

Curatorial essay written for the exhibition "Eduardo Kac: Lagoglyphs, Biotopes and Transgenic Works", Oi Futuro, Rio de Janeiro, Brazil (January 25th to March 30th, 2010).

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## Life Encoded - The Communication Art of Eduardo Kac

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Over the last decade Eduardo Kac has emerged as the figurehead of the artistic practice commonly referred to as bio art. Bio art draws on various fields of contemporary biology, among them plant and animal breeding, cell and tissue culture, the synthesis of artificial DNA sequences, and transgenic art—in Kac words, "a new art form based on the expression of synthetic genes in a host organism, or the expression of an existing gene in a different organism." While there is no doubt about Kac's leading role in this field, his body of work circumscribes a domain that is not easily reduced to the "bio art sphere": from holographic and digital poetry that found its continuation in "biopoetry;" to fax and slow scan TV telecommunications projects (late '80s and early '90s) that evolved into Internet-based telepresence art (from the '90s onwards).

*Biotopes, Lagoglyphs and Transgenic Works* takes a wide look at Eduardo Kac's artistic practice and brings together key works and newly produced projects that exemplify the breadth of his approach. The common thread of Kac's artistic creations could be captured by the concept of the encoded nature of life. His work addresses the notion of code in poetry (language as sign system), genetics (DNA as a form of sign system) and algorithmic instructions. At the core of Kac's projects lie questions about the encoding or transcoding of communication: communication that takes place on the cell level in all living organisms or between species; communication between sign systems that takes the form of transcoding and remix; encoded exchanges between remote locations via networks that establish telematic connections and telepresence. Together, the works exhibited in the Oi Futuro exhibition explore these facets of encoded life.

One of Kac's signature works, *Genesis* (1999), metaphorically and literally took the connection between "the word" and creation as its starting point and expanded its boundaries. For the project, Kac created a synthetic "artist's gene" by translating a sentence from the biblical book of Genesis—*Let man have dominion over the fish of the sea and the fowl of the air and over every living thing that moves upon the earth*—into Morse Code, and then converting the Morse Code into DNA base pairs. The synthetic gene is cloned into plasmids, which are transformed into bacteria exhibited in a gallery installation, which involves the mutation of the genes. *Genesis* examines

and questions the relationships between multiple contexts, among them biology, belief systems, information technology and ethics. The interplay between these various contexts is produced by the 'writing' and translation of different forms of information that result in the creation of a life form based on code. At the same time, Kac undermines simplistic readings of genetics as a "script of life": his projects problematize and explore the complexities of what constitutes life in the age of genetic engineering.

The transcoding and transgenic manipulation that was essential to *Genesis* finds a more radical and personal expression in the *Natural History of the Enigma* (2003/08) series, of which several projects are included in the Oi Futuro exhibition. At the center of the series is *Edunia*, a genetically engineered flower that is a hybrid of Kac's DNA and a Petunia flower. The *Edunia* expresses Kac's DNA in its red veins, alluding to the shared heritage of the redness of blood and the redness of the plant's veins. Kac isolated DNA derived from his blood and combined it with a promoter that makes the gene express itself in the veins of the plant. The work was developed between 2003 and 2008. The gene that Kac chose for the project is responsible for identifying foreign bodies, usually in order to reject them. The *Edunia* flower thereby becomes a form of existential play and enigma, integrating the very biological mechanism that normally would identify and reject the "other" and erasing the boundaries that prevent integration of the building blocks of species. The artist as creator integrates himself into a life form, combining species and questioning existing biological taxonomies. *Edunia* is an ontological challenge, at least when it comes to established categories of "being." The enigma of *Edunia* is an ontological one; it radically questions which entities exist or can be said to exist and challenges their traditional hierarchical groupings according to similarities and differences.

The *Natural History of the Enigma* series consists of a number of projects, among them a large-scale public sculpture, as well as a suite of lithographs, prints, and seed packs that are included in the exhibition. The *Edunia Seed Pack Studies*, a group of lithographs, alludes to the visual convergence of roots and the flowerhead's veins. The lithographs served as studies for the *Edunia Seed Packs*, hand-made paper objects that contain the *Edunia* seeds, collectible objects that give their owners the power to grow the hybrid of artist and flower. A group of lambda prints titled *Plantimal* shows *Edunia* flowerheads whose "faces" all look distinctly different, portraying the flower both as a (non-human) individual and, art-historically, questioning the 'taxonomy' of an artist's (self) portrait. What is rushing through the veins of the *Edunia* flowerheads is the "blood of the artist," transcoded and abstracted in phylogenetic expression. *Edunia* evokes a long history of art trying to transcend the boundaries between art and life, turning the artwork into a living being. As Jack Burnham stated in *Beyond Modern Sculpture* [1], "Behind much art extending through the Western

tradition exists a yearning to break down the psychic and physical barriers between art and living reality." In Cocteau's film *The Blood of a Poet* an artist sketches a face whose mouth starts to move. He tries to rub out the mouth only to discover that it has been transferred to his hand, which he places over the mouth of a female statue, who starts speaking to him and persuades him into passing through a mirror into a parallel world. While maintaining the metaphorical power of the blood of the poet/artist who "becomes" the life form, Kac's *Edunia* illustrates that, through contemporary science and its transcoding of structures of life, we have entered a new era of meaning for both art and life.

The writing of life forms and the do-it-yourself aspect of creating them are at the core of *Cypher* (2009), a new artwork by Kac that fuses a sculptural artist's book and a DIY transgenic kit. The stainless steel kit opens up like a book and has the title of the work displayed both on the cover of the kit and the spine of the slipcase. Inside the kit is a minilab with Petri dishes, nutrients, and synthetic DNA, with a poem written by Kac embedded in its genetic sequence. When the viewer—or reader/writer—follows the "transformation protocol" outlined in the kit by integrating the synthetic DNA into bacteria, the poem comes to life, making the normally pale bacteria glow red. Once the transformation has been implemented it will become part of the whole bacterial system since each newly reproduced bacterium will contain it. In Kac's coding of the poem, he fused two systems of writing, pairing alphabetical letters with short DNA sequences by creating a composition with a high occurrence of the fourletters representing the genetic bases CGTA (Cytosine, Guanine, Thymine, Adenine). Poetry and code become integral to each other—to meaning and life, to the verbal and bacterial (sign) systems. *Cypher* is the artist's book as laboratory, fusing sculpture and poetry, technology and biological life, and counteracting Frankensteinian notions of the destructive and monstrous agencies of manipulated life forms. While being literal—in its enactment of words coming to life—*Cypher* never privileges the primary meaning of words, but sustains the poetic and metaphorical.

The art object as living organism takes yet another form in *Specimen of Secrecy about Marvelous Discoveries*, a series of works that Kac describes as "biotopes." The biotopes are ecologies of thousands of microorganisms framed in a transparent casing with earth, water, and other materials. In this case the artist's process is less an act of encoding than an orchestration of the organisms' metabolism through combining them with nutrient-rich media and controlling the energy they receive in order to keep them still or in motion and thus create a living animation. Among Kac's biological works, the biotopes are the ones that most explicitly explore abstract visual form and at the same time redefine and fuse different media. They are living painterly objects that appear to be still images, yet are constantly evolving slow-motion animations generating and never repeating themselves. Colors and geometric visual forms are

responses to the external environment (e.g. temperature and light) and the internal metabolism.

The biotopes are more than the sum of their microorganisms. Together, the individual life forms constitute an artwork as ecology and living system, with behaviors that express themselves in a visual slow-motion animation. As "forms" they interact with and enable each other's existence in relation to their internal system and the external world. As specimen they enable *Marvelous Discoveries* of the intrinsic connections between art and life, the "natural" evolution of forms and abstraction, and the nature of living forms as a responsive medium in dialogue with the world.

The biotopes and transgenic works featured in the exhibition find their counterpart in a series of works that take the concepts of encoding and writing to a more abstract level, exploring relationships between sign and communication systems: the *Lagoglyphs*. These projects reference and expand what probably is Kac's most well-known work, *GFP Bunny*, whose first phase was completed in February 2000 with the birth of the fluorescent bunny Alba who glows green when exposed to blue light of a specific frequency. In collaboration with scientists in a lab in France, Kac inserted the fluorescence genes found in the jellyfish *Aequorea victoria* into a fertilized rabbit egg. Kac's project did not exclusively consist of the creation of a GFP bunny—GFP (Green Fluorescent Protein) research with life forms has been conducted in research labs for quite some time—but in the transposition of this type of experiment into a cultural realm, where it created heated public debates about the ethical implications of genetic manipulation of life forms. The ongoing controversies and discussions surrounding the project constitute the second phase of the work. As bio art scholar and curator Jens Hauser has put it, the bunny "has attained the quasi-planetary iconographic value of a Che Guevara of biotech art."<sup>2</sup> The bunny may not exactly function as a revolutionary countercultural symbol, but it certainly challenges common cultural definitions of "natural" life forms. A major goal of Kac's work is to normalize the "other," enable its social integration, and illustrate the consequences of transgenics without easily condemning it. Hauser raises the question whether Alba could or should be considered an alien. The *Lagoglyphs* series pick up on the iconographic value of the rabbit and the notion that certain life forms are "alien" to us.

The *Lagoglyphs* are a series of artworks, ranging from silkscreen prints to animations, in which Kac creates a visual language and form of writing that he describes as "leporimorph" or "rabbitographic." The *Lagoglyphs* are pictograms, visual symbols composed of two units—one green, one black—that each represent the bunny, yet do not capture or define its concept. The glyphs suggest calligraphy but, as pictographic writing, resist any assigned meaning. Their referent is the bunny but their visual signifier (a shape rather than word) is as unstable as their signified (the mental concept or ideational component). They are variable, textured gestures, open to

interpretations and create a visual code for a mutable other. Each medium in which the *Lagoglyphs* are presented highlights a different quality: while the silkscreens underscore calligraphic aspects in sequential variations, the animations place an emphasis on the generative mutability of writing.

The metaphor of communicating and transmitting a sign system to the "alien" other is taken even further in the *Lepus Constellation Suite*, five disks that each have a lagoglyphic "message" on their surface. By means of satellite broadcasting equipment and a parabolic dish antenna these messages were transmitted to the Lepus Constellation (the Gamma Leporis star below Orion) from Cape Canaveral, Florida, on March 13, 2009. The constellation is 29 light years away from Earth, which means that Kac's messages would arrive in the year 2038. In *Lepus Constellation Suite*, Kac quite literally connects sign systems across the universe: the lagoglyphic rabbit complex meets the lepus (Latin for hare) constellation. As sign systems, both reference a rabbit / hare and involve an act of "naming" that is grounded in physical form, yet remains ungraspable and literally or conceptually out of reach—suspended in a 29-year-long act of communication.

In this exhibition the transmission of the rabbitographic sign literally reverses the gaze from space back to Earth in the form of a *Lagoogleglyph* (*Lagoglyph Google Earth*). Inscribed on the roof of Oi Futuro, in Rio de Janeiro, is a pixelated, plotted lagoglyph referencing a rabbit head—specifically made by Kac for the eye of a satellite used by Google. The artist rented the same satellite to produce a photograph identical to the kind used in Google Earth. *Lagoogleglyph* is potentially visible to anyone on the planet via Google's geographic search engine, one further step on the bunny's path to quasi-planetary iconographic value as an ambiguous other and engineered, plotted, luminous life form. Together, the *Biotopes*, *Lagoglyphs* and *Transgenic Works* reveal life as a complex sign system in all the (bio)ambiguities emerging from multiple acts of transcoding.

## NOTES

1 - Jack Burnham, *Beyond Modern Sculpture: The Effects of Science and Technology on the Sculpture of this Century* (New York, George Braziller, 1968).

2 - Jens Hauser, "Gènes, génies, gênes" in: Jens Hauser (ed.), *L'Art Biotech*, catalog (Nantes, France, Le Lieu Unique, 2003).