Transbiological Re-imaginings of the Modern Self and the Nonhuman: Zoo Animals as Transbiological Entities

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Abstract:
Biological and behavioral sciences rely heavily on a humanist discourse of species and matter that limits its inquiry to a set of phenomena that in some ways serve, resemble or define the ontology of the human self. In this essay I explore alternative ideas of biology that seriously restructure our thinking about the modern self. If, as Foucault suggests, power-knowledge shapes identities, norms and politics through the medical appropriation of bodies and through the production of scientific theories and practices, then what is the possible challenge to these forms of knowledge? I look at transbiology as a new branch of science that offers an alternative to the mainstream biological exploration of the body and the self, and maps new institutional cartographies of science and most importantly philosophical ontology.

Keywords: transbiology, nonhuman, technoscience, reproduction, zoo animals

Introduction

The notion of transbiology has been developed by Donna Haraway in her book *Modest_Witness,* and later by Sarah Franklin. It is an approach that aims at re-engineering the boundaries of the self, nature and the human by focusing on hybrid entities and shape-shifting categories emerging from the new technological advancements open to biosciences. Franklin looks at the practices of cloning, stem cell research, tissue engineering, and regenerative medicine to investigate modern subjectivity in relation to reproduction, kinship and genealogy.

With Haraway's cyborg and Franklin's sheep Dolly on the horizon, I want to map the new territories and spatialities of transbiology in relation to the nonhuman animal. My point of departure will be the space of the zoological garden. I am interested in how the transbiological reformulations of embodiment, becoming, living and evolving can be applied to the process of re-thinking humanness and animality that occur at the zoo. More specifically, I argue that zoo animals are postmodern, artificially engineered, hybrid entities which not only exist in relation to the human, but to put it even more strongly, they ontologically enable "the human" to exist. Zoo nonhuman animals have been bred in captivity for generations, their genetic material is an object of international trade, and most recently they have become subjects of genetic engineering – all of this makes them fall into the definition of transbiological organisms that are "made to be born."[1] I ask: what is the meaning of a transbiological re-definition of materiality and embodiment in the context of the zoo as an institution? What roles do reproduction and kinship play in this technoscientific realm of the genetic immortality of certain species? My aim in this essay is to test the transbiological inquiry of human/nonhuman relations in the space of the zoological garden in its current historical context, and therefore delineate possible points of fissure in the grand project of Enlightenment humanism. I hope that looking through the lenses of transbiology will allow me to pay special attention to the issues of sexuality and reproduction.

[1] Zoo nonhuman animals share these conditions with domestic and farm animals, however the institutional setting and scientific-epistemic practices to which they are subjected to are different.

Mapping Out Transbiological Imaginaries

I have decided to use transbiology in this research, because as a theoretical tool it helps me present my main argument about the institution of zoological garden. Namely, that it is not at all a space devoted to nature and the animals, but yet not fully to humans either. Taking a position in which the zoo serves as human entertainment only, means being completely blind to the material reality that zoo nonhuman animals are subjected to. Instead, I argue that the zoo is a "contact zone,"[2] to use Mary Louise Pratt's concept, a space where nature and culture intermesh in an irreversibly hybridical manner. That is why I want to make a step away from the painfully humanist path of theorizing about the zoo as an all-too-human panoptical institution, and instead choose to critically focus on contemporary zoo practices and the status of animal embodiment. A transbiological approach to technoscience will guide my analysis, because as the remaking of the biological functions through scientific reconstruction of genetic materiality, it conceptually conceives of animal-hybrid-bodies, which I argue populate the zoological menageries. Before I go into the details of my argument, let me map out exactly what I mean when I use the term transbiology and how it is useful in a project that attempts to crush the myth of human exceptionalism.

Transbiology is deeply concerned with stories of origin – the origin of life, of reversing and controlling the cycles of reproduction, and the place of the body and humanness in these processes. To find the origins of the transbiological field it is necessary to go to Haraway's famous *Cyborg Manifesto* and her figure of the cyborg. It is defined as a "cybernetic organism, a hybrid of machine and organism, a creature of social reality as well as a creature of fiction."[3] In the context of technological advancements and the proliferation of chimerical bodily realities, the cyborg is a highly political entity that grows in parallel to the Foucauldian biopolitical subject. Haraway points out that "cyborg unities are monstrous and illegitimate; in our present political circumstances, we could hardly hope for more potent myths for resistance and recoupling."[4] Moreover, she sees biotechnologies along with communication technologies as tools for re-crafting bodies in a posthuman reality – "cyborg imagery can suggest a way out of the maze of dualisms in which we have explained our bodies and our tools to ourselves."[5] Reproduction and kinship play a crucial role in Haraway's re-thinking of biological discourses, which avoids anti-scientific demonology. It is especially visible in her later work, where the cyborg becomes an offspring of a material-semiotic lived reality, inhabiting "less the domains of 'life,' with its developmental and organic temporalities, than of 'life itself,' with its temporalities embedded in communications enhancement and system redesign."[6]

Haraway's genealogy of embryology has been taken up by Sarah Franklin, who, in her essay "The Cyborg Embryo: Our Path to Transbiology" puts reproduction in the centre of her definition of transbiology, and the ambiguous figure of the embryo (a not-yet-human entity that can have a form of a two-celled zygote, a blastula, or an embryonic body) as the main actor of her analysis. In transbiological laboratories, with stem cell research and tissue engineering on the table, the fusion of the technological and the natural creates new worlds and entities that quickly leave the sterile space of the laboratory and become our everyday companions. Throughout the article, Franklin makes a suggestive comparison between transbiology and the figure of the cyborg. She writes that, "like the cyborg, transbiology is also made up out of the complex intersection of the pure and the impure, where quality and biological control are literally merged to create new kinds of organisms, but this purity is hedged about by pathology of various kinds."[7]

The transbiological organism and the cyborg share the same technoscientific pedigree, but do they share the same politics? It seems that Haraway's cyborg politics was meant to be an emancipatory feminist and socialist project that with a tint of perverse illegitimacy would turn the tables of both, the grim biopolitical scenario and the puritanical myth of scientific control over the natural and artificial phenomena. Transbiology has its own politics that might seem less radical and more bound to the logics of the market in the age of late capitalism. After all, regenerative medicine, IVF (in vitro fertilization) clinics, cloning and stem cell research labs are top biomedical businesses with budgets higher than many countries' health care investments. Franklin notes that "like the cyborg, the transbiological is not just about new mixtures, playful recombinations of parts or new assemblages: it is fundamentally defined by the effort to differentiate

[2] Mary Louise Pratt, *Imperial Eyes: Travel Writing and Transculturation* (New York: Taylor & Francis, 2008).

[3] Donna Jeanne Haraway, *The Haraway Reader* (New York, London: Routledge, 2004), 7.

[4] Ibid., 13.

[5] Ibid., 39.

[6] Donna Jeanne Haraway, *Modest−Witness@Second−Millennium.FemaleMan−Meets−OncoMouse: Feminism and Technoscience* (New York, London: Routledge, 1997), 12.

[7] Sarah Franklin, "The Cyborg Embryo Our Path to Transbiology," *Theory, Culture & Society* 23, no. 7–8 (December 1, 2006): 176, doi:10.1177/0263276406069230.

these dirty descent lines into functional, safe and marketable human biology."[8] Social theorists and philosophers of science often easily take up the notion of technoscientific hybridity as an appealing concept that allows the mixing of social reality and embodied experience, forgetting about the messiness of this operation and the power relations that are not so easily erased from the picture. This is why it is important to remember the hybrids' insubordination and their monstrous lineage that is inherent to corporate scientific creations. Technoscientific objects are not easily limited to any rigid economic, institutional, social and epistemic settings, and tend to spill over the boundaries set up by laboratory standards with rather insubordinate consequences to the material and political realms. This should be the benchmark of a post-anthropocentric turn that I think transbiology as a new language of biology can help us realize. According to Franklin, "*transbiology*—a biology that is not only born and bred, or born and made, but *made and born*—is indeed today more the norm than the exception."[9] I think that this short definition resembles Bruno Latour's argument about western modernity being ultimately a proliferation of natureculture hybrids. For Latour the biggest myth of the Occidental modernist project is that the realm of nature can be smoothly separated from the domain of culture. Paradoxically, the more militant the Westerners become in guarding the boundaries of these two entities, the more impossible it is to neatly separate pure beings that would not be contaminated, or as Franklin says, dirty. It happens partly because the tool that was imagined to be the best at keeping the boundaries non-permeable is science. In his book *We Have Never Been Modern* Latour argues that to be truly modern means to engage in two practices: *translation*, that creates the natural-cultural hybrids, and *purificati*on, that creates two distinct ontological zones of Nature and Culture.[10] The tension between the two zones creates an in-between area populated by hybrids and cyborgs. In this sense, according to the Actor-Network Theory, transbiological imaginary has its origins in the Enlightenment project of modernity and is a product of the scientific revolution. Latour's main argument is that we have never actually been modern, although we are convinced of even being post-modern. Donna Haraway in her book *When Species Meet* titles its first part "We Have Never Been Human" paraphrasing Latour. She writes: "modernist versions of humanism and posthumanism alike have taproots in a series of what Bruno Latour calls the Great Divides between what counts as nature and as society, as nonhuman and as human."[11]

Coming back to Latour, in his later book *Politics of Nature* he tries to show how a human-nonhuman collective would look like and what steps would be necessary in order to make these fuzzy assemblages work. Deeply imbedded in the field of anthropology of the laboratory,[12] he shares Franklin's observation that scientific practice is far from creating risk-free objects with clear boundaries. According to both theorists, any belief in scientific objectivity should have been buried a long time ago. What about the hybrid creatures that start to enter the world whether we like or not? Should we be alarmed by their existence? Latour responds to that concern:

> [W]e do not need a dramatic and mysterious "conversion" to search for new nonhumans: the small transformations carried out by scientific disciplines in laboratories are entirely sufficient. Yes, there is indeed an objective external reality, but this particular externality is not definitive: it simply indicates that new nonhumans, entities that have never before been included in the work of the collective, find themselves mobilized, recruited, socialized, domesticated. [13]

These new domesticated entities come about with the new language of post-molecular biology. The transbiological domain rests on the *trans*-coding between discourses, intensive work of *trans*lation revealed by Latour, and the *trans*fer of both knowledges and material substances. The domestication and wilderness of nonhuman animals seems to be the crucial part of what constitutes the work of translation that is taking part in the zoological garden. I argue that the language of genetic code together with the evolutionist discourse of extinction provide a model for transbiological rethinking of the function of the zoo in its discursive, and most importantly, material form.

The perfect semiotic-material example of the new transbiological language is genetic coding and the gene as a concept that emerged as a central category for molecular biology in the twentieth century. Hans-Jorg Rheinberger analyzed the trajectory of this concept to argue that the gene is an "epistemic thing" – a fuzzy concept with imprecise boundaries. "Such objects" – he writes – "derive their specific historical contours from variable epistemic practices. In classical genetics, the gene unquestionably served as a formal entity that made it possible to explain in the context of ever more ingenious experiments in cross-breeding, the emergence or disappearance of certain characters in subsequent

[8] Ibid.
[9] Ibid., 171.
[10] Bruno Latour, *We Have Never Been Modern* (Harvard University Press, 1993), 10–12.
[11] Donna Jeanne Haraway, *When Species Meet* (Minneapolis, London: University of Minnesota Press, 2008), 9.
[12] Bruno Latour and Stève Woolgar, *Laboratory Life: The Construction of Scientific Facts* (Princeton University Press, 1979).
[13] Bruno Latour, *Politics of Nature: How to Bring the Sciences Into Democracy* (Harvard University Press, 2004), 38.

generations."[14] Rheinberger argues that "what makes a gene a gene" in molecular biology is its impreciseness that later translates also into the imprecise objects of study that are constantly "in flux". He eloquently demonstrates that what we now think about genetics, heredity and evolution is structured by series of translations, negotiations, meaningful mistakes, half-baked definitions and shaky hypotheses that occur both in the laboratory and outside of it. He argues that this impreciseness and fuzziness has positive effects in science: "as long as epistemic objects and their concepts remain blurred, they generate a productive tension: they reach out into the unknown and as a result they become research tools."[15] Maneuvering between concepts like the gene, the molecule, nuon, DNA, genome and integron, Rheinberger traces the new language of post-molecular biology in the sequence of terminological/linguistic shifts "from control to information, message and code, thence to communication and signaling systems, and finally to language itself, to the text, written and read."[16]

From the point of view of this hybrid terminology that eventually enabled the transbiological approach, organisms that become subjects of science can be treated as symbolic, and not just as material outcomes of the scientific machinery. I would like to use Rheinberger's term "contained excess" to examine how zoo animals inscribe into the transbiological imaginary.[17] I treat "contained excess" as the theoretical counterpart of caged animals, because it brings about the zone of indistinction from which hybrid creatures emerge. For Rheinberger "contained excess" equals productive tension coming from the friction of the rough, imprecise edges of scientific fuzzy objects and their work of running into different situations/realities. Latour calls these kinds of objects "hairy" as if they were overgrown with socionatural relations, revealing the work of different actors and actants in their structural appearance. In contrast to the "bald objects" of epistemological naturalism, these fuzzy hybrids "have no clear boundaries, no well-defined essences, no sharp separation between their own hard kernel and their environment. It is because of this feature that they take on the aspect of tangled beings, forming rhizomes and networks."[18] In this sense I argue that zoo animals are contained within the friction zone[19] of culture and nature clashing – they are supposed to stand for wild animals, while at the same time they are exhibited in the middle of contemporary cities in fabricated naturalness. The institution of the zoo itself is hard to be clearly defined. Is it a place of science? Is it an entertainment venue? Or maybe an archive of endangered species that helps to conserve the last reservoirs of wild nature? Therefore, I argue that the zoo itself is a place of contained excess – a bricolage made up from various interconnections between science, the market, and a specific kind of ecological politics.

However most importantly, it is the zoo nonhuman animals that are truly transbiological, fuzzy objects. Franklin notes that "transbiology is real, material, factual and consequential in all of the senses that Latour articulated so vividly in his account of the birth of new entities such as somatostatin, which become not only things, objects, stable functions, but part of a genealogy of other objects 'sedimented' through their increasingly routine use to become the taken-for granted conditions of the world around us."[20] In this sense, zoo nonhuman animals are often taken for granted as just being there in the space of the zoo. I suggest looking at these nonhumans from a different perspective, as organisms that have been subjected to series of genetic manipulations, trainings, trade and also torture. I look at zoo animals as having a long history of scientific appropriation and colonial past. I would even dare to say that zoo animals are transgenic creatures, because of their ambiguous relation to the environment they are forced to inhabit, and their supposed function in the space of the zoo. I find it extremely ironic that a cheetah is exhibited in a space with fake rocks and an African savannah landscape painted in the background of its wall. A plaque with the description of the specimen refers the visitors to a certain place in Ugandan jungle, while the actual cheetah is fourth generation zoo attraction bred in a laboratory and bought from another zoo. I will now explore this paradoxical relationship between animal embodiment, its environment and discursive framing of its existence, along with new possibilities posed by the transbiological approach.

Trans-zoological Encounters

I decided to investigate the zoological garden from the perspective of transbiology, because most analyses of the zoo are limited to a spatial and visual analysis of this institution. I will first exemplify this approach in studying the zoo.

[14] Hans-Jörg Rheinberger and Timothy Lenoir, *An Epistemology of the Concrete: Twentieth-Century Histories of Life* (Duke University Press, 2010), 154.
[15] Ibid., 156.
[16] Ibid., 213.
[17] Ibid., 156.
[18] Latour, *Politics of Nature*, 24.
[19] Anna Tsing, "Unruly Edges: Mashrooms as Companion Species," *Unruly Edges: Mushrooms as Companion Species*, n.d., http://tsingmushrooms.blogspot.com/.
[20] Franklin, "The Cyborg Embryo Our Path to Transbiology," 178–179.

Irus Braverman in her article "Looking at zoos" seeks to go beyond the Foucauldian notion of panopticism.

Despite this declaration, she ends up glorifying "the importance of vision in the zoos' presentation of animals as well as the major technologies that are used to intensify such animal visions."[21] Randy Malamud in his book fully devoted to zoo stories, *Reading Zoos*, also places a lot of emphasis on zoo spectatorship. Investigating humans more than animals, he argues for closeness between spectatorship and voyeurism or even exhibitionism understood here as social disorders. "Zoo spectatorship" – he writes – "is passive, minimally imaginative, cheaply vicarious, at least slightly distasteful, conductive to a range of socially inappropriate or undesirable behavior, and inhibitive, rather than generative, of the creative experience and appreciation of nature."[22] However problematic this graphic and clinical equation of spectatorship and voyeurism might be, Malamud makes an argument against the objectification of zoo animals. By exposing (and in a way condemning) the erotics of the zoological gaze of the visitors, he also points to the resemblance between the zoo and panopticon – another classic trope in theorizing zoo. Following Foucault from *Discipline and Punish* Malamud suggests that the zoo semantically and institutionally reiterates the prison's surveillance system. Foucault actually wondered if Jeremy Bentham, the famous architect of the Panopticon was inspired by the construction of La Vaux's menagerie at Versailles: "one finds in the programme of the Panopticon a similar concern with individualizing observation, with characterization and classification, with the analytical arrangement of space. The Panopticon is a royal menagerie; the animal is replaced by man, individual distribution by specific grouping and the king by the machinery of a furtive power."[23] Not to deny the intense power relations that permeate the zoological institution, but this kind of framing is bound to purely historical accounts of the zoo machinery and in some ways it commits the common sin of a classically poststructuralist approach in the humanities – it fetishizes the event of the Enlightenment and its imaginative power over the present. In this way it never gets to the point of seeing the zoo in its current form, and therefore omits new kinds of practices and power relations that spring from technological advancement and that occur at the "backstage" of the zoo.

Malamud notices that "the spectator's position is circumscribed by paradox: the zoo promises it will allow them to see everything, but they may really see nothing."[24] Indeed, from the perspective of the visitors the complicated machinery of the zoological industry remains largely concealed. The curious and arrogant gaze of the audience of the zoological spectacle is spared the view of a different technological spectacle that takes place behind the scene. I argue that the contemporary zoological garden is closer to a hi-tech laboratory than to a prison. Most importantly, this technology is all about reproduction and sexuality.

According to Donna Haraway "transgenic creatures, which carry genes from 'unrelated' organisms, simultaneously fit into well-established taxonomic and evolutionary discourses and also blast widely understood senses of natural limit."[25] This description of a transbiological organism could be easily applied to zoo nonhuman animals. The "genes from 'unrelated' organisms" do not necessarily mean that they are from different species; the "unrelatedness" is a crucial factor for zoo scientists who control and plan animals' mating in order to avoid interbreeding. The goal is to create another healthy specimen that will "fit into the taxonomic" table that the zoo exhibits. Despite the fact that the whole story of the zoo's genetic manipulations is wrapped up in an ideological framework of wildlife conservation, ensuring biodiversity or even rescuing "endangered species", one of the main reasons for introducing these cautious and sophisticated breeding plans and costly IVF technologies is that due to international treaties and commerce law it is often impossible to acquire specimens from "the wild" anymore. Nigel Rothfels in his essay on immersion exhibition as a new trend in zoo practices, writes: "When we hear about the impressive Species Survival Programs (SSPs), in which accredited zoos work together to breed endangered animals, we are not supposed to trace their origin to the difficulties of obtaining new wild-caught specimens in a world of international laws and treaties designed to protect animals from commercial trade."[26] Species Survival Programs are part of zoo propaganda that is actually all about saving the institution from extinction. The new immersion exhibitions promise zoo-goers not only a better, more realistic imitation of nature and an exciting encounter with exotic animals, but also pad the conscience of zoo spectacle consumers. The zoo ticket is promised to be a "ticket to paradise" for endangered species, as part of the fee is supposed to go nature conservation in "the wild". However, let's not forget that the technology invested in recreating a piece of a Congolese jungle in the middle of the Bronx has to pay off too. Rothfelds concludes that "the point is that elaborate new high-

[21] Irus Braverman, "Looking at Zoos," *Cultural Studies* 25, no. 6 (November 2011): 810.

[22] Randy Malamud, "Zoo Spectatorship," in *The Animals Reader: The Essential Classic and Contemporary Writings*, ed. Linda Kalof and Amy J. Fitzgerald (Oxford, New York: Berg, 2007), 220.

[23] Michel Foucault, *Discipline and Punish: The Birth of the Prison*, trans. Alan Sheridan (New York: Vintage Books, 1995), 203.

[24] Malamud, "Zoo Spectatorship," 222.

[25] Haraway, *Modest−Witness@Second−Millennium.FemaleMan−Meets−OncoMouse*, 56.

[26] Nigel Rothfels, *Representing Animals* (Indiana University Press, 2002), 217.

tech immersion habitats/enclosures/cages for primates and pandas and other animals—exhibits that make celebrities out of the animals and out of the zoo directors—seem only to generate a need for more spectacular exhibits and more spectacular animals."[27] In addition, only certain animals are good celebrity material, as the recent panda-mania, or whale obsession after the movie *Free Willy* seem to demonstrate.

What kinds of technologies are employed in a contemporary zoo? The landscape immersion revolution that Rothfelds talks about requires modern equipment to produce "jungle sounds" from camouflaged speakers, fake mountains with computer systems hidden inside to manage the temperature, air humidity and light intensity. Some plants are not real, some branches are made out of epoxy, steel and urethane, some trees are just replicas; the waterfall is controlled by a computer program and can be easily shut down. Recently visitors have also been encouraged to look up information and watch short presentations on LCD touchscreens situated near the cages with nonhuman animals on display, or to pick up cards with a QR barcode that after being scanned by a smartphone will lead you to the zoo's website. Every new generation of planners and designers create virtual worlds and landscapes believed to do a better job of re-constructing and mimicking nature. Nowadays, they promise a "shift in zoo philosophy, from the 'homocentric' perspective that had long prevailed to a 'biocentric' ethic more in tune with the environmentalism of the day."[28] This ideological stagecraft is the modern bioparks' trademark. As Jeffrey Hyson noticed, "the ecological exactitude that planners so admire in contemporary exhibits seems to be utterly lost on most visitors—a situation that seriously compromises any claims for the educational power of environmentalist landscape architecture."[29]

Apart from these popular entertainment industry alterations of the zoo exhibition, there is another side of technological immersion. I am referring here to medical technologies, which are the most interesting from the point of view of transbiology. Zoo nonhumans exist in an artificially created environment that is supposed to be a perfected, better "nature" for them: "food is plentiful and more and more interesting; parasites are carefully managed; sicknesses are combated with the full range of modern medical technologies."[30] With an army of veterinarians and teams of biologists, the zoo manages animal welfare and ensures reproductive success for animals who are now "freed" from the dangers of the wilderness, where diseases, poachers (a very racialized category in the zoo rhetoric), and the destruction of their natural habitats seem to lurk behind every non-plastic tree. Special feeding plans and antibiotics are necessary to make some of the animals survive in an environment that is far from their natural habitats. The difficult process of acclimatization is technologically boosted, so that penguins can survive in the Singapore Zoo and meerkats in Budapest Zoo.

It wasn't always like that – the rates of animals that died because of and during the transfer to new climate zones and failed acclimatization were much higher in the 19th century. Part of the reason why, is due to the fact that animals which populate the zoos nowadays are quite distant relatives of those first founding specimens. Just as the invention of antibiotics was a breakthrough in human history, for zoo nonhumans it was also a revolutionary step.[31]

The biggest zoological gardens have modern laboratories as part of their institutional setting. The title of one of Bruno Latour's essay "Give Me a Laboratory and I will Raise the World" could be an accurate description of the zoo lab – inside a production and re-modeling of critters happen as parts of recreating the natural world in a miniature. Latour writes that "the very difference between the 'inside' and the 'outside', and the difference of scale between 'micro' and 'macro' levels, is precisely what laboratories are built to destabilize or undo."[32] Microlevel scientific negotiations taking place in the zoo laboratory later translate into macro-societal changes in the form of the aforementioned discourse on wildlife conservation and ecological principals as part of the zoo's rhetoric. Moreover, Rothfelds argues that "the enthusiasm with which zoo professionals have embraced such reproductive technologies such as in-vitro fertilizations, frozen-thawed embryo transfers, and nuclear transfers to 'reproduce' particularly endangered or charismatic species such as elephants, pandas, great apes, and African wildcats suggests just how deeply the idea of the zoo as an Ark has resonated within the zoo world."[33]

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27 Ibid., 218.

28 Jeffrey Hyson, "Jungle of Eden: The Design of American Zoos," in *Environmentalism in Landscape Architecture*, ed. Michel Conan (Washington: Dumbarton Oaks, 2000), 23.

29 Ibid., 40.

30 Rothfels, *Representing Animals*, 202.

31 Bruno Latour, *The Pasteurization of France* (Massachusetts and London: Harvard University Press, 1993).

32 Bruno Latour, "Give Me a Laboratory and I Will Raise the World," in *Science Observed. Perspectives on the Social Study of Science*, ed. Karin Knorr and Michael Mulkay (Sage, 1983), 143, http://www.bruno-latour.fr/articles/article/12-GIVE%20ME%20A%20LAB.pdf.

33 Rothfels, *Representing Animals*, 217.

Reproduction lies at the heart of zoo's scientific laboratories. A recent story from the Chicago Zoo about the breeding of lowland gorillas revealed different factors of control over animals' reproduction, and the technology involved in making a successful genetic match. According to the BBC article "zoo biologists use genetic analysis, demographic statistics and keen familiarity to plan the sex lives of their charges. Their goal is to avoid inbreeding and produce healthy offspring."[34] They use computer analysis to pair a genetically suitable couple. Genetic tests, a software that traces pedigree way back to the wild, and international databases all become intrinsical elements of the breeding plan. The reasons for such careful calculations are partly revealed by Sarah Long from the Population Management Center at the Lincoln Park Zoo: "We're not getting new founders... wild-born animals. Now zoos are more focused on preserving what we have."[35] Later the article shows that the female gorilla was even given oral contraceptives before the biologist thought it would be appropriate for the couple to mate. Oftentimes, the sexual act is excluded from the breeding process by the use of IVF technology - the conception of new specimens takes place on a Petri dish in the laboratory. Some zoos even specialize in breeding certain species, and are well-established brokers of animal gametes on the international zoo market. The rescue from extinction is provided by gametes and tissue samples being preserved cryogenically.

While Malamud argues for "the zoo as a venue for symbolically playing out issues of human sexuality – straightforwardly or ironically", I try to switch the attention from human animals to the control of the nonhuman animals' sexuality and sex lives.[36] Maybe it does not strike us as much as it should, because we are used to pets, domestic and farm animals being objects of human genetic manipulations for centuries. Yi-Fu Tuan argues that a sentimental attitude towards domestic animals developed in Western Europe and later in North America from the 17th century onwards.[37] He sees the reason for that in the growing distance between humans and nature. "Wild animals"—he writes—"and even farm animals were becoming less and less the common experience of men and women in an increasingly urbanized and industrialized society."[38] Interestingly, this alienation from nature coincides historically with the menageries and zoos emerging as new sites of human-animal encounter. Judging from the examples of pets and zoo animals, the affection towards animals with which humans try to reconnect takes a form of total control of their reproduction and sexual behaviour.

Genetic immortality, designed kinship structures and controlled genealogies – these seem to be the main components of the zoo's transbiological enterprise. The result is that zoo animals are "made to be born." Some specimens are more valuable than others, due to their specific characteristics, genetic make-up, or simply a better pedigree. Sarah Franklin in her essay on human reproductive practices wrote that thanks to the IVF method people commit to "the cycle of the removal of 'natural' limits through technology."[39] If one thinks of the nonhumans, the same technology is used to remove limits of breeding in captivity that is often a huge obstacle for certain species. But can one really compare zoo animals to lab nonhumans? I argue that this comparison is not only justified, but even valuable as something that might reveal layers of human-animal relations that occur at the zoo – some of which have been obscured by too much focus on spectatorship and the human side of this posthuman relationship. This relationship is thick from layers of colonial exploitation, multiple re-demarcations of the human/animal boundary, centuries of scientific manipulations, animal capital, bioethics, legal frameworks, battles between architects and landscape designers, ecologists, and finally environmentalists who have stepped in recently. I argue that investigating these many layers could help in understanding the connections between kinship, descent, species, sexuality, reproduction and science. This perspective is similar to Franklin's approach in her book *Dolly Mixtures*, devoted to the infamous cloned sheep, where she "tries to situate her emergence as part of the history of agricultural innovation and its close connection to life sciences – in particular reproductive biomedicine."[40] Digging into Dolly's genealogy and the rich significance of her existence to the politics, medicine, ethics and economics, Franklin manages to reveal the historical trajectory that made the sheep a biosocial entity, queering the notions of the biological, cultural, technological and political. With the new form of reproduction (trangenesis) Dolly still belongs to the long history of animal husbandry, control over their bodies and reproduction, and even imperial expansion. Franklin writes: "because Dolly's assisted creation out of technologically altered cells confirms the viability of new forms of coming into being, or procreation, her existence can be seen to redefine the

[34] Daniel Nasaw and Matt Danzico, "The Science and Heartbreak of Zoo Romance," *BBC*, December 5, 2011, sec. Magazine, http://www.bbc.co.uk/news/magazine-15725454.
[35] Ibid.
[36] Malamud, "Zoo Spectatorship," 226–227.
[37] Yi-Fu Tuan, "Animal Pets: Cruelty and Affection," in *The Animals Reader: The Essential Classic and Contemporary Writings*, ed. Linda Kalof and Amy J. Fitzgerald (Oxford, New York: Berg, 2007), 150.
[38] Ibid., 151.
[39] Sarah Franklin and Helena Ragoné, eds., *Reproducing Reproduction: Kinship, Power, and Technological Innovation* (Philedelphia: University of Pennsylvania Press, 1998), 108.
[40] Sarah Franklin, *Dolly Mixtures: The Remaking of Genealogy* (Durham, London: Duke University Press, 2007), 1.

limits of the biological, with implications for how both sex and reproduction are understood and practiced."[41] What she calls the "remixing of sex" shows how the transbiological imaginary thoroughly affects reproduction, sex, and sexuality. Later in the book, Frankling mentions how cloning is associated with the fear of same-sex reproduction.[42] She draws on Jackie Stacey's analysis of science-fiction cinema that featured new genetics. Stacey notices: "The reproduction of sameness through sexual difference is no longer so straightforward when the means for assuring its continuity are new technologies of replication that trouble the authority of paternity, inheritance, and heterosexuality in the cultural imagination."[43]

I want to point to the close relation between Dolly and zoo animals. The futurism of the zoo's genetic research shifts the discussion toward the topics of extinction, immortality, and even toward the possibility of turning back time by reproducing species that have already gone extinct. These kinds of magic tricks have already happened before – for example the attempts to recreate aurochs, an ancestor of domestic cattle that went extinct, started in Germany in the 1920s. Brothers Heinz and Lutz Heck, both directors of zoos in Berlin and Munich tried to "breed back" the aurochs by selective breeding of their domestic descendants with the biggest phenotypical resemblance to the extinct species.[44] Their project continues till today. The Polish Foundation for Recreating Aurochs established in 2006 has already extracted DNA material from bones and horns of museum specimens of the ancient ox.[45] Scientists plan to use the cloning method and modern biotechnology to bring these creatures that went extinct over 400 years ago back to life. Another project called "TaurOs Project" by a Dutch Foundation called "Stitching Taurus" mixes the Heck brothers' approach and the biotechnological method.[46] Dutch scientists select DNA sequences from primitive breeds of cattle to match it with the aurochs DNA from museum samples. With these kinds of projects that proliferate in zoos all around the world another layer needs to be added – the national dimension of animals' genetic manipulation. It is not a coincidence that Polish scientists are attempting to recreate aurochs – a symbolic, strong and magnificent animal that appears on many cities emblems and takes people back to the "glorious" past of their country. New biotechnologies promise almost infinite possibilities for zoos to reproduce and re-create specimens, but also to invest in post-modern animal totemism, by feeding some people's politics of ressentiment.[47]

Conclusions

In this essay I have argued that zoo animals are hybridical, transbiological entities that activate different registers of politics, science, and economy. They resist extinction and a linear understanding of evolution by existing as technologically enhanced creatures, sharing bloodlines with Haraway's transgenic mouse and Franklin's cloned sheep. Zoological laboratories can be understood in terms of Rheinberger's "contained excess", which ends up releasing productive tension for re-thinking certain categories that are widely used in science and everyday life. While he looks at the concept of the gene, I would like to suggest that transbiological negotiations that occur at the zoo transform concepts of species and reproduction. Donna Haraway notes that:

> The word *species* also structures conservation and environmental discourses, with their 'endangered species' that function simultaneously to locate value and to evoke death and extinction in ways familiar in colonial representations of the always vanishing indigene. The discursive tie between the colonized, the enslaved, the noncitizen, and the animal—all reduced to type, all Others to rational man, and all essential to his bright constitution—is at the heart of racism and flourishes, lethally, in the entrails of humanism.[48]

The transbiological zoo nonhuman animal bears the history of colonization, animal husbandry, national pride and genetic appropriation. Imbedded in the past as a symbol of biological and environmental conservatism, at the same time it "mixes sexuality" as a product of an alienated nature. Positioned somewhere between wilderness and domestication, the embodied reality of zoo animals makes them part of the transbiological imaginary. As species-types they are supposed to be perfect examples of their kinds, but as they are subjected to the same technology that created

41 Ibid., 5.

42 Ibid., 203.

43 Jackie Stacey, "Masculinity, Masquerade, and Genetic Impersonation: Gattaca's Queer Visions," *Signs: Journal of Women in Culture and Society* 30, no. 3 (March 2005): 1873, doi:10.1086/426798.

44 Cis van Vuure, *Retracing the Aurochs: History, Morphology, and Ecology of an Extinct Wild Ox* (Pensoft, 2005).

45 Katarzyna Burda, "Wrócą Tury Do Natury?," accessed April 25, 2012, http://www.newsweek.pl/wydania/1195/wroca-tury-do-natury,58488,1,1.

46 "Project TaurOs," *Project TaurOs*, n.d., http://www.stichtingtaurus.nl/cStdPage.php?ref=54&userID=5a026820ac22db0fc627bb00ac22f4d5.

47 Friedrich Nietzsche, *The Genealogy of Morals*, ed. Horace Barnett Samuel (Courier Dover Publications, 2003).

48 Haraway, *When Species Meet*, 18.

the sheep Dolly, they queer the pathways of genealogy, reproduction and descent.

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