Chapter 74
Plastika [Totipotenta]

Catherine Nyeki
Plurimedia Artist,"plasticienne", France

ABSTRACT

Over the last ten years, my work has developed into a biotope abounding in diversity, a sort of virtual "vivarium" composed of interactive pieces, musical creations, drawings and writings in numerous sketchbooks, films and installations. A digital work of art is by definition non-uniqueness; it is potentially transformable at any moment. It is both fascinating and intriguing to have access to such a "plastic material". My artistic research, which has flexible boundaries and echoes that of today's nanosciences, genetics and cell biology, has gradually led me to improve certain personal concepts like the sensitive microscope, tactile laboratory, imaginary incubator, parallel botany, nano evolutions, visible and audible strata, multilingual semantic zoo, bud cell, virtual tissue, body graft… and the list goes on. My contribution's title, Plastika [Totipotenta], is taken from my last solo exhibition in Paris that brought together recent works related to plasticity, questioning a sort of constantly evolving "modeling clay"-type thinking. This chapter is an invitation to question the various levels of plasticity concepts applied to some of my latest works that have been inspired by current biotechnology and my recent collaboration with a cell biologist.

INTRODUCTION

The conflicting ethical debates on stem cells and genetic manipulation that invade our screens and newspapers today cannot possibly leave anyone indifferent. How can a specific stem cell restore a part of a body in one case, then have the opposite effect in another? What is the program? If there is indeed one. We have seen for several years now that questions on relevance and uncertainties are increasingly being raised in the so-called "hard" sciences. My last privileged experience in 2009 with Michel Gho, a researcher at the French CNRS laboratory of the Department of Developmental Biology (University of Paris VI) was humanly very rich. The recent theoretical hypothesis concerning the role of chance in the evolution of cells opens up astonishing new perspectives on living plasticity. This discovery has a disturbing resonance with my artworks that have been, up until now, totally

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disconnected from the scientific community. My works, which belong to a virtual world but are increasingly anchored in reality, have evolved in a way that is similar to developing stem cells. This creative process has led me towards hybrid conceptual territories, like "malleable cellular buds" that possess both hereditary and chance factors. In the following presentation of several of my works, we will see how this mutation came about through the description of interconnections that are not always plainly visible. *Why Plastika [Totipotenta]?* Plastika as in plasticity. In biology, it is the ability of an organism to adapt to a given environment. Plasticity can be observed in the behavior of the brain. Plasticity generally means the ability to be shaped or formed. It differs from "elasticity", which refers to the ability of something to change temporarily and revert back to its original form. The ancient Greek word "plassein" means to shape, to model or to give birth. In plastic art, as the contemporary poet, essayist and researcher in neuroscience Marc-Williams Debono writes in his book, L'ère des plasticiens: de nouveaux hommes de science face à la poésie du monde:

Plastic artists would like to experiment with reality without having any a priori knowledge. Just as neuroplasticity enables the brain to organize itself according to new experiences, the artist is the architect of his/her very own evolution… This is how the chaotic brain plans the ordered future of man, as well as his creative potential. Thus, man has taken a step further in evolution, which calls for both dynamic interaction between the environment and the genes necessary for brain development, and generic memories that recapitulate and reorientate the progressive stages in hominization.

[Totipotenta] refers to totipotent stem cells. Totipotency is the ability of a single cell to divide and produce all the differentiated cells in an. Totipotent cells formed during sexual and asexual reproduction include spores and zygotes. In some organisms, cells can differentiate and regain totipotency. For example, a plant cutting or callus can be used to grow an entire plant. Etymologically, totipotency means "full authority", indicating that these cells can theoretically be differentiated into cell types that may constitute any part of the body (e.g. epithelial cells, nerves, bones, etc.). Plasticity is a strange "nodal concept" covering several disciplines of the life sciences. Ours is an era of tremendous progress in the field of biology, in which advances in genetics, biochemistry, embryology, cell and evolutionary biology have been made parallel to one another. The recent progress achieved in molecular biology and genetics has begun to reveal correlations between countless observations that were previously unidentifiable. Embryonic development, genetics, the physiology of cells and organs and the evolution of species tend to offer an overall theoretical view according to Dominique Lambert (PhD in Physics and Philosophy) and René Rezsöhazy (PhD in Biology) in their essay on the surprising plasticity of living things entitled "Comment les pattes viennent au serpent" (How snakes come to have legs):

Our reading of the latest findings in biology does indeed highlight, in counterpoint to the relative robustness and autonomy of the biological organism, the extent of its vulnerability, its heteronomy and its capacity to be determined not only and essentially by an internal program, but by an environment that is likely to 'in-form' and deform it significantly […] plasticity can be considered as an expression of existence in the essential systems of living things, or of a completely original, dynamic and constitutive connection established between a certain robustness (i.e. maintaining consistency, structural invariance, etc.) and a kind of malleability (ability to be deformed or 'in-formed').

The evolution of theoretical biology shows the gradual emergence of formalisms of which the characteristic is to describe life in terms of multiple