

The Berlin Nanoscript

Ricardo Dominguez and Amy Sara Carroll

Introduction



[Prelude](#) | [Act One](#) | [Act Two](#) | [act three](#)

In 2007 curator André Lepecki invited the just-formed project **particle group** to participate in the *Nomadic New York* exhibition at the House of World Cultures in Berlin, Germany. **particle group** created a "particle sniffer" installation and also developed "The Berlin Nanoscript" (an agit-prop gesture in three scenes) that attempted to offer a performative nanoscape to address: (1) our multifarious concerns with unregulated nanoproducts currently found on the market shelves, (2) growing questions about the new science of nanotoxicology (our voices, part of a much larger chorus), and (3) our experiments with the para/literary, at this time taking the form of trans_patents (micro-tales of nano futures).¹ "The Berlin Nanoscript" was performed in various venues in Berlin—at the House of World Cultures, at a large mall in front of a pharmacy (the mall police escorted us out), and finally in the middle of Alexanderplatz (near its main metro stop). Our concerns, then and now, are NOT about a possible "Nanocaust," but about the nano(cost)s of new technologies that remain invisible to large segments of the population, costs which disproportionately effect those deemed most "Othered" (and/or most "vulnerable"). Always-already, again "then and now," we cup/ped the question—*what can be done?*—in the palms of ours hands... to let it flutter forth still indeterminate: *how can we route around both the seductions of nanotopias and the fears of nanopocalypses to stage critical encounters with particle capitalism, which encourage transdisciplinary alliances between nanotechnological and activist communities?*

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For further information about products containing unregulated nanoparticles:

<http://www.nanotechproject.org/inventories/consumer/>

<http://news.bbc.co.uk/2/hi/science/nature/7408705.stm>

<http://www.foresight.org/nanodot/?p=2826#more-2826>

Note

¹ The trans_patent is a direct descendent of another project by Diane Ludin, that of the "i-Biology Patent Engine" (i-BPE). In "i-BPE Strategy Text: sketches towards Deep Harmonization," Diane has written of the relationship between i-BPE and European surrealism's "Exquisite Corpse" gaming, a process she quotes Max Ernst as naming, "mental contagion" (in Pandilovski, Melentie, ed. *Art in the Biotech Era*. Australia: Experimental Art Foundation, 2008. 35).

Berlin Nanoscript: Prelude

(The stage is dark, then the slow illumination of two white lab workers at opposite ends of a long table and with a large screen behind them. Each sits facing a computer.)

PRELUDE *in stereo, alternating lines between Dr. Ludin and Dr. Dominguez*

Fabrication 1

Let the particle go a short way and it will show you where the level of meaning rises and falls, its blended muse traveling into a mold, the pebbles in dust-duplicated? triangles and mountains miniature as the desire to change. Let the particle move toward diminished containment—with insistent allure.

Fabrication 2

There is no such thing

as the smallest particle of matter,

so go forth towards

other scales.

Go forth, prey, go forth,

dwell between - PAR/T (i) C-L=E/s

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you there - (i) - hear -.

(We are clean now. Begin.)

Prelude | [Act One](#) | [Act Two](#) | [act three](#)

Berlin Nanoscript: Act One

Dr. Ludin:

Particle! Particle! Burning bright?

In the labs of the night

What posthuman hand or eye?

Could frame thy fearful trans_patenttry?

Dr. Dominguez:

In 2005 researchers in the University of Texas in the United States found that carbon nanotubes squirted into the trachea of mice caused inflammation of the lungs and granulomas (tumour-like nodules of bloated white blood cells in the lining of the lungs), and five of the nine mice treated with the higher dose died almost immediately.

Dr. Ludin:

In what gene deeps or skies? Burnt the ownership of thine eyes?? On what code dare it aspire?? What IP dare seize the fire?? And what patent, and what part,? Could twist the WIPO of thy heart?? And when thy particles began to beat,? What dread sensor? And what dread fleet?

Dr. Dominguez:

In another nanotoxicity experiment in 2006 at Tottori University, Japan, researchers showed that within a minute of contacting the mice's tiniest airways, carbon nanotubes began to burrow through gaps between the surface lining cells and into the blood capillaries, where the negatively charged nanoparticles latched onto the normally positively charged red blood cells' surface, thereby potentially causing the red blood cells to clump and the blood to clot.

Dr. Ludin:

What the atomic force hammer? What the chain?? In what furnace was thy brain?? What the chip? What circuit grasp? / Dare its deadly errors clasp? When the nanities threw down their gears /? And watered ownership with their tears / Did K. Eric Drexler smile his work to see?? Did nano-carbon 60 who made the Lamb make thee?

Dr. Dominguez:

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Researchers from the University of Rochester, New York, in 2006 reported an increased susceptibility to blood clotting in rabbits that had inhaled carbon nanospheres (buckyballs, an isotope of carbon shaped like a tiny football). Buckyballs present in water at 0.5 parts per million were taken up by largemouth bass, which suffered severe brain damage 48 hours later, the extent of the damage being 17 times greater than that seen in non-nano scale particles tested.

Dr. Ludin:

Particle! Particle! Burning bright?
In the labs of the night
What posthuman hand or eye?
Could frame thy fearful trans_patenttry?

Dr. Dominguez:

Nanoparticles in the lungs are translocated to the circulatory system and from there throughout the body, accumulating in the liver, spleen, and bone marrow. Nanoparticles inhaled through the nose and air passages are translocated to the brain through the olfactory nerves, and accumulate in the brain. Nanoparticles can enter the body through the skin; and quantum dots injected into the skin accumulate in lymph nodes with potential effects on the immune system.

Dr. Ludin:

Particle! Particle! Burning bright?
In the labs of the night
What posthuman hand or eye?
Could frame thy fearful trans_patenttry?

[Prelude](#) | [Act One](#) | [Act Two](#) | [act three](#)

Berlin Nanoscript: Act Two

(First lab image appears on the screen.)

Dr. Dominguez:

Particle Capitalism! Particle Capitalism!
Burning bright In the labs of the night
What posthuman hand or eye
Could frame thy fearful trans_patenttry?

Dr. Ludin:

"It is true that one cannot patent an element found in its natural form; however, if you create a

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purified form of it that has industrial uses-say, oxygen-you can certainly secure a patent."-Lila Feisee, Biotechnology Industry Organization's Director for Government Relations and Intellectual Property (2006).

Dr. Dominguez:

We are no longer under the sign of natural selection or even artificial selection-we are now under the force of particle selection. Everything on the planet, from indigenous aromas to public spaces to our atoms, is now forced to march into the World Intellectual Property Organization (WIPO) filters of globalization. The neo-liberal matrix that started to emerge fully in the 90's has played itself out on three stages: digital/Virtual Capitalism, genetic/Clone Capitalism and nanotechnology/Particle Capitalism. Each of these stages of techno-capital is being integrated via a new "deep harmonization" of the global Intellectual Property agenda: copyright laws, trademark laws and patent laws. A process that starts in the research chambers and ends in ownership enclosures, from patenting technology to patenting life, from patenting information to patenting atoms and creation of Trans_patents.

Dr. Ludin:

Particle Claimed! Particle Claimed!
Burning bright In the labs of the night
What posthuman hand or eye
Could frame thy fearful trans_patenttry 3,156,523?

"What is claimed is Element 95."—from Glenn Seaborg's US patent 3,156,523, issued November 10, 1964—the shortest patent claim on record.

Dr. Dominguez:

Remember that almost as soon as scientists figured out how to manipulate life through genetic engineering, corporations figured out how to monopolize it. A dangerous precedent was set back in the 1960s when a Nobel Prize-winning physicist "invented" the chemical element Americium (element no. 95 on the periodic table) and acquired US patent #3,156,523. In the US alone, patents awarded annually on nano-scale products and processes have tripled since 1996. The current nanotech patent grab is reminiscent of the early days of biotech-"it's like biotech on steroids" in the words of one patent attorney. At stake is control over innovations that span all industry sectors-from electronics, energy, mining and defense to new materials, pharmaceuticals and agriculture. As the Wall St. Journal put it, "companies that hold pioneering patents could potentially put up tolls on entire industries."

Dr. Carroll (*recorded*):

Trans_Patent 6608386: Sub-nanoscale electronic devices and bacterial processes? July 12, 2006? By Assignee(s) Yale University/YU (New Haven, CT)? Inventors: Reed; Mark A. (Southport, CT); Tour; James M. (Columbia, SC)

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Sometimes Lila would feel a bit itchy as she floated in her partner a few hours before integration-birth. Most birthing was now a trans_patented condition involving sub-nanoscale trading-it was the only way to pay the cost of life now. So every hour during this last trimester Lila and her partner would ferment mass nanowire production on her in-vitro skin in collaboration with the Yale University Inc., nanoteria colonies. She could feel the oldest most sustainable microbes on the planet staging WIPO-2 contracts for the latest off-scale metal-changing particles. Hundreds upon hundreds of Yale University Inc., products were waiting impatiently for Lila to catch a bit of crying air at the edges of her partner's canal to install and run-for just-in-time delivery. Delivery was all that mattered now.

Dr. Ludin:

Governments, industry and scientific institutions have allowed nanotech products to come to market in the absence of public debate and regulatory oversight. An estimated 500 plus products containing invisible, unregulated and unlabeled nano-scale particles are already commercially available (including food products, pesticides, cosmetics, sunscreens and more)-and thousands more are in the pipeline. Meanwhile, no government has developed a regulatory regime that addresses the nano-scale or the societal impacts of the invisibly small. This unregulated agenda is being driven by the new protocols of Venture Science the core of Particle Capitalism.

Dr. Dominguez:

Only a handful of toxicological studies exist on engineered nanoparticles, but it appears that nanoparticles as a class are more toxic than larger versions of the same compound because of their mobility and increased reactivity. This raises serious health concerns because nanoparticles can slip past guardians of the body's immune system, across protective membranes such as skin, the blood brain barrier or perhaps the placenta.

Dr. Ludin:

Some governments and scientists are belatedly conceding that nano-scale particles raise unique risks for health, safety and the environment. Given the knowledge gap, some experts recommend that release of engineered nanoparticles be minimized or prohibited in the environment:

"Release of nano-particles should be restricted due to the potential effects on environment and human health."—Nanotechnology and Regulation within the framework of the Precautionary Principle. Final Report for ITRE Committee of the European Parliament, February 2006.

Dr Dominguez:

"Until more is known about their environmental impact we are keen that the release of nanoparticles and nanotubes in the environment is avoided as far as possible. Specifically we recommend as a precautionary measure that factories and research laboratories treat manufactured nanoparticles and nanotubes as if they were hazardous waster streams and that

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the use of free nanoparticles in environmental applications such as remediation of groundwater by prohibited.—Royal Society and Royal Academy of Engineering, "Nanoscience and Nanotechnologies: Opportunities and uncertainties," July 2007.

Dr. Carroll (*recorded*):

Late Onset of Particle Capitalism (i)

27 07 2006? Strike when the iron is hot: the spot bubbles to the surface-red-faced-some malicious, illicit strawberry, singed below a soft cap of hair, I discover it there by accident, demand an explanation. Vague mumblings of scalp stimulation, postpartum emotion in high gear. I dream of an embedded chip, my son's induction into the matter market. What matters is this: He is okay. Well, temporarily. Weeks later, the market crashes, so to speak-in the ER, we become parental footnotes while the real work is done-intubation, a central line, the social worker in talcum tones. The doctor lays down her hand, a pack of worst case scenarios that fan out across the table. He may not make it through the night and if he does we cannot predict the extent of the "devastation." Devastation? Loss of limbs, loss of hearing, loss of vision, permanent brain damage, multiple organ failure. Unable to process listing-as-event, I adhere to my own paranoid versions of the tale: they are removing the chip*, deactivating the product. He is temporarily checked into an upscale refurbishing clinic. On a respirator to regain consciousness, he manufactures nipple dreams, which intersect with my own fantasies of his lopsided smile, an escape-artist's grin. In other words: recycling lines pared out to me, choking on their saccharine-sweet cadences, I wish first that he might live and then greedily branch out to demand additional reassurance. The white-coated herds that hoard expertise like pocket change prove all too accommodating, commodity-trading interpellation: late onset GBS, bacterial meningitis; each one of us, a petri-dish, navigating the birth canal.

[Prelude](#) | [Act One](#) | [Act Two](#) | [act three](#)

Berlin Nanoscript: Act Three

Dr. Ludin:

"We wish we could take grey goo off the Center for Responsible Nanotechnology's list of dangers, but we can't. It eventually may become a concern requiring special policy. Grey goo will be highly difficult to build, however, and non-replicating nano-weaponry may be substantially more dangerous and more imminent."

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We identified several severe risks.

Economic disruption from an abundance of cheap products

Economic oppression from artificially inflated prices

Personal risk from criminal or terrorist use

Personal or social risk from abusive restrictions

Social disruption from new products/lifestyles

Unstable arms race

Collective environmental damage from unregulated products

Free-range self-replicators (grey goo)

Black market in nanotech (increases other risks)

Competing nanotech programs (increases other risks)

MORE CAN BE IMAGINED

Some of the dangers described here are existential risks, that is, they may threaten the continued existence of humankind. Others could produce significant disruption but not cause our extinction. A combination of several risks could exacerbate the seriousness of each; any solution must take into account its effect on other risks. Some of these risks arise from too little regulation on a global scale.

Dr. Dominguez:

Working nanotechnology will be a significant breakthrough, comparable perhaps to the Industrial Revolution-but compressed into a few years. This has the potential to disrupt many aspects of society and politics. The power of the technology may cause two competing nations to enter a disruptive and unstable arms race. Weapons and surveillance devices could be made small, cheap, powerful, and numerous. Cheap manufacturing and duplication of designs could lead to economic upheaval. Overuse of inexpensive products could cause widespread environmental damage. Attempts to control these and other risks may lead to abusive restrictions, or create demand for a black market that would be very risky and almost impossible to stop; small nanofactories will be very easy to smuggle, and fully dangerous. There are numerous severe risks-including several different kinds of risk-that cannot all be prevented with the same approach. Simple, one-track solutions cannot work. The right answer is unlikely to

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evolve without careful planning.

Dr. Carroll (*recorded*):

When Lily was lucky, she got a contract for weapons. The pay was good because it was dangerous. The weapons would come gushing suddenly out of her with much loss of blood, usually in the middle of the night: an avalanche of glossy, freckled, somewhat transparent bits of weapon goo-particles, each one with a number of soft blue eyes and rows of bright sharp teeth. No matter how ill or exhausted Lily felt, she would shovel them, immediately, into rusted tin cans or milk cubes and tie down the lids with auto-clean tape. If she didn't do that, immediately, if she fell asleep, the particles would eat her. Thrashing in their containers as she carried them down the steps, the particles would speed eat each other, till nothing was left-the last one left would always eat itself-"the highest state of artificial evolution," her sister would whisper to her before the accident. She would have to hurry, shuffling as fast as she could under the weight of so many containers, to the Neighbors. The Neighbors only paid her for the ones that were left alive. It was piecework.

Dr. Ludin:

It's a Small World After all-Nanoera Inc.

Dr. Dominguez:

Particle Capitalism does not represent a new phase of capitalism in a temporal sense-yet, at the same time there is an uncanny sense that something new is happening here.

Dr. Ludin:

Your Matter Is Our Market-NanoMiX Corp.

Dr. Dominguez:

Particle Capitalism is not just an encroachment of capital on a new domain of science. But that this new domain of precise atomic and molecular manipulation is now being constituted as a business plan about what constitutes material reality-as just another tale of the matter market.

Dr. Ludin:

Reassembling Your World One Atom at a Time-NanitesNow Inc.

Dr. Dominguez:

Particle Capitalism functions as unregulated form of venture science that implodes the ethos of science to the valuation of life-as-matter with the valuation of the market.

Dr. Ludin:

Market Catch Your Self-NanoCatch Inc.

Dr. Dominguez:

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Recombinant society falls quickly before nano-fest destiny. Biotechnology, like digital networks, becomes a side event before the next state of command and control society. Each of us will rapidly become the by product of artificial nanotechnology "vitamins", interdependent molecular subassembly engines, and marked by inter-linked "termination dates." We will become more than replicants and less than nothing. The cross-roads between the imaginary and all too real construction of nanotechnology is perhaps already behind us.

Dr. Ludin:

In the game of life and evolution there are three players at the table: human beings, nature, and machines. I am firmly on the side of nature. But nature, I suspect, is on the side of the machines.

Dr. Dominguez:

Not much difference between a banana and a human. Same Atoms, just arranged differently.

Dr. Ludin:

Not much difference.

Dr. Dominguez:

Not much difference at all.

(Both lab workers shut down their computers, eat a banana, and walk away.)

[Prelude](#) | [Act One](#) | [Act Two](#) | act three