German firm Behnisch & Partner conceptualizes architecture as a complex organism. Such plurality of operative expressions in use today – and these are only a few – deserve comprehensive discussion. For the purposes of this essay, however, I will concentrate on two illustrative, transformative metaphorical notions and the attributes they share that inspire responsive practice.

Organism As Bauplan For Architecture

In the design of the IBN, Behnisch & Partner elaborates qualities of the lifeworld of architecture understood as a complex organism. A formation of 60' x 100' "postage stamp" shaped gardens serve as the project's primary organizational structure, with each garden representing a regional biotope; a grassland garden, a marsh garden, a woodland garden, etc. Each of three office wings is situated between two of the gardens and is said to "**grow** between the gardens." Singled glazed greenhouses - inexpensive and easily obtainable in The Netherlands - span gardens between office wings. The atria that are created serve as the offices' "**lungs**," providing warmth in winter and coolness in summer, enabling a dramatic downsizing of the heating system, and obviating the need for air conditioning altogether. Because the greenhouse roofs provide a first layer of protection against the elements, the office facades become light and "porous" centers of sensation, a **skin** that actively, selectively absorbs and transmits (the wanted) and

refracts and transforms (the unwanted). With offices facing and open to gardens, the atria become the Institute's social **heart**, where scientists gather, conduct research and confer.

The IBN as *Organism* coheres within itself – it has internal organizational logic that is the residue of past articulations: the inclinations and previous experiences of the designer, the programmatic needs of the client, the technical rigors of building as embodied in the "code," etc. At the same time, as with an organism, the IBN "contains a reference to its future." (18) In the likely event that the Institute's scope and mission evolves, that it secures grants, hires researchers and finds itself in need of additional space, the garden structure and laboratory **wing** to the north anticipate the location of new offices. The adaptable portions of the building unfurl against a fixed armature. Merleau-Ponty's notion of organism as described by Mark Hansen is illuminating of both inhabitation and inhabitant initiated architectural response: "Behavior is what transforms such intrinsic potentiality into history while simultaneously preserving it as a "source" for future growth." (19) The IBN is incomplete, is never complete but "weak formed," ever adaptable to changing needs, to the disquiet of persistent animation within.

Thus the IBN holds true to a contemporary understanding, as described by Robert Mugerauer, of both "the unity of the organism, and the dynamic, interactive relationship that organisms have with their environments." (20) A play exists between the IBN's intrinsic dispositions and those entities and phenomenon with which it is engaged in

the "Umwelt" to which it adheres. Merleau-Ponty on the organism, "We have a section (intersection) that creates a new territory, and the place of the section decides what will be regenerated because it prescribes to the internal dynamic what it has to produce in order to retrieve its equilibrium." (21) There is a thematic open-endedness to the adjustment of vent openings and deployment of operable shades in the IBN's greenhouse roofs and porous facades, a setting into action prescribed by the sensed disequilibrium created by changes in surroundings – of shifts in temperature, light, and the movement of air.

Furnishing Encampments

Students in the 2001 Glenn Murcutt Master Class in New South Wales, Australia, were asked to design a gallery in a bowl-shapes meadow adjacent to Murcutt's Riversdale Educational Retreat Center. (1999) During a site visit architect and tutor Richard Leplastrier suggested that the primary task was that of "furnishing with particular purpose this larger room we are in," a notion that shifted students' concern from designing a building to a process more receptive of landscape and climate. (22) Leplastrier's metaphorical notion of a meadow having room-like qualities awaiting furnishings liberated the students to "pull apart" the building program, to examine critically whether the hallways, restrooms, the café and storage needed the same level of climate control and environmental separation as the galleries. For many of the Gallery's spaces, minimal provisioning of shade and shelter was deemed acceptable. Conceiving the gallery not as an object in a field but rather an assemblage of activity settings in a spatial continuum including neighboring buildings and the tree-fringed meadow led to (otherwise unrealizable) opportunities for energy savings, material efficiencies and enriched thermal and visual experience.
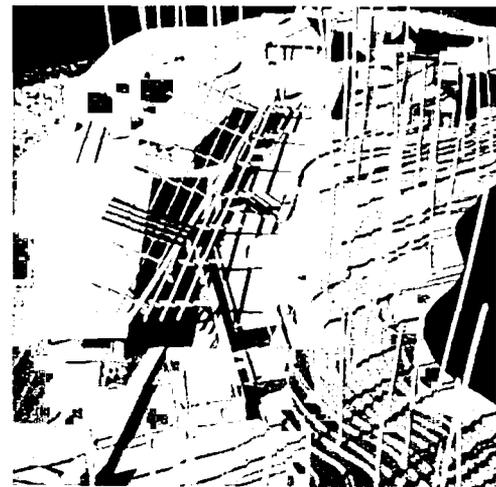
Figures 5, 6 & 7. Gallery design as part of the 2001 Glenn Murcutt Master Class (by author, Ivelisse Otero and Craig Tan)

Entailments associated with "*architecture as furnishing a larger room"* include such notions as:

*   Our environment is comprised of spaces that have room-like qualities (a bowl-shaped meadow; a clearing in the forest); our environment is made up of rooms

*   Outdoor rooms have an ability to provide some measure of human comfort and protection

*   Architecture can be made up of sets of furnishings

*   One arranges sets of architectural elements in a room

*   Architectural elements may be repositioned as per user needs, changes in conditions (climatic, other), etc.

*   Architecture can be lightweight, perhaps portable

*   Architecture should be functional, ergonomic and comfortable

A first critical presupposition at work in the notion of architecture as "furnishing with particular purpose this larger room we are in" is that the environs of a building project have room-like qualities, and the furnishings we employ are participants in this context. Before designing, one of our first tasks should be to observe and identify the size, complexity, orientation, materiality, structure and quality of light of this room, as these qualities have a profound ability to condition – shelter, screen, brighten and envelop – the to-be-designed

subspaces that will serve as the nexus of human activity.

A second critical operation is the assigning of characteristics to traditional architectural elements we more typically attribute to contemporary furnishings, qualities such as unpretentiousness, economy, lightness, and even portability. Furnishing-like building components such as window and bay assemblies, awnings and shade elements, walls, partitions and screens can be configured and modified to allow sensitive, comfort-providing adjustment in an elegantly purposeful way. Thoughtfully located, flexible furnishing-like building elements should result in a greater responsiveness to the surrounding room versus a distancing of automation; *we position our furnishings advantageously given what is there.* These furnishings serve as the interface between sheltered and preexisting space, where desirable environmental phenomena – cooling summer breezes, winter sun, etc. - are admitted while undesirable *phenomena – rain and hail and direct summer sun* - are prevented from entering inside.

In his work *The Body in the Mind*, Mark Johnson maintains that

"We almost always superimpose a container schemata on our center-periphery orientation. Where we draw the bounding container will almost always depend on our purposes, interests, perceptual capacities, conceptual system, and values. But we tend to define both our physical and mental identities by virtue of their containment." (23)
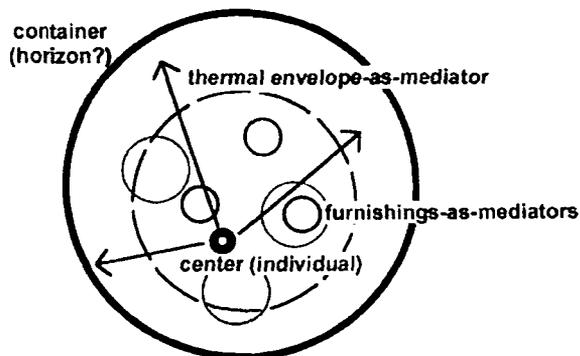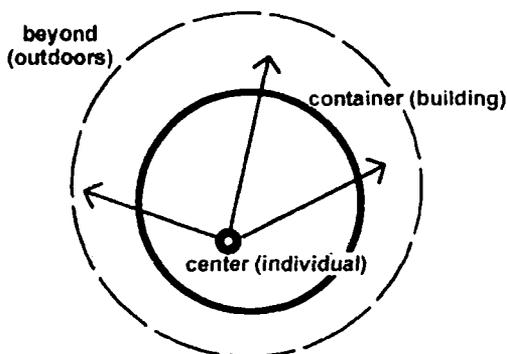
Figures 8 & 9. Traditional center-periphery orientation (L) & extended containment with "architecture-as-furnishings" (R)

As embodied creatures we are containers and perceive ourselves as contained by entities in our surroundings. It is possible for us to adjust our perception of containment, such as with the notion of "architecture as furnishing this larger room," where a built entity no longer contains but rather mediates between our (container-like) selves and a larger (bounded) entity. Our primary inhabitation becomes an environment, a horizon, a landscape under the stars. A fluid, mobile connectedness is intimated as a basic way in which humans engage with the world, (re)calling to mind Murcutt's notion of architecture as "encampment" and inviting Karsten Harries' claim that "we cannot really be at home in the world as long as we fail to accept that we are wayfarers, nowhere fully at home." (24)

Architectonic of the Intraworldly

"The architectonic brings intraworldly events back on the plane." –Maurice Merleau-Ponty (25)

If we agree with Van der Ryn that "design is a hinge that inevitably connects culture and nature through exchanges of materials, flows of energy and choices of land use," then conceptualizations of architecture described above might help to encourage disclosure of and graceful engagement with exchanges previously obscured, when for example sun and wind and light come into contact with beings as conditioned by the elements that comprise works of architecture. (26) A work of architecture becomes envisioned as resourcefully abundant assemblages of networks and flows that concentrate at loci of human activity. Not only spatial and formal conditions are acknowledged but other,

dynamic qualities as well, as Harrison Fraker suggests;

"A complete understanding of the relevance of passive concepts on architectural form goes beyond the formal analysis of visual qualities alone. It requires perception ... of thermal and luminous phenomenon that are not visible in the same sense as architectural space. *Boundaries in the thermal or luminous environment are subtle and not sharply defined.*" (27)

Whereas *Architecture as Building* emphasizes an iconic image – the singularity and static fixity of a work, *Architecture as Organism* and *Architecture as Furnishing a Larger Room,* in demanding recognition of something beyond the work itself, suggest critically that the task of the architect is an *intertwining of making and world* that conditions intertwining of (human) organisms and environment. Architecture becomes *activated,* an understanding that resonates with Ricoeur's very notion of metaphor; "to present all things *'as in act'* – such could well be the *ontological* function of metaphorical discourse, in which every dormant potentiality of existence appears *as* blossoming forth, every latent capacity for action *as* actualized." (28)

Buildings are neither beings nor stools, yet what possibilities such incongruities open up! Language intervenes and activates, strict interior conditions and controls loosen, (minor) fluctuations become tolerable - even desirable, and dynamic, expressive opportunities emerge. Forms relax (weaken), interactions intensify, clients sail. Inhabitation holds together – "tensions" – architecture's efficient multiplicities.

preliminary explorations   organism metaphor   allowing relaxation
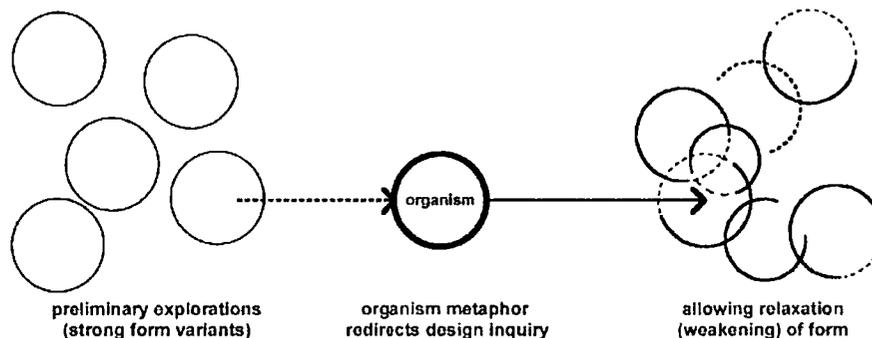(strong form variants)   redirects design inquiry   (weakening) of form

Figure 10. Architecture as Organism: crystallization of intention encourages weakening of form

Watermarks and Interdigitation

Consciously or not, in employing metaphors as part of the design process, architects frame an awareness of (certain) conditions that influence the direction of future explorations. It would be worthwhile, therefore, for architects to examine their basic presuppositions as (metaphorically) expressed in daily encounters and interactions with colleagues, consultants and clients. It might also prove to be richly rewarding to explore unaccustomed notions, to invite new manners of thought so as to reshape practice. I might suggest two ways to go about this:

Extending and Compounding Green Metaphors

Merleau-Ponty's intimation of the organism as "watermark," that "global reality is delineated like a watermark" suggests fragility and semi-visibility, delicate impression rather than overbearing expression. (29) As it is difficult to speak of a watermark without mindfulness of the paper on which it is impressed, perhaps we ought not speak of architecture without consideration of its situatedness, more than a 'site' but its presence and pressing upon the earth. What is the force of this pressing (the traces of depression)? Can the body of architecture recede as it presences, as with "Merleau-Ponty's project of foregrounding the body's value while explaining it as silent, structuring, concealed background"? (30)

Extending One's Field of Concern so as to Summon New Operative Schemas

Much research is underway to develop alternative building materials, advance energy performance and more efficiently "harvest" on site resources so as to minimize problems "off-site." Yet little work has been done to understand the site-specific ecological impacts of architectural interventions. And while wildlife biologists and landscape ecologists are developing greater understanding of factors that contribute to ecological health and are learning how to "repair" landscapes - through habitat restoration, increased landscape connectivity, etc. - their efforts seldom address the building "footprint." How might an architect's articulation of the design task evolve by borrowing from ecological understandings with greater precision, concepts such as "peninsular interdigitation," patch/matrix "breaks," and "edge/corridor

effects"? (31) What "ecotones" – methodological and spatial overlap zones – might be generated in describing the problem anew? What new sorts of architectural ecologies – of benefit to humans and non-humans - might result?

Conclusion

Ideas about metaphor and design discussed in this essay presuppose that design influences our prevailing beliefs (ethos) and prevailing beliefs influence design in a cyclical process. The tinkering, exploration and play that is characteristic of design in its preliminary stages adopts in part what has taken place previously, but is also inevitably, given peculiarities of time, place and people, an attempt to create something new. What is created is visited, described, disseminated and subsumed by members of the culture, folding in and affecting prevailing beliefs. Metaphors intervene in this process, entering the circle at precipitous moments and deepening incisions of meaning, both for works of architecture and the ethos they signify.
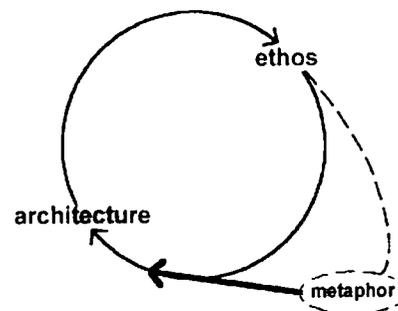

Figure   11.   Metaphor   (re)entering   the ethos/architecture atmosphere

Our most widely shared descriptions of what architecture is (and how to go about making it) – a foundation of culture, a "castle," a "machine for living in," and very likely the idea of a building itself – are contingent and have been promulgated via metaphorical insight. If a primary purpose of metaphor is "to bring to light new resemblances the previous classification kept us from seeing," given the incongruity that many sense exists between built entities - that are fixed, static and sluggish - and our understanding of the world - as active, dynamic, simultaneously

disclosing and concealing, the very incongruity of the metaphors we have discussed might prove fruitful in animating our discourse and in evolving our thinking as to what architecture can be. (32) Architectural innovation is instantiated through inventive, concerned description of the kind of environment – active, inclusive, diverse, fragile – we see value in making. "The natural world can become... an object of veneration if it is first an object of thought, as the prototype of coherence." (33)

Notes

1) Gaston Bachelard. *The Poetics of Space.* Boston: Beacon Press. 1994 (originally published 1958): 59.

2) Clifford Geertz. *The Interpretation of Cultures.* New York: Basic Books. 1973: 210.

3) For those familiar with the work of George Lakoff and Mark Johnson, in particular their book *Metaphors We Live By*, my indebtedness should be clear. The systematic framework for clarifying the pervasive influence of metaphors in our thinking developed by Lakoff and Johnson sharpened and directed the observations in this essay as to the manner in which language intervenes in the architectural design process.

4) George Lakoff and Mark Johnson. *Metaphors We Live By*. Chicago: University of Chicago Press. 1980: 158.

5) Paul Ricoeur. *The Rule of Metaphor: Multi-Disciplinary Studies of the Creation of Meaning in Language.* Robert Czerny, trans. Toronto: University of Toronto Press. 1977: 211.

6) George Lakoff and Mark Johnson: 10.

7) George Lakoff and Mark Johnson: 18.

8) George Lakoff and Mark Johnson: 59.

9) David Abram. *The Spell of the Sensuous.* New York: Vintage. 1996: 84.

10) George Lakoff and Mark Johnson: 145.

11) G.Z. Brown. *Desirable Interface Characteristics of Knowledge-Based Energy Software Used by Architects.* Saint Louis: ASHRAE Annual Meeting. 1990: 1-2.

12) George Lakoff and Mark Johnson: 17.

13) It can be debated the extent to which the association of knowledge with light is universal (shared by embodied humans with the capacity of vision in the presence of light) or whether this conceptualization is rather a paradigmatic *Enlightenment* concern for heavenly truths and detachment from earthly concerns.

14) George Lakoff and Mark Johnson: 139.

15) Bruno Latour. *We Have Never Been Modern.* (translated by Catherine Porter). Cambridge, MA: Harvard University Press. 1993: 32.

16) I would like to thank to Rob Pena, project architect on the Draper Hall project, for furnishing documentation on this and other works by Van der Rijn Architects.

17) Please see my paper *"Archipelagoes of Weak Formed Buildings: Contemporary Ecology Informing Contemporary Architecture,"* American Collegiate Schools of Architecture Annual Conference, Miami, FL, 2004 for a more thorough consideration of the IBN. The description is a firsthand account as I worked for Behnisch & Partner from 1993-1997 and was a lead member of the IBN design team from the competition phase through construction.

18) Mark B.N. Hansen. *"The Embryology of the (In)visible,"* in *The Cambridge Companion to Merleau-Ponty.* Cambridge, UK: Cambridge University Press. 2005: 239.

19) Mark B.N. Hansen: 239.

20) Robert Mugerauer. *"Deleuze and Guattari's Return to Science as a Basis for Environmental Philosophy,"* in *Rethinking Nature: Essays in Environmental Philosophy.* Bloomington, IN: Indiana University Press. 2004: 193.

21) Maurice Merleau-Ponty. *Nature: Course Notes from the College de France.* Robert Vallier, trans. Evanston, IL: Northwestern University Press. 2003: 234.

22) For a more comprehensive consideration of the work of Leplastrier and the context of this quote, please see my paper *"Lightness of Building: Furnishing a Regenerative Architecture,"* American Collegiate Schools of Architecture Annual Conference, Louisville, KY, 2003.

23) Mark Johnson. *The Body in the Mind: The Bodily Basis of Meaning, Imagination and Reason.* Chicago: University of Chicago Press, 1987: 125.

Karsten Harries. *The Ethical Function of Architecture.* Cambridge, MA: MIT Press, 1997: 166.

25) Maurice Merleau-Ponty: 250.

26) Sim Van der Ryn and Stuart Cowan. *Ecological Design.* Washington, D.C.: Island Press, 1996: 8.

27) Harrison Fraker. *"Formal Speculations on Thermal Diagrams," Progressive Architecture.* April (1984): 104.

28) Paul Ricoeur: 40.

29) Maurice Merleau-Ponty: 207.

Richard Shusterman. *"The Silent, Limping Body of Philosophy,"* in *The Cambridge Companion to Merleau-Ponty.* Cambridge, UK: Cambridge University Press. 2005: 162.

31) See Richard T.T. Forman & Michel Godron. *Landscape Ecology.* New York: John Wiley & Sons. 1986.

32) Paul Ricoeur: 197.

33) Paul Shepard. *Nature and Madness.* San Francisco: Sierra Club Books, 1982: 118.