Outfitting the Laboratory of the Symbolic:
Towards a Critical Inventory of BioArt

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In the year 2000 artist Eduardo Kac made network television news with an announcement that he had commissioned the "creation" of a transgenic bunny named "Alba." The PR campaign included a picture of Kac holding a white rabbit and another, iconic image of a rabbit photographically enhanced to appear green since the green fluorescent protein expressed by the DNA extracted from the jellyfish *Aequorea Victoria* and spliced into the zygote of one of Alba's forebears only shows when illuminated by a special spectrum of light. Kac claimed as his work, known as *GFP Bunny* (GFP for green fluorescent protein), all the discussion that would arise from this act of guaranteed controversy, as well as the social integration of the rabbit via his family (comprised of himself, his wife and his daughter).

The controversy and dialogue is selectively documented in a number of ensuing works, all widely publicized. The proposed social integration was transmuted into a campaign to "free Alba" as France's Institut National de la Recherche Agronomique where the rabbit was produced refused to let it leave the premises amid some dispute as to the nature of the agreement.[1] The details of this bit of controversy do not seem to have been claimed by the artist in his book on the subject, his photographs of Alba-laden newspapers being read in glamorous settings, or his interactive screen piece in which audiences can collide Alba headlines to make recombinant biotech buzz texts.[2]

Alba was not the first transgenic rabbit, nor the first with a code for green fluorescent protein added to its genome. Transgenic animals and plants incorporating GFP DNA have a long service record in biotech laboratories as this fluorescent feature quickly establishes whether or not the target organism has indeed taken up the genetic modification. Rabbits, homogenic or transgenic, are a staple of laboratories, along with mice, frogs, fish, flies, worms, bacteria, yeast, viruses, other microorganisms and a slate of plants. The most favored

ones are called “model species” for their usefulness in research. Such utility is measured by questions of interest to the humans doing the research and range from similarity to humans in effects of cholesterol and the progress of cancers to the brevity of generations when producing mutations or selective breeding.

In a project called *Workhorse Zoo*, Adam Zaretsky and Julia Reodica installed a portable clean room in the Salina Art Center in Salina, Kansas, and stocked it with a selection of “the industrial workhorses of molecular biology.”[3] The large glass windows of the 8-by-8 foot unit gratify the ritual of looking for which art spectators are trained, but the fishbowl their gaze invades here showcases the creatures most subjected to the professional gaze of science. As the artists state: “These are the organisms whose genomes have been sequenced and partially annotated. These are the evolutionary templates with whom we search for homologies to assess our own inherited pains. Much of the public has little or no idea how much the deadly study of these select strains effects their health and potential physical future.”[4]

For the first week of the exhibit Zaretsky and Reodica, having included H. sapiens in the workhorse menagerie, lived in the hepa-filtered enclosure equipped with a refrigerator and porta-john. The other cohabitating species were not caged, but each had some version of a hospitable habitat replica (tanks for the fish, burrowing materials for the mice and worms, etc.). Each day the artists impersonated figures familiar to the popular imagination, e.g., biotech scientist, bioterrorist, anthropologist, medical doctor, patient, mother, and /or infant, and entertained college students, children, lawyers’ luncheon groups, church groups and local farmers.

After completing a Masters in Fine Arts, Zaretsky spent a year as a bench scientist in the Arnold Demain Laboratory of Microbiology and Industrial Fermentation at MIT where he conducted his own experiments on the effect of music on the growth of engineered E. coli used in the development of pharmaceuticals. This unconventional but not trivial practicum has furnished him an insider’s experience of the technology, methods and culture of research biology, but he has not assembled these to assume the authority of a scientist, or to pursue the kinds of research a qualified scientist might. A few moments at the emutagen.com website

make clear that he is much more interested in lining up these tools to skew them with patent irrationality, exhibitionism, aesthetic experimentation, humor, emotional attachment, the flat-footed layperson's question and a well pondered transparency bordering on the confessional. These are hardly the attributes invested in scientific confidence, but one may assume that the work in question has a different mission.

Artist Brandon Ballengée has maintained considerably more sobriety in his appropriation of scientific methods. For over a decade, he has conducted serious field research in wetland and other ecosystems, to make contributions to scientific institutions, ecological reclamation efforts and to environmental education through innovative visual forms of documenting and communicating his findings. Some areas of special interest include toxic algae blooms, amphibian population decline and deformities, and the legacies of atomic and chemical pollution. Using selective breeding in controlled genetic colonies of a Dwarf African Clawed Frog of the Hymenochirus family, he has been working for almost the entirety of his professional career to re-establish one species currently believed to be disappearing, if not already disappeared. All of Ballengée's work proceeds through a network of collaboration with scientists and institutions.

Although he exhibits his work for the art-seeking public in the relevant institutions he also integrates contact with other populations into phases of the research and production of his projects. To this end he designs and teaches workshops in ecology, field biology, evolution, genetics and digital imaging for schools and the general public at urban and rural parks, museums, zoos, pet stores and fish markets, and artist residencies in various locations.[5]

Natalie Jeremejinko has literally brought biotechnology to the streets in a long-term project called *One Trees*. From one genetic source she cloned 1000 trees and had over 200 of them planted along sidewalks and in parks throughout San Francisco, a city notorious for microclimates owing to dramatic changes in elevation and the weather patterns conjured by the proximate ocean, bays and not-too-distant Sierras. Like most cities the distribution of its hazardous environmental conditions correlates pretty well to its geography of wealth and poverty. The rhetoric of cloning perpetuates images of multiple cookie-cutter organisms, but as these trees grow to maturity urban travelers can witness for themselves the same variety we

expect from genetically nonidentical trees. The role of the environment in producing phenotypic variety is adumbrated, not only to complicate simplistic formulas of genetic determination, but also to register immediately local conditions.[6]

In another project, *Feral Robotic Dogs*, Jeremejinko has worked with different groups of students to upgrade and repurpose commercially available robotic pet dogs. Drawing on electronic and engineering basics she works with university design students or untrained teenagers to equip the dogs with all-terrain locomotion, wireless communication systems, and sensors for detecting toxins. The hacked toys are then released as "packs" in mediagenic events at sites where the public has reason to be concerned about persistent toxic histories. It turns out a disturbing number of new schools and parks are built on toxic waste sites. A workshop of teens in the Bronx made their own pack and set them loose at the local park to call attention to what a 50-page technically worded report couldn't advertise adequately.

Since then these teens have been invited to every public meeting as consultants on what to do about the park. Their relationship to toys and electronics is changed offering new exits from passive consumption. Their relations to power and their role in their own environment is reengineered to create expectations of participation and the wedge of autonomy.[7]

For many people in the general public, owing to its successfully tendered media campaign, *GFP Bunny* may have been their first exposure to the concept of "BioArt," much less transgenic BioArt, but the subgenre had been extant for some time in various more and less technologically mediaphilic forms well before y2k. The reorganization of value that has accompanied the social and psychic disruptions of the twentieth century has accustomed the public to the continuous migration of art onto unexpected terrain. It is not surprising that the first exodus of artists from the landscape-bearing canvas and into the natural environment itself occurred just as the planet's inhabitants were becoming aware of earth as spaceship earth, a mothership needing parental stewardship itself. The wave began to swell in the 1960s when artists like Robert Smithson and Michael Heizer applied the tenets of conceptual and minimalist art to the field, but its crest was filled out by the first-generation environmental movement, feminism and the utopian perspectives of the 70s. Now the contemporary art

corresponding to the earthworks of a previous generation integrates new technologies, cognizant that technology as much as anything sets the terms of the human relationship to the natural. Nothing makes this more clear than the biotechnologies elaborating the meteoric rise of the life sciences in the thirty-five years since the first Earth Day in 1970.

The question of this paper is, given the volatized identity of art, how do we evaluate BioArt? The category itself has various definitions, each implying a criteria, e.g., BioArt uses the imagery of contemporary medicine and biological research; or true BioArt should actually use and not merely represent biological material. It may follow the imperative that it perform activities loosely recognized as scientific; this requisite may be met by using scientific equipment and/or procedures, and/or making a hypothesis and testing it (no matter how inconsequential the motive question), or the project may be designed to further an inquiry usually considered the province of the life sciences. Or it may aspire to address a controversy or blind spot posed by the very character of the life sciences themselves. What are the problems that come with that turf?

What is the Context for the "Bio" that Informs BioArt?

The explosion of well-funded specializations in biology, notably under the rubrics of genetics, bioinformatics and biotechnology, is very much a function of the ways biology has been adapted to the mechanics of the hegemonic doxa of our time, neoliberalism. As a political economic theory, neoliberalism maintains that individuals and society flourish best when government confines its function to the guarantee and protection of private property, free markets and free trade. This ideology has achieved extraordinary influence through its association with moral notions of individual freedom and human dignity, especially vis-à-vis their perceived enemies: the totalitarian regimes of communism and, since the end of the cold war, Islamic fundamentalism. Promoted this way, the universal human desire for such a system is taken to be self-evident. The necessity of enforcing free markets and free trade through U.S. and European controlled supra-national bodies like the World Trade Organization and the International Monetary Fund, and even by means of pre-emptive war, is

noted as a contradiction by protesters characterized as anti-globalists. From Seattle to Genoa, suppression of protests against the global enforcement of neoliberal rules is only one recent phenomenon that has made the interdependence of market fundamentalists and state power obvious.[8]

Via this ideology anything humans value becomes legally articulated as something to be owned by one party literally at the expense of another: not only real estate, material products and technological inventions, but also the basics of life, health and safety: knowledge, creativity, nutrition, sanitation, medicine, water. Consequently (and certainly not only in the sciences) we have seen a transformation of the living world into limitless possibilities to stake legal property and an inalienable right to profit. Add to this a jurisprudence that grants corporations the rights and protections of individuals and a *de facto* privilege for that status when held by a corporation as opposed to actual individual persons. Situate this in a system of public research and educational institutions that, again in accordance with neoliberal principles, has been gradually defunded and so relies increasingly on corporate partnerships and the generation of patentable, marketable knowledge products.[9] Then drive this entire system around the globe via brutal trade agreements in which intellectual property regimes are enforced by the world's military and economic superpower.[10] This is the context of the life sciences today.

Under neoliberalism, the governance of the vitality and fertility of whole populations, is arrogated by market forces. Looking primarily at the social welfare directives of France in the 1970s, Foucault conceptualized *biopower*,[11] managed by the state in a concert of rational, statistical and behavioral studies, models and incentives. It works through public health, health and life insurance, pension funds, retirement planning, vaccination programs and similar phenomena. However, in the U.S., and now more than ever, pension funds and retirement plans, proper diet and sanitation, vaccination and antibiotics, managed fertility and extended longevity are transferred to the domain of the private under the primacy of the right to property and individualized prospects. The rhetoric of the personal: personal responsibility, personal choice and personal opportunity, delineates a model self-reliant citizen that does not expect these functions from the state, or any democratically constituted macro-subject.

Foucault poses the *norm* as the element that circulates between the disciplinary and the regulatory, applicable to both the individual body and the multiple factor of the population at large.[12] In the discourses of both neoliberalism and biotechnology, the availability of the norm, whether in matters of health, beauty or performance, is sold through the device of the success story. We hear, above the hum of generalized inconsistency, carefully edited narratives such as the rebirth of New York City through tough neoliberal policy after the manufactured fiscal crisis of the 70s; a study in which a breakthrough genetic therapy appears to retard the progress of an incurable disease; or the always in-the-pipeline food crop that will end hunger in the Global South. The promotional apparatus of both biotech research and the market economy promises access to an idealized norm of a continually improved human existence. Obtained at the level of the individual body, it is sold at the level of the mass media, and decisions for the entire population are made on the premise of its widespread availability. However, if it comes through at all, it will only be available to those with the means to purchase it on the market. And a public discourse including any serious reference to a common good quickly gives way to one reminiscent of social Darwinism.

This is the context in which I set out, a little while ago, to formulate a criteria for BioArt. I wanted to establish some measures of evaluation that were not about trying to make a case for BioArt as art in the conventional, vexed, socially exhausted definition of art. The BioArt that I am interested in does not want to become propaganda-ware for the biotech industry. I make the assumption that it wants to address a kind of problem in the world where most people live.

I conceived the problem this way: Science in the service of neoliberalism alienates the nonspecialist whose life is profoundly effected by its commercial application. I am not making a case against specialized knowledge *per se*, which will continue to prove authoritatively recondite to the nonspecialist in many contexts. It is the refiguration of science, still vested with traditional claims to truth and service to the public good, while shaped to narrow market agendas, that requires a new enfranchisement for a broader scope of society. Current mechanisms of alienation function to extend the status quo and thwart public contestation. These operations can be sorted into three principle categories: first, abstraction

and mystification; second, the ambiguous nature of funding, i.e., whether public or private, which effectively obscures the interests involved; and third, legal instruments designed to protect knowledge as trade secrets or private intellectual property. These include patents and material transfer agreements (MTAs), which govern the use of biological research materials as intellectual property. In my schema, I presumed that the artist is a person who creates various forms of interruption of these barriers on behalf of herself and other member of an alienated public. Figure 1 is an example of one of the diagrams I created in this process:

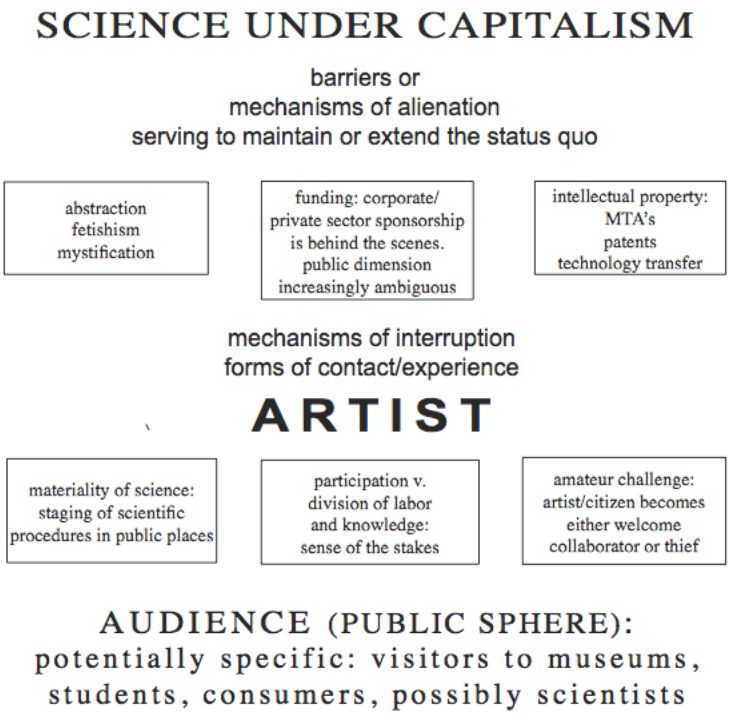

Figure 1

As the diagram shows, I organized possible methods of the artist into categories loosely corresponding to the categories of alienations: staging of scientific procedures in participatory theaters can provide experiences of the materiality of science; initiation across

specialized knowledge fields enfranchises nonspecialists to author new narratives with a perspective on the real stakes involved; playing the amateur, the artist takes pains to find collaborators within scientific fields and /or consents to become a "thief" of privatized knowledge in order to politicize or at least problematize this sequestering (see the case of Steve Kurtz for an example of an artist who built a relation of trust with a collaborating scientist only to be indicted by the U.S. Justice Department as a thief).[13]

I presented my schematic a couple of times and put it away to do a variety of other things. When I returned to it a few months later I found it haunted by questions issuing from the part I had left unexamined. If I were going to base this criteria on a contextualization of the life sciences, perhaps I should do the same for the category of art.

What Frames the "Art" in BioArt?

The canonical art of the late modern period in Western democracies had a peculiar mandate: to be democratic and yet difficult; to be a non-discursive form of communication in a highly diverse society; to be universally recognized as authentic but to offer semantic legibility only to the initiated.[14] Such authenticity is founded on persistent mutations of Kantian disinterestedness. As much as art and science are played as opposite kinds of human endeavor they are both burdened with disinterestedness, especially in the affairs of the world. In science it goes by the idea of institutionalized objectivity. In art it serves the institutionalization of the art act or product, which has no integrated role in daily life. The scientist suppresses personal opinion to voice the truths of nature. The artist delivers her truths through a hypertrophied individualism presumed to be nonconformist.

By now we have many credible accounts for the confounded mandate of art: under a regime of rational instrumentalization, artists asserted the value of the irrational, the useless and the perverse; artists needed to distinguish themselves from the predatory message machines of marketing and mass media which were all about being accessible; artists have been caught up in the avant-garde game of offending the conventional values of the bourgeoisie who prove their own nonconformity by validating the artists who are in turn

supported by the ensuing patronage of their works.

Whatever account we prefer, I want to note the extent to which the harmony between art and the institutions of art's validation has been challenged from within art practice by the artists themselves. In wave after wave the aim or the temporary effect of these challenges has been to make art more relevant to a broader or more diverse population. One recurring feature of these efforts is a radical reorientation of the mechanisms, routes and inclusions of distribution. When I speak of distribution I am referring to the varieties of institutional interface that constitute audiences for artists and/or their product: museums, galleries, art press in the form of professional reviewers and specialized publications, as well as the collectors whose subjectivities and imaginations are captivated by these distribution systems and whose dollars essentially sustain them.

Most of the major discursive and practical interventions in standardized fine art practice that have been historicized as movements have implied or explicitly pursued new or altered strategies of distribution, as the innovations of artists throw curves into this reception device. One may think, for example of the impressionists and the Salon des Refusés, Dada and surrealist artists exhibiting in cafes and dance halls, circulating posters and experimental publications; Fluxus artists, the magazine inserts of conceptual artists, performance art, mail art, cable-access and activist video, community-based art, net.art, etc. However, what is retained at the level of the canon, what is retained at the level of permissible, transmissible DNA, is purged of the disturbance to authorized forms of creativity and unidirectional, centralized distribution. The problem is not just that change in these arrangements destabilizes the investment of billions of dollars, but that change in these arrangements requires validation of other forms of art, artists and creative practice. This in turn destabilizes the charge of the existing distribution system to produce a firm distinction between the professional artist and the amateur. In a society built on democratic ideals, this takes a lot of energy to sustain, and may be one of the reasons why the fine arts are marginalized even as "creative industries" charge ahead.

To put it another way: Since the invention of photography and the development of cheap handheld cameras with cheap available films; the intermittent flowering of Super8, the

invention of video and the proliferation of consumer video equipment, digital technology, home computers, desktop printing, and internet methods of exposure; since the availability of formal education (for those with money or credit) and the incessant visual education of the public by ubiquitous media presence, the value-added forms claiming inheritance of the historic lineage of the fine arts need more and more rhetorically intricate support to maintain their rarified qualification.

Most gallery artists perform to the expectation of their distinction by filtering the semantically obdurate or highly personal gesture through references to the everyday in materials and content. The larger perspective on these dynamics is further complicated when we take into account another development of the concept of biopower which relates it to the well-promoted phenomena of the knowledge economy, referred to also as the information economy, the experience economy and/or the creative class.[15] Under this economic paradigm the individual invests in herself, in her cultural and creative capital—with the immaterial assets of education, cultural adaptability, teamworking, affective and communication skills, signifiers of interpersonal mastery—all toward the goal of optimum performance in the high-end marketplace. Here the same novel forms of self-expression that qualify artists, when integrated with socially skilled business-minded interface, command high remuneration.

Not long ago, ambitious artists had little to gain from higher education. Now more than ever, art school is considered obligatory for learning the system, making contacts and establishing pedigree. While it is unclear to what extent terminal degree art programs are about developing any particular standards, they are clearly expected to consolidate the human cultural capital specific to art world success. If we assume that both are part of the project, how might they relate to each other?

Take this example: a graduate student in a prestigious art school makes work based on popular television shows. She is also very engaged with the fan world, an extensive realm of people who watch the shows, tape the shows, make their own websites, images, video, music and texts based on their favorite shows, characters and stars. These include remakes, remixes, rewrites, collages, etc., some playing with transgression, many highly subjective, some acknowledging the role of the fan, others not. Overall, the spectrum can absorb the work of

the graduate student. At a critique with a group of faculty at the art school the student is asked what makes her work different from the work of any other fan. Specifically she is asked, "Where's the criticality?"

Would that be criticality of the relevant television show? Of the other fans? Of their products? Of the production value of their products? Of the fact that millions of Americans sit in their homes watching TV shows and using their creative energy and consumer equipment to add to television reality while other realities are ignored? Even if they are all real artists, all brilliantly 'critical' of the television show itself, according to what values do we evaluate the experiences or second order perspectives they provide? The trouble with criticality even to the limited extent that artists embrace it is that it is rarely grounded by a well-defined ethical referent. I select this example to indicate the currently deracinated status of criticality. Presumed to be one of the possibilities for marking the ontological distinction between art and popular culture, criticality has become a legitimating effect lingering from the highly intellectualized art practices of the 1980s and early 90s informed by feminist, postcolonial, Marxist, neo-Freudian and queer critical theory. These intellectual platforms were explicitly related to more politicized art and briefly offered something like an ethical structure for meaning in elite cultural production. The undermining of those politicized art practices came about only remotely through the “culture wars” in which elected officials capitalized on moral outrage over indecency in order to eviscerate public funding for the arts (a change in public spending policy consistent with neoliberal principles). Arguably more fatal opposition came from within the artworld itself by critics such as Peter Scheldahl and Dave Hickey in favor of a “return to beauty,” coinciding with the 90s stock market bubble and a boom for investing in beautiful art.

The lasting effects of that moment of political receptivity, like many previous efforts to rearrange the terms of representation and access to resources will be most felt wherever they have been absorbed in cultural practice beyond the high-profile, high-investment artworld. The system that sustains the fine arts as an exclusive professional realm continues to reward those artists who trade on insider knowledge and can best pull off the mystification of their own relation to specialized creativity, without threatening actual social relations.

In some obvious ways, artists face many of the same challenges scientists do in relation to an alienated public. Blockbuster museum shows apart; contemporary "fine art" is a small, misunderstood subculture. Unless its practitioners are willing to change radically the nature of art itself and the apparatus of its distribution, it is hardly a good candidate to significantly redefine the public's relation to science. Moreover, professional artists interested in the life science and subject to career pressure for visibility and the command of resources, tend to select projects according to the same biases driving professional scientists who must command resources to do any science at all. Understandably artists want to address the controversial issues raised by the commercialized life sciences. Unfortunately this can reinforce Big Science's deformation of all meaningful biological inquiry into profit-yielding questions, e.g., genetics, while the urgent project of understanding the stunningly complex field of ecology is being starved. This is often the downside of current ideas of criticality: it becomes another capture device for creative energy that could be redefining value itself at a more vital intersection.

By this time my schema required a double to address its compound object:

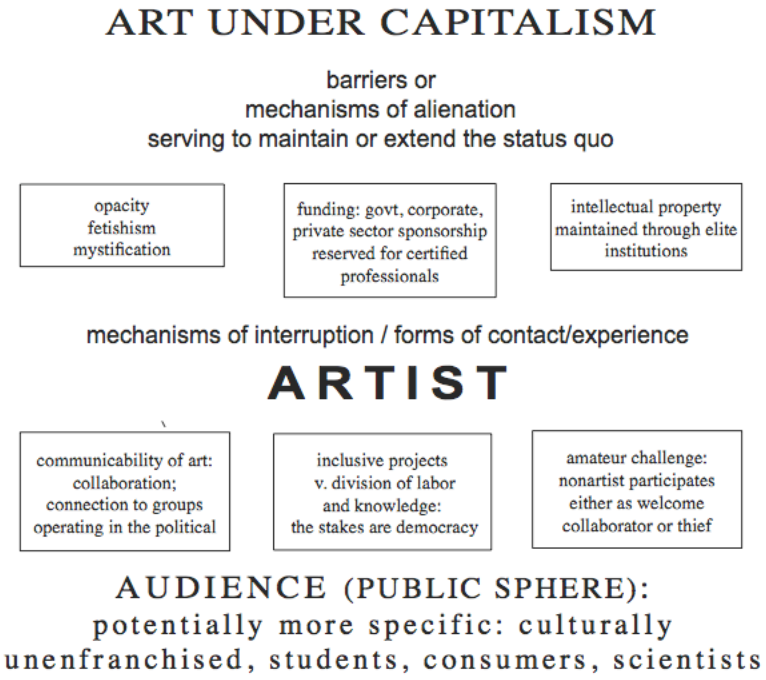

Figure 2

Criteria in the Ecology of Reception

If the reader were to scan again my account of the examples opening this text, I'm sure my biases would be even more apparent than on the first take. Still, it is only just that I should revisit those works now with my criteria in play. What I have proposed is not a point system or checklist, but rather a set of guidelines intended to expose the unique causes and outcomes of artistic efforts, which by their very nature steer us into the territory of the unquantifiable. When we closely examine the supposed members of a category we often find that no one specimen attains all of the attributes of the category. Similarly, I imagine that neither a provisional nor even a more evolved schema will be adequate to the range of situations we are

invited to consider.

Among other things, *GFP Bunny* is about publicly forming a respectful self-to-other relationship with a transgenic animal (in a footnote on his website the artist refers to the work of Martin Buber, most famous for his concept of I-Thou relations). In his quest to have us accept chimerical monsters by bringing a transgenic animal into his family, Kac provides on his website a long essay on the history of human tampering with animals through selective breeding. Unfortunately he does not explain the controversies that may have prompted the scientists at the Institut National to withdraw their participation from the project, nor any of the economic and environmental downsides of genetic engineering, or even how many failures—dead animals—would have gone into the production of one Alba.

Along with playing the piece for sensationalism, the press seemed happy to correlate the bold image of the artist as creator—whose materials now include life itself—with the forward-looking industry. One may conjecture that it is just this connection and the possible impression of irresponsibility engendered therein that the scientists at the Institut National wanted to avoid in the wake of the mad cow and the foot and mouth scandals that had recently shaken public confidence in the UK and Europe. The precise nature of the collaboration is obscure; the "ownership" of Alba is not transparent; the discrepancy between the accounts given by the Institut National and the artist are not addressed. For all its availability to a general public, the project does little to demystify either the artist or the complex, embedded status of biotechnology in oligarchic corporate structures.

The website archives comments from the general public on the destiny of Alba. The opinions collected there are overwhelmingly in favor of the artist getting to keep his rabbit, of the rightness of Alba going home to where she belongs. This archive testifies to the failure of the piece to communicate the complexity of the issues, displacing the controversy to a battle between the individual (artist) and the authority (insensate institution). Having generated this well of sympathy, the artist's handling of the controversy appears at best a missed opportunity to engage the public in a higher level of debate on questions of proprietary technology, safety, the public sphere and how to apply these innovations. However, the notoriety of *GFP Bunny* does offer a useful starting place for discussion between more and less informed people. Even

the amount of text devoted to it in this essay testifies to its seduction as an object of pedagogy!

A striking number of the entries repeat the sentiment best distilled as "how can I get one?" This suggests another outcome: adding one more niche of desire, now for transgenic pets, which a public may decide it is their right to demand. Where most successful (in the desire of parents for genetically advantaged children, in the desire of farmers for products they have been led to believe will arm them against brutal economic odds), the acceptance of experimental genetic technologies is achieved through creating consumer demand for something which defers scientific, social and ethical controversy. In itself, *GFP Bunny* is a well-executed fetish object sustaining the mystification of creativity and the opacity of partnerships, ownership, knowledge partitions and stakes in the life sciences.

While the staged laboratory of *Workhorse Zoo* is patently fictionalized and does not attempt to replicate the microbiology lab in a naturalistic fashion, it is based on an informed index of the materiality of scientific practice. The conflation of the arcane and rational laboratory with the spectral spaces of the gallery and the zoo (emphasizing the metaphoric use of "zoo" as a sort of madhouse) is unexpectedly transgressive. And yet these species and their routine serviceability are indeed the foundations of scientific practice. The artists' relation to authority figures is one of burlesque although they have commanded at least enough resources—intellectual and material, specifically in the support of the Daniel Langlois Foundation[16]—to pull this off. They fully inhabit the figure of the zany artist even while they present a wealth of information about their subject. Introducing more information than it is likely to explain, the piece may engage a public but not satisfy previously held convictions, as abbreviated news forms are likely to do.

While not on the scale of a national news share, the audience appears to have been fairly diverse. As often happens, the exchange of broadcast coverage for hands-on immediacy may press the viewers who actually do confront this peculiar menagerie further toward contemplating the peculiar basis of our scientific truths than would be possible through consumption of a syndicated digest. The fact that Zaretsky has done time as a bench scientist at a prestigious institution somewhat elides the need for collaboration with a credentialed

scientist. But more precisely, construction of the work requires no specialized access—anyone could put it together—so the question of proprietary tools is moot. The utter transparency of the source of everything in the piece from the animals to the foods puts the question of ownership onto the grounds of routine: does acquiring living organisms through conventionalized routes allow anyone to do anything with them?[17]

The audience is induced to question just what relation the artists' antics bear to an actual lab, but the very encounter with this vaudevillian theater of scientific and other persona is likely to lodge questions about scientific procedure persistently in the minds of viewers. I venture that doubts engendered in a setting constructed by credible, specific elements and experienced in a direct, theatrical way are a possible strategy of making the pieces of abridged information that come to the non-science public on a daily basis more meaningful. Warranting new points of entry, these experiences could begin to turn such sound bites into the basis for further questions, to explore what goes on in research labs, why and for whom.

Creating points of access, not so much to laboratory as to field methods, is the foundation of most of Brandon Ballengée's projects. Equipped with a formal education in the arts and not in science, he models the tradition of the amateur naturalist who has much to contribute to the field. Nowhere does this continue to be more germane than in the still young, complex and underserved discipline of ecology,[18] which requires hours of observation and data collection in the field. Shortly after its rise in the 1970s with the awareness of the effects of manmade environmental pollutants, it began to lose ground in university biology departments as the boom in biotechnology and changes in patenting and technology transfer laws made genetics the hub of revenue streams in research.[19] While Ballengée's assiduous fieldwork in amphibian populations and algae blooms is unlikely to attract the media attention of an Alba, it does excellent pedagogical service in the range of workshops and participatory processes he has pioneered in various institutional settings.

If he does achieve the recovery of an extinct species by "reverse breeding" he will be sure to have his day in the general press. The media scene one pictures in such an event is much closer to that surrounding a hopeful shred of news from the environmental front, rather than a gesture replicating "the unique phenomena of a distance" that Walter Benjamin once

attributed to the cult object,[20] in this case the cult being art, science, or both. It is significant that Ballengée's work has developed through working partnerships with scientists and scientific institutions, and that the field he entered without the conventional credentials obviously takes him seriously.[21] It is also significant that he is not a professional scientist and has contributed something different than what that vocation is structured to include, namely the visual, symbolic and communication skills of an artist. Consistent to another tradition of artists, one that may not be favored in "the marketplace of ideas," Ballengée creates and adjudicates socially determined notions of value. The model he offers us is one of self-motivated acquisition of knowledge, committed to values that market-driven science has increasingly abandoned.

Although her proficiencies cover a different terrain, Natalie Jeremejinko's work shares with Ballengée's a dedication to pedagogy and the reorientation of values in the life sciences. Formally educated in both neuroscience and engineering, she has amassed a great deal of expertise—not toward establishing herself as an expert in those fields, but in order to do projects that experts would not do for the realistic fear of jeopardizing their authority. What she retains throughout her endeavors is a feel for the nonexpert: the artistic deftness of *One Tree(s)* and *Feral Robotic Dogs* is to make scientific "data" legible to nonscientists. Legibility is understood as a complex phenomenon including attraction, relevance to common experience, engagement of the senses and adroit interface with popular media.

Projects like these and many others of Jeremejinko's depend on the cooperation of teams of people, not only students but public employees and all manner of interested participants. The collective effort may serve to expand the scope, bring the design through levels of testing and refinement, extend the timeframe, distribute investment, or all of the above. She consents to continue learning and experimenting in a shared arena, preventing mystification of her process.

Neutrality in Perspective

"I don't want it to be too political," I often hear my students say about a project they are working on. I'm not a political artist. I don't want to be too didactic. I don't want to hit people

over the head. I don't like things to be obvious.

Perhaps I should begin to catalogue all the forms of disavowal of the political I hear from practitioners in every field. I'm beginning to think what I really need to understand is how resistance to something called the political has been so well accomplished in a democratic society. Because democracy, the concept and structure which ostensibly does legitimate our government's power over our lives (and deaths), is not a democracy if the people in it are allergic to all forms of political life.

What interests me is the fact that every discipline has a good reason not to be overtly political. In the sciences, including the social sciences, to be perceived as having a politics is to suggest that you cannot step easily from yourself to the objective position of the scientist and back again, a move which is apparently the basis for the field's credibility. In almost any profession with an expectation of responsible decision-making, to have a politics is to jettison good judgment, to loose perspective. In the arts –where expectations for the most part have not included responsible decision-making –being passionate, personal and opinionated are assets, but being political is considered the end of creativity. It is having an opinion that might be collective, that might not be individual, that might not be private, and that might not be free. Because like all values in our particular liberal democracy freedom is understood as private, and one of the jobs of the artist is to perform freedom –but altogether too much in the terms by which our society is most conditioned to recognize it.

As artists we can start formulating the unrecognizable, first by refusing to perform a freedom increasingly defined by conditions that legitimate primacy of the private, private expression, private feelings, private experiments, private intellectual property, private losses, private giving, private destinies. Especially as it becomes undeniable that such a "private" guarantee of freedom is rank privilege accorded to fewer and fewer people, those who already enjoy the lion’s share of security and aesthetic enhancement. In the overweening neoliberal psychology of public life, the rhetoric of privatization has falsely pitted the liberty and the functional diversity of individuals against all forms of collective endeavor. If the artist aims to make an impact on the use of science and related biotechnologies to concentrate resources in the hands of a very few, she must creatively refigure both scientific and artistic practice.

Endnotes

Outfitting the Laboratory of the symbolic

[1] Christopher Dickey, "I Love My Glow Bunny," Wired 9.04 (April 2004).

2 See http://www.ekac.org/gfpbunny.html (accessed September 30, 2006)

[3] http://www.emutagen.com/wrkhzoo.html (accessed September 30, 2006).

[4] Ibid.

[5] http://www.greenmuseum.org/content/artist_index/artist_id-19.html (accessed October 31, 2006).

6 http://www.onetrees.org/ (accessed September 6, 2006).

7 http://xdesign.ucsd.edu/feralrobots/ (accessed September 6, 2006).

8 David Harvey, *A Brief History of Neoliberalism* (New York: Oxford University Press, 2005).

9 As some readers have pointed out to me, publicly funded science brings its own problems, e.g., when civilian access to classified research pursued under military auspices is denied or deferred. Any combination of funding sources for scientific research raises essential questions regarding the purposes of science and the beneficiaries of what are considered its contributions (or threats) to human and other life. When funded by a public tax base in a democracy, those questions are hypothetically up for debate and oversight; the more that labs and personnel once considered publicly oriented become dependent on corporate funding, the more those questions are directed by corporate entities unaccountable to a public. For an excellent overview of the influence of corporations on universities, see Jennifer Washburn, *University Inc.: The Corporate Corruption of Higher Education* (New York: Basic Books, 2005).

10 For a continually updated source on the details of bilateral trade agreements being negotiated far from the public spotlight see www.bilaterals.org. Under >Key Issues >Intellectual Property, they write the following:

> Through FTAs [free trad agreements], BITs [bilateral investment agreements]

and other forms of direct agreements between countries, the US and Europe are insisting that the partner country adopt their standards of IPR protection and enforcement. For many countries, and many peoples, these propositions are nothing short of revolutionary. Because it means they have to

- extend protection for branded drugs and limit parallel imports, hampering the availability of affordable generic medicines
- start patenting plants and animals, which means farmers cannot save seed or reproduce fish breeds or livestock
- get rid of screen quotas that give preference to the showing of local films
- start patenting computer software, to the detriment of local programmers and the creative open source movements now mushrooming up across the world as a cheaper alternative to Microsoft
- extend copyright protection, which already causes serious problems for students, libraries and educational institutions
- clamp down on piracy of popular consumer goods like digital products, clothing and music
- make IPR infringements criminal offences, even though IPR is part of civil law

11 Michel Foucault, March 17, 1976 lecture, in *"Society Must Be Defended": Lectures at the College de France 1975-76* (New York: Picador, 2003).

12 Ibid.

13 For more information on this case, see http://www.caedefensefund.org/ (accessed November 20, 2006).

14 For an especially clear articulation of this paradox see Grant H. Kester, "The Eyes of the Vulgar," in *Conversation Pieces: Community and Communication in Modern Art*, Grant H. Kester (Berkeley: University of California Press, 2004).

15 The concept of a knowledge-based economy was developed by Peter Drucker who coined the term "knowledge worker" in 1959 in the context of the need for new thinking in industrial management and organization. Drucker elaborated his ideas in numerous books and articles.

See Peter Drucker, *The Age of Discontinuity; Guidelines to Our Changing Society*. (New York: Harper and Row, 1969). The "experience economy" is just one example of theories placing the value in the evolution of the locus of "value added" (in goods and services) now in the consumer demand for an experience or memory created by a concert of aesthetically produced directives. See J. Pine and J. Gilmore *The Experience Economy* (Boston: Harvard Business School Press, 1999). See also Virginia Postrel, *The Substance of Style: How the Rise of Aesthetic Value Is Remaking Commerce, Culture, and Consciousness* (New York: Harper Perennial, 2004). The idea of the creative class has been most associated with sociologist Richard Florida who is credited with the term. His identification of an economically powerful, emergent class includes scientists, academics, architects, designers, writers, artists, software engineers, health care professionals and many others whose jobs are knowledge intensive, draw on creative, transferable skills and perform best under flexible nonhierarchical management structures. See Richard Florida, *The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community and Everyday Life* (New York: Basic Books 2002).

16 The project received funding from the Daniel Langlois Foundation for Art, Science, and Technology. "The Foundation seeks to nurture a critical awareness of technology's implications for human beings and their natural and cultural environments, and to promote the exploration of aesthetics suited to evolving human environments." http://www.fondation-langlois.org/html/e/page.php?NumPage=96 (accessed October 31, 2006).

17 *Workhorse Zoo* is similar to *GFP Bunny* in the generous provision of background text on the website documenting the piece. Here Zaretsky and Reodica emphasize the issue of bioethics and animal rights, and each section of their text is followed by a long list of philosophical and other questions to the viewer, each ending with "why is this your belief?" Unfortunately, no answers to the questionnaires are posted. Correspondence with Zaretsky revealed that none were archived, but also that these questionnaires continue to be used by educators using documentation of the work in the classroom.

18 Although many forms of ecological thinking can be found throughout history, ecology as a discipline is regarded as a new science especially given our increasing awareness of its complexity.

19 Jennifer Washburn, *University Inc.: The Corporate Corruption of Higher Education* (New York: Basic Books, 2005).

20 Walter Benjamin, “The Work of Art in the Age of Mechanical Reproduction,” in *Illuminations: Essays and Reflections* (New York: Schocken Books, 1969), 222.

21 Ballengée has contributed specimens to the collections of the American Natural History Museum, The New York State Museum, and the Peabody Museum at Yale University, the Museum of Vertebrate Zoology at U.C. Berkeley. He has collaborated with Dr. James Barron, Ohio University Lancaster, and Dr. Stanley Sessions, Hartwick College, researchers at the Natural History Museum in London, Woods Hole Oceanographic Institution, and many others. He is a field observer for the United States Geological Survey's North American Reporting Center for Amphibian Malformation (NARCAM) and has participated in and instigated numerous wetlands surveys throughout North America. In 2001, he was nominated for membership into Sigma Xi, the Scientific Research Society.