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Cocky Eek

PNEUMATOLOGY

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Pneumatology: coming from *pneuma* (wind, air, breath, spirit and soul)

This research project looks at inflatable structures. It is an enquiry into what makes them come alive, the source of their beauty, their visual inspiration, and how they can be dealt with when they expire. The project has involved collecting material samples, catalogues & links, and has aimed to create shapes inflated by wind.

Lightness as a state of being

Thinking about contemporary environmental concerns, at least one thing became clear to me: we can't create anything when building on a foundation of fear or guilt. I would like to slide this burden from my shoulders and embrace a more airy quality: lightness. In *Six Memos for the New Millennium*, Italo Calvino highlights "lightness" as one of the defining qualities of an aesthetic of the future. He describes a scene from Cervantes' novel which leaves me with an unforgettable impression of lightness, in which Don Quixote drives his lance through the sail of a windmill and is hoisted up into the air. Thinking about this image, it makes me wonder if we cannot construct our worlds with such lightness. Imagine a lighter life, constructed from more mobile, flexible, portable, organic materials, one which is more related to our natural surroundings and the elements, in which we can create our homes or shelters wherever our heart is; with no fixed form, beginning, or end, either spatially or in time.

"How would it be if we could construct our habitats from just air; basically all one needs is just a skin to keep its integrity. And we call them inflatables."

"The Renaissance embodied the idea of air, or pneuma (wind, air, breath, spirit and soul), in the art of building of the period. One of the primary goals of Renaissance architects was to enhance the powers of pneuma so as to foster the art of well-being, essence. Wind and ventilation were core principles of classical buildings. Pneuma was a wonderful link for establishing harmony between the human body, architecture and the cosmos. Building was envisioned as a mediator between the inhabitant's soul and the *anima mundi*, the soul of the world. We can see here a link with contemporary environmental questions. The French Renaissance architect Philibert Delorme (1514-1570) states that "the prudent architect is fully utilizing all his senses, and explains that the sense-less architect

has 'little nose' because he does not have the intuition of good things." Such observations suggest that the pneumatic architectural imagination is multi-sensorial. Renaissance notions of *pneuma* revealed a concern for the connectedness of person and place, an architecture that could refine the qualities of air. "

[paraphrasing from *Aeolian Winds and the the Spirit in renaissance Architecture*, Barbara Kenda]

While working on the survey (http://libarynth.org/inflatable_inspirations), I found that there were three periods in recent history when inflatables became an important cultural phenomenon.

1904–1919. This period marks the beginning of fully controlled dirigibles. The navigational capacity of airships introduced the first airborne passenger service. Pioneers in the States and Europe start to experiment with all kinds of wonderful airships. This all came to a halt with World War I, when air-balloons and lighter-than-air forms of transport came to be considered as outdated and ineffective.

1967–1972. About sixty years later, groups like the Eventstructure Research Group, Haus-Rucker-Co., E.A.T. and AGIS create constructions with a strong physical and mental impact. These inflatables can be seen as devices that greatly encourage public interaction and prove to be very popular. Haus-Rucker-Co.'s inflatables had no computational embeddings, but their PVC envelopes were often decorated with the circuit-board-like pattern of dots and lines. At the moment, the Luminaria from the Architects of Air (UK) are still creating total experience environments very similar to AGIS's constructions in the sixties (such as *Colourspace* and *Dreamspace*). Also, Agis and the Architects of Air's spaces can act as a beacon that entices people and arouses curiosity, even in those who have no interest in art. The

Architects of Air are still designing and fabricating all their patterns solely by hand.

2003 till now. The third highlight I see is the development of interactive inflatables projects such as ALAVs (Autonomous Light Air Vessels), Usman Hague's Open Burble and Sky Ear project, and Thoughts Go By Air from Machine Cent'ed Humanz; they are all evolving projects of networked objects that communicate among each other, people, objects, and the environment. It seems that all three projects have really been co-developed over several years in a physical and virtual environment, allowing them to constantly exchange relevant information.

The inflatable challenge: how to make spaces come to life?

As a start I wanted to put together a visual collection of inflatable structures that would provide an overview of different techniques and structures for inflation. During the research process, I rapidly became dissatisfied with the oceans of uninspiring material, so I decided just to look for inflatables I really liked. In the resulting collection I found one main quality – they were all alive in one way or another. For instance, it was the inflatables you would want to be immersed in, play with, become entangled with. Some of these inflatables are very simple in design, but have an amazing opening effect. “Inflatable Inspirations” (http://librarynth.org/inflatable_inspirations) is an online visual collection of fourteen sections, each including a variety of inspiring inflatables. No one section gives a complete overview of its field by any means, but all of them tickle my curiosity in one way or another and can lead to new vibrations...

“When I am working on a problem, I never think about beauty but when I have finished, if the solution is not beautiful, I know it is wrong.”

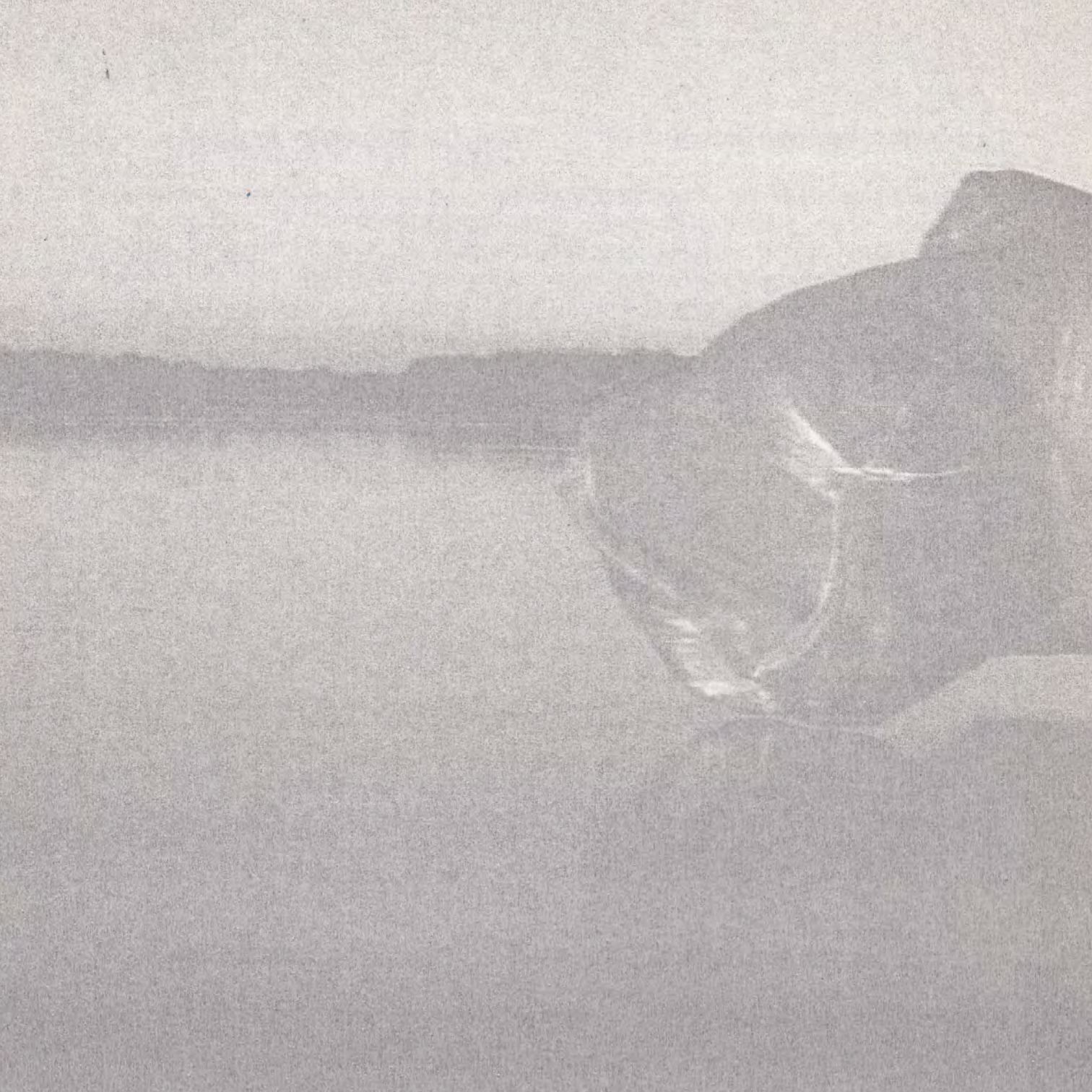
(Buckminster Fuller, see http://librarynth.org/buckminster_fuller)

Juhani Pallasmaa outlines some general problems in contemporary architecture in *The Eyes of the Skin*:

“The current over-emphases of intellectual and conceptual dimensions of architecture contributes to the disappearance of its physical, sensual and embodied essence.

While computer design can give us new insights in architecture we shouldn't forget that creative work calls as well for bodily and mental identification.

In general while our experience of the world is formulated by a combination of five senses, much architecture is produced under consideration of only one – the most dominated in our time – sight. The





suppression of the other sensory realms has led to an impoverishment of our environment, causing a feeling of detachment and alienation.”

She goes on to write:

“The inhumanity of contemporary architecture can be understood as the consequence of the negligence of the body and the senses, and the imbalance in our sensory system. Every touching experience in architecture is multi-sensory; qualities of space, matter and scale are measured equally by the eye, ear, nose, skin, tongue, skeleton and muscle, the way places feel, the sound and the smell of places has equal weight to way things look.”

Patterns of air

In looking for possible guidelines on how to create synaesthetic spaces I came across Christopher Alexander’s writings. In 1977 he developed a pattern language to create “living architecture.” It’s a useful tool for anyone wishing to go beyond the general problem domains, as outlined above, in our contemporary architecture. His pattern language is based on the actions which take place in space and time that make one feel “alive.” My summary of Alexander’s work can be found on: http://libarynth.org/pattern_language.

Following from Alexander’s Pattern Language, I made a specific pattern language for inflatable architectural structures. It’s based it on the Architects of Air’s (UK) inflatable “Luminarium.” The Architects of Air specialize in making magical inflatable labyrinths and taking them around

the world: Every year they deepen their patterns by making a new labyrinth. I assisted/explored for three days in their Luminarium. This inflatable pattern language can be used as a guideline for creating living inflatable spaces: http://libarynth.org/an_inflatable_pattern_language

I came across some problematic patterns in the Architects of Air's Luminarium, similar to those found in my own inflatables and in the work of other inflatable experts I have interviewed. From this, I have underlined the most common obstacles one comes across in inflatable structures. When we are able to overcome these obstacles, our structures will become more stable and alive. My research considers such issues as dominant odors, choosing the right materials, energy sources, climate control, etc. I have not given actual solutions to any design problems, but occasional suggestions here and there. More can be found at "Design Considerations for Inflatable Structures": http://libarynth.org/design_considerations_for_inflatable_structures.

I've collected innovative material samples for the construction of inflatables for FoAM's library in Brussels, which include biodegradable materials, alternatives for PVC, materials which don't absorb smells, semi-transparent, self-healing materials, etc. A small collection of catalogues from inflatable manufacturers and such can be found in the physical library. An online inventory of links to innovative inflatable manufacturers, research labs, producers and other individuals and organizations working with inflatables, both in artistic and technological fields can be found on: http://libarynth.org/inflatable_structures

To test some of my hypotheses, I conducted some experiments to create inflatables which are inflated solely by the wind.

Working from design principles

When I started working on this research, I encountered gRig's three design principles that deserve some discussion: *sustainability*, *playfulness*, and *modularity*.

Sustainability. I wonder if sustainability is a word that really empowers us. I find the word itself weighs me down and rather paralyzes me: pushes my guilt buttons and somehow blocks my creativity. The idea of sustainability makes it feel like we have to shrink our presence, our systems, and our activities, which is against our human nature. But we humans are part of nature too! When working with materials, it might be more empowering to focus on its (bio or technical) life-cycles, considering that everything is made to die one day... Another thing I would like to mention is that something will sustain itself when it is made with real *care*; when its patterns are deeply connected to our own experiences and surroundings, then we are automatically inclined to take care of it.

The second design principle, *playfulness*, reminds me most of a documentary I saw about otters; in one scene an otter is swimming in a river after a thick layer of snow has fallen. One moment the otter is passing a hilly bank covered with snow. He emerges from the water, runs up the hill, and slides back down into the water, repeating this five times before continuing to swim in the river. There was no purpose for the otter to slide down this hill – no other reason than his enjoyment. I selected the pictures for the “Inflatable Inspirations” web page with pure joy, and did the same in creating the inflatable spaces inflated by local winds. It's a very energizing way of working.

The third principle is *modularity*. I wonder if, working with modular structures, we can make spaces which are alive. Concerning spatiality,

Christopher Alexander always asked himself: *how does it feel?* as the most important scientific question. So one can ask oneself how does it feel to be in a modular surrounding? Also note that nature is never modular. Nature is full of *almost similar units* (waves, raindrops, blades of grass...), but though the units of one kind are all alike in their broad structure, no two are ever alike in detail. The same broad features keep recurring over and over again, but in their particulars they are never identical. Each part is slightly different according to its position in the whole. Each branch of a tree has a slightly different shape, according to its position in the tree. Each leaf on the branch is given its detailed form by its position on the branch. That's why a tree or a wave or foam are never boring. So an alternative is to think of *differentiating spaces*: not a process of addition, in which pre-formed parts are combined to create a whole, but a process of unfolding, like the evolution of an embryo, in which the whole precedes in parts and actually gives birth to them by splitting (so becoming different in the process of growth or development). Only a process of differentiation can generate a natural thing, because this kind of process can shape parts individually, according to their position in the whole.

Possible Futures

Here are a few possible trajectories to follow up in the future:

Where the spatial visions of the sixties and seventies have stopped, the computer now allows us to create fascinating constructions of endless dynamic spaces, held together by complex continuous surfaces. Yet to me many of these designs were and are lacking something. They remain digital artifacts, as they are created in the artificial limitless world of the computer and therefore don't deal with the parameters of the physical world. I see

fruitful new developments for inflatable spaces when they are co-developed over time in a physical and virtual environment, allowing the two to constantly inform one another; to create innovative living spaces without a feeling of detachment or being alienated.

Concerning innovative materials, maybe we don't have to achieve perfection right now: for instance the full spectrum of biodegradable materials we want are just not available at present; but nevertheless we can still set our goals in a twenty-year timeframe and define where we want to go from now.

Many forms are made from inflatable structures, but most forms are a repetition of the same principles. A thing to consider is that hybrid structures can get us further: they can give rise to new possibilities in form. A good example is a hybrid of an inflatable and a tensile structure which can create lightweight and large-span structures like Airlight's Tensairity bridges (see "The Non-Categorized Inflatables: http://libarynth.org/the_non_categorized_inflatables).

Finally, during our experiments we found that coffee, chocolate and inflatables are a good combination - food & inflatables, inflatable food, food in inflatables - might be an interesting trajectory to explore.

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Although the “guild for Reality integrators and generators” may have been active for centuries, since November 2006 six cultural organisations have begun to open the doors of the guild. The current gRig members share a mutual purpose; to mix separate realities, as well as bring whole new realities into existence. They are committed to research and create situations in hybrid (or mixed) reality, where digital media and physical materials, objects and spaces are increasingly intertwined. It is on these fuzzy edges that experimental technology and contemporary culture amplify each other’s potentials. We have found these edges to be the most fertile ground for innovative social and cultural advances, in which the Guild for Reality Integrators and Generators can be best called into service.

gRig sites 2006-2009

FoAM (Belgium) is a transdisciplinary laboratory committed openness, resilience and a holistic approach to life. FoAM seeks out and connects people in the interstitial spaces between professional and cultural boundaries, encouraging them to mix realities of art and science, digital and physical, nature and technology, adopting the motto - “grow your own worlds”. <http://fo.am.be>

nadine (Belgium) is an arts laboratory aimed at developing research focusing on transdisciplinary experiments in the fields of new media and live arts. *nadine* is a flexible and evolving project that doesn’t shy away from questioning itself to be able to stay on top of the constantly changing needs of artists. <http://www.nadine.be>

Time’s Up (Austria) is a research institute using experimental situations as a means of investigating the behavior of the public individual in everyday and nearly everyday situations. <http://www.timesup.org>

Performing Pictures (Sweden) works in the area of moving images and new technologies for media delivery as part of the Interactive Institute – a Swedish experimental IT-research institute that combines expertise in art, design and information technology. In their artistic practice Performing Pictures explore and develop responsive film art. <http://performingpictures.se>

KIBLA (Slovenia), a multimedia artcentre, is focused on the new (contemporary) educational, cultural and artistic praxis, connecting education and research, culture and technology, arts and sciences, emancipating and demystifying media as a creative tool in education and new forms of art. <http://kibla.si>

InterMedia (Norway) investigates the intersections between design, communication and learning in digital environments. Their approach is multidisciplinary and involves critical research, development and experiments. <http://intermedia.uio.no>



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