L-ink BioHob

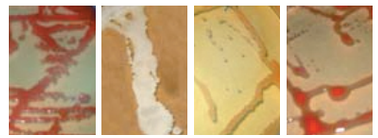
Parents: NatalieJeremijenko > WebHome > IndependentStudies > ShannonSpanhake

http://jove.eng.yale.edu/twiki/bin/view/Experimentalproduct/LinkBioHob

Intro

"L-ink" is an open-source system consisting of pre-existing materials and concepts formulated specifically to exist within the context of the objectives stated below. The components of the system are micro-organic pigments, agar formulations, an analysis lab, and an informational wiki site. "L-ink" has two objectives, the first to explore the potential of creating an alternate form of representation and interpretation, defining an artistic medium, and second, to offer a level of scientific and artistic engagement outside (but not excluding) an institutional/commercial scientific lab or artistic context.

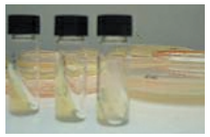
Interpreting Representations



Throughout history, pigments have been primarily a static material. Extracted from plants and animals and mixed with various kinds of liquids, changing over-time only as a result of drying or oxidation. Concurrently, various representations of the concept of passing time are deeply embedded within the history of image making. From Egyptian paintings that represent the transition from life into the afterlife to Duchamp's "Nude Descending A Staircase, No. 2" to Muybridge and the still camera, various tools and techniques have been used.

Film and video accomplish this goal through representing the passing of time by moving still images in series, holographic technology accomplished this goal by presenting images (a limited quantity) which could be composed in one frame, and computational artificial life and intelligence accomplish this goal quite successfully via algorithms. However, creating a physical, moving image, composed in a single frame has yet to be solved.

"L-ink" is a tangible, evolutionary, image making system; it does not require a processor, lasers, film, or have to be plugged in to create or present images. The images are alive and dynamic, continually evolving with an epistemology all their own challenging our perception of reality.




What we believe to be a simple straight line, the pigments understand and translate in a very different way. To them the line is a point of origin, the place of their birth, over time generations form colonies and spread looking for resources, offering us their understanding of what we perceive to be that initial straight line.

Scientific discoveries give proof to the reality represented and interpreted in art. “L-ink” mediates information generated from the symbiosis of art and science in a way previously unexplored, striving to answer the following question: What can this medium teach us about ourselves through it’s translation of our concepts and ideas?


L-ink, an abbreviation for “life ink”, is a shareware system which relies on the collective participation and distribution among a network of users sharing results, ideas, and materials. L-ink is available in various kit forms each having different objectives. A sample kit includes the following materials:

1. 500mL bottle of YM agar
2. 2 packages of 10 disposable inoculation loops
3. 6 ft. of parafilm
4. 10 petri dishes
5. 3 pigments of your choice
6. Gloves
7. Grow-by-number Image of your choice
8. Aluminum frame
9. Glaze Coat resin for preservation
10. Lab protocol
11. Worksheets
12. Access to informational site
13. Lighting for illumination also available.


above: *Transformation* by Shannon Spanhake -
microbial ‘stars’ growing in non-pathogenic pigmented growth medium

Shannon Spanhake’s *Transformation* is a reproduction of the top-left quadrant of the flag using Saccharimyces cerevisias, a unicellular organism for the white stars, and a specially formulated growth medium for the blue background. From Rameses to Stalin, the point of warfare fought under flags was to annex the enemy and claim their territory, micro-organisms have a similar property, they too fight over territory rich in resources. This war results in the transformation of the microbial landscape at a macroscopic level, visible through the spread of the micro-organisms altering the original shape of the star. This piece is presented not only as a reproduction of a segment of the flag, but primarily as a representation of the change in meaning embedded within the flag as a symbol.

In light of the Steve Kurtz (Critical Art Ensemble) situation, *Transformation* challenges the right to exercise the freedom to use harmless biological agents as "prophylactic, protective, and peaceful bona fide research", as is considered legal in Section 817 of the USA Patriot Act. The flag is intended to represent all of the freedoms and rights guaranteed in the U.S. Constitution and its Bill of Rights, yet it is the symbol which has been used to justify the loss of freedoms for the war on terror.

Caushon: Radioactve[1] wRiting

Denna Jones

The 1998 black comedy "Dead Man on Campus" contains a line that has a certain sort of resonance for the relationship between science and art – or at least the written outcome of many art/science collaborations. Describing the stash of prescription drugs he robbed from his family, a new student delivers his marketing spiel; " . . . and here's my brother's Ritalin. It's good for math and science, but don't try writing English papers on it; they won't make any sense." The "joke" hinges on the audience's recognition that although Ritalin is prescribed to heighten concentration levels in hyperactive children, it is increasingly familiar on American university campuses as a substitute for the more traditional stimulants of smokes and coffee. It also neatly encapsulates the sometimes-problematic relationship between science and art practice, and science and art outcome. When a highly specialised scientific discipline – biotechnology in this case – and a more nominally creative discipline – art, join together to create the hybrid breed "bioart", resulting texts describing the outcome or product often read like Ritalin-fuelled manifestos.

So there's an interesting dichotomy at work in the biotech hobbyists kits commissioned by Locus+ from Eugene Thacker and Natalie Jeremijenko. On the one hand there's an exciting, democratic, open-source, student-like vibe to dispersing knowledge through off-the-shelf-style online kits. On the other hand, if the information meant to aid the kit creator (descriptions, background information and written outcomes) is laden with heavy-going jargon and dense technobabble, isn't there a danger the audience will be peer restricted and not "real" people? If the art world – as Jeremijenko describes it – is "a very prissy little thing over in the corner", and major cultural changes are "determined by technoscience", then isn't it incumbent on practitioners to ensure physical structures and explanatory literature are designed with the layperson foremost? Maybe what we need is a "Popular Mechanics"-style how-to guide for the bioinformatic technology era.

John Logie Baird picked up supplies from the corner shop to invent a prototype mechanical-electrical television set in the mid-1920s. A hobbyist-cum-inventor. But the bona fide amateur – the dedicated, non-affiliated "loner" with an urge to squeeze and re-shape boundaries and a wild-eyed desire for success – might need more than innate curiosity to succeed as a home hobbyist. He or she might need a beginner's guide to hobbyism. A wade mecum. A dashboard mounted GPS system. Something akin to a vintage copy of "The Golden Book of Chemistry Experiments". Just the sort of book consulted by über genius home hobbyist David Hahn.

1 Sign posted on David Hahn's shed door.

Born in a Detroit suburb in the mid-1970s, Hahn was inspired by "Popular Mechanics" and "The Golden Book of Chemistry Experiments" to build a nuclear breeder reactor in his parent's garden shed. Yes, a high school student in 1995 gunning for Eagle Scout - the highest achievement in the Boy Scout canon – created a reactor with items he obtained freely and legally; (except perhaps for the small matter of titling himself "Professor Hahn" in his begging letters). Coffee filters, pickle jars, smoke detectors, tritium from gun sights, and an antique clock with a radium dial were augmented with techniques and advice gleaned or cajoled from universities, suppliers and unsuspecting public agencies. The neighbours were saved from possible annihilation only because his set-up was discovered before he added the on-off switch. The lesson this story makes clear is that knowledge is out there to be found. Legislation won't stop the resourceful and determined from discovering it, so we might as encourage an "open source" outlook and manage the outcome.

Sequence and structure are essential to bioinformatics. Equally sequence and structure are needed for effective language communication. Fritjof Capra theorised in "The Web of Life" (1996) that a living system is a web of interrelationships, and the key to living systems lies in the smooth synthesis of two very different approaches: substance/structure and form/pattern. But a formalised approach to sequence and structure is not always the goal in literature. Eugene Thacker cites inspiration from William Burroughs' "cut-up" approach where Burroughs re-arranged existing texts into new sequences. More recent and perhaps more familiar examples of non-linear style include "Pulp Fiction" and "Memento." An understanding of a text on the first read-through is not always a sign of good writing, nor even a desirable quality. Milton's "Paradise Lost" and Spenser's "Faerie Queene" are "coded" texts that require knowledge of the politics of the period or the reader skims the surface and takes away a level of meaning, but not necessarily the meaning the author hoped. But how-to-manuals and the "translation" of academic science to the public aren't pure literature. Sequence and structure still apply.

'Creative Biotech' presupposes a level of knowledge equal to that of a literary don, and it is therefore primarily the educated reader who will derive the greatest benefit. If we want to encourage exploration and innovation, and we recognise these privileges come with a responsibility to consider the ethics of what we pursue, surely this means creators must strive to deliver an outcome so the majority can understand its implications? If the reader takes away only a partial understanding from the text, is this 'lesser' meaning nevertheless sufficient to fulfil the objectives of the authors, broadening a general understanding of biotechnology? Or should we take the view of a mid-20th century Oxford don who thought those who didn't possess an intellectual knowledge of science might as well be scrunched up and thrown in the bin marked "natural luddite"? There's a very real urgency for creatives in science and contemporary art to aim at the former and avoid the latter. Although there are science degree courses such as those offered at Cal Poly that now require a science communication course as a prerequisite to graduation, the popular magazine trend in America seems to be leaning towards a level of defeat. "Mag-a-logs" - magazines that erase the line between advertising and journalism by featuring nothing but products, price and location – are now the fastest growing and highest grossing in the magazine sector. A culture of images. Is this a backlash against too much information, or a result of writing that excludes 90% of its audience? Maybe the audience just grew tired of trying to understand and gave up?

It might appear rather boring or worthy to consider the notion of "good" or "bad" writing in this context, but these factors are fundamentally linked to the relative transparency of the text itself. Essentially, it is this goal that Locus + had in mind when they invited Eugene Thacker and Natalie Jeremijenko to jointly move the goalposts not just between disciplines but also between creator and consumer. Offering free online hobbyist kits acknowledges there's a new generation of David Hahn's who are exceedingly clever but still need the mechanics of invention laid out in accessible terms. Every law ever created has been broken. Every rule transgressed. Every taboo broken. Somewhere in the online community a member of the next generation of explorers is downloading a home hobbyist kit. Let's just hope he or she understands the instructions.

Amateurs and Hobbyists

Heath Bunting

Over the past five years I have been following the developments of biotechnology in the areas of food production, intellectual property rights, and DIY culture in anticipation of the next new media boom. I believe that biotechnology will follow the same course of development as computer science: starting initially in the successful university / military industrial partnership and gradually driven by profit interested organisations into the domestic environment with the assistance of early enthusiasts and adopters such as artists.

The organisers of the Ars Electronica Festival, one of the most successful cultural/ tech/ new media (art) events, have publicly boasted its success in bringing unpopular technologies to the fore, facilitating their public acceptance. Ars Electronica has become a sign-post for these technological transitions; it has become a recognised platform from which the technological endorsements of artists and musicians drip-feed into the biotechnology sector.

Ten years ago even the self-proclaimed progressives in the general public were highly suspicious and critical of computer systems, regarding them as machines of control and surveillance used by greedy bosses or repressive criminals. Today they are commonplace in the studios of artists and homes of all but the very poor. Similarly I predict that in another ten years time or less the general public will be enthusiastic users of domestic biotechnological equipment. As with computer systems, biotechnology gadgets will be access points to utility and identity products and will be treated with as little thought as mobile telephones are presently.

The first toys (e.g.: Discovery Kids DNA Explorer) have already appeared on the market, which will enable the priming of a whole new generation of Biotech Hobbyists. Next will come adult entertainment platforms, followed by devices of distribution and production. As with the computer revolution, the essential participant will be the bedroom hobbyist. All recent cultural revolutions have originated in people's domestic sphere e.g. techno music and the Internet. This is because these key domestic products have generally been disassemblable, cheap, documented and flexible e.g. Amiga, IBM, PC compatible computer, enabling the hands on, self-taught enthusiasm of the amateur to develop.

I believe artists should not only be active participants when this change happens, but that they should also be driving it from the beginning. For this to happen artists must not only have access to knowledge and production resources, but also a critical context and an exchange economy.

I have personally been actively involved in three main educational and productive endeavours in the field of Biotech Hobbyism:

'Growing Things' was a conference held at The Banff Centre, Canada co-organised by myself and the director of the New Media Institute (NMI), Sara Diamond. It was attended by a full spectrum of practitioners ranging from scientists to art students. Although the event itself was based within the organisational context of NMI, my main role was to source, and integrate the participation of non-institutional projects and people. NMI's strategy in this scenario was to help fetishise the artist in the minds of big business and vice versa, with the intention to start productive relationships. It was during one of these festivals that I first met Natalie Jeremijenko.

In 1997, Natalie, and myself produced the first biotechnology publication of amateurs and hobbyists called Biotech Hobbyist Magazine (BHM). BHM was modeled on the many advertising supported hobbyist publications such as Everyday Practical Electronics (http://www.epemag.wimborne.co.uk/), containing editorial, practical project information and news sections. Having grown-up and educated myself with similar publications during the 1980's, to the extent that I built myself a computer from scratch at the age of thirteen: we believed this format would succeed as an educational tool for future artists and activists.

Our method was to bring together the resources of business and scientific institutions with the enthusiasm and innovation of amateur hobbyists in a light and playful context. This, we hoped, would undermine and democratise the closed world of government and business biotechnology.

Biotech Hobbyist Magazine only appeared as one publication issue, failing to consolidate itself further whilst other dot.com boomers and Brit-Art capitalist cheer-leaders vulgarised culture. Ultimately the project was of limited success; although Biotech Hobbyist has had greater longevity and has been carried through various workshops and events, my collaborator had more pressing biotechnology projects; newborn infants. Also, differing economic and production methods between the USA and Europe created difficulties. Like many of the leading artists in the USA, Natalie Jeremijenko is integrated in the university network, with easy access to information and resources, but held in an inflexible economy. I was operating in the Euro Artist mode of being denied institutional integration on the basis of class, but freely and profitably trading in an alternative DIY market. These differences could have been a great strength, but instead proved to be a weaknesses.

Whilst Biotech Hobbyist Magazine failed bear further fruit, I developed a project Natural Reality Superweed (NRS). NRS was an attempt to break the myth that you need a million dollar budget and a doctorate to practically engage in biotechnology. To prove this point, with a meager budget of 500 dollars raised through an internet appeal and no formal education in biology I constructed a Genetically Modified Organism (GMO) project in under 4 months. NRS was a weed that could not be destroyed by the most widely used herbicide known as Roundup. It was also an attempt to marry the concrete with the symbolic, which is where I believe lies the true excitement of biotechnology for artists.

Over 1000 instances of NRS were distributed worldwide by post, nevertheless in many ways it failed to fulfill its potential. Most interestingly though was the fact that my peers, people that are already close to technology, refused to accept that it was actual and not a hoax. This collective response effectively disabled the most important part of the project, which was to show that biotechnology was in easy reach of the street.

These three examples, although my own work, nevertheless reflect a cross-section of activity which can be classified under the umbrella of Biotech Hobbyism. The work of Natalie Jeremijenko and Eugene Thacker contained in this publication, whilst distinctly different, further demonstrates the variance in this form of practice. In spite of the fact all three of us work independently, across different continents and in greatly varying forms of bioarts practice, it is visibly evident that our concerns in the field of biotech are inextricably linked: ethical considerations can only be formed through understanding and understanding itself is a factor of education and access to information.