



ARTICLE

NODE "ORGANICITIES"

Cryptobiologies

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Submission date: May 2006

Published in: November 2006

Abstract

This essay explores the relation between animality and biotechnology, focusing both on contemporary issues, such as "biodefence", as well as historical issues, such as the Mediaeval bestiary. Animality—as the human capacity to "think the animal"—is found to exist within the networks and passages that both constitute and threaten social, economic and political life.

Keywords

biotechnology, animality, genetics, animal, epidemic, biological warfare, monster

Resumen

Este ensayo trata la relación entre animalidad y biotecnología, centrándose tanto en cuestiones contemporáneas, como la «biodefensa», como en cuestiones históricas, como el bestiario medieval. La animalidad —como la capacidad humana de «pensar el animal»— se encuentra entre las redes y conductos que tanto constituyen como amenazan la vida social, económica y política.

Palabras clave

biotecnología, animalidad, genética, animal, epidemia, guerra biológica, monstruo

There is a great deal of code-making and code-breaking in biotechnology. We “crack” the genetic code, “decode” the genomes of various organisms, “encode” those codes into actual computer databases, all to help us decipher the information of disease-causing agents, which themselves are able to evade medicines by their rapid rate of genetic mutation. Yet, in the midst all this talk of codes, we often forget that many of the applications of industrial biotechnology result not in codes but the flesh of “life”: mice, sheep, pigs, goats, and so on. Their use in livestock breeding, transgenics and medical research suggest to us that we have not only decrypted the “code of life”, but we have advanced to a level where we can “encrypt” life in the form of these unique animals.

However, our relationship to animals is at best a complicated one. The history of Western thought on the topic can be viewed as a continued effort to separate the human from the animal (Aristotle’s description of man as a “political animal”, Descartes’ formulation of the *bête machine*, the debates surrounding *The Descent of Man*). The search for the set of characteristics that would definitively separate human from animal often presumes a clear division between the natural and the artificial, or what we would refer to today as biology and technology. Yet even a cursory look at biotechnology today suggests that something is afoot. What happens when we produce animals that are not “natural”? What do we make of these biologies that are also technologies? Are they of nature, of technology, or of something else entirely? How do we relate to these non-natural, even super-natural animals?

What I would like to do here is to briefly present three cultural relationships between human and animal, relationships that not only challenge us to rethink the animal, but also the human. In an everyday sense, we coexist with animals of all types, from our domesticated dogs and cats to the animals displayed in the meat, poultry and seafood sections of the grocery. We call to animals, and we also eat animals. We develop, with our pets, unique modes of communication, and, with our food, we also develop unique modes of consumption. In this everydayness of the animal, in this quotidian relation we have with animals, we as human beings practise this dual form of orality—communicating and consuming, speaking and eating, word and flesh.

But what of animals that are not everyday? What of human-animal relationships that are far from ordinary, but are rather extraordinary? Of course, exotic animals can also be pets, in which case the exotic becomes everyday. So perhaps a better question to ask is, are there instances in which the human-animal relationship occupies a grey zone in between the everyday and the exceptional, the ordinary and the extraordinary?

Biotech Animality

Genetic engineering as applied to animals occupies a curious position in Western, technologically-advanced cultures. It is at once

the most hi-tech and esoteric method of working with nature, and yet its applications are the most quotidian (food, pets). Certainly, breeding techniques have been known for many, many years, and their applications in domestication and farming have been documented by archaeologists, anthropologists and historians. However the introduction of genetic engineering techniques into the biotech industry in the 1970s has had a profound impact on the way we view the human-animal relationship—an impact we are undoubtedly still witnessing. To take a few well-known examples: genetically-modified organisms (GMOs), which, in the broadest sense, may be taken to include microbes (e.g. bacteria that digest oil spills), the whole range of cloned mammals in science research (Dolly, but also cloned mice, cows, pigs, monkeys), the field of transgenics (e.g. goats genetically engineered to produce human insulin in their milk), biotech livestock (meatier chickens, fatter pigs, etc.), and of course genetic engineering applied to domestic pets (e.g. allergy-free cats).

These and other examples constitute our contemporary biotech “bestiary”, a whole new “natural history” of the biotech zoo, a whole new classification system of previously impossible creatures, hybrids and teratologies that would seem to be more the domain of fantasy than fact. Certainly, science fiction itself often speculates on the possibilities of such impossible beings, but what is equally fascinating is the moment at which such seemingly impossible *biologies* cross a certain threshold and become everyday *technologies*. Our perplexity in attempting to comprehend the very existence of GMOs, transgenic animals, cloned mammals and genetically engineered pets is an indicator of the grey zone occupied by this biotech bestiary.

Like the mediaeval bestiary, our contemporary biotech bestiary is filled with beings that resist category, animals that frustrate systems of classification—the “set” of all animals that have no set. By definition, the impossible animal, the fantastic being, the monster, are all forms of unnatural life, or even life that cannot—or should not—exist. But more than this, the monster also throws up a challenge to the very concept of “nature” and of our relation to and distance from that which we call “natural”. From the early modern era to the 19th century, the study of monsters (derived from the Latin *monstrum*— “to warn”) is this attempt to comprehend the animal being that does not “fit”, the animal life that has no home, no “proper” place. Teratology—the study of monsters—is a documentation of this animal displacement. From Ambrose Paré’s *Des Monstres et prodiges* (1573) to Geoffroy Saint-Hilaire’s *Histoire Générale et Particulière des Anomalies, ou Traité de Tératologie* (1832), the treatise on monsters is, in a sense, a classification of unnatural life or life that should not exist. Such studies are positioned between naturalistic explanations of anomalies and a range of supernatural interpretations. Monsters oscillate between being divine prophecies, a display of the “wonders of nature” and medical-scientific errors deviating from a norm.

In his delightful *Book of Imaginary Beings*, the Argentinean author Jorge Luis Borges discusses our dual fascination with the “real”

animal kingdom and with the impossible animals that inhabit myth and folklore: “Let us now pass from the zoo of reality to the zoo of mythologies, to the zoo whose denizens are not lions but sphinxes and griffons and centaurs. The population of this second zoo should exceed by far the population of the first, since a monster is no more than a combination of parts of real beings, and the possibilities of permutation border on the infinite.”¹ Borges compiled his book prior to the era of genetic engineering, but it is tempting to read his comments on hybrids and recombination in relation to our current biotech bestiary. We might even wonder if there exists a whole “micro-monstrosity” of viruses, bacteria, fungi. This is the term used by philosopher of science Georges Canguilhem, who, a few years after the Watson-Crick publications, wondered if the historical interest in teratologies has been transformed into a current concern with “information”, “noise” and “error.”

Becoming Microbial

Surely we as human beings are more than the microbes that inhabit our bodies and that sustain many of our biological processes. Microbes, strictly speaking, are not “animals”—they are microbes. We are animals... we think—except that our thinking about our animality makes us more than animals. Yes (we say to ourselves), we are more than our microbes. Except, of course, when “our” microbes are not ours (infection), or when “our” microbes are always coming-and-going (contagion). The biological processes of contagion and infection always elicit a certain anxiety and fear for us, and for good reason. Contagion and infection are more than mechanisms of antigen recognition and antibody response; they are, as our textbooks tell us, entire “wars” and “invasions” continuously fought on the battle lines of the human body (to which autoimmune disorders add degrees of metaphorical complexity).

Contagion and infection are paradoxical processes. They elicit a rigorous “defence” of the body’s boundaries, and yet we as living beings are defined by our continuous exchange of matter and energy with our surroundings. Only certain things are allowed to pass, only certain things are exchanged. All of this denotes a systems-wide, *network* perspective. It is no accident that computer networks, economic exchanges and cultural ideas have been described in terms of viruses (computer viruses, viral marketing, memes). There is an abstract topology, a network form, that pervades each of these systems. They are constituted by “nodes” and “edges” (dots and lines) that have variable rates of exchange and connectivity. Such networks have several forms, or topologies, each with an analogous control structure: centralized, decentralized and distributed. It is for

this reason that many “network science” perspectives have studied biological and computer viruses interchangeably: the microbe is the “message” that is passed along channels of contagion (the edges) between each person (the nodes).

Thus, the “war” that takes place in contagion and infection is not simply limited to the body’s interior; it is also a conflict that is scaled up, as it were, to the level of the population, and indeed, the nation. This is the point where virology and immunology fold onto epidemiology and public health. The task of public health agencies is thus to distinguish “good” circulations (travel, trade) from “bad” circulations (virulent microbes). What public health organizations such as the WHO and the CDC call “emerging infectious diseases” are networks in this way. Microbes establish networks of infection within a body, and networks of contagion between bodies, and our modern transportation systems extend that connectivity across geopolitical borders (“global health”).

However, it is misleading to say that microbes “do” this or that they “do” that, as if they were little homunculi with malintent. But it is equally misleading to simply say that we humans “do” this or “do” that, especially as most epidemics involve many factors that include microbial evolution, drug-resistance and environmental factors, in addition to the more human concerns of education, preventive practices and prescription drugs. Indeed, if microbes are in some way synonymous with networks, then the whole question of agency is rendered problematic. It is this that incites the greatest discomfort. How is it started? How can it be stopped? How can it be prevented? Not only do the networks of contagion and infection render human agency and control problematic, but, when we take into account all the factors that go into an epidemic, we see as many “nonhuman” agencies as human ones (e.g. viral mutation, bacterial resistance). Representations of epidemics in popular culture—from Daniel Defoe’s *A Journal of the Plague Year* to contemporary zombie films such as George Romero’s *Land of the Dead*—can be understood as cultural reactions to this strange, fearful, “nonhuman life” of microbial networks.

In fact, we are still unsure as to whether viruses are living or non-living—they seem to be simple assemblages of matter without the ability to independently reproduce, and yet recent research has revealed their troubling ability to genetically mutate and exchange genetic material with a host organism. Virologists such as Luis Villareal (echoing the work of Lynn Margulis) have suggested that the old question of the living/non-living status of viruses is superseded by another question: the role that viruses have played in evolutionary processes, whether or not they are “alive”. It seems that microbes are not only very, very old, but that they have developed innovative ways of living with (and inside) us human beings. Should we say the

1. Jorge Luis Borges (1974), *The Book of Imaginary Beings*, Norman Thomas di Giovanni (tr.), New York, Penguin, p. 14.

reverse as well, that human beings have developed innovative ways of living with microbes?

Whatever Life

One of the hallmarks of contemporary U.S. biodefence policies has been the implosion between emerging infectious disease and bioterrorism, a collapse of a distinction in cause in favour of a unity in effect. Nowhere is this more evident than in the conceptual—even ontological—articulations performed in the language of biodefence. For instance, the U.S. 2002 Bioterrorism Act contains at numerous points a refrain, one that can also be heard in other national and homeland security documents: “bioterrorism *and* emerging infectious disease”. The opening sections of the Bioterrorism Act give public health administrators the ability to develop strategies “for carrying out health-related activities to prepare for and respond effectively to bioterrorism and other public health emergencies, including the preparation of a plan under this section”.² Here, the word “and” plays a central role in the document as a whole, implying a certain quality of *whatever*: the notion that “bioterrorism and emerging infectious disease, it makes no difference which”, that is also a notion of “whichever it is, it matters a great deal”.³

However, the most remarkable consequence of this implosion is in what the “and” enables in the way of public health practices. As part of a broad endeavour to facilitate biodefence research, the U.S. Project BioShield has, since its announcement in 2002, allocated funding for the development of “next-generation medical countermeasures” such as drugs, vaccines and diagnostics. In 2003 the U.S. National Institute of Allergy and Infectious Disease (NIAID), a department within the National Institute of Health (NIH), received a multi-million dollar award for research into “human immunity and biodefence”. Later that same year, NIAID officials released a progress report outlining their research goals. The report states that the “increased breadth and depth of biodefence research not only is helping us become better prepared to protect citizens against a deliberately introduced pathogen, it also is helping us tackle the continuous tide of naturally occurring emerging infections...”.⁴ Distinctions in cause are effaced by the biological latency of the disease-causing agent, a latency that is also social, political and economic—precisely because it is biological. Indeed, it is this notion—that biology is more-than-biological because

it is biological—that can be said to be the conceptual foundation for the flurry of biodefence legislation in the U.S. since 9/11: The Bioterrorism Act, Project BioShield, the Biosurveillance Project, the National Electronic Disease Surveillance System (NEDSS), the National Pharmaceutical Stockpile, as well as a host of classified bioweapons projects.

However, we can note a more fundamental issue at stake in these developments, and this surrounds the problematic of biological “life itself”. By this phrase I mean the ways in which the domain of the biological—a shifting and discontinuous domain, to be sure—is articulated as a problem of control, regulation, and modulation, a condition that Michel Foucault has described as “biopolitical”.⁵ The problematic of biological “life itself” also denotes the ways in which the domain of the biological is rendered as technically specific (in viruses, bacteria, genomes, vaccines) as well as a pervasive, general, even existential, condition (the presumed facticity or givenness of “life itself”). For Heidegger, one of the ways in which *Dasein* or Being reveals itself is in the *Angst* associated with the very fact of existence. This *Angst* is to be differentiated from the fear of particular things and the particular threat they represent; thus *Angst* is not fear. “That about which one has *Angst* is being-in-the-world as such... What *Angst* is about is not an innerworldly being... The threat does not have the character of a definite detrimentality which concerns what is threatened with a definite regard to a particular factual potentiality for being. What *Angst* is about is completely indefinite.”⁶

Except—and this is the crucial difference—Heidegger’s distinction revolved around the question of *Dasein*, and not the question of biological “life itself”. In fact, for Heidegger, the question of “life” was not a question at all, for the sciences of biology and psychology, in their asking of the question “what is life?” mistakenly presume to have already answered the more fundamental question “what is Being?”.⁷ However, while Heidegger dismisses the question of biological “life itself”, what we are witnessing in the ontology of biodefence is a certain conceptual displacement. Whereas Heidegger contrasted the question of Being (in terms of *Angst*) with the question of life (as “fear”), today we have a reformulation of the latter in terms of the former—an *Angst* that is about biological “life itself”. In biodefence, *Angst* is correlated to biological “life itself”. That about which one has *Angst* is the pervasiveness of the biological as threat, as what is threatened, and as response. “The fact that what

2. Title XVIII, Subtitle A, Section 2801. The full title is *The Public Health Security and Bioterrorism Preparedness and Response Act of 2002*.

3. Giorgio Agamben (2003), *The Coming Community*, Michael Hardt (trans.), Minneapolis, University of Minnesota Press, p. 1.

4. U.S. National Institute of Allergies and Infectious Disease (NIAID), “NIAID Biodefence Research Agenda for CDC Category A Agents: Progress Report” (29 September 2003).

5. The phrase “life itself” refers to a concept employed by molecular biology researchers in the 1950s and 1960s (foremost among them Francis Crick), as well as its more critical use in science studies by Richard Doyle, Sarah Franklin, Nicholas Rose and Donna Haraway.

6. M. Heidegger (1996), *Being and Time (Sein und Zeit)*, J. Stambaugh (trans.), Albany, State University of New York Press, § 40, p. 174 [186].

7. *Ibid.*, § 10.

is threatening is *nowhere* characterizes what *Angst* is about.”⁸ The logic of biodefence—that “life itself” is an indefinite and indeterminate threat—culminates in a social, cultural and political *Angst*, a biological *Angst*, an *Angst* of “life itself”. Here the problematic of “life itself” is how to articulate, within the domain of the living, that which is threatening versus that which is threatened, resulting in a peculiar type of “existential biology”.

Occult Biologies

If contagion and infection can be seen as networks, and if such networks incite fear in us, in part due to their “nonhuman” character, how do we comprehend this ambivalent, affective dimension to biological “life”? Writing about the politics of public health response to disease, Michel Foucault notes that plagues have historically elicited two responses: a “poetic fantasy of lawlessness” (social anarchy, the “dance of death”) and a “political fantasy of total control” (quarantines, pesthouses, death tables). Foucault’s comments ask us to view contagion and infection as being more-than-biological—as social, cultural and political as well.

A historical look at epidemics reveals this aspect of the more-than-biological. For instance, epidemics are often found where there is war or military conflict. Thucydides remarks that, during the Peloponnesian War, there were rumours of the wells being intentionally poisoned—a possible early example of biological warfare. The mediaeval practice of catapulting diseased and/or decaying cadavers of soldiers and animals would carry this further. The Great Plague of London in 1665 took place in the midst of civil war, and it was no accident that Thomas Hobbes would compare civil dissent with a “diseased” body politic in his *Leviathan*. Epidemics are not only found in the midst of war but they are often interpreted in ways that are more than medical or natural. During the Black Death, which ravaged most of Europe in the mid-14th century, the predominant explanations were, unsurprisingly, religious. Italian and German chroniclers of the period note the predominance of religious processions, “flagellant” groups, and the apocalyptic exhortations of popular soothsayers. In the era of European expansionism, disease—which often accompanied imperial and colonial enterprises—was often interpreted by both colonizer and colonized as a sign of divine retribution or providence, depending on the point of view.

It is with scientific hindsight that we have since “historicized” such supernatural interpretations of epidemics: the plague bacillus, we explain, was carried in fleas, living on rats, themselves populous aboard merchant ships travelling between southern Europe and the Mongol region. But an exclusive reliance on medical facts—however

useful—obscures the ambivalent, affective cultural dimensions of epidemics. The bacillus-flea-rat connection is perhaps culturally reflected in religion, myth, folklore—from the Brothers Grimm modernization of the “Pied Piper of Hamelin” to Werner Herzog’s expressionist tribute *Nosferatu*—there is an entire cultural history of plague to be written. Such a history would have to feature animals, not just as carriers of disease, but as carriers of disorder, filth, impurity—even as carriers of divine retribution. Rats, bats and packs. There are always many of them; it is rarely a single rat, a single flea, a single bacillus that is the harbinger of disease. French philosopher Gilles Deleuze notes that there are three types of animals: anthropomorphic, domesticated pets (the mirror of the human), our scientific species (official, institutional, “state” animals), and finally there is a third type of animal, the “pack” or the “swarm” animals, the animals that do not exist except as many—animal multiplicities. They are not “a” bee, but a swarm, not “a” bird but a flock, not “a” bacterium but an epidemic. This latter animal is traditionally interpreted as an underworld animal, an animal without head or face, a demonic animal—“I am legion”.

Weird Biology

We return again to the question of the animal—or rather, of “animality”. In the case of “emerging infectious disease”, animals as groups often become the links between human and human (mad cow, monkeypox, bird flu, etc.). But beneath this is another level of animality, that of microbes passing between organisms, microbes exchanging genetic material in networks of contagion and infection. Is this too an instance of animality? In modern fiction, the under-appreciated genre of “supernatural horror” is replete with examples of a contagious, swarming “life” that is also radically non-human and unnatural—H.P. Lovecraft’s ancient, formless “Shoggoths”, Clark Ashton Smith’s primordial, amorphous “Ubbo-Sathla”, Frank Belknap Long’s surrealistic “Space Eaters” and the entire dark matter bestiary of William Hope Hodgson’s *The Night Land*. For this reason, formless, pack or swarm animals—even when presented as epidemics—show us an animality that we *apprehend* but do not *comprehend*. The writer Georges Bataille reiterates this: “The animal opens before me a depth that attracts me and is familiar to me. In a sense, I know this depth: it is my own. It is also that which is farthest removed from me, that which deserves the name depth, which means precisely *that which is unfathomable to me*.”⁹ And our apprehension of such animals is ambivalent, precisely because they symbolize radical, non-human transformations. This is why supernatural explanations predominate in historical instances of plague, and this is also why

8. Ibid., p. 174.

9. Georges Bataille (1992), *Theory of Religion*, Robert Hurley (tr.), New York, Zone, p. 22.

the genre of supernatural horror is the domain in which we find “nameless offspring” and “logical monsters”.

To say that we as human beings cannot really know what it is like to be an animal would be commonplace. But to ask what it would be like to be a pack, a swarm, a flock—this is the question of animality. It is a more “abstract” question, a question not of species, genus and organism, but of topologies or patterns that effortlessly cut across

species. The threshold of our understanding is not between human and animal, but rather between humanity and animality. As Jorge Luis Borges notes, “we are ignorant of the meaning of the dragon in the same way that we are ignorant of the meaning of the universe, but there is something in the dragon’s image that fits man’s imagination, and this accounts for the dragon’s appearance in different places and periods”.¹⁰

Recommended citation

THACKER, Eugene (2006). “Cryptobiologies”. In: “Organicities” [online node]. *Artnodes*. Iss. 6. UOC. [Date of citation: dd/mm/yy].
<<http://www.uoc.edu/artnodes/6/dt/eng/thacker.pdf>>
ISSN 1695-5951



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10. Borges, p. 12.