

Rethinking Art as Intimate Science: Climate Art as a Hard Humanity

Introduction: Science as Cargo Cult

Re-reading the “Origin of the Species” by Darwin, on its 150th anniversary, one is struck by the lucidity and humility of the argumentation as well as the transformative power of its conclusions. Yet the scientific theory of evolution is still not widely understood or accepted by most people. The climate on our planet has never been stable, and climate variations have been one of the drivers of the evolution of the species on our planet. But we have no sense for “climate”, the way we have a sense for “temperature”.

Arrhenius first wrote about the impact of increasing CO₂ on global climate in 1896, and yet at the highest level of government the issue was still argued until recently. Somehow the ambitious enlightenment projects of the Renaissance and the Scientific Revolution are incomplete. Most scientific knowledge is not culturally appropriated. In many ways science has become a “cargo cult”. Many people use the cell phone for daily survival, but could not explain the difference between a photon and an electron.

Making Science Intimate

I believe that one of the reasons for this is that common science does not make common sense. As a scientist, the vast majority of the information about the world I study is mediated to my senses through scientific instruments; almost none is captured directly by my naked senses. I can tell when my instrument is hallucinating. I develop new words to describe phenomena I encounter that have no counterparts in daily life. I can manipulate concepts that are not grounded in my experience as a child. But this intimacy with the world mediated through instruments is not the daily experience of most people. The human brain takes about 15 years to mature to its full size and architecture, and this construction takes place through the sensual debate between the brain’s projections and the interactions with the world beyond the body. Our brain develops a deep intimate sense of the force of gravity, of up and down, but we have no senses that are able to confront us with the reality of climate change.

I think one of the interesting new developments is a generation of artists that is now collecting data about their world using scientific instruments but for their cultural purposes. Not only are they making powerful art, they are making science intimate, sensual, intuitive. And we need our children to experience the work of these artists.

Micro-Science

A second reason for this disconnect of modern science and public understanding, is that science is carried out mostly in guarded (mostly male) monasteries. This institutional isolation of science is a historical accident of its development, particularly because of its close connection to government and industry in wartime. But there are signs that kinds of “micro science” are developing, a new form people’s science that is made possible by the internet and the new public access to scientific data and instruments. Science producing communities have ownership over the knowledge they help generate, and this knowledge is locally rooted and meaningful. To coin a phrase, Micro Science is to the National Science Foundation what Micro-Credit is to the World

Bank. I am not calling for a renewal of amateur science, but rather embedding mediated contact with the world in everyday life. The work of technological artists is part of this movement.

Hard Humanities: The Engineering of Rapid Cultural Change

I think that the encouragement of intimate science by artist and micro science at all levels of society are important components of the hard humanities. The hard humanities are the disciplines in the arts and humanities that will be essential to navigating the cultural transformation we face within the next two generations. Controlling climate change, abandoning our dependency on oil for energy, creating the conditions for just sustainable development, these will require as deep a cultural transformation as our ancestors accomplished over tens of thousands of years in moving from agrarian to urban societies. The work of artists in promoting art-science and art-technology collaboration is in a very real sense part of the tool kit for survival. This is a strong claim: artists using new media and new technologies are not creating play-things for rich people but are part of the rapid cultural engineering we need to do to face the burning issues of our times.

Landscape Artists

We know what a landscape artist is, and indeed landscape artists over several hundred years have helped shape our cultural imaginaries of the relationship between humans and nature. A key transformation brought about by Renaissance artists and scientists was the re-contextualizing of humans within the natural world, as well as the relationships of individuals to their societies. When Paul Cezanne painted and re-painted the scenery of Provence he developed a visual vocabulary and artistic stance that has influenced art making for a hundred years. When Claude Monet or Vincent Van Gogh laid the groundwork for new ways of representing the world, it was not at all obvious at the time what the impact of their new way of seeing would be; thousands of landscape artists work today in their traditions.

What is a Climate Artist ?

But what is a “climate artist”? A hundred years from now we will identify the climate artists working today who helped shape a new cultural imaginary. I believe that ‘climate art’ will somehow involve making perceptible and sensual information about our changing world, sense data accessible through instruments and not via the naked body.

Today artists like Marko Peljham with his Makrolab create new kinds of artist’s studios that make sensory connection to the data environment; the artist claims as his territory the ‘landscape’ accessible only through scientific and technical instruments.

Beatriz da Costa with her “Pigeon Blog” engages pigeon racing communities in collecting environmental data for art purposes; the data about pollution levels is collected and made ‘sensible’ not only as abstract data but also embedded within a particular social community.

Andrea Polli works in urban environments making visible local micro climates. In her work “Heat and the Heartbeat” she sonifies small changes in ambient temperature and projects future climate change .

Sabine Raff monitors oxygen levels and translates them through an art making robot that draws on the walls of the gallery.. Her art making instrument takes data about the world and converts it into ‘visualisations’ that are the equivalent of the process used by landscape artists, but using a ‘mediated” sense data.

New Zealand artist Janine Randerson, in her work Remote Senses, takes data collected from orbiting satellites, Chinese and American, to project visualizations of meteorological data, converting the global large scale information to local meaning.

Katherine Moriwaki with her “Inside Outside Handbag” and other artists working with smart textiles, create clothing and objects that respond so ambient environmental data. If we were as sensitive to methane and carbon dioxide as we are to heat and light, we could not ignore the changes in our air.

Argentinian artist Andrea Juan makes expeditions to Antarctica to make performances linked to the measurement of methane levels and ice melt, just as the artists on Darwin’s journeys sought to make sense of the scientific data collecting.

We do not know yet what kind of art making will best help us transform our cultural relationship to climate, but I believe it will involve artists work taking scientific data with instruments but for artistic purposes.

Activities of the Leonardo Network

The Leonardo organization and network was founded over 43 years ago when the term “computer artist” was still disputed. They have appropriated the computer as a means of cultural production; computers are now more widely used for cultural and social purposes than for industrial or scientific purposes. Today we see artists, involved with science and technology, working in a variety of ways in the burning issues of our times. To do this they must now appropriate the sense data obtained using technological instruments. As I have articulated above, I think this work is part of the tool kit needed for the rapid cultural engineering ahead.

The Leonardo “Lovely Weather” working group (1) has been discussing and documenting the work of artists involved today in work connected to climate change. A number of texts have been published in the Leonardo publications and web sites (2). Our current call for texts “Environment 2.0” has been organized by Drew Hemment and the work will be connected to the Futuresonic conference (3). We are working with the Letterkenny Art Center on artists residencies, teamed with scientists working in specific places that are particularly sensitive to small changes in micro climate.

Over recent months a number of us have been developing the concept of “Open Observatories’ which disseminate tools, techniques, data and knowledge for carrying out

projects in micro science, intimate science, peoples science and crowd sourcing (4). These open observatories would allow small communities to develop locally generated knowledge that can be the basis for local action to help these communities evolve rapidly and respond to the changes that will be needed to confront climate change, breaking oil dependency and sustainable development. Open observatories would include the work of artists collecting data for cultural and artistic purposes as well as community leaders and researchers seeking to find ways to mediate personally meaningful access to scientific knowledge. Finally Open Observatories might become the locus for societal retroaction on the direction and content of future science, and help establish a new social contract between science and society. They might provide test beds for climate artists.

Rethinking Learning with Intimate Science

So how do we create new cognition, new sensualities, that connect us to the world around us using new technological “extensions” ? Cathy N. Davidson and David Theo Goldberg recently authored the report (5) *The Future of Learning Institutions in a Digital Age*. This report highlights a number of ways that we need to rethink how we create learning situations as part of a life long process. They identify ten principles:

“Self-learning: Today’s learners are self-learners. They browse, scan, follow links in mid-paragraph to related material. They look up information and follow new threads. They create their own paths to understanding.

Horizontal structures: Rather than top-down teaching and standardized curriculum, today’s learning is collaborative; learners multitask and work out solutions together on projects. Learning strategy shifts from a focus on information as such to learning to judge reliable information. It shifts from memorizing information to finding reliable sources. In short, it shifts from learning that to learning how.

From presumed authority to collective credibility: Reliance on the knowledge authorities or certified experts is no longer tenable amid the growing complexities of collaborative and interdisciplinary learning. A key challenge in collaborative environments will be fostering and managing levels of trust.

A de-centered pedagogy: To ban or limit collective knowledge sources such as Wikipedia in classrooms is to miss the importance of collaborative knowledge-making. Learning institutions should instead adopt a more inductive, collective pedagogy based on collective checking, inquisitive skepticism, and group assessment.

Networked learning: Learning has traditionally often assumed a winner-take-all competitive form rather than a cooperative form. One cooperates in a classroom only if it maximizes narrow self-interest. Networked learning, in contrast, is committed to a vision of the social that stresses cooperation, interactivity, mutual benefit, and social engagement. The power of ten working interactively will invariably outstrip the power of one looking to beat out the other nine.

Open source education: Traditional learning environments convey knowledge via

overwhelmingly copyright-protected publications. Networked learning, contrastingly, is an open source? culture that seeks to share openly and freely in both creating and distributing knowledge and products.

Learning as connectivity and interactivity: Challenges in a networked learning environment are not an individual's alone. Digital tools and software make working in isolation on a project unnecessary. Networking through file-sharing, data sharing, and seamless, instant communication is now possible.

Lifelong learning: The speed of change in this digital world requires individuals to learn anew, face novel conditions, and adapt at a record pace. Learning never ends. How we know has changed radically.

Learning institutions as mobilizing networks: Rather than thinking of learning institutions as a bundle of rules, regulations, and norms governing the actions within its structure, new institutions must begin to think of themselves as mobilizing networks. These institutions mobilize flexibility, interactivity, and outcomes. Issues of consideration in these institutions are ones of reliability and predictability alongside flexibility and innovation.

Flexible scalability and simulation: Learning institutions must be open to changing scale. Students may work in small groups on a specific topic or together in an open-ended and open-sourced contribution.” (5)

These ideas I think would serve as a good discussion point of how climate artists can contribute to creating deep new sensualities about our relationship to the world. And in particular we need to involve children before the age of 15, when their brain structure has matured, to develop ways of understanding the world that is only accessible through mediated senses. These will contribute to the “hard humanities” and how our society can undergo the rapid cultural mutation needed to survive the coming centuries.

The Leonardo Education Forum together with the SIGGRAPH Education Committee are sponsoring a special series of session at SIGGRAPH in Los Angeles in August 2010. We invite all interested readers to contact us at rmalina (at) alum.mit.edu if you are interested in contributing.

When Leonardo was founded 43 years ago, it was 7 years after Keeling and colleagues started measuring CO2 levels in Mauna Loa. Climate artists over the next 43 years are on the front lines of the hard humanities.

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(1) <http://www.leonardo.info> and <http://www.olats.org>

- (2) Lovely Weather: http://www.olats.org/fcm/artclimat/artclimat_eng.php
- (3) Environment 2.0:
<http://www.olats.org/fcm/artclimat/apelcontribDrewHemment.php>
- (4) Open Observatories: http://139.82.134.7/open_observatory/
- (5) The Future of Learning Institutions in The Digital Age:
<http://www.hastac.org/blogs/jonathantarr/future-learning-institutions-digital-age-report-now-available-mit-press>