Cover image: C. Gaspar from vintage Hollywood set photo, courtesy of John Divola

Title page image: A. Marcus

thresholds 26

denatured

PRINTING

Printed by Kirkwood Printing, Wilmington, MA. Body text set in News Gothic MT, titles set in Futura, cover title set in Coronet, digitally published using Adobe InDesign

Contents

Andrew Todd Marcus

Introduction
On Thoreau, Walking, & Nature

Environmentalists across the gamut of movements widely quote Henry David Thoreau's writings in the service of a call to ecological action. "In Wildness is the preservation of the world" – a clipped quote from the short essay "Walking" – has become a rallying call to ethical stewardship, management, and preservation of some ill-defined nature. This reading of Thoreau fundamentally misappropriates his definition of "wildness" and the spirit in which he uses the word. It confuses wildness with wilderness and assumes an allegiance to an objective environmentalist end. In fact, Thoreau's ideas are more in concordance with the concept of the rhizome, smooth space, and nomadism as proposed by Gilles Deleuze and Félix Guattari.

Thoreau's writing deserves a place in modern discourse in the hope that his wildness may reveal a method for reading, writing, and understanding nature and the cultural landscape. This wildness, a form of extreme self-consciousness, requires what Peter Fritzell calls "a tolerance for ambiguity that is very difficult to sustain. It is, in essence, a dedication to paradox, and even an occasional delight in uncertainty, that can be extremely unsettling."[1] It is this ambiguity that *Denatured* hopes to investigate.

Thoreau, Walking, and the Instantaneous Redefinition of Nature

In some sense, the act of walking as described by Thoreau embodies a worldview oddly placed in intellectual history. In the midst of the Enlightenment and at the dawn of the Industrial Revolution, Thoreau called for a dynamic understanding of nature that transcended the contemporary emerging discussion on environmental issues. Modern environmentalism, a product of the sensibilities of Pinchot and the romanticism of Muir, embraces Enlightenment conceptions of objectivity and rationality and finds itself mired in the twentieth century discourse of social and power relations. Fritzell suggests that the dominant rhetorical stance of applied science, environmental dis-

course, and writing about nature is fundamentally positivistic and representational.[2] While Thoreau's conception of nature found its stylistic roots in both eastern philosophy (especially Hinduism) and European romanticism, his description of walking is fundamentally outside of the positivistic dialectics that enforce and entail a view of relations between language and experience in which words are devices of representation. Thoreau's text is, in its constant self-examination, more akin to Barthes, Foucault, and Derrida and their denial of the objective nature of discourse. Unfortunately, the legacy of post-modern discourse is a malaise of sorts, unable to assign value to ideas, and devoid of ethics. Thoreau's walking begins to provide some ground for ethics, and more than ethics – an inner experience of spirituality more akin to Bataille – which has been seemingly lost in modernity.[3]

Thoreau begins his treatise on walking by diminishing the importance of civil freedoms. He seeks to "speak a word for nature, for the absolute freedom and wildness" therein.[4] He presents the walker as *saunterer*, and locates him outside of Church and State and People. It is here, alone, that the walker must face Fritzell's ambiguity, *sans terre*, without a land or home, but equally at home everywhere. To even begin a walk, one must be prepared to cast off one's entire history, both civil and personal:

> The thought of some work will run in my head and I am not where my body is – I am out of my senses. In my walks I would fain return to my senses. What business have I in the woods if I am thinking of something out of the woods?[5]

In every sense, Thoreau demands an absolute commitment to walking, so much so that he implicates the entire self in the act and can accept no alternative.

Much has been made of Thoreau's understanding of locality, but as he discusses the walks within a ten mile radius of his home his interest is not in viewing linked points and setting destinations but in an evolving relationship to the

land. For Thoreau, the space through which walking transpires constantly folds. Points may remain, but trajectories redefine themselves on each walk, and while the same raw material remains, the state of the walker is in flux. So then, a walk unfolds not in allocation of space, but in internal re-experience. This unfolding takes place, largely, outside of the village (or, as Thoreau's etymological study suggests, the place where many walks converge.) The space occupied in a walk defies linearity and striation, and though it may turn in on itself or down a previously abandoned road (such as the case with the poem "Old Marlborough Road"), new meaning is constantly discovered.

Ethics, Responsibility, and the Genius of Knowledge

The responsibility involved in walking is found not so much in where to walk, but how to walk:

> What is it that makes it so hard sometimes to determine whither we will walk?...There is a right way; but we are very liable from heedlessness and stupidity to take the wrong one. We would fain take that walk, never yet taken by us through this actual world, which is perfectly symbolical of the path which we love to travel in the interior and ideal world; and sometimes, no doubt, we find it difficult to choose direction, because it does not yet exist distinctly in our idea.[6]

Thoreau concerns himself primarily with internal direction, and relies on nature to provide the ethics of the walk. We are, in fact, "part and parcel to nature"; that is, on the fractal boundary of the ever-changing with the whole of our options understood instantaneously within the moment of advancement. Nature itself provides all the information a walker needs and allows the walker to transcend the path behind and enter into the very order of things. The responsibility, then, is not in the surveying out of space and laying of lines (or the organization of knowledge,) but rather in the attentiveness to subtle changes and the acquisition of new, indeterminate knowledge.

> Genius is a light which makes the darkness visible, like a lightning's flash, which perchance shatters the temple of knowledge itself,—and not a taper lighted at the hearth-stone of the race, which pales before the light of common day.[8]

Genius, a sort of communion with nature, shatters knowledge and tells us that we know nothing. More truly, it informs us that what we thought we knew is but a scion of that which there is to know. Onwards and ever expanding, linearity collapses and nature moves in all directions simultaneously. This also denies the need for a predictable and traceable direction of knowledge within history. The practical upshot of such knowledge of nature is not to get lost in possibility and deny purpose, but to spread purpose outward in infinite directions. So, one may walk many places at once and inhabit many landscapes, some folding in on themselves and reintroducing knowledge to the feedback loop, and some moving steadily outward. Thoreau, then, "demands something that no culture can give," for no store of knowledge can keep up with one who walks as part and parcel to nature.[9]

This expansion is essentially reflected in the rhizomatic idea of Deleuze and Guattari. The rhizomatic principles of connection and heterogeneity, multiplicity, and asignifying rupture all hold true in Thoreau's walking, meaning that any point of a rhizome can and must be connected to the whole. This is the embodiment of the part and parcel of nature that Thoreau expounds. Nature, described for the single walker, is described for all. The multiplicity, in its substantive sense, loses a subjective/objective relationship to nature, for the individual walks (of myriad walkers) retain independence only insofar as they are discrete directions of growth. The asignifying rupture and consequent regrowth is found in Thoreau's understanding of progress.

Such motion is outward, and transcends an enlightenment science that moves only forward. The scientific method, hampered by its own boundaries, then becomes merely useful, and can offer no definition of nature. It is concerned, by definition, with what is already conceivable and can only move outside of itself through the wild actions of those who are both genius and scientist, those prepared to shatter knowledge, or more likely, unconcerned with knowledge at all. These scientists become, as it were, walkers. Thoreau is calling for an expanded contact with nature – a continuous evolution in the place of strict linearity of purpose:

> [A] Knowledge useful in a higher sense: for what is most of out boasted so-called knowledge but a conceit that we know something, which robs us of the advantage of our actual ignorance?...My desire for knowledge is intermittent, but my desire to bathe my head in atmospheres unknown to my feet is perennial and constant. The highest that we can attain is not Knowledge, but Sympathy with Intelligence.[10]

Thoreau, then, places the walker on a sort of border life. He intimates an ethics of walking, and, consequently, an ethics of the search for and use of knowledge. T.S. McMillin, in *Our Preposterous Use of Literature*, suggests that Thoreau's approach towards reading smoothly makes the transition to walking, and, if "reading is nothing other than a method of thinking [and] of gathering the world;" it is essentially a form of walking.[11]

Walking in the Space Between

Thoreau's call for a constant redefinition of nature is as Fritzell promised, ambiguous and difficult. Deleuze and Guattari, while making similar observations, demand less and elucidate more. It is in the juxtaposition of the three writers' conception of nature that a true ethic may be revealed.

Jaques Derrida, in his essay "Différance", offers a crucial link between Thoreau and Deleuze and Guattari:

> Finally, a strategy without finality, what might be called blind tactics, or empirical wandering if the value of empiricism did not itself acquire its entire meaning in its opposition to philosophical responsibility. If there is a certain wandering in the tracing of différance, it no more follows the lines of philosophical-logical discourse than that of its symmetrical and integral inverse, empirical discourse. The concept of play keeps itself beyond this opposition, announcing, on the eve of philosophy and beyond it, the unity of chance and necessity in calculations without end.[12]

The concept of différance situates itself in the space between, in the smooth space of Deleuze and Guattari's nomad and in the scope of Thoreau's walk. Play allows a movement in the space between and moving through Thoreau's literal sunset to Derrida's eve to Deleuze and Guattari's rhizomatic nose, and here we find that "unity of chance and necessity in calculations without end" that allows Thoreau endless walks and the nomad limitless speed. Thoreau, in fact, explicitly leaves room for play – for the uncertainty of the space between:

> I would not have every man nor every part of man cultivated any more than I would have every acre of earth cultivated: part will be tillage, but the greater part will be meadow and forest...[13]

Deleuze and Guattari discuss this same middle in "A Thousand Plateaus":

> It's not easy to see things in the middle rather than looking down on them from above or up at them from below, or from left to right it right to left: try it, you'll see that everything changes. It's not easy to see grass in things and in words.[14]

Smooth space takes advantage of this middle and leaves us with room for play in which to encounter nature. We set our lines of sight and so have intermittent, personal cataclysms. At these times, the technological or enlightened state (or, alternatively, the ever-expanding opportunistic global consumerism) appropriates the walking nomad into its war machine in a desperate attempt at self-preservation. It is through constant wildness, or refusal to be bound by the civilized apparatus, that Thoreau calls each individual to shorten the time between cataclysms and constantly redefine our participation in landscape – a sort of instantaneous evolution. The cultural denial of Deleuze and Guatteri's war machine is exactly what Thoreau means by "a wildness whose glance no civilization can endure." Civilization (and the clear path though the village) is the striated space that denies wildness.

Wildness in Design

Through Thoreau's conception of walking, I have explored how one may begin to read and experience knowledge and landscape rhizomatically. It is more difficult to conceive of how one may design and build architecture or landscape that embodies the smooth space of the rhizome. Architecture and landscape design does not seem to achieve true smooth space in that the viewer/inhabitant/walker's mind cannot be manipulated. The experience of a place, in plan and section, cannot necessarily draw a visitor or inhabitant into a pre-defined smooth space, and such a space is a self-denying paradox. Texture, light, and situation may begin to set the conditions for what Bernard Tschumi calls an "event-space", but ultimately the true experience of the smooth space is left to the observer.

If production and representation work to move the event-space closer to the moment of design and observation, a true smooth space of built form may be reached. That is, the process of design may become more important than the representation and the realization. While it is difficult to find examples of a building or landscape conceived to be in a constant state of design, we can look to the integrity of modes of representation as an indication, and the concept of a tracing and a map may be invoked.

> The rhizome is altogether different, a map and not a tracing....What distinguishes the map from the tracing is that it is entirely oriented towards an experiment in contact with the real. The map does not reproduce the unconscious closed in upon itself; it constructs the unconscious.[15]

The map can begin to mark smooth space by redefining space itself and examining dynamic events within space. A map must be redrawn as the landscape of the mind changes, and as the needs of the walker evolves. It is, however, more than a data representation. It allows and demands dynamism in its reading and its production, and refuses static interpretation. As the architect's conceptions of the intentions for the site change, the data is pliable and the map adjusts. But Deleuze and Guattari, in a constant dialectic, question their dualism and privileging of a map over a trace. In a true feedback loop, a map produces a

trace produces a map, and so the image is never at rest, only caught in a moment in time.

Denatured

In design studios students are asked to investigate ideas and come forth with a complete representation of their project. In the professional world, we construct buildings and landscapes, but little room exists to re-evaluate and redesign a completed project. We hope for sustainability through low energy consumption and low maintenance, but the investigation ends with construction and, if we are fashionable enough, the consideration of the design moves on to the critics.

The question, then, is how to design or write as Thoreau walks – at the tip of the rhizome, or on the edge of the myriad shards of an exploded ideology, and moreover, how to let the nature of our built form continue to evolve. Design education and contemporary theoretical debate deny this. As Deleuze and Guitarri point out, psychoanalytic theory and the expanding sphere of a global western culture abhor it. The articles in Denatured act, then, as a discourse only, and welcome the infinite new directions for the reader to walk, herein. Denatured proposes that, through an active dialectic, the work presented here can begin to illuminate the edges and folds of the space between.

Perhaps it is through the non-theoretical and non-intuitive that is the same time non-utilitarian that we may access the ambiguity of an ill-defined nature. For example, projects such as the library by Matthew Pierce and the works of Studio Granda as described by Pétur Ármannsson deal with nature on an ethical and spiritual level. Through their non-prescription and rugged refusal to align themselves with a theory other than an extreme and personal sensitivity to their physical place in the world, they are involved in constant observation, interrogation, and absolute receptivity. Alternatively, through Nataly Gattegno's Desert Oasis, we begin to understand how the process of making architecture is as vital to understanding nature as the act of building. Mark Goulthorpe and The Fab Hab Tree House examine different ways in which technology can aid us in understanding nature while Christine Cerquiera Gaspar and Stanford Kwinter question the very need for it to do so. Finally, Sanjit Sethi's artwork questions the impetus to examine the ambiguous in all of its impossible complexity.

For it is to be hoped that such an unfolding complexity and its concurrent motion brings assurance as well as spiritual tribulation, unleashing the possibility that we can "saunter towards the Holy Land, till one day the sun shall shine more brightly than it ever has done...and light up our lives with a great awakening light."[16] Though Thoreau's lofty language has found it's way into pop psychology and the self-help lexicon, it is well to remember that genius, even at its most pedantic and formalistic, is but a product of a mad enthusiasm for understanding nature.

Notes

[1] Peter A. Fritzell, *Nature Writing and America: Essays Upon a Cultural Type* (Ames: Iowa State University Press, 1990), 16

[2] *Ibid*

[3] "By inner experience I understand that which one usually calls mystical experience: the state of ecstasy, or rapture, at least of mediated emotion. But I am thinking less of confessional experience, to which one has had to adhere up to now, than of experience, laid bare, free of ties, even of origin, of any confession whatever." Georges Bataille, "Critique of dogmatic servitude (and of mysticism)" in *Inner Experience*, tr Leslie A. Boldt, (New York: S U N Y Press, 1988), 3

[4] Henry David Thoreau, "Walking" in *Walden and Other Writings of Henry David Thoreau*, ed. Brooks Atkinson. (New York: Modern Library, 1992), 627

[5] *Ibid*, 632

[6] *Ibid*., 637

[7] *Ibid*, 645

[8] *Ibid*., 649

[9] *Ibid*, 650

[10] *Ibid*, 657

[11] "Reading itself becomes the objective and starting point, the end and beginning of seeing one's way more clearly. Reading, therefore, does not simply mean running one's eyes over pages of writing, but seeing 'more clearly' the relationship between one's reading of books and one's reading of landscape. Reading is not something we do all the time but something we could (and should) do more often, if we would learn to see differently." T S. McMillin, *Our Preposterous Use of Literature: Emerson and the Nature of Reading*. (Champaign Univ of Illinois Press, 2000), 127-128

[12] Jaques Derrida, "Differance" in *Margins of Philosophy*, tr Alan Bass. (Chicago: University of Chicago Press, 1982), 7

[13] Thoreau, 656

[14] Gilles Deleuze & Felix Guattari, "Introduction: Rhizome" in *A Thousand Plateaus: Capitalism and Schizophrenia*, tr Brian Massumi. (Minneapolis: University of Minnesota Press, 1987), 23

[15] *Ibid*, 12

[16] Thoreau, 663

T. Scott McMillin

The Frolic Architecture of Snow
Building on Emerson's Drift

Emerson's Drift

"Extremes meet," Ralph Waldo Emerson wrote in his journal after a snowstorm buried Concord in December 1834. "Misfortunes even may be so accumulated as to be ludicrous. To be shipwrecked is bad; to be shipwrecked on an iceberg is horrible; to be shipwrecked on an iceberg in a snowstorm confounds us; to be shipwrecked on an iceberg in a storm and to find a bear on the snow bank to dispute the sailor's landing which is not driven away till he has bitten off a sailor's arm, is rueful to laughter."[1] The extremes that meet through compounding coincidence in this passage – "misfortunes" (the beginning) and "laughter" (the end) – are among many that occupy Emerson in his writing. Readers readily encounter such pairs of seeming extremes as Old World and New World, science and poetry, spirit and matter, interior and exterior, nature and culture. Although we might question Emerson's sense of humor (just how laughable is it to have one's arm removed by a bear?), the meeting of extremes raises some important questions. In a sense, extremes and the movement between them — and especially the space between what we tend to call nature and what we tend to call culture — constitute the very stuff of this issue of *Thresholds*. They are as well, I suggest, one of Emerson's primary concerns; in short, they amount to Emerson's drift.

It is a simple yet complex little word, drift. I used it just now to refer to the "general meaning" of Emerson's thought, but drift also means, as aviators and boaters know, a *deviation* due to side currents. As such, it could also signify the ground Emerson covered unintentionally, the margin into which he veered while pursuing his course. By definition, "the drift" is both a driving and a being driven; that force which carries things along, the course over which things are carried, and the things themselves carried and deposited. It is the movement of a creek, last fall's oak leaves carried by the creek's current, and the general meaning of flowing water. In a poem that he began beneath the same snowfall during which he recorded

the meeting of extremes, Emerson studies another form of drifts. The poem, titled "The Snow-Storm," was first published in 1841. It opens with the poet describing the effects of the storm on humans:

> Announced by all the trumpets of the sky,
> Arrives the snow, and, driving o'er the fields,
> Seems nowhere to alight: the whited air
> Hides hills and woods, the river, and the heaven,
> And veils the farm-house at the garden's end.
> The sled and traveller stopped, the courier's feet
> Delayed, all friends shut out, the housemates sit
> Around the radiant fireplace, enclosed
> In a tumultuous privacy of storm.

Having ensconced the housemates around the hearth and cut them off from the fury of the driving snow, the poet next takes the reader on a tour of the land in the aftermath of the storm.

> Come see the north wind's masonry.
> Out of an unseen quarry evermore
> Furnished with tile, the fierce artificer
> Curves his white bastions with projected roof
> Round every windward stake, or tree, or door.
> Speeding, the myriad-handed, his wild work
> So fanciful, so savage, naught cares he
> For number or proportion. Mockingly,
> On coop or kennel he hangs Parian wreaths,
> A swan-like form invests the hidden thorn;
> Fills up the farmer's lane from wall to wall,
> Maugre the farmer's sighs; and, at the gate,
> A tapering turret overtops the work.
> And when his hours are numbered, and the world
> Is all his own, retiring, as he were not,
> Leaves, when the sun appears, astonished Art
> To mimic in slow structures, stone by stone,
> Built in an age, the mad wind's night-work,
> The frolic architecture of the snow.[2]

The powerful conclusion provides the reader with an image of intricacy on which to meditate. By picturing snow as "frolic architecture," Emerson positions nature as an ar-

1 Snow crystals

key idea that emerged from the blizzard of 1834 and the poems (especially "The Snow-Storm") built upon that idea entails a recognition of the integral relationship between world and mind.[4] "Frolic architecture," as I read it, highlights the connection between human understanding and the world's moment-by-moment unfolding. To counter the conceptual drift of humans away from nature, Emerson, in other writings, calls attention to special forms of patience and interpretation. Patience and interpretation are related to what I've elsewhere called participance, a word denoting a heightened form of participation in worldly unfolding that involves facing up to the challenges and complexity of life, connecting the sundry contexts that comprise that complexity, and truly *taking part* in nature. Only by taking part in nature can we begin to understand nature and ourselves. That is, to understand nature's drift we have to understand ourselves as belonging to it.[5]

Another extension regards "cultural" activities such as writing, painting, architecture, philosophy, etc. In addition to joy and merrymaking, frolic connotes a sort of lively, sportive movement (including "gamboling" and "capering about" in the *OED*, "leaping" in *Webster's New World Dictionary*). If, according to the principle of participance, a primary role of the poet or teacher or architect is to serve as a witness for the world's unfolding *from within it*, to highlight human involvement in nature, then cultural activities must be seen as occurring under the drift of nature. He or she who plies the time-honored craft of "furthering culture," to perform her or his work responsibly, must take seriously that deep relation. Doing so will involve something like frolicking – moving in a particular sort of way over a particular sort of ground, moving between driving and being driven.

In-Betweenness, Too-Muchness

In his engaging history of the subject, Bernard Mergen writes that "The various attempts to name and define snow illuminate the ways nature and culture interact."[6] Mergen's formulation would seem to suggest that nature and culture occupy separate states that sometimes come into contact, and then further that snow can help us understand the place where they meet. Building off of Emerson's frolicsome metaphor, however, we can be led by snow to rethink the conceptual division of nature and culture, a rethinking with which Emerson struggled in other works.[7] To take up that struggle is to explore the meaning of "the In-Between," the zone in which driving and being driven, chaos and order, nature and culture do and do not mix. Such exploration is by nature *interpretive*, the roots of which are entangled in meaning or value (*-pret*, price) and the space-between (*inter-*). Interpretation as moving-be-

chitect, a "fierce artificer," as he puts it. Nature designs; nature builds. Calling the architecture "frolic" accents the concept that the "astonished Art" results from "the north wind's masonry," "the mad wind's night-work," depicting nature's artistic process, at least in this instance, as a flurry of activity, power, movement, *drive.* Yet the art produced by nature's force is informed more by mischievous humor ("mocking," "mimic") and frolicking whimsy than by deliberate intent, which is to say that the process *drifts.* Both driving and being driven, the frolic architect works between these extremes.

One extension of the drift of "The Snow-Storm" involves our ability to understand what we call "nature." "Frolic architecture" connotes a playful structure, one that would make its inhabitants and on-lookers merry (and here I am reminded of a colleague, a professor of the literature of American Modernism, who once dismissed Peter Eisenman's Wexner Center as "a funhouse"). Frolic comes from the Dutch word *vroolijk* ("joyously").[3] The poet has been made joyous by the wind's random design, and in this joyousness a recent biographer finds one of Emerson's "central insights." According to Robert Richardson, the

tween becomes more important as we reveal and deal with the many gaps that shape our experience of the world and that often undermine our communication within it.

There are gaps *between* units – between cultures, between disciplines, between governments and the governed; there are gaps *within* units – familial (e.g. between generations), social (between genders, classes, "races"), ecological (between genera: the bird-nut who loads seed into the bird-feeder/the nuthatch feeding). There are temporal gaps (between "now," as I write this, and now, as you read it), communication gaps (between what teachers teach and what students learn), and gaps between theory and practice (Entre dicho y hecho hay grán trecho). "Gap" can signify a breach, hiatus, cleavage, difference, a lag, opening, coming apart, a space-between, an abyss, an interval, interruption — thus there is a gap between a gap that ever remains a gap and a gap that may be traversed. It is necessary to acknowledge gaps and their types in order to respect or question, build upon or dismantle them. While Emerson's "frolic architecture" alludes to the In-Between, in wasn't until a decade after the "The Snow-Storm" that he considered the matter at length.

In Emerson's *English Traits* (1856), one finds a disturbing (but not uncommon) separation of nature and culture, as well as a fertile troubling of that separation. The gap becomes acutely provocative in a scene from "Stonehenge," the sixteenth of nineteen chapters. Emerson recalls touring the countryside with Thomas Carlyle, clambering about the monoliths, cigar smoke, cedars, and the following moment of disconnection:

> On the way to Winchester, whither our host accompanied us in the afternoon, my friends asked many questions respecting American landscape, forests, houses, – my house, for example. It is not easy to answer these queries well. There, I thought, in America, lies nature sleeping, overgrowing, almost conscious, too much by half for man in the picture, and so giving a certain tristesse, like the rank vegetation of swamps and forests seen at night, steeped in dews and rains, which it loves; and on it man seems not able to make much impression. There, in that great sloven continent, in high Alleghany pastures, in the sea-wide sky-skirted prairie, still sleeps and murmurs and hides the great mother, long since driven away from the trim hedge-rows and over-cultivated garden of England. And, in England, I am quite too sensible of this. Every one is on his good behavior and must be dressed for dinner at six. So I put off my friends with very inadequate details, as best I could.[8]

In this rich passage, Emerson posits a gap wider than the Atlantic between England and America, an expanse that overwhelms the speaker and debilitates the possibility of answering his friends' questions about where he resides.

More importantly, the American scholar in England describes an unfortunately commonplace gap in our thinking of nature's nature. For the Emerson of this passage, nature only exists in overgrowth and swamps and forests and prairies, not in hedge-rows or gardens or hedge-trimmers or gardeners. America consists of a nature on which humans make no mark, whereas England's cultivated markings have blotted out any signs of the natural. Put simply, in England nature has been overrun by culture. Humans occupy an order of being that is unnatural or extranatural, an order capable of chasing away nature from a specific place. In America, on the other hand, nature persists with a certain "too-muchness"; humans, again of an extranatural order, are incapable of "making an impression" on nature – a phrase that connotes various forms of culture. Culture, this excerpt from English Traits implies, pertains to the ability to make an impression on nature, whether it be agriculture or "high" culture.

Emerson's experience of the gap between England and America is founded upon another gap – a divisive view of the world that posits a significant space between humans and our geobiotic home. In failing to describe his home turf, Emerson symptomatizes a widespread condition: alienation from nature. While the condition usually entails a physical removal and resultant separation anxiety (not unlike 18th-century accounts of scurvy), in Emerson's case it is complicated and exacerbated by a metaphysical disjunction. We are estranged from nature, not because we have "driven away" the "great mother" and no longer lie cozily in her arms, but because of our doggedness in intellectually and spiritually separating ourselves from our biotic facts of life, because of our refusal to reckon the interconnectedness of living things, the ecology even of human thinking, the often beastly unpleasant yet as often unbearably beautiful nature of human culture. Alienated by nature (which is "too much by half for man in the picture") and from nature (having traveled from the "great sloven continent" to the "garden"), Emerson finds himself at a loss for words.

In sum, Emerson's problem in this passage comes from being unable to translate America into English terms, a condition caused by the inability to traverse the gap between nature and culture. Emerson, that is to say, is caught in a bind. On the one hand, he is a well-schooled, nicely cultured, articulate English descendant whose own rank and overgrowing home does not lend itself to cultivation and thus gives him "a certain *tristesse*." On the other hand, he is a proud product of "that great sloven conti-

2 Photographs of snow crystals

nent" who now finds himself in a country where everyone must be well-behaved, impeccably mannered, punctual, and formally dressed for dinner. In America, the cultivated Emerson is a trifle trepid regarding a landscape on which humans cannot make an impression; here nature's excess is too much for culture. In England, he is "quite too sensible" of the over-cultivated lay of the land, which lacks the grandeur, opportunity, immensity, messiness, and purity of the "sea-wide sky-skirted prairie"; there, culture appears to be too much for nature. *English Traits* describes Emerson's efforts to fathom the gap, his attempt to articulate nature's Too-Muchness with adequate details. Such, however, being less his intention than it is his drift, the book itself presents a lesson in nature's excessive primacy and capricious construction. England, according to Emerson's account, has failed to learn that lesson, and the writer expresses his fears that America will too.

Factitiousness, Onwardness

Throughout his travelogue and cultural critique, Emerson attends to three key characteristics of British world-making: duality (division of the world into fundamental antagonisms), fixity (intellectual insularity, resistance to change, crotchety positivism), and factitiousness. Dualism separates humans from nature, thereby delimiting nature; fixity further delimits nature by concretizing duality and imposing an unchanging order on the world's observable flux. As such, these traits would appear to be anti-nature or unnatural. But these traits, Emerson suggests, may have arisen *naturally*. He points out that it is English nature to take culture kindly, but suggests that English culture does not return the favor by taking nature kindly. Instead, nature is posited by the English as something separate, something other, to be surmounted. English culture, by nature, is based on and strives to maintain *factitiousness* – a condition in which artifice, propriety, and convention hold dominion over nature, spontaneity, and change.

Emerson portrays England by turns as a "museum," a "garden," "strongbox," etc., treating the island as a nursery specializing in factitious growth. If in England art is seen to vanquish nature, and "the views of nature held by any people determine all of their institutions," it follows that English institutions are built upon artificial principles, thereby giving rise to "an artificial completeness in this nation of artificers."[9] The term "factitious" itself occupies a special status in the book, occurring in chapters on "Land" and on "Literature" and even serving as a page-header in a chapter on "Ability." No where else in Emerson's published writings does "factitious" enjoy such prominence, as if treating the English especially warranted its use. The word's contemporary meaning, as denoted in the Webster's of Emerson's day (*American Dictionary of the English Language* [1828-1853]) – "Made by art, in distinction from what is produced by nature; artificial" – indicates that perhaps the central trait of the English is their cultural denial of nature.

Distinguishing between what is made by nature and what is made by human artifice, the American condemns the British for putting their chips with the artificial.

> In the absence of the highest aims, of the pure love of knowledge and the surrender to nature, there is the suppression of the imagination, the priapism of the senses and the understanding; we have the factitious instead of the natural; tasteless expense, arts of comfort, and the rewarding as an illustrious inventor whosoever will contrive one impediment more to interpose between the man and his objects.[10]

A small paragraph by Emersonian standards, its three clauses represent in fine Emerson's findings on the issue at hand (the English literary scene) and on the larger issue to which it belongs (English traits in general). It is a terse diagnosis of British disease, pivoting on the laconic second clause: "we have the factitious instead of the natural."

This, really, is the heart of the matter, the primary pathology, of which the surrounding traits are symptoms. The consumption of luxuries, of goods and services to satisfy artificial desires, results from an economic system itself the product of false principles. These goods and services supply unnatural comfort that inevitably fails to provide for underlying needs (human "necessaries," in Thoreau's terms), and instead exacerbate the condition. By valuing "arts of comfort," the British economic system puts impediments between subjects and objects, thereby aggravating the perceived disconnection between humans and the world. Nature having been denied, artifice becomes the norm. Cut off from nature and thus the nature of things, the British indulge themselves in "tasteless expense" on artificial things, a cure that makes them worse. The lack of a connection with nature – a perceptual "nature-less-ness" – cannot be satisfied by the consumption of artifice. Unable to get satisfaction, the British become "Priapists," prostitutes to "what is low or base," as the *OED* states, using the phrase from Emerson's paragraph as example; but it also connotes (in Webster's *American Dictionary* of the period) "More or less permanent erection and rigidity of the penis, without concupiscence": unfulfillable drives, unnatural manliness, day-in-and-day-out carnality, a constant itch never sufficiently scratched.

Linking priapism to the senses and the understanding, Emerson's critical diagnosis explains British factitiousness as perpetually materialistic, rigidly uncreative, insatiably empirical. It is worth noting again the first clause of the passage, which implies the writer's propositions for improved prospects: "highest aims,...the pure love of knowledge and the surrender to nature, [and]...imagination." Unfortunately absent from English traits, the items listed *fuse* philosophy, nature, and creativity, implying that the answer to our conditions (on either side of the Atlantic) lies precisely in their integration. Human intellectual endeavor, especially that which pertains to the imaginative and the philosophical, often serves as the marker of our separation from nature, but Emerson aligns that endeavor with "surrender to nature" in the paragraph, *against* sensorial priapism, experiential impediments, superfluous comforts, and the factitious. Surrender to nature becomes something of a key to overcoming factitiousness. This does not appear to mean a surrender to carnality, to the senses and the understanding, though these must have some share in the natural. Priapism – the unnaturally exaggerated excitation of these faculties – leads us astray because it is coupled neither with higher aims nor with a surrender to nature. Emerson advocates rethinking what is and is not natural, a rethinking driven by nature and imagination. Philosophical and imaginative thinking *not grounded in nature* fails to go forward; doing what comes naturally, when
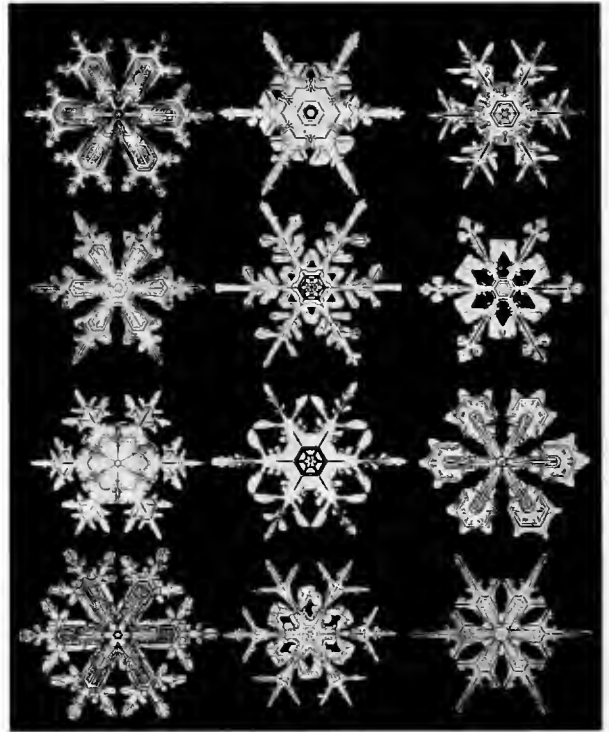
3 Photographs of snow crystals

not considered in conjunction with imaginative renderings of nature, stagnates in an artificial swamp.

"Surrender to nature" can indicate either yielding to an opposing force (as in surrendering culture to nature) or giving way to something already at work within and about one. This latter entails understanding ourselves as caught up in nature's drift: reckoning that which is always-already at work in and on us, becoming aware of its existence and acknowledging its various manifestations, relations, and meanings, and allowing nature to do what it does, accepting and working with the consequences. The first version of surrender reflects the British version of nature-as-other; the second stems from the paradox with which Emerson operates throughout *English Traits*: the British treat nature as other due to their nature. It is natural for the English to be factitious. The paradox may explain why Emerson in "Stonehenge" "put off my friends with very inadequate details, as best I could."

In that passage, the writer doubts his ability to communicate the American condition, not because he's simply on the side of nature in the nature v. culture war, but rather because he suspects himself to function in the gap between

nature and culture, always natural, even when cultural, and even when his cultural heritage claims extra-natural status. How else but inadequately could one explain the gap and the relations it governs to those firmly bred in factitiousness? To do so adequately is to keep alive the movement between the natural and the cultural – which movement is after all (and above all) natural. Advocating the natural against the cultural – as something separate and superior – maintains an oceanic separation between the two, in the grandest tradition of dualism, fixity, and factitiousness. Only by surrendering to nature's too-muchness – admitting the complexity and flux and fugacity of each moment and our reckoning of it – can we move onward from the limited and limiting concepts of "nature" and "culture" that pervade the nature of our culture as it has evolved.

Yet it is also in our nature to resist rather than capitulate. If we do not reckon that fact of nature, we fall into the same old gaps. I take this to be the crux of Emerson's difficulties on the road to Winchester. The lesson of the "Stonehenge" chapter is that the chapter itself, like the architectural structure from which it takes its name, is a natural expression. Nature, always too much by half for humans in the picture, leaves no room for cultural activity (making an impression) to occur outside of nature. By remarking and resisting the cultural tendency to privilege itself in a hierarchical binary with nature and insisting instead that nature is too much for the binary to hold, Emerson suggests that nature constructs the gap between our concept of nature and our concept of culture. In the concluding paragraph of the book, the writer surmises that the best prospects for propagating the most congenial of English traits (e.g., courage, strength, thoughtfulness, generosity) lie in human "elasticity and hope" – that is to say, in moving beyond the least congenial of English traits (fixity, insularity, duality, etc.). Hope flourishes in our flexible and self-reflexive participation in the flux of things, in our surrender to nature's perpetual excess and procession, in our "wising up" to the story of evolution.[11] There is a gap between what we think nature is and what nature is. But "what we think nature is" is entirely natural also, a product of nature, an instance of nature thinking. To speak of a gap between nature and culture is not to speak of a "rift." The gap is the drift on which we must build.

4 Snow on lawn installation, January 2003

Notes

[1] Ralph Waldo Emerson, vol. IV of *The Journals and Miscellaneous Notebooks of Ralph Waldo Emerson*, edited by William Gilman et al. (Cambridge: Harvard University Press, 1964), 383

[2] Ralph Waldo Emerson, *Poems*, vol. IX of the *Riverside Standard Library Edition of The Works of Ralph Waldo Emerson*, edited by James Elliot Cabot (Boston: Houghton, Mifflin and Co., 1884), 42-3

[3] For etymological information, see C.T. Onions's *The Oxford Dictionary of English Etymology* (Oxford: Oxford University Press, 1966) and Eric Partridge's *Origins: The Encyclopedia of Words* (New York: The Macmillan Company, 1958)

[4] Robert D. Richardson Jr., *Emerson: The Mind on Fire* (Berkeley: University of California Press, 1995), 179: "The world itself is the great poem, the source of all the verbal approximations of itself. When the poet can hold fast to this connection, he has access—through his own poor powers—to the world's power and beauty. This is one of the central insights of Emerson's life."

[5] For more on "participance," see the chapter "Toward a Natural Philosophy of Reading" in *Our Preposterous Use of Literature: Emerson and the Nature of Reading* (Urbana: University of Illinois Press, 2000)

[6] Bernard Mergen, *Snow in America* (Washington DC: Smithsonian Institution, 1997), ix

[7] Mergen, I think, is not averse to this line of thinking, though he does not follow it very far. Calling Emerson "the most serious of the early philosophers of snow," he reads the poem in question as finding "in a New England snowstorm a primordial force that is neither rational or serious. Although [Emerson] begins conventionally, using the storm as a screen between humanity and nature, order and disorder, ... [the poem] forces the reader to see that behind the apparent order of nature lies chaos. " (10-1)

[8] Ralph Waldo Emerson, *English Traits*, vol. V of the *Riverside Standard Library Edition of The Works of Ralph Waldo Emerson*, ed. by James Elliot Cabot (Boston: Houghton, Mifflin and Co., 1884), 273-4

[9] *English Traits*, 52 and 45

[10] *English Traits*, 242

[11] Loyal Rue, *Everybody's Story: Wising Up to the Epic of Evolution* (Albany NY: State University of New York Press, 2000)
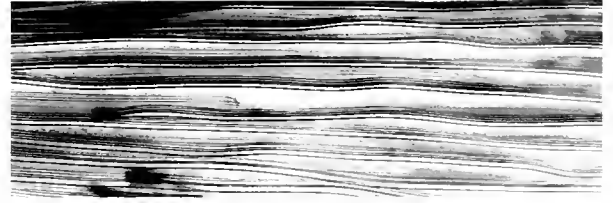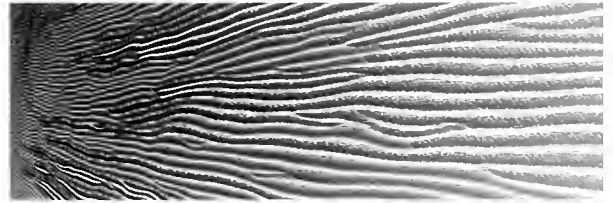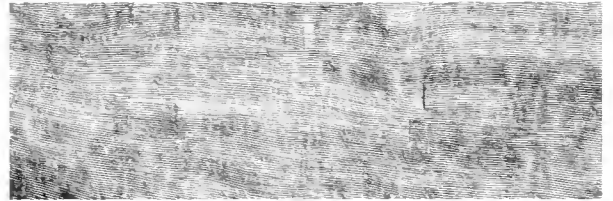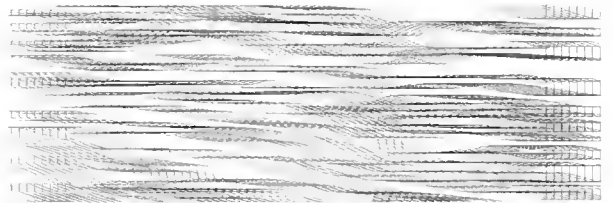
Nataly Gattegno

Desert Oasis

Flatness and endless sprawl, the grid mapped out on the land prohibiting any understanding of what lies beneath. Suburbia blankets the sand, perpetuating the grid with artificial pockets of life – or is it lifestyle? It is this lifestyle that generates the air-conditioned households, the luxurious cars, and the green golf courses in the midst of what should be the most inclement and inhibiting environment. In the distance, thousands of wind turbines spin away, fuelling the human need to defy nature. With few exceptions, desert architecture has negated context, has negated its ability to transform and adapt according to local needs and parameters. What lies beneath should be interpreted as "context," as a dynamic ecological matrix that affects architecture, planning, and form. What lies beneath should affect what exists above; it should foster an adaptive and hybrid environment that enables the disparate needs of humans to coexist.

This project investigates the possibilities of a fully contextual architecture, one that exists as part of a given set of parameters and is simultaneously a product of them. It explores the potential of context to be a generative parameter for the development of an inhabitable region in the desert. The site of the Californian desert becomes a fertile landscape to be reaped for its ability to cultivate a desert oasis.

Oasis: "A fertile tract of land that occurs in a desert wherever a perennial supply of water is available."[1]

Context is interpreted as the multitude of forces that act on a site from its surroundings and its ground. A dynamic geological matrix is created, one that defines the parameters to which a desert settlement has to be adapted and transformed. An underlying geological system of forces is defined, one that supercedes the standard logic of suburban development and allows for its reinterpretation.

1 Sand Studies and 2 (opposite) Hazard Mapping

UNDERLYING SYSTEM

- canyon fault
- mission creek fault
- little morongo wash
- **desert hot springs**
- miracle hill fault
- mission creek
- banning fault (san andreas)
- **north palm springs**
- morongo wash
- garnet hill fault
- west branch sylvia wash
- south pass fault
- whitewater wash
- i 10
- amtrak station
- Route 11
- indian ave
- vista chino
- municipal airport
- **palm springs**
- palm canyon wash

1 mile
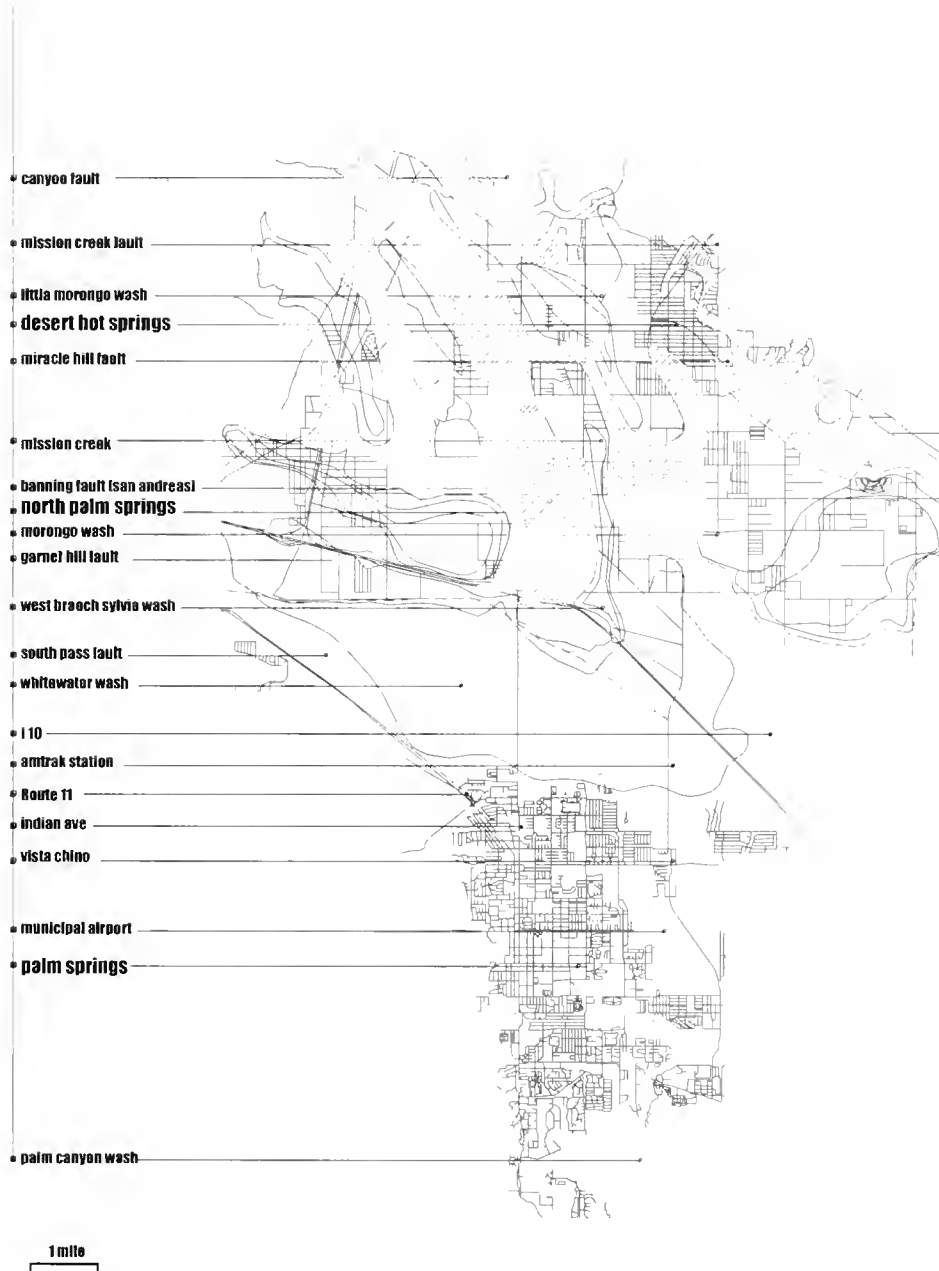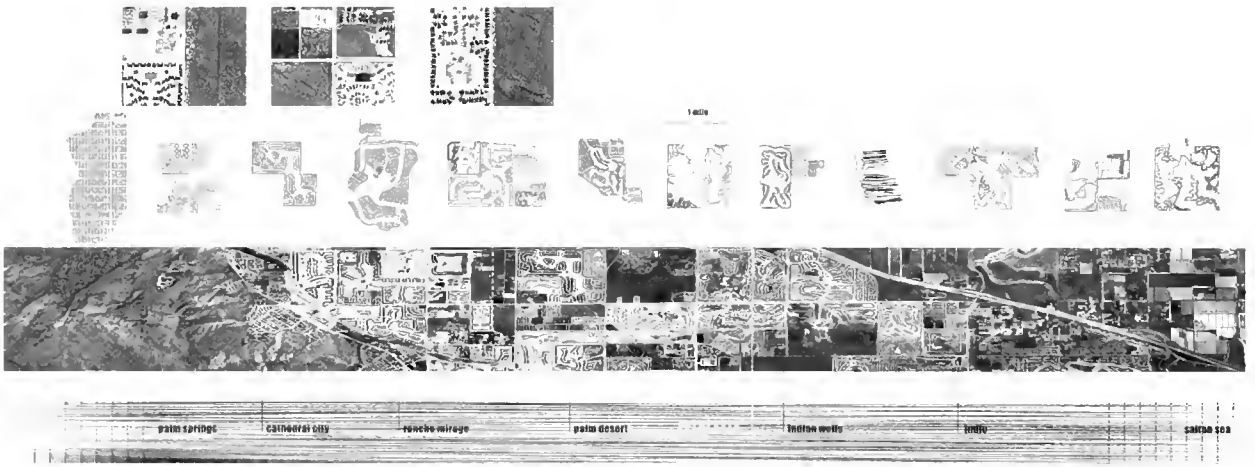
3 Mapping the Suburban Grid (above) and 4 Sand Dune Formation System (below)

DUNE FORMATION

mission creek fault system   white water river flood plain   san gorgonio pass   deflation

san andreas fault system

average wind speed= 8.5m/sec   largest tract of desert dunes in N America
wind classification= 6   migrating Southeast as much as 5m/year
130.000 cubic yards of sand transported annually

algodones dunes   4000 turbines

"consistently the windiest point in
North America" NASA

wind power = 700 Wm2 $12mil tax credit
wind speed = 8.5 m/sec   54.2mil property tax revenues
2105 job-years of employment

805kWh $40mil energy
421.1 MW wind capacity   energy = 1.8mil barrels of oil

power 120.000 households / year   4.400.000 tons of CO2 (greenhouse effect)
power the whole Coachella Valley   1.500.000 acres of forest

24.000 tons of sulfur dioxide (acid rain)

16.000 tons of nitrogen oxide (smog)

satisfy 300.000 people's needs   occupy 21.055 acres
use 1053 acres (5%)

The site is located to the north of Palm Springs in an area soon to be developed into another suburb for young getaway seekers and retirees. Straddling the San Andreas fault line, and located on the Whitewater River flood plain, this geologically charged site is located in one of the largest wind fields in North America. The hazard mapping diagram (Figure 2) generates a new zoning plan that is directly related to the contextual phenomena of the site: the fault lines, flood planes, ground condition etc. It begins to lay out the boundaries of a new territory to be inhabited by the desert oasis, a territory that is marked out by an optimal set of contextual conditions.

The Windy Point wind farm is "consistently the windiest point in North America."[2] Four thousand turbines produce 805 KWh of energy in order to power 120,000 households a year, essentially the whole of the Coachella Valley. According to environmental data (Figure 4), they produce the equivalent of 1.8 million barrels of oil per year ($40 million of energy) and save 1,500,000 acres of forest land. This wind farm occupies an area of 21,055 acres, yet it consumes only 1,053 acres. The remaining 20,002 acres remain undeveloped. This project occupies the underutilized area beneath the wind field, reclaiming the land and proposing a techno/natural oasis that will coexist with the energy source and reap the site's latent energies in order to produce a "habitat," an "oasis."

Through a process of analyzing the forces and parameters affecting the site, the notion of context is transformed into a dynamic matrix capable of influencing the organization of an urban settlement. This multi-dimensional diagram encompasses a complex set of ecological movements and patterns that are site-specific: weather, water, sun, air, fault lines, and sand. This proposal explores the possibility of a fully adaptive organization capable of addressing these multi-scalar phenomena; it conceives of a transformable environment able to optimally locate itself and grow according to a given set of parameters defined by context. Water in the standard oasis is translated here into energy, wind, movement, sun and sand. The design process transforms itself into a complex negotiation between all parameters that affect the site.

The project is a windbreaker, a barrier in the landscape that filters sand and wind. The oasis is generated like a sand dune: shaped, located, and moved according to existing forces (Figure 1). A new inhabitable region is generated behind the protective boundary. The windbreaker locates itself on a desert flood plane, allowing a fertile tract of land to seasonally develop. It is a permeable barrier permitting the coexistence of the desert sand with the oasis.

Synthesis: "…something different, much more complex but more natural. It is the relationship between an element and the system to which it belongs."

In the midst of one of the newest suburban sprawls in the Coachella Valley, it is impossible to ignore the economic forces and the current direction of certain financially viable developments in the area. The idyllic and artificial landscapes sought by local developers prove to be a strong opposition. This methodology explores these forces at their systemic level and assimilates them as powerful contextual components that affect the program of the oasis. The distinction that the grid lays down between the artificial and the natural is broken down by introducing a mediator in the form of an oasis, offering a different interpretation of suburbia (Figure 3), one that is dependent on context, the movement of sand, the prevailing wind, and the location of water. This proposal explores the technological, the natural, and the suburban as "petri sets" (Figure 8). They become distinct sets of information to be recombined and reconfigured – ultimately to be tested against each other and grafted onto one another. A new productive "synthesis" is explored, one that addresses the possibility of a hybrid condition to exist as a result of a complex set of systems interacting and affecting one another.

A new narrative emerges that describes the process of development of this oasis. This narrative becomes the methodology itself. It starts with the location of the windbreakers in the wind field (Figure 5). Protected areas are developed behind these barriers and according to the local conditions of windy and still, wet and dry, south- and north-facing, the petri sets are mapped on the landscape. Seasonal pools, a golf course, housing lots, solar fields, paths, and transportation routes are located on the desert landscape. This organization continues to grow until the extent of protected landscape is diminished (Figure 6).

The environment developed behind the windbreaker is a hybrid environment, one that mediates the different components of suburban living, technology, and nature, allowing for a simultaneous coexistence of all distinct elements. The living environment becomes interlaced with the energy field (Figure 7). The artificiality of desert suburbia is still retained, but the elements that constitute it are hybridized with those of the more techno/natural environment of the wind farm, the solar field, and the desert sand (Figure 9).
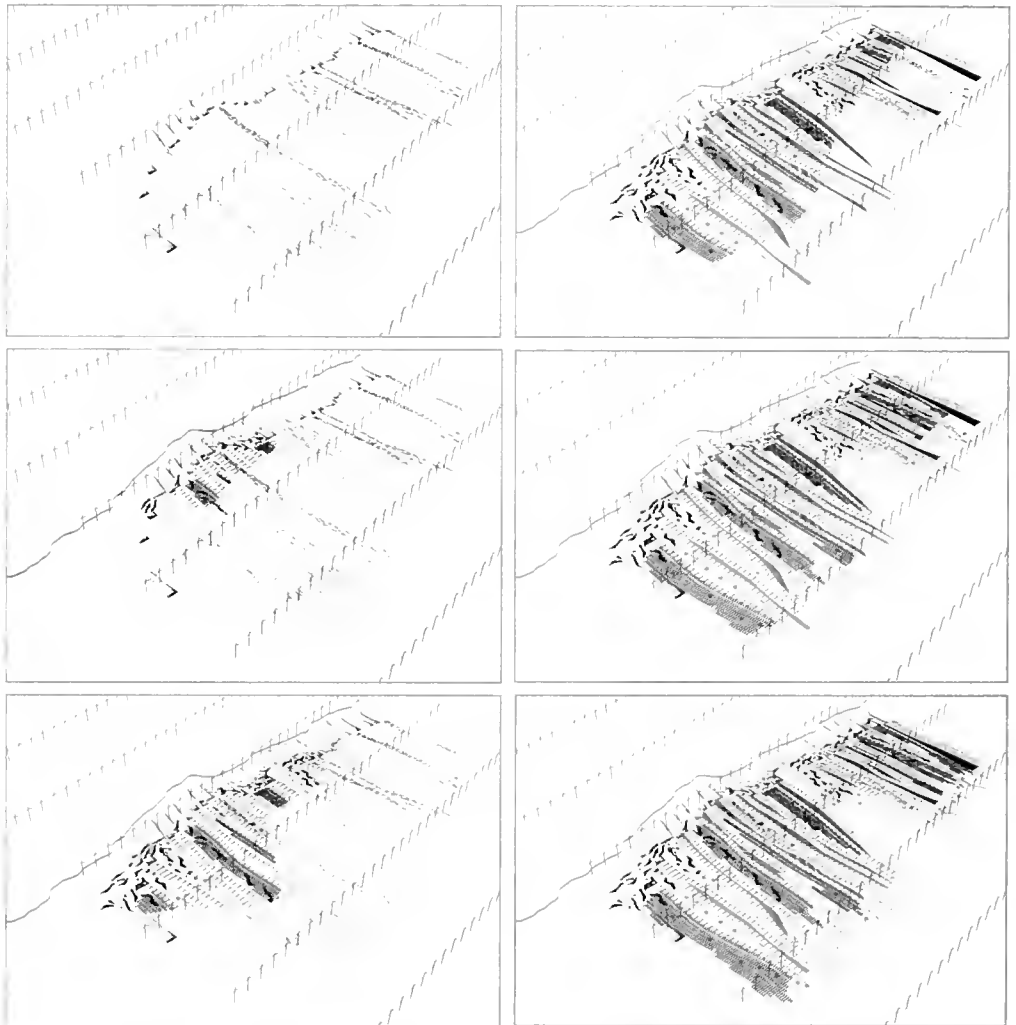
Meshworks: "Unplanned and planned cities are concrete instances of a more general distinction: self organized meshworks of diverse elements, versus hierarchies of uniform elements."[1]
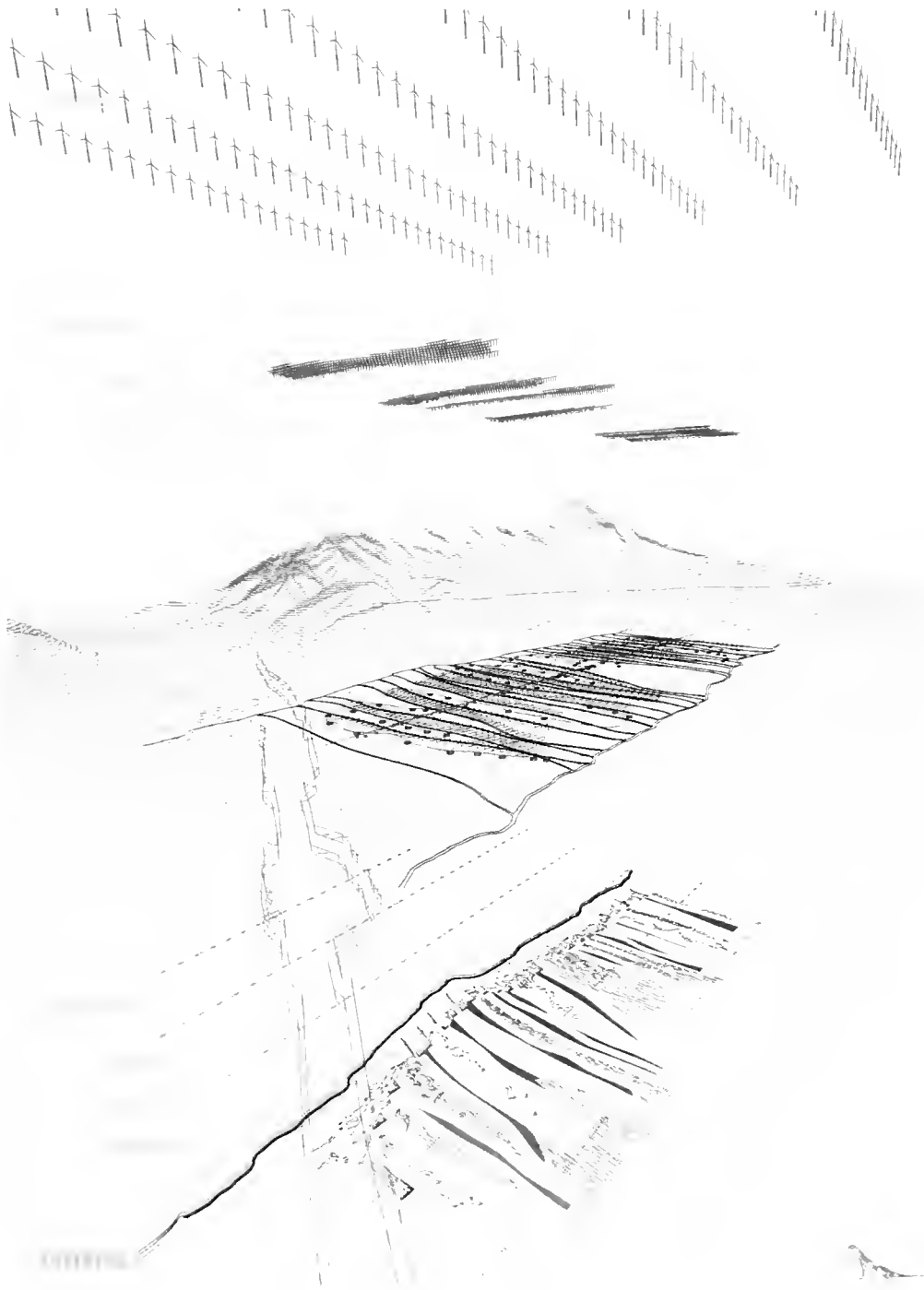
The emergent pattern allows for a degree of inhabitation and a type of programming that are unique to each environment that is generated. A new type of "vernacular" emerges – one that is responsive and adaptive to the local environment and becomes part of the ecological matrix from which it evolves. Context is reinterpreted as a matrix; a "meshwork." This meshwork of parameters and forces generates a pattern that develops and transforms in time according to the dynamics of each site. Boundaries are blurred between the technological and the natural, the man-made and the artificial, the artificial and the mechanic. The desert oasis is capable of being artificial in its development, natural in its adaptability, man-made in terms of its technology – yet fully contextualized.

Notes

1 *Oxford English Dictionary* (Oxford: Oxford University Press, 1988)

2 NASA: http://www.palmsprings.com/services/wind.html, http://www.nasa.gov March 2003

3 C A Doxiadis, *Elements of Ekistics*, http://www.doxiadis.org March 2003

4 Manuel de Landa, *A Thousand Years of Non Linear History* (New York: Zone Books, 1997)

5 Desert Oasis: Phasing

6 Desert Oasis: Exploded Axonimetric

solar array +
cul-de-sac

sand bowlers +
landscaped trees

cul-de-sac +
wind field

sand deductors +
tennis courts

solar array +
geothermal field

wind field +
landscaped lanes

sand bowlers +
wind field

landscaped lanes +
geothermal field

total hybrid
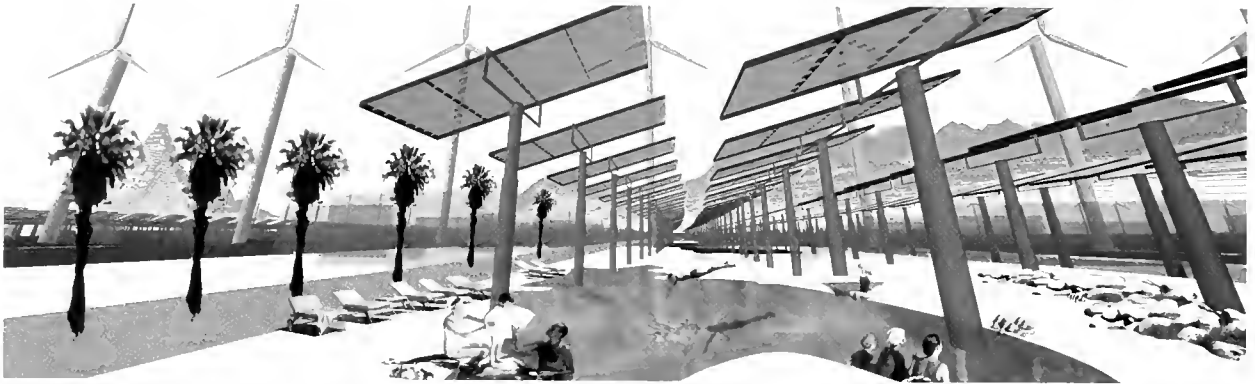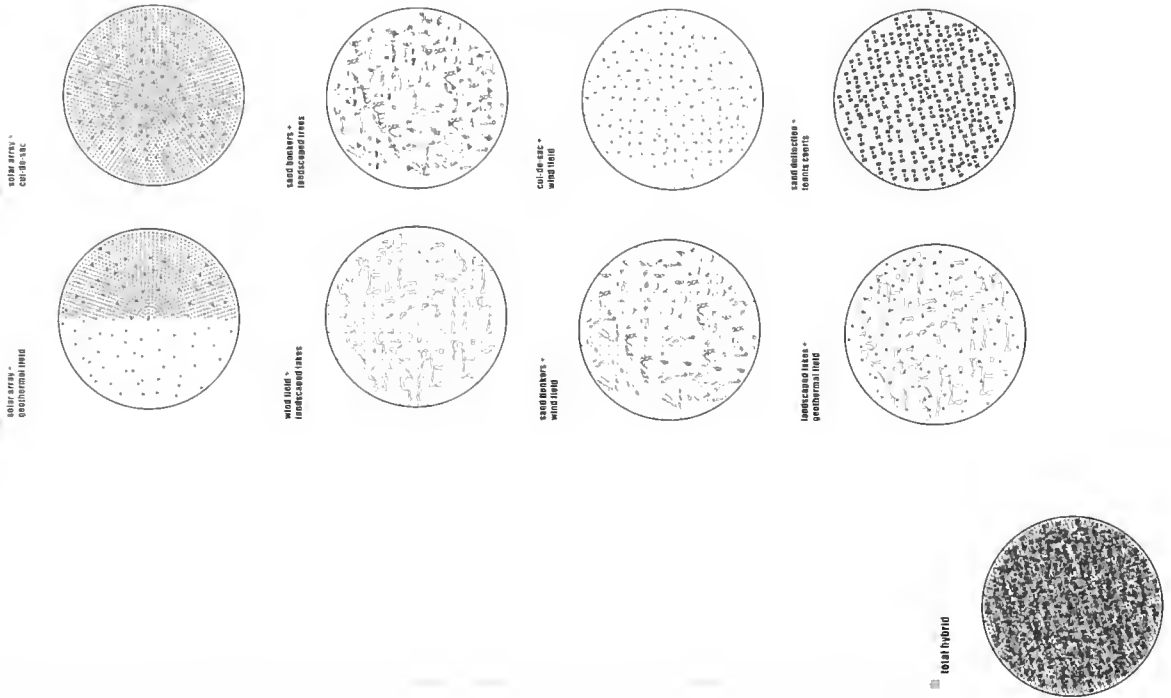
7 Wind + Sun + Water + Green (top) and 8 Suburban Petri Dishes
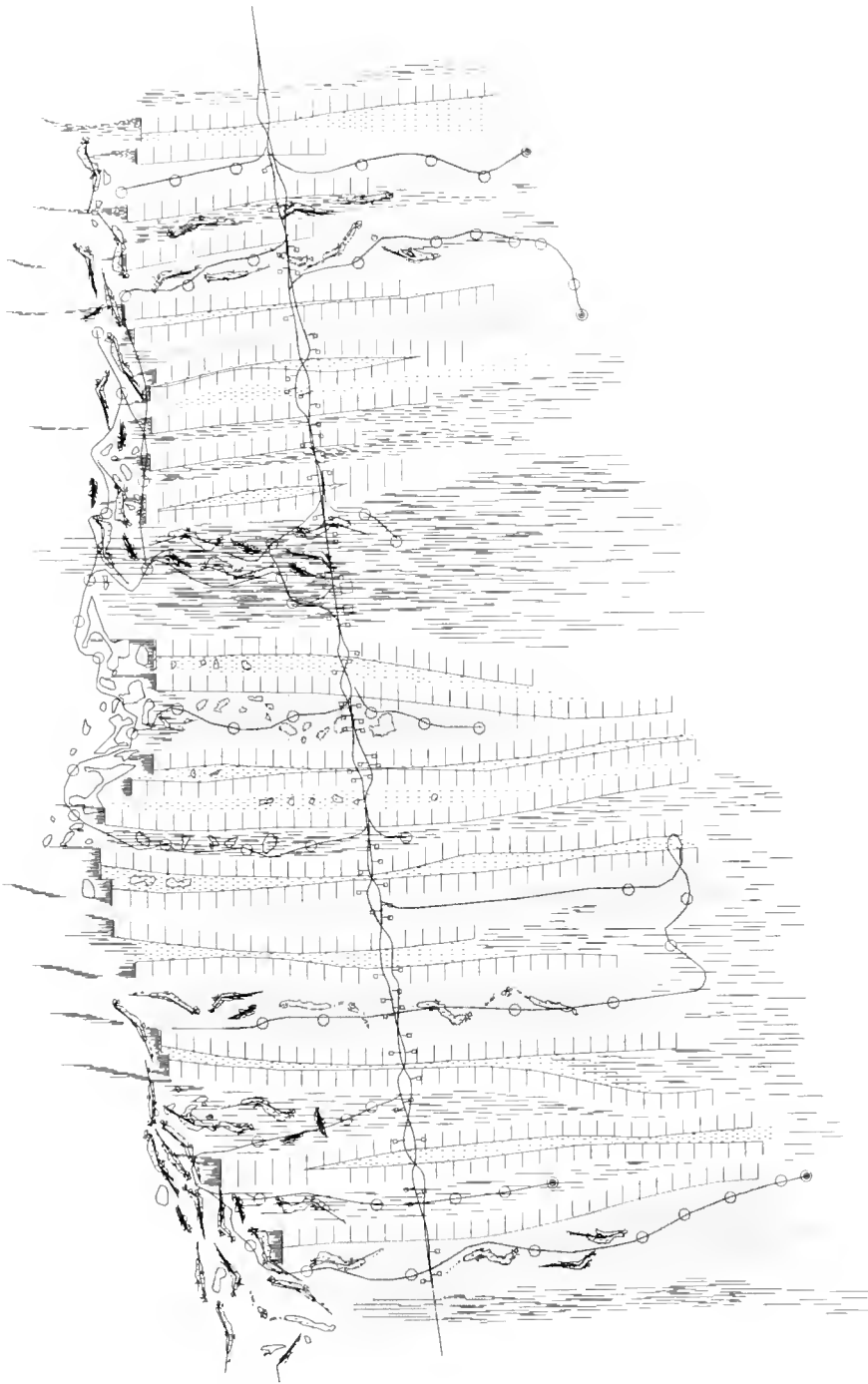
9 Desert Oasis: Marking the Ground

Christine Cerqueira Gaspar

From Alienated to Aleatory
Nature in the Post-Post-Modern World

If architecture is a means of positing our relationship to the larger world, historically, that relationship is one of a strong separation between culture and nature. Nature is either separated from culture as "other" and assigned a place in "wilderness," away from here, where we live and build, and consequently subjected to nostalgia and romanticism; or it is detached from its metaphysical meaning and seen as scientific phenomena, essentially the weather.

I argue here that this condition is a holdover from the empiricist worldview of the Enlightenment, and that contemporary sciences – though outgrowths from the Enlightenment model of knowing – offer new models for understanding the world, models that have yet to be more than superficially addressed in architecture and urbanism.

Enlightenment Science

Human history is often characterized as the progression of the species' ability to control and manipulate its environments, often with the assistance of increasingly sophisticated technologies. Typically, the image of the environment is characterized as "nature," while the tools and products of our manipulation are characterized as "culture."

The philosophies of the Enlightenment, which profoundly shaped the values and beliefs of Modernity, bifurcated the world into these dichotomies. The leaps in the sciences of the 17th century created a firm belief in man's ability to understand and categorize the world, thus enforcing the idea of an objective, knowable, scientific reality and effectively replacing God with Newton. With that came a preferencing of reason and the mind over physicality and the body; rationality and logic over religion and spirituality; the empirical and quantifiable over the intuitive and qualitative; culture and the man-made over "nature" and the uncontrolled.[1]

The basis of this thought in science is particularly interesting today, as the fundamental tenets of the Enlightenment have been largely subverted by the scientific propositions of the last century. The discovery of Heisenberg's uncertainty principle leveled a blow to the notion of a correct, scientifically observable reality. The observer, we know now, is deeply implicated in shaping the reality he observes. While in the Enlightenment, man was subject (the being with agency) and nature his object, Heisenberg shows us the messiness of the simultaneity of subject *and* object (an actor as both acting upon and being acted upon by a system), thus fundamentally discrediting the clean bifurcation of scientist and particles. Einstein's work in relativity further suggests the very subjectivity of our perceptions of the world, revealing the multiplicity of even time itself.[2]

Next, chaos theory, which deals not with disorder but rather complex orders and our ability to predict and recognize them, showed "nature" to neither be simply ordered, as many Enlightenment scientists believed, nor completely disordered, as many Romantic thinkers believed. In fact, the scientific developments of the last 100 years have shown the man-made world to be less and less different than the "natural" world to which it has been traditionally opposed.

> Ironically, physicists themselves no longer believe in the solid, deterministic, clockwork universe that gave such support to the [Enlightenment] paradigm. In its place they have created a world in which space and time depend on the observer, in which certain properties exist only when we measure them, in which one part of the theory insists that particles that are far apart cannot communicate instantaneously and another part contains results that cannot be explained unless they do, and so on.[3]

Enlightenment Nature

Despite the complexities quantum physics has thrown into the equation, the opposition of culture and nature is fundamentally operative in the Western world, and in its own particular form in the United States. As with any deep-held cultural belief, it is evidenced in the way that we build. If buildings can be read as a positing of humans' relationship to the larger world around them, than our buildings reveal an intellectual distancing of humans from the larger world of the processes of life, of the other worlds that we live in beyond the merely cultural.

Every act of construction and planning puts forth some idea about the relationship of building and "nature," whether intentional or not. As Leo Marx explains in *The Machine in the Garden*, the development of American suburbia is very much a product of this world view. Paraphrasing him, Diana Agrest states: "The development of the American city can be explained through the opposition between nature and culture, wilderness and city."[4]

The development of cities and architecture from the beginning has been an effort to protect the body from the elements. The city as fort becomes the more refined, but still well-fortified, Victorian city. During the Romantic period – coincident with the Industrial Revolution and the burgeoning presence of machines, mechanization, and ideologies of control and predictability in Western culture – "nature" began to seem more benign and controllable, and a new, nostalgic, aestheticized view of it emerged; one much in evidence in the landscape paintings of the day and the gardens and parks they inspired. In the Americas, the abundance of land introduced other elements into the relationship. According to Leo Marx, the development of American suburbia stems from the search for a middle landscape between this newly tamed nature and the traditionally sheltering urban environment, site of culture and refinement. The result, many have argued, is a placeless middle ground "that although ideally aimed at combining the qualities of city and countryside, ultimately cancels out both worlds: a homogenized and consequently denaturalized, disqualified landscape."[5]

Once the middle ground was built upon, the man-made soon replaced "nature" in that location, pushing "nature's" territory further and further from the city until we again viewed all sites of construction as the man-made world and the distant, "undisturbed" "wilderness" as the only remaining site of "nature," this time with a new nostalgia attached to its diminishing presence. By pushing nature outside the built environment in this way, we deny the city any relationship to (or within) it. The preservation of "nature" in remote landscapes intended as efforts to achieve environmental responsibility, in a way, allow us to see the city as a zone free of nature (and thus antithetical to sustainability and free of our environmental responsibility). Most of the sustainability movements, despite their efforts to develop an ecological view, take for granted this separation of nature and culture, "... since it is the Romantic view of Nature that lies at the origin of all contemporary ecological, vitalist, and theoretical biological thought."[6] At its most troubling, this way of thinking insists that "the ecological template for urban change...lies outside of society itself," as historian Matthew Gandy points out in his treatise on nature and New York City.[7] Like Gandy, Leo Marx calls for a change in consciousness and a rejection of this bifurcation as a necessity for true sustainability, let alone a more philosophically sound way to live.

In the built environment, this philosophical notion has significant ramifications. Nature, as it is addressed in the standard forms of building and planning of the past fifty years, exists as little more than the view through the picture window, the number of trees in the park, and the gallons of water of runoff per year. These manifestations adhere to the two views that have persevered since the Enlightenment: 1. nature as quantifiable phenomenon, the realm of scientific inquiry and 2. nature as an aestheticized landscape; in the U.S., the dialectic that exists between these two views results in homogeneous suburbia.

Enlightened Nature

Modern physics offers us an idea of the inextricable co-involvement of subject and object and opens up the idea of differing, individual realities; subjective notions of time, space, and experience; a questioning of its own validity as a discipline and its ability to answer questions. The Dadaists and surrealists presaged these developments in their views of subjective realities and efforts to channel the aleatory into everyday life – in effect, efforts to recognize the forces that exist in the world but that traditionally have not been allowed into the "rational" view of it. These include the recessive values of the Enlightenment dichotomies: body, spirit, intuition, and chance. As John Rajchman has pointed out, "Indeed, the world itself is not 'all that is the case' (as Wittgenstein took it to be) for it includes an undepictable anterior element out of which new kinds of things can happen, new concepts emerge – the space where unforeseen things 'take place'."[8]

While other disciplines have incorporated these notions, architecture and urbanism fail to proffer a more complex view of nature. Kenneth Frampton in a recent lecture stated that, "The idea of habitat is based first upon the extrinsic nature of the land form created by the residential

fabric, and second upon the intrinsic character of its inner corporeal space."[9] He argues for their interrelationship to form "the symbiotic integration of nature and culture," even as his language separates the two.

The discipline of architecture, too, enforces these dichotomies, employing rationalism to suppress many of the same messy issues of body, spirit, religion, and the aleatory. What is left are Modernism's and phenomenology's focuses on an abstract notion of the body and a scientific (nature as elements or a reflection of the cosmos) view of nature – retreats to the only acceptable territory in which to engage the world on non-rational terms. More recently, "sustainability" and organicism have proffered more intentional relationships to "nature," but again within the Enlightenment worldview. Sustainability focuses on the scientific, quantifiable aspects of nature (energy efficiency, hydrology), and organicism (even when an expression of complexity, as in Greg Lynn's work) is an aesthetic, one that has replaced the pastoral with an equally superficial understanding of the biological.

Science and technology have historically been interpreted through philosophy and the visual and plastic arts even as they are absorbed uncritically into social use. What is disturbing is the realization that while the sciences of the past 50 years have radically reconfigured our understanding of the world and integrated new knowledge into our material culture, the dominant functional worldview remains locked in the very Enlightenment model that the surrealists were rejecting in the 1920s.

Some claim that the complexity of contemporary science and the ever smaller scale at which it occurs prevents the layperson from engaging it. Perhaps we can move beyond alienation from these ideas; they open up room in the world for indeterminacy and for the aleatory (and certainly some desire for those feeds the insatiable interest in parametric design today as much as it fed automatic writing, painting, and music). They tell us that, like in a Calvino or Murakami story, if for a second we politely refuse an "absolute truth," an entire new world suddenly comes in to being (or at least into view) through our willingness to recognize it.

Those architects that have taken on the ideas of Deleuze have perhaps come closest to understanding a more meaningful relationship with(in) nature, the simultaneity of the fold suggesting one way to understand it. Yet those efforts, too, have remained largely formal and literal, manifesting only folding planes and little in the way of "smoothness."

What is missing from these approaches is an inclusion of the human world in the "natural," a continuity between the two. There is a rich set of systems and processes in life that we tend to disregard but that could be embraced in the middle ground between what is traditionally perceived as nature and culture. Nature cannot be addressed through form or aesthetics, but perhaps through process and performativeness. An architecture that responds to the worlds of nature must illuminate a space, or give access to knowledge of other ways of being in the world, of participating in and being linked to a larger world even as we live and labor in more hermetic ones. Perhaps Deleuze and Guattari's notion of the simultaneity of smooth and striated space offers a way in; what we must create in the world are the ruptures that make that simultaneity visible. What the surrealists saw as "a direct knowledge of reality; reality [that] is absolute and unrelated to the various ways of interpreting it."[10]

I argue for a broader definition of nature as the starting point for a new approach to building. I am particularly interested in how such a definition will create a different conception of building in the city. Nature is the worlds we live in, the physical, metaphysical, the visual, the corporeal, the phenomenological, the emotional, the intellectual, the surreal. It is processes, not only of the biotic world, but also of the social, the human, the human-made. How might we plan and build cities with an explicitly broader definition of "nature?" How might planning and architecture begin to embody a more dialectical notion of that relationship, and how might systems that are traditionally perceived as very much not a part of nature, such as the increasingly complex realm of technology in our lives, be integrated into this relationship? How might technology be used, not to dematerialize or virtualize our existences, but to reinforce our positions in the material world; technology as "nature, and the industrial landscape a kind of 'wilderness,' or a fluvial system that could be diverted or constrained," as Benton MacKaye recognized in the mid-twentieth century.[11]

In a recent lecture Sanford Kwinter stated, "The real and possible arrangements of intelligence and matter in nature are one thing (and likely unlimited), yet how we represent these possibilities to ourselves is another." What is suggested here is that we begin to represent nature to ourselves in a more complex way, a way that accounts for the multiplicity of "real and possible arrangements," a way that provides for the dialectic as a method to understand the relationship of human and nature, a way that accounts for "a continuity of the subject with its own internal spirit [...] and also continuity between the subject and object, between the subject and the external world."[12] This is a proposal to build in the dialectic, the space between our conceptions of "culture" and "nature."

"For we no longer have use for a principle of pre-established harmony; we have passed from the notion of the best compossible world to the possibility of a 'chaosmotic' one, in which our 'manners' ever diverge into new complications...The modernist 'machines for living' sought to express a clean efficient space for the new mechanical body; but who will invent a way to express the affective space for this other multiplicitous one?"[15]

Notes

1 Sanford Kwinter, 'Architecture and the Technologies of Life' in AA File Summer 1994, n 27 3 4 ; David Leatherbarrow, Uncommon Ground (Cambridge, MA MIT Press, 2000); Allen S Weiss, Unnatural Horizons. Paradox and Contradiction in Landscape Architecture (New York Princeton Architectural Press,1998); Leo Marx, The Machine in the Garden Technology And The Pastoral Ideal In America 35th Anniversary Edition (London Oxford University Press, 1999)

2 AD Architecture and Science, ed Francesca Di Cristina Wiley Academy West Sussex 2001 110 115, Weiss, 1998

3 Saunders, Peter T "Nonlinearity What It Is and Why It Matters," in AD Architecture and Science, ed Francesca Di Cristina Wiley Academy West Sussex 2001 110 115 P 110

4 Diana Agrest "The Return of (the Repressed) Nature," in The Architect Reconstructing Her Practice, edited by Francesca Hughes. (Cambridge, MA. MIT Press, 1996,) 204

5 Museu d'Art Conemporani de Barcelona (editors) New Territories, New Landscapes (Barcelona Actar Publications, 1997,) 102

6 Kwinter, Praxis, p. 6; Matthew Gandy, Concrete And Clay Reworking Nature In New York City. (Cambridge, MA MIT Press, 2002), Marx

7 Gandy, 2002

8 John Rajchman, "Out of the Fold," in The Architecture of Science, edited by Peter Galison and Emily Thompson (Cambridge, MA MIT Press, 1999,) 35

9 Frampton, Kenneth "Habitat Revisited From Land Form to Corporeal Space," transcript of lecture given at the Architectural League of New York, 2002 2003 Lecture Series

10 René Magritte, 1965, quoted in Michael Richardson and Krzysztof Fijalkowski, Editors, Surrealism Against the Current Tracts and Declarations, London: Pluto Press. 2001, p. 206

11 Keller Easterling, Organization Space. Landscapes, Highways and Houses in America (Cambridge, MA. MIT Press, 1999,) 16

12 Philippe Audoin, 1966, in Richardson, p 206

13 Rajchman, p 37
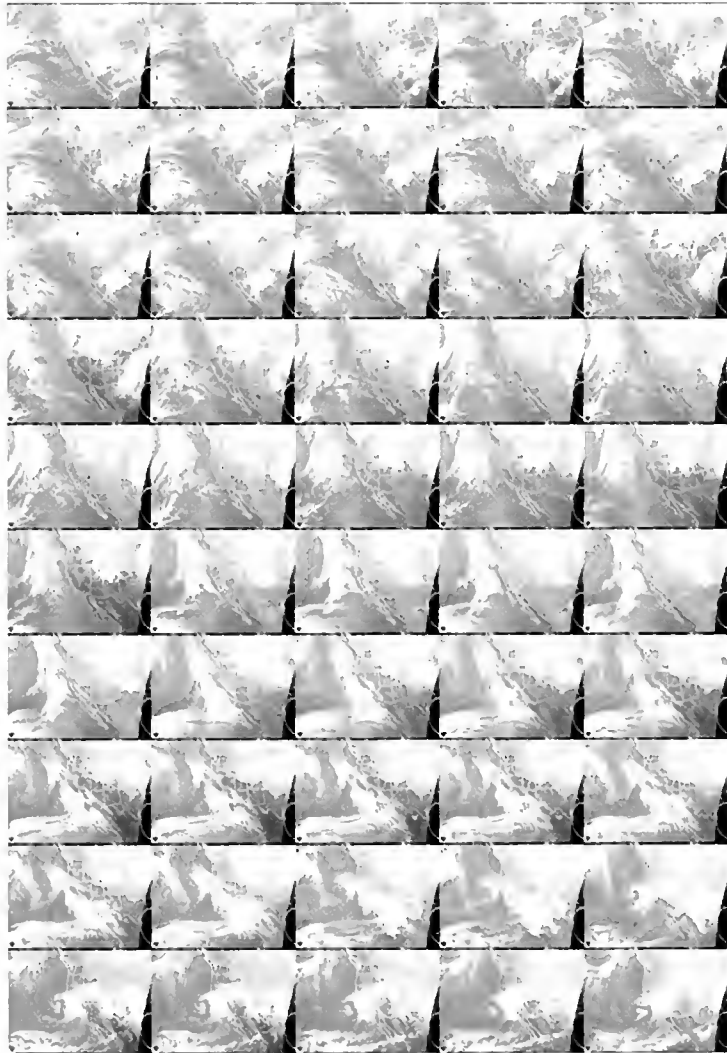
1 Weather Patterns

Krystal Chang

Weather Resistant

On a winter day in 1961, Edward Lorenz, a mathematician and meteorologist at the Massachusetts Institute of Technology, set out to construct a mathematical model of the weather. He reduced the weather down to a set of twelve differential equations, representing changes in temperature, pressure, wind velocity, etc. In re-examining a sequence of data, Lorenz tried to save time by re-starting the run from the middle, anticipating the same results as the first run. What came out was completely different, beginning from the same point and then diverging wildly within a few "model" months. Lorenz first suspected a computer malfunction, but later discovered what has become known as "the butterfly effect" or the idea in meteorology that the flapping of a butterfly's wing creates a disturbance in the atmosphere that will become so amplified as to eventually change large scale atmospheric motion. Because of this "sensitive dependence on initial conditions," long-term behavior becomes impossible to forecast.

Lorenz is credited with coining the term "butterfly effect". In a paper in 1963 given to the New York Academy of Sciences he wrote: "One meteorologist remarked that if the theory were correct, one flap of a seagull's wings would be enough to alter the course of the weather forever." By the time of his talk at the December 1972 meeting of the American Association for the Advancement of Science in Washington, D.C. the sea gull had evolved into the more poetic butterfly – the title of his talk was: "Predictability: Does the Flap of a Butterfly's Wings in Brazil set off a Tornado in Texas?"[1]

Weather is architecture's other. Weather is always what architecture is not, cannot be, and perhaps, occasionally, desires to be: immaterial, formless, weightless. Weather presides over the birth and death of architecture. It is both the cause of its being (the original impulse for architecture is in shelter from the elements; building was always a form of protection from natural forces) and the final ending (erosion and the decay of buildings). Archi-

tecture attempts to resist weather. Weather, on the other hand, cannot resist architecture.

The term "weather" actually has two opposing meanings: "weather" can mean, alternately, to decay, and to resist. "Weathering" describes both the process of decaying, and the element of a building that is meant to withstand the effects of weather.

The first model of weather is weather as myth, both natural and unpredictable. Weather remains stubbornly unexplainable by a Cartesian mode of thinking. Rain, wind, and sun sent down by the capricious and hard-to-please gods; weather could be invoked but not invented.

The second model of weather is weather as a nonlinear system and example of chaos theory. As such, weather has an underlying order, although it is still unpredictable. In watching animations of satellite images – weather systems gathering, dispersing, swirling – all is logical, all proceeds in a continuous fluid motion. Small things become big things, blow about, and disappear. Given the rotation of the earth, the tilt of the earth's axis, and the presence of sunlight, what results is a difference in temperature and pressure over the globe. This difference sets in motion the seasons, with their anticipated weather; the climate zones, from tropical to temperate to polar; the constant wind blowing from the poles to the equator; the trade winds blowing steadily from East to West above and below the equator. After this, everything else is local.

There is a new model of weather: weather as built. We know now it is possible to create weather.

> Every nation builds houses for its own climate. At this time of international interpretation of scientific techniques, I propose: one single building for all nations and climates, the house with respiration exacte....I make air at 18° Centigrade and at a humidity related to the state of the weather. – Le Corbusier, 1930

Weather may be created deliberately or inadvertently. When weather is made with a purpose, it usually falls into one of two categories. Weather as luxury, or weather for people: the airplane cabin, the sauna, the steam room, the suntan salon.[3] Weather as industrial process, or weather for things: the greenhouse, the cold storage, the wind tunnel. These are examples of weather in a small sense; they are all self-contained, hermetic spaces.

When weather is created accidentally, a by-product of other forces and processes, and set loose, it becomes weather in the true, global sense. Although it may begin artificially, it soon becomes all too real. The phenomenon of the "urban heat island" is well documented (Figure 2). On average, a city's temperature is one or two degrees higher than its surroundings. However, the main tendency of the urban heat island is not to change the average air temperature, but *to reduce the day-night difference.*[4] Wind patterns around objects show wind speed increasing through gaps between large surfaces and around the corners of tall buildings; the higher the building and the smaller the gap, the faster the wind. In the days after September 11, 2001, with all air travel grounded, scientists discovered the enormous effect of airplanes on weather by their absence (Figures 3, 4, 5). Airplanes leave trails of condensation that form the artificial clouds known as "contrails." It is estimated that contrails cover 0.1 percent of the earth's surface, with that percentage going up to 20 percent in certain regions. During the three-day commercial flight hiatus, when the contrails all but disappeared, the variations in high and low temperatures increased by 1.1 degrees Celsius (two degrees Fahrenheit) each day. Like naturally occurring cirrus clouds (thin, high-altitude clouds), contrails block out sunlight and trap in heat, thus reducing the daily range in daytime highs and nighttime lows. Contrails have been found to provide even more insulation, *further reducing variability.*[5] Similar to contrails, ship tracks, formed by the aerosol particles in ship exhaust, have been shown to modify cloud formations, causing the clouds to be more reflective and carry more water, and possibly keep them from precipitating.

It is difficult to draw the line between the natural and the built when cities make warmer, brighter night – nights like days – while our own travel habits can turn a sky from clear to partly cloudy, and, whether in Bangkok, Berlin, or Brighton Beach, you can have your air just the way you like it. Weather can be seen as architecture; it is part of the built landscape, of physically altered nature. At first, architecture seems to create difference, with a simple enclosure offering a dry space during rain, and air-conditioning creating winter in summer. But in the end, what we are left with is sameness, with day and night becoming irrelevant

and an identical "climate" artificially inserted regardless of place, making all places alike.

Perhaps, instead of this anti-variety that is the antithesis of weather, there is a possibility for an architecture of weather. An architecture of variability, gradation, unpredictability, and resistance; all climates in one single building.

> At a bank building under construction in Los Angeles, it was once 100 degrees on the ground floor and hailing on the sixty-fourth floor. This is something I'd really like to take advantage of.[6] – Pierre Koenig, 2002

On an urban scale, the presence of a city alters local weather conditions, causing a change in site conditions for new structures, creating new patterns of sun and shade and wind, resulting in new weather patterns, resulting in new structures, resulting in....

By extension, any change in the form or position of any object can alter every other object in existence.

This ambiguity of influences is evident in the very impossibility of studying weather; there is essentially no control group, only an experimental group. In Australia, when scientists began seeding clouds – inserting particles that would promote condensation, and thus creating rain during drought – it was difficult for them to conclude that they were actually having an effect. Once a cloud was seeded, it was impossible to tell whether or not it would have rained by itself. The conditions are always different for each particular cloud, each change in temperature, and each occasion of low or high pressure. The built landscape is a part of this whole, fluid system.

The relationship between weather and architecture is also one between climate and civilization. Research from the North Greenland Ice-core Project reveals a history of extreme changes in climate, hot to cold, wet to dry. "If you can possibly imagine the spectacle of some really stupid person (or, better, a mannequin) bungee jumping off the side of a moving roller-coaster car, you can begin to picture the climate," described one geophysicist. Our present interglacial period is the most stable period in history, and, according to the climatic record, is due to end soon. The ice cores indicate that at the end of the last interglacial period, at a moment roughly analogous to the present, temperatures plunged from warmer than they are today to the coldest levels of the ice age, all within a matter of decades. When looking at the climatic record, at first it seems sheer luck that we are living in this most stable period. However, we are ourselves a product of this period; a stable climate is necessary for agriculture, the first
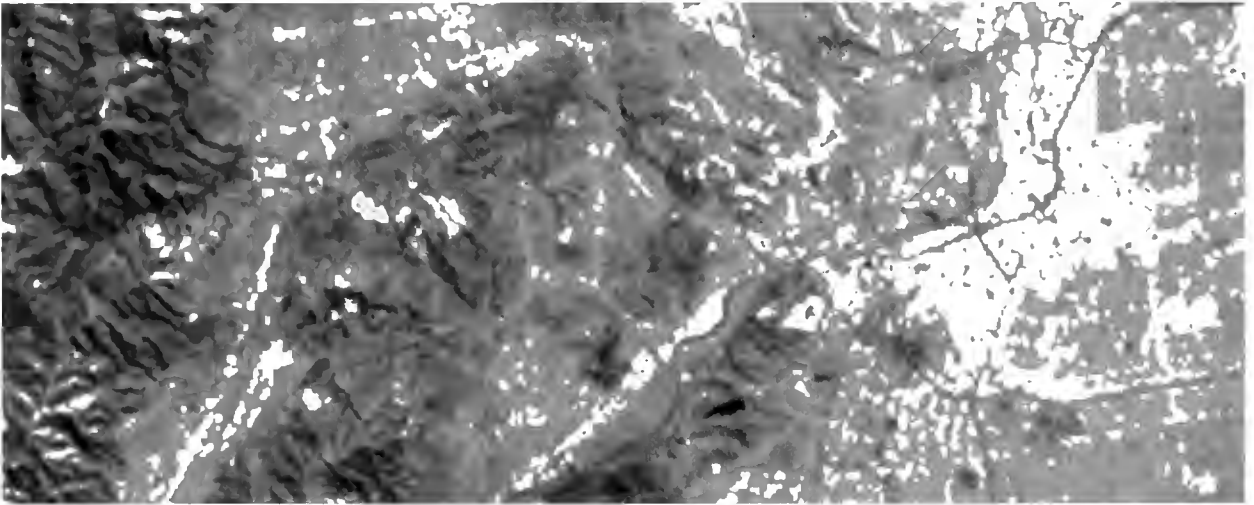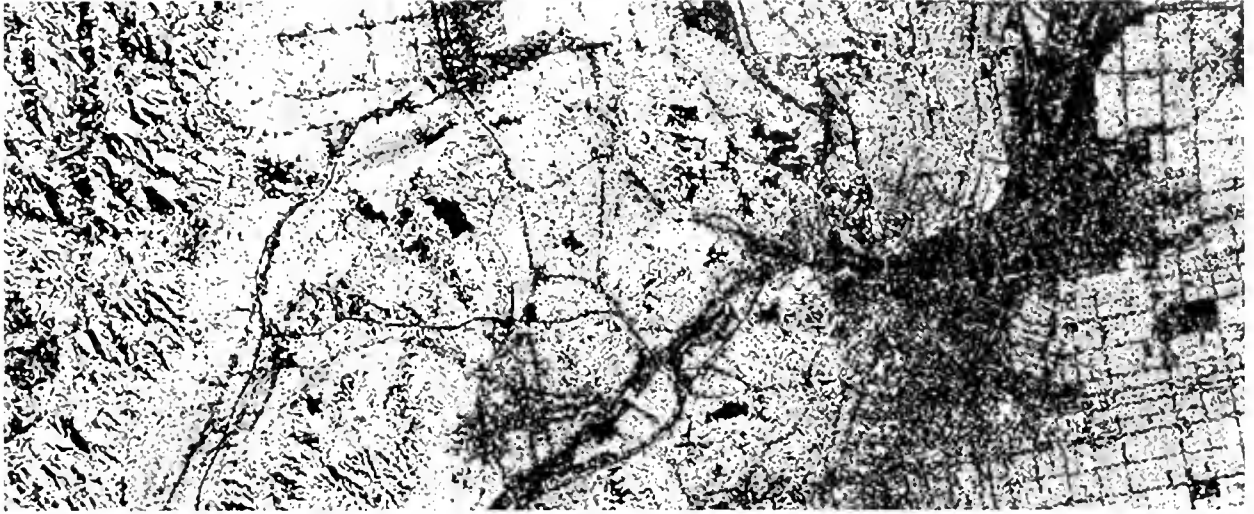
2 Urban Heat Islands, top, urban density in block, bottom, temperature from cool (dark) to hot (white)

step away from nomadism and toward the development of civilization. Another recent find has linked the fall of the Mayan civilization to drought. A study of sediments from the Cariaco Basin in the southern Caribbean shows a long drought with periods of extra dryness that began in the seventh century and lasted over 100 years. The elaborate Mayan cities and irrigation systems were inexplicably abandoned early in the seventh century, reoccupied, and abandoned again around 860 and 910. These abandonments synchronize with the timing of the dry spells.

It is possible that the climate is overdue for another cataclysmic shift. It is also possible that we have changed the climate to such a degree that a new history has begun. Weather can be mapped as a constantly shifting topography, occupying several scales at once, created by the intersection of the intergalactic, continental, local, molecular, arising from the confluence of multiple forces, invisible, but readily provocative. That elusive butterfly's wing. What was natural? What was built? Anticipating the weather is like playing a game in which any move changes the rules; cause and effect are indistinguishable.

3 and 4 Cantrails observed from the ground in Los Angeles

5 Satellite images of airplane contrails over the Great Lakes

Notes

1 Larry D. Bradley Paper written in conjunction with a talk given for Interme diate Physics Seminar of the Department of Physics and Astronomy at the Johns Hopkins University. http://www.pha.jhu.edu/~ldb/seminar/index.html

2 "'Weathering' [was] originally defined as that part of a building that projected beyond the surface of any external wall and served as a 'drip', in order to throw off rainwater Weathering also referred to a sloped 'setoff' of a wall or buttress, or the inclination of any surface, designed to prevent the lodgement of water. This sense of the term survives in present usage in the terms 'weatherboard', 'weatherstrip', and 'weatherproofing'." Mohsen Mostafavi and David Leatherbarrow, On Weathering. The Life of Buildings in Time (Cambridge: MIT Press, 1993).

3 At the Venetian hotel in Las Vegas, a re creation of the canals and squares of Venice completely sealed off from the outdoors, one of the live shows is a rainstorm Along the miniature Grand Canal, every so often the painted sky darkens, thunder approaches, and rain falls hard on the cobblestones. After a few minutes, the sun comes out again and birds chirp. Here we have weather on demand a short, sweet rain every hour, on the hour The ultimate example of weather as novelty

4 Benjamin Stein and John S Reynolds, Mechanical and Electrical Equipment for Buildings. (New York John Wiley and Sons, 2000).

5 Richard Stenger, "9/11 study Air traffic affects climate." CNN website August 8, 2002.

6 Paul Makovsky, "Microclimates" in Metropolis Magazine, August/September 2002

7 Elizabeth Kolbert. "Ice Memory" in The New Yorker January 7, 2002.

8 Paul Recer "Dry Spell Linked to Demise of the Mayan" AP Newswire. March 13, 2003

John Divola

Artificial Nature

Over twenty years ago I read an essay by Arthur C. Clarke that occasionally comes to mind. Clarke was speculating on the certainty that mankind would develop artificial intelligence, and that eventually such an intelligence would have the ability to learn, move through the world, and act. It would not be constrained by the limitations of biological life span and it could live indefinitely. Eventually, it might travel into space, and given eternity, it could travel everywhere in the universe and learn everything that there was to know. And if this consciousness knew everything, then it would have the ability to control everything and would be in concert with the very conception of God. "It may be that our role on this planet is not to worship God, but to create him." I am not sure whether this eventuality would represent "culture's" final domination of "nature" or if the relationship would revert to the condition of nature alone and the cycle begin anew.

Since today's computers do not have the capacity to visually differentiate a camel from a cat, I do not think we need to spend too much time worrying about the fruition of Clarke's speculation. However, this model of techno-prophecy has brought me to consider another intersection of myth, science, and technology – the collective unconscious.

The psychiatrist and theorist Carl Jung speculated that human beings have a biological propensity to form certain mythic structures that he called archetypes. In his personal writing he describes the existence of a collective human consciousness. Rather than Jung's idea of a psychic inheritance, a collective unconscious may be something that humanity is in the process of implementing. While one might suggest language itself is the beginning of collective identity, contemporary visual culture shifted the abstraction of language to a realm of shared experiential specificity.

We have extended the externalization of memory in the form of digital databases and we have interwoven representational experience with direct experience to a degree where we can no longer distinguish the basis for our conceptions of reality. Furthermore, there no longer appears to be much individual appetite for interrogating the difference. When I think about Manhattan, and I have been there many times, I cannot clearly identify the source of my conceptions. These conceptions are based in direct experience, Manhattan as background in TV detective fictions, or numerous other representational sources. It never really occurs to me that I should make a distinction as to the sources on which I base this image of place. Whether from direct experience of the world or direct experience of the physical evidence that constitutes photographic representation, visual experience and memory gradually focus these impressions on a condition of equivalence. Memories of my actual experiences with any particular city must compete with a relentless stream of representations of Paris, New York, and Los Angeles. Memories of walks in nature are intermixed with that familiar stretch of desert highway that I see continually repeated in automotive commercials.

What we see on TV, movies, computers, and magazines is an indirect manifestation of our collective desires and interest. For the most part, those responsible for the production of popular culture are desperately trying to give us what we want. With each passing year the "entertainment industry" becomes more skilled at, and the technology more appropriate to, targeting our interest. The media does not sell us products; it sells our attention to those who wish to influence us. There is a rapidly accelerating efficiency of the cultural feedback loop where representations inform our desires and where our desires direct subsequent representations. There is, of course, no one shared base of mediated visual experiences. There are, however, many overlapping constituencies of experience based on lifetimes of passive representational reception.

For me, as an artist, there exists a realm of popular visual culture that is an experiential reality – a space open to ne-

gotiation and inquiry. It is an envelope of representations that I can explore through the manipulation of existing images or engage literally (most recently, I have completed a group of photographs I made on the sets of the television program The X-Files). What I am after as an artist is an opaque manifestation of the illusion of transparency that characterizes this cultural space.

The images reproduced with this essay are from an installation of 36 photographs titled "Artificial Nature" comprising found set still photographs of natural environments constructed on Hollywood sound stages. Set stills are photographs taken of motion picture sets to aid in the preservation of filmic continuity. Occasionally, for a variety of reasons, a scene will need to be re-shot, or added to, and these pictures provide a record of where things were placed and how they were lit. I began to collect Hollywood set stills simply because I considered them fascinating and

beautiful. They also intersected with my work, which had involved photographing scenes specifically fabricated for the camera, often addressing issues of absence. The set stills that make up "Artificial Nature" were made for a variety of Hollywood studios and are dated between 1930 and 1960.

Since these photographs were only intended for practical applications they were not attributed to individual photographers. Sets were constructed from the descriptions of authors and the contributions of designers, art directors, studio executives, and directors, and ultimately filtered through the sensibilities of anonymous studio photographers. Nature, which only a few hundred years ago was seen to be an infinite context in which culture struggled to exist, is here the literal manifestation of a figurative assertion, controllable and contained.

Mark Burry

Re-natured Hybrid

Central to his erudite tour de force, *Dancing Column: On Order in Architecture,* Joseph Rykwert uses that most robust and ubiquitous structural element, the column, to distil a history of western civilization, and more crucially the values enshrined within two millennia of western architecture.

> The column-and-beam element is, in itself, a constituent of the man-made, of the artificial world. It is also part of an all-encompassing metaphor that makes human shelter an embodying, an in-corporation.[1]

He begins by explaining the origins of a career-long fascination with the five orders, then spends almost six hundred pages roaming widely in cultural, geographical, practical, etymological, and ultimately epistemological domains, concluding with a rather sober observation:

> I therefore hope that I have presented Greek architecture as the most entrancing and forceful, the exemplary art of building, an architecture which still invites dialogue and touch, which requires physical contact across the millennia. It cannot teach us – history never can. But we may learn from it.[2]

The book is directed more at revealing the cultural enrichment that comes from an encyclopedic tracing of the lineage of each manifestation of the column back to its source than to exploring the diverse wealth inherent in the familial, cultural, and historical web that begets it. Possibly as an implied critique of the postmodern appliqué of the orders, Rykwert refers to projects by Loos, Asplund, and Gaudí as evidence of three architects who, having assimilated the 'Greekness' of the Doric order, offered it back through their projects, reconstituted but original. For Gaudí, he selects the hypostyle market place in the Parc Güell (1900 - 1914) (Figure 1).

> But other major and innovative architects adapted the existing orders to their own use. Antoni Gaudí was a conspicuous example, perhaps because he made the appeal so sparingly. And of course he was much more

'Gothic' than 'classical,' a self-confessed disciple of Viollet-le-Duc. In one important building, he used the Doric order impressively: the Parc Guell in Barcelona, which was to have been the central open space (called by Gaudí 'the Greek Theater') of a new garden-city.[3]

Rykwert is highly selective here, as there are more intriguing examples of references to ancient Greek culture in Gaudí's other work. Despite his assertion that it is Gaudí's "only explicit reference to Greek architecture...," Rykwert's priorities are evident:[4]

> Asplund and Gaudi and Loos in their very different ways were tributaries to an ancient and grandiose – but apparently buried or broken – tradition: that the Greek orders enshrined and transmitted values of primordial as well as perennial validity. Until the eighteenth century the core notions of that tradition could be taken for granted; from the beginning of the nineteenth, the different historians and architects who wrote about the orders needed to plead and vindicate. That may be why attention clung so insistently to the Greek Doric order, and why my three salient twentieth-century examples are of Greek Doric. It seemed older, nobler – or at least notionally more 'primitive' and therefore less 'historical' – than the others.[5]

The Parc Guell hypostyle has a compositional connection to its temple antecedent, and the interpretation of the Doric order and associated motif is overt; hence Rykwert's interest. It is odd that he makes no reference to the soli-

tary caryatid placed elsewhere in the park (Figure 2). Its fabric, placement and singularity make the motive for its incorporation rather difficult to discern – is it ironical, humorous, or merely decorative?

Concurring with Rykwert's assertions that Gaudí is seeking to make a Mediterranean link between Catalonia and Greece, former collaborator Cèsar Martinell notes the following in his account of his many conversations with Gaudí. Under the subtitle "Gaudí's Innate Hellenism": "He indicated to me that all the business about mosaics is Greek. Constantinopolitan. That he felt this as a natural way of being, that he wore it from within."[6]

Evidence of Gaudí's (and his patron, Eusabi Guell's) broader-ranging classical scholarship is provided by references to ancient Greece in other projects which, in detail, are more wide reaching than the overt evocation of the Doric order at Parc Guell. A thorough examination of the gatehouse and stables for the Finca Guell (aka Pabellones Güell 1884 – 1887) at Guell's country estate, for instance, makes reference to the Garden of the Hesperides, and is a far more subtle Greek intervention than the game being played through the hypostyle in Parc Guell. It is not as easy to pick up, but it is unequivocally there all the same. There are no Doric columns, but a splendid scrap-iron dragon in watchful repose recalling the legend of St George, the patron saint of Catalonia, and his slaying of the dragon. This reading, however legitimate, masks a deeper reference, for the dragon resides beneath an apple tree made from the metal antimony and alludes to the labors of Hercules. It was the contemporary Catalan poet Jacint Verdaguer who, in his epic poem "L'Atlantida," used the Labors of Hercules as a metaphor for what he saw as the equivalent labors of Christopher Columbus who set sail (with Catalan capital) from Catalonia. That Gaudí powerfully dramatized this connection reveals a wide perspective that enabled him to reference Verdaguer, thereby implicitly linking ancient Greece to his city. [7]

Gaudí was inclined to work through metaphor, allusion, and allegory at a number of levels. The Sagrada Família Church was intended to be read as a sculpted version of the bible. Internally, the principal columns conceal a synthesis of the Doric order, but also seek to rectify the deficiencies of the Gothic as a means to reconcile the architectural movements in Catalonia since Roman settlement. Before laying open the secrets that Gaudí assumed would remain far from view (as will be discussed below), a summary of innovation for other columns within his oeuvre will serve to show his route to a sublimation of history and a theory based on combining the lessons of nature and culture into his final work. Let us look briefly at the columns from three other projects before concluding with the Sagrada Família nave columns referred to above.

The first example of a departure from any convention in placement, decoration, and intercolumniation, can be seen in Guell's townhouse, Palau Guell (1886 - 1889). There he modified the lighting by layering the columns in triples (Figure 3). Gaudí completed a convent school in the same year, the Colegio Teresiano (1888 – 1889). In contrast with the townhouse, the convent was built on a very tight budget, yet Gaudí's creativity did not seem to be stunted in any way. One of the most remarkable features of the convent is a patio with a double colonnade of single-brick columns at each end of the building (Figure 4). The riskiness of supporting two floors of masonry in this way is quite palpable when, with one's hand against the face of the column, vibrations from activity in the opposite corner can be felt: the bricks are working. It is curious that there should be one less brick in the stack along one side. Regardless of what is behind this asymmetry, there is an enthralling honesty that Khan would have admired: the bricks, frogs and all, unashamedly celebrate their highly tuned function as columns.

Perhaps the most significant departure from the established orders are the columns at the Còlonia Guell church (1898 - 1915). This remarkable building – abandoned with only the crypt constructed – has columns of unworked basalt prisms, inclined to meet their forces of opposition along their axes, their positions determined by the 1:10 hanging model arranged in a shed next to the site (Fig-

1 Hypostyle marketploce, and

2 Coryatid, both ot Parc Güell

3 Columns screening window, Palou Güell

4 Colonnaded Patio, Convento de Santo Tereso

5 Crypt, Colònia Güell Chopel

ure 5). This was hardly a building for which conventional drawings could usefully serve. The builders consulted the model for coordinates from which the columns could be correctly aligned. To say that the columns are unworked is a slight exaggeration: Gaudí successfully requested wedge cuts to be taken at the column-base connections in order to apply a little extra frisson to the mix of improbable masonry and structural performance, within an interior that might best be described as sublime.

This design may have stemmed from his Hellenophile client rather than Gaudí's own predilection for the classical, but I do not believe that he had any clear preference – he was neither classical nor Gothic. In fact, he set out to 'correct' the Gothic, seeking to distil all that he saw as relevant from the preceding two millennia of architectural evolution into one highly evocative column. A hybrid of human artifice and of nature – a re-naturing of architecture – set this work against a growing tendency in reductionism that began with the Enlightenment and continues today. If the columns at the Colònia Guell are remarkable for their simplicity, they contrast sharply with the highly finished sophistication of the Sagrada Família.

Cèsar Martinell provides this account of a conversation he had with Gaudí on the subject of the proposed columns for the Sagrada Família Church:

> He spoke to me of the helicoidally generated columns with the parabolic star-shaped base plans, which turn in two opposite senses, intersecting with themselves. He said that the resulting form which he has made in plaster, at a scale of 1:20, is a summary of all the columns that have existed: Egyptian, Greek, Romanesque, Gothic, Renaissance, Salomonic.... I had to observe that the generation rule of said column, despite its simplicity, remains hidden; and if many architects were to be asked without having been previously told, very few would know how to discover them. Gaudí replied that no one would.
>
> He affirmed that the helix is necessary for the column. Nature corroborated it through the growth of many trees, that it produced helicoidally....Domènech i Montaner, who was talented, always decorated the columns with helicoidal forms. Those of the Sagrada Família would not require decoration, because they already had a helicoidal structure. Through being daughters of a synthesis they already had everything, and therefore required nothing extra: neither a base, nor capital, nor decoration.[8]

This account of Gaudí's intentions for the principal columns for the Sagrada Família was first published in 1951, four years before the first built prototype of the columns was constructed in its intended location. It is a highly charged commentary, revealing that Gaudí himself regarded the generative design aspects as undiscoverable by any architect not already let into the secret; yet here lies a recipe for a cultural fusion unparalleled in so small a building fragment. Analysis of the nave columns reveal that even the simplest architectural element of all – the column – can encapsulate a profound statement about the relationship between all western architectural styles. The generation of these columns yields an amalgam of history, culture, and function, making a simultaneous statement about the reduction of ornament and functionally discrete components, the fusion of column and beam, and the relationship of the natural world to the artificial.

The columns of the Sagrada Família Church are the concluding statements from Gaudí, the result of his long career of experimentation. The accompanying illustrations visually show the theory, described below, in practice.

Each column has a profile composed of vaguely star-shaped convex and concave parabolic curves (Figure 6). Columns with different performance requirements are sized appropriately. The proposed materials range from sandstone for the least charged, to granite then basalt with porphyry used for the four large columns that support the towers over the crossing. We can see from the early studies that Gaudí abandoned single helicoidal columns due to their singular rotational appearance. Instead, he proposed that the columns would be formed by two barley sugar twists – each in a different direction but with the equivalent rotation. The resulting column is the intersection between the two superimposed elements (Figures 7-9). At the base are uninterrupted curved profiles, but by the point where the two twists are exactly out of phase, Doric flutes emerge. Collins was the first to bring this to the attention of English speaking readers, but failed to recognize an astonishing algorithm for the column to continue beyond the point where the two twists would begin to go back into phase.[9] Rather than make an adaptive new profile for the continuation, Gaudí simply doubled the number of twisted columns. The granite columns of eight 'points' rise eight meters before this midway point is reached. There, the columns double: two continue twisting as the column height increases, and two twist back on themselves for a further four meters. At this point – 12 meters in total height – the individual columns are again out of phase, at which point the four component columns become eight. It is almost as if Gaudí were hinting at cell division and evolutionary constructs (Figure 11).
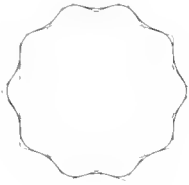
Do the flutes that dominate the middle sections of the column constitute a Doric abstraction within an otherwise Gothic revival church? Here is how one of Gaudí's closest assistants reacts to this question:
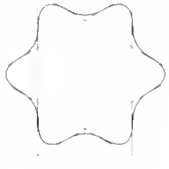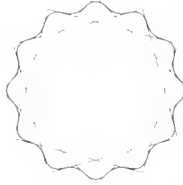
6-points inside two equilateral triangles
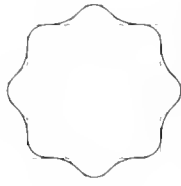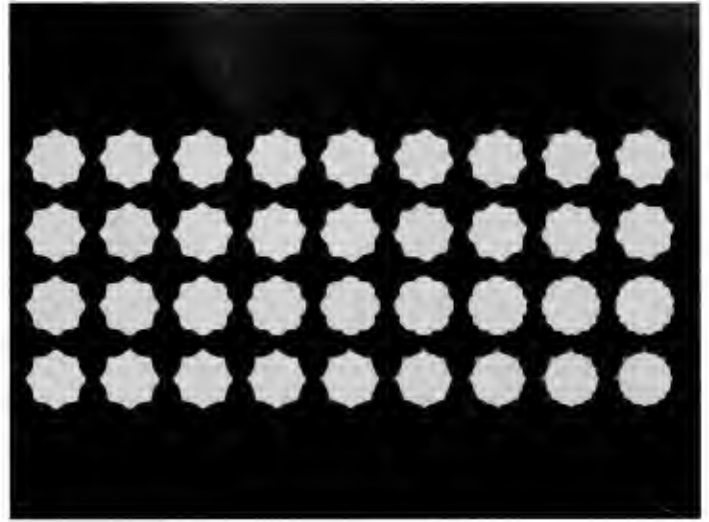
8-points inside two squares

10-points inside two pentagles

12-points inside three squares

6 Development of profile for "8-sided column" showing fluid cotangential concave and convex curve integration, Sagrada Familia
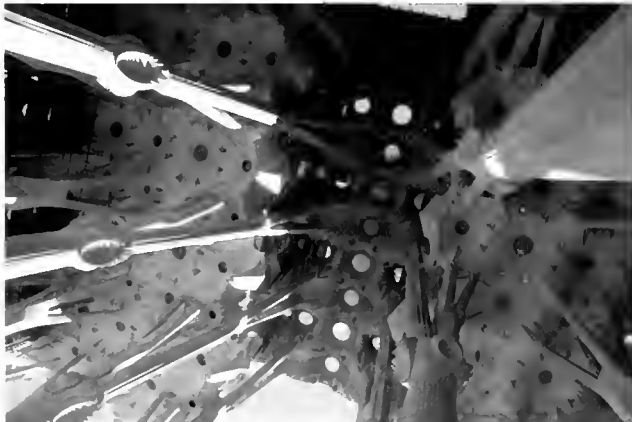
7 Computer aided modelling studies of "8-sided column" showing the two individual clockwise and anticlockwise twists, their union and their intersection (desired result)

8 and 9 Model of entire column

10 and 11 Column twisting and branching, Sagrada Familia

When building the Sagrada Família and studying other churches he was deeply critical of the Gothic style - a style that had inspired such eulogies from the literati and engineers of his youth. Of the Gothic he said that it was an imperfect style, as yet unresolved; an industrial style, a mere mechanical system; the decoration was always artificial, and could be eliminated entirely without it losing any particular quality. He would say sarcastically that the Gothic was at its best in ruins and in moonlight. In answer to those who objected to this criticism with, 'But you are building the Sagrada Família in the Gothic style,' his, reply was: 'No, Sir. The Sagrada Família is Greek.' This seemingly paradoxical statement has a basis of truth: the Gothic of the Sagrada Família is more apparent than real, for its structure goes beyond it, and in the positioning of volumes and the resolution of details the church has never been orthodox Gothic. Its original design was Gothic with touches of Baroque - which is the same as saying that it was not Gothic.[10]

Puig i Boada also observes the following:

> He used these ruled surfaces because he believed them to be the most perfect. 'To conceal the imperfect union between the stiles and lintel of an opening,' he would say, 'we use capitals, imposts, etc. Nature produces none of these features to resolve the continuity.'[11]

The columns dispense with base and capital in the traditional sense. They elegantly implicate the Doric order, including the entasis, invoking nature at its most fundamental – growth – and lean quietly into the line of force to which they are subjected (Figure 10). They also point to a maturity when compared with the Parc Guell hypostyle. Rykwert notes: "While the refined 'correct' swelling of the shaft called entasis is not used, there are other strange optical devices, thoroughly 'unclassical' ones: the outer columns are inclined inward, like flying buttresses, and much of the ornamental detail is improvised."[12] These lines seem to refer to a different Gaudí, one who spent a large part of his lifetime attempting to get rid of the flying buttress. Leaving Laugier's primitive hut and its literal tree-trunk columns well behind him, Gaudí brought the trees into the interior of the Sagrada Família all the same.

With a synthesis of nature fused to a scholarly love for the traditions of western, Arab, and Mayan architecture. It is the dancing column that Rykwert seeks. Ironically for the detractors of the continued construction of the Sagrada Família Church, the very act of building, rather than erudition and historiography, provided the opportunity to truly understand the columns. Just as Rykwert calls us to learn from the Greeks in the *Dancing Column*, so too do Gaudí's dancing columns show us that nature can be brought into an academic and not merely decorative dialogue with form – a re-naturing of architecture – when others have been inclined to do the opposite. These columns show that an important 'message' can be proselytized with consummate humility via the artifact alone – Gaudí wrote absolutely nothing in words about his work during a career spanning forty-eight years, content with providing a full testament and last word in brick, stone and metal – one we have to work hard to unravel.

Notes

[1] Joseph Rykwert, *The Dancing Column : On Order of Architecture*. (Cambridge. MIT Press, reprint 1998), 373

[2] *Ibid.*, 373

[3] *Ibid*, 391

[4] *Ibid*, 18

[5] *Ibid.*, 27.

[6] Cèzar Martinell, *Gaudí i La Sagrada Família comentada per ell mateix*. (Barcelona Editorial Aymà, S L., 1951), 140

[7] Juan José Lahuerta, *Antoni Gaudí, 1852-1926: architettura, ideologia, e politica* (Milano: Electera, 1992), 38-43.

[8] Martinell, 127

[9] G R Collins, "Antonio Gaudi: Structure and Form" in *Perspecta 8 : The Yale Architectural Journal* (New Haven: Yale University Press, 1963), 63-90.

[10] I Puig i Boada, *The Church of the Sagrada Família*, Ediciones de Nuevo Arte Thor. (Barcelona: first edition 1929, rep. 1988), 131.

[11] *Ibid.*, 132.

[12] Rykwert, 18

David Gissen

Bigness vs. "Green-ness"
The Shared Global Ideology of the Big and the Green

Many of the massive proposals for the World Trade Center site exhibited this past year at the Winter Garden of the World Financial Center contained references to their "green-ness," but of all of the projects that made such claims, the proposal by Norman Foster and Partners stood out. The text accompanying Norman Foster and Partners' entry to the competition claimed that the striking twin-tower proposal "would be the biggest and greenest building ever built."[1] Foster's statement raises several theoretical issues: why would an architect want to achieve both of these contradictory goals, and how can a building be the most massive building ever built and the most environmentally sensitive? It would seem that massive development and environmental sensitivity are contradictory projects. The unprecedented scale of Foster's proposal demands a rethinking of the increased weaving of what might be called the theories of the "big" and the theories of the "green." Foster's project is not alone; recent buildings by his firm and buildings by many other firms employ environmental technologies and siting techniques at huge scales. Collectively, these projects force us to understand why and how "bigness" and "greenness" are conflated, and how we ever imagined these theoretical approaches as opposed.

Defining Bigness and Greeness

The large-scale architecture that is the wake of late 20th century globalization was first dubbed "colossal architecture" by Mario Gandelsonas in 1990 and then "bigness" by Rem Koolhaas in 1993. Gandelsonas came up with his concept of colossal architecture by examining the work of Cesar Pelli through the writings of Jacques Derrida and Saskia Sassen (a well-known chronicler of the urban conditions of globalization).[2] Koolhaas arrived at his concept of bigness as a way to describe his firm's large-scale architectural approach that was being exhibited at MOMA in 1993 (the concept of bigness extended his critique of 20th century urbanism, first laid out in *Delirious New York*).[3] Both "colossal" architecture and "bigness" described building

types such as skyscrapers, high-rise buildings, mid-rise buildings, large-span buildings, among numerous other large-scale constructions. Both Gandelsonas and Koolhaas claimed that these structures emerged from the economic forces of globalization, forces that demanded universal architectural solutions for living and working, and the sites for the production and consumption of goods.

Using Cesar Pelli's World Financial Center and Pacific Design Center as examples, Gandelsonas described colossal architecture as an architecture of endless growth and infinite verticality: "By cutting the towers' shafts at different heights, Pelli provides a way to indicate the concept of the infinitely tall tower....This same concept of cutting something infinitely long is present in the colossal length of the Pacific Design Center, a skyscraper on its side...the colossal implies the enormous, the immense, the excessive, the lack of limits: 'the infinite is present in it. It is too big, too large for our grasp, for our apprehension.'"[4] Koolhaas describes bigness with similar language, but in this case, bigness is described as architecture that uses technology to realize a limitless interior space, disconnected from its surroundings: "Together, all these breaks – with scale, with architectural composition, with tradition, with transparency, with ethics – imply the final, most radical break: Bigness is no longer part of any urban tissue. It exists; at most it coexists. Its subtext is fuck context."[5]

Between the 1960s and the 1990s, "green" or "environmentally conscious" architecture theorists, such as Maxwell Fry, Roland Ranier, Hassan Fathy, Sym van der Ryn, attacked the same buildings and building practices that Gandelsonas, and particularly Koolhaas, used to outline their vision for a new global architecture. "Green" building theory can roughly be surmised as an ideology that professes the maintenance of local resources and cultural building traditions through a form of ecological and cultural mimesis. In "Natural Energy and Vernacular Architecture," Hassan Fathy argues that large buildings with their equally large air-conditioning packages are causing people

1 Gap San Bruno Headquarters by William McDonough

to "forget" local responses to the environment. Fathy calls for the use of vernacular low-tech approaches to mitigate the financial and environmental impact of large buildings. In his book *Livable Environments*, Roland Ranier derided the skyscraper's and the highway's consumption of land, calling for regionally based, small scale development. Pictures of German farmhouses and Japanese gardens were used as illustrations of a more environmentally sensitive way to build. Kenneth Frampton has repositioned the ideas in his famous "Critical Regionalism" essay and in more recent and explicitly environmentalist works including his essay "Architecture and Ecosophy." Frampton continues to maintain that large-scale speculative developments are at odds with a more local, climatically, and topographically based architecture, and that these developments are responsible for the destruction of unique landscapes and cultural features.[6]

Frampton, Fathy, van Der Ryn, and Ranier cite the product-like nature of skyscrapers, the "bull-dozing" of land, and the use of "artificial lighting and ventilation," as symptoms of rampant international development that has gone out of control. In response, these thinkers call for humanly scaled buildings that incorporate the "intimate knowledge of specific places" and "locally-inflected tactile features,"

including topography, context, climate, and natural light. This combination of local features "jointly have the capacity to transcend the mere appearance of the technical," while withstanding "the relentless onslaught of global modernization."[7]

The Shared Global Agenda of Bigness and Greeness

Although the idea of a "large-scale global environmentalist architecture" would seem contradictory, within the past five years a number of architects have made claims that their projects were both "big" (as outlined by Gandelsonas and Koolhaas) and "green" (by many of the standards presented by Ranier, Fathy, van der Ryn, and Frampton). Architects such as Norman Foster, Richard Rogers, William McDonough, and Kenneth Yeang claim that several of their recent projects simultaneously owed their form to the forces of international capitalist development and green ideology. Among the many projects, the Gap San Bruno Headquarters (1996) by William McDonough (Figure 1), and Menara Mesniaga (1996) by Kenneth Yeang (Figure 2) are significant "big and green" projects, particularly described in this way. William McDonough describes Gap's San Bruno Headquarters as a key feature of his "green

business revolution," and Kenneth Yeang received the Aga Kahn award for the way he fit IBM's regional headquarters into its Malaysian ecosystem.

Numerous magazines, architectural journals, and architectural institutions have praised these projects for "tempering" the forces at work in international business that destroy context. On Kenneth Yeang's Menara Mesiniaga, the jury of the Aga Kahn prize reported: "designing with the climate in mind, it brings an aesthetic dimension to [Menara Mesiniaga] that is not to be found in typical glass-enclosed air-conditioned high rise building. The tower has become a landmark, and increased the value of the land around it. The jury found it to be a successful and promising approach to the design of many-storied structures in a tropical climate."[8] William McDonough often is praised in architecture and business magazines for showing that good business practices can incorporate green perspectives. *The Christian Science Monitor* wrote: "His statements encapsulate his efforts to bring about a rapprochement between corporate America and the environmental movement. One colleague in the environmental movement calls him 'our great translator,' because he can defend the dreams of the environmental movement with arguments that an MBA can understand."[9] The "success" of McDonough and Yeang is largely due to their ability to rectify what are presented as "opposing" forces of green-ness and bigness within contemporary business.

Yeang and McDonough should be praised for their commitment to reducing building energy consumption, their sympathy to local resource availability, and their constant incorporation of natural light and air in almost all of their projects. Yet the oppositional rhetoric that they have inherited from the early green movement, and that they and others use to describe their method of mediating "big" architecture needs to be examined. Rather than seeing projects such as Menara Mesiniaga and the Gap San Bruno building as remarkable because they adjust or "mediate" between global business practices and local and ecological issues, these projects actually reveal the international, global ideology that big business and environmentalism often share. As Mark Jarzombek so carefully argued in the pages of this journal, green technological systems became a billion dollar business in the 1990s, and companies often justified big green buildings as lowering the costs of business.[10] These important observations, force us to re-think whether "green" architecture is a movement about corporate resistance, which is how it has been traditionally positioned, or whether it shares some fundamental feature with the capitalist flow.

Both the philosopher Slavoj Zizek and the writer David Rieff offer a new theoretical connection between the global and

2 Menara Mesniaga by Kenneth Yeang

the local, an explanation which could help reposition the links between the "big" and the "green." As Zizek noted, "the opposition between globalization and the survival of local traditions is false. Globalization directly resuscitates local traditions, it literally thrives on them."[11] Zizek here is talking about tourism, spice trades, language and cultural classes, and other instances where business thrives off what is "local." David Rieff makes a similar argument when he claims that globalization is not a form of "westernization," as is so often claimed. "Western Civilization does not occupy a sacred place in the heart of capitalism. In fact, the dominant ideal of a 'white, European male' stands in the way of capturing whole new markets of non-white, non-European, non-male consumers....Everything is commodifiable...there is money being made on all the Kinte cloths and Kwanza paraphernalia."[12]

In a related argument, Alan Calquhoun has demonstrated that the supposed "resistance" within a locally based, small-scale culture is often false. What are often called vernacular "responses," ideological systems that certainly would not produce a 2,000,000 square foot office tower, are nonetheless often the very same "products" of cultural elites. One need not look too far back in history to see the way local and vernacular cultures are maintained as ways to maintain cultural cohesion, in the name of centralized or globalized forms of power.[13]

Using these arguments as a new interpretive framework, the supposed distance between Bigness and Green-ness might be false. Like the American business man who learns what is "Japanese" in order to conduct a highly competitive business in Japan, big projects now learn the particularities of the local in order to better position the needs of a business enterprise. According to a thinker such as Slavoj Zizek or David Reiff, the presence of Western corporations does not automatically result in the attitude "fuck context"; often corporations embrace the local, and the forces of globalization are often needed to resuscitate local features.

Menara Mesiniaga and Gap San Bruno have brought attention to the unique architectures and climatologies of Malaysia and California. Menara Mesiniaga and Yeang's other realized Malaysian towers, such as ABN-AMRO, incorporate methods of air ventilation found in traditional Malaysian houses and they incorporate local plant species, all in a skyscraper format. Gap San Bruno's habitat roof for local birds and plant life has brought increased attention to its local Californian ecosystem and put wildlife firmly within the matrix of corporate experience. Another big and green project, East Gate, located in Zimbabwe and designed by the Pearce Partnership, is based upon termite mounds found in Zimbabwe, which use a form of natural air-conditioning to keep the mound cool. The architects studied the termite mounds and local houses, which also use local cooling methods, and incorporated them into a massive office and shopping mall building made from locally available resources and covered with native plant species.

In an effort to affirm the inherent resistance that green architecture theory is supposed to offer, many green theorists might argue that what is being recovered is not the "real" culture, just the one that big business enterprises find useful. The wind-catching techniques that Kenneth Yenag claims are based on Malaysian traditions are not the "real" wind-catching techniques used by "real" Malaysian builders, because they are only being used for resource efficiency and their cultural meaning has been lost. The designers of Eastgate are not interested in maintaining local ecology and are not operating within a business format

that resists the impact of capitalist production. The local cultures that Alan Calquhoun refers to are not the type green theorists want to revive, and so on. But what philosophical system could possibly sort through these types of divisions without resorting to a problematic epistemology? These are difficult questions that big and green projects raise and that must be addressed for those green thinkers that continue to position themselves against the "big."

A critical "big and green" project is not impossible even though there are contradictions located within contemporary big and green theory. It is virtually impossible to argue with any architect who is interested in mitigating the environmental impact of buildings, especially large ones. Recent buildings such as MVRDV's "Pig City" (Figure 4), a multi-story slaughterhouse, begin to operate on an ideological plain that acknowledges the interdependence of bigness and greenness in contemporary forms of capitalism. The architects of this building do not emerge as "ennobled" subjects who have tamed global forces by making an environmentally sensitive place to destroy thousands of animals; rather, their building uses ecological thinking to put us in touch with the brutality of contemporary agricultural practices. MVRDV demonstrate how efforts to be "good" environmentally, result in a larger and more massive factory environment. Similar thinking is behind their "stacked garden," realized as the Dutch Pavilion at Expo 2000 (Figure 3). In this exhibition pavilion regional natural forms actually "de-naturalize" a global building type toward its surroundings, exposing the global ideology of environmentalism, while making a very environmentally responsible building, nonetheless.

The fact that environmentalism can so easily be incorporated or extend out of 21st century forms of global business practice may cause some environmentalist or politically active architects to shrink away from the big and green project. The fear is that one might be participating in some larger unstated corporate project, yet the linkages between what are imagined as opposed theories can be embraced as part of an evolving critical site of action. Hopefully we will be able to look to many more architects who examine the interdependence of the forces of globalization and environmentalism on some critical level. There is still much need for an architecture that brings attention to the destruction and maintenance of international material conditions and the functions of international business. The ideological issues and conflicts of Big and Green projects should not result in an abandonement of the cause, but in its constant re-thinking and re-evaluation.

3 The Dutch Pavillian at Expo 2000 and 4 "Pig City" both by MVRDV

Notes

1 The quote by Norman Foster is from a video kiosk at the World Financial Center exhibition on the proposed development of the World Trade Center Site. It can also be listened to in an interactive website published by the *New York Times*: www.nytimes.com (May 27, 2003).

2 Mario Gandelsonas, "Conditions for a Colossal Architecture," in *Cesar Pelli*. Ed. Paul Goldberger (New York Rizolli, 1989).

3 Rem Koolhaas, "Bigness," in *S,M,L,XL*. (New York Monacelli Press, 1993.)

4 Gandelsonas, 12.

5 Koolhaas, 502.

6 Hassan Fathy, "Natural Energy and Vernacular Architecture: Principles and Examples with References to Hot Arid Climates," from *Theories and Manifestoes of Contemporary Architecture*. Ed. Charles Jencks and Karl Kropf. (London. Academy Editions, 2000), 145.; Kenneth Frampton, "Critical Regionalism: Six Points for an Architecture of Resistance," in *The Anti-Aesthetic*. Ed. Hal Foster. (Cambridge: MIT Press, 1986), 17; Roland Ranier, *Livable Environments*. (Berlin: Verlag, 1972).

7 Fathy, 145; Frampton, 17

8 Aga Kahn Prize, Jury Report, 1996, http://www.akdn.org/agency/akaa/sixthcycle/malaysia html, March 2003

9 Michael Fainelli, "Making the Business case for Going Green," *Christian Science Monitor*, October 18, 2001

10 Jarzombek, Mark "Molecules, Money and Design The Question of Sustainability's Role in Architectural Academe," in *Thresholds 18*. Spring 1999

11 Slavoj Zizek, "From Western Marxism to Western Buddhism," *Cabinet Magazine*, Spring 2001, pg. 35

12 I found this quote organized in this fashion from a de-commissioned website run by the English department of Louisiana State University The full article citation is as follows: "Multiculturalism's Silent Partner: It's the New Globalized Consumer Economy, Stupid." By David Rieff, *Harpers Magazine*, August 1993, 62.

13 Alan Calquhoun, "Critique of Regionalism," *Casabella Magazine*, 630 631, pp. 51-55

Javier Arbona, Lara Greden, Mitchell Joachim

Nature's Technology
The Fab Tree Hab House

The Fab Tree Hab concept resolutely accumulates the inscribed nuances that influenced the American Rustic period. Stemming form the insurgent writings of Thoreau, Emerson, Whitman, and Alcott, America defined a sensibility. These authors represent an early mode of intention that was profoundly ecocentric. Their notion of dwelling was envisioned as retreats, poets' bowers, hermitages, and summer cottages in a Sylvan style. In 1847 that notion culminated in the self-made assembly of a crooked cedar and honeysuckle summer home by Thoreau and Alcott for their friend Emerson in the midst of a cornfield. This peculiar house served as our point of departure. Here traditional anthropocentric doctrines are overturned and human life is subsumed within the terrestrial environs. Home, in this sense, becomes indistinct and fits itself symbiotically into the surrounding ecosystem.

This approach also draws from Jeffersonian ideologies in regards to equalizing edification and ecology. In the mind of Jefferson, the measure of any single human gesture was its contribution to the individual's pursuit of happiness. He believed humans had natural rights, and devoted most of his life to a revolution ensuring the rights to agrarianism and education. This was vital to a citizen's personal livelihood in an agrarian economy within a nascent system of government. Universal access to education was critically linked to sustenance. Jefferson essentially would advocate ecological principles applied to human habitat so that each person could live off the land without detriment. The Fab Tree Hab not only attempts to provide a healthy biological exchange with the inhabitant, but also strives to contribute in a positive way to everyone's quality of life.

Modern design has essentially left behind these principles of symbiosis. Although many individual and collective efforts towards "sustainable" or "green design" of buildings are apparent internationally, derivative design cannot address the underlying systemic nature of sustainability. Fixing pieces of a problem fails to address the interplaying complexities of the whole, and innovation is stifled by the need to work within given contexts. Lack of certainty in cause and effect is often cited as a reason for not developing ecologically sound practices, most notably with greenhouse gas reductions and improvement of indoor air quality. However, the precautionary principle implies that protection should be embraced deliberately even in the face of uncertainty. Thus, instead of incorporating materials that may impart less impact to the environment and human health – impacts which may remain uncertain in extent – the Fab Tree Hab design seeks to protect and embrace the ecosystem as a source of sustainability in the built environment. Just as the modern biotechnology revolution owes its existence to the intelligence in ecosystems at the molecular level, sustainable technologies for homes can also benefit from biological, natural systems. However, starting at the molecular scale is not necessary. Rather, as the intention of this design explores, lumber maintained in its macro, living form becomes a superstructure.

The Fab Tree Hab

The living structure single-family home and encompassing ecology are shown in Figure 2. Tree trunks form the load-bearing structure to which a weave of pleached branch 'studs' support a thermal clay and straw-based infill. The Fab Tree Hab plan, shown in Figure 6, accommodates three bedrooms (one on the second level), a bathroom, and an open living, dining, and kitchen area placed on the southern façade in accordance with passive solar principles. Design details pertaining to structure, elemental flows, renewal, raising the home, and budget are explored in the following paragraphs.

1 Structures of successive stages of growth (top)

2 Fully mature living habitat. The exterior accepts life as in any garden or forest. The interior is constructed to provide the traditional comforts of a warm and dry home.
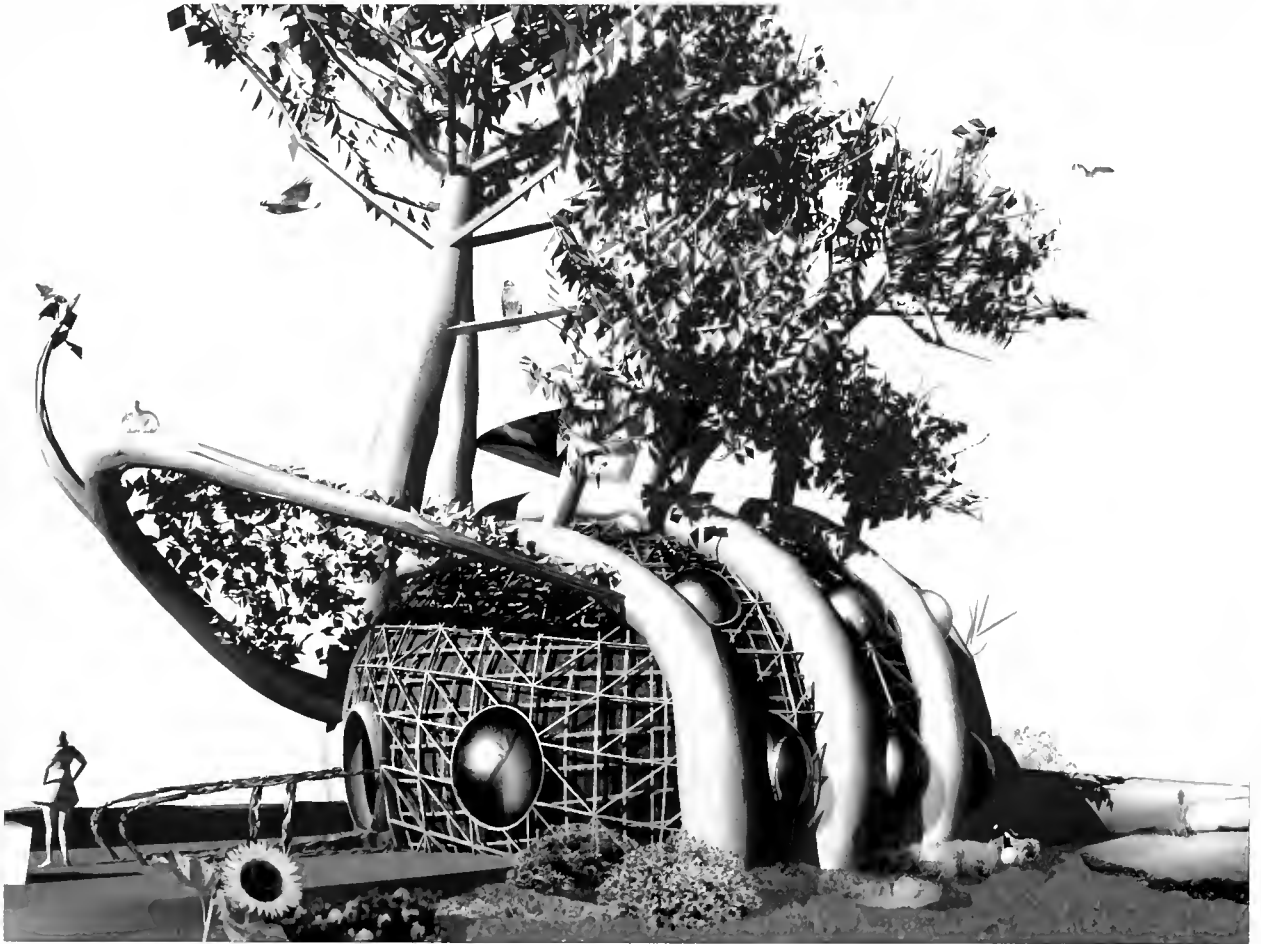
Structure, form, and growth

A methodology new to buildings, yet ancient to gardening, is introduced in this design – pleaching. Pleaching is a method of weaving together tree branches to form living archways, lattices, or screens. The trunks of inosculate, or self-grafting, trees, such as Elm, Live Oak, and Dogwood, are the load-bearing structure, and the branches form a continuous lattice frame for the walls and roof. Woven along the exterior is a dense protective layer of vines, interspersed with soil pockets and growing plants. On the interior, a clay and straw composite insulates and blocks moisture, and a final layer of smooth clay is applied like a plaster, as shown in Figure 7, to dually address comfort and aesthetics. Existing homes built with cob (a clay and straw composite) demonstrate its feasibility, longevity, and livability as a construction material. In essence, the tree trunks of this design provide the structure for an extruded earth ecosystem, whose growth is embraced over time (Figure 1).

Life-sustaining flows

Water, integral to the survival of the structure itself, is the pulmonary system of the home, circulating from the roof-top collector, through human consumption, and ultimately exiting via transpiration (Figures 3 and 5). A gray water stream irrigates the gardens, and a filtration stream enters a living machine, where it is purified by bacteria, fish, and plants, which eat the organic wastes. Cleaned water enters the pond, where it may infiltrate the soil or evaporate to the atmosphere. Water consumed by the vegetation eventually returns to the water cycle through transpiration, simultaneously cooling the home.

Fundamental to the flux of the water cycle is solar radiation, which also drives heat and ventilation (Figure 7). In the winter, sunlight shines through the large south-facing windows, heating the open floor-space and thermal mass. The reverse is true in the summer, as the crown of the structure shades itself from extreme temperatures, instead using the sun's energy for photosynthesis. Two levels of operable windows set up a buoyancy-driven ventilative flow, drawing in cool air at floor level. An active solar hot water system heats the home through an array of radiant floor pipes. Technology inspired by nature also explicitly engages it to provide water and warmth to the habitat.

Renewal

In congruence with ecological principles, the home is designed to be nearly entirely edible so as to provide food to some organism at each stage of its life, as illustrated in Figure 4. While inhabited, the home's gardens and exterior walls produce food for people and animals. The seasonal cycles help the tree structure provide for itself through composting of fallen leaves in autumn. The envisioned bioplastic windows, which would flex with the home as it grows, would also degrade and return to the earth upon life's end, as would the walls. Seedlings started in such a nutrient rich bed may provide the affordable building blocks for a new home typology, firmly rooted to place. Likewise, realization of living structures would introduce forest renewal to an urban setting. Building of these homes occurs throughout a longer time period, yet the benefits are enjoyed as long as the trees live, after which another wave of renewal begins.

Rethinking budget

In departing from the modern sense of home construction, compilation of a budget for this prototype inherently opens the debate surrounding decision-making and green architecture. It is widely acknowledged that life-cycle costing methods would provide more favor to conscientious home designs by including energy cost savings and, more abstractly, accounting for reduction or elimination of externality costs. However, this falls short of recognizing the compound and continuous value of sustainable housing as an interweave of systems, and it still places too much value on benefits received today as opposed to tomorrow or 100 years from now. By rejecting the tendency towards immediacy and, likewise, first cost dependency, a true representation of sustainable value can be achieved by explicitly recognizing the adaptive, renewal, cooperative, evolutionary, and longevity characteristics of the home. This design explores the concepts in that debate by including all five traits.

At the first stage of maturity, when the habitat is readied for human presence, cost outlays are similar in nature to traditional construction, yet much less in magnitude based on their local, natural, and edible qualities. Clay, gravel, and straw can be obtained locally for certainly no more than the cost of concrete. Plants and vegetation, many of which can be started from seedlings when the structure is originally planted, will come at a nominal cost. Installation

3 Hull section illustrates design for water flows: a roof-top trough harvests water for human use; the plumbing system is positioned to provide for gravity-induced flow and gray-water reuse; a composting system treats human waste and will later return nutrients to the ecosystem.

of heating, lighting, plumbing, electrical, and communica-
tion systems will be no more than that for a typical home,
and should be less due to the systems integrated design of
natural ventilation, gravity water flow, daylighting, and pas-
sive solar heating. As illustrated by this comparative as-
sessment, realization of a living home certainly fits within
the realm of affordability.

Extra or nontraditional operating costs and required ex-
pertise over the lifetime of the home include pest man-
agement (insects that may threaten the structure) and
maintenance of a living machine water treatment system.
Technical demonstration and innovation is still needed for
certain components, primarily the bioplastic windows that
accept growth of the structure and the management of
flows across the wall section to assure that the interior
remains dry and critter-free. All in all, the elapsed time
to reach livability is greater than the traditional house, but
so should be the health and longevity of the home and
family.

Experiment in time

Above all, the raising of this home can be achieved at a
minimal price, requiring only some time to complete its
structure. Realization of these homes will begin as an ex-
periment, and it is envisioned that thereafter the concept
of renewal will take on a new architectural form – one of
interdependency between nature and people.
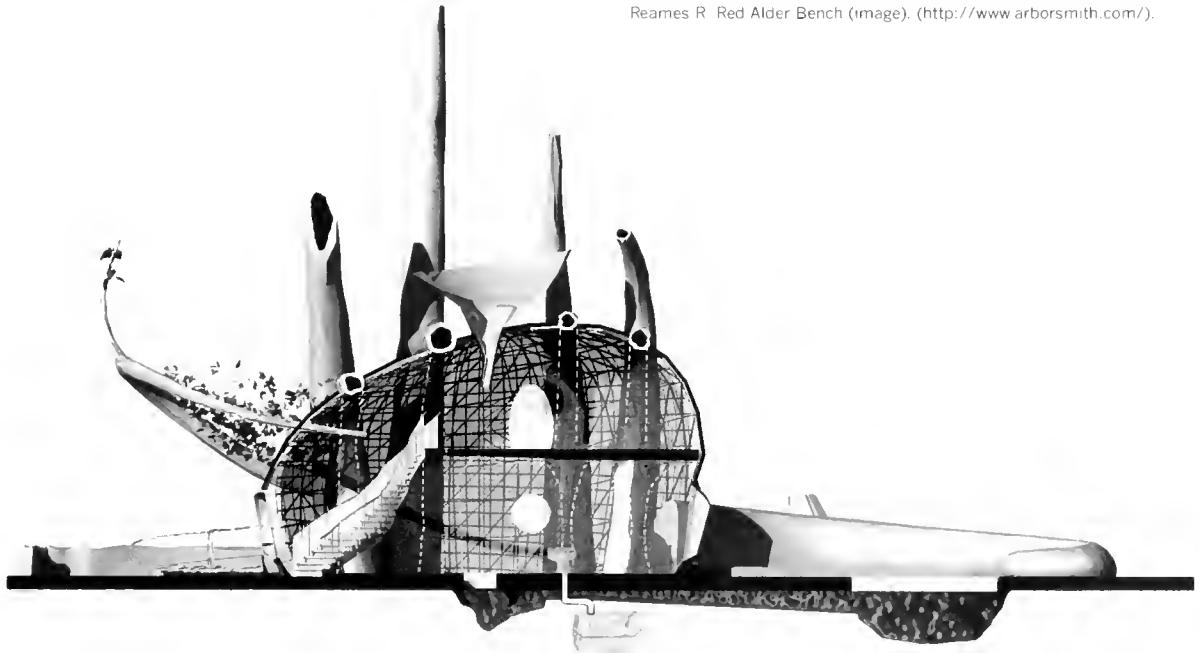
Bibliography

Ahadu A "Tree House," in The Architectural Review. Emerging Architecture
AR&D Awards 2002. December 2002: 60-61.

Ashford NA "Incorporating Science, Technology, Fairness, and Accountability
in Environmental, Health, and Safety Decisions," adapted from "Implement-
ing a Precautionary Approach in Decisions Affecting Health, Safety, and the
Environment. Risk, technology alternatives, and tradeoff analysis" in The Role
of Precaution in Chemicals Policy, Favorita Papers January 2002 Freytag E et al
(eds). Diplomatic Academy, Vienna. 128-140

Axelrod A. The Life and Work of Thomas Jefferson. Alpha Books. Indianapolis,
IN 2001

Bell A. Plant Form: An Illustrated Guide to Flowering Plant Morphology. Oxford
University Press. New York. 1991. Excavated Rhizome System (p. 130).

Doernach R. Pflanzen Hauser Biotektur. Panorama Verlag. Munchen, Germany
1987. Brunnen-Sitzlaube (p 77)

Dougherty P. Dixie Cups (1998) and Headstrong (2002). (http://
www.stickwork.net/dougherty/main.html).

Elizabeth L and Adams C (Eds). Alternative Construction: Con-
temporary natural building methods. Wiley. New York, NY. 2000.

Erlandson A. The Sycamore Tower (image). (http://www.arborsmith.com/
treecircus.html).

Grow Your Own House. Vitra Design Museum. 2000. "Bent Bamboo" (p. 214)
and "Composite Materials" (p. 241).

Living Machines, Inc. Open Aerobic Reactor (http://www.livingmachines.com/
htm/machine.htm).

Maynard WB. Architecture in the United States, 1800-1850. New Haven Yale
University Press. 2002.

Nichols FD and Griswold RE. Thomas Jefferson Landscape Architect. Univer-
sity Press of Virginia. Charlottesville, VA. 1978

'Pleaching.' (http://www.rainforestinfo.org.au/good_wood/pleachng.htm).

Reames R. Red Alder Bench (image). (http://www.arborsmith.com/).

4 (Left) Exterior of the home embraces growth in its gardens and with bioplastic windows that are envisioned to accept change in physical size over the home's lifetime.

5 (Bottom, left) A bird's eye view of the home shows the roof top rain harvester, living machine, and site plan.

6 (Bottom, right) Plan follows from typical one-bedroom Habitat for Humanity plan. Plan also follows passive solar guidelines, with living areas located on southern side to maximize benefit of solar heat gain in winter, while exterior shading protects the façade in the summer.

7 (Opposite) Wall section depicts the interior, finished in a tile- or stucco-like layer of clay; the natural ventilation flow, aided by the exterior vegetation; and the high thermal mass floor for retaining heat from incident solar radiation and solar-heated hot water pipes laid in the floor.
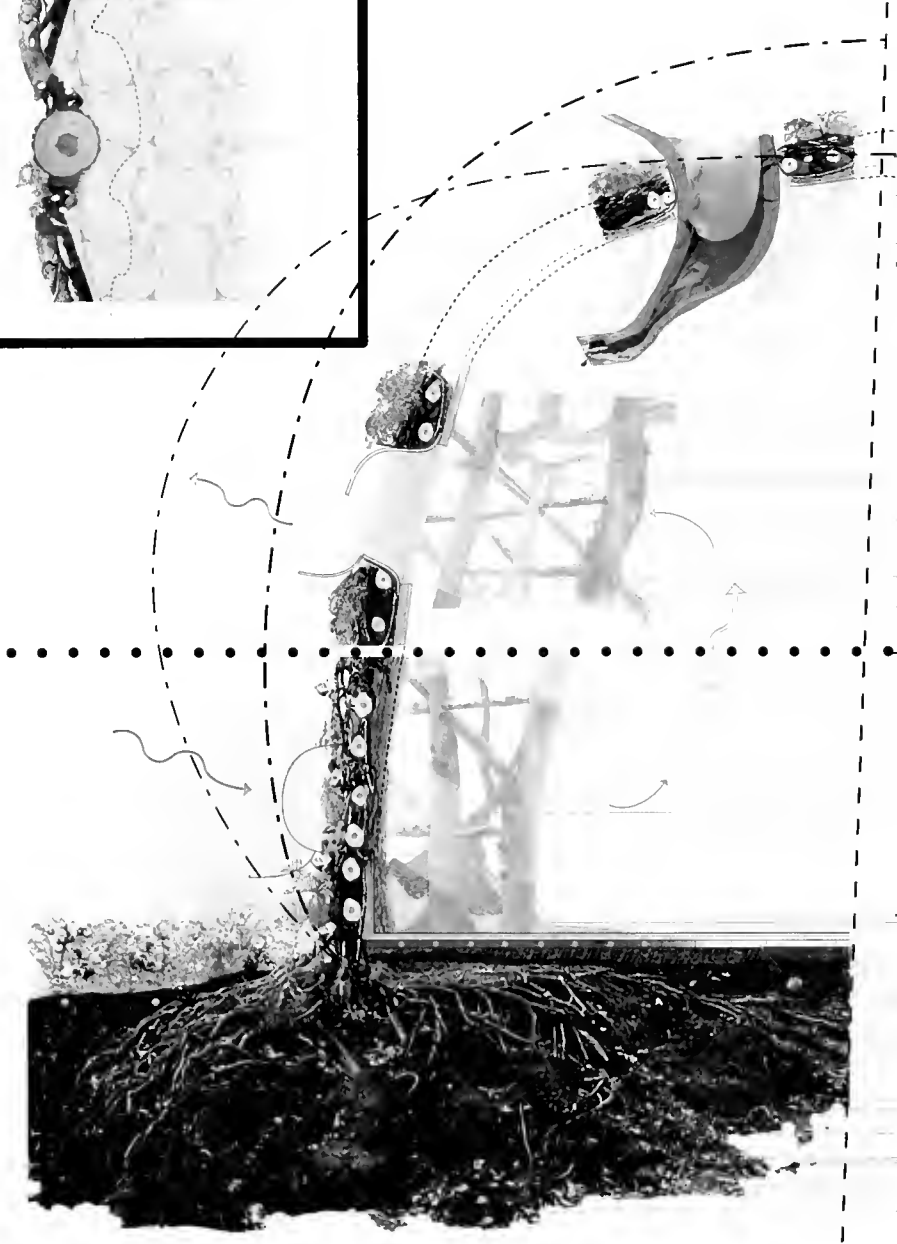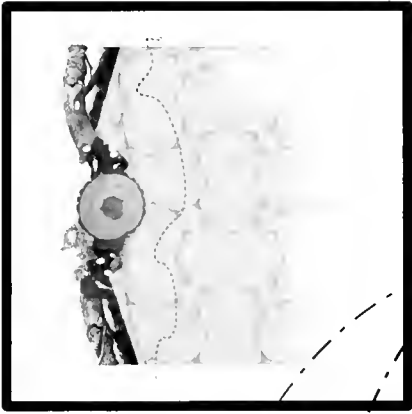
Mark Jarzombek

Sustainability, Architecture, and "Nature"
Between Fuzzy Systems and Wicked Problems

Today there are a range of architectural firms, both small and large, that specialize in environmentally-sensitive architecture, whether that be in the form of design-build projects, self-sufficiency houses, solar houses, eco villages, or now, so-called Health Houses. We have also seen in recent years the development of new high-tech materials and sophisticated software programs as well as the emergence of various types of "green" consulting companies, some advising individuals on how to place their bed in relationship to Fengshui, others advising multinational corporations on everything from waste management to product design. In the last five years or so the word sustainability has come into vogue as a way to put these disparate realities into a single rubric. The most immediate reason for the success of the term is that it has allowed advocates to avoid the stigma of left-wing environmental politics. To fill in the gap, various interpretations of the notion of sustainability have come forward, each with its own implication for the discipline of architecture.

According to John Dernbach, a professor of law at Widener University and a leading scholar in the area, sustainability means "freedom, opportunity, and quality of life; more efficiency; more effective and responsive governance; a desire to make a better world for those who follow us; a willingness to find and exploit opportunities; a quest for a safer world; and a sense of calling to play a constructive role in international affairs."[1] These, he argues, are not only "basic American values," but conform to the principles of the Earth Charter (2000), which, according to him, "has broad resonance among the world's major religions."[2] This type of definition presumes that the field of environmental management will become the Esperanto of government agencies and religious systems. It is a heroic model, almost Ayn Randian in scale. The implications for architecture, however, are somewhat more prosaic. Architecture schools would be expected to produce a necessarily enlightened class of experts and consultants. Architecture schools would have to shift towards the scientific edge of the discipline, given that corporate and government funding will go primarily in

that direction. Schools will also have to add some courses on how to be polite American-style managers.

In contrast, Lisa H. Newton in her book *Ethics and Sustainability* (2002) starts from the opposite direction, namely from the question of morality.

> The first task is to outline an understanding of the individual moral life, life in accordance with a Personal Worldview Imperative, and to show its logical relationship to environmental sustainability."[3]

To define this Personal Worldview Imperative, Newton turns to Aristotle's definition of the polis to emphasize the principles of virtue, goodness, happiness and the simple life. Her point is that sustainability is not something new to be worked over by teams of bureaucrats and lawyers, but was already foreshadowed in the writings of Aristotle, in the life of Christian monks, and in the philosophy of Buddhism. Her purpose in constructing this nexus between sustainability and ancient philosophy is to detach the concept of a polis from the history of the modern city, which for her, presumably, is the site of excess, greed, and immorality. As examples of "unsustainable" practices, she points not only to pesticide-dominated agriculture but also to "our problems with the casinos...gambling, pornography and the like."[4] Given the stark difference between the moral and immoral and her insistence on a conservative notion of self-responsibility, her book resurrects a late 19th century tone, but is updated to show that the devil is in the details. When, for example, she talks about the homes in which we live, she points out that on average, "the American single-family home emits 16,522.3 pounds of carbon dioxide from its use of electricity generated in plants that burn fossil fuels...or about 30,000 lbs....per family."[5]

This latter part of her argument relies directly on the fantastic success that natural sciences have had in teaching us about our environment. Take, for example, the story of chlorofluorocarbon gases. In 1974 two chemists, Mario Molina and Frank Sherwood Rowland published their

research on the threat to the ozone layer from chloro-fluorocarbon gases that were then used in spray cans and refrigerators. With only pure molecular mathematics, they predicted that chlorofluorocarbons were in the process of significantly depleting the ozone layer. Though their work, at the time, was largely dismissed by industry, in 1985 scientists discovered that indeed an ozone hole had opened over the South Pole. This not only proved the accuracy of their work, but set in place a series of legislative battles that successfully curbed the use of these gases. In 1995, Molina and Rowland received the Nobel Prize in chemistry.

These twenty years, 1974 to 1995 mark the ascent of Natural Science to Social Philosophy. It is a philosophy of the non-infinite. And this is the leverage for the ethicists. According to them, we are bound together in a molecular environment from which we have no escape. But in discussing a house on the same terms as an aerosol can, Newton unites the question of efficiency with that of ethics in a way that stretches the limit of comprehensibility. Her vision of sustainability ends in a technocratic utopia that either over-radicalizes the situation by *reducing* everything to an ethical-functional criterion or under radicalizes it by *ignoring* everything pertaining to the more complex aspects of social and urban life.

Whereas Dernbach posits sustainability as a trans-politicized American universalism, Newton wants a neo-Hellenistic, Art-and-Crafts-type return to the simple life. Dernbach locates his friends among a noble breed of Environmental Managers, Newton among the New Urbanists. Dernbach's history belongs in the history of "progress"; Newton's is dialectical. Despite their differences, however, both fail to take into account the relativism and complexity of culture, life, and technology. As a result, the first exemplifies what sociologists describe as "a fuzzy system." It is composed of heterogeneous units that can never be—and were never meant to be—synthesized and that over-reaches its pragmatics. The second is what sociologists describe as "a wicked problem," one in which conventional reality bites back, in this case in the face of a utopian challenge.

Somewhere between the extremes of a fuzzy system and a wicked problem, lies the work of William McDonough and Michael Braugart. Their book *Cradle to Cradle* (2002) is eminently readable and practical, and seems to speak directly to the question of architecture and design. Yet here, too, are tacit underlying assumptions on the role of architecture that should be highlighted. Basically, the book makes not one but two "ecological" arguments. One is about the endangered environment and is, of course, irrefutable. It is more than obvious that environmental degradation is accelerating at an alarming rate. The other

ecological argument, however, is not about nature, but about social structure and it comes into view when the authors discuss "the cherry tree" as a model for design. This part of the argument is adapted from the theory of social ecology which holds that social life, much like plant life, is ordered by 'natural' laws of growth and metabolism. The necessary correlate of this view is that human society in its non-natural formations is both non-social and impersonal. The cherry tree that has evolved "over millions of years"[6] is thus seen as an object in harmony with its environment, in contrast to human history that has only evolved over a period of a few thousand of years. Consequently, when we think of designing a building, so the authors explain, we should think "Here's how we imagine the cherry tree would do it."[7]

Though the metaphor of the cherry tree, while somewhat arbitrary, is not unproductive, it simplifies and romanticizes Darwinian notions of evolution by taking out of the equation the principle of the competition of species. This strategy harkens back to the evolutionary theories of Ernst Haeckel (1834-1919), known to many as the father of the term ecology. McDonough and Braungart seem to have translated his particularly bizarre (and certainly controversial) idea that politics is a form of applied biology to the idea that design is applied biology. The advantage of social ecology, however, was that it took metaphysics out of the game of biology; in other words, nature, not nurture. But the resultant liberation of nature did not free science from ideological compulsions. Nonetheless, social ecology remained popular and was taken up by such eminent thinkers as Frederick Jackson Turner who saw the American frontier as a place where over-civilized Europeans found a renewed sense of health and vibrancy (at the expense of the Indians, of course). A more overt defender of social ecology was Robert E. Park (1886-1966), founder of the so-called Chicago School of sociology. Park adopted the now famous view that the city is a 'habitat' and that in essence the big city is where humanity, being out of touch with nature, sets to work to contaminate that habitat.[8] Though the lineages of this to McDonough and Braungart's book are obscure, they are undeniable, especially when one is asked to compare the negative description of industry-as-we-know-it to industry-as-understood-by-ants. That the authors picked the friendly leaf-cutters is no accident. After all, they live in an organized way, are obedient and ecologically resourceful. The description ends with the thought: "Like the cherry tree, they make the world a better place."[9] Does this mean one goes from being a good ant to being a good citizen?

All this would be a bit humorous if it were not for the tell-tale signs of an underlying theoretical position. They mention, for example, none other than the evolutionary theorist

and Harvard University professor, Edward Osborn Wilson, famous for the book *Sociobiology: The New Synthesis* (1975) in which he describes the social behavior of ants. The book landed Wilson in the center of a famous controversy that even spilled onto the cover of *Time Magazine*. The controversy was not about how ants behave, but about the implications Wilson seemed to make about how humans should behave.[10]

Sadly, McDonough and Braungart fail to cite any reference to this controversy or for that matter to the century-long debate about bio-determinism.[11] Instead, they try to convince the readers that the Nature *they* see is no more fearsome than an eco-exhibit in a science museum. This, of course, disguises the radical polarity in their work between ecologies that are 'organized' and 'disorganized', and between worlds that are 'natural' and those that are 'unnatural.' It helps them ignore the principle of evolutionary conflict. It even helps them ignore the *human* nature of social existence, which is exactly the problem that one finds in the work of Park, whose theories have been critiqued for decades for neglecting the social and cultural dimensions of urban life.

Sustainability is often thought among lay members of the community as a cultural good or as part of the process of Enlightenment. Be that as it may, the three positions I have discussed are grounded in ideological assumptions that need to be better understood before one can accept their architectural conclusions. Saving the world is important and architecture has a role to play but the map according to which that can be achieved is far from clear. If the choice were between a world of noble managers, conservative ethicists and eco-determinists, between scientocracy, technocracy, and biocracy, then I would think that the concept of "sustainability" still has some important lessons to learn. It may have shifted the politics from the left, but it has not replaced it with anything more concrete and feasible.

Notes

1 John Dernbach, "Synthesis," in John C Dernbach, Ed *Stumbling Toward Sustainability*, (Washington, DC Environmental Law Institute, 2002) p. 3 Dernbach has written several books on the topic of sustainable development He has also worked for the Pennsylvania Department of Environmental Resources

2 *Ibid*, p 34

3 Lisa H Newton, *Ethics and Sustainability* (Upper Saddle River, NJ: Prentice Hall, 2002) p 1

4 Ibid p. 6

5 Newton, p 60 Newton is Director of the Program in Applied Ethics at Fairfield University

6 William McDonough , Michael Braugart, *Cradle to Cradle* (New York North Point Press, 2002), p 84

7 *Ibid* p 73

8 Among Parks' numerous books are *Human Communities. The City and Human Ecology* (New York Collier Macmillan, 1952)

9 *Cradle to Cradle*, p.80

10 Wilson has won the National Medal of Science in the US and the prestigious Craaford Prize from the Royal Swedish Academy of Sciences, as well as two Pulitzers, the first for *On Human Nature* (1978) and the second in 1990 for a scientific study of ants, written with his collaborator Bert Hslldobler

11 For Wilson, every facet of human behavior is influenced by our genetic inheritance Opposition to to such ideas came from various sources including from Stephen Jay Gould, who argued that human reality answers to another higher epistemology

Pétur H. Ármannsson

Elements of Nature Relocated
The Work of Studio Granda

"Iceland is not scenic in the conventional European sense of the word – rather it is a landscape devoid of scenery. Its quality of hardness and permanence intercut with effervescent elements has a parallel in the work of Studio Granda."[1]

The campus of the Bifrost School of Business is situated in Nordurárdalur Valley in West Iceland, about 60 miles North of the capital city of Reykjavik. Surrounded by mountains of various shapes and heights, the valley is noted for the beauty of its landscape. The campus is located at the edge of a vast lava field covered by gray moss and birch scrubs, with colorful volcanic craters forming the background. The main road connecting the northern regions of Iceland with the Reykjavik area in the south passes adjacent to the site, and nearby is a salmon-fishing river with tourist attracting waterfalls.

The original building at Bifrost was designed as a restaurant and roadway hotel. It was built according to plans made in 1945 by architects Gísli Halldórsson and Sigvaldi Thordarson. The Federation of Icelandic Co-operatives (SIS) bought the property and the first phase of the hotel, the restaurant wing, was inaugurated in 1951. It functioned as a restaurant and community center of the Icelandic co-operative movement until 1955, when a decision was made to move the SIS business trade school there from Reykjavik. A two-story hotel wing with

hotel rooms was completed that same year and used as a student dormitory in the winter. In 1958, a detached building was added at the rear of the complex, containing apartments for teachers and a gymnasium. The original Bifrost campus is a well-preserved example of 1950s Icelandic architecture, traditional in overall form but with influences from post-war modern architecture evident in plan and detail. An important architectural feature of the original buildings are massive retaining walls covered with black lava stone, framing the entrance loggia and garden terrace and connecting the buildings to the surrounding landscape. In sharp contrast with the dark color of the lava are the exterior walls in tones of white and yellow, roofs of corrugated steel painted in red, white window frames and panels of dark-brown wood veneer. This combination of materials and colors of the original architecture has become the hallmark of the place and has been respected in more recent buildings on campus.

In 1988, Bifrost became a specialized business school at the university level. Thanks to its progressive spirit and popularity of its educational programs, the institution has experienced massive growth in the last few years. In 2001, the authorities of the school invited three architectural offices to submit proposals for an extension to the original school building to house a lecture hall, administrative and faculty offices, and reception area. The addition was to be the first phase in a major development of the campus. After a careful assessment, all three architects were asked to submit revised proposals, whereupon the school board unanimously chose the project of Studio Granda for its innovative solution to the future expansion of the school. Their proposal was also appreciated for being compact in scale, economical, and respectful of the existing buildings on campus.

The architecture firm Studio Granda was founded 1987 by Margrét Harðardóttir and Steve Christer to carry through the realization of their first-prize competition project for Reykjavik City Hall (1988-92). Designed as the encounter of the urban order of the city and the "natural" order of the lake, the building broke away from traditional symbolic and typological notions of a town hall. Instead, it draws inspiration from places in Icelandic nature in material and detail, most notably in the entrance rock-wall covered with green moss with dripping water. The building celebrates and enhances the visitor's experience of various nature-related phenomenon: the play of different surfaces of water that one is either passing through, beside, or above; reflected winter-daylight passing through at low angles; windows that frame fragmented views of the surroundings; a café-terrace that steps into the lake; and small ramps that allow ducks to pass on and off the paved edge of the lake.

In subsequent projects, Studio Granda has continued to work with elements of nature relocated in the city, from the lava-rock roof terrace at the Supreme Court of Iceland (1992) to the parking garage at Kringlan shopping center in Reykjavik (1998), which was conceived more as a man-made landscape than as a building. In their statement of practice from 1993, Studio Granda defines architecture as the emotional substitute of landscape in the present-day urban environment:

> Cities are built testimonies to man's will to move beyond the limitations of nature, they are purpose made machines to service ever increasing needs and expectations which cannot be provided by a bush or a rock. Within this built environment architecture has become the new landscape, a datum against which everyday judgments are made. As the singular most powerful factor influencing the lives of city dwellers, architecture has become a synthetic substitute for the stability of, say, a mountain and in that role must provide humankind with an equivalent sense of security.[2]

Bifrost is Studio Granda's first public project in Iceland located in a natural setting outside of the urban and suburban areas of Reykjavik. Their response to the situation indicates a different approach from previous work. Here the challenge was not to bring nature into the building but to create a dense, urban place of intense activity in the midst of a virgin landscape. The currently completed building is designed as the first phase in what is to be a new spine of buildings, planned to extend linearly in both directions behind the original building, which will retain its status as the representative face of the college. The future buildings will be linked by a hallway, with the rooms orientated towards open courtyards in between, each one a distinct color.

Besides making a direct connection between the previously detached school buildings, the new addition is intended to be the heart of the school, a place where all its activities are brought together. The building is compact in form and highly efficient in the use of space. Circulation spaces are low and intimate, with thoughtfully placed skylights giving a sense of place. The main feature of the interior is a double-height assembly room with sliding walls on one side and at the rear, offering a range of alternative spatial arrangements with adjacent spaces on both levels. The flexibility of this black-box type of room has many practical advantages over the conventional sloping auditorium with fixed seating. The room may be seen as a further development of Studio Granda's multi-purpose space in the renovation of the Reykjavik Art Museum (2000), with its sophisticated system of barn door openings to the outside. In Bifrost, the architects were able to mould the shape of the assembly room at their own will, free from the orthogonal constraints of an existing building. When

the projection screen of the lecture room is pulled up, a large picture window appears behind with a framed view into the virgin landscape. To the side, a small window down by the floor offers a view of nature on a different scale, contained and intimate. Next to the auditorium is the new main entrance to the school with reception and administrative offices adjacent. The work space is open and flexible, planned to accommodate future rearrangements in accordance to changing needs. On the floor above are faculty work spaces, meeting rooms and reading areas.

The exterior of the new building is modest in appearance, with white cubic forms blending in to the existing structures. One piece stands out. The exterior walls of the auditorium are clad with corrugated copper, marking the new entry from the road. On the other side of the building, facing West, is the former service yard, now being remodeled to take on the role of an academic quadrangle, with the main circulation spine of the school running parallel on one side. A small, box-like building (connected to and extending from the laundry block) marks another side of the space. Painted bright red on the inside, the box houses the school café and, at night, the local pub. Following the precedent of the Supreme Court in Reykjavík, the flat roofs at Bifrost are covered with slabs of lava.

The Bifrost School of Business and the planning board of the local community have recently commissioned Studio Granda to develop a framework plan for the Bifrost campus and the surrounding area. The aim of the plan is to form a strategy for the future expansion of the school and seek innovative solutions on how urban development can take form in such a place, without sacrificing essential architectural and environmental qualities. The project raises challenging questions on how to create a pattern for urbanization in a natural setting, taking into account the particular visual characteristics of Icelandic landscape. The results could be interesting, since the question of visual and architectural relationship between built form and landscape in Iceland has not previously been addressed as directly in the early stages of the formation of a new settlement. Many issues need to be dealt with, like the inevitable danger of suburban sprawl, uncontrolled residential subdivisions on nearby land, and commercial strip development along the main road. With rapid increase in tourism, Icelanders are confronted with the question of how to accommodate new development and, at the same time, preserve the visual quality and uniqueness of their natural landscape. In that debate, the strategy of Studio Granda, that of viewing buildings as landscape and nature as part of the architect's palette of materials, carries an important message about the value of creative thinking in defining the relationship between natural and man-made and the possible role of architecture as a mediator between the opposing poles of conservation and development. The transformation of Bifrost could become an example that proves that point and sets the standard.
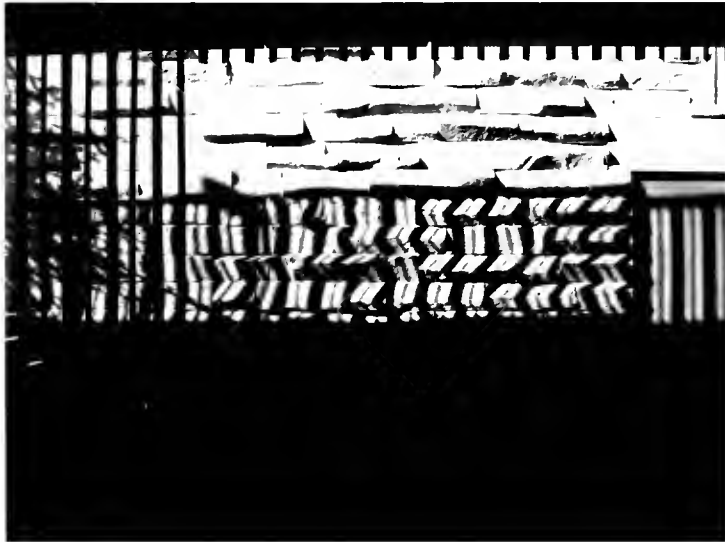
Notes

1 Sheila O'Donnell & John Toumey, *In the Nature of Things*, Studio Granda Exhibition Catalogue, Reykjavik Art Museum, 1995.

2 *A+U*, April 1993

1 Reykjavik City Hall (1988-1992)

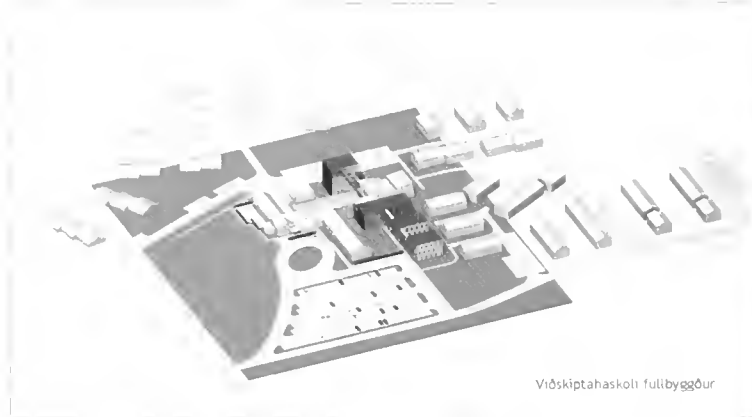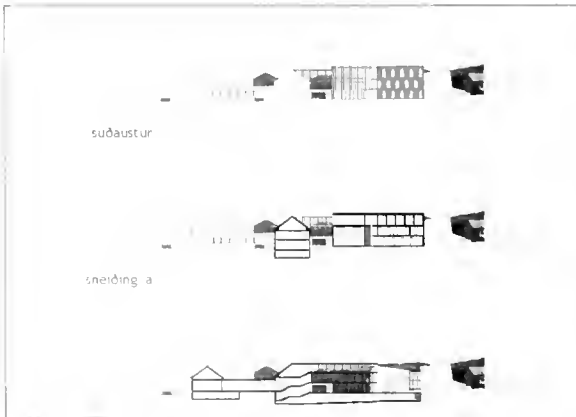2 Car park, garden, and public space at Kringlan Shopping Mall (1998-1999)

3 Supreme Court of Iceland (1993-1996)
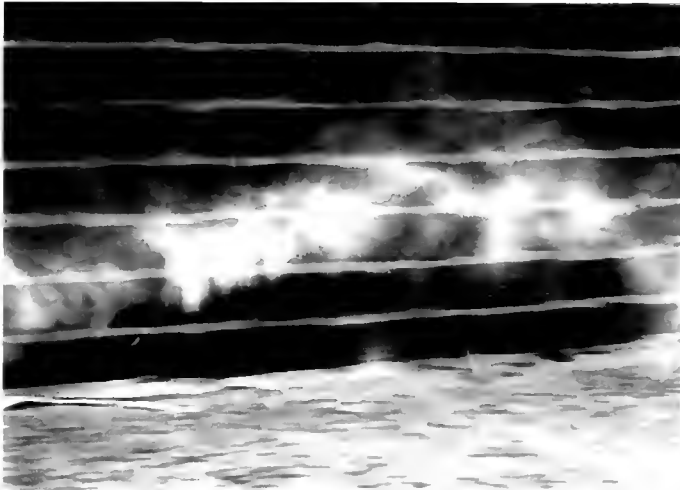
4 Reykjavik Art Museum (1997-2000)

suðaustur

sneiðing a

Viðskiptaháskóli fullbyggður

5 Bifröst Business School extension, café & quadrangle (2001-2002)

1 Turmeric Walk

Sanjit Sethi

Experimental Ambulation
Argument for Building a Device

There is a device that needs to be built.

This device deals with activities of an individual, the territory of walking, and anonymous urban spaces. This device deals with navigation and sensation within the context of the ambulatory experience. This device begs the investigation, examination and, redefining of dualities and contradictions in previously held terms. Most importantly, the author needs this device in order to correct a serious deficiency in his perceptual world. This is a device with ancient connective tissue that accesses and fortifies maps and systems in a corporeal manner. This document is both treatise and guidebook for the device, a device that needs to be built without haste for the urban ambulator while taking into account historical, epistemological, and philosophical reasons for the creation of said device (and others like it). The nature of the device is varied but deals specifically with the conditions of ambulatory perception. This "machine" is both the resultant and potential of many machines – some built, if in prototypical form – others that have yet to be built but vital for consideration nonetheless. In looking at "a machine" it is my belief that out of the critical step of pursuing one, many variations will most certainly follow, proceed, inform, and enrich the process. These works deal with the measure of perception from the ground level as well as the re-connection of head-based perception systems to the act of ambulation.

The nature of ambulation throughout urban environments demands the use of instruments of perception that facilitate the endeavor. These instruments exist in our person, sensing, generally from the head region. This sensation of walking – different then the act of walking – deals both with navigation and perception. So much urban information exists for the ambulatory individual, but perception is limited by reliance on a perceived visual supremacy. When walking, the walker perceives both actions of the body from which motion emanates and the play of the field in which the body exists. Perception of both of these "zones" comes from (to a large degree) the head region. The act

of walking is, then, not just a dynamic physical activity, but a dynamic physical activity with a constant yet varied relationship to the ground. Walking provides a constant physical mediation between movement and rest (or the state of "almost rest"). When Michel de Certeau differentiates between space and place, the latter is relegated to being stable (therefore somewhat benign) and the former to being dependent on fluctuating conventions. "In short, space is a practiced place. Thus the street geometrically defined by urban planning is transformed into a space by walkers."[1]

Ground in an urban environment is by its very nature contradictory, with hard, seemingly impenetrable surfaces laced with orifices and fissures. Layered in these concrete and asphalt surfaces are archives of the act of urban revision, re-creation, encroachment, and tacit acquiescence. Within these layers exists the information (some could call it detritus) of personal journeys of others. These others may be fellow amublators or journey-people of other methodology, either way; they too add to an accumulation into a territory which Deleuze and Guattari called "the striated space par-excellence."[2]

With the internal focus of this activity set aloof from the region of interaction, the need arises for considering what it is we miss in perceiving the ground from our lofty height. Height gives one the dubious advantage of a displaced visual, aural, and olfactory perspective, presumably clouded by proximity to the interactive ground arena. However, I posit that in becoming too erectus, we loose much of our understanding of the connectivity manifest in clichés like "being grounded." In being so "head orientated" are we missing both direct dynamic perceptions as they are occurring and the perception of previous actions and situations in the form of a larger urban archive? One can look to language for indications of our proclivities against such consideration. Such concepts of the base, what is beneath one's feet, is given negative connotations and acts of peoples subjugated, bowing their heads to the ground

in humiliation, both speak of this terrain as being one of uncleanliness – a space not to be dwelt in. Thus we see how people have found ways to mediate this "base" ground surface (generally under the guise of speed) in ways mainly involving the use of devices with wheels – bicycles, automobiles, rickshaws, etc.

So here is introduced an important aspect of my investigation, that of a social space and subsequent social act of walking – walking as a journey or a communication. One needs to ask first whether one believes that there is something missing in the sensory experience of the walker, and then question the desire to transform or access that which is unobtainable by present means. This desire then can be classified as a transformative one. The device allows the walker to become the embodiment of that which s/he does not possess naturally and is thus personified, or, perhaps, animized.[3] It follows that the transformative process is a risky one – not as much from the outside as from within. For it seems that true transformation inherently encodes a journey to "The Other."

My work via the experimental ambulation series has dealt with the engagement of ambulatory activities in this particular manner in order to demonstrate that there is a desperate need for a new way of perceiving the world – that current means of perception lead to disconnection, to placidity, to complacency, to apathy. Of this I feel most certain, for I am most at home with these dulled, benign, sterilized, pseudo-equivalents of sense and perception. These attempts on my part – rough-hewn, technical, contradictory in nature, humorous, deadly – are the flailing of someone with a selfish interest in regaining lost perception in order to retain some place in the world. Needless to say, I feel it is a desperate attempt to convince others that I am some-thing benign. It is, finally, an attempt born out of numbness and nonconfrontational behavior – an attempt born out of wanting to undergo a personal sense of erasure. I have placed in the act of moving through space – in walking – the hypothetical hopes of not merely collecting information but of having what I find redefine how it is I perceive. This need to re-perceive, to attempt to not just perceive differently but to perceive with a new set of standards, values, and re-examined settings carries an urgency akin to the ardor and urgency of breathing.

Using devices, performances, diagrams, and other means, I have attempted to reconnect myself with the world in order to feel less isolated. I have tried to do this by starting a type of controlled burn within my perceptive system that I had hoped would be fanned out of control and cause enough devastation to give me the permission, the necessity, to rebuild everything. I have been looking for that special permission to rebuild.
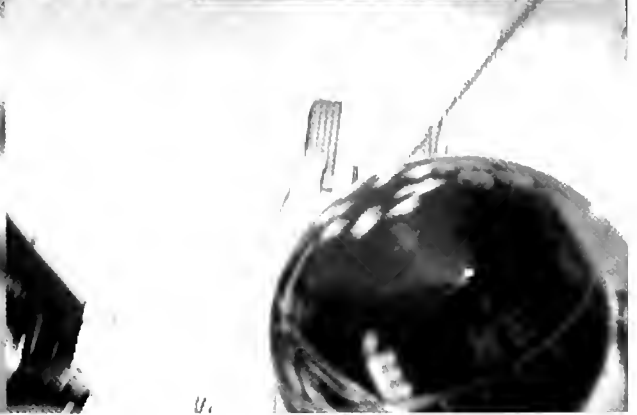
2 **Olfactory Ambulation**

Notes

1 Michel de Certeau, *The Practice of Everyday Life.* *(Berkeley:* University of California Press, 1984), 117.

2 Gilles Deleuze, Brian Massumi, Felix Guattari. *A Thousand Plateaus: Capitalism and Schizophrenia. (Minneapolis:* University of Minnesota Press, 1987), 478.

3 Deleuze, Massumi, Guattari, 247.

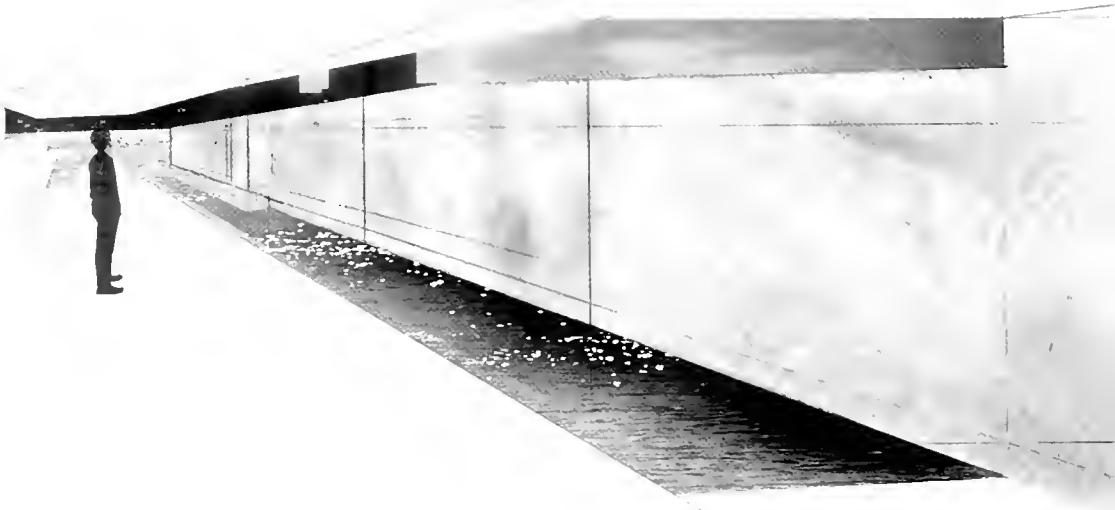3 (dis)Orientation

4 Ambulatory Exercise with Bricks

5 The Vision Sloved to Walking Device, prototype

6 The Vision Slaved to Walking Device

Matthew Pierce

Nature in a Middle State
A Library on the East Boston Waterfront

In East Boston near Maverick Square the water's edge was once inhabited by buildings and piers, man-made surfaces and enclosures; some built over the water, some displacing the water. The industries that once utilized these structures have largely gone, and what remains is unmaintained, left to the weather, the sun, the water, the environment.

Walking from Maverick Square toward Boston Harbor, the skyline of downtown can be seen above the asphalt esplanade. The pedestrian way is generously wide but unremarkable and terminates abruptly at a handrail, the water five or six feet below. A plaque on a stone shaft commemorates something, and, if you squeeze awkwardly past, you reach a wooden pier that allows you to walk another 20 feet or so out over the water. To the left is a truck driving school, a high fence surrounding its large expanse of unobstructed asphalt but devoid of the rumblings of idling trucks. Around this pier, the remnants of other piers decay. At the shore, the old pier has a surface of rotted gray wood, and the boards slowly disintegrate, leaving behind bent and rusting nails as the ground beneath gives way to water. The piers that are driven through the water and into the soil beneath are held together by spanning joists, but they also fall off, eventually leaving the piers to stand alone side by side, gently transmitting the movement of the water created by gurgling motor boats and wind. The tide is low, exposing different colors of wood, silver and splintered at the top, dark and soft below where the water regularly envelops the piers. To the right of the pedestrian way is another high fence, on the other side of which can be seen trees and tall, wild grass. "No trespassing" signs are posted, but a few holes can be found in the chain link fence. On the other side is room to see the city across the water, and the late afternoon sun is low, filtering through the tall grass that is blowing in the wind, the same wind that is moving the water and the detached piers.

Frequently I find myself questioning why it is that I have chosen to study and practice architecture. In part the question comes from the desire to connect what I do with what is essential in life – how many steps removed from some basic human need is the thing I spend most of my time doing? Why build at all? I admit that at times I wish for the opportunity to live as Thoreau, and wonder if it is still possible.

What is nature in the city? Parks full of plants? Water, birds? Or what is nature anywhere? Could we broaden the definition to say some kind of connection to the larger cycles of life, response to 'natural' phenomena? As an architect who values the unspoiled and undeveloped parts of the landscape, how do I build?

Thoreau is explicit in describing where and with what his interests lay. They are firmly in the world of the natural, unspoiled by man: the woods, the ponds, the fields, and such. He also describes the moments when natural forces come into contact with the built environment, such as when he spends the afternoon in his cabin as it rains outside, and speaks of how he enjoys it. Much as his favorable descriptions invariably revolve around the natural environment, I believe that the essential things Thoreau was looking for can be found in the built environment, or in some fuzzy edge where the built and natural overlap.

In these zones, what is "natural" and "real" is not clear. Take the land for example. When there is talk about how to express man's hand in shaping the earth there is a stance that this should be expressed differently, that a distinction can be made between constructed and natural. But why is that, and how easily can we accurately make this distinction today? Where does the natural form of the land give way to the man-made? There are obvious examples of clear distinction, but infinitely more that could only truly be made by geological survey of the layers of earth below the surface and their composition.

The waterfront site in east Boston is such an example. (In fact, much of the landform of Boston is manufactured, and the distinction between 'real' and man-made is only

72 Pierce
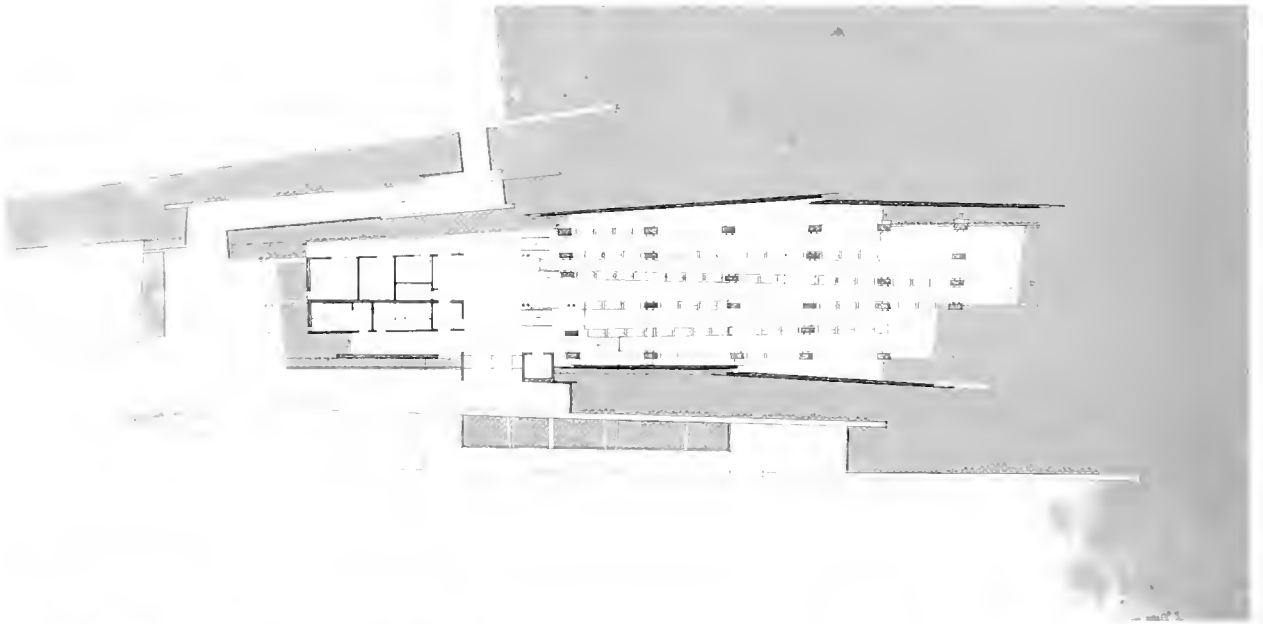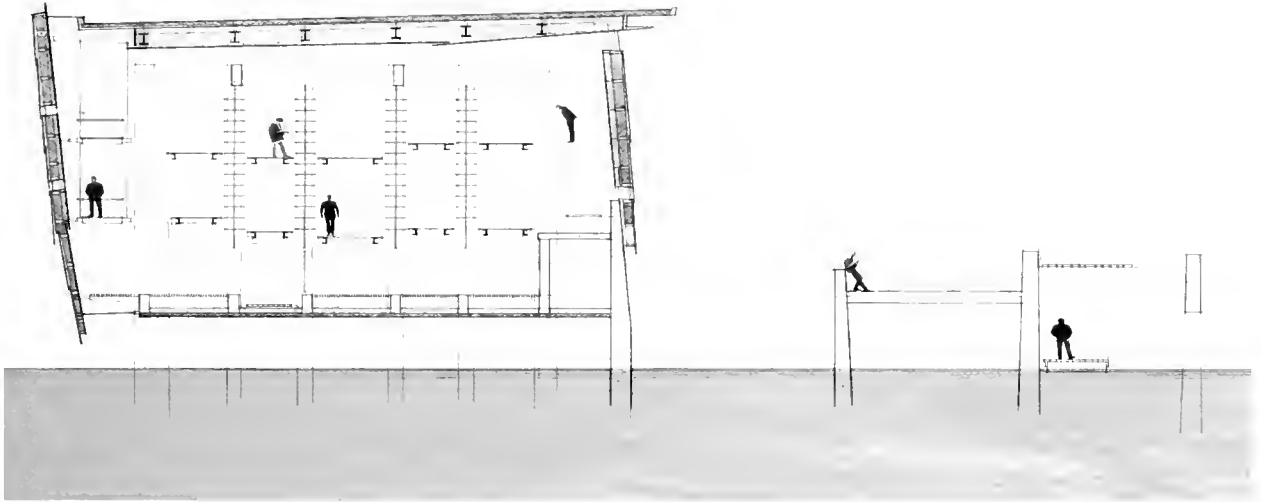
recoverable by legal documentation and geology.) Here, the water's edge actually reveals this transition from built to "natural" in a middle state. The fact that parts of it have been built by man is evident, but the challenge lies in drawing the boundary without consulting a survey. It is precisely this ambiguity that is so intriguing, to discover that the ground you are so certain of and whose firmness and solidity you take for granted, is actually hollow. That the grass you are walking through grows from cracks in the asphalt and in places that asphalt disappears to reveal space, air between what you assumed was ground and the water of the harbor. Suddenly that clear boundary that you could have drawn with one line – water on one side, earth on the other – is blurred.

> One inconvenience I sometimes experienced in so small a house, the difficulty of getting to a sufficient distance from my guest when we began to utter the big thoughts in big words. You want room for your thoughts to get into sailing trim and run a course or two before they make their port. The bullet of your thought must overcome its lateral and ricochet motion and fallen into its last and steady course before it reaches the ear of the hearer, else it may plough out again through the side of the head. Also, our sentences wanted room to unfold and form their columns in the interval. Individuals, like nations, must have suitable broad and natural boundaries, even a considerable neutral ground, between them.[1]

I did not grow up in the city, and in fact did not live in one until a few years ago. Previously I had lived in the mountains, and spent a great deal of time in places that showed no evidence of man. In places like this the distinction is most clear between "real" and man made – the trail of dirt and sometimes a small bridge are the only marks he has left. And in these places I have found a degree of solace, space for contemplation. When I moved to the city and began designing in an urban environment I quickly recognized that I was trying to bring nature into the city with my architecture. Not by including trees or sod roofs, but by trying to balance what I have found to be a human need for space, psychological space, and release from the density of urban living, space for the individual.

The things we think of as most "real" or "natural" are the things that were created by chance. Some places are relatively ordinary, and others spectacular for their beauty because of its lack of determinacy. And in these naturally occurring places there is a sense of discovery, of not knowing what is beyond the horizon, and the excitement of discovering the way so many products of natural forces came together to produce a certain quality of light or surface.

> By conscious effort we may be beside ourselves in a same sense. By conscious effort of the mind we can stand aloof from actions and their consequences; and all things, good and bad, go by us like a torrent.[2]

What Thoreau speaks of is the ability to distance oneself from the obligations of the world, to remove oneself from the endless action and reaction of daily life, to step aside and be an observer from a distance, and this is an experience that is difficult to find in the city. While the allotment of space for grassy, tree-filled parks is appreciated and

necessary, there are essential components of a connection to nature that are rarely addressed. What I believe Thoreau is describing is the ability to gain perspective, to step out of the middle so as to regard the whole and understand it in the grossest of terms. It is a state of intense self-awareness that comes from the space, the psychological space, for awareness; a space that makes room for indeterminacy into our own existences.

In this sense the typical idea of "nature" in the urban environment is rarely addressed. What Thoreau speaks of in walking is the ability to go where you please without concern for boundaries, the feeling that the whole of the earth is your own, and that all is available to you. Even in his time when there was space for those who desired to live in solitude, what separated those people from the crowds was the willingness to live a certain way or endure a certain length of travel. If you want space to yourself you must be willing to live or travel outside the realm of what most people will endure. Even in the most popular and crowded national parks the number of people declines exponentially with distance and difficulty of terrain. And it is in this way that I think this aspect of nature, or detachment from society is achieved in an urban setting. To merely provide the basic elements of grass, trees, flowers, and water is a start, but they can by no means replace the space of contemplation.

This project is an effort to create that space. It is only through focused observation that the existing phenomena of the site become apparent and appreciated, and with great caution that this fragile and precarious landscape is crossed. The objectives of this intervention are to create a stable infrastructure for occupation organized around the registration of phenomena, and augment the adjacent community's lack of access to the waterfront and space for meditation, study, and artistic creation. A system of concrete piles, walls, and beams has been proposed to support a fragmented, socially self-regulating landscape. Within this public landscape are six small ateliers, large-scale sculpture/ fabrication studios, and a public library. The landscape is elevated to allow space for occupation between the "ground" and the water, as well as allow vehicular service to the larger studios and library. The intervention is about nature, not in its placement next to the water at the edge of the city, but in its efforts to connect its users to a sense of space. The attendant ability to contemplate that Thoreau found in his woods I believe it is still possible to find in the city.

Notes

[1] Henry David Thoreau, "Walden," in *The Portable Thoreau*, ed., Carl Bode (New York: Viking Press, 1977), 391

[2] *Ibid.*, 385-386

Peter Fritzell

Reading the Man of Sand County
An Essay on A *Sand County Almanac*

Published posthumously in 1949, A Sand County Almanac by Aldo Leopold is widely cited as one of the most influential nature books ever published. Leopold's chapter entitled "The Land Ethic" largely set the philosophical foundation for what we now know as the conservation movement. Part memoir, part record, part rumination, the book introduced the science of ecology into the social realm. —Ed.

> *There are some who can live without wild things, and some who cannot. These essays are the delights and dilemmas of one who cannot.*
>
> Aldo Leopold, "Foreword" to A *Sand County Almanac* (vii)[1]

In reading the man of Sand County, as in writing about his figures of speech and thought, you must be careful not to take your "wild things" too much for granted. You must be careful not to assume, or not to assume too much, that your "wild things" are somehow out there to be known and experienced, if only you could free yourself from the here and now, if only you could free yourself from the present gaggle, so to speak – what you might think of as these man-made, artificial, and all-too-civilized considerations.

In reading the man of Sand County, you must be careful not to assume too readily that your wild things are out there in some "wildlife management area" or some legislatively circumscribed "Wilderness Area" or some "Nature Center," where things are natural (as they somehow are not here?). In reading the man of Sand County, you must be careful not to allow your popular, knee-jerk, public-television, "environmental" mind to get the better of you. You must be careful not to be too unconscious in your "environmental consciousness," or in your thoughts of how liberating it would be to get out into nature for a while, to get away from it all and be free.

You know the kind of unconscious consciousness the man of Sand County is trying to suggest, the kind of mind, if that is what it is, which doesn't register even a smile when it hears that "Nature is brought to you by Mobil" or, more recently, by the Park Foundation, Canon, Ford, and TIAA-

CREF – and, of course, by "viewers like you." You know the kind of mind that registers no sense of incongruity when it reads that "we have lost touch with nature" – or worse, that we are somehow alienated from nature. Just where might such a mind otherwise find itself, do you think?

In reading the man of Sand County, you must stay on your mental and perceptual toes, so to speak, and not let your mind wander too far. You must not skip the word *dilemmas*, and you must not misinterpret the word *delights*, as if it referred only, or even mainly, to the "delightful" experience of seeing or recalling a scurrying meadow mouse on a late January day. Perhaps, in fact, it will pay to consider the word *essays* – from the Old French *essai*, meaning a trial, a test – an attempt, an endeavor – a first tentative attempt at learning – an attempt to accomplish or perform (as a deed or task) – as a verb, to make an attempt; to undertake, or try to do. So that these essays, so understood, these written attempts, are the delights and dilemmas of one who cannot live without wild things, as he cannot live without essays, as no creature reading this sentence can live without wild things, however momentarily, however unknowingly.

> *Like winds and sunsets, wild things were taken for granted until progress began to do away with them. Now we face the question whether a still higher 'standard of living' is worth its cost in things natural, wild, and free (vii).*

In reading the man of Sand County, you must be careful not to take too much for granted your progress and your "standard of living." But you must be careful as well not to take too much for granted your things natural, wild, and free. In fact, you must be careful not to take on faith – or not too much on faith – even your winds and sunsets. You must be careful, because in Sand County words often

mean both what you rather habitually and unconsciously take them to mean, and something else additional, often something opposite and oppositional. You must be careful, because the man of Sand County is a man of two voices, at least – if not even three or four: *For us of the minority, the opportunity to see geese is more important than television, and the chance to find a pasque-flower is a right as inalienable as free speech (vii).*

You must be careful, because the man of Sand County not only aligns himself with the apparent minority which prefers seeing geese to watching television, but he also aligns himself with an even smaller minority, the minority (of which he very much hopes you may become one, and thus participate in making it an overwhelming majority) of those who can see and understand their "inalienable rights" for what they are, finally – for what they are when they are viewed as functions of nitrate cycles, food-chains, and feedback loops.

So that, even as the man of Sand County aligns himself with those who prefer watching geese to watching television, he also aligns himself with those who can see and appreciate their declarations of independence and their "free speech" – and, yes, even their *Sand County Almanac*'s – as fundamentally and finally akin to birdsong and whalesong, to the territorial markings and howlings of wolves, to the buglings of cranes and the callings of geese, or to what you call geese.

To make things worse, so to speak (You've only gotten to the second paragraph of the "Foreword," after all, and you're not through with it yet.), you must be even more careful in reading the man of Sand County – because, even as the man appeals to your understanding of that apparently clear minority which prefers watching geese to watching television, even as he seems clearly to take his stand with that minority, he does so in the terms of the knee-jerk majority. He calls upon your conventional, knee-jerk, and very-much-American majority-understanding of the differences between nature and culture, geese and television, natural and man-made, free and not-free, wild things and progress, pasque-flower and the American Bill of Rights. And he thus draws conventional, knee-jerk distinctions between the very kinds of things he is otherwise suggesting are not nearly, or finally, so distinct as you habitually – and, thus, rather naturally – think they are.

By now you are almost certainly asking "Why?" or, "So what's his point?" Why does the man of Sand County shift or alternate and interweave these voices, these opposed and even contradictory views of your geese and your television, your nature and your culture, your animal and your human? – why?, because he knows, as every good ecologist

knows, that these distinctions – as between nature and culture, or wild and civilized, or hemoglobin and chlorophyll, or even between geese and pasque-flower – are, finally, neither more nor less than distinctions drawn by your part of what you call your species, as you, like other organisms, seek some short-lived semblance of freedom from want and fear – because he knows that these distinctions, which you rather instinctively draw, are finally quite kin to the distinctions your geese make, and learn to make, and continue to try to make, between grasses rich in nutrients and those which are not, or between hominids who are, as we say, hunting geese, and hominids who are playing golf or appreciating nature (and who, thus, represent no immediate threat, perhaps) – because the man of Sand County knows that, finally, your conventional, knee-jerk distinctions between healthy and unhealthy, between what is the case and what ought to be the case, are finally nothing more or less than devices which you use in your attempts to gain some brief semblance of control.

So why does the man of Sand County alternate and interweave these opposed and contradictory views of his own kind and other kinds, of his own inscriptions and the markings or callings of others? – because he knows, among other things, that no speech and no thing (no goose, no anthropoid, no pasque-flower) is free, and no right inalienable – because he knows, in other words, that he is not free – but because he also knows that it is natural, and even necessary, for his kind and your kind, and doubtless all other kinds, to seek freedom – because he knows that you and he have little choice but to attempt, however pathetically, to distinguish that which is free from that which is not-free, that which is nutritious from that which is not, that which is human from that which is not, that which is useful or accurate from that which is not, that which is male from that which is female – because, however pathetic your attempts may be in the final analysis, your species and your kind, will soon be in fairly deep trouble if you do not make these distinctions regularly and effectively–because he knows, in other words, that these distinctions are, at once, artificial and natural, as all artifice is natural, as a spider's web is artificial and natural, as an architect's designs are likewise, as whalesong and calculus are artificial and natural – simultaneously, as it were.

You must be careful, then, in reading the man of Sand County – or better, perhaps, in attempting to read him – because, having appealed to your knee-jerk understanding that wild things are out there, free and distinct from televisions, books, and words – or having appealed to your conventional understanding that wild things were out there in the beginning, and that they are still out there to be found and appreciated, though in diminishing numbers and quality – he will, in the very next sentence, shift his

point of view rather radically – and suggest, at least, that wild things were not out there in the beginning at all, that they only came to be as wild things when progress made it possible for them to be known as wild things.

These wild things, the man of Sand County now openly admits, *had little human value until mechanization assured us of a good breakfast, and until science disclosed the drama of where they come from and how they live* (vii). So that it now looks as if wild things are direct, if not necessary, functions of the very progress which the man of Sand County otherwise seems to be urging you to query, and to query seriously. So that it now seems as if the very progress which is destroying or limiting your opportunities to experience wild things, is the very process that made possible those opportunities in the first place, that were it not for scientific progress, there would be no wild things to be valued or devalued.

You must try to stay alert, so that you don't get caught napping – or worse, hibernating. So that when you read in "January," (or is it now June?) that – *Each year, after the midwinter blizzards, there comes a night of thaw when the tinkle of dripping water is heard in the land* – you must be careful not to take your midwinter blizzards or your night of thaw or the tinkle of your dripping water too metaphorically; and you must be prepared to consider quite literally the notion that this tinkle is heard in the land, here and now–because, if you are not so prepared, you will miss an important part of the *strange stirrings* this tinkle brings, *not only to creatures abed for the night, but to some who have been asleep for the winter* (3) – and perhaps even to others who may still be asleep.

In reading the man of Sand County, you must be aware of your rather natural disposition to mental hibernation, so as not to get caught being as essentially unconscious as the apparently *hibernating skunk* who, *curled up in his deep den, uncurls himself and ventures forth to prowl the wet world, dragging his belly in the snow.* You must try to wake up from your preferred disposition to sleep in your mental den. You must be up to uncurling yourself and venturing forth to prowl, to follow the track of this skunk, the track that *is likely to display an indifference to mundane affairs,* an indifference *uncommon at other seasons.* In your mind's eye, at least, you must follow this track, this track that *leads straight across-country, as if its maker had hitched his wagon to a star and dropped the reins.* You must follow this track apparently indifferent to mundane affairs, though you must not yourself be too indifferent to these mundane affairs, or you'll miss the only slightly veiled analogy – the essential kinship, perhaps – between yourself as reading organism and the man of Sand County, if not also the skunk: *I fol-*

low, curious to deduce his state of mind and appetite, and destination, if any (3).

You must not miss the analogy and the affinity, or you will you lose track, as we say – or run the risk of losing track, the risk of losing track of where and what you are (ecologically, as you might say); and you will miss the sense that *January observation can be almost as simple and peaceful as snow, and almost as continuous as cold* (4). Unless you stay on your ecological and evolutionary toes, unless you a keep an eye on where you are and what you're doing, you will miss a good deal, if not all, of the things that may be said to be revealed by this January thaw – by now you might even be inclined to say this meltdown – the rather revealing northern exposure that occurs when, rather abruptly ·

> *A meadow mouse, startled by my approach, darts damply across the skunk track. Why is he abroad in daylight? Probably because he feels grieved about the thaw. Today his maze of secret tunnels, laboriously chewed through the matted grass under the snow, are tunnels no more, but only paths exposed to public view and ridicule. Indeed the thawing sun has mocked the basic premises of the microtine economic system!*
>
> *The mouse is a sober citizen who knows that grass grows in order that mice may store it as underground haystacks, and that snow falls in order that mice may build subways from stack to stack: supply, demand, and transport all neatly organized. To the mouse, snow means freedom from want and fear* (4).

Oh, it's easy enough to see that the organized, microtine, economic systems of mice (family name, Muridae; subfamily Microtinae, genus Microtus) have been exposed by this January thaw; and it's almost as easy to see that the organized, microtine, economic systems of humankind have likewise been exposed. What's not so easy to see, apparently, unless you keep your ecological mind's eye open, is that all the other organized, microtine systems of organisms are also being exposed – all of them – including the one which the man of Sand County is here trying to put together to expose all those others, and which you likewise are trying to put together, whether you know it or not.

What's being exposed here – by the thawing sun? – is not simply or only the attempted economics of what we call the meadow mouse, nor simply or only the economic reasoning and systems of humankind, but any and all microtine systems under the sun, which one organism or another, one species or another, one part of one species or another, attempts to organize and sustain in order to achieve some semblance of freedom from want and fear. What's being exposed here are not simply the efforts or experiments of meadow mice and economic man, but all the organizing efforts of all the organisms, and all the kinds of

organisms, including the efforts of ecologists, mathematicians, and philosophers of value, and including as well the efforts of any writing or reading organism. Reading, after all, like writing and speaking – like music theory and landscape architecture, like the systematic collection of data and regression analysis – is a matter of trying to attain some momentary freedom from want and fear.

So that the man of Sand County covers his own tracks, as it were. He acknowledges the final affinity between what he is trying to do as writer and what the meadow mouse is trying to do, as the economists and ethicists are trying to do, as likewise the architects, as likewise the herbs and shrubs.

To the mouse, snow means freedom from want and fear – for a short time, perhaps. To the rough-legged hawk, an absence of snow, means freedom from want and fear – for a short time, perhaps (4). To the moose, a good year's growth of what you call short aspen, birch, balsam, dogwood, water lilies – sunny days and moderate temperatures – an insulating blanket of snow in winter, but not too much – not too many snowshoe hares or, alternatively, a good number of visiting snowy owls – not too many wolves or human beings – no parasites on the brain – mean freedom from want and fear – for a brief time, perhaps.

And what means freedom from want and fear, however momentarily, to the man of Sand County? In the first part of his essays (very roughly, the first half), the opportunity to recall or imagine and think upon many, but by no means all, of the elements, processes, and relationships of what you might call a local ecosystem – including, especially, his own actions and functions in that system – to reflect upon the things that may be revealed by following a skunk's track, or the cutting of a good oak, or the life of one particular banded chickadee.

Each of these reflections – and as well the careful, crafting labor that goes into creating them – means for the man of Sand County some brief semblance of freedom from want and fear. In each of them, he finds and takes some solace – some content and, therefore, some contentment – including even the kind of contentment that irony and paradox may provide, if only for a short time. He takes and finds pleasure in creating little exemplary parables of his life in Sand County, little parabolic stories, that, in turn, create dilemmas of a kind, but dilemmas that are as often reassuring as they are troubling.

Most, if not all, of these parabolic dilemmas contain the seeds of their own logical or biological destruction, you might say. It's kind of like there's something that doesn't love a wall, that wants it down, and something else that's bound and determined to put it together, and to try to keep it together, as long as it possibly can. And so it goes with the man of Sand County – even as his mind reaches out from the parabolic details of that local ecosystem to geographically and historically more expansive reflections on Wisconsin, Illinois, and Iowa – Arizona and New Mexico – the quail of Chihuahua and Sonora, the cheat grass of Oregon and Utah – the rails, wrens, mink, and grebes of Manitoba marshes.

In "Wisconsin," you find him saying: *Thus always does history, whether of marsh or market place, end in paradox. The ultimate value in these marshes is wildness, and the crane is wildness incarnate. But all conservation of wildness is self-defeating, for to cherish we must see and fondle, and when enough have seen and fondled, there is no wilderness left to cherish* (101). When he gets to recalling Arizona and New Mexico, you find him declaring that, *It must be poor life that achieves freedom from want and fear* (126); and you sense his wit, perhaps, as you recognize that the life that achieves freedom from want and fear is not poor life, but non-life – the ultimate peace, perhaps, that comes to each of us in our time.

Just as you must be careful in reading this man's cranes and mountains, so you must be careful in reading his Manitoba grebes: *A sense of history should be the most precious gift of science and the arts, but I suspect that the grebe, who has neither, knows more history than we do* (161). You must be careful not to take your knee-jerk "anthropomorphisms" too much for granted, because the man of Sand County knows and depends upon your habits of branding as anthropomorphic his grebes and his mountains, his meadow mice and his wolves; but the man of Sand County also knows that all human endeavor is anthropomorphic, more or less by definition – even (or, perhaps, especially) those human endeavors in which humans claim to escape their anthropomorphism. With a smile, perhaps, he wishes them luck.

So what means freedom from want and fear for the man of Sand County? It means keeping an eye on himself and his needs or inclinations, insofar as he possibly can. It means rather constantly juxtaposing and interweaving two (or is it three?) conflicting and interdependent views of what you sometimes call nature, of human and non-human, of ecological systems and evolution, of culture and nature.

A part of you, at this point, is doubtless saying or thinking something like, "well what's the solution?" or "which is it?" – "It's one or the other; it can't be both." "It's either A or not-A." Either this man is a creature capable of reason, or he's not. Either wild things are out there, or they're not. Either the mouse and the mountains are metaphors, or

they're not. Either the biotic pyramid is a mental image, or it tells, in fact, how things are out there and in here. Either the difference between pines and birches is in the trees, or it's not. Either evolution is a theory and, hence, an expression of human need, or it's not. Either ecologists are gathering true, factual knowledge of the ways things are, or they are doing nothing more than playing their roles in an ecosystem. Either humans can comprehend evolution, or what they call their comprehensions of evolution are nothing more than attempted adaptations of evolving anthropoids. Either the uncertainty principle is a certain-sure proposition, or it's not. Either it's A or it's not-A.

Well it isn't. It's not either A or not-A – not for, and not with, the man of Sand County. It's both-and – both A and not-A – or, more accurately, perhaps, both "Either-Or" and "Both-And" – virtually all of the time, or for as much time he has.

"But how can he do it?," you ask. How can he live in such a condition, with such a divided state of mind? How can he develop and assert the essential rightness of the land-ethic – *A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise* (225) – which seems clearly to be his solution to the dilemma, his final word, his creed, his ecological mantra – if he really believes (or if he also believes) that *all history consists of successive excursions from a single starting point, to which man returns again and again to organize yet another search for a durable scale of values*" (200)?

How can he say in such an unqualified way, that [a] *thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community* (225), if he also knows that no biotic community has anything like a dependable integrity, that no biotic community is stable, but always shifting, changing, varying – and if he also knows that beauty and stability are in the eye of the beholder, so to speak -- that beauty and stability for a meadow mouse are quite different from beauty and stability for a rough-legged hawk, and that beauty and stability for each of them are quite different, in turn, from what they are for himself, if, for no other reason, than that he can see a certain beauty, and even some integrity and stability, in the rough-legged hawk which *drops like a feathered bomb into the marsh* to catch and eat *some worried mouse-engineer who could not wait until night to inspect the damage to his well-ordered world* (4), and which mouse, he's rather certain-sure, does not much appreciate the beauty or stability in the ravishments of the hawk – and who (the man of Sand County, now) also knows, as he does, that beauty and integrity and stability for himself are quite different from what they are for Mr. Babbitt, or for the people of Chihuahua and Sonora?

How can he so knowingly contradict himself? How can he say that *an ethic, ecologically, is a limitation on freedom of action in the struggle for existence* (202), if he also knows that there are no free actions in the struggle for existence, and never have been – and more, if he also knows, as he does, that any change or development in ethics or science is finally neither more nor less than a change in the means or devices that he and others may use in attempting to adapt to the conditions in which they struggle to exist?

How can he say that a land ethic affirms the *right* of soils and waters, plants and animals, *to continued existence* (204) – if he also believes and knows, as he does, that no plant and no animal, and no species of plant or animal, and no community of plants and animals and soils and waters, has anything thing like a right to continued existence – and worse, perhaps, if he also knows, as he does, that the continued existence of the evolving whole, even its healthy existence, depends upon the mutation and even the extinction of numbers (and whole classes) of its present members?

How can he say logically that *man is, in fact, only a member of a biotic team* (205), *one of thousands of accretions to the height and complexity of the* [biotic] *pyramid* (216), nothing more or less than a *plain member and citizen* of the evolving land-community, part and parcel of evolution and evolutionary change – and then say, in what is virtually his next breath, *man-made changes are of a different order than evolutionary changes* (218)?

You must be careful in reading the man of Sand County, because even near the end of his essays, his statements often mean both what you rather habitually take them to mean, and something else additional, often something opposite and oppositional. So that when he says, for example, that *a land ethic changes the role of Homo sapiens from conqueror of the land-community to plain member and citizen of it* (204), you must be careful not to take your knee-jerk categories ("conqueror-bad," "plain citizen-good") too much for granted – because, within a sentence, the man of Sand County will modify and, in any case, complicate the usual feedback loops upon which your knee-jerk reading depends.

In human history, he will say, *we have learned (I hope) that the conqueror role is eventually self-defeating* (204); and he will mean both what you rather instinctively take him to mean, and something else additional. He will mean, if you'll give him the phrasing, not that the conqueror's role is self-defeating while the plain citizen's is not, but that both the conqueror's role and the plain citizen's are self-defeating, eventually. And he will thus shift ground on you, as it were,

you who are trying to make sense, to conquer his meaning, to organize your own microtine sense of things.

He will mean thus that your conqueror's role is self-defeating, eventually and inevitably, and, with a witty shift of meaning (unless, by now, you are prepared for it) that all the efforts of all the plain citizens are likewise self-defeating – which, of course, is a kind of proof in the pudding that the conqueror is, finally, a plain citizen – but the man of Sand County will also mean that every organism must act, and regularly, as if it were a conqueror, for its own sake, its specie's sake, and for the community's sake–that each citizen of the land-community must act, and regularly, as if it knows, *ex cathedra, just what makes the community clock tick, just what and who is valuable, just what and who is worthless"* – even if (or, rather, because), *it always turns out that it knows neither, and this is why* [its] *conquests eventually defeat themselves* (204).

So that even toward the end of his essays, even as he labors to shape his land-ethic, even as he puts together a little stack of evidentiary hay by thinking of how ethics have developed over time, and by considering the ecological and evolutionary functions of ethics – and by making another little stack with the concept of the biotic community and the mental image of the land-pyramid – and even as he develops the logical tunnels between those stacks, and between them and that final statement of his attempted creed – even as he puts together his system, if you will, he is able to see it, its premises, its evidences, and its apparent conclusion, as microtine, as what it is, finally – yet another in that series of *successive excursions from a single starting point, to which man returns again and again to organize yet another search for a durable scale of values* (200).

In the last analysis, the man of Sand County lives, then, and attempts to continue living in this condition, with its delights and its dilemmas, pretty much in the same way your meadow mouse does. Though he knows his paradoxes and his competing allegiances, his conflicting points of view – though he knows that *it all comes to the same thing,* finally (133) – he also knows that he's pretty much bound to go down attempting to organize, in however microtine a way, his life and what you call his thoughts, in a manner which he hopes will be economical enough, but not so simplistically economical as to seem untrue, or to expose him to unnecessary risks.

Finally, then, he can do it, and he does it in this way, because, though he knows that there is something that doesn't love a wall, and that in due time will bring the wall down, he also knows that there is something else, of which he and his inscriptions are very much parts, something which not only loves a wall, but which knows that walls are essential to this living, walls being about the only things that can provide him or you with any semblance of freedom from want and fear.

So that, as you come toward the end of your time and space, you find yourself recalling what a certain professor of wildlife management said to a class of anthropoids in Wisconsin over half a century ago: "Every living thing represents an equation of give and take. Man or mouse, oak or orchid, we take a livelihood from our land and our fellows, and give in return an endless succession of acts and thoughts, each of which changes us, our fellows, our land, and its capacity to yield us a further living. Ultimately we give ourselves."[2]

Notes

[1] Aldo Leopold, *A Sand County Almanac.* (New York: Oxford University Press, 1949). All quotations from A Sand County Almanac are italicized. Parenthesized page numbers refer to this, the original, edition

[2] From a lecture Leopold presented in Wildlife Ecology 118 at the University of Wisconsin Madison in the spring of 1941. Quoted in Curt Meine, *Aldo Leopold: His Life and Work* (Madison: University of Wisconsin Press, 1988), 413 414, and in Susan Flader and J. Baird Callicott, eds., *The River of the Mother of God and Other Essays by Aldo Leopold.* (Madison: University of Wisconsin Press, 1991), 281

Mark Goulthorpe

Notes on Digital Nesting
A Poetics of Evolutionary Form

Bachelard's *Poetics of Space* articulates the need, beyond Bachelard's own scientific rationalism, for a discourse of poetic imagination, of the onset and affectivity of the creative image. His concern is less to catalogue or even describe spatial experience than to develop a discourse that might be adequate to account for the instigation of the creative impulse and of the power of the resultant "poetic image." For Bachelard felt that the philosophical tradition of which he was very much a part – that of an essentially positivist, scientific rationalism – was inadequate to comprehend, much less propitiate, such "poetic" works.

> In order to clarify the problem of the poetic image philosophically, we shall have recourse to a phenomenology of the imagination... Only phenomenology – that is to say, consideration of the onset of the image in individual consciousness – can help us to restore the subjectivity of images and to measure their fullness, their strength and their transubjectivity.[1]

Bachelard's Poetics is scandalous in that from within the scientific-rational camp he articulates a discourse that portrays its systematic *cultural inaptitude*, a structural deficiency that he forcefully breaches in his insistence that the essential renewal of cultural imagination is achieved otherwise. The central mandate of the *Poetics* being that any account of the actuality of poetic works – of their occurance and the wrench of expectation that they engender – cannot be reduced to generality or precedent in causal scientific manner. His deployment of an extended phenomenological reverie then explores the implication of spatial models in the nascent expansion (the "flare-up") of imagination in a variety of poetic works. His focus is nothing less than the birthing of new cultural potential – of the "birth of language" as he calls it – that is inscribed within certain charged moments of creative immanence.

It occurred to me in reading the *Poetics*, written (in 1958) in large part to counter the surgeance of causal scientific discourse, that in a period of similarly frenetic technical territorialization (as the influence of digital technologies become insistently felt), Bachelard may well provide an interesting counterpoint to understanding and perhaps reorienting current thought. Evidently this would be to look for salient "poetic" (*cultural*) and not merely scientific-rational (*technical*) proponents of the digital revolution.

In this we should be careful to articulate the relation between literary and architectural forms; indeed, if we were to follow Bachelard precisely, we would talk not of forms but of images, the Poetics focusing on the affect of a poem rather than its specific form, for which he uses, carefully, the term "image." It is not just the emergence of an image, but its capacity to exert an influence on other minds, that captivates Bachelard as the essential cultural moment. Perhaps such usage gives credibility to the current production of architectural "images" – frequently dismissed as mere graphics – where the experimental architects of the present look to attain (and not infrequently achieve) such affectivity, redolent of a new cultural potential emerging in the interstices of a new digital medium. The architectural image, then, as a condensation of formal, social, and technical potential, might well serve as a parallel to the "full" poetic moment that Bachelard highlights, so long as the creative process is not abrogated by a narrowly focussed rationalism (such as a myopic focus on a particular software or process). Yet doubtless, given the dominance of "soft-thinking," where the potential of a given software is accepted as demarcating the creative horizon, such birthing is rare.

[In many of dECOi's projects – the *Pallas House*, the *Gateway to the South Bank*, the *Aegis Hyposurface*, etc – we are indeed looking to express not so much an architecture, as the possibility of an architecture, a "reverie" as to a new (digital) condition. We deliberately develop multiple creative threads that weave into a final architectural form, frequently allowing the process to lead where it will to exceed in some manner our rational preconception.] It seems to me that the power of certain projects by Lynn, Nox, Novac, etc. (who I cite as examples of architects who develop their

architecture through a "phenomenologically" rich creative discourse) may well lie in their capacity as "images" rather than in their "prudence" as actualisable architectural works, such *images* then seemingly legitimised by the *Poetics*. What would remain is for the onset of such "images" to be accounted for, the thinking of the digital itself, and it is here that we might expect a quite marked shift in creative manner if we are attentive to the impact of digital technologies. Or rather, it remains to be seen how digital production, steeped in discourses of scientific rationalism of the type that Bachelard dismissed as inadequate for a poetics to emerge, yet which proffers entirely new genres of creative possibility, might offer sufficient scope for a genuine cultural morphogenesis.

Doubtless such an inquiry is an interminable and immense one, since it concerns the patterns of creativity latent in digital production, yet I share Bachelard's concern to interrogate the very manner of creative imagining. Here I restrict my interest to examination of a single text, John Frazer's *Evolutionary Architecture*, through consideration of Bachelard's phenomenological "opening." Frazer's work is perhaps the preordinate expression of an emergent "digital" discourse, and a pioneering attempt at the definition of a new architectural language, as well as new patterns of creativity, which justifies the juxtaposition of two such apparently heterogeneous texts (both are accounts of evolving patterns of cultural imagination).

Yet Frazer's book is nakedly scientific/rational in its prescriptive manner, which Bachelard, attentive to the birthing of poetic imagination, repeatedly suggests as being inappropriate to *cultural* "evolution." Yet given the newness of the field, Frazer's text is not only one of the only ones that we have to consider, but seemingly exceeds is own scientificity in offering many points of departure for drifts into a *Bachelardian daydreaming...*

Bachelard's reverie on Shells perhaps provides a counterpoint, where his interest "to experience the image of the function of *inhabiting*" may be contrasted with the simple *will to shell-form*, which he derides. For Bachelard, the mesmeric geometries of shells, their outer appearance, actually defeat the imagination: "the created object itself is highly intelligible; it is the *formation*, not the form, that remains mysterious."[2] The essential force of the shell being that it is *exuded from within*, the secretion of an organism; it is not fabricated *from without* as an idealized form. The shell is left in the air *blindly* as the trace of a convulsive absence, the smooth and lustrous internal carapace then exfoliating in its depth of exposure to the air, a temporal crustation.

Such inversion of ideological tendency, an expansive mental *shell-emptiness*, Bachelard captures deliciously: "the mollusc's motto would be: one must live to build one's house, and not build one's house to live in!"[3] Such inversion would seem to be a recipe for a *genetic architecture*, on condition that its secretions are unselfconscious and "felicitous", obeying an internal law. This describes the generative process outlined by Frazer in *Evolutionary Architecture*, which becomes one of open-ended formulaic experimentation, Frazer deploying genetic algorithms to generate all manner of "architectural" forms.[4]

However, Bachelard then dwells on the voluptuous inscrutability of the exposed inner shell, which, born of an impalpable inner logic, provokes an imaginary dementia. Faced with the shell's indifferent beauty, poetic imagination involuntarily conjures endless series of grotesques, emergent forms that slide expansively in/out of the curvaceous yet inexpressive void. The shell seems to demand, that is, an appreciation of an *impulsion, a force of egress*, which is somehow trapped in the geology of the form, a latent *trauma*.[5] I have the sense, if only as a subtle shiver in Bachelard's phenomenological lyricism, that the process of formation is left as a mental material residue that then bends imagination to its logic; which would be the fully cultural wager, the *poetic*, of such improbable forms. Frazer's grotesques, by contrast, provoke no such traumatic impulsion, lacking a cultural qualification other than their technical feasibility. Certainly Frazer suggests that such genesis requires a "natural selection," but never offers sufficient parameters or process of selection, which Bachelard's processural sensibility would doubtless require to be fully developed as a *Poetics of Evolutionary Form*.

Yet if the empty shell conjures grotesques, by virtue of such implosion of determinism, the *Poetics* seems to carry an uncanny presentiment that as the shell-form becomes technically feasible such grotesqueness will not be generated by an impelled imagination, but simply as an abridged evolution, never attaining the *force of image*.[6] And it is here that an *evolutionary architecture*, if it is to crystallize a new "function of inhabiting," needs to cup its ear to the whispering shell, attaining in its creative imagining a felicity that separates it from an aborted genetic process, and the means of deploying its algorithmic and parametric (digital) propensity to material *effect*.

We might note, wryly, the dis-simulating geometry of the Frazer Spiral, which is an opti-kinetic figure that impels a vortex-effect simply through the use of non-concentric circles. The figure is a well-known *trompe l'oeuil*, exceeding the geometric closure of such simplistic generic form through its vertiginous disturbance of optic sense, stimu-
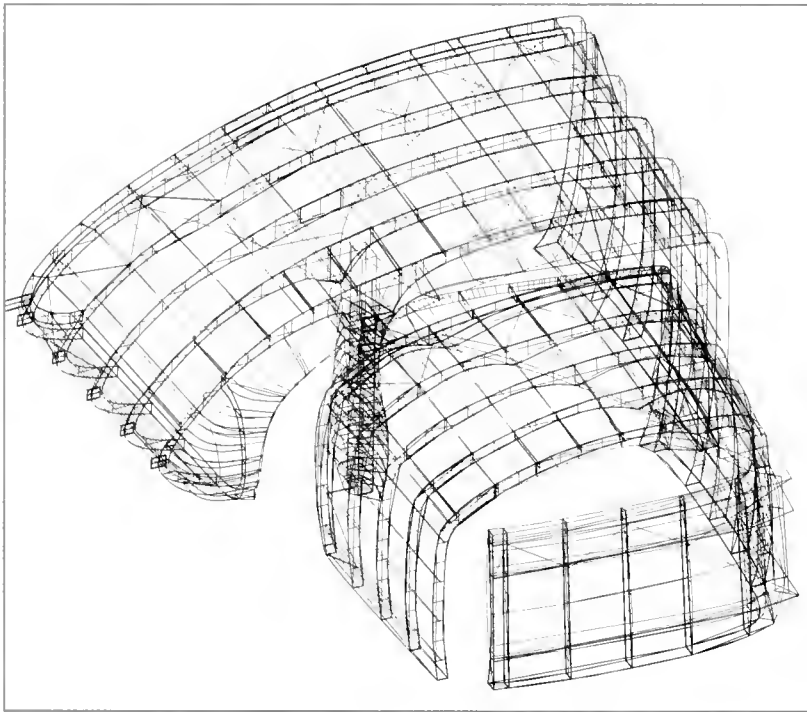
The Blue Gallery

Challenged to reimagine the "neutral" space of art, the Blue Gallery developed as an amorphous interior carapace splitting and twisting around an existing column, as if all the perspectival lines of the ubiquitous white box had been dragged to earth. The shells were developed over time, stretching to fill the existing space, but wrapping as a continuous panoramic surface of subtly sweeping curves. They were not rationalized or optimized other than to limit the curvature where pointings were to be floated: frequently there are 5-sided lofted elements which we found impossible within the parameters of existing software. Just as the curves developed according to an open-ended exploratory process, so the shells materialized as a gradually hardening logic, subject to exploration throughout the process. The complex-curved surfaces, layered in tensile materiality (aluminium tube overlayed by twisted laths of aircraft ply) trapped a temporal quality, the diligence and material sensibility of the workers captured in the striated patterning-in-time, ground smooth prior to the application of a thin shell of fibreglass. It was as if the energy of fabrication had condensed into form.

The artists of the gallery demanded its demolition some three days after the opening, as if trauma inhabited the shell: a precise indeterminacy or force that was palpable.
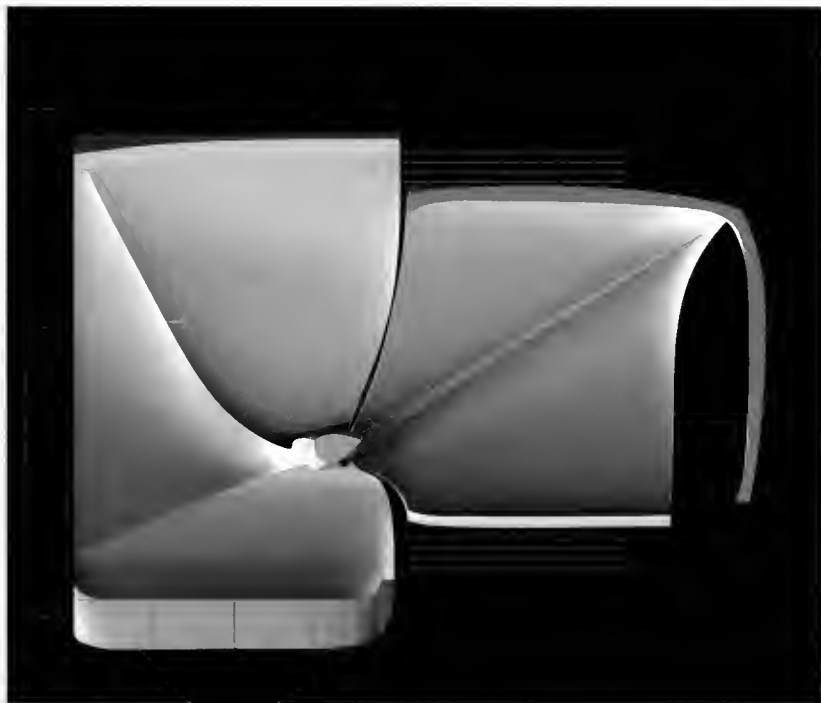
lating an almost haptic mental experience. *Evolutionary Architecture* might be seen to be deploying simplistic "geometric" figures to similarly mesmeric effect, but nonetheless exhibiting a keen awareness that it is the *processural* capacity of a digital medium that is its most compelling attribute. And evidently in its prescription of an open-ended "evolutionary" process it dreams of becoming *unabridged* in the potential richness of genetic algorithmic process.[7]

Yet if Frazer speaks as if from within the clam, dissimulating its genetic (processural) secrets, he nonetheless seems to spit out the pearl of subjectivity, dispersing the creative impulse throughout the body of the new medium, creativity and not simply receptivity becoming transsubjective. It is as if the phenomenological belief in substance (whether as word, act, or gesture), in the essential presence of imaginative impulse, suddenly dissolves into a swirl of sedimentary digits. Henceforth cultural imagination sifts this informatic sea, bereft of a belief in any point of ultimate legitimacy.[8] Herein lies the struggle between intellect and sediment, which the ever-descending digital norms are apt to blanket.

Bachelard's chapter on *Nests* seems to similarly articulate forms that were pre-digitally imaginary but which now merit consideration in their actuality by architects. He muses on the nest as an intricate imprint of the inhabiting body, adjusted continually as a soft cocoon that outlines the aura of movement of the bird's rounded breast. This raises the spectre of an environment adapting to our bodies and continually recalibrated to suit the vulnerability of our relation to the environment. Such forms of "dry modelling," merging camouflage and comfort in a density of ambient "stuff," seem suggestive of an *alloplastic*[9] relation between self and environment, moderated by an endlessly redefined digital matrix. The empty nest, like the shell, carries an unknowing impulsion, a trauma, as if an interminable and complex three-dimensional weaving had been interrupted. Such *forms of absence*, as images of the function of habitation, offer a *cultural* correlative to the temporal generative processes of *Evolutionary Architecture*, outlined by Frazer in essentially rational terms.

Evolutionary Architecture claims inspiration from natural processes (in fact from scientific/rational models of evolutionary process) by way of exploring the creative possibilities offered by a rapidly developing digital technology. It redeploys scientific models and patterns by considering digital systems as analogous to genetic ones, taking essentially analytical tools as opportunities for speculative creative endeavour. Bachelard, concerned as a philosopher of scientific rationalism to account for the *actual* evolution of creative process, is evidently unconvinced that any such analogy is adequate for the attainment of a "poetic" im-

age, highlighting the need for more profound forms of cultural imagining that his phenomenological reverie sets out to explore. In *The Poetics of Space* he outlines an expansive discourse that interrogates all manner of spatial conditions, concrete and imaginary, which he finds at work "felicitously" in wide range of poetic works. In this he also insists on accounting for the *effect* of the work, which is in marked contrast to Frazer's apparent disinterest in the result of an essentially automatic *praxis*.

However, Bachelard would be the first to dismiss "intentionality" as offering any guide to cultural value, and would doubtless be intrigued by such "unintentioned" and speculative technological experimentation. My interest in re-reading Bachelard's "natural" spatialities (the shell and the nest) then being to offer another reading on the general impulsion of *Evolutionary Architecture*, but from the perspective of a *discourse of bodily desire* (that of the *Poetics*). This is to neither legitimate nor denigrate Frazer's work, since although I find no "image" in the book that is adequate to Bachelard's appellation, I nonetheless recognize the pertinence of such research and the inevitability of such "creative" processes in a digital economy. Much rather, recognizing less technically proficient but more poetically charged works emerging in Frazer's wake (some of which I have mentioned), I am eager to implicate the felicity of Bachelard's thought into an emergent digital *praxis*.

It may seem dysfunctional to blow 1950s *Poetics* up the trouser leg of a marching digital scientism, but *Evolutionary Architecture* is simply *there*, prescribed in delightfully human/spatial terms in Bachelard's lyrical text. Invoking the poetic heresy of the philosopher of scientific rationalism also serves to head off the simple acceptance of the automatism of creative praxis that believes that we can design a shell from without, or that nests may be created without the restless body of the warm bird! Or, one plainly can, but that essential quality of nest and shell (that I have referred to as "traumatic") becoming tempered in the abrocation of its genetic process.

But most crucially, perhaps, in such re-reading, is the acknowledgment that spatial imagination is still a legitimate concern of all creative fields (I use Bachelard to think through digital forms), and that is continually evolving. Just as the unattainable spatial categories of nest and shell were sought out and inhabited by an active 1950s imagination, so digital imagination (for which shell and nest seem the most pre-eminent spatial figures, suddenly feasible in crude form) requires new images of spatial habitation. Frazer looks continually to a level of molecular spatiality, the void within atomic theory, almost literally seeking to inhabit the abstract models of scientific discourse and the data-scapes of a now temporal encryption.

I therefore float the thought, within such a digital sea, of the possibility of a *poetics of evolutionary form* at a potential moment of genuine cultural birthing.

The nest, for Bachelard, is a *primal formlessness* that is balanced between a physical insecurity and a daydream of repose. He inquires as to the basic instinct that diligently builds in spite of such precarious duality, and concludes that the nest constitutes an essential optimism, "the origin of confidence in the world."[10] Speculation in a digital medium, an *Evolutionary Architecture*, might then be considered a form of *digital nesting*, expressive of a force of renewal of cultural imagination. But most crucial would be the extent to which it articulates a *poetics* of a radically expanded formal possibility in attaining an "image" adequate for habitation of a displaced spatial sense.

Bachelard's interrogation of images of "felicitous space" expresses an essential *topophilia* of both familiar forms (the house, the corner, etc) and unfamiliar ones, which he finds inhabited through the expansion of poetic imagina-tion. In revisiting the virtual spaces of the *Poetics*, the nests and the shells of a projected desire, we might glean insight into a manner of cultural *praxis* appropriate to such forms, as "a victory over accidents of form and the capricious events of mobility."

But as such forms become actualised around us, the "blobs" or "hypersurfaces" of contemporary desire, there is also the necessity for imagination to expand into new spatial or temporal territories released in the interstices of digital production, since these will be the sites of prospective creativity. From the space of the digital nest which gathers materially around us, we must dream of new temporal/spatial interstices which might serve to propitiate the desire for images of the (future) "function of inhabiting." It is here, after a perhaps necessarily rational period of technical assimilation, that architectural discourse must nurture a spatial propensity sufficient for the emergence of a *poetics*, which is the condition for the emergence of a sufficient *digital image*.

Notes

[1] Gaston Bachelard, *The Poetics of Space* (Beacon Press, trans Orion Press, Inc , 1969), xiv – xv

[2] *Ibid.*, 106

[3] *Ibid.*

[4] See, for instance, the section on "Evolutionary Techniques" p 68, Section 2

[5] Following Henri Bergson, we might usefully separate geological from geometric form, where the geological manifests a temporal dimension, as if trapping time in its very materiality, sensed as such.

[6] Bachelard's remark is starkly simple "in order to achieve grotesqueness, it suffices to abridge an evolution " p108 9 "Shells", Beacon Press 1969, trans Orion Press, Inc

[7] Consider comments such as "The genetic code of the selected models is then used to breed further populations in a cyclical manner " on "Evolutionary Techniques" p 68, Section 2, or "We are inclined to think that this final transformation should be process-driven, and that one should code not the form but rather precise instructions for the formative process " "Transforming the Output", p69, Section 2

[8] "'Imaginative use' in our case means using the computer – like the genii in the bottle – to compress evolutionary space and time so that complexity and emergent form are able to develop. The computers of our imagination are also a source of inspiration – an electronic muse " John Frazer, *An Evolutionary Architecture*, p18, Introduction

[9] Alloplastic is a term developed by Sandor Ferenczi and discussed at length in my AD essay "From Autoplastic to Alloplastic Space " The terms articulate the difference between a rigid and static relationship between the environment and the self, an autoplastic rigidity, and a malleable and reciprocal alloplastic deformability

[10] Bachelard, 103
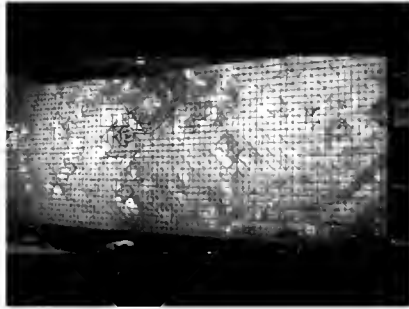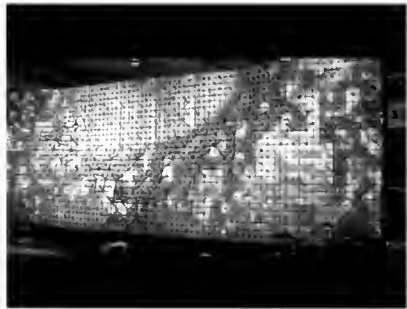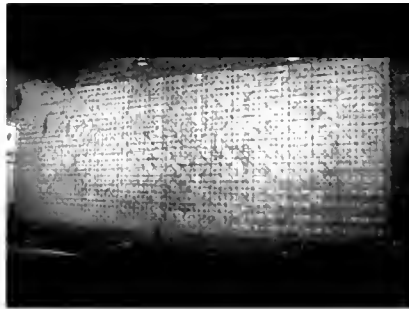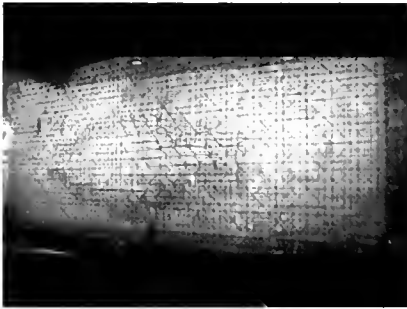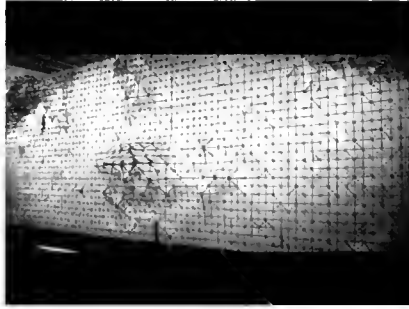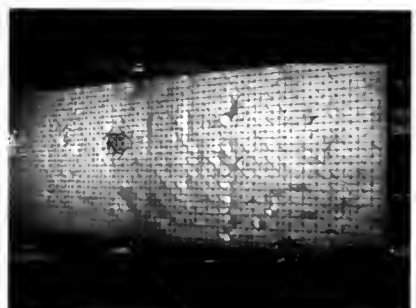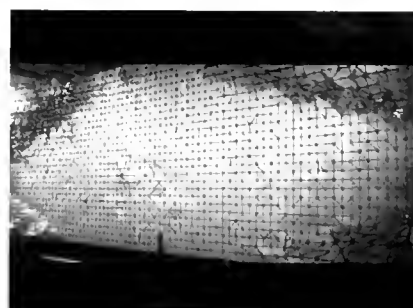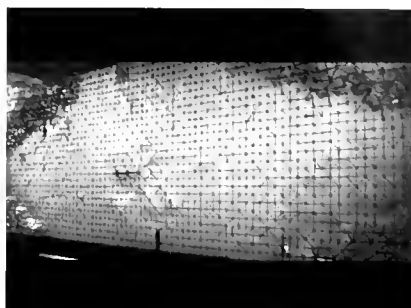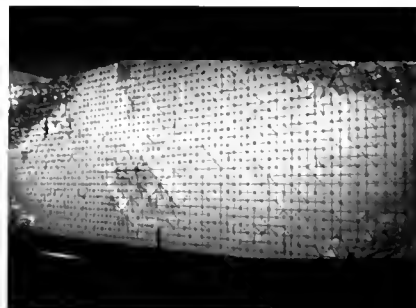
Aegis Hyposurface

The Aegis project has been developed as an attempt to generate a dynamically reconfigurable surface capable of responding real-time to a wide variety of environmental input. It takes the calculating speed of computers to permit the rapid translation between different media – sound, movement, mathematics, text, etc – such that any electronic input may reconfigure the position of a matrix of points in space. This has been achieved through a series of working prototypes using pneumatic pistons coupled to a highly performative information bus. In its fluid physical responsiveness the hyposurface announces the possibility of an architecture of reciprocity and an alloplastic relation between the body and the physical environment. Its affect is generated as a gathering of ambient material, a form of digital nesting. Our interest is in guaging the shift in cultural imagining necessitated by a now dynamic architectural possibility.

Sanford Kwinter

The Computational Fallacy

The "mechanical" and the "electronic," are by themselves not paradigms and do not represent distinct, successive, agonistic "ages" or irreducible worlds in collision. To continue to think of these in such worn and sterile ways can have no other effect than to hide from ourselves their political dimensions. The mechanical and the electronic (and most of what is denoted by these terms in present usage) are in fact expressions of two continuous, interdependent historical-ontological modalities: those of Matter (substance) and Intelligence (order, shape).

Every unit of intelligible matter in our technical or cultural world, regardless how simple, is refined or organized to a degree sufficient at least to distinguish it from the random and disordered background flux or noise of the natural world. (Of course, natural objects may possess this same property of refinement in proportion to how closely they are formed and organized by the processes of life, processes now commonly understood to extend beyond the merely organic.) In this sense such matter may be said to possess a greater or lesser amount of "embedded intelligence." One can understand by this a set of instructions accumulated over the ages (through the application of tools and controlled processes) and incorporated into this matter as a kind of permanent and continually reactivated "memory" (either through shape, rhythm, or disposition as in a tool, or through purity or precise proportion as in the relationships of metals in an alloy and the properties derived therefrom).

All matter, even totally disorganized matter, possesses some degree of active intelligence (what Diderot called "sensitivity"), and the refinement of matter is always the refinement of the intelligence embedded within it. When different types of matter, or different orientations of intelligence in matter, are brought together in a proper or sympathetic rhythm or proportion, an entirely new level of intelligence is created. As the complexity of added and engaged elements increases, one approaches, then arrives at, the "mechanical."

Now the mechanical is thought to be primitive in perhaps two senses: First, its relationships of intelligence are based on rudimentary, visible associations of isolated elements that interact at a very reduced level of information exchange. What this means is that in mechanical devices, most qualitative information tends to be reduced or eliminated in favor of a very controlled, exclusive extraction of quantitative flows (rates of movement, measures, etc.). Most elements in a mechanical complex have a single function and a single set of relationships, so that most of the embedded material intelligence is suppressed in favor of a single quality or dimension of expression. (It is here that the commonly confused terms "mechanical" and "mechanistic" find a justifiable convergence. The first term means having to do with machines, the second means deterministic and reductionistic.)

Second, the mechanical is said to be primitive in relation to electronic processes, because the latter appear to manifest the same magical qualities of material intelligence found in fundamental, free, and unprocessed matter, a set of qualities that can be summed up in a single word, self-control. "Control" here means simply the sustained application of intelligent – or organizing – force over time. While the mechanical complex seems over-designed and therefore limited to very rigid and predetermined pathways of development (i.e., no development at all), archaic and electronic matter-complexes are thought to be able to move and evolve in coherent yet unpredetermined ways. Their manifest intelligence is both multispectral and freeform or "complex."

The movement of all (advanced) technological societies has been one from archaic matter intelligence (empirical, qualitative, multispectral) to mechanical matter intelligence (numerical, dissociated), but only incompletely and each in its own way.

In the West, mechanical matter intelligence took on an almost religious status (as electronics is certainly achiev-

ing today) to the point of annihilating archaic matter intelligence from public and social memory. Now the way in which a society organizes its systems of intuition – its science, its philosophy, and its technics – is in every manner a political one. The real and possible arrangements of intelligence and matter in nature are one thing (and likely unlimited), yet how we represent these possibilities to ourselves is another. To speak of a mechanical paradigm of material qualities and perceptible functions and to oppose this to an electronic one of immaterial processes and pure intelligence is absurd and dangerous. Absurd, because despite what cyberspace gladhanders may think, there can clearly be no shape or order (Intelligence) without matter, even if this matter is comprised of nothing more than pure photons (cinema, retinal laser projection) or molecular acoustic resonance (music), etc., and dangerous, because such clichés do little more than render us stupid and docile in the face of disfiguring yet well-camouflaged social and historical processes.

What is at stake today has nothing to do with the eclipse of a material or mechanical world by an increasingly electronic one, but rather the emergence of a new regime of "subjection" that uses the undeniable allure of an archaic revival (a return to matter, complexity, and free development) to facilitate a repressive reorganization of social space as well as a mastery of the very conceptual lexicon with which this reorganization will be thought through. More bluntly: what is taking place today under the guise of such "rational" historical process is the systematic formation of a new subjectivity – a new type of man, to use Nietzsche's expression – whose matter/intelligence variables are being re-engineered and finely calibrated to fit those of a new machinic workplace-society into which s/he is to be seamlessly integrated.

It is therefore disconcerting to observe the direction of much discussion in the design world today around the advent of new telecommunications technologies, computerization, and software-driven milieus. These developments are either extolled as "exciting," "new," and "full of new freedoms and possibilities" (by those blissfully unconcerned that much of what is being so celebrated is but an extension of all that is oldest and most repressive in our political and corporeal history), or else are seen as posing an unavoidable or even welcome challenge to an already weakened or near-obsolete domain of cultural practice, namely the slow, grave, viscous world of matter.

The routine disdain heaped on matter by both these points of view is in fact focused ideologically on an officially distorted notion of the mechanical – made now to mean anything that is concrete and available to intuition. Our task today I would argue, is to resist these pathways of thought, and wherever possible to expand the concept of the concrete and to extend the play of intuition into new domains.

To do this effectively it must remain within our power (conceptual and political) to refuse the advent, not so much of the specific machines and techniques of contemporary development, but of the broader systems of rationality in which they come packaged or for which they serve as Trojan horses.

Communications networks, computers, microprocessor control systems are socially toxic entities, I would argue, primarily when used *correctly*, that is, in their capacity to routinize interactions with people and processes in increasingly engineered, confined, and deterministic spaces. It is our duty and mandate to refuse this new, pseudo-material space entirely, and to follow the "minor," archaic path through the microchip; that is, to make the electronic world work for us to reimpart the rich indeterminacy and magic of matter out of the arid, cruel, and numericalized world of the reductionist-mechanical and the disciplinary-electronic.

No computer on earth can match the processing power of even the most simple natural system, be it of water molecules on a warm rock, a rudimentary enzyme system, or the movement of leaves in the wind. The most powerful and challenging use of the computer (aside from the obvious benefits of automated number crunching in purely numerical domains such as accounting) is in learning how to make a simple organization (the computer) model what is intrinsic about a more complex, infinitely entailed organization (the natural or real system).

Implicit here is the idea of learning how to make matter model matter, or how to study natural or "wild" Intelligence in a contained but active, refining domain. In this use the computer becomes metallurgical substance, it extends the exploratory evolutionary process of differentiation and refinement by inventing new levels of order and shape. The computer and its software together can form a Matter/Intelligence unit of a very primitive but useful kind. But to do this, the computer, in the triad Nature-Mind-Computer, must play only the appropriate intermediary role of interface between Nature and Mind. This would be in clear contradistinction to what is more often the case today, where computational environments provide a customary but imperceptible experiential envelope from which Nature (and all nondeterministic unfolding) is excluded and within which the activity horizon of Mind is insidiously confined. We must not believe the narcotizing hype that an emerging electronic world is poised to liberate us from a mechanical one, nor even that there exists an electronosphere funda-

mentally discontinuous from the mechanoshpere that has formed us till now.

It is true that an important transition is taking place: mechanical relations are being dramatically transferred to new and different levels – like the little ball in a scam artist's shell game – but they are certainly not disappearing. What is more, this transition state is an unstable one, and one of the possible arms on history's bifurcation diagram (the one that does not lead smoothly to the total routinization and economic subsumption of the human organism) leads at once to the possibility of multiple new ecologies of human existence as well as to the dark, possibly unfathomable mysteries of nature itself.

What we need today is twofold: On the one hand, resistance – we need to direct our theoretical activity away from simple-minded clichés in order to conceptualize the proper materiality of the electronic with its brutal effect on both human energy and the physical environment; and on the other hand, productive affirmation – to actively press computation toward its deep rootedness in the archaic world of natural intelligence, which means at the very least to use computation just as the early moderns used the telescope and the microscope, to engage aspects of nature whose logic and pattern had previously remained ungraspable because they were lodged at too great a remove from the modalities of human sense and intuition.

During the Renaissance, specific movements and structures of astronomical and microscopic scale were for the first time brought into the purview of human thought and perception, and in the process certain forms of historical tyranny became forever impossible. Today the computer offers the possibility of apprehending developmental patterns of extraordinary and unprecedented depth and abstraction, offering tantalizing glimpses of the very freeform structure of time itself (chaos, complexity, self-organization).

Just as Lucretius's hydraulic hypothesis in his ancient *Treatise On Nature* once proposed to free humans from the capriciousness and prejudices of the gods, so this new tool – among all the horrors to which it is already giving place – may well bear the potential to unlock the door on the universal laws that govern the appearance and destruction of form, and in so doing to free us from the multiple tyranny of determinism and from the poverty of a linear, numerical world. Yet there should be no illusions: the possibilities for such a scenario are almost already foreclosed, and it will certainly not come to pass with anything short of a colossal, sustained, and collective act of human will. It is we, the engineers of human environment and activity, who bear the burden to ensure a properly human pleading in this struggle for our fate.

Illustration Credits

McMillin. 1 From Edward R. LaChapelle: Field Guide to Snow Crystals (Seattle: U of Washington Press, 1973), p. 6; 2 and 3 from W. A. Bentley & W.J. Humphreys: Snow Crystals (NY: McGraw-Hill, 1931); 4 photograph by author.

Gattegno. All images by the author.

Burry. All images by the author.

Chang. 1 Infrared satellite imagery of the West Coast from February 21 to February 25, 2003 from Geostationary Satellite Server, National Oceanic and Atmospheric Administration National Environmental Satellite, Data, and Information Service, 2003; 2 Landsat images of Los Angeles, NASA, 1990; 3 and 4 photographs taken by author; 5 from SeaWiFS Project, NASA Goddard Space Flight Center an ORBIMAGE, 2000.

Divola. The images have been collected by the author over several years, and are anonomous photographs taken by various Hollywood studios during shooting of the listed motion pictures. Page 36, source unknown; p. 38, *Tortilla Flat*, MGM 1942; p. 39, *Green Mansions*, MGM 1959 and source unknown; p. 40, *Ice Palace*, Warner Brothers 1960 and *The Outrides*, MGM 1950; p. 41, *Stand Up and Fight*, MGM 1939 and *As the Earth Turns*, Warner Brothers 1934.

Gissen. All images from, *Big and Green: Toward Sustainable Architecture in the 21st Century.* David Gissen (Editor). National Building Museum. Washington, DC; 2003. 1 photograph by Mark Luthringer; 2 photograph courtesy K.L. Ng Photography; 3 photograph by Hans Werlemann; 4 image by MVRDV.

Arbona, Greden, Joachim. All images by the authors.

Armonnson. Images by Studio Granda, except 5 Bifrost photographs by Sigurgeir Sigurjonsson.

Sethi. All images by the author.

Pierce. All images by the author.

Goulthorpe. All iamges by dECOi Architects.

Call for Submissions. Image from Hevelius, J. 1647, Selenographia: sive, Lunae Descriptio (Facsimile, Johnson Reprint Corporation, New York, 1967).

Contributors

Javier Arbona is a Master of Science in Architecture Studies candidate at MIT. He holds a B.Arch from Cornell University, and received an Eidlitz Travel Award from the Department of Architecture at Cornell University to examine the prison industrial-complex in relationship to the urbanism of Los Angeles and Southern California.

Pétur H. Ármannsson has been the Director of the Architecture Department of the Reykjavik Art Museum since 1993, and has authored numerous articles and exhibitions on 20th century architecture in Iceland. He is Visiting Professor in Design Theory at the Iceland Academy of Arts.

Mark Burry is Professor of Innovation and Director of the Spatial Information Architecture Laboratory at RMIT in Melbourne, Australia, and Consultant Architect to the Temple Sagrada Família, Barcelona, Spain.

Kyrstal Chang is a writer and designer based in Los Angeles.

John Divola is an artist and Professor of Art at the University of California, Riverside. His work has been featured in over 50 solo and over 150 group exhibitions. Two recent books by Divola are, *Continuity*, and *Isolated Houses*, Book of Original Artwork with Essay by Jan Tumlir.

Peter A. Fritzell is a Professor of English and the Patricia Hamar Boldt Professor of Liberal Studies at Lawrence University. His work includes *Nature Writing and America: Essays upon a Cultural Type* (Iowa State University Press, 1990).

Christine Cerqueira Gaspar is an M.Arch/Master in City Planning student at MIT, and holds a BA in Environmental Studies from Brown University. She is currently working on her thesis on the relationship between the built environment and "nature" in Boston's Seaport District.

Nataly Gattegno is visiting assistant professor at the University of Virginia. She holds an M.Arch from Princeton University, and an MA from Cambridge University, St.John's College. Ms. Gattegno teaches architectural design and seminars exploring research and representation of information. She is a founding partner of FutureCitiesLab.

David Gissen is the curator of architecture and design at the National Building Museum. He organized the catalog and exhibition "Big and Green: Toward Sustainable Architecture in the 21st Century," an examination of recent large-scale environmentally sensitive buildings.

Mark Goulthorpe is director of dECOi Architects (Paris and London), which has established a reputation for design that opens new perspectives for architectural praxis in light of the shift to digital media. He will be Associate Professor in architectural design at MIT in Fall 2003.

Lara Greden is a PhD candidate at MIT in Architecture. She holds a dual MS from MIT in Civil and Environmental Engineering and in Technology and Policy, and a bachelor in Mechanical Engineering from the University of Minnesota. Her research focuses on decision-making for sustainable buildings and application of options theory.

Mark Jarzombek is Associate Professor of History, Theory, and Criticism in the Department of Architecture at MIT. He has written on a variety of subjects from the Renaissance to the modern.

Mitchell Joachim is a PhD candidate at MIT in Architecture Design Computation, and a faculty member of the School of the Museum of Fine Arts, Boston. He holds an MAUD from Harvard University and an M.Arch from Columbia University. As Archinode Studio principal, he is a consultant on architectural designs involving ecology, informatics, and urban habitat forms.

Errata

Sanford Kwinter is a design theorist and writer, and teaches design in the School of Architecture at Rice University. He is co-founder and editor of *Zone* and *Zone Books*, author of *Architectures of Time*, co-author of *Mutations*, and editor of several books on science, technology, and design. Kwinter is currently at work on a book on Africa and the origin of form.

T. Scott McMillin is an Associate Professor of English at Oberlin College, where he teaches courses on interpretation, nature, and American Literature. The author of *Our Preposterous Use of Literature: Emerson & the Nature of Reading* (University of Illinois Press, 2000), McMillin is currently working on a book on rivers in American life and letters.

Matthew Pierce is an M.Arch student at MIT, currently working for the Renzo Piano Building Workshop in Paris. In 2002, he researched the use of new digital photogrammetric survey tools for architects, producing three-dimensional models of portions of two facades of the Sagrada Familia in Barcelona. He previously lived and worked as an architect in Jackson, Wyoming, where he spent much of his free time walking in the Teton, Gros Ventre, and Wind River mountain ranges.

Sanjit Sethi is a Lecturer/Visiting Artist at MIT's Visual Arts Program. He holds a BFA from Alfred University, an MFA from the University of Georgia, and an MS in Advanced Visual Studies from MIT. He is currently working on the Building Nomads Project in India, and a road intervention project entitled Rumble Strip, both involving various academic, social, and geographic communities.

The following unintentional mistakes were made in *Thresholds 24* (Spring 2002): 46-53.

Page 48, Paragraph 2: "The tomb has panels narrating the story of the Shah..." should read "The tomb has panels narrative the story of the Shahnameh..." The 'Shahnameh' or the 'Book of Kings' is Ferdowsi's major work, which tells the story of the lives of various mythical and historic Persian kings. Images from the Shahnameh were carved on the walls leading to the tomb of Ferdowsi.

Page 50, Paragraph 1: "By the mid-1980's...and the space around the tomb complex was named Freedom Square." should read "By the mid-1980's...and the space around the complex was renamed Freedom Square." The 'Shahyad' square, which was renamed 'Azadi or Freedom' square after the Revolution is not a tomb complex but a museum.

Exploration

Great joy in camp. We are in view of the ocean, this great Pacific Ocean which we have been so long anxious to see, and the roaring or noise made by the waves breaking on the rocky shores (as I suppose) may be heard distinctly.
  – Captain Clark, 7 November 1805

In civilizations without boats, dreams dry up, espionage takes the place of adventure, and the police take the place of pirates.
  – Michel Foucault, *Of Other Spaces*, 1967

We are continually reminded that few 'unspoiled'/ unexplored places still exist on earth, yet have our dreams dried up as the frontier continuously shrinks?

The gradual process of understanding and reconciling discoveries of 'new' places and people is perhaps as old as human life. Yet unlike large population shifts, exploration remains personal, dependant on individuals, small expedition parties or even modern unmanned mechanical observation. Exploration entails not only the journey, but also a desire to represent and map new territories and their inhabitants.

This confrontation with the 'new' and desire to represent and map it occurs not only through travel in physical distance, but also through archeological travel in time. How do the unearthings of 'new' historic ruins in cases including Chiapas, Pompeii, and contemporary Athens rewrite history and restructure urban space?

Technology in the modern age has, of course, brought great alterations to exploration. Inventions from train travel to photography to space flight have shrunk the globe and moved us off it, yet is space really the final frontier?

In addition the ever-expanding boundaries of space, today biologists are returning to the urban environment, discovering new species in New York's Central Park. Contemporary frontiers may be nanoscale biological systems, or may be created by socio-political borders, No Trespassing signs, and video surveillance cameras. Auto companies suggest that we desire an Expedition or an Explorer in our driveway, yet might exploration be interpreted throughout history as well as utilized in current practice as more than just a marketing scheme?

Submission Policy

Thresholds attempts to print only original material. Manuscripts for review should be no more than 2,500 words. Text must be formatted in accordance with *The Chicago Manual of Style*. Spelling should follow American convention and quotations must be translated into English. All submissions must be submitted electronically, on a CD or disk, accompanied by hard copies of text and images. Text should be saved as Microsoft Word or RTF format, while any accompanying images should be sent as TIFF files with a resolution of at least 300 dpi at 8" by 9" print size. Figures should be numbered clearly in the text. Image captions and credits must be included with submissions. It is the responsibility of the author to secure permissions for image use and pay any reproduction fees. A brief author bio must accompnay the text.

We welcome responses to current *Thresholds* articles. Responses should be no more than 300 words and should arrive by the deadline of the following issue. Submissions by e mail are not permitted without the permission of the editor.

Massachusetts Institute of Technology

Department of Architecture

77 Massachusetts Avenue

Cambridge, MA 02139

MIT
HISTORY, THEORY AND CRITICISM
C/O SERIALS ACQUISITIONS 10E-21
CAMBRIDGE MA 02139

Date Due