Bioinstincts

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> Things must be pushed to their limit, where quite naturally they reverse themselves and collapse. At the height of value, we are nearer to ambivalence.
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> (Jean Baudrillard, *Symbolic exchange and death*)

Introduction

The work looks at the recent progress in biotechnology and regenerative medicine and how it may change the way man perceives life and death. The objectivity and the rapidity of the science seem to prevent humanity from building any cultural meaning around it. Especially when man confronts himself with the new ways of experiencing death in the age of biotechnology and regenerative medicine, he seems not to be able to establish any symbolic exchange between life and death that could make the passing acceptable as a shade of life and as a reversible event of life. What if we could envision symbolic meanings of our new passing and build a material culture around them?

Nowadays the way we perceive death is quickly turning from the idea of a natural event in everybody's life into the feasible possibility of controlling our passing through the intervention of science. I wonder how we would cope with death in the society we live in, where biotechnology and medicine seems to be able to neutralize human mortality. I try to foresee future rituals that man could perform around death. From setting different scenarios around the way we perceive death in our actual age, I build up social fictions and new objects that I design specifically for them.

The dilemma of symbolic exchanges between life and death in the age of death's technical reproducibility

Man experiences death both as the most natural biologic event and as the most

cultural one. Death occurs in the intersection between biology and culture: that's why over different times man felt the need to build a meaning for death[1]. The representation of death in myths, rituals, religions, has been the cultural answer in attributing meaning to the passing.

Nowadays biotechnology and regenerative medicine are changing the way we experience life and death. This could lead us to thinking about them differently from the natural biological course. On the one hand, we could replace damaged cells or organs, on the other hand, we may experience the lack of success in science in those cases where death cannot be avoided. As a side effect of scientific development, death still occurs due to incurable disease or by accident. Instead of living the passing as a natural event in our life, we may experience it as an industrial product in the same way life has been extended through bioengineering manipulation. During my research I began to realize that nowadays we are more or less unconsciously experiencing death as:

> 1) *a-mortality*[2]: through the replacement of sick tissues with stem cells and transplantations our life is extended beyond the natural biological possibility, proceeding towards a theoretical immortality;
> 2) *accidental death*: death that suddenly occurs to a particular individual without any previous warning, such as terrorist attacks or domestic gas leaks;
> 3) *death as expiration date*: irreversible death that occurs when medicine fails, for instance for the terminally ill patients.

In all cases we experience the scientific irreversibility of the passing and the autonomization of death as an individual event, not as a social relationship between the members of the same community. Any symbolic exchange between life and death seems to be impossible because of their cultural disjunction.

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[1] This concept is developed by Edgar Morin (2002) in *L'uomo e la morte*. Roma: Meltemi Editore. In his preface to the edition of 1970, he says: 'Death is exactly placed in the crucial joint that links together the biologic world and the anthropological one, since it represents the most human aspect, the most cultural of the whole *anthropos'*, p.25. Edgar Morin was active in the study of anthopo-biotics and he introduced the term 'genetic anthropology' to refer to his subject.

[2] According to Edgar Morin, the a-mortality is based on the biological property that molecules/cells are not susceptible to die; according to the definition of the biotechnologist Simone Maccaferri, the a-mortality is based on the biological property that molecules/cells continuously replace themselves.

Envisioning new symbolic exchanges between life and death in the biotech age

According to the hypothesized three new ways we experience death in the age of biotechnology and regenerative medicine, I began designing different scenarios for new symbolic exchanges we could associate with them. My aim is to turn the perspective we may have on science - in order to suit the human need to create a cultural meaning around the new ways of experiencing death. Man experiences death differently, according to the socio-technical context the person lives in[3]. The context also determines the cultural meaning people build on their passing. Each project of death, as symbolic exchange, has to be coherent with the humanity which designs it, referring here as humanity as a society within its particular context.
In our current age, science and technology are the socio-technical conditions that will determine the new cultural meanings of life and death. The progress of science seems to immunize humanity from mortality giving the possibility to recover from chronic and terminal illness. On the other hand, man is still susceptible of accidental death, from domestic gas leaks to terrorist attacks. As a result, man may start to see death not as a biological event in his life, but something that may occur to the "unlucky on call". We may need to be reminded about our biological mortality[4], but at the same time we should suit our human feeling of keeping the death away from us, of being protected from dying.

My design consists of bioengineering instincts for accidental death that could accomplish to both those requirements. I have designed those particular instincts in the human species to give man back the awareness of his own mortality in an age where biotechnology and regenerative medicine are changing the boundary between life and death.

On a big scale, redefining the biological time of a single species in the whole ecosystem may involve serious consequences on the ecological equilibrium[5]. In this

[3] The anthropoietic program the person takes part of.

[4] A kind of new memento mori for the biotech age.

[5] As the philosopher Murray Bookchin (1982) claims in his work *The ecology of freedom: the emergence and dissolution of hierarchy*, the supremacy of a species over another one may be the cause of the collapse of the whole ecosystem. He was the founder of the discipline of Social Ecology, a radical philosophy that aims to apply nature structure to society. The following is a quote that could particularly support one of my hypothesis of an application of biotechnology and regenerative medicine that may take over the limiting nature of human beings: "The very notion of the domination of nature by man stems from the very real domination of human by human." (1982).

context, the action of bringing back the consciousness of being mortal may actually consist of an ethical choice made by the individual towards the whole ecosystem. On an individual scale, it would be up to the parents to decide whether or not bioengineering their baby's embryo with the instincts' genes. On the one hand, it would depend on their moral values to agree on the genetic modification or not for the sake of the social ecology, which considers the society as part of the natural ecosystem. On the other hand, the ethical decision of engineering the awareness of self-mortality should not be disconnected from the natural parents' concern of protecting their baby. From the parents' point of view, providing their child with an instinct of accidental death actually expresses their attempt to protect him/her from the danger.

The *Bioinstincts* for accidental death are inspired by the way animals have adapted to the dangers over their evolution. A kind of sea pansy and the railroad worms developed luminescence to deceive their predators. Butterflies did the same modifying the spots, the colors and the pattern of their wings. What would happen to the human beings if they could get the instincts against accidents? How would their physical aspect adapt to the expression of such instincts?

Designing new symbolic exchanges between life and death for the biotech age

I developed further the *Bioinstincts* scenario from a quite diffused cause of accidental death occurring in the domestic environment: the gas leak. My project focused at this point on the design of a new material culture and new rituals as symbolic exchanges between life and death. Both the interactions and the objects of my design are meant to mend the disjunction between life and death through the mediation of a symbol that brings back the imaginary into the reality and dissolves the reality into the imaginary. The aim of my design is to visualize the cultural ri-appropriation of death through the scenario I built and to offer tools and processes to perform the new symbolic interactions between life and death.

The bio-instincts for gas leaks consist of the design of glowing eyes that activate in case of gas saturation in the air. The developed eye would consist of chemo receipting eyelashes and of extra eyelids with bioluminescent spots. The shape of the eyelids is also functional for the reflection of the light to the pupils. Thanks to the glowing effect of your eyes, you will get up at night if a domestic gas leak occurs in your house. The bioengineering of the instinct starts from the artificial modification of

the human genome in the baby with the genes that codifies for the instinct itself. Anyway just introducing the new genes is not enough to get the modified body structure and the behavior responses. The context is what allows the genes to express into the morphological and behavioral changes. That's why my bioengineered baby, although genetically designed to perceive instinctively a domestic gas leak by chemo receipting eyelashes and bioluminescent eyelids, needs to be provided the right environment to develop these physical features. Actually he or she would be born under developed, still susceptible of the domestic danger of gas leak, and would need to be put into an incubator. It would both protect the baby thanks to the positive pressure inside and favor the body development thanks to a pipe communicating outside where the mother could breathe out from time to time. The CO2 provided by the mother in small concentration would simulate the environmental condition that would allow the genes to express in the baby as physical features[6]. The incubator represents the physical object where the dialectics of my project shows itself in all its contradictions. It is the place where the short circuit between the responsibility of the human species and the caring for your own baby generates and solves into the decision of bioengineering your baby and raising him into a technical environment. But it is also the place where the natural environment itself, and I mean here an environment which excludes any accidental contamination from domestic gas, is reproduced artificially by the technical womb of the incubator and the toxicity is provided naturally by the breathing out of the mother. In a future scenario we could actually be confronted with an artificial human evolution, like babies' bioengineering for a more natural and primitive consciousness of death; with a technological breeding which still relies on the instinctively natural protection from a mother to her child and with the intellectual will[7] of man to codify the human mortality directly in the human genome, even before the birth.

Getting nearer to ambivalence

I would like to explore the moral and ethical concerns that motivate my design and me. I was questioning how death could still be accepted in our biotechnological age without denying the contradictory feelings that the idea of dying generates in man. My work is an attempt to research how deeply the new developing technologies can

[6] The CO2, known as carbon anhydride, stimulates similar reactions in the body compared to the carbon monoxide, responsible of intoxication due to domestic gas leak, but still having less toxic effect on it.

[7] I say here intellectual because I want to exclude any religious or beliefs system involvement.

adapt to human feelings, when biotechnology and regenerative medicine themselves deal with the critical human aspects of life and death. The bioengineering of instincts of accidental death may be a way for man towards reconciliation with death itself, both on the big scale of the species and on the small scale of individuals. On the other hand, it could also represent an *artificial* evolution of the species. Thanks to these instincts we could reach a condition of *species adaptation*[8] to death, like the animals that realize the danger by particular features of their bodies and subsequently act to survive.

Actually man's progenitors belonging to the *Australopithecus* were provided with instincts for danger and death, but according to the evolutionary biologist Ernst Mayr[9] they lost them as a consequence of climatic changes, when in the Eastern Africa the tropical forest turned into bushes and savannah. In particular the loss of these instincts was determined by the evolution of the *Australopithecus* into *Homo sapiens.* Homo sapiens adapted to the dangers of the environment developing his brain and intellectual capability and adding morphological changes to his body. As humans, we have adapted to death by using our intellect. This means we protect ourselves by thinking and making decisions more than following our innate instincts. Despite all the improvements in biotechnology and regenerative medicine, we are still susceptible to accidental death.

I wonder where the cultural attitude to interfere with death may lead the human species. We have never been nearer to the achievement of defeating death than today, thanks to the development of biotechnology and regenerative medicine. Every time we interfere in the end of life with the tools and techniques that scientific progress provides us, we consciously or not may run the risk of letting artificial genetic variants take over the evolution and become permanent artificial adaptations. The danger may be in the fact that the mutation could artificially appear and later naturally be selected without us having any control on it. Personally artificiality doesn't scare me and I must agree with the artist Patricia

[8] According to Charles Darwin theory, an adaptation is a positive characteristic of an organism that has been favored by natural selection and that allows the organism to live in its own environment. It can be structural (changes in the body morphology), behavioural (changes in the way the organism perform in its context) and physiological (the organism could start performing chemical reactions inside its body). The adaptation appears randomly as genetic variant in one organism and then naturally selected. That means that all the organisms without that variant would die out, while the other ones with it would in turns replace them.

[9] For more details, see Ernst Mayr. *What makes biology unique? Considerations on the autonomy of a scientific discipline*. London: Cambridge University Press, 2004.

Piccinini[10] when she says that the perception of what is natural and what is artificial depends on the context we belong to[11]. But artificiality does contain a risk when we are not able to control it, because we cannot predict the behaviour or future development of what we create. That is mainly the reason why the philosopher Hans Jonas (1984) speaks about the need of introducing a new ethics, the *ethics of the future*[12] that could deal with critical issues, such as biotechnology and regenerative medicine. He introduces the *heuristics of fear* as the method that may drive our long term choice regarding science. We need to imagine and emphasize all the possible impacts of the scientific progress on a macro scale in order to understand where it becomes dangerous and meaningless for humanity and finally being able to take the right decision.

It may be dangerous if the human species looses the consciousness of its mortality because of the following disequilibrium in the social ecosystem and the uncertainty of the human identity. It could be seen as a paradox, but this genetic manipulation of accidental death instincts is meant to bring man back to his more natural essence, that of a human being which is born and going to die.
So where actually could we establish the border between artificial and nature? Could the use of a “new” technology or a technology we are not comfortable with be enough for setting this border?

These are some of the questions I try to address with my work and also motivate my

[10] Patricia Piccinini is an Australian artist. She is interested in expressing the critical debate on the emerging technologies, such as biotech, through the arts. She wants to question people about the boundary between nature and artificiality and about the good and bad aspects of applying biotech. One of her thought that inspires me is: “after centuries and centuries of selective breeding, the ancient correspondent of biotechnology, we actually think about our horses as natural, even if they are the result of man manipulations.” (Piccinini, 2008).

[11] That’s why our generation may perceive the city environment more natural than a wild forest. These two signifiers, the city and the forest, were always been associated respectively to the signified of artificiality and nature. What is changing around us and actually allow us to attribute different signified to the signs “city” and “forest” is the context. As saying that in the biotech age, we may have a different perception of what is natural and what is artificial comparing to some decades ago.

[12] For more details, see Hans Jonas . *The Imperative of Responsibility: In Search of Ethics for the Technological Age. Chicago:* University of Chicago Press, 1984.

design. Both my passion for the topic of life and death and my curiosity for emerging technologies inspire my personal way of working as a designer. I try to make technologies adapting to human deepest feelings, fears and dreams. Mine is a design like a question mark, that doesn't ask you to buy it or not, but to think if you would like it to exist or not. It is a question about a scenario that you would be willing to accept or not. My products become alive when people debate on them.
I feel there is a lot to be explored in the field of emerging technologies and human interactions with them. My instinct tells me that there are many more ways for us to experience those interactions than the way we may do now.

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