Philip Beesley: The Limits to Growth

Tim May with Philip Beesley

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HOLO 1

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Emerging trajectories in art, science, and technology

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HOLO 1

Emerging trajectories in art, science, and technology

Directory

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Inside the artist's studio

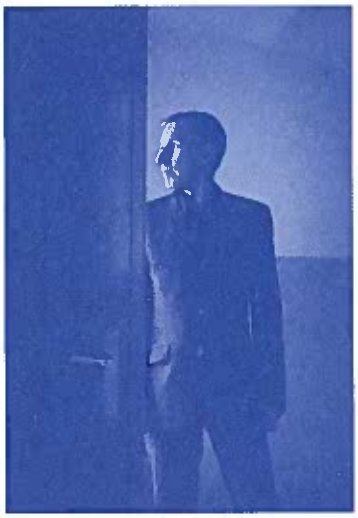
II. Perspective

One theme, multiple angles

III. People

IV. Grid

Key nodes in the network



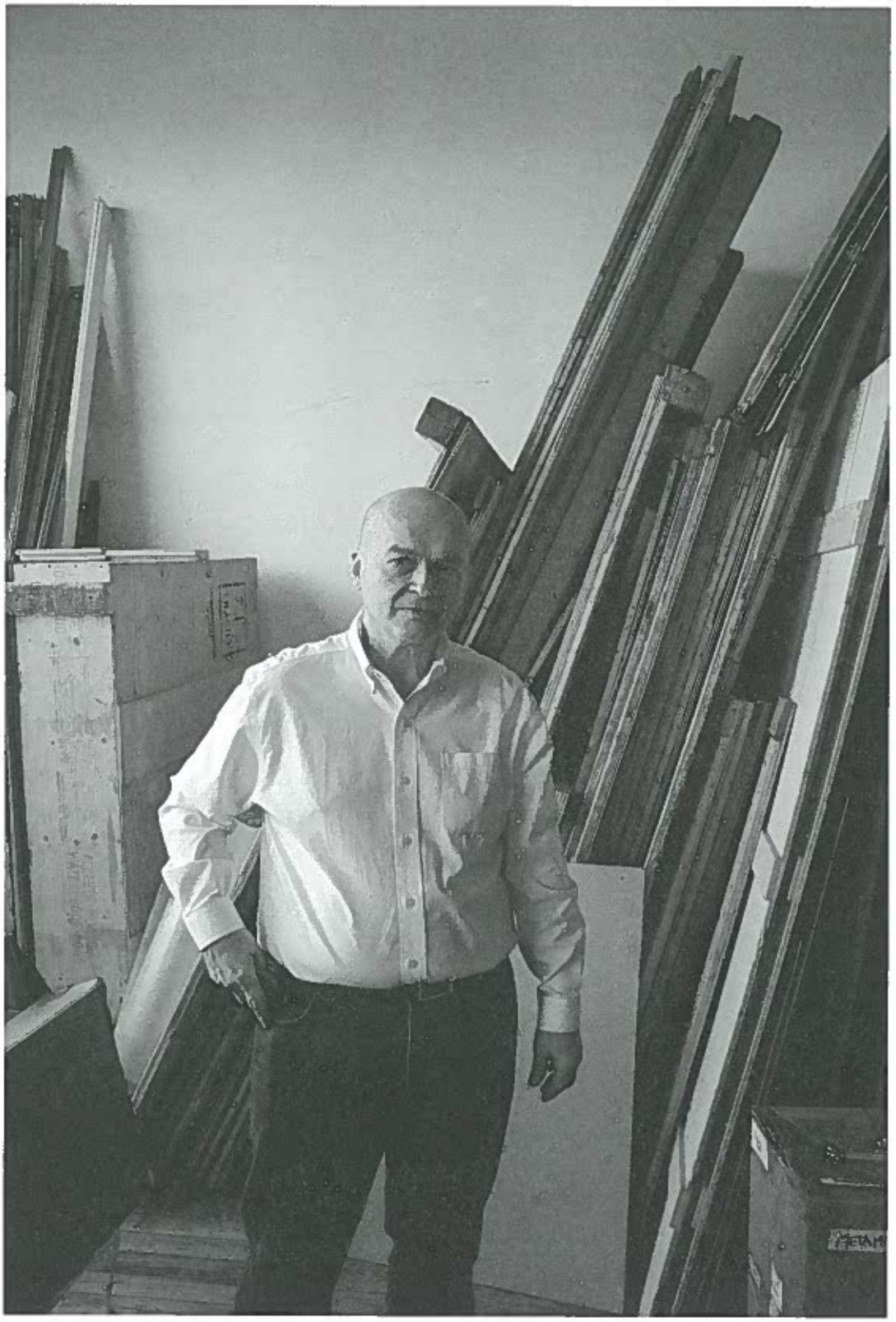
V. Frames

Tools in the making

VI. Stream

Progress unfolding

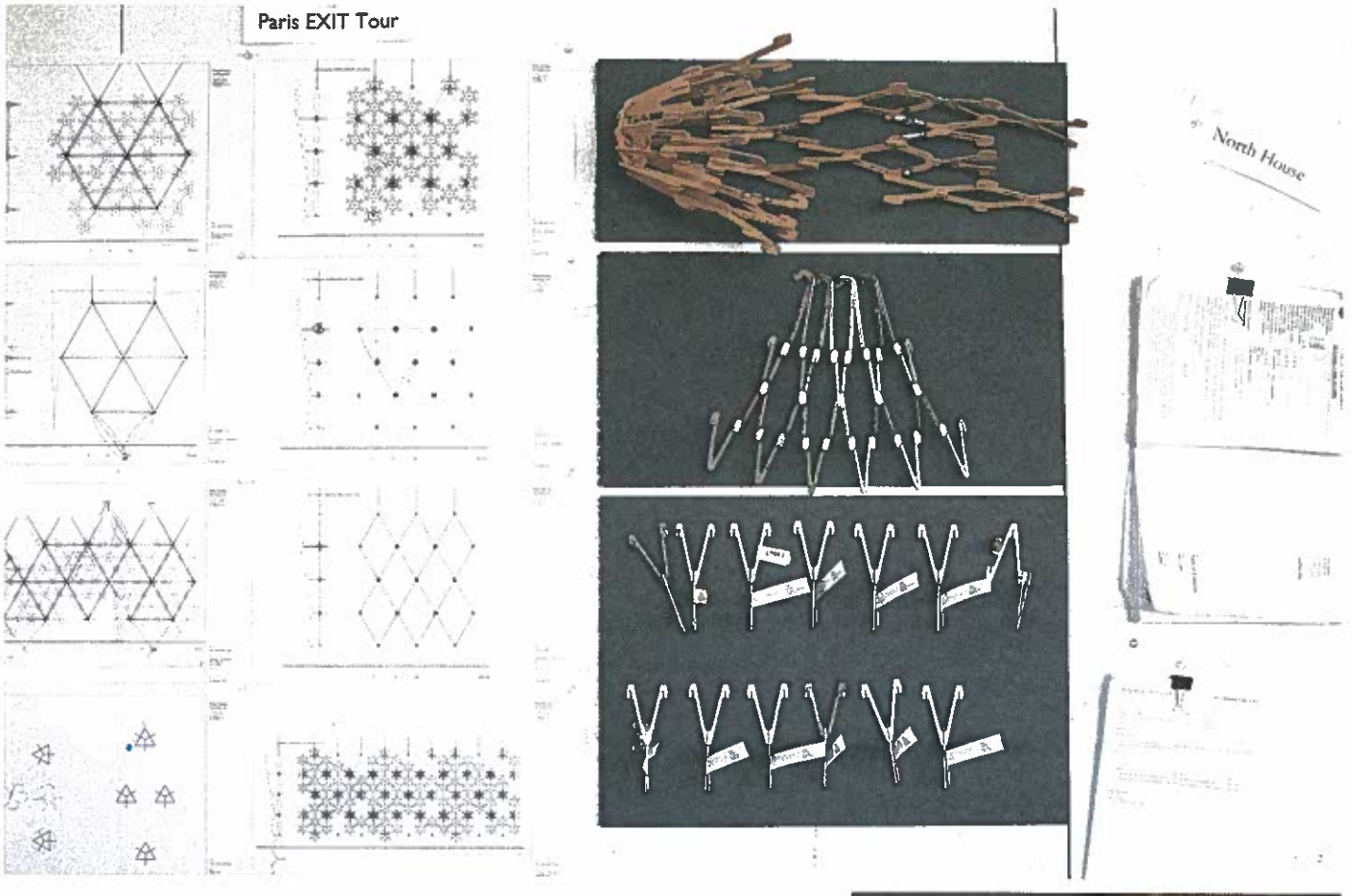
II. People
Philip Beesley



The Limits of Growth

Philip Beesley is taking faltering first steps towards creating living environments. The Canadian architect's alien landscapes are populated with undulating biomorphic canopies dense with gentle, swaying foliage. Built from acrylic, animated with microcontrollers, and 'aware' through sensors, the evocative installations reach out, beckon to, and even tickle visitors. Does this work herald a new era of empathic machines?

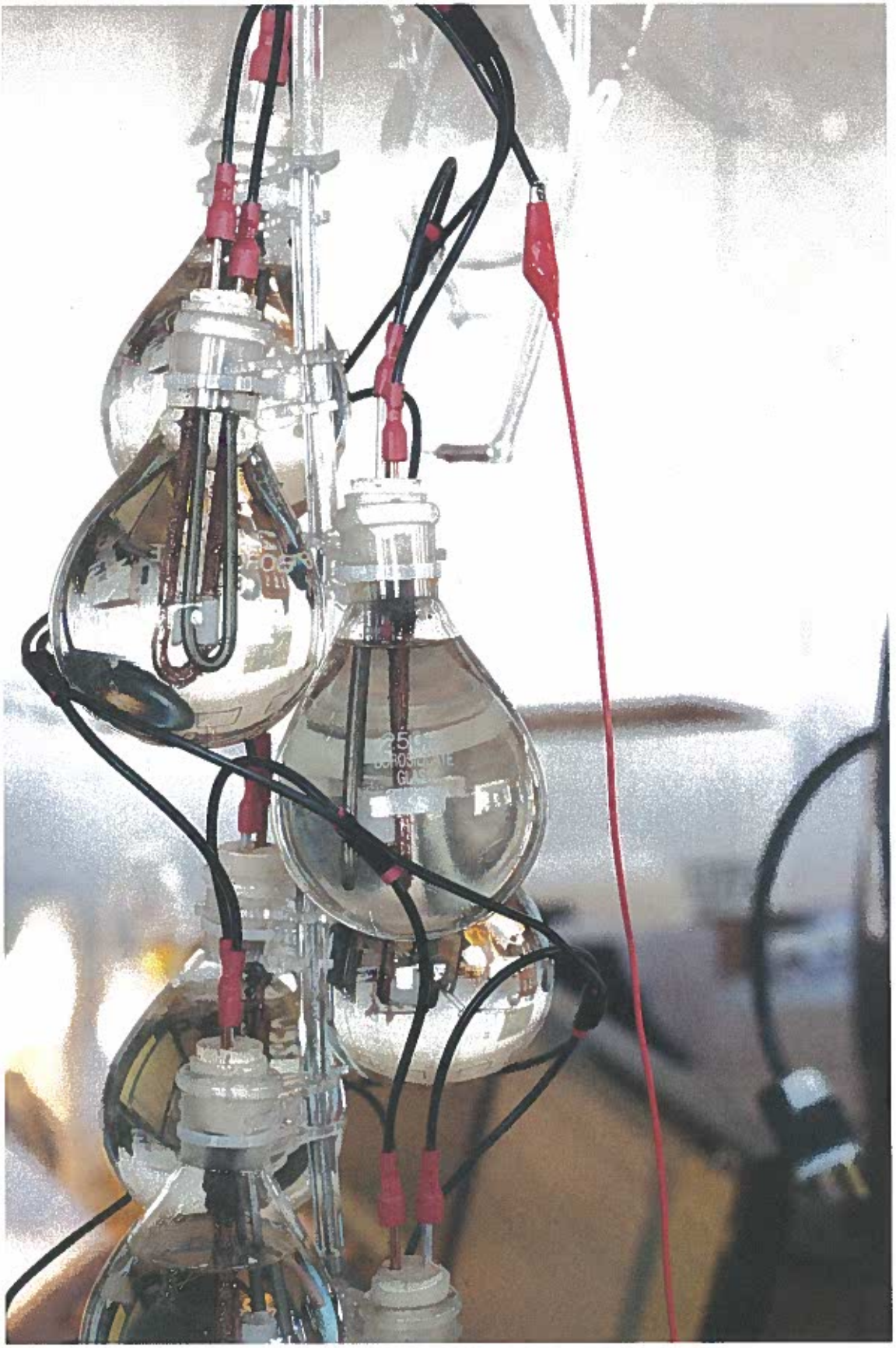
Text: Tim Maly —— Photography: Erika Jacobs



Above: The assembly techniques used to construct Beesley's installations have emerged from approximately two decades of architectural experimentation and refinement.

Right: While many installation components are fabricated in studio and assembled on site, other parts (wires, electronics, glass vials, zip ties) come from overseas via the standard manufacturing chain. The tension and/or coordination between local and global permeates every facet of the production process.

Far right: Clusters of beaker-like vessels frequently populate Beesley's work. Used as containers for catalyzing rudimentary chemical reactions, they allow his creations to "emulate a lymphatic system."



Far left: Although afraid of heights, our photographer Erika Jacobs braved a skyjack ride up to the stratosphere of Beesley's studio to document the dense canopy of overhanging acrylic models.

Left: The 'hanging archive' of models built with both tried and true and more experimental assembly techniques, informs projects that are presently in production.

Below: Beesley and studio manager Sue Balint discuss the finer details of a parametric model. In the past, Balint worked in theatre design. Her large scale set decoration skills transferred quite seamlessly to interactive architecture.

——The first thing that happens when I meet Philip Beesley is he takes me on a skyjack ride. A skyjack is a small mobile platform, used by maintenance teams to reach the ceiling when a ladder won't do. You've probably seen one in a mall. It's a clumsy, brutish machine, loud and solid, made up of hard right angles with railings painted safety orange. It's the opposite of Beesley's work.

We don't climb far, maybe five metres. High enough to ascend beyond the tangle of half-completed or half-disassembled prototypes of various recent and upcoming works. From above, we can see their underlying structure and logic. Tessellations of simple patterns are woven between one another and made eerily organic by the multiplication of small imperfections.

"Reticulated." He says this a lot. He says it first when we are up there, surveying the ragged hints of installations. He shows me how one undulating canopy is composed of a network of interlacing forms. Further away, another set of stalactite-like shapes has lights that flash in patterns, as if a spark was climbing the column.

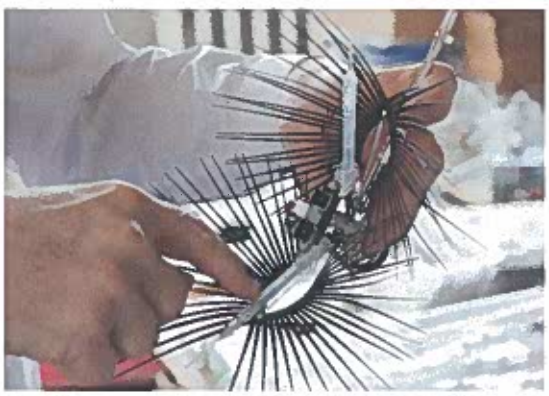
Beesley has an impish smile. When he talks, he speaks quietly, quickly, and at length. When I ask him what he means when he describes his work as "faltering first steps," the result is a nine-minute oral journey that weaves together Plato and Lucretius, the tingling sensation you get when you hold a finger between your eyes, the value of playfulness and waste, and the blurry boundaries of collective identity.

The studio I visit in Toronto's Junction Triangle neighbourhood is in transition. On the first day I come by, barely anyone is there. Beesley is away teaching and most of the rest of the team is in recovery after a major installation at clothing giant Simons' flagship store in West Edmonton Mall. Studio manager Sue Balint tells me that the Beesley studio's population ebbs and flows and I've caught them at a low ebb. Soon they will be gearing up for another show, called *Epiphyte Veil*, which will be exhibited at the VIA and L'été à Saint-Sauveur festivals (France), and EXIT Festival (Serbia).

During the tour, Balint tells me about another transition in progress: Beesley and his team are expanding their scope, thinking more and more in terms of larger and more permanent installations. For a practice rooted in hand crafted and often quite delicate parts—many of them assembled by a small community—finding a way to grow the work without losing its core is a pressing question. It's one which has been at the heart of the practice all along.

"I like thresholds," Beesley tells me on my second visit. "I feel more comfortable there." Beesley's installations are almost entirely thresholds. He describes them variously as: foam-like, amphibian, places of flux, transitional shorelines, and reticulated. Every project is custom-made for a particular installation, and while the presentation has evolved, there is a clear family resemblance in the sequences of work. Hyperbolic meshes of white, silver, or clear material create an undulating canopy over your head. Crystalline structures reach down to the floor. Strange beakers of chemicals and lights form networks of unknown function, while albinic leaf-like structures tremble and move in reaction to your presence or to some unseen stimuli.

These spaces are intended to be small-scale, village-like, and intimate. Even when they take up a lot of room, they provide numerous nooks and crannies for



Beesley demonstrates the range of motion of one of *Protocell Cloud*'s acrylic fronds.

Home and native land. While Beesley has received considerable recognition from the Canadian architectural community, he was awarded the highest possible honour when he was asked to represent his country at the 2010 Venice Biennale of Architecture. A bi-yearly showcase for new forms and innovative ideas, Beesley installed *Hylozoic Ground*, a vast suspended geotextile forest.

Pop-up assembly. One of the core structures in *Epiphyte Veil* are tall and thin acrylic towers that flare at the base like lacy stalactites. They begin life as flat disks. Carefully spaced concentric circles of dashed lines are cut in each disk using a laser cutter. The disks are then heated in a toaster oven and attached to a rigged up base and pulley system. One tug on the string and the disk bursts up into the tower shape. Once it's cooled, it's remarkably strong.

people to explore. Beesley says it's part of a larger concern for finding ways to engage with massive scales in human terms. He describes our era as one of "quiet atrocities." The great extinction, global capitalism—these are forces operating on a global scale which must be addressed. The question is: how? He says he's acutely ambivalent about our relationship with large-scale cultural experiences. He wants instead to find spaces for more personal variation.

He finds hope in the language of resilience. He talks about how his creations, though seemingly fragile, are in fact very strong. He talks about rope and how bundles of small things can accumulate and create a great coherence. He talks about the force-shedding properties of textiles. He compares the compliant toughness of Mylar to the crystalline brittleness of other materials. He's interested in constructions where "any given part is weak and corruptible but the whole has remarkable tenacity or weed-like performance."

Fiction and science can be highly productive bedfellows when they oscillate within a single studio.

"Picture a strong generous room, but with deeply reticulated boundaries that anchor and extend and allow quite gentle thresholds to encircle a place of common experience, like a glade or a sanctuary or an asylum, so that individuals find their place in relationship to a common centre rather than being thrust into one."

Can the model of the space be a model for action? Perhaps. The work is not only made of thresholds, it's created on a threshold as well. The parts are mass-produced yet hand-assembled. Small variations and a tolerance for these imperfections allow uniform parts to flow into organic shapes. The work is made of Mylar, plastic, metal, glass, and yet it is alive.

Alive? Yes. Beesley describes the work as living and he is serious about this. Many of Beesley's past installations are named some variations of "Hylozoic ___." *Hylozoic Ground, Hylozoic Solid, Hylozoic Grove, Hylozoic Veil*. Hylozoism is a Greek term and a philosophical doctrine that holds that all matter is in some sense alive. It's a doctrine which Beesley holds.

His undulating and moving forms, driven by fishing wire, memory metal, motion detectors, and microcontrollers, are not pantomimes of life, he says. These assemblies are very much living. "I'm quite hard pressed to be able to speak coherently about the boundary between what is living and what is not. Of course, that could be a matter of sensitivity. If we think about St. Francis projecting reverence outward it may just be a matter of how one feels. On the other hand, there's some really astonishing thought that's being shared now." He talks about Karen Smith's theories on the mineral origin of living systems, and on the work of collaborators Martin Hanczyc or Dana Kulić. He describes how protocellular structures can appear in minerals. "Rather than my implications that a rock is alive being a teenage preciousness," he says, "we do have some remarkably disciplined theory saying exactly that."

If Beesley's work is alive, it is on the far edge of life, just barely crossing the threshold (if such a thing exists) from inert matter to living being. Beesley understands this, calling some of the reactive chemical concoctions that live in glass 'protocells,' while other projects allude to 'fields,' 'groves,' and 'soil.' Consider *Protocell Mesh*, displayed within the *Prototyping Architecture* exhibition in the UK in early 2013. It included an array of protocells that captured carbon from the atmosphere and converted them into inert calcium carbonate. The implication of the work is that the installation could be carbon neutral or carbon positive in its production and exhibition. "It is not net positive," says Beesley. "It's profoundly consumptive. And yet, the possibility and potential that it points to, I think, makes a strong argument."

Free-running. Beesley's inspiration isn't limited to ancient greek ontology and biological forces. During our discussion, he explains how a time-based understanding of design would allow for different kinds of structures. He compares it to a frog racing across floating lily pads; if the frog stopped it would sink, but it never stops. "Any gamer knows that," he tells me. "How on earth does the wall climber in *Assassin's Creed* do it? Well, it's through those kinds of instincts of working with a multitude of cycles." In perhaps the greatest surprise of our conversation, Beesley reveals he is not only an avid fan of the videogame series but that it has influenced his thinking about interactions and flow enough to warrant a namecheck.

THE BUILDING BLOCKS OF NEAR-LIFE

An inventory of Beesley's most commonly used materials and components

Acrylic Long a mainstay of Beesley's production, acrylic is cheap, strong, flexible, and easy to work with. Early projects were often made of hundreds or thousands of identical components, which tessellated through 3D space and had to be clipped together by hand. More recently, Beesley's team has begun working with laser cutters and heat to bend and shape flat surfaces into complex shapes.

Aluminum and Steel Metal plays an important role in piecing together the elements of Beesley's work and ensuring safe scaffolding from which the various parts of an installation can be hung. As the studio has moved into more permanent installations, they have begun using metal forms in more visually prominent ways.

Chemicals and Glass Concoctions of organic and inorganic chemicals housed in clear glass phials are used to create protocells that undergo chemical reactions over the lifetime of a particular piece. Substances used have ranged from commonplace (olive oil) to visceral (human blood).

Lights and LEDs Networks of LEDs that bathe surfaces in dancing, oscillating patterns create additional movement and change. In some cases, theatrical lighting is used to further illuminate the space.

Memory Metal and Servo Motors The memory metal is mostly used to contract wires; when a current runs through the metal it suddenly tenses up before slowly relaxing again. The servo motors are generally installed to make various parts flutter and shake.

Mylar Many of the sculptures feature leaf or feather like elements that move and sway. These are almost always made of white Mylar. Beesley uses the material for its slight stiffness, which allows the patterns to keep their shape, and for the sound it makes when it flutters.

Sensors and Microcontrollers The sculptures are rigged with actuators connected to a network of sensors (often proximity-based) and Arduino microcontrollers to tell them when and how to move. Some interactions are simple and clear—you move close to something and it moves in response—while others are much more subtle.

Similarly, the curiosity-based algorithms and other chemical- and data-based configurations of learning and self renewal that infuse the work are experiments in progress, or gestures towards possibilities. Some previous installations have had protocells with reactive components hanging next to protocells that only looked like they did. "Fiction and science can be tremendously productive bedfellows when they oscillate within a single studio."

Historically, this oscillation has been conducted through temporary works, in what Beesley calls a staging (as in stagecraft) or situationist approach. When materials and techniques are in flux, it's more effective to keep moving through cycles of development. This has led to occasional problems where people have approached the studio asking to remount one of Beesley's earlier works, only to discover that it no longer exists. The parts were cannibalized and the techniques have advanced. The rate of production is increasing. Going back to 1996, forty-eight installations are listed on Beesley's website, and a quarter of those have been produced within the past two years.

The environments created by Beesley's work are intended to be at once safe, welcoming, soothing, and also a little alien and unsettling. Aside from the chemicals, which are whatever colour they need to be, the materials are always desaturated. Beesley compares this approach to the art of the watercolourist rather than the art of the illustrator. The idea is that white allows the installations to take on influences from the environment. "This work is founded on a hope and an evocation of a possibility," he says. "The practice of leaving a strong space for our own reactions to it is one that guides an understatement of identity."

Finding the right balance between alien and soothing is difficult, and Beesley and his collaborators tell me stories of different cultural reactions from various audiences. *Aurora*, mounted in Toronto for the Nuit Blanche festival, had its low hanging parts removed at the last minute, when it became clear that larger than expected crowds would risk damaging the parts within reach. In Taipei, *Protocell Cloud* needed volunteers to coax people to explore rather than stand to the side. In Sydney, Australia, *Hylozoic Series: Sibyl*, mounted for the 2012 Biennale, included hundreds of suspended hypodermic needles. The implied threat of these hanging weapons proved to be too upsetting to parents with children, necessitating "aggressive pruning and adjustment."

"The goal and challenge in tuning the work for the public is in finding the right level of instability," says Beesley. "Instability can be productive or it can be disabling. We are a long way from having a design language for this." If that design language can be found, Beesley hopes it will also point to ways to grapple with global scale problems without resorting to mass culture. As the variation in response demonstrates, one approach will not fit all.

Beesley's approach in the studio is to run it as a highly collaborative affair. "Working creatively is very different from the master holding the signature," he says. Balint tells me that the nature of the work is changed very much by the makeup of the group available to work on it. At the moment of my visit, their star programmer is away finishing a degree so they find themselves reusing code. In his absence, they are advancing their material techniques, making shapes using laser cutters, pulleys, and ovens.

Beesley projects go through five or six cycles of iteration and testing before they proceed to assembly. Most of the work involves physical prototyping rather than drawings. Because Beesley is on the road so much of the time, the studio coordinates virtually. Everything is heavily documented and everyone sends daily emails with photos or sketches of the work they did.

Selected ambient works. The sound design for Beesley's work is largely based on the noises that the sculptures make as they move and react to their environments. These native sounds, however, are picked up by a set of microphones, amplified and then mixed with additional ambient compositions. This 'secondary score' is produced by Jonathan Tyrrell, one of the studio's designers.

Expansion. When HOLO's own Alexander Scholz helped with the assembly of Beesley's Nuit Blanche installation *Aurora* in 2010, the studio was still located on the main floor of the architect's downtown Toronto home. Scholz recalls hordes of busy volunteers navigating the small model-infested brick house or squeezing down a narrow, wooden staircase that led to a tiny basement into which the laser cutter and 3D printer were jammed. The studio moved to its current, much larger location in early 2012. "It's nice to not wake up to the smell of plastic in the morning," Beesley quips.

Finishing a Beesley project is a community affair. Teams of volunteers work in shifts to assemble pieces that can be prepared for shipping. On site, another team of volunteers must be recruited to complete the installation. Balint tells me that these volunteers often end up being custodians of the work. They know it well enough to fix problems or repair damage, and they care enough to check in on it from time to time.

This sense of collective work permeates every aspect of the practice. The size of the team fluctuates depending on the needs of the studio, meaning that there is an ever-changing roster of volunteers, contract workers, and full-time staff. I am told several times that no one ever truly leaves the community. They just pursue other projects for a while, returning as time, need, and money allow. As the work grows in size, Beesley must find a balance between maintaining the community-based participation models of production and taking advantage of various efficiencies that come with scale and mechanization. "I'm looking for both/and in terms of participation," Beesley says. "I think that scale can offer adventure rather than polarized loss."

Beesley says the prospect of more permanent installations has him thinking about durable things with ephemeral parts and qualities. *Aurora* at the Simons clothing store in Edmonton required the team to consider basic questions like how complex surfaces could be cleaned. Given the multi-festival itinerary of *Epiphyte Veil*, the installation had to be durable—easy to assemble and take down repeatedly—without anyone from the studio being present to oversee construction. Beesley says these experiences have been very productive for the team and for thinking about the future of the work.

"I'm very attracted to more of a spectrum of qualities," he says. "The tremendous strength accumulation of stainless steels in a structural core combining with cellulose resonators or fibrous wicking that has scent gland lures attached to it." He's considering elements with long durations that slowly exhaust themselves, or a succession of skins on top of permanent scaffolds.

Beesley describes Canada as being blessed with funding models which prioritize mixing research, business, and art together, and says that's a model for the way his work could expand. "Tribal qualities working in concert with very businesslike organization can produce satisfying, effective, and viable work," he says. "I would sure hope that that's true. If not then growing will turn out to be a loss ..."

What's at risk is the community-building that results from the current method. Assembly work, I'm told, is tedious, but in a good way. The repetitive process of clicking parts together to craft the meshes and reticulated spaces creates the kind of spirit that Beesley hopes the work will evoke once it's done. Together, the teams sit and talk while their hands work. Beesley says that many volunteers report on how satisfying the collective experience is. "We find ourselves in contemplative spaces," he tells me. "You do something to fill the time so you start to communicate." He describes strangers from different places, sitting in close proximity, doing a choreography that leads to connections and conversations, like the sharing of childhood experiences. "These moments aren't rare," Beesley tells me, "but they are precious."——

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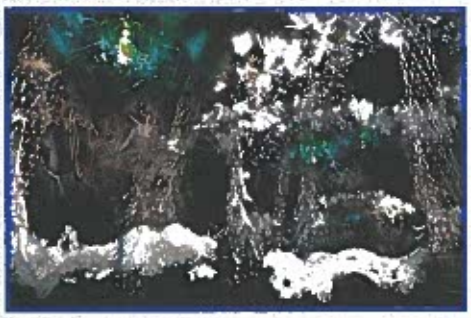

(2)

(3)

(p.134) Sargasso
2011, installation / collaborators: Rob Gorbet, PBAI studio team / installed at: Luminato Festival Toronto (CA)

(p.142) Protocell Cloud
2012, installation / collaborators: Andrea Ling, Martin Correa, PBAI studio team / installed at: 7th Digital Art Festival Taipei (TW)

(1) Hylozoic Series
2010, installations / collaborators: Rob Gorbert, Rachel Armstrong, PBAI studio team / installed at: Venice Biennale of Architecture (IT) 2010, Festival de México (MX) 2010, Mois-Multi Festival, Québec City (CA) 2010 / *in 2008 an early version of the series, Hylozoic Ground, was installed permanently at Ars Electronica Centre in Linz (AT)*

(2) Hylozoic Series: Sibyl
2012, installation / collaborators: Rob Gorbet, Mark-David Hosale, Rachel Armstrong, Alain Baril, Philippe Baylaucq, PBAI studio team / installed at: 18th Biennale of Sydney (AU)

(3) Radiant Soil
2013, installation / collaborators: Andrea Ling, Jonathan Tyrrell, Rachel Armstrong, PBAI studio team / installed at: *En Vie/ Alive*, Espace EDF Fondation Paris (FR)

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Citation for the above:

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