The Productive Force of Materiality: Three Views of a Generative Device

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In the fall semester of 2010, three instructors at the University of south Florida School of Architecture and Community Design set about coordinating their efforts in the creation of a unified assignment for three studio sections at the same level in the curriculum. The Core 3 studio is the third in a six course sequence in architectural design, during which students build upon a solid grounding of fundamental design concepts to explore complex building programs and site integration. The assignment began with a 24" x 24" construct which required students to engage in a material exploration of ways in which building skin, structure and site contribute to a materially rich architectural narrative. For the purpose of this exercise, students focused on Skin, Bones, or Earth to create a device possessing a character defined by variability, while retaining a conceptual simplicity. Constructs were directed to consist of a complex arrangement or pattern of materials reliant on a rigorous repetition of a simple concept. These complex constructions should be seen to arise out of a multiplicity of relatively simple interactions to create a discernible whole, or emergent pattern. Such a system should be perceived as irreducible, to be understood as a system distinct from, yet still a function of the parts that comprise it. Students were asked to use conventional materials in unexpected ways, unconventional materials in unimaginable ways, and to devise new materials from improbable sources (Figs. 1-4). At the core of this philosophy lay the rejection of visual metaphor in favor of topical synthesis, regeneration, emergence, and innovation. These constructs were then used as a generator for a riverside boathouse and swimming facility in the post industrial landscape of Tampa Florida.

As a result of the varied research agendas of the three faculty members, the work of each design section began to take on a distinctive flavor as the initial explorations gave way to fully expressed building concepts. Following, as articulated by (risking a certain pretentiousness but with hopes for a discursive clarity), a theorist (Kara), a materialist (Weston), and an urbanist (Bassett), are three ruminations on the use of materiality as a productive force for the generation of architecture. In one view, the constructs exist as a meta-syntax, or placeholder for textural, structural, or formal conceptions of architectural space. In another, the initial work is considered as a means of crafting a context upon which to build an architectural narrative. In the final view, the material devices are seen as design mediators for crafting a translation from buildings to landscape and to the urban surface.

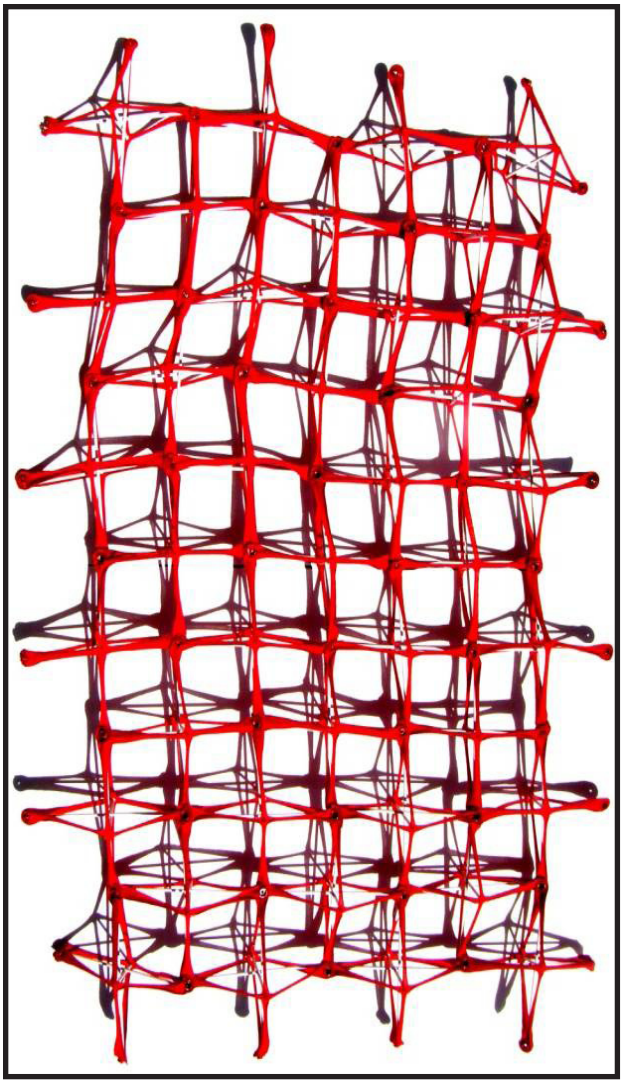

Figure 1: Lasercut T-Shirt Construct by Dustin Merritt. Photograph used by permission.

NOTATIONAL MATERIALITY

The student work presented here exemplifies what can be called 'notational materiality'. Deviating from a commonsense tectonics, these systemic constructions are without a context of meaning yet. They exist as a result of a technique of construction, yet the logic of construction neither comes from a specific tectonic scale embedded in tradition, nor from a discursive geometrical conception of space. They explore the possibilities of making an internal material structure which may then take on different meanings through further iterations in different contexts of scale and use. Notational to the degree that they depend on iterative processes to become architectural entities in the context of an architectural project, these constructs also operate at a material level prior to questions of materials of construction. They present a materiality beyond materials.

Alvaro Siza's statement on materiality is illuminating: "I am not sure what materials to choose. Ideas come to me as immaterial, as lines on white paper; and when I want to fix them I have doubts, they escape, they wait at a distance," (Siza 1997). An uncritical assumption of the discourse on materiality in contemporary architectural thinking is that materiality is about a givenness that exists outside of the designer: the impregnable reality of the materials of construction, the ultimate necessity for realization of ideas, and the ultimate necessity for the concrete reality of the building. Materiality in this sense is about the realization of architectural form by 'real' materials where the form is driven by the inherent properties of the materials of construction.

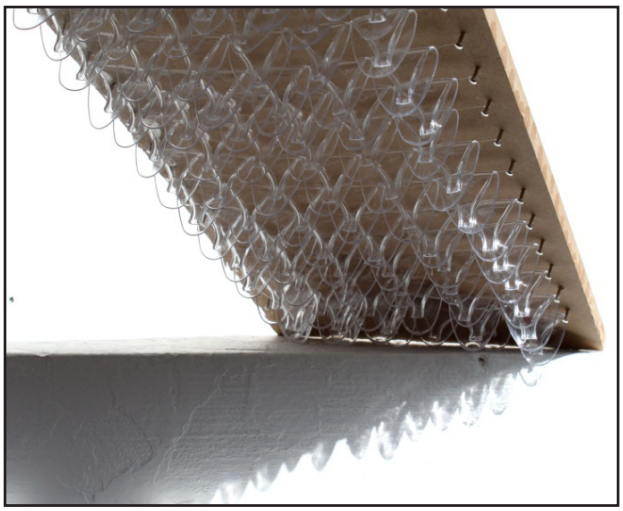

Figure 2: Bent Plastic Spoon Construct by Caitlin Vaccaro. Photograph used by permission.

Free from this mainstream assumption of the necessary reality of the materials, and in accordance with Siza's insight on architectural ideas, these works pose the question of materiality in the way they are constructed as a web of possible physical relations between minimally defined core elements. The internal systemicness of these works is material enough to suggest certain physicalities at various scales and not material enough yet to determinate a given material of construction. The iterative possibilities of these constructs enable thinking

different degrees of transparency, different conditions of light, reflection, refraction, various modalities of visibility, levels of hardness, softness, and even textures at different scales. However, these essential conditions of materiality are explored, projected, therefore critically thought, rather than simply assigned through a selection out of some given range of materials.

On the other hand, these speculative constructs are not about a spatial / formal discourse either. They are inherently worldly in the way they are constructed as material relations between elements. They exist as made entities prior to any determining spatial / formal conception. Rather than projecting abstract relations between elements in terms of an authoritative registration between form and space, or space and use, they weave a web of elemental relations that exist as an open texture, an open syntactic unity, that can take on different projections for space and use in future scales and contexts. Thus, the notational materiality exemplified by these works is a mediative structure that enables thinking the performative spatiality of architectural form. This notion of architectural form as spatial performance goes beyond understanding architectural form as a representational device. Internally purposive without a purpose, these systemic studies encourage new ways of thinking and making architectural form and space as they multiply possible material conditions for inhabitation through iterations and transformations.

BEYOND THE THING ITSELF

In the 1968 classic His Master's Voice, science fiction author Stanislaw Lem explores the Kantian concept of the *noumenon*, or the subjective reality underlying all phenomena. This novel is quite nearly an anti-positivist manifesto in the form of a story about scientists seeking to decipher an alien transmission without the context of the culture that produced it:

> There exist, speaking in the most general way, two kinds of language known to us. There are ordinary languages, which man makes use of – and the languages not made by man. In such language organisms speak to organisms. I have in mind the so called genetic code. This code is not a variety of natural language, because it not only contains information about the structure of the organism, but also is able, by itself, to transform that information into the very organism. The code, then, is acultural... (Lem 1983).

Similarly, design students early in their careers are thrust into a conversation for which their life experiences can provide little perspective. While the contexts behind the theories which drive the motivations of their instructors are quite opaque, the visual phenomena produced as a result are often not. Fortunately, design is not set in the positivist framework that hinders Lem's scientists, and so students are able to learn much with their senses, and thus to think with their hands. Design is not science. Students must overcome a lifetime of procedural cop shows, courtroom dramas, and killer thrillers which have taught them that the words *research* and *science* are synonyms, in order to devise constructs which produce an encoded logic from a context rather than vice versa.

In discussions of architectural materiality, it is often useful to draw from genetics, or the informational language of nature, as a means of demonstrating coherent rigorous constructions in the natural world of built things. Nature can be a model for a form of design which demands endless variation. The complex beauty of biology derives from non-linear, trial-and-error based problem solving. From the nano-structures on a gecko's foot, to the naturally ventilated termite mound, natural systems have evolved to solve all manner of architectural problems through a highly localized system of material deployment (Benyus 1997). This arsenal of biological approaches can be hybridized with anthropocentric and ages-old architectural design strategies to be used as a baseline for an architecture which, like nature, can seem as an act of acrobatic resource management. The characteristic ad-hoc material variation of natural constructions results in directional variations in strength, uniformity, and repetition to produce strikingly beautiful, yet performative constructions. The appearance of these constructions is a result of information buried deep in the cells of organisms, but their interpretation as visual language must be understood as a man-made construction, and is therefore a tool in the designer's arsenal.

Armed with such arguments, or at least the visual understanding of the outcomes of such talk, students are freed to explore the architectural space of material phenomena, and are challenged to produce context from a rule-based materiality. In one such construct, recycled cardboard is rolled into tubes to produce "molecules" which when stacked produce a honeycomb-like array that seems to vary endlessly,

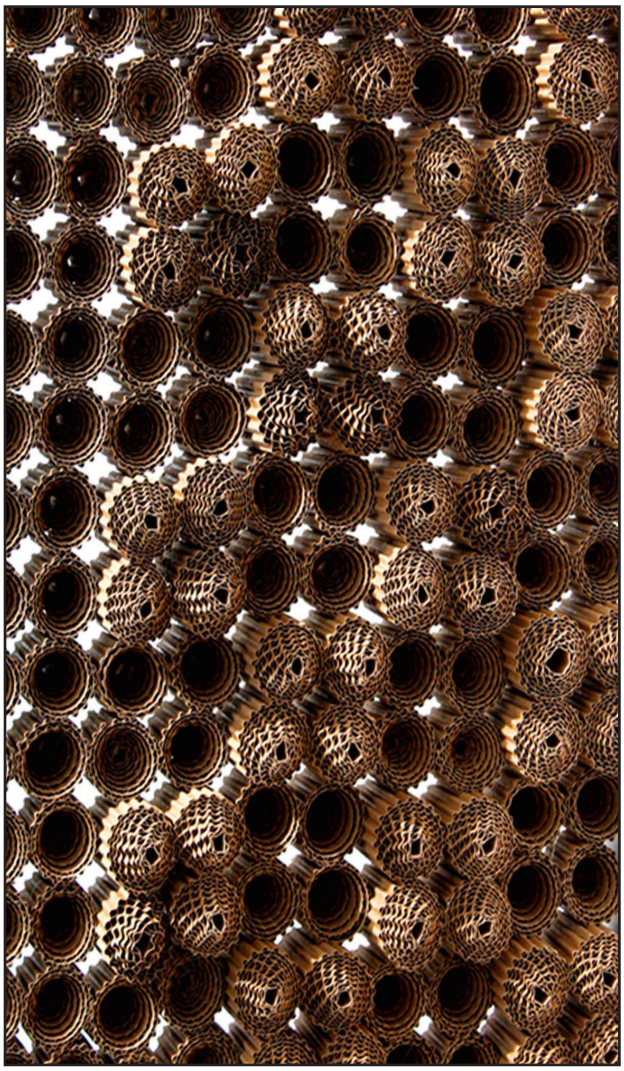

Figure 3: Rolled Cardboard Construct by Diana Duran. Photograph used by permission

while being at the same time endlessly repetitive (Fig 3). The student states that her goal was to "produce an object which was complex in texture but simple in structure, [out of a unit which] lends itself to extrusion and presents infinite opportunity for the exploration of depth and texture…" These units themselves are interactive, and can be pushed in or out in order to produce a material effect which is not only spatial, but also haptic in nature. The form produced from this rolling and stacking exercise can thus be understood as a demonstration of the apprehension of the embodied logic of a material as a product of the human hand rather than the human head, and as an act of both making and of experience: an encoded logic which precedes context. The thing thus brought into being possesses a formula from which it produces itself.

THE SKIN AND BONES CONSTRUCT AS A MEDIATOR OF THE LANDSCAPE/SITE AND URBAN SURFACES

In his seminal text, "Programming the Urban Surface", Alex Wall states that "there has been a renewed interest in the instrumentality of design and its enabling function-as opposed to representation and stylization" (Wall 1999). As he points out, "landscape no longer refers to the prospects of pastoral innocence, but rather invokes the functioning matrix of connective tissue that organizes not only objects and space, but also the dynamic processes and events that move through them". Landscape, "as an active surface, structure(s) the conditions for new relationships and interaction among the things it supports", becomes a particularly useful model for architecture students when beginning to read and gain an understanding of the landscape of a given site condition. Traditionally defined "as the art of organizing horizontal surfaces", landscape, is characterized by "a strategic deployment of processes, both natural and man-made, as well as being a medium which is capable of temporal change" (Waldheim 2002). To the architecture student first engaging with the site and their reading of it, the fluidity of the landscape, as critically mediated through the iterative translation of their construct, opens up a realm of possibilities. These are a weave of elemental relationships between program events and site. The inherent blurring between landscape and structure can work across a spectrum of scales, in a multi-scalar approach.

A so-called found object, the iteration and translation of the meditative structure/construct, privileges attention to, and the negotiation of these surface conditions of site and landscape-its materiality and dynamic nature lending itself to being responsive in its translation. This at once privileged and symbiotic relationship of structure-site engenders an architectural construct which is generative and derivative of the forces acting upon it, more lucid and responsive to the elements of landscape, lending itself to future scales and constructs.

Through its iteration and translation, the skin and bones construction translates and mediates between the built and the natural environment. Landscape

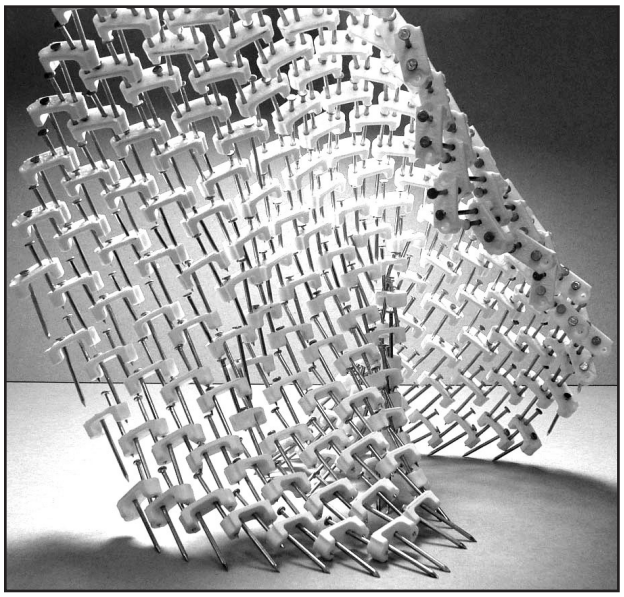

Figure 4. Wire Staple Construct by Fiorella Rabines. Photograph used by permission.

is a fluid medium within which to operate. The act of translation, at first reading, pushes student exploration beyond conventional means and methods of reading site, often resulting in static intervention *on* it, as opposed to *within* it. The inherent properties of the skin and bones construct as meditative structure, becomes the fluid medium within which to respond and negotiate the potentials and the latencies of site. The so-called ground structure "that organizes and supports a broad range of fixed and changing activities of the city", is described by Wall as being an, "urban surface (which) is dynamic and responsive like a catalytic emulsion, the surface literally unfold(ing) events in time" (Wall 1999). The construct and its materiality(ies) share similar characteristics to those of landscape; those of an ability to respond to temporal natures through transformation, an inherent and indeterminate framework within which to adopt and respond. The operational tactics of the construct operate lend itself to an iterative device operational within a dynamic framework and complex system.

Student's translations of their constructs into site can be at once responsive and dynamic to environmental forces acting on them, such as wind, sun, light and water. At once a generative tool and fluid mediator between the possibilities and conditions of site/landscape, the construct is a more symbiotic mediator between the built and natural environments. This might generate: an "in-betweeness" of conditions; a blurring between landscape and structure; inside and outside; the inhabitation of the site through translation and transformation; responsiveness in surfaces and materiality to the non-linear, dynamic forces of the site/landscape acting on it, in addition to supporting future scales and contexts. Translation can also mediate concepts of choreography of space in time through sequences of spaces, paths, threshold and boundaries through the landscape, generative of program.

The selected site is at once a rural-urban and post-industrial condition, also fluid and mediative. Its palimpsest includes multiple layers of pasts, and imbues it with meaning. Two industrial buildings, the Waterworks Building and former Tampa Armature Works Trolley barn, stand as relics of its industrial past. A timeline of historical aerials show a softened shoreline and floodable temporal landscape replaced by a hardened sea wall and periodic flooding.

Figure 5: Looking northward through an overpass onto the site. Photograph by Shannon Bassett used by permission.

Student site intervention is structured in a way that begins with a reading and mapping of the site and its conditions. Initial site analyses are synthetical and across multiple scales of understanding. The skin and bones construct presents the agency for a fluid interface and mediation through translation between programs and site. This condition at once: blurs the relationship between the interior-exterior; provides different contexts for operation and exploration of scale(s) and engages the phenomenological aspects of nature. Its translation is at once responsive and transformative to a continuously transforming medium of landscape.

The student stated that her goal with the translation is that "The skin and bones construct becomes a manageable filter system, responsive to aspects of (the student's) reading of the site and landscape and the environment".

Another student's project responds to the fluctuation of tidal level and proposed reconstructed ecological systems through the softening of the shoreline, part of the site operational strategy and becomes a surface and barrier (reef) for new ecological life along a surface edge of the river, becoming an operator on surfaces. Aspects of the construct translate into breathing skin of an unconditioned space required by the boathouse program. Parts of the skin become exposed the water and the river- edge ecologies acting upon on it, creating a sponge to support living systems, namely ecological processes and habitat restoration on an existing "dead" (ecological) site.

Another student states that "My structure becomes adaptive to programmatic functions acting on it, an unconditioned breathing space, provision of shading, and retaining the river the tide with the restoration of natural ecologies along the edge."

Landscape as a medium, negotiated through the skin and bones construct, provides a method enabling the student to explore the meditative the relationships of building, site, architecture and landscape, drawing them into more symbiotic and responsive relationships. It presents a methodology of structuring the site investigation through iteration and translation, creating the opportunity for a generative interrelationship with architecture. Simultaneously, this provides consideration for the creation of strong opportunities for constructions and the possibility of the physical relations of scales of landscape and environmental factors and the opportunities for redefining relationships between humans and their environment.

CONCLUSION: ACTION THROUGH MATERIAL EXPERIENCE

> It is possible to be efficient in action and yet not have a conscious experience. The activity is too automatic to permit of a sense of what it is about and where it is going. It comes to an end but not to a close or a consummation in consciousness. Obstacles are overcome by shrewd skill, but they do not feed experience. There are also those who are wavering in action, uncertain, and inconclusive like the shades in classic literature. Between the poles of aimless and mechanical efficiency, there lie those courses of action in which through successive deeds there runs a sense of growing meaning conserved and accumulating toward an end that is felt as accomplishment of a process (Dewey 1934).

If the architectural object has any collective significance left in today's world, it lies in some performative sense of making. Unlike any linguistic device or a cognitive apparatus, the material consciousness of the constructs presented here cannot be reduced to the consciousness of an intentional state that identifies things in the world: 'this is red', 'this is a tree', 'this is a church'. Their internal systemicness precedes any such intentionality as their existence is more a happening in the immediacy of here and now even before we 'know' what it is that happens through empirical and linguistic associations. Theirs is a level of exchange and interaction through material ordering; a marking, spacing, modulation. Their capacity to intervene in the world of our experiences is neither because of their apparent mechanical efficiency nor does it come from an aimless repetition that may adapt and evolve endlessly. A deliberate willingness to act guides their making, disciplines their gestures.

We think that a sense of "growing meaning" is still the core of the idea of the unity of thinking and making in the architectural design process. However, the material constructs presented in this paper also reject any ontological or epistemological source for their possibilities of meaning. Buried in the depths of history or psyche, any idealized source as such is delayed endlessly in their resonances, reverberations, or in their fragile suspendedness. In the making of the thing at hand, in the concreteness and material immediacy of its own rules, the promised event is a wholehearted action: a performance that *may* rearrange phenomena, nature, history, i.e., the sites for possible actions, without falling back into some easy mimesis.

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