

Jeremy Rifkin Biologists who dress up hi-tech eugenics as a new art form are dangerously deluded

Dazzled by the science

Recently, J Craig Venter, the gene scientist whose company, Celera Genomics, led the race to map the human genome, announced a plan to create the first artificial life form in a laboratory dish. Venter, who has teamed up with the Nobel laureate biologist Hamilton Smith, says he hopes to use a \$3m US government grant to create partially man-made organisms that could produce hydrogen for fuel or break down carbon dioxide from power plant emissions. Other scientists worry that Venter's creation could wreak havoc on natural ecosystems or be used to create new kinds of biological weapons.

Venter is among a new genre of biologists who see themselves less as engineers and more as creative artists — designers and architects of what they envision as a "second genesis" — this one inspired not by divine guidance or by the forces of evolution, but by the human imagination. Ironically, this subtle shift in the focus of the biological sciences from "engineering" to "art" is being mirrored in the art community, raising the question of whether a new social gestalt is being readied to make acceptable this radical new manipulation of nature.

All of a sudden, artists around the world have discovered DNA and are feverishly at play in their studios using the cutting-edge tools of biotechnology. An American artist, Eduardo Kac, commissioned a team of geneticists in France to create a transgenic rabbit named Alba with a fluorescent gene from a jellyfish in its biological code. The rabbit, which glows, is considered a living piece of genetic artistry. Currently, an exhibit entitled *Genesis* is touring the US with much fanfare. Like Kac's illuminated rabbit, many of the works on display use the tools of genetic science to create living representations just as their predecessors used paintbrushes to create their representations. A group calling itself the Critical Art Ensemble engages in a performance piece called *GenTerra*, in which it releases transgenic bacteria into the audience. Christine Paul, the curator at the Whitney Museum of American Art says: "We are witnessing the emergence of a new type of artist, the artist/scientist/researcher."

The new biotech artists say that such exhibits will help the public wrestle with the scientific, ethical and legal issues surrounding the new genomic science. Many of the artists hope that their work, which includes digitally produced portrait photographs of hybrid cat people and tubes of real DNA suspended from the ceiling, will provoke an emotional response from the audience and force people to think about the many implications of the new science. Maybe.

But it's far more likely that the real consequence of such art exhibits will be to legitimise the idea of a new "artful" eugenics movement. The melding together of genetic science and artistic expression could help ease the way to a popular acceptance of Venter's new microbe, as well as cloned, transgenic and chimeric animals and designer babies.

More than 30 years ago, Nobel laureate Joshua Lederberg wrote expectantly of the possibility of designing "a useful protein from first premises, replacing evolution by art". Recombinant DNA techniques are increasingly being viewed as the "artist's" tools of the post-modern era. With the new technologies, human beings assume the role of creative artists, continually transforming evolution into works of art.

Already in laboratories around the world researchers are creating new hybrid creatures that have never before existed. Scientists have fused together the embryos of a sheep and goat, two totally unrelated species, and given birth to a new creature called a Geep, a chimeric animal with the head of a sheep and the body of a goat. The anti-freeze gene in a flounder fish has been inserted into the genetic code of a tomato plant, to make it resistant to freezes. Human growth hormone genes, the human immune system and even human brain tissue have been inserted into the genetic blueprint of mice embryos. The mature mice express these human genes in their bodies. The mice with the human growth hormone genes grew twice as big as ordinary mice. Scientists have even grown human skin, pancreases and breasts in laboratory jars.

Other scientists have inserted the nucleus of a human cell into a cow egg whose own nucleus was removed in a partially successful effort to create a quasi-human embryo. Spider genes have been inserted into goat embryos and the mature goats produce spider silk in their milk. And Japanese scientists have just announced that they are planning to use tissue from the legs and testicles of a

dead mammoth to clone the extinct creature and "display" it at an ice age wildlife park in Siberia. Are these "beings" works of engineering, or works of art?

In their near limitless possibilities to reconstruct and reinvent the body, move DNA across species boundaries, erase the genetic past and pre-program the genetic future, the new geneticists bring the biology of life squarely in line with the new protean spirit. Life, long thought of as God's handiwork, and more recently viewed as a random process guided by the "invisible hand" of natural selection, is now reimagined as an artistic medium. Freeman Dyson writes: "It is impossible to set any limit to the variety of physical forms that life may assume ... It is conceivable that in another 1,010 years, life could evolve away from flesh and blood and become embodied in an interstellar black cloud ... or in a sentient computer.

A growing number of people already see themselves — their very corporeal being — as the ultimate work of art, a continually metamorphosing "project", taking on new shapes, forms and attributes. The widespread popularity of cosmetic surgery, psychotropic mood-enhancement drugs and personal therapies of all kinds are a reflection of the new sense of self as an unfinished work of art.

By masquerading as artistic tools, genetic engineering technologies create

the illusion that the new era somehow represents a creative renaissance of sorts. Rather, the new technologies threaten to smother the artistic sensibility altogether. Art, historian Lewis Mumford reminds us, "is essentially an expression of love, in all of its many forms ... in contrast to technics, which is mainly concerned with the enlargement of human power". Genetic engineering represents the ultimate enlargement of human power. Making decisions over what genes to insert, recombine or delete in an effort to alter, transform and redesign oneself is less an artistic expression then, and more a technological prescription. It is not art, but artifice.

Now that we can begin re-engineering ourselves, we mistakenly think of the new technological manipulation as a creative act, when in reality it is merely a set of choices created in a laboratory

and purchased in the marketplace. The biotech revolution is the ultimate consumer playground, offering us the freedom to recast our own biological endowment and the rest of nature to suit whatever whim might move us. More importantly, the new genetic technologies grant us a godlike power to select the biological futures of the many beings who come after us. This is a new and dangerous form of hi-tech eugenics whose cold engineering edge has been softened by the guise of artful expression. Beware of Venter's new creations. They may be less a harbinger of a second renaissance and more a reflection of the "brave new world" that Aldous Huxley warned of more than 70 years ago.

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