architecture as response
An Idea of Nature

The elements of sun, wind and precipitation may instigate the making of buildings, but it is our assembly of nature into a collection of myths, sensory experiences and scientific observations that inspires the architectural response. To claim that nature is an idea before a physical reality is not, at least in this case, a venture into idealist philosophy. As a materialist—which it seems most environmentalists are—one believes that the physical world exists independent of one’s perception of it. It is the perception of that world as a unified, teleological (goal-oriented) entity that environmental philosophers and ecologists are now calling into question.

If we build according to an idea rather than follow actual conditions, we would do well to be on familiar terms with that idea. Of perhaps greater importance: if we wish to advance our practice by creating buildings that serve both humans and nature equally, we must be willing to replace an outmoded or destructive view of nature with a version that accepts humans as fully engaged participants. Our tendency to neglect this is what leads, arguably, to the denial of natural status to the settled realm.

It is possible to diagram something as fundamental and yet as complex as our relationship with nature, although I suspect that the simplification this requires reflects much of our current difficulties. At right, circle a represents all of material reality preceding human presence. Bisecting the form in circle b, the left side represents the realm claimed by humanity or “culture” while the right corresponds to what we regard as “pristine” nature or “wilderness.” Although presented here as equal domains, in the United States, for example, less than ten percent of the total land area is designated as wilderness, with arguably all of that undergoing indirect effects from human activity. Hence the call by purists that “nature” is no more. The arrow indicates this constant pressure we exert to enlarge our own domain, with the positive and negative symbols representing the debate regarding our penetration. Here is perhaps the most useful aspect of this model in that it illustrates how environmentalists and those who seek unfettered access both tend to place humans outside nature.

From our side of the diagram, we experience the whole through different means of recognition which are not absolute but continuously evolving. In addition to everyday observation, we also perceive the “otherness” of nature through our developing scientific blueprint, a collection of concepts we scrutinize for their ability to describe the properties of matter and energy, as well as the behavior of organisms. Within such a model, the two sides are locked into a state of contention as the ever-changing socially and individually constructed ideas of nature and culture that we carry in our minds and use to direct decisions about the world. As typically conceived, it is truly dichotomous: culture’s gain is nature’s loss, and vice versa.

The decision to frame the two areas as a single whole rather than two reflects my own need to understand nature as unified in its overall scheme and humans as nature’s products. The puzzle of consciousness I embrace as its own cause for duality—a circumstance of human identity that composes the boundary as an automatic effect of our being.

When architect William McDonough speaks of two world “metabolisms” where “nutrient” flows are divided between the technical (human-made) and the biological, he is using a similar nature-concept. By suggesting that we close the cycles of these two flows in order to “eliminate the concept of waste,” he is making a comparable observation about humans as part of nature but acting in such a way as to require their own distinct part of the diagram.39 The inherent problem with circle b, however, is not only its
simplicity, but its clarity. In the end, neither side of the debate can deny our unique role, regardless of the ends to which it might be put.

Developing the model away from a dichotomy towards what I would describe as a more accurate representation of material reality, circle e indicates human action as an implicated yet distinct subset of nature’s whole. On balance, I sense that sustainable behavior requires that building eventually take place on that conceptual border between culture and nature, for despite the intensity of our efforts, we cannot leave culture behind. Finally, in circle d, a square indicates the frontier between "first" and "second" nature, altered from a circle to illustrate human distinction. The smaller circle upon it indicates the position of the architecture I envisioned for this project, a product of and for both regions that in multiple ways becomes the border between culture and nature.

In short, the biomorphic form my clients envisioned seemed to propose that human acts can occur independently of their cultural contexts. Not until we break from a paradigm of ontological difference where human ideality operates in isolation will we see ourselves as fully implicated in the environment. Peeling away the veeners applied by history, we impart nature with true existential status, unscripted and non-teleological. Such a condition, dislocating and threatening as it may be initially, will eventually allow for new myths (or the return of old ones) which are in synch with a world-view that strives for greater human/nature correspondence.

In the final analysis, we must see culture as nature. Otherwise, we will only oversee a steadily shrinking preserve from our isolated realm of artificial exemptions.

The yin yang symbol has served as a reminder of the interpenetration of culture and nature for centuries.

At this point I could sum up my views with four operating principles:

One’s idea of nature is always a matter of perspective based on a combination of mythic, sensory and scientific information.

Architecture, whether intentionally addressing an idea of nature or not, is in many ways a response to that perspective.

Correspondence between one’s ideas of architecture and nature is essential to the creation of architectural meaning within an ecological perspective.

Conceiving of ourselves as part of nature frees us from the impression that we can only evoke nature through symbolism, analogy or other referential means.
Architecture as Response

Just as John Ruskin held that we “cannot remember without buildings,” neither can we build without revealing our perceived place in nature. Such revelations, regardless of whether they are consciously examined during design or not, are the mold in which we cast our architectural ideas. Whatever we build, it can now be understood as part of an array of successive scales that range from the immediate site to the containing region, and lastly, to the imprecise idea of the environment in its totality. Where such scales begin with the tangible and the concrete, they eventually lead to the abstract global concepts that works of “green” architecture must negotiate in order to achieve meaning. This is what makes the signification side of environmental architecture so subtle and difficult to contend with, both as a designer and a user.

But are buildings natural? Or are they only the products of “second nature,” and as such, artificial by definition? Likely only a matter of semantics, such a question can still only be addressed within the confines of a particular narrative or world-view. Again, within the naturalist’s perspective it follows that if humans are nature’s products then our constructions are too. Perhaps the real value of this line of questioning is perhaps the inverse: to what extent are our buildings artificial? To what degree do they ignore or exclude the region outside the cultural zone of the diagram? In terms of re-usability (either by humans or other organisms), the rapport a building has with its surroundings and the degree to which it utilizes renewable energy could plausibly determine such a quality of artificiality. Buildings that are conceived and constructed with the same idea of nature as most television sets, which function only in the cultural realm due to their inability to bio-degrade or draw power directly from their surroundings, might be viewed as much more artificial—and therefore less natural—than the iconic log cabin for example.

Amid all this metaphysical ambiguity, the human-free designation of “wilderness” has become the point of reference against which we typically measure degrees of naturalness in the landscape. This was an important point for my clients to understand and would eventually lead them to determine the kind of human presence they were willing to call “natural.”

This proved a difficult point to illustrate, however. During a later visit to the area, I looked for a tangible example, a human artefact in which nature and culture converged though still maintained their recognizable qualities. What I settled on I found near the project site itself—a trail marker or “cairn,” that when stacked simply and to ends of pure utility, appears to be as natural as it is cultural. Here was a point on the boundary line of my nature-concept diagram.
Yet no human structure can completely merge with its site and still be reasonably regarded as architecture. Much of the conundrum this presents is contained in how we use the word "artificial." Employed to mean both "human-made" and "non-natural" simultaneously, the term is concisely reflective of the conceptual and physical wedge we have driven between ourselves and the rest of nature. That artifice could ever be considered natural, with humans included in natural systems, is prevented by the word's primary use in describing things as false, alien or ersatz.

Artist Andy Goldsworthy’s stone, ice and wood cairns provide a refined example of an act of artifice that appears to have natural status. Qualitatively similar to the rest of his sculptures, his cairns are unique in that they are also an established sign. They succeed artistically not because we mistake them for the construction of another creature, but because they convince us, however briefly, to mistake ourselves as such. In that regard, their power seems to be their ability to release us from human-centered experience just long enough to view our existence in nature for its integrative attributes. Where building what nature builds is an act of mimicry and concealment that denies our labor participation in its own cultural discourse, the cairn represents an example of building as nature builds, by working within the natural world according to need and ability.

Aided by this notion, I began to see the house as a responsive and responsible human presence, an acceptance of natural citizenship within both spheres, culture and nature. An architectural conversation that tries to be strictly about culture, or vice versa, we agreed was not as interesting as one in which there was a sense of activity across the diagrammatic boundary, an activity or quality we called “reverence.”
The Ecological Analogy: Function and Context

My first response to my clients’ desire to appropriate natural forms was to warn them of the risk of falling into the constructional difficulties associated with the organic “style.” This involved the repeated suggestion that as nature usually takes the shortest path, so too do we by relying on orthogonal frameworks. At the same time, I was careful to stress that architecture, like other art forms, separates itself from the potential blandness of purely Cartesian lines by treating material and the sensitive handling of its condition as both means and end. The biomorphic, curvilinear vocabularies they were interested in using are suspect not only for this reason, but because they tend to provide little connection to the traditions of the culture that creates them. This was a matter I began to press as fundamental as far as relating the building to the fabric or ethos of their site. Author and architect Sidney Robinson made it to the heart of the matter with his observation that “nature is somehow at the heart of organic architecture, but as a referent, not an origin.”

Yet at the foundation of the Western architectural tradition remains a 2,300 year-old idea that in particular appliances encourages the observation of nature as a model for artifice. It is also an elegant articulation of a nature-concept in the sense that it infers a supposed dualism or separateness between nature and artifice. The organic analogy first developed through two basic interpretations, the “compositional” and the “functional,” since its earliest descriptions in classical texts such as Plato’s Phaedo and Aristotle’s Poetics. Initially concerned with the aesthetic qualities that emerged from the composition of elements within visual and rhetorical media, the analogy was drawn from the basic observation that beauty in organisms was greatly related to their tendency toward unity. This was transferred to artifice by pursuing similar qualities such as wholeness, harmony and cohesive-ness between elements. Perhaps the most widely referenced aspect of these observances is the rapport of part to whole, where the former is shaped by virtue of its internal consistency and visual clarity within the latter. As this developed quantitative dimensions, the study of proportion and proportional systems within the part-to-whole relationship took on a primary role in Western aesthetic and architectural theory.

Functionalism

Partially inspired by a reverse comparison with mechanical devices, a subsequent functional interpretation of the analogy looked beyond visual organization and coherence to matters of purpose and utility and how these govern form. Although later established as a means of divining scientific principles, this line of questioning remains a primary avenue of aesthetic inquiry. Maintained as the aesthetics of functionalism, the equating of the beautiful with the useful or the expression of usefulness continues to monitor the sciences and their subject matter, making ana-tomical study and its catalogue a rich area for designers, architects in particular. Usually credited to Louis Sullivan, the maxim “form follows function” is more accurately attributed to French zoologist, Jean-Baptiste Lamarck (1744-1829), who as a forerunner of evolutionary theory was the first modern scientist to look for actual physical principles behind the differences in species. But while Lamarck became consumed with his flawed notion that acquired traits could be passed on, his more successful contemporary, Georges Cuvier (1769-1832) was publishing on his principle of the “correlation of parts,” an anatomical theory that determined that there was a “necessary and functional interdependence between the various organs” such that the anatomy of an organism forms a “single system.” This was essentially the organic analogy of Aristotle re-stated in a modern scientific context, but the effect such observations would have on architecture went far beyond the impact Aristotle had on the building of his day.
When applied to design, the geometric elegance of a structure such as the Parthenon—until then believed to be of proportions that were free of material limitation—was now understood as inseparable from its physicality, and according to the organic analogy, now belonged just as much to the material world as to that of the geometric ideal.

During the later Romantic period, the functional interpretation of the analogy surged as the escalation of biological study coincided with the analogy’s use as an integral conceit of literary criticism and art theory. With the concept of an affecting environmental context now taking shape across multiple fields, the virtue of “fitness” began to attract great interest as an aesthetic quality. The first to articulate this within the study of art was the American sculptor Horatio Greenough (1805-1852). By stating that, “I contend for Greek principles, not Greek things,” Greenough condemned the spread of Neo-classical and eclectic architecture from Europe and implored his countrymen to return to the Aristotelian conception of the organic analogy. In what appears to be a combination of Aristotle’s views on natural history and the findings of Lamarck and Cuvier, Greenough describes a functionalist aesthetic that defines beauty as simply “the promise of function.”7 Although he follows the classical organic description of natural development moving from interior to exterior and part to whole, his examples of isomorphic success are drawn mainly from machines and water-craft. These would become seminal thoughts in the later formation of the most concentrated form of the functional interpretation: the “machine aesthetic” of the twentieth century.

Ecological Analogy

Whereas the classical organic analogy concentrated mainly on the internal dynamics of natural formation as manifest within the body and consistent with its cultural foundations in animism, a more modern version would begin to suggest that in that bodies are shaped equally from without by other bodies and external conditions of climate and micro-climate, so too might artifacts and buildings be considered similar (although not identical, hence the preservation of the analogy) products of their immediate environments. Just what is “immediate” is, of course, the crux of the current debate.

Working outward from the general observation that natural beauty involves an interdependent relationship between part and whole, the recognition of function and the further observation that material and size determine proportion and shape, we eventually arrive at the ecological analogy, which recognizes that natural bodies are part of larger wholes and that they too exist in interdependent relations with other bodies. From this it can be derived that each system has its own set of unique organizing principles which, through its constellation of elements (cultural entities included), seeks a balance. As we enter these systems, we change their balance. Therefore, much of the skill of
practicing architecture from an ecological perspective will be in the comprehension, determination and execution of new balances and their compatibility with other systems, and, ideally, with the ultimate system of the biosphere itself.

Perhaps a casualty of romantic idiosyncrasy, the current usage of "organic" typically describes nature only by its non-linear appearance. As a consequence, we seem to have lost its ability to express basic similarities between natural and human objects in an objective, operational way. Whereas in the nineteenth-century Samuel Coleridge could still succinctly explain Shakespeare's plots as functionally "organic" in the sense that they contain no superfluous elements, today this would likely require explanation in order to prevent readers from envisioning naturalistic imagery. This is where the notion of imitating natural process and not natural form begins to achieve its meaning.

As a guide, I asked my clients to consider the role of non-human nature according to four applications of the classical organic analogy:

**as a way of shaping the composition**

**toward qualities of wholeness**

**as a guard against superfluous elements**

**as a guide for evaluating integral fitness**

**between the building and its site(s)**

**as an example of natural process**

Regarding this last consideration and its translation into architecture, I asked them to see the processes behind natural forms for their universal aspects of openness, economy and contingency. If there is a characteristic which all landforms and organisms share, it is that they have no reason to conceal the method of their constructions. On the contrary, nature is an open book where matter, information and energy come together freely over time. That there is order in this we must realize is likely as much a function of our own perception as it is an emergent property within nature. Whether this is because the human brain is "hardwired" to recognize patterns and produce order, or that we simply reflect an ordered universe, organic aesthetics are likely more natural for us than for nature. Although natural processes may appear to us to take place in a controlled layering of discrete, sequential events, what makes them so difficult to emulate is their apparent disorder.

To give them a sense of my point at a simple level, I directed them to the creek and how it had created its curving path through the mountains by eroding the outside of the bends while building up deposits on their inside. Finding a beaver dam during a hike in nearby Avery county, we observed the way the animal reveals itself through its shelter-making, the logs reflecting its size as determined by what it can cut and transport, for example. Of specific interest were the teeth-marks on the log ends and how they represented the same integral decoration humans prize as the "mark of the tool."

1-2 Beaver activity in nearby Avery county
3 Turned and gouged bowl, David Pye
4-5 Familiar examples of North American indigenous architecture
Again, to build as nature—that is, according to an unbridled innate ability—is to proceed unfettered, challenging the rest of the physical world to provide an eventual (and indifferent) means of balance. This is why "sustainable" architecture is such a new thing in the world, as it reflects an awareness of impact as well as the gesture of correction. We have only to look at examples of indigenous housing to see a purely utilitarian naturalness in existence. As far as these structures may or may not reflect the nature-concept of their builders, they are indisputably architecture. But pure utility is only part of our experience in nature, and certainly not the only reason we dwell there for pleasure. In that our survival in both realms demands a certain expressed duality between ourselves and the elements, as does that of all species, we remain challenged to build like the rational animals we are: free, yet aware of the earthly constraints and rhythms that our greater knowledge reveals. Thus it would appear that we “draw” the organic analogy whenever we pursue an idea of nature through design, and in the process imply distance between ourselves and the rest of nature.

Ultimately, to be natural is to allow innate processes to occur. Yet a critical aspect of our evolution would now seem to be the self-policing behaviors that make sustainability possible. In the spirit of this, I suggested that my clients imagine the house not as an organism but as a natural feature of the landscape brought about by an organism possessing knowledge of the total system that contains it. Behind this was the hope that they would begin to think of their house as not only resulting from the same sort of processes that shaped many of the surrounding features (human products included), but as a unique creation with a genesis and "phylogeny" all its own. I wanted them to recognize in each instance the qualities of directness and the way elements tend toward traceability, as well as how the dimension of time is in some way always evident.

All part of an effort to convince them to restore some key facets to their term “organic,” I suggested they think of the analogy as a means of validating our own natural task of constant resistance, whether this be to seek “uniformity amidst variety,” or security amidst chaos. All life must establish a reliable and relatable means of fending off the rest of nature, or perish. By that I meant that an analogy’s inference of a condition of duality relates human activity to the mystery of nature while at the same time it implies that separation exists between the two. “Analogy” by definition is simply a way to correlate things from different and somewhat un-related categories of being, where their distance can only be bridged by the use of symbol or some other similarity of aspect. Whether we as builders engage nature functionally or conceptually through symbol and imitation, the analogy we “draw” becomes a record of the interface.

As a final exercise, I asked them to use five words to describe themselves in as objective a manner as they could. They chose:

- intelligent
- rational
- vulnerable
- orderly
- sensual

Now willing to think of their house as the expression of an exceptional though fully integrated entity in terms of the land, we proceeded to use their list of qualities to guide a first set of sketches.
Drawing the Analogy

As a manifestly holistic process, how a design begins to some degree determines how and where it arrives. As the first act of the design process, a drawing constitutes the reflection of our creative intentions by expressing the operating models within the mind that we use throughout the progression. The challenge would seem to be how one carries the openness and traceability of the sketch through to the final result while concurrently bringing select aspects to the process to a close. Equally important is the preservation of these paths of development, not only in terms of documentation but in the design itself. This must be accomplished without compromising one’s findings so as to lose track of the core concept. The art of architecture, then, would seem to begin with the ability to sketch honestly and intelligently.

Before putting pen to paper, I made a distinction between two different modes of drawing: the diagram, which represents the relations between ideas and objects with equal effectiveness; and the sketch, which mimics sight by employing perspective. Whereas a diagram can focus mostly on relational and active aspects and may or may not bear any resemblance to the final form, the strength of a sketch is its ability to unite form and concept by providing something to evaluate according to visual experience. Typically, the conceptual nature of the diagram precedes the concreteness of the sketch, thereby crystallizing early ideas before material or structural considerations are brought into the process. In this way there is almost a natural order to a design’s early stages, where the diagram leads the sketch which in turn renders the diagrammatic idea. It is this attention to the relation between parts that makes the diagram so indispensable before and during the schematic phase.