

# Double-Rabbits and Cockroaches: Sketches from the Transgenic Bestiary

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## I. Introduction

In the Anthropocene – that is, in the epoch defined by man’s impact on the Earth – new questions have arisen regarding the relationships between animals, mankind, and machines, as well as plants and stones. Such questions do not concern the special position occupied by mankind, but rather the technical shape of the environment, the co-existence of different species, and also the cosmopolitan transformation of the concept of species itself and thereby its forms of reflection, such as those classified under the term *speciesism*. These issues also affect the relationship between art and science. What would otherwise generally be debated in separate arenas has found a forum for the exploration of similarities, for intermingling and interdisciplinary work, and not only through the efforts of artistic research. Recent developments in Media Art (BioArt) and Media Studies, along with a historical fascination with related issues, have been largely responsible for this trend. As can be demonstrated, there has been a genuine biologisation of the concept of media. In both artistic practice and in media theory, the concept of media is no longer limited to physical and engineering interpretations; increasingly, a biological concept is the focus of attention.

In this context, I would like to consider two examples – rabbits and cockroaches – that will permit me to examine this area of fascination, linking it to a methodological plea for a specific scientific field: a Media Studies enlightened by the cultural sciences – historically aligned, technologically informed, concerned with aesthetics, and guided by (social) theory – a field that will elevate changing environments and their impact upon humanity to the focal point of its analysis.

## II. Double-Rabbits

Literature has always reflected the various negotiations involved in the context of the manipulation of people and of animals. This is not solely a product of our contemporary views on species, as can be found in the books of Dietmar Dath or Margaret Atwood, in which living beings are narratively exploited in a way that could theoretically fall under the definition of *speciesism*. The realm of dreamed-up things has always been pertinent to real-world circumstances, in that there the unintended effects of nuclear explosions are acted out and alternative blueprints for organisms are realized. In Arno Schmidt's *The Egghead Republic: A Short Novel from the Horse Latitudes* (*Gelehrtenrepublik. Kurzroman aus den Rossbreiten*), published in 1957, these types of mutations have long since become dystopian reality: Multiplicity (such as hexapodia) and cross-species breeding are the rule in the novel's view of the future year 2008 – at least, in the location of the main action, a hominid preserve (*Hominidenstreifen*) in the American West where the bizarre results of mutations caused by radiation are kept under careful quarantine. Schmidt's early vision of organic combinatorics creates a dystopic scenario that reveals what can occur when species boundaries become unstable as the result of a man-made catastrophe. In contrast, if we consider not the grotesque multiplicity of limbs and intermingling of creatures but rather their sheer productivity, the setting becomes almost utopian. The reader encounters a world in which reproduction is ennobled rather than condemned – a realization of what we extol as the ability to process on parallel or multiple levels, or multi-tasking.



Fig. 1: Multitasker 1 (animal)  
<http://desconjunturas.files.wordpress.com/2009/10/multitasking.jpg>  
(retrieved on 16.04.11)



Fig. 2: Multitasker 2 (female)  
<http://desconjunturas.files.wordpress.com/2009/10/multitasking.jpg>  
<http://shaadomanthra.blogspot.com/>  
(retrieved on 16.04.11)

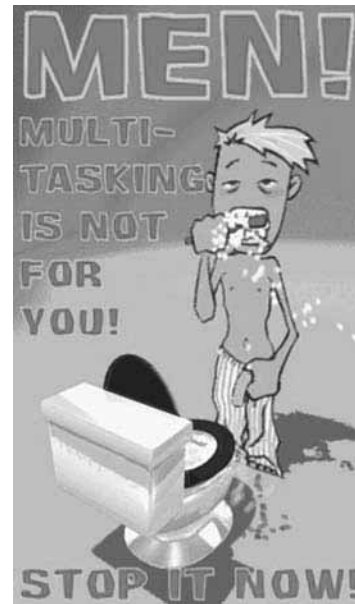


Fig. 3: Multitasker 3 (male)  
<http://belli.twoday.net/stories/5110361/>  
(retrieved on 16.04.11)

These creatures capable of multi-tasking may well be particularly suited to meet the everyday needs of the modern world; however, they also introduce a specific type of animal to the scenario. At the centre of these considerations is not a diffuse monstrosity, but rather a calculated productivity in the sense of parallel processing. Many-legged animals such as octopus, polyp or the mythical kraken guide the iconography and serve as apt illustrations of such efforts, especially at the origin of all economics, namely informatics.

In this regard, a certain point should be particularly emphasised. This concerns the possibility that a concept of division and multiplication could be framed in such a way that it would not be reflexively attributed to the field of psycho-pathology, but rather elevated to represent the fundamental challenge of a new economics. This new schizophrenic multiplicity shall be its principle orientation. This vision will be reflected and mediated in various settings, which despite their scattered nature would seem to have a common focal point. The type of multi-tasking introduced by the American mentalist Harry Kahne, who astonished audience in the 1920s with his »Multiple Mentality« act, is not far removed from the current speculations being made in the field of biological engineering.



Fig. 4: Harry Kahne, mental marvel and daredevil from Keiths Theatre, amuses the cross word puzzle fans as he works a puzzle backwards, while being hung from the top of one of Washington's tall office buildings, 1925. Library of Congress, National Photo Company Collection.  
[http://www.slate.com/blogs/the\\_vault/2012/12/03/harry\\_kahne\\_the\\_mental\\_marvel\\_was\\_capable\\_of\\_doing\\_six\\_things\\_at\\_once.html](http://www.slate.com/blogs/the_vault/2012/12/03/harry_kahne_the_mental_marvel_was_capable_of_doing_six_things_at_once.html)  
(retrieved on 16.04.11)

Kahne, who was capable of writing simultaneously using all four extremities and his mouth, and also of processing up to six tasks in parallel and in all imaginable poses, was an obvious choice for recognition as the proto-multi-tasker *par excellence*. His unique feature, the basis for his enormous popularity and marketability, was his octopod, was his krakenesque multiplicity. The Swedish artist Lars Sitberg transforms this enthralling quality into art in his video works, especially *Ambidextrous Performance* from 2006, which exhibits and reflects the fascination with ambidexterity in a simple fashion.



Fig. 5: Lars Siltberg in: *Multitasking – Synchronität als kulturelle Praxis*, ed. von der Neuen Gesellschaft für Bildende Kunst und die Europäische Medienwissenschaft, Berlin 2007, 84.

Again, this imagery that connects Kahne's feats and also Siltberg's performance art with scientific speculation, the subject of so much debate, could not be more fundamental. It relates directly to the current discussion about the opportunities and risks of technology that (under the umbrella term *transhumanism*) is creating a furore far beyond the ivory towers of academia – not least due to its highly relevant consequences for the definition of mankind and the design of future ways of life. Jean-Marie Lehn, the pioneer of submolecular chemistry and winner of the Nobel Prize in Chemistry in 1987, presented his considerations on the matter under the title *The freeing of mankind from the chains of evolution and the dichotomy between the natural and the unnatural*.<sup>1</sup> The occasion for his remarks was a conversation about the future of mankind and technology, more specifically concerning whether new scientific discoveries would enable us to live forever – and whether such a future would actually be desirable. When asked about the possibilities offered by synthetic biology (which he helped to establish), Lehn invoked examples from the field of multi-tasking.

What initially seemed harmless and perhaps a bit facetious – the possibility to simultaneously swallow and breathe – quickly led to more fundamental questions connected not only to the iconography of parallel-processing performance artists and housewives, but also to the mutations arising from radioactive contamination. Why, the chemist and nano-technician mused, would it not make sense to breed a human with wings or with four arms? In light of the results of transgenic manipulation in the field of embryology, this should be a relatively minor undertaking. Such experiments have long since shown positive results, as Lehn

<sup>1</sup> Tobias Hülswitt, Roman Brinzanik, *Werden wir ewig leben? Gespräche über die Zukunft von Mensch und Technologie*, Frankfurt/M. 2010, 100-117.

explained with reference to the work of the Swiss embryologist Walter Gehring, whose laboratories in Basel have produced flies with functioning eyes on their legs; the possibility of having extra hands (here, the scientist makes an effort to maintain cultural balance) would enable him to play four-hand compositions at the piano without a partner. Lehn evinced little patience for the idea (expressed by his conversation partner) that such experiments would reach and perhaps even exceed the boundaries of humanity. He countered this notion with the basic precept that man-made things cannot be unnatural and that these changes would themselves represent a part of the evolutionary programme. Why not also strive for the ability to accompany oneself at the piano or, by means of a natural process, to acquire wings and fly?

Far from the contemplated realities of such scientific interference, in his novel *Doctor Katzenberger's Journey to the Spa*, the author Jean Paul (1763-1825) describes an eight-legged double-rabbit, whose curiously multiplicitous condition attracts the greedy eye of the anatomist Katzenberger. Jean Paul links the physical form of the double-rabbit to an economic calculation – involving, of all things, an early communication system.



Fig. 6: Conrad Lycosthenes, *Wunderwerck* [...], Basel 1557, Reprint, ed. P. Hohenstein Weidmann and P. Michel, Hildesheim 2007, fig. 17.

Here, it is not the idea of playing piano four-hands with oneself, but rather the efficiency of a messenger system with relay stations for changing horses that serves as the imagined application for a miraculous animal equipped with a double set of rabbit legs:

»The doctor looked at the rabbit with eyes almost slaving and yearned to snatch him up like an eagle. »I am, said the man, jumping to the side with a frown, a pharmacist of this town, and I am the owner of this curiosity. Looking is permitted, but there can be no touching before the purchase. However, I will turn it on all sides, as I see fit, for this creature has no equal in the country or on earth.« »I beg your pardon,« said the doctor, »but in the royal cabinet in Chantilly, a similar double-rabbit was preserved that was one rabbit on the back of another, as if a spatula could turn it to run in relay, allowing it to travel on fresh legs while the other four stretched out in the breeze, resting as they rode.«<sup>2</sup>

For all the ironic humour of such situations, the speculations associated with the four-handed piano player and the doubled messenger creature nevertheless attest to the continuity of a specific source of fascination based upon the increase of one's skills and thereby one's advantages. But there is more to this idea: The speculations concerning transgenics indicate that its character can switch between difference modes of intervention – between nature and culture, between operations involving cultural techniques and real interventions, between dream machines and technical realizations, between literature and laboratory, between science and fiction, and between humanism and transhumanism. However, it is also evident that the outlines of this idea's configuration have remained stable. Regardless of context and the degree of realization, personal reproduction here plays a leading role, or at least represents a factor in such a system. Connected thereby are essential questions of supervision, controllability, and the complexity of such processes within an entity that could previously consider itself to be a discrete entity, at best an individual. Phenomena such as the ambidexterity with hands and feet displayed by Kahne become an opportunity to consider questions of responsibility and processes of regulation, and ultimately to decide whether genuine forms of parallel processing are involved or whether certain activities merely simulate such processing. In brief: an opportunity to resolve the dilemma of *how many* the individual in question actually is, how many he merely *seems* to be, and through what operations the status of such multiple value might be endangered (or have been endangered).

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<sup>2</sup> Jean Paul, *Dr. Katzenbergers Badreise*, in: *Jean Paul's sämtliche Werke*, 24. Bd., Berlin 1842, 64.

### III. Cockroaches

I now turn to my second creature. Here, the cockroach is of interest not so much as the object of taxonomic terminology, but rather as the attractor of a certain type of cultural knowledge and its phantasmal nature. In this regard, the German cockroach, or *Schwabenkäfer* (the vernacular and pejorative term), has an understandably unsavoury reputation. As an unloved storage pest, it has demonstrated tireless diligence in rebuffing efforts to control it, and has been, despite all aspersions, a worthy opponent. The common cockroach is regarded as sinister – as a threat.



Fig. 7: Werbepostkarte des Kakerlakenvernichtungsmittels Elimin. Farbige Fotolithographie, Zürich, Orell Füssli, circa 1893 (own collection).

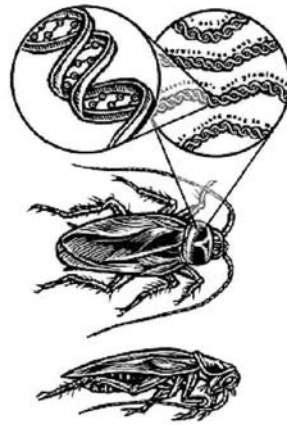
Recounting the history of the cockroach would be a truly exhausting endeavour. Where, in what way, which representative of which genus, in what setting, what physical damage it causes, what idiosyncrasies have predestined it to inflict so much damage in terms of cultural



fears, what roles its animalistic qualities (such as its speed, its sly pauses, its ability to camouflage itself, its resistance to all imaginable environmental conditions) play – all these are details that any such history, in equal parts laborious and entertaining, would have to include. But because the story told here does not focus on this cat-and-mouse game between man and insect, this aspect can be kept relatively brief. The setting is America at the very end of the twentieth century. On the occasion of the millennial celebrations, the *New York Times* and the Museum of Natural Science advertised a competition for the »New York Times Capsule« with the goal of preserving the actual state of the second millennium for posterity, whatever the future might bring. The entry of the American virtual-reality apologist Jaron Lanier was among those rejected by the judges. Under the title *Cockroach Libraries*, his proposal suggested that cultural transmission with its fragile media be replaced by biological transmission.

What Lanier's contribution recommended was no less than the attempt to implement in the heart of New York City a living archive based on transgenic manipulation. Philippe Codognet, a French philosopher, outlined the project. Its background context was the news that the development of technical storage media had reached a point at which alternatives would be required. According to the philosopher's assessment, »Living organic storage could quickly become more convenient and useful than digital archives and the plastic support of CDs, DVDs, and Sony Memory Sticks.« This prediction can be complemented by reference to the tradition of written transmission – clay tablets, parchment and paper, scrolls and books deposited in libraries and archives – that is, by reference to every item of information in the Gutenberg galaxy that should lead to precisely the cultural semantics to which the genetics project aspires. Above all, this recalls the concept of the »book of life«, the basis of science historian Lily E. Kay's influential monograph that opened the door to the public awareness of genetics. This awareness has continued to grow, in part due to the aestheticization of DNA and its manifold involvement in so-called BioArt. Lanier's project takes the semantics of writing at its word, quite literally. The living archive of his cockroach library is based on a specific quality of DNA: its redundancy. This redundancy is generated by the »introns«, which represent a large percentage of the genome; their information, which has no apparent purpose, is transmitted intergenerationally. Lanier describes the technical process as follows:

»Once an archive is selected, it will be written into a computer file and coded into DNA base pairs. The sequences will then be synthesized by conventional protocols. Then the archival DNA will be ligated into cockroach intron DNA via injection into eggs.«<sup>3</sup>



*Jaron Lanier's Archival Cockroaches*

Fig. 8: Philippe Codognet, »De Docta Ignorantia. Transgenic Cockroaches as Living Archives«  
<http://pauillac.inria.fr/~codognet/santa-barbara.doc>  
(retrieved on 04.01.2011).

However, because any consideration of storage necessarily involves precise numbers, there is a focus on the plan's realizable capacity as well as on its price. With regard to capacity, according to Lanier, the creatures are made to order. His calculations of the coding process reveal the amount of information one can programme into the cockroaches and the costs this would incur: »A single cockroach's introns will easily be able to contain the articles, letters, and other primary texts of one full year's editions of the *Times Magazine*. [...] The cockroach easily has over a billion base pairs in its introns, which will have a capacity to represent over 250 million letters.«<sup>4</sup> With respect to cost, Codognet points to the accounting procedures of American biotechnology firms, which assess fifty cents per base pair for the generation of a DNA sequence – at least, at the time of his deliberations. Coding an ASCII-format letter (that is, using a seven-bit format) would by his estimation cost two dollars.

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<sup>3</sup> Lanier quoted from Philippe Codognet: »Transgene Archive«, in: Sven Spieker (Ed.), *Bürokratische Leidenschaften. Kultur- und Mediengeschichte im Archiv*, Berlin: Kulturverlag Kadmos 2003 (copyrights; Bd. 13), 223–242, at: 228.

<sup>4</sup> Lanier quoted from Philippe Codognet: »Transgene Archive«, *ibid.*, 228.

Naturally equipped with the property of self-reproduction, this process would create a cost-effective cultural memory that would be as untroubled by worries over its survival as the carrier would be over its content. And the cockroach libraries would enjoy an additional advantage: Not only would they be indestructible, but they would also over the course of time become a natural part of their cultural environment. As Lanier explains, »Within approximately fourteen years, the archival roaches will inexorably become so endemic as to become an ubiquitous and permanent feature of the island [of Manhattan].«<sup>5</sup> In the cockroaches of Manhattan, submissively operating as unknowing agents of an archive they cannot access, the Book of Life would be made flesh – or, to be entomologically correct, made chitin.

But what are the advantages of the cockroach? Owing to its enormous resistance to radiation, it could shield stored data, allowing it to survive natural catastrophes and also nuclear scenarios. This characteristic of the humble roach was reported following American atomic bomb tests at Bikini Atoll; it is thus no wonder that this photophobic insect has roused the interests of various groups. Re-imagined as cyborg beetles, they have long figured as the incarnate representation of the border between organic life and technology, between living things and robots. This includes (but is not limited to) technologically upgraded roaches that for whatever reasons of importance to humans could undertake various tasks for their masters, for example, investigating contaminated areas with radiation gauges in the form of backpacks.

However, mankind is not solely interested in the selfish exploitation of the abilities of animals for its own purposes. Humans would like to come closer to animals, to be able to communicate with them. Although the subject of communication with animals has often been discussed, resulting in a rich narrative of entertaining animal stories, the study of social behaviour is quite new; it is only recently that ethology has expanded beyond the study of contact between members of the same species or closely related species. How animals deal with their own kind and their observers (often patronising, interfering humans) has always been a concern. However, it is not how grey geese interact with other grey geese under the observation of Konrad Lorenz that is of interest, but rather their social behaviour in an environment that includes creatures of another orientation or construction. By means of biorobotics and the development of so-called »insbots«, the social behaviour of roaches will finally be investigated.

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<sup>5</sup> Lanier quoted from Philippe Codognet: »Transgene Archive«, *ibid.*, 229.

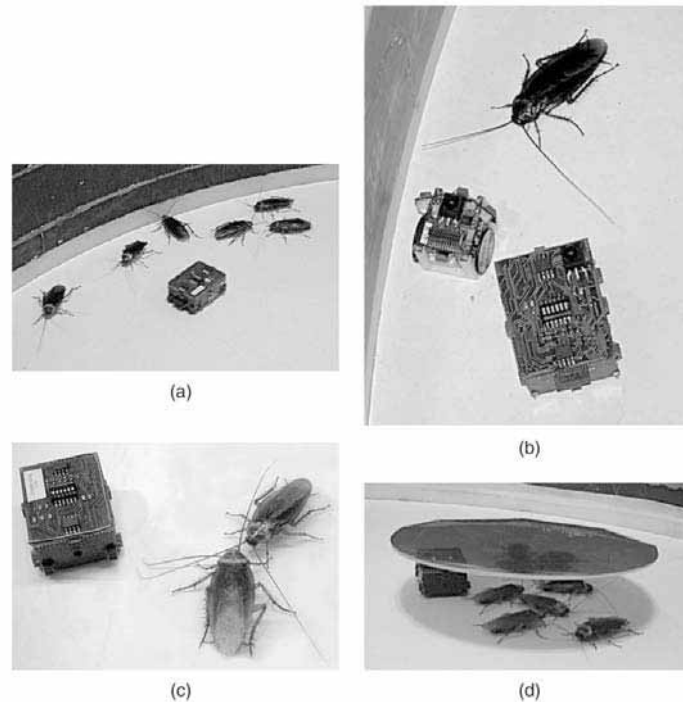


Fig. 9: Gilles Caprari et al., »Animal and Robot. Mixed Societies. Building Cooperation Between Microrobots and Cockroaches«, in: IEEE Robotics & Automation Magazine, June 2005, 58- 65, at: 59.

With this innovation, matchbox-sized mini-robots enter the picture. In an almost provocative manner, the technical design of the robots renounces the approximation of the insect's form, instead striving for proximity. The robots thus employ a double objective: to imitate the social behaviour of the insects and to stimulate contact. This enables the insbots (as well as the cockroaches and also insbots of other sorts) to explore and specify their environment and its built-in safeguards. As the author of a related study describes, the main objective is »to establish a social interaction with [the insects]«. <sup>6</sup> Although the discussion of social interactions is still cautious and the research attempts have been limited to the dimensions of an experimental setting, other researchers have taken the consequences of changes in the social order between organisms and technology quite seriously. With an article titled *Animal and Robot Mixed Societies: Building Cooperation Between Microrobots and Cockroaches*, the researchers involved indicate what the European project LEURRE has set as its goal. The design of a new ecology on the basis of a mixed society has thus been placed on the agenda.

<sup>6</sup> Masoud Asadpour, Fabien Tâche, Gilles Caprari et al.: »Robot-Animal Interaction: Perception and Behaviour of InsBot«, in: *International Journal of Advanced Robotic Systems* 3:2 (2006), 93–98, at: 93.

The project is ambitious, including the use of behavioural models, their global control, and ultimately »a general methodology for the design and control of mixed societies«.<sup>7</sup>

This mixed society is now in a position to elevate its potent formula (a reworking of Norbert Wiener's programme of cybernetics) to a new status. In half a century, Wiener's syntactic structure described in *Cybernetics: Or Control and Communication in the Animal and the Machine* has developed into »a general methodology for the design and control of mixed societies«. In other words, through designs and self-controlled entities that enable communication between animals and machines, communication has been replaced by an innovative form of society.

Post-humanistic art seems to have long since internalized these lessons; this is particularly evident in works of BioArt. The concept and existence of biobots owes much to this art: Bio-artists such as Eduardo Kac, with his genetically manipulated luminescent fish and the GFP Bunny Alba (a rabbit genetically modified with green fluorescent proteins), have introduced the subject to public discussion. To add one further example of the combinatorially possible constructions, the so-called »roachbot« should not be overlooked. Developed by the concept artist Garnet Hertz, the roachbot is an inversion of the remote-controlled cockroach: Here, the cockroach controls the robot. The cockroaches, placed on a rotating sphere, control the fate (and the path) of their technical partners by means of their movements on the sphere's surface. Hertz, who subtitled the internet presentation of his project *Control and Communication in the Animal and the Machine* (after Wiener's cybernetic treatise), unsurprisingly merits notice in Jussi Parikka's *Insect Media: An Archeology of Animals and Technology*, which documents not only the project's overlap between strictly separated kingdoms of nature but also between the disciplines responsible for scientific processing.

Double-rabbits or fluorescent rabbits, insbots or roachbots: The impressive range of creatures and machines produced by evolutionary robotics and transgenic biology represent a challenge to the concerns of a new ecology. They share the world with humanity – and in a manner that repositions art and science in relation to each other.

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<sup>7</sup> Gilles Caprari, Alexandre Colot, Roland Siegwart, José Halloy, Jean-Louis Deneubourg, »Animal and Robot. Mixed Societies. Building Cooperation Between Microrobots and Cockroaches«, in: *IEEE Robotics & Automation Magazine*, June 2005, 58-65, at: 58.