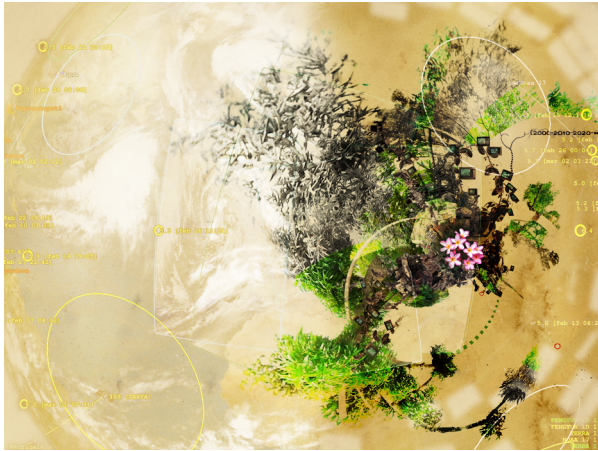# Cursory Speculations on HPI

by Maja Kuzmanovic and Nik Gaffney, FoAM, Belgium.

"There are in all extensions of human power, or additions to human knowledge, various collateral influences, besides the main and primary object attained." **A.A.L**

With the understanding that we are a part of an inter-connected and interdependent planetary eco-system, contemporary human culture moves slowly from a culture of consumption and seg-regation to a culture of participation, integration and generation. Our technological inquiry, into the minutiae of molecules, atoms and bits, is reaching the limits of rational reductionism and rediscover-ing the robust beauty of growth and interdependence in complex systems – from food to fabrics, from genetics to global networks. We are beginning to see design which aims to produce and recycle, rather than relentlessly consuming and wasting. We suggest that these changes in contemporary cultures, economies and technolo-gies are beginning to resonate with the characteristics of our close neighbours in the domain of eukarya - The Plants.

As we move beyond a world dominated by information technology into an era in which the biological world is beginning to penetrate the "technosphere", different modes of interaction may be required. We propose that parallel to the field of HCI - Human Computer Interaction, we should explore the field of HPI - Human Plant Interaction. HPI explores the nature of surfaces and processes required to facilitate reciprocal interaction between humans and plants. Before HPI can become a mutually beneficial symbiosis, we need to ask ourselves why, where and how can this two-way inter-face be realised? What cognitive and social biases need to be over-come? Can we develop a generalisable approach to interfacing with the entire plant kingdom, or do we require localised interactions between different species, ecotopes or alkaloids? How do we bridge the differences of time and place on each side of human-plant inter-faces? By rediscovering the value of humility, can humans learn how to become part of systems more complex, older and stranger than themselves?

Megatart's stratagem - from Rhizome to Rainforest

"Our present global crisis is more profound than any previous historical crises; hence our solutions must be equally drastic. I propose that we should adopt the plant as the organisational model for life in the 21st century, just as the computer seems to be the dominant mental/social model of the late twentieth century, and the steam engine was the guiding image of the nineteenth century." (McKenna, 1992)

Over millennia of evolution, humans developed increas-ing mobility between places, avoiding environmental or social deg-radation by moving "away". On a cosmic scale, we are earth-bound organisms just as immobile as plants - there is no "away" for a globalised human society. As our economies and cultures operate on an increasingly planetary scale, current instabilities cannot be overcome by moving "away" - adaptation needs to come from within. By suggesting "plants as organisational models" McKenna underlines several urgent human needs - to understand the value of diversity and collaboration over monocultures of competition; to approach problem-solving through whole systems thinking, rather than pure reductionism; to redesign industry and economics to adopt more cyclical, "cradle to cradle" processes (McDonough, 2002).

The rise of nanotechnology and a "global, atmosphere-based energy economy" can be completely in harmony with detoxifying the natural environment and preserving biodiversity, if we as a species are willing to take the risks of "re-establishing channels of direct communication with the planetary Other, the mind behind nature" (McKenna, 1992). While McKenna's recommended lenses are the plant based psychedelic tryptamines[1] (uncannily similar in structure to some human neurotransmitters[2]), we suggest that a symbiotic HPI provides a technological analogue and as such, is simultaneously more feasible, acceptable and perhaps insidious to a civilisation reinforced by global ICT. These technologies appear at the "surface", an area of contact between the dissimilar realms of humans and machines. To operate on this surface, HCI reduces the range of human expressions in exchange for enhancing those actions in reasonably specific, agreed upon ways. Thus HCI is insular, autistic and often mute.

Near future, bio- and eco-technology suggest the possibility for HPI to act at different scales with the living systems surrounding us, working with patterns, gradients and potentials. From rhizome to rain-forest. From Deleuze & Guattari's "and . . . and . . . and. . ." of the rhizome, to the "and . . . and . . . and. . ." of the deeply interconnected, multivalent, multiplicit unity formed by a rainforest ecosystem. A "Pataecology", an ecological, biomimetic systems thinking, an ecology "superinduced upon metaphysics (...) extending as far beyond metaphysics as the latter extends beyond physics."[3] An ecology of imaginary solutions, inhabited by the plausible and improbable, as they pollinate or mutate, eating or being eaten.

1. In particular; DMT (N,N-dimethyltryptamine), Psilocybin (4-Phosphoraloxy-N, N-DMT and 5-Methoxy-DMT as contained in Virola or Ayahuasca preparations.
2. cf. Serotonin (5-Hydroxytryptamine) or Melatonin (5-Methoxy-N-acetyltryptamine)
3. From Alfred Jarry's description of Pataphysics

Cellular Communications - Chemical Concurrency

It is important to realise that HPI may not be able emerge without a technological substrate, a mediation layer analogous to a cell membrane, or language interpreter. For such technologies to become possible, HCI specifically and computing in general, needs a radical shift away from serial, singular, fragile systems to embrace the distributed, concurrent, robust techniques nature utilises. We are seeing the beginnings of such a departure - with theories from biologically inspired computing[4], or in the more practical domain languages such as Erlang[5].

Aside from "archaic" ethnobotanical experiments, what are the ways to establish a two-way interface for communication between humans and plants? The notions of space, time, movement and persistence differ greatly between the human and botanical realms. Where human progress is often described as linear, the progression of plants is cyclical, seasonal. On a larger scale, humans and plants both occupy interdependent regional habitats, which temper and define them. In order to interface with plants, humans would need to go through a gradual time-unbinding[6], a relinquishing of the short-term, short-lived, incremental and individualistic advances, for slower, collective cycles of growth and decay. Successful time-unbinding may be enough to allow communication with plants about our divergent perceptions of space and movement, but would humans be able to grasp what it is like to be a forest, consisting of billions of roots and rhizomes, trillions of leaves, stems, branches, flowers and insects? Would our thinking become more reticulate, our logic less linear? Would these communications lead to a more integrated, holistic consciousness?
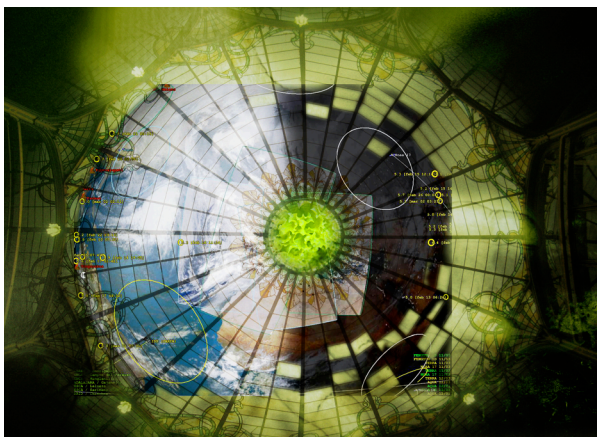
The Vegetal Mind - from Viriditas to Thalience

"Thalience is an attempt to give nature a voice without that voice being ours in disguise. It is the only way for an artificial intelligence to be grounded in a self-identity that is truly independent of its creator's." The Hamburg Manifesto in Ventus

Attempting communication with plants would require humans to grasp the logic of the "vegetal mind". At present, we don't even know where to begin, but a plant consciousness would no doubt be considered alien, unable to be perceived unassisted.

The field of Computer Science has developed a variety of methods[7] to determine the nature of machine consciousness somewhat akin to our own. However, as Schroeder notes, human sentience is not the only possible expression of consciousness, so why measure sentience by how well it mirrors humans? Nature, inspired by Thalia (the flourishing muse) may contain a myriad of possible consciousnesses, operating according to their own, internally consistent, externally incomprehensible logic - "Thalience" (Schroeder, 2007).

Long before Schroeder, Hildegard von Bingen, a naturalist, poet, composer and mystic in the habit of a Benedictine nun, spoke of an incomprehensible greenness, a consciousness permeating all eco-systems. Hildegard's "Viriditas" is the vigour that maintains balance and provides an indefinite freshness. Humans, according to the same vision, were the most recently arrived, dependent on the world as a whole - yet being stewards of this balance, able to comprehend the importance of their task and "(...) also honour the stability of the world: the orbits of the Sun and the Moon, winds and air, earth and water... We have no other foothold."

References

Korzybski, A. 1995. Science and Sanity: An Introduction to Non-Aristotelian Systems and General Semantics (5th ed.). Institute of General Semantics.

McDonough, W., & Braungart, M. 2002. Cradle to Cradle: Remaking the Way We Make Things. New York: North Point Press.

McKenna, Terence. 1992. "Plan/Plant/Planet." In The Archaic Revival, edited by McKenna, Terence. San Francisco: HarperCollins.

Schroeder, Karl. 2007. Ventus. Tor Books.

Paun , George. 2004. "Membrane Computing: An Introduction" in Proceedings of UPP 2004, edited by Jean-Pierre Banâtre, et al.

Beal, Jacob. 2004. "Programming an Amorphous Computational Medium" in Proceedings of UPP 2004, edited by Jean-Pierre Banâtre, et al.

Roth, Stephanie. 2000. "The cosmic vision of Hildegard of Bingen" in The Ecologist, January/February 2000.

---

4. eg. Amorphous Computing (Beal, 2004) or Membrane Computing (Paun , 2004)
5. Information about Erlang can be found at http://erlang.org/faq/faq.html
6. In the 'General Semantics' proposed by Alfred Korzybski, 'time binding' differentiates human activity from the 'space binding' and 'energy binding' activities which define animals and plants respectively. (Korzybski, 1995)

---

7. The most well known being the "Turing Test", with its various variants