# Introduction

Artists first began to exhibit live works in the 1930s, although by then the idea that organisms could be art was already several centuries old. By the 1970s plants and animals were appearing in the works of many artists, including some who were well known, like Hans Haacke, Joseph Beuys, and Agnes Denes. Today artists work not only with plants and animals but also with bacteria, fungi, slime molds, and cell lines that live only in vitro. Art made of or by living organisms has come to be known as bio art.

Specializations have emerged, including bio-ecological art and biotech art, which is bio art that has been technologically manipulated. Manipulation may be as simple as hybridization by traditional means or as complex as genetic engineering. Bio art has played a significant role in introducing the public to issues associated with biotechnology and the commodification of life.

Bio art registers a cultural shift away from dualistic views of the world, in which art and nature are separate, toward nondualistic, ecological constructs that merge the two. This is a momentous cultural experiment. Throughout much of Western history dualism has prevailed in which matter and spirit, and human and nonhuman life have been understood as belonging to separate realms. This dualism, which goes back to ancient times fosters anthropocentric assumptions and beliefs that inform most art today. Almost all contemporary figurative work, for example, tends to favor anthropocentrism. However, contemporary art also presents important alternatives. Bio art is unique in that its very materials suggest nondualistic possibilities.

Most writing on bio art, and on biotech art in particular, addresses social and political problems. We have come to expect books on biotech art to deal with such issues as eugenics, the commodification of life, cloning, race, gender, genetically modified foods, and surrogate motherhood. Some commentaries engage the ethical concerns that arise when animals are used in bio art or in laboratory research. But relatively little attention has been given to aesthetics. *Green Light* focuses on aesthetic issues associated with biotech art and other interventions in evolution.

Hans Gumbrecht identifies aesthetic experience as an oscillation between presence and meaning.[1] Consciousness of presence arises with primary perception, such as occurs when light rays fall on our retinas. Meaning arises from the judgments, associations, and narratives that our minds produce. Aesthetic experience mediates between the mind and the world. Mediation accomplishes two things: it processes raw presence to establish the relevance of sensations, and it checks the tendency of consciousness to operate independently of the external world. The second function of aesthetic experience is fully as important as the first. When we consistently impose meaning on the world without due respect for the complexities of presence, our minds become tyrannical. Aesthetic experience is an antidote to delusion.

Because of this art can operate at a small but significant remove from ethics, politics, and economics. This may happen even if an artist is indifferent or hostile to aesthetics and art, as for example was Marcel Duchamp. His brilliant attacks on art and his abandonment of art for chess helped make him the most famous aesthete of the twentieth century. What he abandoned, however, was not aesthetic experience per se but certain ideals of beauty that had long dominated Western visual culture. By rejecting them, especially those rooted in Platonism, he expanded the frontiers of expression into realms that were new to Western art. Partly because of Duchamp, contemporary artists, including those who produce biotech works, are free to direct attention not only to beauty but also to chance, ugliness, abjection, rage, indifference, nihilism, frivolity, and a host of other qualities and conditions.

Aesthetic perception so consistently shapes human understanding of the world that the organisms closest to us have been evolutionarily affected. For thousands of years people have favored creatures for "attractive" or "interesting" characteristics. Traditionally such selection has been carried out without knowledge of genetics, evolution, or even of most modes of sexuality. The sexual nature of plants, for instance, was unknown until the end of the seventeenth century, and yet by that time extremely refined selections of ornamental plants were being grown in Europe, China, Japan, and the Ottoman Empire.

Ornamental plants, pets, sporting animals, fanciers' animals, and laboratory domesticates are repositories of effects of human consciousness on evolution. In the light of biotech art, many domesticates can be understood as bio folk art. From it, we may gain some sense of what to expect from biotechnology. Very likely the wishes and desires that have produced such organisms as Boston terriers, Siamese fighting fish, chrysanthemums with quill-like petals, and fruit flies with antennae projecting from their eyes will affect how DNA is manipulated in the future.

In *Green Light*, I look at a wide variety of life forms that humans have helped shape, but I emphasize plants. They represent the great majority of species that humans have domesticated. Also, they have been central to my practice as an artist.



The primary reason why many more plants than animals have been domesticated is that on the whole, plants are lower maintenance than animals. There are plenty of exceptions, of course. Where I live in western Oregon, cattleya orchids must be grown in greenhouses, but domesticated pigs have become feral. Dogs are more typical, however. In Oregon they need daily care to flourish. As for plants, the most important crop plants in my immediate vicinity are quinces and wine grapes. They are highly domesticated but require little more attention than planting, staking, once-a-year pruning, and, with quinces, summer watering once every few weeks.

Another reason for favoring plants is that plant breeding is more open-ended than animal breeding. Vertebrates are sentient, which limits or should limit breeding objectives. The prerequisite for conscious experience is a nervous system, which plants lack. This makes them, along with fungi, microorganisms, and cells in vitro, invaluable materials for artists. Not that there are no ethical considerations in plant breeding—far from it. However, when we breed sweet peas, we do not have to worry about them suffering. The same is not true when breeding greyhounds.

*Green Light: Toward an Art of Evolution* is a collection of notes. The note form, which is commonly used in philosophy and occasionally in cultural commentary, such as in Susan Sontag's *Notes on Camp*, is suited to subjects that compel consideration even though too little evidence is available to reach firm conclusions. This is our situation today with respect to the role of aesthetic experiences in evolution.

The notes in *Green Light* consist of brief reflections, riffs, vignettes, quotations, accumulated facts, and an occasional list. Now and then I venture a hypothesis. Some of the notes are brief—a sentence or two. Others are longer—groups of paragraphs running to several pages. Each fragment is separated from its neighbors by a break.

The thread that connects these notes will, I hope, be clear. If we are to develop a sustainable way of living, which must include how we use our powers to affect evolution, life in all life's variousness must move toward the center of the conversation that is our culture. By all its variousness, I mean all, not just periwinkles that might produce cures for cancer, or charismatic organisms like wolves and old-growth trees. But whether or not we create a sustainable culture, the aesthetic experiences available to us through plants, animals, and other forms of life are among the richest that life affords.

The notes in *Green Light* move back and forth in time, proceeding overall from past to present to possible futures. The first chapter, "Divine Plants and Magical Animals," surveys the history of bio art and the issues it raises. Among these, as I have mentioned, is the role that aesthetic perception has played in the evolution of plants and animals, especially those most closely associated with us: domesticates.

Over many centuries, an enormous variety of domesticated organisms have been shaped by human aesthetic preferences. Chapter 2 takes a look at some of these organ-

isms. Many are familiar, such as racehorses, sharpeis, and goldfish. Others are less well known, like Onagadori chickens, which have tail feathers twenty or more feet long.

Chapters 3 and 4, "The Rainforests of Domestication" and "The Rise of Ornamental Plants," focus on the most diverse category of aesthetic domesticates, ornamental plants. So many species have been domesticated that they have come to outnumber all other species of domesticates combined, including those that provide basic necessities such as food.

The practice of growing ornamentals seems to have arisen independently in four different places: Mesopotamia, ancient China, Mexico, and South America in or near the Andes. By the seventeenth century, sophisticated ornamental selections were widely grown. The idea that such organisms were artlike emerged in Europe at about this time. However, another three centuries would pass before a few plant breeders claimed their work as fine art. This happened only after publication of *The Origin of Species*. In Chapter 5, "Darwin's Sublime," I examine Darwin's relationship to the arts, and the implications of his ideas for bio art.

Chapter 6, "Playing God," traces the gradual emergence of bio art in the cultural space opened by Darwinian consciousness. But that space also became a breeding ground for race- and class-based eugenics, which helped prepare the way for the Holocaust. The Second World War produced massive, culture-wide trauma, one result of which was an abrupt severance of art from genetics. For almost forty years after the war's end, they remained almost completely disconnected.

Meanwhile, plant and animal breeding continued to develop, benefiting from scientific developments and postwar prosperity. Chapter 7, "Standards of Excellence," shows how plant breeders, in the absence of the consciousness that we associate with art, codified aesthetic worth. Chapters 8 and 9, "Doubles" and "Kitsch Plants," explore the consequences of aesthetic decision making alienated from art consciousness: an explosion of genetic kitsch.

A backlash was inevitable, and indeed, one had been building since long before the Second World War. Chapter 10, "Bastard Flowers, Genetic Goofies, and Freud's Bow Wows," explores the history of contempt for domesticated creatures. This contempt found expression in ethology, ecology, and literary and philosophical works. One of these, Gilles Deleuze and Félix Guattari's *A Thousand Plateaus*, has had a significant influence on contemporary art about animals.

The aesthetic assumptions that have dominated ornamental plant breeding since the Second World War also dominate commercial applications of genetic engineering. Chapter 11, "Biotechnology in the Garden," traces the histories of the two best-known commercial applications of genetic engineering to ornamental plants, the quests for blue roses and red irises. For all their technological originality, these projects are aesthetically cautious. Blue roses and red irises are centuries-old dreams.



The most aesthetically original applications of biotechnology are concentrated in the arts. Chapter 12, "Recent Art Involving DNA," surveys developments in bio art from the Second World War up to the present, with an emphasis on biotech art.

The final third of *Green Light*, chapters 13 to 18, is devoted to problems that contemporary biotech artists, ornamental plant breeders, and many animal breeders face. Some of these problems are philosophical. Chapter 13, "Naming Life," examines what plant names tell us about ourselves and our relationships with plants.

In the West these relationships have traditionally been informed by anthropocentrism, the belief that nature belongs to humans rather than humans to nature. Chapter 14, "Anthropocentrism and Genetic Art," provides an overview of how anthropocentric and nonanthropocentric views of the world find visual expression. Contemporary art, including biotech art, is torn between the two modes. The outcome of this struggle will affect efforts to create a sustainable way of life.

One obvious possibility is that these efforts will fail. Chapter 15, "The Angel of Extinction," looks at some of the many end-of-the-world and end-of-civilization-as-we-know-it scenarios envisioned by poets, novelists, philosophers, and scientists. Such stories and predictions increasingly affect collective consciousness and serve as a backdrop to contemporary art, most conspicuously art concerned with evolutionary processes.

The foreground, however, is always a mass of details. Chapter 16 looks at similarities and differences among seven different breeding complexes of ornamental plants.

Plant breeding in general and biotech art in particular bear a different relationship to time than most other contemporary forms of expression. Chapter 17, "The Slowest Art," reflects on the significance of plant breeding's slowness and the long view it can afford. The final chapter, "Breeding for Wildness," suggests approaches to creating new life that take into account what we know about ecology, aesthetics, and ourselves.