

# Sewing/Sowing: Cultivating Responsive Geotextiles

Charles Stankieveh

*In Eriia, to establish the relationships that sustain the city's life, the inhabitants stretch strings from the corners of the houses, white or black or gray or black-and-white according to whether they mark a relationship of blood, of trade, authority, agency...spider webs of intricate relationships seeking a form.*

- Italo Calvino

## BOXES, BLOBS, BRANES<sup>1</sup>

As our glass boxes turn into glass blobs, the question must be asked: do current trends in architecture provide better places in which to dwell? Surely the movements of the eye caused by the ripple of folds in the curved surfaces of our 21st-century buildings are a welcome change upon the landscape of urban centres struggling to resist gridlock. For in a world framed more and more by computer screens, it seems only natural to desire buildings that break out of our glass cages. But is switching from straight lines to 'NURB' curves really that radical of a change? From an engineering perspective, perhaps; from a visual perspective, definitely. But do we need a new image on the architectural billboard? In the last hundred or so years, a natural progression in architecture has developed: from the drape of the Statue of Liberty's copper skin to the curtain wall of the Modernist skyscrapers and the dialectical return to the contemporary warped surfaces of glass and new materials.<sup>2</sup> At the core of all three designs one finds the sustained idea of conceptualizing a building as a skeleton with a skin, an idea established in 19th-century sculptural and engineering principles. However, even as these new buildings are stretched, morphed and tessellated, we grow tired of looking at them, but not because of their lack of beauty or craftsmanship. Quite on the contrary, we grow tired of looking at them because we grow tired of *looking*.

The drape of the curtain wall in the 20th century provided engineering feats of elegance and power, giving the world an International Style, but it also created a lack of respect for the *site*, sacrificed to the hegemony of *sight*. Alternatively, a different thread of architecture concerns itself with *topos* (place) and our sensual experience of the site. Instead of working from the *image* of a textile presented by the Statue's copper clothing, a new focus on textile *structures* and membrane *processes* offers a potent path for the future of architecture in the 21st century. Particularly, Philip Beesley's 'geotextiles' lifted from infrastructural uses to architectural possibilities offer an experimental entanglement of body, building and the environment.

## THE FALL OF THE CURTAIN WALL

The curtain wall was part of a transformed aesthetic of architecture, finding its own style not in quotations from the past but from its own function and technical marvels such as the industry of train stations and the spectacle of exhibition spaces. As an engineering technique, the curtain wall relied on a skeletal support structure positioned on the interior of the building, relieving the walls of their normal load-bearing task. Henceforth, the exterior walls could be made of new materials, like glass, and hung from an internal framework of steel or reinforced concrete. Not since the shift with Gothic architecture in the medieval ages had architecture taken such a dramatic step into the light. Literally able to compose glass houses, 20th-century architects created buildings where inside and outside were conflated. The iconic Mies van de Rohe's *Farnsworth House* (1946-50) and Philip Johnson's *Glass House* (1949) with their floor-to-ceiling walls of glass attempted to foster a value of transparency where the boundary between environment and dweller became visually erased with the use of new materials. But this exclusively visual act of joining inside and outside through the technique of framing the landscape can further segregate the other senses and their experience of the outside. That is, the act of the inhabitant taking in the view of the exterior often negates the feeling of outdoor climate, smells and sounds. Ironically, the implementation of glass boundaries heightens the separation between the body and the natural environment. The dweller (or shall we say spectator) scans the vista as a pilot<sup>3</sup> would through his cockpit's canopy or a driver<sup>4</sup> would through the windshield speeding down the expressway, surveying the landscape with the utmost of ease and comfort: 'it is worth returning to the curious fact that pure vision is *pure kinesthesia*, best described as a form of flight.'<sup>5</sup> Here, the glass envelope functions properly when the surface reflects narcissistically from the exterior and acts invisibly from the interior, containing the air at about room temperature.<sup>6</sup> Ocular illusions of transcendence materialized under the bell jar.

## THE WORLD IS FLESH

In a world growing more and more *virtual*, the drive to interface with information grows stronger, reinforced through a feedback loop.<sup>7</sup> Clothing with embedded computers, sensors controlling room atmosphere, noise-cancelling headphones, the consolidation of audio-visual communication/entertainment/information

management into mobile PDAs (personal digital assistants) are some of the commodities mediating the everyday world. Most designers are attempting to capitalize on this exploded area of the market by creating 'faster, lighter, stronger' interfaces not concerned with the senses but with ergonomic design—something quite different. However, some designers are urging us to reflect and reconsider our built spaces as sites which offer more than just an amplification of visual information. Juhani Pallasmaa's classic text *The Eyes of the Skin: Architecture and the Senses*, first published in the mid-1990s during the boom of digital architecture, offers an argument for an architecture concerned with the 'polyphony of the senses' (to use the words of Bachelard).<sup>8</sup> Stemming from a philosophy of phenomenology and an embodied architectural practice, Pallasmaa builds upon Merleau-Ponty's conceptualization where the 'world is flesh.'

There are many faces to phenomenology, some heavily reliant on Kantian schematics of the subject, where an internal Cartesian/Kantian manifold synthesizes space and time within the mind of the subject. In contrast, other practices of phenomenology offer an understanding of reality where the world, the body and the mind are not distinct entities and are perhaps even false categories in themselves. However, it is important to note these complications of categories are not the deconstructionist complication of binaries. As important as language and the symbolic order are in shaping reality, we are dealing with a reality that is not a spectrum (along which binaries compete) but multiple, mutually inclusive dimensions. A topological extension or critique of phenomenology combined with recent observations in politics and proprioception offers an architecture where the floors and walls fluctuate dynamically. This floor or horizon would be what Merleau-Ponty called the *chiasm*—the intertwining—a concept that challenges typical notions of objectivity and subjectivity.<sup>9</sup> At the *chiasm*, intentionality is diffused and the 'production of subjectivity' finds itself immersed in the flesh of the world, oscillating between 'the visible and the invisible.' As Merleau-Ponty hazards, 'Where are we to put the limit between the body and the world, since the world is flesh?'<sup>10</sup>

One strand of architecture sharing Merleau-Ponty's observations spans the 20th century—in the work of Frank Lloyd Wright, Alvar Aalto, Steven Holl, Peter Zumthor, Paulo Mendes da Rocha, Tadao Ando, and many others. Unlike the buildings driven by new materials for high performance and 'supercharged digital design,' the work of these architects seeks a holistic experience. The experience of walking through such a building is about engaging all the senses. This is not to say that technological advances and the implementation of new technology is a morally deficient gesture. To the contrary, the now everyday technology of central heating makes humble houses a place of comfort and welcome during the cold season. But a well designed window that lights a space dynamically according to different times of the day is just as effective a modulator of space as is the virtual window of a video screen displaying real-time data.<sup>11</sup> The issue is how to create dwellings and spaces that integrate necessary information technologies with our sensory needs and psychological

desires—and for some, spiritual ways. In fact, the ability to ingeniously intertwine all of these needs is more than a curiosity, it is an essential task in the upcoming century—one not easily undertaken nor fulfilled. However, as Brian Massumi questions:

*Practices of architecture allied with experimental art...can be twisted away from addressing pre-existing forms and functions toward operating directly as technologies of emergent experience...Imagine if these were to become infrastructural to architectural engineering...Could architecture build on the ability of digital technologies to connect and interface different spheres of activity on the same operational plane, to new effect?*<sup>12</sup>

One would hope that a hybrid architecture can emerge, borrowing from the sensual experiences of phenomenological architecture while also borrowing from the radicalism of experimental architecture.

The idea for a hybrid architecture echoes Le Corbusier's desire in the later phase of his work, where he hoped to enter 'the phase of natural harmony of the *deuxième ère machiniste* [the second machine age] in which the industrial superstructure and the rural base would achieve a happy equilibrium.'<sup>13</sup> This philosophy manifested itself in a small house he built in India during the early 1950s which included a grid concrete structure as well as several vernacular climate control characteristics such as a turf roof. A second renewal is necessary, not for the machine age but for the information age. The infatuation with the speed of information and our continual seduction by new fabrication techniques must be kept in check with processes of proven architecture that works with the senses. A long history already exists building physical interfaces for the senses—not in research labs but in the age-old fields of furniture design and architecture. Presently, the older idea of *balancing* industrial and rural needs to transform into the *entanglement* of information and senses: not a static building envelope of concrete and grass, but a dynamic canopy of fibres and gardens. Of course, as Aalto points out, 'one has to exercise tact when approaching nature, that life has to be cultivated carefully—but [by] using technology.'<sup>14</sup> If our subjectivity is immersed in the world and there is fundamentally a lack of clear distinction between the production of subjectivity and the building of the environment, we must be conscious of our investment in our built spaces, realising (as is now the norm in ecological practices) that care for the environment means care for the self and vice versa.

## THE GARDEN CALLED SUBJECTIVITY

For many, architecture is the extension of man's psyche into the natural environment. For through his tooling of the land he creates a built space meeting his needs and fulfilling his desires. In turn, the architecture he fashions, fashions him. Pallasmaa, however, sees things differently: 'Architecture is essentially an extension of nature into the man-made realm, providing the ground or perception and the horizon of experiencing and understanding the world.'<sup>15</sup> When constructing a multi-sensory experience it is important to view architecture as an extension of nature, not as an extension of man. Establishing this 'ground' creates a fundamentally different workflow.

At the birth of architecture, this distinction was irrelevant because of the effect of humans on the environment, but with the massive change towards the destruction of our climate, the fabric of our existence is in jeopardy. This is not just to draw attention to 'ecological' concerns but also to the flatness of our everyday relation with buildings and cities which seem in constant disavowal of the senses. Of the several tactics by which to salvage our world and therefore influence our interaction with it, the use and production of green spaces plays an elemental part...in particular the garden in its various shapes and sizes.

The garden provides a rich and sensual experience: the visual pleasure of landscape design, the smell of flowers, the sound of water flowing from a fountain, the touch of intimacy in hidden alcoves and grottos, and the taste of fruit from harvest. Of course, the benefits extend beyond the limits of the classic five senses. Gardens also provide a communion between species (human and other), a quiet place to reflect, an open space to play, and an investment in time. The garden functions at a pace normally forgotten about in today's computer age: the time of seasons, the time of light, the time that expects patience.

The garden need not only fulfill mythological functions of creation, falling from grace and other fantasies. What about the gardens of today? The need for parks and gardens in urban centres is on the rise as we realize that the life of a city is intimately connected to its green spaces. Take Manhattan and London as two examples of metropolises that still sustain a high quality of life despite their scale. As the cities around the world dramatically swell in upcoming years, these two will maintain a certain desire for habitation due to their allocation of public green space—and not just for the psychology of recreation.

In addition to the master plans of urban parks, individuals and organizations are privately fulfilling the need for small paradises in the landscape of parking lots. Two strategies of urban gardening are in practice today, with two different results. The community garden is a practice where a group of people share a plot of land in the city centre divided into subplots, each with a small garden. This tradition allows people in apartment buildings (vertical urbanism) to maintain a garden without having direct access to a personal yard (horizontal urbanism). The result is a community of people sowing, tending, and harvesting not only vegetation but stories and relationships—qualitative information.<sup>16</sup> The other urban gardening practice, and an idea gaining popularity, is the roof garden. While often the opposite in social spirit to the community garden, the roof garden, which is mostly private, can still function as part of a larger green concern: 'The benefits of green roofs are many: longer roof lifespan, greater sound insulation, reduced heating and cooling system needs, and a cutback in storm water runoff. Green roofs decrease carbon dioxide and increase oxygen in cities, making them cooler in the process and reversing the so-called *urban heat island effect*.'<sup>17</sup> Thus, two important characteristics can be gleaned from contemporary gardens: 1) community gardens foster a patchwork community and provide the locus and means of cultivating social information

structured on organic processes, and 2) roof gardens elevate the garden from street level and integrate its biological attributes into urban architecture to create hybrid canopies. It is these two attributes which I argue should be the guiding principles of the gardens of the future, a future which will hopefully find a way to cultivate social information while integrating its means biotechnically into the infrastructure of architectural engineering. In this way, we will be intimately connected with the two main external forces shaping the production of our subjectivity: our social sphere and our built environment.

## GARDENS OF TOMORROW

What will the gardens of tomorrow be like? One would hope that the traditional practice of tilling topsoil, planting seeds and tending to the growth of plants will always retain a certain simplicity, but this does not mean new gardening techniques and uses for gardens should not be explored. Philip Beesley's sculptural work, starting with the *Chthonian Projects*, pursue such a branch by meditating on the present function and future possibilities of geotextiles. Already used industrially and established in infrastructural development ranging from toxic waste containment to soil erosion prevention, the geotextile is a hidden presence in much of the current landscape. Embedded into the surface layer of the earth, a geotextile can provide separation, filtration, drainage, reinforcement and/or protection, depending on its specific product design. Essentially the effectiveness of the geotextile resides in its ability to integrate into the landscape in a seamless manner. Once the fabric is implemented, the surrounding vegetation grows in, around and through the material, creating an entangled intermeshing of natural and technological. The integration between synthetic fibres and organic rhizomes allow for a hybrid fabric that offers renewed life to environments that would otherwise be devastated by the human footprint. In psychoanalytic terms, the geotextile attempts to treat trauma—be it a chemical spill, erosion, infrastructure impact and so on.

Some of Beesley's first geotextiles are earthworks establishing his initial discourse with the earth's surface as a reaction to his archaeological finds during his Prix de Rome research. Traumatized by his discovery at the Palatine Hill—that the literal foundation of Roman civilization, and thus the resulting Western civilization, is built upon child sacrifice—Beesley developed a coping strategy of reburying that which he uncovered: 'I began to respond to the Porta Mugonia excavations by conceiving a textile cover used for reburial of the archaeological site. The structure was conceived as a hybrid burial shroud, constituted as artificial living turf akin to the massive Republican and Imperial accretions of the Palatine Hill itself. *Palatine Burial* was a fabric *soil*, a spreading geotextile reinforcing the soil and fostering new growth.'<sup>18</sup> In a sense, all of Beesley's geotextiles are re-enactments of this reconciliatory burial, a hope to rebuild the social fabric and create spaces with a renewed sense of growth. For with a burial, the body literally and ultimately breaks down the final barrier between the flesh of the human and the flesh of the world. Ashes to ashes, dust to dust, the microscopic enmeshes to create the fertile soil for new life.

Loosened from the industrial confines of geotextile functionality, the early works *Haystack Veil* and *Erratics Net* are earthworks utilizing repetitive geometric meshes on a large scale and capitalizing on the vast scope of territory covered by the sculptural fabric. After these two projects, which feel like gestural sketches, Beesley's methodology switches from fieldwork to laboratory research: a movement from earthworks to gallery space, from site-specific to non-sites (Robert Smithson). In practice, the use of real soil is replaced with implied soil, in exchange for a complexification of the geometric structural meshwork and the integration of distributed processing networks that control responsive articulations. The first evolution of the work occurs at this stage: Beesley models the flow of information processing on the flow of organic growth.<sup>19</sup> The geotextile moves from static fabric to dynamic membrane. The digestive machine of organic soil decomposing bodies is here supplanted by sensors tracking the 'erotic prey' of the gallery visitor.

But unlike the (x,y,z) matrix used in computer vision to analyze the motion and location of subjects within its surveyed territory,<sup>20</sup> the geotextiles of Beesley are not woven textiles with a warp and weft, they are not grid structures or lattices. They are more analogous to the structure of felt with their 'entanglement of the...microscales of the fibers.'<sup>21</sup> Installations like *Implant Matrix* and *Hylozoic Soil* are architectural textiles of knotted processes including topological meshes akin to Klein bottles and digital information networks sensing human presence. Organic structural design, distributed processing and dynamic relations are what make up the architectures of the future and which are really the extension of ideas from the past found in Victor Horta's Art Nouveau designs or Alvar Aalto's philosophy:

*Nature, biology, is formally rich and luxuriant. It can with the same structure, the same intermeshing, and the same principles in its cells' inner structure, achieve a billion combinations, each of which represents a high level of form. Man's life belongs to the same family. The things surrounding him are hardly fetishes and allegories with a mystical eternal value. They are rather cells and tissues, living beings also, building elements of which human life is put together. They cannot be treated differently from biology's other elements or otherwise they run the risk of not fitting into the system; they become inhuman.*<sup>22</sup>

But what about that which is not even physical? It is fine for these architects to relate different physical entities, but what about the recent introduction of digital technologies? Deleuze and Guattari's description of a nomad art seems to continue the same line of thought:

*It is inorganic, yet alive, and all the more alive for being inorganic. It is distinguished both from the geometrical and the organic. It raises 'mechanical' relations to the level of intuition. Heads (even a human being's when it is not a face) unravel and coil into ribbons in a continuous process; mouths curl in spirals. Hair, clothes... This streaming, spiralling, zigzagging, snaking, feverish line of variation liberates a power of life that human beings had rectified and organisms had confined, and which matter now expresses as the trait, flow or impulse traversing it. If everything is alive, it is not because everything is organic or organized but on the contrary, because the organism is a diversion*

*of life. In short, the life in question is inorganic, germinal, and intensive, a powerful life without organs, a body that is all the more alive for having no organs, everything that passes between organisms (once the natural barriers of organic movement have been overthrown, there are no more limits).*<sup>23</sup>

*Hylozoic Soil* attempts this very overthrowing, a search not for the 'inhuman' of Aalto, but the living 'inorganic' of Deleuze and Guattari. The connection between the interface and the user, or the building and one who moves through it, is not at the level of thought, it is at the proprioceptive level where natural eye jitter (nystagmus) happens to twitch in sequence with the memory alloy of a whisker in *Implant Matrix*. And thus begins a feedback loop between the analog and the digital, the haptic and the optic, Euclidean and non-Euclidean space, between inside and outside.

Another important shift in Beesley's research develops in the later geotextiles where the elevation of the work is raised from the ground into the air. *Haystack Veil* was dispersed along the ground like a normal geotextile, but as we move into the later pieces such as *Reflexive Membranes*, *Implant Matrix* and *Hylozoic Soil*, the work is suspended, taking on a multidimensional form closer to the microfibre structure of felt than a lattice woven fabric. This subtle change in position from underfoot to overhead suggests the possible future use of geotextiles and gardens not only on the ground in parks, but as integrated hybrid landscapes in the verticality of the urban situation. Imagine the future of buildings where our skyscrapers are not reflective skins of glass and metal but flowing surfaces with geotextiles; not only skyscrapers composed of woven carbon fibre structures able to twist and respond to the torque of environmental conditions but geotextile canopies able to sculpt the psychological and emotional responses of the client.<sup>24</sup> As the field of high-performance textiles finds implementation in functional infrastructure, medicine and architectural design, the need shifts beyond seeing if new materials can perform from an engineering perspective to learning how to utilize networks of information and structural textiles as an effective means of creating an increase in the qualitative feeling of our environments.

Situated at the prototype stage, the art exhibitions of Beesley's installations serve as a 'laboratory for built work.' In the same vein as the seminal 1976 exhibition *The Idea as Model*, Beesley's architectural models are not about representation empowered by the Lilliputian effect of contrasting scale between client and toy building.<sup>25</sup> Instead of a model anchoring the narrative fantasy of a proposed project, the idea-model functions as a conceptual tool with its own aesthetic principles. In this way, we can see these highly artificial experiments as thought processes speculating on 'what the surface of a building could be like.'<sup>26</sup> If all of this seems far fetched, Beesley's geotextiles share an imagination similar to Archigram's *Plug in City* or Yves Klein's experiments towards an *Air Architecture*—projects that influenced our infrastructure and thinking more than perhaps fabrication and construction.<sup>27</sup> Then again, in the near future, that Art Nouveau pattern moving on the wall might not be a hallucination—the wall might actually be moving. Without conscious thought, it just might be a Beesley topiary shifting to offer protection from an ozone-piercing sun.

## NOTES

- 1 *Brane* has 3 important functions within the scope of this essay: 1. *memBran*: 'a pliable sheetlike structure acting as a boundary, lining, or partition in an organism,' 2. *Brain*: intelligent processing network, 3. *Bran*: in theoretical physics defined as 'an extended object with any given number of dimensions, of which strings in string theory are examples with one dimension. Our universe is a 3-brane' (Oxford Dictionary).
- 2 Hal Foster compares Gehry buildings to the Statue: 'For all the futurism of the computer-assisted designs of architects like Gehry, his structures are often akin to the Statue of Liberty, with a separate skin hung over a hidden armature and with exterior surfaces that rarely match up with interior spaces' 'The ABC of Contemporary Design' *October* Vol. 100 (Spring 2002): p. 191-199. Anthony Vidler on the interior similarities of Greg Lynn and the Statue: "The 'inside' of architecture, then, to return to an early theme of Lynn, would not be shaped by occupation or by any other attribute than its profoundly residual character—like the fortuitous insides produced, say, by the external necessity to fashion a shape like that of the Statue of Liberty." *Warped Space: Art, Architecture and Anxiety in Modern Culture* (Cambridge, Massachusetts: MIT Press, 2000). Philip Beesley and Sean Hanna compares Foster and Partners' Swiss Re Headquarters to the Statue: 'Lighter,' *Extreme Textiles: Designing for High Performance*, ed. Matilda McQuaid (Indianapolis, IN: Princeton Architectural Press, 2004)
- 3 Norman Foster
- 4 Diller + Scofidio
- 5 Brian Massumi, *Parables of the Virtual: Movement, Affect, Sensation* (London: Duke UP, 2002) p.148
- 6 Were the vectors of sightlines reversed in glass architecture, we would run into the nightmare of Jeremy Bentham's Panopticon: trapped in a reflective cage of self-analysis, exacerbated by the paranoia of being watched by the unknown. See Dan Graham's work ranging from his glass pavilions to his theoretical *Cinema* based on the phenomenon of one-way mirrors.
- 7 An overused word defined in multiple ways, I would define the virtual as the obsessive accumulation of information combined with the speed of its access and transfer, creating overdetermined clouds of possibility
- 8 Juhani Pallasmaa, *Eyes of the Skin: Architecture and the Senses* (London: Academy Editions, 1996) p. 41
- 9 It is at Merleau-Ponty's 'crossing over' that the desires of normally opposed viewpoints like Massumi and Pallasmaa find common ground—despite their disagreements about phenomenology. While Massumi is suspicious of the moral connotations embedded in the writing of Pallasmaa (rooted in Heidegger and the organicism of Frank Lloyd Wright's value of 'integrity'), contextualized in the face of Modernism's corporate glass boxes, Wright's attempt to design buildings based on their interior function with resulting exterior appearance is the precursor to Greg Lynn's 'inside' of architecture with its 'residual' character (or Lars Spuybroek's *Deep Surface*). The shared concern is not moral but ethical, a formal strategy to keep open the space for growth in the field of design. Whether this manifests itself in 1930s architectural revolution or new millennial revolution, the point is that they are architectures of the same revolution—one a temporal rotation later. Of course, Pallasmaa desires to create a sense of the home (*heimlich*) while Massumi desires the unhomely (*unheimlich*). Nevertheless, both strategies are tactics to dissolve subjectivity into space, into architecture apropos the senses: while Pallasmaa hopes to define one's subjectivity through pleasure and immersion into comfort, Massumi wishes to complicate and challenge one's subjectivity through disorientation and augmentation. Perhaps it is most productive to locate the two thinkers' similarities by referring to two specific buildings: Pallasmaa's acclamation of Wright and Massumi's championing of Spuybroek. Wright's *Fallingwater* (1935-9) and Spuybroek's *H2O Expo* (1994-7) both attempt to create the form and atmosphere of their buildings from the flow of water. Their differences are not in idea but merely in their stylistic contexts (International Style versus digital) and the technologies available at the time. Neither building is less experimental if taken in the context of its construction.
- 10 Maurice Merleau-Ponty, *Basic Writings*, ed. Thomas Baldwin (Routledge, 2004) p. 255
- 11 The artists James Turrell and Robert Irwin provide striking examples where the relation between architecture and a window can be poignantly affective
- 12 Massumi, p.192
- 13 William J. R. Curtis, *Modern Architecture Since 1900*, 3rd ed. (NY: Phaidon, 1966) p. 425
- 14 Quoted in Richard Weston, *Alvar Aalto* (NY: Phaidon, 1995) p. 100
- 15 Pallasmaa, p. 41. Here again we see the classic divide between a Cartesian engagement with the world (*res extensa*) versus a more 'bottom-up' approach.
- 16 A recent practice of guerrilla gardening in public spaces normally left unattended is another example of urban gardening. With this strategy, the in-between places of meridians, tree wells, back alleys and other 'no man's land are reappropriated and beautified: from no man's land to nomadic gardens.
- 17 Christian Werthmann, *Green Roof: A Case Study* (NY: Princeton Architectural Press, forthcoming)
- 18 Philip Beesley, *Chthonian Projects* lecture, July 31, 2006
- 19 For an interesting example of a visual version of organic information processing, see Benjamin Fry's *Organic Information Design*, M.Sc. Thesis, MIT Media Lab, 2000, and his project *Valence*
- 20 While the computer screen is 2D, and thus explains an X, Y matrix, colour space is a depth in computer graphics, Z. Spatial location is represented by raster location (the line of video), but the colour value is represented by a third coordinate (often a string of RGBA values). This system shares the fundamental idea of colour space as depth in a 2D field sketched out at the turn of the 20th century in the works of the De Stijls, especially the 4D experiments of avant-garde architect Theo Van Doesburg.
- 21 Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, trans. Brian Massumi (Minneapolis, MN: Minnesota Press, 1987) p. 475-6
- 22 Quoted in Weston, p. 100
- 23 Deleuze and Guattari, p. 498-9
- 24 Beesley co-authors an essay with Sean Hanna in the exhibition catalogue *Extreme Textiles*. The overall exhibition and book explores architectural implementations of textiles, focusing on the engineering marvels of recent advancements in technology. In contrast to this line of research, Beesley's art exhibitions provide the opportunity for a more sensual exploration of technotextiles. *Extreme Textiles: Designing for High Performance*, ed. Matilda McQuaid (Indianapolis, IN: Princeton Architectural Press, 2004). For a proposal of carbon fibre structures reinforced with resin, see the overview of Peter Testa Carbon Tower, p. 110-118
- 25 Though an interesting observation could be made between the structural and material similarity between Beesley's clear plastic modular architectures and Jim Henson's clear sugar-crystal architectures built by the *Fraggle Rock Doozers* as well as other pedagogical toys popular in the 1980s such as the clear snap-fit *Capsela* equipped with small motors, gears and other mechanics illustrating basic physics principles.
- 26 Philip Beesley, 'Orgone Reef,' *Architectural Design* vol. 75, no. 4 (July/Aug 2005)
- 27 For Archigram, see especially the textile graphic on the cover of *Archigram* no. 7 and Chapter 3: 'Beyond Architecture: Indeterminacy, Systems and the Dissolution of Buildings' in Simon Sadlers *Archigram: Architecture Without Architecture* (Cambridge, Massachusetts: MIT Press, 2005) p. 92. For Yves Klein, see Peter Noever and François Perrin's Yves Klein: Air Architecture (Ostfildern, Germany: Hatje Cantz, 2004). This is not to undermine Beesley's keen interest in present-day modes of fabrication: see his publication *Fabrication: Examining the Digital Practice of Architecture*, eds. Philip Beesley, Nancy Cheng and Shane Williamson (Cambridge, Ontario: University of Waterloo School of Architecture Press, 2004). I mainly wish to draw attention to his installations as part of the more imaginative aspect of his multifaceted practice.

**Hylozoic Soil: Geotextile Installations - 1995/2007**

Philip Beesley

**Other publications by Philip Beesley:**

**Fabrication: Examining the Digital Practice of Architecture**

Ed. Philip Beesley, Nancy Yen-Wen Chen, and R. Shane Williamson  
AIA/ACADIA, 2004

**Responsive Architectures: Subtle Technologies**

Ed. Philip Beesley, Sachiko Hirose, Jim Ruxton, Marion Tränkle, and Camille Turner  
Riverside, 2006

**Future Wood**

Ed. Oliver Neumann and Philip Beesley  
Riverside, 2006

**Mobile Nation**

Ed. Martha Ladly and Philip Beesley  
Riverside, 2007

**On Growth And Form: Organic Architecture and Beyond**

Ed. Philip Beesley and Sarah Bonnemaïson  
TUNS Press, 2007

**Library and Archives Canada Cataloguing in Publication**

Includes bibliographical references.

ISBN 978-0-9780978-5-1

1. Sculpture
2. Geotextiles
- I. Title

**Design and Production**

Eric Bury and Charisma Panchapakesan

Printing by Pandora Press

Kitchener, Ontario

This book is set in Akzidenz Grotesk and Adobe Jenson

Copyright © 2007 Riverside Architectural Press

All rights reserved by the individual paper authors who are solely responsible for their content. No part of this work covered by the copyright herein may be reproduced or used in any form or by any means - graphic electronic, or mechanical, including photocopying, recording, taping or information storage and retrieval systems without prior permission of the copyright owner.

**ARCHITECTURE**  
WATERLOO ARCHITECTURE CAMBRIDGE



Social Sciences and Humanities  
Research Council of Canada



Conseil des Arts  
du Canada Canada Council  
for the Arts



la fondation Daniel Langlois  
pour l'art, la culture et la recherche



ONTARIO ARTS COUNCIL  
CONSEIL DES ARTS DE L'ONTARIO

torontoarts council