

### *Eduardo Kac*

Since the 1980s poetry has effectively moved away from the printed page. From the early days of the minitel to the personal computer as a writing and reading environment, we have witnessed the development of new poetic languages. Video, holography and the web have further expanded the possibilities and the reach of this new poetry. Now, in a world of clones, chimeras, and transgenic organisms, it is time to consider new directions for poetry in vivo. Below I propose the use of biotechnology and living organisms as a new realm of verbal expression.

1) *Microbot performance*: Write and perform with a microrobot in the language of the bees, for a bee audience, in a semi-functional, semi-fictional dance.

2) *Atomic and molecular writing*: position atoms precisely and create molecules to spell words. Give these molecular words expression in plants and let them grow new words through mutation. Observe and smell the molecular grammatology of the resulting flowers.

3) *Marine mammal dialogical interaction*: compose sound text by manipulating recorded parameters of pitch and frequency of dolphin communication, for a dolphin audience. Observe how a whale audience responds and vice-versa.

4) *Transgenic poetry*: synthesize DNA according to invented codes to write words and sentences using combinations of aminoacids. Incorporate these DNA words and sentences into the genome of living organisms, which then pass them on to their offspring, combining with words of other organisms. Through mutation, natural loss and exchange of DNA material new words and sentences will emerge. Read them back via DNA sequencing.

5) *Amoebal scripting*: Hand write in a medium such as agar using amoebal colonies as the inscription substance and observe their growth,

movement, and interaction until the text changes or disappears. Observe amoebal scripting at the microscopic and the macroscopic scales simultaneously.

6) *Luciferase signaling*: create bard fireflies by manipulating the genes that code for bioluminescence, enabling them to use their light for whimsical (creative) displays, in addition to the standard natural uses (e.g., scaring off predators and attracting mates or smaller creatures to devour).

7) *Dynamic biochromatic composition*: use the chromatic language of the squid to create fantastic colorful displays that communicate ideas drawn from the squid Umwelt but suggesting other possible experiences.

8) *Avian literature*: teach an African Gray parrot not simply to read and speak, and manipulate symbols, but to compose and perform literary pieces.

9) *Bacterial poetics*: two identical colonies of bacteria share a petri dish. One colony has encoded in a plasmid a poem X, while the other has a poem Y. As they compete for the same resources, or share genetic material, perhaps one colony will outlive the other, perhaps new bacteria will emerge through horizontal poetic gene transfer.

10) *Proteopoetics*: create a code that converts words into aminoacids and produce with it a three-dimensional proteinpoem, thus completely bypassing the need to use a gene to encode the protein. Write the protein directly. Synthesize the proteinpoem. Model it in digital and non-digital media. Express it in living organisms.

11) *Nanopoetry*: Assign meaning to quantum dots and nanospheres of different colors. Express them in living cells. Observe what dots and spheres move in what direction, and read the quantum and nanowords as they move through the internal three-dimensional structure of the cell. Reading is observation of vectorial trajectories within the cell. Meaning continuously changes, as certain quantum and nanowords are in the proximity of others, or move close or far away from others. The entire cell is the writing substrate, as a field of potential meaning.

12) *Agroverbalia*: Use an electron beam to write different words on the surface of seeds. Grow the plants and observe what words yield robust plants. Plant seeds in different meaningful arrays. Explore hybridization of meanings.

13) *Molecular semantics*: Create molecular words by assigning meaning to individual atoms. With dip-pen nanolithography deliver molecules to an atomically-flat gold surface to write a new text. The text is made of molecules which are themselves words.