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The tradition of the oppressed teaches us that the "state of emergency" in which we live is not the exception but the rule. We must attain to a conception of history that is in keeping with that insight. Then we shall clearly realize that it is our task to bring about a real state of emergency. 1

$$(Nature(TM) + Culture(TM))dn = New\ World\ Order,\ Inc.$$
$$n=0$$

"Nature" is a topos, or commonplace. Nature is a topic I cannot avoid. It is the imploded, densely packed location for the simultaneously ethnospecific, cultural, political, and scientific conversations about what the allowable structures of action and the possible plots in the sacred secular dramas of technoscience—as well as in the analysis of technoscience— might be. This nature, this common place and topical commons, has possessed me since I was a child. To inhabit this nature has not been a choice, but a complex inheritance. I was riveted by natural law and fixed in the time zones of the Christian liturgical year, and then set loose in the culture medium of the molecular biological laboratory. For people nurtured in the worlds in which I grew up, whatever else it also is, nature is good to think with. [End Page 59]

Nature is also about figures, stories, and images. This nature, as trópos, is jerry-built with tropes; it makes me swerve. A tangle of materialized figurations, nature draws my attention. A child of my culture, I am nature-tropic: I turn to nature as a sun-loving plant turns to the sun. Historically, a trope is also a verse interpolated into a liturgical text to embellish or amplify its meaning. Nature has liturgical possibilities; its metaphoricity is inescapable, and that is its saving grace. This nature displaces me definitively by rooting me in its domain. The domain in which I am so organically rooted in the last years of the twentieth century is the fully imploded, fully artifactual, natural-cultural gravity well of technoscience. We do not so much swerve into this well as get sucked into it irrevocably. We had better learn to think this nature, this common and shared place, as something other than a Star Wars test site or the New World Order, Inc. If technoscience is, among other things, a practice of materializing refigurations of what counts as nature, a practice of turning tropes into worlds, then how we figure technoscience makes an immense difference.

In this meditation, I want to suggest how to refigure—how to trope and how to knot together—key discourses about technoscience. Rooted in the (sometimes malestream and maelstrom) cross-stitched disciplines of science studies, this short essay is part of a larger, shared task of using antiracist feminist theory and cultural studies to produce worldly interference patterns. Because I think the practices that constitute technoscience build worlds that do not overflow with choice about inhabiting them, I want to help foment a state of emergency in what counts as "normal" in technoscience and in its analysis. Queering what counts as nature is my categorical imperative. Queering specific normalized categories is not for the easy frisson of transgression, but for the hope for livable worlds. What is normal in technoscience, and in its analysis, is all too often war, with all its infinitely ramifying structures and stratagems. All too often, the war of words and things is the luminous figure for theory, explanation, and narrative.

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A lurking question stalks the project of refiguration: How can science studies scholars take seriously the constitutively militarized practice of technoscience and not replicate in our own practice, including the material-semiotic flesh of our language, the worlds we analyze? How can metaphor be kept from collapsing into the thing-in-itself? Must technoscience—with all its parts, actors and actants, human and not—be described relentlessly as an array of interlocking agonistic fields, where practice is modeled as military combat, sexual domination, security maintenance, and market [End Page 60] strategy? How not? Let us work by learning to play an old game. After all, ever since World War II, game theory has had a very high profile in technoscience, much envied and imitated in the human sciences and popular culture alike. 2 Let us turn to a game made of figures—string figures. Here we might find some knots of interest for tying up approaches to technoscience.

Cat's Cradle

In setting up a game of cat's cradle for science studies aficionado/as who want time off from the video arcade shoot-em-ups of much scholarly practice, I need to hold onto two strands that structure all the figures:

(1) Feminist, multicultural, antiracist technoscience projects aim to intervene in what can count as a good primal story, reliable rational explanation, or promising first contact among heterogeneous selves and others. Feminist, multicultural, antiracist technoscience projects do not respect the boundaries of disciplines, institutions, nations, or genres. The projects are as likely to be located in computer graphics labs as in community meetings, in biomedical worlds as in antitoxics work. Feminist, multicultural, antiracist technoscience projects include, for example, popular cultural production (film, TV, video, print fiction, advertising, music, jokes, theater, computer games), diverse practices for apprehending and refiguring the ethnospecific categories of nature and culture, professional studies of technoscience (philosophy, anthropology, history, sociology, semiology), community organizing, labor practices and struggles, policy work at many levels, health politics, media interventions, environmental activism, technical [End Page 61] design, engineering, and every sort of scientific research. These practices regularly do not respect boundaries between and among sacred categories, such as nature and society or human and nonhuman. But boundary crossing in itself is not very interesting for feminist, multicultural, antiracist technoscience projects. Technoscience provokes an interest in zones of implosion, more than in boundaries, crossed or not. The most interesting question is, What forms of life survive and flourish in those dense, imploded zones?

(2) Textual rereading is never enough, even if one defines the text as the world. Reading, no matter how active, is not a powerful enough trope; we do not swerve decisively enough. The trick is to make metaphor and materiality implode in the culturally specific apparatuses of bodily production. What constitutes an apparatus of bodily production cannot be known in advance of engaging in the always messy projects of description, narration, intervention, inhabiting, conversing, exchanging, and building. The point is to get at how worlds are made and unmade, in order to participate in the processes, in order to foster some forms of life

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and not others. If technology, like language, is a form of life, we cannot afford neutrality about its constitution and sustenance. The point is not just to read the webs of knowledge production; the point is to reconfigure what counts as knowledge in the interests of reconstituting the generative forces of embodiment. I am calling this practice materialized refiguration; both words matter. The point is, in short, to make a difference—however modestly, however partially, however much without either narrative or scientific guarantees. In more innocent times, long, long ago, such a desire to be worldly was called activism. I prefer to call these desires and practices by the names of the entire, open array of feminist, multicultural, antiracist technoscience projects.

Optical metaphors are unavoidable in figuring technoscience. 3 Critical vision has been central to critical theory, which aims to unmask the lies of the established disorder that appears as transparently normal. 4 Critical theory is about a certain kind of "negativity"—i.e., the relentless commitment to show that the established disorder is not necessary, nor perhaps even "real." The world can be [End Page 62] otherwise; that is what technoscience studies can be about. Technoscience studies can inherit the bracing negativity of critical theory without resurrecting its Marxist humanist ontologies and teleologies. If the poison of metaphor-free facticity can be neutralized by the tropic materiality of worldly engagement—and again, engagement without narrative or scientific guarantees—then technoscience studies will have done its job. Perhaps cracking open possibilities for belief in more livable worlds would be the most incisive kind of theory, indeed, even the most scientific kind of undertaking. Perhaps this is part of what Sandra Harding means by "strong objectivity"! 5 "High" theory might be about pushing critical negativity to its extreme—i.e., toward hope in the midst of permanently dangerous times. So, for me, the most interesting optical metaphor is not reflection and its variants in doctrines of representation. Critical theory is not finally about reflexivity, except as a means to defuse the bombs of the established disorder and its self-invisible subjects and categories. My favorite optical metaphor is diffraction—the noninnocent, complexly erotic practice of making a difference in the world, rather than displacing the same elsewhere.

Two colored fibers run through my work:

(1) I draw on intersecting and often coconstitutive threads of analysis—cultural studies; feminist, multicultural, and antiracist theory and projects; and science studies—because each of them does indispensable work for the project of dealing with sites of transformation, heterogeneous complexity, and complex objects.

(2) For the complex or boundary objects in which I am interested, the mythic, textual, technical, political, organic, and economic dimensions implode. That is, they collapse into each other in a knot of extraordinary density that constitutes the objects themselves. In my sense, story telling is in no way an "art practice"—it is, rather, a fraught practice for narrating complexity in such a field of knots or black holes. In no way is story telling opposed to materiality. But materiality itself is tropic; it makes us swerve, it trips us; it is a knot of the textual, technical, mythic/oneiric, organic, political, and economic. [End Page 63]

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I try to attend to the differently situated human and nonhuman actors and actants that encounter each other in interactions that materialize worlds in some forms rather than others. My purpose is to argue for a certain kind of practice of situated knowledges in the worlds of technoscience, worlds whose fibers reach deep and wide in the tissues of the planet. These are the worlds in which the axes of the technical, organic, mythic, political, economic, and textual intersect in optically and gravitationally dense nodes that function like wormholes to cast us into the turbulent and barely charted territories of technoscience. Along with other science studies scholars, I use the terms actors, agencies, and actants for both human and nonhuman entities. 6 Remember, however, that what counts as human and as nonhuman is not given by definition, but only by relation, by engagement in situated, worldly encounters, where boundaries take shape and categories sediment. If feminist, antiracist, multicultural science studies—not to mention technoscience—have taught us anything, it is that what counts as human is not, and should not be, self-evident. The same thing should be true of machines, and of nonmachine, nonhuman entities in general, whatever they are. Both technoscience and technoscience studies teach people like those likely to be reading this essay, who like me are kicking and screaming in symptomatic Western universalist objection, that there is no pan-human, no pan-machine, no pan-nature, no pan-culture. The saving negativity of critical theory teaches the same thing. There are only specific worlds, and these are irreducibly tropic and contingent.

The choice to use the terms actors, agencies, and actants invites trouble, but it circumvents worse trouble, I hope. The invited trouble is obvious. Actors and agents seem a lot like the self-moving entities of a cosmos furnished in enduring Aristotelian style. They look a lot like preformed, modular subjects or core substances, with adhering accidents. Actors and agents act; they author action; all real agency is theirs. All else is patient, if occasionally passionate. [End Page 64] All else is ground, resource, matrix, screen, secret to be revealed, fair game to be hunted by the hero, who is, to repeat ad nauseam, the actor. Actants are a little better; they at least are collectives for a semiotic action-function in a narrative, and not just fictionally coherent, single substance-actors. Actants are bundles of action-functions; they are not Actors and Heroes. To understand a story, it is almost never a mistake to anthropomorphize an actor; it might be a big mistake to anthropomorphize an actant. Part of the legacy of all this Aristotelian furniture is that everything in the world not "self-moving" (and guess who is most self-moving of all—our old friend, the self-invisible man) ends up having to be patient. Nonhuman nature (including most white women, people of color, the sick, and others with reduced powers of self-direction compared to the One True Copy of the Prime Mover) has been especially patient. (As you can see, this little lesson in the history of philosophy is a bit eclectic. No matter, cosmic interior decorating in post-pomo essays shows worse taste than that.)

To insist that both those humans denied the power of self-motion in the history of Western philosophy and also all of nonhuman nature be seen to be lively, consequential, where the action is, agents, actors, etc.—in short, movers and shakers in the knowledge-production game—I am willing to risk the metaphysical chronic fatigue syndrome induced by the language of agencies and actors. I do not yet know how to insist on such things well enough

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by a means other than stressing one pole of a disreputable binary, while refusing to use the more patient pole for much of anything. This is an occupational hazard for feminists of my cultural history. We seem terribly afraid of patience; we mistake it for passivity. Hardly any wonder. Like the characters in Marge Piercy's Woman on the Edge of Time, I do not know how to leap out of my natural-cultural history to make it all come out right.

I try to get out of the trouble my language invites by stressing that the agencies and actors are never preformed, prediscursive, just out there, substantial, concrete, neatly bounded before anything happens, only waiting for a veil to be lifted and "land ho!" to be pronounced. Human and nonhuman, all entities take shape in encounters, in practices; and the actors and partners in encounters are not all human, to say the least. Further, many of these nonhuman partners and actors are not very natural, and certainly not original. And all humans are not the Same. This is a key difference [End Page 65] from the way the humans and the non-human components of knowledge production are generally figured in scientific discourse. In that kind of discourse, the objects of discovery and explanation might be hidden, but they are preformed, there, ready for the first voyager to pronounce "land ho!" and forever after pose as the ventriloquist (representor) to the way the world really is. And the subjects/actors who do the discovering are, at least ideally, interchangeable, all the Same, self-invisible, reliable, modest witnesses—self-invisible, transcendent Subjects, in short, out on a noble journey to report on embodied Nature. Traditional scientific realism depends on that kind of reality, where nature and society are "really," foundationally, there. It is really existing reality, a bit like actually existing socialism used to be—quite totalitarian, really, though said to be fully objective, i.e., full of objects. I find such realism simply objectionable, and full of nothing but tricks. Expunging metaphoricity from the sacred realm of facticity depends on the conjuring trick of establishing the categorical purity of nature and society, nonhuman and human.

All that is needed for a game of cat's cradle is now in play. Drawn into patterns taught me by a myriad of other practitioners in technoscience worlds, I would like to make an elementary string figure in the form of a cartoon outline of the interknitted discourses named (1) cultural studies; (2) feminist, multicultural, antiracist science projects; and (3) science studies. Like other worldly entities, these discourses do not exist entirely outside each other. They are not preconstituted, nicely bounded scholarly practices or doctrines that confront each other in debate or exchange, pursuing wars of words or cashing in on academic markets, and at best hoping to form uneasy scholarly or political alliances and deals. Rather, the three names are place markers, emphases, or tool kits—knots, if you will—in a constitutively interactive, collaborative process of trying to make sense of the natural worlds we inhabit and that inhabit us; i.e., the worlds of technoscience. I will barely sketch what draws me into the three interlocked webs. My intention is that readers will pick up the patterns, remember what others have learned how to do, invent promising knots, and suggest other figures that will make us swerve from the established disorder of finished, deadly worlds.

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Cultural Studies: A set of discourses about the apparatus of bodily/cultural production; emphasis on the irreducible specificity of that apparatus for each entity. Not culture only as symbols and meanings, not comparative culture studies, but culture as an account of the agencies, hegemonies, counter-hegemonies, [End Page 66] and unexpected possibilities of bodily construction. Deep debts to Marxism, psychoanalysis, theories of hegemony, communications studies, critical theory of the Frankfurt variety, the political and scholarly cauldron of the Center for Cultural Studies at the University of Birmingham. Relentless attention to the ties of power and embodiment, metaphoricity and facticity, location and knowledge. Unconvinced by claims about insuperable natural divides between high and low culture, science and everything else, words and things, theory and practice.

Feminist, Multicultural, and Antiracist Theory/Projects: The view from the marked bodies in the stories, discourses, and practices; marked positions; situated knowledges, where the description of the situation is never self-evident, never simply "concrete," always critical; the kind of standpoint with stakes in showing how "gender," "race," or any structured inequality in each interlocking specific instance gets built into the world—i.e., not "gender" or "race" as attributes or as properties, but "racialized gender" as a practice that builds worlds and objects in some ways rather than others, that gets built into objects and practices and exists in no other way. Bodies in the making, not bodies made. Neither gender nor race is something with an "origin," for example in the family, that then travels out into the rest of the social world, or from nature into culture, from family into society, from slavery or conquest into the present. Rather, gender and race are built into practice, which is the social, and have no other reality, no origin, no status as properties. Feminist, antiracist, and multicultural locations shape the standpoint from which the need for an elsewhere, for "difference" is undeniable. This is the unreconciled position for critical inquiry about apparatuses of bodily production. Denaturalization without dematerialization; questioning representation with a vengeance. [End Page 67]

Science Studies: reflexivity, constructionism, technoscience instead of science and technology, science in action, science in the making (not science made), actors and networks, literary/social/material technologies for establishing matters of fact, science as practice and culture, boundary objects, the right tools for the job, artifacts with politics, delegated labor, dead labor, confronting nature, the culture of no culture, the nature of no nature, nature fully operationalized, escape velocities, obligatory compared to distributed passage points, representing and intervening, how experiments end, social epistemology. All the disciplines of science studies: history, philosophy, sociology, semiology, and anthropology; but also the formation of science studies out of the histories of radical science movements, community organizing, and policy-directed work. These histories are regularly erased in the hegemonic accounts of disciplinary and interdisciplinary development in the academy and the professions. 10 [End Page 68]

I seek a knotted analytical practice, one that gets tangled up among these three internally nonhomogeneous, nonexclusive, often mutually constitutive, but also nonisomorphic and sometimes mutually repellent webs of discourse. The tangles are necessary to effective critical practice. Let me name this knot tendentiously and without commas: antiracist multicultural feminist studies of technoscience—i.e., a practice of critical theory as cat's cradle games. 11 This is a game for inquiring into all the oddly configured categories clumsily

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called things like science, gender, race, class, nation, or discipline. It is a game that requires heterogeneous players, who cannot all be members of any one category, no matter how mobile and inclusive the category seems to be to those inside it. I want to call the problematic but inescapable world of antiracist feminist multicultural studies of technoscience simply "cat's cradle." Cat's cradle is a game for nominalists like me who cannot not desire what we cannot possibly have. As soon as possession enters the game, the string figures freeze into a lying pattern.

Cat's cradle is about patterns and knots; the game takes great skill and can result in some serious surprises. One person can build up a large repertoire of string figures on a single pair of hands; but the cat's cradle figures can be passed back and forth on the hands of several players, who add new moves in the building of complex [End Page 69] patterns. Cat's cradle invites a sense of collective work, of one person not being able to make all the patterns alone. One does not "win" at cat's cradle; the goal is more interesting and more open-ended than that. It is not always possible to repeat interesting patterns, and figuring out what happened to result in intriguing patterns is an embodied analytical skill. The game is played around the world and can have considerable cultural significance. Cat's cradle is both local and global, distributed and knotted together.

If we do not learn how to play cat's cradle well, we can just make a tangled mess. But if we attend to scholarly, as well as technoscientific, cat's cradle with as much loving attention as has been lavished on high-status war games, we might learn something about how worlds get made and unmade, and for whom. "String theory" and "super string theory" are names for high-status explanatory models in cosmology and physics. These theories of the universe are designated TOE—i.e., a Theory of Everything. TOE is a joke, of course, but a very revealing one about the deep ideological resonances and commitment to unified totality in the knowledge-power games of the "hard" sciences, with physics and mathematics the "hardest" cases of all. Cat's cradle is not that kind of game; its string theories are not theories of everything. Cat's cradle is, however, a mathematical game about complex, collaborative practices for making and passing on culturally interesting patterns. Cat's cradle belongs to no one, to no "one" culture or self, to no frozen subject or object. Cat's cradle is a wonderful game for demystifying notions like subject positions and fields of discourse. I like the trope embedded in this string theory. Cat's cradle players are very unlikely to think that war games give the best models of knowledge building and the best tropes for one's own practice. Narrative structures built on miming cat's cradle patterns would not produce another Sacred Image of the Same.

Cat's cradle is where I think the action is in science studies, feminist studies, antiracism, and cultural studies—not in the mind-numbing militarized games of endless agonistic encounters and trials of strength passing as critical theory and as technoscience. If, as we must do, we are fruitfully to mistake the world for the trope, [End Page 70] and the trope for our own method, in a spiraling mimesis, cat's cradle promises to be a less-deadly version for moral discourse, knowledge claims, and critical practice than heroic trials of strength. Tracing networks and configuring agencies/actors/actants in antiracist feminist multicultural studies of technoscience might lead us to places different from those reached by tracing actors and actants through networks in yet another war game. I prefer cat's

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cradle as an actor-network theory. The issues here are not "mere" metaphors and stories; the issues are about the semiosis of embodiment, or, in Judith Butler's nicely punning phrase, about "bodies that matter."