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mind-body problems

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In this article, I lay out some of the cultural assumptions in recent accounts of mind and brain in neuroscience, in which it is argued that human social activities can be reduced to neural processes in the brain. Since the current dominance of these accounts in the United States threatens the work of social and cultural anthropology and other non-reductionist disciplines, I develop some ways the arguments of their critics can be bolstered with insights from anthropology. I ask what social features of the present context could be inciting this turn to a hyper-rational, neuronal account of human consciousness, and explore fear of the newly valued irrational energy (akin to mania) often required by contemporary entrepreneurial capitalism as a possible source. To counter the forms of individual subjectivity encouraged by neuroreductionism, I argue that ethnography could contribute to a form of subjectivity that renders individuals thinkable only as social beings. [language, metaphor, cognitive science, neuroscience, manic depression, stock market, capitalism, United States]

Perhaps we have been asking too much of neurons; or, if not too much, at least the wrong things.

—Geertz, 1962

The 1999 Spring Meetings of the American Ethnological Society were devoted to the theme “rethinking nature and culture.”¹ Preparing my contribution (the presidential lecture), I reminded myself how dichotomous pairs like nature/culture, body/mind, irrational/rational, or passion/reason—the second term of which is often given higher value than the first—have lain at the heart of Western reason since at least the Enlightenment, helping to shore up invidious distinctions based on gender, race, sex, or nationality. Contemporary anthropologists (among others) have long explored domains in which gendered hierarchies can be bolstered when adult males are accorded the realm of culture, mind, rationality, and reason, while women and children are relegated to the realm of nature, body, irrationality, and passion (Lloyd 1984; MacCormack and Strathern 1980). In other domains, scholars have shown how race hierarchies can be strengthened if white people (or other racial groups cast in a dominant position) are granted a “natural” association with culture, mind, rationality, and reason, leaving black people (or other racially contrasted groups) to manage where

they fit “naturally,” in the realm of body, irrationality, and passion (Gilman 1985; Jordanova 1989).

Gendered and raced associations can also be combined, with powerful effects. In literature on economic development, as Hugh Gusterson (1999) demonstrates, First World countries are often depicted as mature, reliable, stable, trustworthy, law abiding, rational, and logical—in other words, they act like adult men—while Third World countries are depicted as immature, unreliable, volatile, untrustworthy, lawless, irrational, and emotional—in other words, they act like childish women. In the contemporary social sciences, Avery Gordon demonstrates how the producers of rigorous, logical, robust, hard, scientific knowledge about the real world often attempt to consign to the outer darkness—I use the term advisedly—imposters who pretend to produce knowledge about social worlds, while merely telling loose, emotional, delicate, or soft stories (1997:5–13).

Critical efforts to dislodge the dichotomies that anchor hierarchies of gender and race have taken many forms. Some, like Judith Butler (1993) or Elizabeth Grosz (1993), have turned to analysis and validation of the subordinated and excluded term, *the body*, which is “the unacknowledged condition of the dominant term, *reason*” (Grosz 1993:195).² Others, like Avery Gordon (1997) or Hugh Gusterson (1999), argue that those associated with the dominant terms of the dichotomies seek to maintain their separation and distance from the subordinated terms precisely because they unconsciously know and fear the existence of the subordinated qualities within themselves. For Gusterson (1999), the First-World Self in effect contains all the womanly and childish characteristics it imputes, out of fear, to the Third-World Other; for Gordon, the stance that sociology can provide an “unproblematic window onto a more rather than less secure reality” (1997:11) is haunted by a “seething presence . . . one form by which something lost, or barely visible, or seemingly not there to our supposedly well-trained eyes, makes itself known or apparent to us” (1997:8). The ghost haunting sociology is that “the real itself and its ethnographic or sociological representations are also fictions, albeit powerful ones that we do not experience as fictional, but as true” (1997:11).

mind and body in neuroscience

These reflections made me curious about the neurosciences (in which I have begun a fieldwork project) where cultural concepts of *mind* and *body* play key parts. As researchers in neuroscience produce new knowledge about the mind and the brain, will the familiar gender and race associations with the terms *mind/body* and *rational/irrational* hold or shift? The question gains in general importance because a cluster of related disciplines—among them cognitive science, cognitive psychology, and neurophysiology—are pursuing their research agendas with a set of common assumptions, despite their internal differences. The extent of their public and private funding utterly dwarfs the funding of anthropology (not to mention other social sciences, including even economics), which speaks to how difficult it will be for an anthropological analysis of their assumptions to make headway.³

To begin the inquiry, in spite of the odds, I turned to work in cognitive science, in particular to scholars George Lakoff and Mark Johnson, whose work on mind and body in relation to language in their book, *Metaphors We Live By* (1980), inspired the focus on metaphor in my earlier work. I had once thought the odd bits of Lakoff and Johnson’s book that attached metaphors to “natural” kinds of experience (1980:118) could be ignored. After all, the bulk of the account looked at metaphors as they function in relation to other metaphors and in relation to the social context. For example,

their final chapter looks at how the metaphor “labor is a resource” functions in both capitalist and socialist systems to allow labor to be treated as a single, homogenous category whose cost should be kept down, concealing the difference among kinds of labor, some of which are exploitative and demeaning (1980:236–237).

For me, the experience of reading Lakoff and Johnson’s latest work, *Philosophy in the Flesh: Embodied Mind and Its Challenge to Western Thought* (1999), was a massive shock. In place of the play of metaphors with and against each other, they now provide an account of consciousness consisting of neural structures in the brain. Here are some of the main tenets of Lakoff and Johnson’s new position, explained briefly in their own terms:

“Conceptual structures are neural structures in the brain” (1999:20). Neural structures in the brain, what they call the “cognitive unconscious,” constitute a large and essential part of our “conceptual systems, meaning, inference, and language” (1999:12). The claim is not that neural structures are necessary for our cognitive operations; the claim is that neural structures are the same thing as our cognitive operations.

The neural structures that make up reason are a product of evolutionary processes:

Reason is evolutionary, in that abstract reason builds on and makes use of forms of perceptual and motor inference present in “lower” animals. The result is a Darwinism of reason, a rational Darwinism: Reason, even in its most abstract form, makes use of, rather than transcends our animal nature. [1999:4]

“Metaphors are realized in our brains physically as a consequence of the nature of our brains, our bodies, and the world we inhabit” (1999:59). By definition, metaphor consists of two physically separate parts of the brain, two domains, that are neurally linked in response to experience. When the metaphor *prices hit bottom* is activated, *prices* activates the quantity-domain network in the brain and sends activation to the connected verticality domain network. *Hit bottom* activates an inference mechanism in the verticality domain that computes: as low as it can go. “Activation then flows back to the quantity domain network indicating Maximum Negative Change” (1999:55). Quantity and verticality correspond in the brain because they are correlated “in our normal everyday experiences, like pouring more water into the glass and seeing the level go up” (1999:47).

Neural structures are learned, not innate, but they are limited in number and are widespread around the globe (1999:56–57). “We acquire a large system of primary metaphors automatically and unconsciously simply by functioning in the most ordinary of ways in the everyday world from our earliest years. We have no choice in this. Because of the way neural connections are formed during [childhood], we all naturally think using hundreds of primary metaphors” (1999:47). The content of the metaphors comes from everyday life: “If you are a normal human being, you inevitably acquire an enormous range of primary metaphors just by going about the world constantly moving and perceiving” (1999:57). This shaping is fairly specific: “We have a system of primary metaphors simply because we have the bodies and brains we have and because we live in the world we live in, where intimacy does tend to correlate significantly with proximity, affection with warmth, and achieving purposes with reaching destinations” (1999:59). The primary metaphors are shaped in a similar way cross-culturally because human bodies are similar: “It is not just that our bodies

and brains determine that we will categorize; they also determine what kinds of categories we will have and what their structure will be . . . the peculiar nature of our bodies [mostly shared by all humans] shapes our very possibilities for conceptualization and categorization" (1999:18–19).

Given the physical instantiation of categories and metaphors in our brains, they cannot easily be changed. "Though we learn new categories regularly, we cannot make massive changes in our category systems through conscious acts of recategorization (though, through experience in the world, our categories are subject to unconscious reshaping and partial change)" (1999:19).

Naomi Quinn has already articulated the most important response an anthropologist could make to this position in her discussion of Lakoff and Johnson's earlier book, namely: where is culture in this picture? (Quinn 1991). Do all cultures have concepts of intimacy, affection, or journeying, let alone give them meaning in the same way? Taking cultural variation seriously undermines Lakoff and Johnson's postulation of universal physical experience. I would also want to raise serious questions about the political effects of a theory that sees reason in the context of Darwinian evolution and posits that variations in experience directly affect the physical structure of the brain. Will abnormal individuals, for example those who are not able to "go about the world constantly moving" (Lakoff and Johnson 1999:57) be unable to form the same cognitive structures as normal people, and hence be unable to participate in reason?

In 1996, Pat Churchland published *Neurophilosophy*, which opened the door to claims of direct causal linkages between the structures of neural networks in the brain and the phenomena studied by linguists and philosophers of language.⁴ Pat Churchland and her colleagues, Paul Churchland and Terry Sejnowski, among others, work in a field called computational neuroscience. They hold that the brain represents the world by means of networks of neurons. Neural networks can be modeled in computers using "Parallel Distributed Processing" (PDP) or "Connectionist" units. This approach has generated enthusiasm in many quarters. Some have claimed it amounts to a "scientific revolution" (Smith and DeCoster 1998:111), "a major paradigm shift" (Read and Miller 1998:vii), and that it has made meetings of the Cognitive Science Society into "connectionist pep rallies" (Smolensky 1988:1). Some claim computational neuroscience is going to require major changes in our central concepts of what it is to be human (Smith and DeCoster 1998:111).

What is a connectionist unit? It is a computer into which researchers can enter data in the form of numbers, patterns, sounds, or images. Inside the computer, there is a dense network of simple computing units, often compared to neurons. Each unit receives input signals and sends output signals over connections that have a numerical weight indicating their importance. Each unit "decides" the strength of its output signal by a calculation based on the strength of all the incoming signals. The units together "learn" by checking their output against correct outputs researchers would provide. For example, the input could be a written phonetic transcript of a story a five-year-old U.S. child told about visiting his grandmother. The neural net would have the correct output when it had learned to read the transcript out loud (using a voice synthesizer) in understandable English. As it learns, the network reweights the inputs and "grows neurons" as needed to produce the correct outcome.

The hardware mechanisms are networks consisting of large numbers of densely interconnected units, which correspond to concepts. These units have activation levels

and they transmit signals (graded or 1–0) to one another along weighted connections. Units “compute” their output signals through a process of weighting each of their input signals by the strength of the connection along which the signal is coming in, summing the weighted input signals, and feeding the result into a nonlinear output function, usually a threshold. Learning consists of adjusting the strengths of connections and the threshold values, usually in a direction that reduces the discrepancy between an actual output in response to some input and a “desired” output provided by an independent set of “teaching” inputs. [Pinger 1999]

Paul Smolensky, a computer scientist, explains: “These networks *program themselves*, that is they have autonomous procedures for tuning their weights to eventually perform some specific computation” (1988:1; emphasis in original). There seems to be a kind of autonomous intelligence at work here: “The network itself ‘decides’ what computations the hidden units will perform; because these units represent neither inputs nor outputs, they are never ‘told’ what their values should be, even during training” (1988:1). Once trained, the neural net is not limited to the input-output combinations it matched during training; it can handle new inputs (read new stories) flexibly and intelligently, making only the kind of errors a human reader would also make, such as mispronouncing proper names.

A connectionist model of how words are perceived by the eye and brain involves a network that builds itself many connections within units in the same layer, and from higher layers back to lower ones (Posner and Raichle 1994). In many ways, these learning neural nets are extremely appealing for consumers who, judging from the success of early applications, should begin to see them on the market sometime soon. Neural nets are being used successfully in speech recognition, robot design, auto emission regulation, stock market analysis and prediction, and detection of buried ordnance, to name just a few areas. So stunning are these early successes that they inspire a great deal of confidence in cognitive neuroscience and allied fields—and here is where my alarm bells sound: computational neuroscientists often assert that, by building up from connectionist models, all human experiences and activities, including social behavior, can eventually be produced. In the Churchlands’ vision,

accounting for a creature’s knowledge of the spatial location of a fly is difficult enough. Accounting for its knowledge of a loved one’s embarrassment, a politician’s character, or a bargaining opponent’s hidden agenda, represents a much higher level of difficulty. And yet we already know that artificial neural networks, trained by examples, can come to recognize and respond to the most astonishingly subtle patterns and similarities in nature. If physical patterns, why not social patterns? We confront no problem in principle here. Only a major challenge. [Churchland and Churchland 1998:77]

Even rationality could be understood as an evolutionary product of brain networks:

I am assuming that there is a real difference in what we may loosely call “life success” between agents whose behavior is generally at the “in control” end of the spectrum—agents typified by the fictional Captain Kirk—and on the other hand, agents whose behavior is often at the “out of control” end of the spectrum, typified by the obsessive-compulsive subject . . . the relevant behavioral differences . . . are almost certainly deeply related to properties to which natural selection is sensitive. [Churchland and Churchland 1998:244]

And here is how moral values could arise out of the same processes:

On the whole, social groups work best when individuals are considered responsible agents, and hence, as a matter of practical policy, it is probably wisest to hold mature

agents responsible for their behavior and for their habits. That is, it is probably in everyone's interest if the default assumption in place is that agents have control over their actions and that, in general, agents are liable to punishment and praise for their actions. . . . Feeling those consequences is necessary for contouring the state-space landscape in the appropriate way, and that means feeling the approval and disapproval meted out. [Churchland and Churchland 1988:251]

For rationality and morality, the social group becomes the "teaching network" that provides feedback to the learning human neuronal system (see also Flanagan 1996:193).⁵

Although both Lakoff and Johnson and the Churchlands believe mind can be reduced to brain, so to speak, Lakoff and Johnson see mind consisting of the neuronal structures, while the Churchlands allow the possibility that cognition could be an "emergent" property at a higher level of the system (Churchland 1996:282). But the levels in their system do not extend beyond the body. In the introduction to *The Computational Brain*, Pat Churchland and her colleague Terry Sejnowski argue repeatedly that knowledge of the molecular and cellular levels of the brain, though important, is insufficient to understand cognition, which would have to entail knowledge of networks at higher levels (1992:4). But the levels in neuron man, a figure frequently reproduced in neuroscience texts, begin with molecules, but go no farther than the central nervous system. And the authors also assert that we should eventually expect to be able to explain emergent properties, *reduce them*, to lower-level properties (Churchland and Sejnowski 1992:2). Throughout, the emphasis of all these researchers is overwhelmingly on the ways all kinds of learning can be reduced to the operations of neural nets. When they think about the environment as a "teacher" of these neural networks in the brain, their purview is narrow: Lakoff and Johnson think about universal human bodily experience, the Churchlands about behavior adaptive by the lights of natural selection.

With their research expensively underwritten by foundations, corporations, and the government, and their claim to provide reductive accounts of the social and cultural without (from my point of view) much information about social and cultural dimensions of existence, I see the neuroreductive cognitive sciences as the most dangerous kind of vortex—one close by and one whose power has the potential to suck in disciplines like anthropology, severely weakening them in the process. Fortunately, there are opponents to this reductive enterprise even within cognitive science itself, and here I want briefly to join forces with two of them: Hilary Putnam and John Searle.⁶

Some years ago, Hilary Putnam advocated the analogy, "the brain is to the mind as the computer is to its software," but he has now rejected the implications of his earlier view (1988:73). He now argues that commonsense concepts involving intention have an integrity of their own and cannot be accounted for by reductive scientific stories such as those told by the Churchlands and Sejnowski. "Such things as believing that snow is white and feeling certain that the cat is on the mat—are not 'states' of the human brain and nervous system considered in isolation from the social and nonhuman environment" (1988:73). Putnam argues that:

intentionality won't be reduced and won't go away. I shall try to show that there is no scientifically describable property that all cases of any particular intentional phenomenon have in common. By this thesis I mean to deny that there is some scientifically describable "nature" that all cases of "reference" in general, or of "meaning" in general, or of "intentionality" in general possess; I also mean to deny that there is any scientifically describable property (or "nature") that all cases of any one specific intentional phenomenon, say, "thinking that there are a lot of cats in the neighborhood," have in common. [1988:1–3]

To rebut Putnam, Paul Churchland argues that he mistakenly relies on a model of folk psychology to account for intentionality. "Folk psychology" is "the prescientific, commonsense conceptual framework that all normally socialized humans deploy in order to comprehend, predict, explain, and manipulate the behavior of humans and the higher animals" (Churchland 1998b:3). There is something theory-like about folk psychology because it "embodies generalized information, and . . . it permits explanation and prediction in the fashion of any theoretical framework" (Churchland 1998b:3). But it is a theory that is soon to be eclipsed by a better one, neuroreductionism, which explains much more, is rapidly developing, and is compatible with accepted findings in numerous physical and life sciences (Churchland 1998b:8). Folk psychology (FP) will inevitably be eliminated, like other outmoded notions—phlogiston, caloric fluids, or the crystal spheres of ancient astronomy. "FP's emerging wallflower status bodes ill for its future" (Churchland 1998b:8).

How could an anthropologist help Putnam out here? The Churchlands are right that there is a common cultural view among European Americans that a person is made up of inner mental states—Crapanzano among others has shown this definitively (1992). Their mistake is to think that such a cultural view is a theory of a scientific kind. Cultural views do not seek to prove or disprove; they do not seek to explain by means of general laws. Instead, they are part of what people use to build up a picture of the world and of possible worlds. Therefore, the anthropologist might argue, the Churchlands have made a category mistake. U.S. folk psychology will not necessarily be replaced by the view that inner states are neural structures, any more than a habitual gambler's view that a score of 21 wins a hand of Blackjack would be replaced by the view that habitual gambling is caused by possessing a particular set of genes. If a more reductionistic and brain-based picture of human action displaced our current everyday mental concepts, it would not be because (or solely because) the neural net theory had won in the court of scientific opinion. It would be because the environment we live in (and that scientific theories are produced in) had shifted so that a brain-centered view of a person began to make cultural sense. An anthropologist might also observe that by relegating Putnam's ideas to the realm of the folk, which is then given wallflower status, the Churchlands and Sejnowski neatly place themselves on the side of the male, rational, mature, and reliable; and Putnam on the side of the female, irrational, immature, and unreliable.

John Searle is another critic of neuroreductionism. Although he accepts that "conscious processes are *caused by* lower-level neuronal processes in the brain" (1998:53, emphasis added), he argues that consciousness cannot be *reduced to* micro-physical causes without leaving out subjectivity. Such experiences as pains, tickles, itches, thoughts, and feelings "exist only as they are experienced by some human or animal subject" (1998:44). Hence, although consciousness is a biological phenomenon, it cannot be reduced to low-level neuronal processes without losing its subjective nature (1998:57).

Consciousness only exists when it is experienced as such. For other features, such as growth, digestion, or photosynthesis, you can make a distinction between our experience of the feature and the feature itself. This possibility makes reduction of these other features possible. But you cannot make that reduction for consciousness without losing the point of having the concept in the first place. Consciousness and the experience of consciousness are the same thing. [Searle 1997:213–214]

Paul Churchland's reply to Searle tries the same feminizing tactic he used on Putnam: he accuses Searle of having a "Betty Crocker Theory of Consciousness" (1998a:113). He is referring to an explanation of microwave cooking in a Betty

Crocker Cookbook from the early days of microwave cooking, which says the microwave agitates the molecules in food, which vibrate and create friction, which in turn creates heat. Paul Churchland's point is that this account, relying on folk understanding that friction causes heat, is "massively misleading" and reveals a "decisive failure of comprehension" (1998a:121); in reality, vibration of the molecules *is* heat. The cookbook, and Searle, perpetuate "commonsense, prescientific folk-psychological conceptions" (Churchland 1998a:121–122). In other words, Churchland is with the *men* in the neurophysiology lab developing dynamic, powerful, explanatory, hard, rational truth; Searle and Putnam are with the *girls* in the kitchen, stuck in modes of thought that are inept, sloppy, soft, irrational, and false.⁷

As a small footnote, just out of curiosity, I asked Richard Cone, a physicist, how microwaves cook food. He read both Betty Crocker and Churchland on the subject and said:

Betty Crocker is right! When microwaves are absorbed by the charged molecules of food, the molecules absorb the microwaves and oscillate. Just as Betty Crocker says, there is no heat yet. The molecules could simply re-radiate the microwave energy in its original form, as microwaves. Or, if they collided with other molecules (which they are likely to do if there is any moisture in the food), the energy would be converted into random molecular motion. Only at that point would we say the energy had been converted into heat. [personal communication, February 10, 1999]

I think most cultural anthropologists would join Putnam and Searle in opposition to a position in which the dyke between nature and culture has been breached, and all of what anthropologists call *culture* has drained through the hole and dissolved in the realm of neural networks. Transcendental reason, the prototype of masculine, abstract thinking, has indeed been dislodged from its eminent position, and the body, prototype of feminine concrete existence, has risen to take its place. But this body is universal, unhistorical, unconscious of its own production, and possessed of many of the characteristics of modernist scientific accounts: its core operations (in the cognitive unconscious) are (to point to the metaphors informing Lakoff and Johnson's account—metaphors to which they themselves do not attend) hidden in the depths, rooted deep below the surface, and causally generative of almost everything humans do (1999:12–13). The brain becomes sovereign, and its sovereignty conceals what Geertz argued in 1962: that the human brain is a product of a *relation with culture*.

The synchronic emergence in primates of an expanded forebrain, developed forms of social organization, and, at least after Australopithecenes got their hands on tools, institutionalized patterns of culture indicates that the standard procedure of treating biological, social, and cultural parameters serially—the first being taken as primary to the second, and the second to the third—is ill-advised. On the contrary, these so-called "levels" should be seen as reciprocally interrelated and considered conjointly. [1962:729]

You would never know it from the cognitive science literature, but anthropological critiques of this work are plentiful and compelling. I mentioned earlier that Naomi Quinn pointed out long ago Lakoff and Johnson's failure—even in their earlier work—to give culturally constituted meaning a place of its own (1991:65). Many others, such as Dorothy Holland and Jaan Valsiner (1988:264–265)⁸ and John Lucy (1998), have stressed that cognitive theories focus far too much on the products of the brain and too little on how they work "in the life and functioning of actual people" (Lucy 1998:105); they ignore how the meaning of metaphors, for example, is shaped by culture beyond the brain and body.

Along related lines, Claudia Strauss and Naomi Quinn acknowledge in a recent work that connectionist models hold interesting potential for anthropologists because, unlike earlier linear models, they are “flexibly adaptive rather than rigidly repetitive. They can adapt to new or ambiguous situations with ‘regulated improvisation’ to use Bourdieu’s term” (1997:53). But Strauss and Quinn also insist that cognitive scientists “oversimplify the variety of ways in which cultural knowledge is transmitted” (1997:76). Relying on simple models of supervised or unsupervised learning, cognitive scientists ignore the immense complexity of social learning, by turns guided, as Roy D’Andrade has shown (1981), taught, modeled, rewarded, ignored, or coerced (Strauss and Quinn 1997:77–78).

Focusing on social learning, Maurice Bloch (1998) stresses how much happens outside of the circle of language-use proper: Zafimaniry children learn kinship concepts as they breastfeed not only from the mother but from other women of the same moiety, and as they are carried on the back of an older child from the same moiety. In this way, children literally become an “integral part of another body, ‘connected’ to another brain” (1998:50–51). In anthropological linguistics more broadly, the very division between language and culture is being challenged. As Jane Hill and Bruce Mannheim recently put it: “there is no *prima facie* way to identify certain behaviors—or better, certain forms of social action—as linguistic and others as cultural. Even the most formal and minute aspect of phonetics—syllable timing—completely interpenetrates the most identifiably nonlinguistic, unconscious part of behavior—the timing of body movements and gestures” (1992:382).

In spite of all these wonderful shields against neuroreductionism, cultural anthropologists might still feel like a deer in the headlights of a Mack truck, realizing how the new neuroscience is eradicating the social and cultural (by reducing them to more fundamental processes in the brain), how it is gaining recruits from sibling disciplines, and how it relies on a caricature of how anthropology understands social and cultural phenomena.

the social and cultural context of neuroreductionism

What in the historical context of the recent past could be inciting a turn to a neuronal account of human consciousness, an account that rigidly demarcates rationality from irrationality, constrains thought, and erases social context? Returning to Hugh Gusterson’s questions about nuclear armaments in the Third World, anthropologists might ask what—at an emotional and probably unacknowledged level—are advocates of neuroreductionism defending against or afraid of? In Tom Laqueur’s book, *Making Sex*, he describes how a biology of difference arose in the late 17th and 18th centuries and replaced an age-old belief that male and female bodies were homologous physically, even though males had their stuff outside and females had their stuff inside. He suggests that fears of a new and threatening agency of women were unleashed because the old basis for patriarchal authority was destroyed by the fall of traditional monarchies and the rise of liberalism (1990:157). New scientific findings about incommensurable biological differences between men and women, findings that made women seem unstable and at the mercy of physical forces they could not control, served as a bulwark against women’s greater role in society.

So what fear might lie behind the culturally “male” (remember how Betty Crocker was excoriated) rise of the neurology of mind? Has there been a shift in the political scene that makes women or other subordinated groups suddenly seem threateningly out of control? Or could the threat lie within? On the model of Gordon’s

(1997) and Gusterson's (1999) analyses, is there rising fear that the male self contains forces that are uncontrolled and irrational?

My recent research suggests that one particular sphere of social life today—the limitless profit and risk-taking of entrepreneurial speculative capitalism—is a good candidate for something frighteningly out of control. More significantly, my research also suggests that the gendered associations with the realm of entrepreneurial capitalism are in the process of a reversal: fearful loss of control that was seen as female in the 18th century has become redefined as male. In the 18th century, booms and busts in the value of public stock were regarded with dismay and fear. Seen as feeding on itself and without moral limit, the market, a pathologically unstable force, placed “politics at the mercy of a self-generated hysteria (in the full sexist sense)” (Pocock 1985:112–113). Many political and philosophical efforts were exerted to throw a net of rational control (refinement and politeness) over the 18th-century “economic man.” This was an effeminate being “wrestling with his own passions and hysterias and with interior and exterior forces let loose by his fantasies and appetites, and symbolised by such archetypically female goddesses of disorder as Fortune, Luxury, and most recently Credit herself” (Pocock 1985:114).

By the next century, economic man had become firmly masculine, in the guise of the conquering hero of 19th-century industrialization (Pocock 1985:114). This image of the conquering hero has lasted for some time, through the Robber Barons to *Time's* (1998) recent cover issue, “100 Builders and Titans, the Business Geniuses of the Century,” who include only one woman, Estee Lauder. But there are hints that some significant changes may be afoot. The wild, passionate female energy that fueled the speculative economic man of the 18th century, having given way to the controlled masculine energy of the 19th- and early 20th-century Titan, is making a reappearance.

Some light is shed on the background for this change by my current ethnographic work, which I describe in more detail elsewhere (Martin 1999, in press). Briefly, in U.S. popular culture, cognitive and emotional states that feature tumultuous and continuous transformations are undergoing a dramatic change in valence. For example, the many accounts of manic depression (also known as bipolar disorder) flooding popular culture are in the process of redefining manic depression from being a disability to being a strength.⁹ The psychiatrist Kay Jamison takes great pains to describe the positive aspects of manic depression alongside the negative in her best-selling memoir. Manic depression entails a “finely wired, exquisitely alert nervous system” (1995:3). According to Jamison, these thought processes are characteristic of the manic phase: “fluency, rapidity, and flexibility of thought on the one hand, and the ability to combine ideas or categories of thought in order to form new and original connections on the other . . . rapid, fluid, and divergent thought” (1995:105).¹⁰ In the present environment, in which time and space are in many ways stretching, condensing, speeding, warping, and looping linear time and space, the perceptual abilities of mania can easily seem to be talents in accord with new realities. In general, the qualities praised fit perfectly with the kind of person frequently described as highly desirable in the corporate United States; in one recent popular formulation, *The Future and its Enemies*, “stasists” will be left behind by “dynamists” who celebrate “‘emergent, complex messiness’ . . . an order that is unpredictable, spontaneous, and ever shifting, a pattern created by millions of uncoordinated, independent decisions . . . these actions shape a future no one can see, a future that is dynamic and inherently unstable” (Postrel 1998:xv). This world needs people who are always adapting, scanning the environment, continuously changing in creative and innovative ways, flying from

one thing to another, pushing the limits of everything, doing it all with an intense level of energy focused totally on the future (Postrel 1998:57).

The manic has also long been associated with putting everything possible into rapid circulation. Unica Zürn describes her state of mind just before she entered a mental hospital, Wittenau. In the manic phase, she makes everything around her circulate rapidly; she circulates so rapidly, she lifts off the earth.

Whenever she [Zürn is speaking of herself] enters a shop to purchase something, she leaves behind far more money than her purchase costs, and departs the shop with the words: "Happy birthday and many happy returns." Naturally the people in the shops are enchanted. And from now on she encounters one large smile whenever she goes. She also starts to walk in a completely new way: very fast and incredibly nimble. It seems to her as if she were floating two centimetres above the pavement—she's flying! [1994:43]

If there is an increasing demand for restless change and continuous development of the person at all times, in many realms, then the mania in manic depression might readily come to be regarded as normal—even ideal—for the human condition under these historically specific circumstances. I do not mean to imply that appreciation for manic-depressives is entirely new. In her book *The Psychiatric Persuasion*, Elizabeth Lunbeck has shown that in the early 20th century, psychiatrists, such as E. E. Southard, generally reacted favorably to patients they diagnosed as manic-depressive (Lunbeck 1994). One difference between Southard's time and today is the extent to which the category of mania and of manic depression has been widely taken up outside clinical settings in many domains of popular culture. Another difference is the way manic depression is associated with gender categories. In the early 20th century, far more women were diagnosed with manic depression than men, by some estimates twice as many. Lunbeck suggests that gender was encoded in the very category itself: "The most salient characteristics they saw in the manic patient were those associated in other contexts with an unbounded, out-of-control femininity that was at once frightening and alluring" (1994:149). Men diagnosed with manic depression appeared to their doctors, relatives, and friends, "much like women": "excitable, distractable, and talkative, his conduct governed less by rational considerations than by plays of fancy" (Lunbeck 1994:149).

In contrast, dementia praecox (later schizophrenia) was coded "male." Its stolidity, stupidity, and catatonia "were merely the extreme, pathological manifestations of men's naturally more stable nature, just as the periodicity that characterized the manic mimicked in a more marked form the natural periodicity of women" (Lunbeck 1994:150). Today the gender differences for manic depression have disappeared: "manic-depressive illness . . . is equally prevalent across gender," while major depression, with its immobility and numbness, is more common among women, not men (Goodwin and Jamison 1990:168). It would be dangerous to make too much of such statistics, and at this point in my research, I am only speculating, but I wonder if these shifts are linked to the inception of the male manic, seen as potent and effective today despite or more exactly, because of, his instability and irrationality.

Decrying the dominance of free market ideology today and the inability to conceptualize alternatives, David Harvey comments sardonically, "It is the supreme rationality of the market versus the silly irrationality of anything else" (in press:5). But perhaps the irrationality of the market and what must be done to succeed in it have been forced into the open as a result of policies in the United States beginning in the 1980s that fueled investment in the stock market and, in turn, set off a spiral of corporate mergers, layoffs, technological investment, increased profits, and higher stock

prices—all achieved at the cost of job loss, wage stagnation, and a widening gap between rich and poor—each with its price tag of misery (Schaeffer 1997:121).¹¹ Perhaps it is hard not to see anymore that rational choice contains within it irrational impulses and desires. From this vantage point, the excess of CEOs like Ted Turner, whose mania is depicted in the media as talent, is a sign of apprehension: greater knowledge of what capitalism entails and greater fear of what it may require of people. Thus, a new book that analyzes the workings of late capital is called *One World, Ready or Not: The Manic Logic of Global Capitalism* (Greider 1997). It is filled with references to “manic capital,” oscillating with depression, and the calamitous consequences of both. The drop and rapid recovery of the stock exchange in October 1997, inspired a flurry of domain-crossing remarks, such as, “If Wall Street were a person we’d think he was mentally ill” (Uchitelle 1997:1). Similarly, during the market swings of 1998, the *Atlanta Journal and Constitution* quoted stock analyst Alfred Goldman’s description of a “manic-depressive period in the market—a first-quarter with ‘manic’ gains and a second quarter with ‘depressive’ losses” (Walker 1998:1). Under a headline in the business section, “A Manic-Depressive Market Befuddles Even the Professionals,” *The New York Times* described the crisis like this:

Moodiness like this used to be an occasional thing in American stocks. Now, going from euphoria to depression is de rigueur. The trouble is, these market gyrations have consequences: they are highly distressing to investors’ psyches and exceedingly costly to their portfolios. [Morgenson 1998:C1]

The *Los Angeles Times* focused on the massive swings in Initial Public Offering (IPO) activity during the year, about which Jay Ritter, a professor of finance, commented, “The term that comes to mind is manic-depressive” (Vranna 1998:1). The *Los Angeles Times* also noted that the wild swings in the market had spread to Japan: a security analyst from Jardine Fleming Securities Asia, Ltd., is quoted as saying, “I’ve never seen anything like it, it’s astounding. . . . The market is hyper, manic-depressive” (Magnier 1998:1).

As the oscillations continued into 1999, Internet day trader James J. Cramer, who describes “his own pace of buying and selling as manic—as a way of beating the market in good times and bad,” writes in a *TheStreet.com* column: “This market needs a double dose of Zyprexa [an antipsychotic] with some lithium laced in. It has to stop the manic-depressive behavior before it drives us all crazy” (Kahn 1999:1).¹² I am suggesting that today Fortuna might better be called Fortunus: men are uneasily enacting the attributes of Fortuna rather than keeping her under firm, masculine control. There are those in the financial world today—called “contrarian”—who disparage the current stock market as dangerously inflated and urge a high degree of caution in “minding Mr. Market,” who is always changing his mind (Grant 1993:xxi).

Loosening the controlling strictures around unreason is a frightening prospect, especially in light of how central the opposed pair rationality/irrationality has been in Western thought. To return briefly to an earlier time, with the onset of the Age of Reason in 17th-century Europe, many of those deemed irrational were removed from society.

All forms of unreason, which in the Middle Ages had been part of a divine world and in the Renaissance a secularizing world, the civil world of commerce, morality, and work, in short—beyond the pale of the rational world—were placed under lock and key. Beggars and vagabonds, those without property, jobs or trades, criminals, political gadflies and heretics, prostitutes, libertines, syphilitics, alcoholics, lunatics, idiots,

and eccentrics, but also rejected wives, deflowered daughters, and spendthrift sons were thus rendered harmless and virtually invisible. [Doerner 1981:14–15]

But whereas the mass of outcasts was sequestered behind stone walls, the most frenzied, angry, and threatening among them (the maniacs) were brought into direct relationship with social rationality: they were “exhibited as caged ‘monsters’ to a paying populace” (Doerner 1981:16).

The arrangement that presented the insane as wild and dangerous beasts was an appeal to the public to accept the moral yardstick of the absolute state as its own measure of reason. That the absolute animal freedom of the insane could be dealt with only by means of absolute force, that they were to be viewed as objects of a process of obedience training, that their aberrations had to be countered by rational truth, their violence by corporal punishment, and finally, that the threat they posed to society was transformed into demonstrable powerlessness, gave exemplary and clear emphasis to the goals and sanctions of this moral and political appeal. [Doerner 1981:17]

Letting mania out from the confines of the asylum and into Wall Street *is* frightening: who will provide a moral yardstick, a restraining force there?

Is this appearance of mania as a characteristic of the successful entrepreneur so dramatic a change from the previous nearly two centuries? Is this shift scary enough to contribute to the appeal of highly rationalist theories of the normal brain? The fear in question is not, as in Laqueur’s case (1990), focused on out-of-control female passions. Instead, the fear is focused on male passions that might need to be out of control to be powerful in the market—to manifest themselves in the form of the male manic as a potent, risk-taking entrepreneur. Whatever one makes of the idea that fear could be involved in the appeal of neuroreductionism, fear *does* reside like a dark shadow over the gleeful play of mania. For example, consider two photographs of Ted Turner in a *Saturday Evening Post* article on manic depression. The photographs, which juxtapose him in his somber CEO role and his manic yachtsman role, are captioned in a somber tone: “Ted Turner’s father, like Ernest Hemingway’s [and of course like Ernest Hemingway himself] ended his life with a gun” (SerVaas 1996).

Another approach to understanding the social context of the rise of neurophilosophy is to ask: what kind of subjectivity would such a theory support? Could neuroreductionism be considered a kind of governmentality, one of those “technologies and theoretical accounts by which individuals [are] rendered thinkable as governable subjects” (Poovey 1998:146). In *A History of the Modern Fact*, Mary Poovey argues that in the 18th century, when the rule of monarchy and hereditary privilege were in peril, the essays of moral philosophers such as Daniel Defoe contained “theories about liberal (self-) government and the mode of subjectivity that enabled individuals to govern themselves” (1998:xix). The moral philosophers elaborated the interiority of the individual, contributing to a theory of liberal government that depended on self rule and voluntary compliance by individuals (Poovey 1998: 147–148). Elaborating theories of the universality of human nature built a path to social order; if everyone was motivated by the same desires, then human actions involving the new stock market, financial institutions, and voyages to distant lands would be orderly and understandable, not chaotic and incomprehensible (Poovey 1998:147).

There may be no social change in the recent past on the same order as the collapse of monarchy in the 18th century. Even so, candidates for change cataclysmic enough to alter concepts of subjectivity would surely be the uneven impact of international changes in free trade agreements, income and wealth polarization, stock price inflation, and corporate mergers, among other things, since the early 1970s (Schaeffer

1997). Simultaneously, and not independently, in many European and U.S. countries, there has been a massive reduction of the social practices that allowed people to depend on *institutions* for life support. At the federal level, welfare, educational, health, work, and community programs have been severely truncated or eliminated. At the corporate level, large, geographically stable industries had been tied to a locale by their huge investment in manufacturing equipment, and thus once supported local communities for generations.¹³ The possibility of a career, white or blue collar, gave individuals the realistic expectation that they were part of communities in which overlapping social ties would be likely to last over time. In recent years, local communities have been threatened. To cite a specific example of a general trend, Ciba-Geigy, a pharmaceutical company, and the agricultural and drug company Sandoz have merged, spun-off their chemical manufacturing divisions, and formed a new company, Novartis, devoted to research in the life sciences. About ten percent of the two companies' workforces will be downsized, and more than half of their plants worldwide, as well as the Summit headquarters, will be closed. As a Swiss banker commented, "The employees will not love the merger" (*AFX News* 1996). In this environment, if engineers survive the merger, downsizing, and divestment, they might still find their entire body of expertise obsolete. Their community and family ties would almost certainly be threatened by a change in residence, and it would probably not be for the last time.

As many overarching social institutions of the corporation and state shrink, the individual becomes like a node in a network. People are not necessarily isolated on separate islands, but the energy to move from node to node in the network must reside in the individual, and the individual must become the site for investment of resources—or so it seems to me. The person comes to be made up of a flexible collection of assets; a person is proprietor of his or her self as a portfolio. In the 1990s, there was an increase in home-based work (telecommuting), which separates the worker from the traditional workplace. According to a 1996 poll, 19 percent of U.S. citizens were self-employed, freelance, or sequential temporary workers (Saltzman 1996:71). "People need to invest in their development as if they were a corporation," says Anthony Carnevale, chairman of the National Commission for Employment Policy at the Department of Labor (Saltzman 1996:71). Individuals "shapeshift" in their changing environments, accumulating and investing information and resources (Pulley 1997:136). People with the resources to do so are increasingly speaking of themselves as mini-corporations, collections of assets that must be continually invested in, nurtured, managed, and developed. There is a sense in which, as the nation-state yields its prominence in world affairs to the multi-national corporation, individuals move from being citizens, oriented to the interests of the nation, to being mini-corporations, oriented primarily to their own interests in global flows of capital (Gupta and Ferguson 1992; Maurer 1995).¹⁴

So what kind of subjectivity might we guess neurologically based theories of the mind and brain will encourage in relation to these social changes? I can suggest three possibilities: first, our behavior depends on our brains, not on our sociality. Our activities are fundamentally generated by brain states, not by social context. Second, the brain is a product of evolution, itself a process of competition for scarce resources. We can be counted on to strive for our survival even in the absence of sociality. Third, we are all (unless we are abnormal) made up of the same neural structures, and can therefore be counted on to produce similar behavior in similar environments.

Nor is this vision just theoretical. Journalist and editor Virginia Postrel describes a world built on its principles:

The “complex, ever-changing world” is the product not of a powerful central mind but of millions of different trials and errors, experiments and results—done in parallel and without coordination. . . . We make progress not toward a particular, certain, and uniform destination but toward many different, personally determined, and incremental goals. In a global sense, “progress” is the product of those parallel individual searches: the extension of knowledge and the gradual improvement of people’s lives—an increase in comfort, in life options, in the opportunity for “diversified, worthwhile experience.” Progress is neither random Darwinian evolution nor teleological inevitability. [1998:56–57]

Our similarities will not be based on shared participation in social life, but on a shared search for individual betterment. If 18th-century fear in the face of collapsing monarchies was allayed by the study of universal human motivations that would structure behavior and stave off anarchy, perhaps late 20th-century fear in the face of collapsing public and corporate supra-individual supports is being allayed by the study of universal human neural matter that will structure cognition and behavior and also stave off anarchy in the relative absence of supra-individual social life.

Whenever a new kind of knowledge makes claims to a superior account of the world or of humanity, particular sets of experts will rise to the occasion. Most obviously in the case of neurons, they are cognitive scientists of all kinds. Less obviously, they include pharmacologists of the brain (producers of drugs such as Ritalin, Lithium, or Depakote, often described as “managers” who can optimize mental states). If 18th-century moral and political writing attempted to moderate the *female* passions of speculative man, late 20th-century pharmacology attempts to harness for particular purposes the *male* passion, energy, and risk-taking of the entrepreneurial man. In Tom Wolfe’s *A Man in Full*, the mayor discusses the high-rise towers of midtown Atlanta and how they demonstrate the city is not a regional center, but a national one: “He gestured vaguely toward the towers that reached up far above them. ‘They did it!’ Atlanta favors people who are hypomanic—I think that’s the term—people like Inman Armholster who are so manic they refuse to pay attention to the odds against them, but not so manic that they are irrational” (1998:195). Just the right amount of mania? Evidently we can even strive to optimize irrationality.

If the social contract was originally seen as a means of keeping unruly individuals in order, we have now arrived at an odd and chilling reversal: order and rationality now reside in the mind or brain of individuals, and disorder reigns (and is celebrated) in social institutions like the market. Rationality flows in the neural nets of the ordinary human’s brain, while irrationality (mania) characterizes the risk-blind “crazy” CEOs celebrated by *Time* in a section of the special issue, “100 Builders and Titans” (Farnham 1998:207–208). Rationality and control are inside the ordinary individual, without the individual connecting to any social context, while irrational excess characterizes the Titans of Wall Street, even as they become so colossal that they begin to act like states, contributing billions to the United Nations (UN) or signing agreements with municipal and state governments. When the 358 richest people in the world had a net worth equal to the combined income of the poorest 45 percent of the world—2.3 billion people, as the UN reported in 1996—Richard Jolly, the main author of the UN report called the rich-poor divide “Gargantuan in its excesses and grotesque in its human and economic inequalities” (Merchant 1996:4) According to the 1999 UN report, the world’s 200 richest people had doubled their wealth, to more than \$1 trillion, while the assets of the three richest people were more than the combined gross national product (GNP) of the 48 least-developed countries (United Nations Development Program 1999:37). *Time*’s terms for today’s CEOs (“wacky and in

command" or "crazy and in charge") seem a dangerously indulgent choice of words (Farnham 1998:2, 207).

conclusion

As a discipline, cultural anthropology is threatened by the move to neuroreductionism because whole chunks of our sister disciplines (philosophy, psychology, linguistics, cognitive science) are operating on models that ignore the social dimension of experience. We will not be called in as experts in those fields. Where we *are* increasingly called in as experts (in corporations) we are sometimes seen as cultural pharmacologists—technicians who know how to tweak the culture here or there to optimize performance, including a modicum of crazy risk-taking to insure innovations (Jones 1999).¹⁵

What can we do? Ethnography has been called an alternative form of knowledge about human nature, one that largely does not aspire to universals, fundamentals, or units of knowledge that can be used like blocks to build up structures. Instead of breaking nature down into apparently constituent parts, the knowledge ethnography produces reinstates experience of the world or presents it imaginatively. But even more crucially, ethnography could be regarded as a technology of sociality, contributing to a world in which individuals are only thinkable as subjects insofar as they participate in cultural and social activities.

In a world where such a view becomes entrenched, perhaps "reduction" of the social and cultural would feel like a *violent* act. Veena Das has traced the outlines of the fault line, often raised up by literally unspeakable physical violence, between actions that can be incorporated into the human form of life and actions that cannot—that instead "tear apart the very fabric of life" (1998:181). Das shows that a similar edge appears in panic rumors when language loses its "signature" and "both the source of speech and the trustworthiness of convention" are destroyed (1998:186). There is a "mounting panic in which the medium of rumor leads to the dismantling of relations of trust at times of communal riots. . . . Once a thought of a certain vulnerability is lost—the world is engulfed without limit" (1988:186). So high are the stakes in preserving a robust sense that human life is cultural, not only neuronal, that we might hyperbolize that neuroreductionism is like a panic rumor—and, as Das says of panic rumors, "access to context seems to disappear" (1988:186).

Neuroreductionism could make social context seem to disappear despite its central focus on communication. In the computational neuroscience model, individuals communicate, brain to brain, like nodes in a network, not like elaborately interwoven threads in a vibrant cultural tapestry. Similarly, Talal Asad (1994) argues that statistical accounts lead us to think in terms of how one individual's behavior varies from another's within a population, rather than in terms of the cultural forms that comprise meaning—distribution of traits instead of social types or characters. Statistics depend on and use the "liberal conception of modern society as an aggregate of individual agents [citizens of the state] choosing freely and yet—in aggregate—predictably" (Asad 1994:77). Perhaps talking and thinking in terms of neural nets will lead us one step further and encourage us to think of *subunits of individuals* as the components of which groups are made.¹⁶

Like the 18th-century essay, ethnography can draw the reader or viewer into engagement or conversation, instruct by example, and elicit partial identifications—thus creating something akin to a social tie between author and reader. There can be so much pleasure in this that we have in our hands a powerful means of putting into play (in the content of our ethnographies and in ethnographic texts themselves) a form of

sociality that could contribute to an alternative form of governmentality from the instrumental, individual one emanating from brain science. By describing the ineluctably social and cultural complexity of human actions, ethnography renders individuals thinkable only as social beings, and thus ethnography stands up to neurological foundationalism (the new guise of “nature”), saying: we are not all alike, though we are related; we are only human insofar as we are connected to others; human experience is active and inventive, not static and constrained; we may be a product of evolution, but its imperatives do not exhaust the reasons for our actions; because of humans’ immense cultural variability, the fund of experience people can draw on to produce knowledge about the self is far greater than anything brain science can teach us about human capacities. Our writing, teaching, speaking, and filming can both describe these aspects of human experience and actually bring them into existence by creating conversational relationships to our audiences. The goal is not to free ourselves from all governmentality, but to set in motion a governmentality that can counter biologism by insisting on imagining human consciousness as made up of the social and cultural.

notes

1. Ellen Lewin developed the intriguing theme and shepherded the conferees through a very stimulating and enjoyable stay in Portland, OR.

2. In this passage, Grosz explains how dichotomized terms are ranked hierarchically:

Given the prevailing binarized or dichotomized categories governing Western reason and the privilege accorded to one term over the other in binary pairs (mind over body, culture over nature, self over other, reason over passions, and so on), it is necessary to examine the subordinated, negative, or excluded term, *body* as the unacknowledged condition of the dominant term, *reason*. . . . The body has been and still is closely associated with women and the feminine, whereas the mind remains connected to men and the masculine. [1993:195]

3. The National Science Foundation’s 1999 budget provides \$40,000,000 to the *four* subfields of the “Behavioral and Cognitive Sciences” (social psychology, linguistics, human cognition, and child learning) and only half again as much, \$60,000,000, to the *nine* subfields of the “Social and Economic Sciences”—which include cultural anthropology, economics, political science, sociology, law, physical anthropology, archaeology, geography, and decision and risk management (<http://www.NSF.org>, accessed March 1, 1999).

4. Commentators on this book remarked, “she is . . . a real reductionist. The title of her book is to be taken literally—no hyphen between the *neuro* and the *philosophy*: a unified science of the mind/brain is indeed the aim” (Marshall and Gurd 1996:180; emphasis in original).

5. A point I have no space to develop here is that the Churchlands and their San Diego colleagues stress plasticity far more than Lakoff and Johnson do. One close colleague of the Churchlands does a particularly good job making the plasticity of the brain vivid: V. S. Ramachandran, a neurologist who (with the help of Sandra Blakeslee) has written about the experiences of his patients whose amputated limbs continue to hurt, itch, and feel as if they were still attached. Working with a patient whose lower arm had been amputated 10 years ago, Ramachandran found that the parts of the brain once sending and receiving signals to and from the missing hand now sent and received signals to and from hand shaped patches on the patient’s cheek and on his upper arm. When the patient was touched on these areas, he felt sensation on his cheek or upper arm, but simultaneously, he also felt it in the fingers, thumb, and so on, of his severed hand. Ramachandran argues that the area of the brain devoted to hand sensations is flanked by the face area below and the upper arm area above. When input from the hand area was lost upon amputation, the patient’s face and upper arm brain areas “invaded the vacated territory of the hand and began to drive the cells there” (Ramachandran and Blakeslee 1998:29). The implications, says Ramachandran, are “astonishing,” “staggering”: “brain maps can change, sometimes with astonishing rapidity [a matter of weeks]” (1998:31). The implications

are so astonishing because they overturn an established dogma in neurology—"the fixed nature of connections in the adult human brain" (Ramachandran and Blakeslee 1998:31). Instead, the brain's "connections are extraordinarily labile and dynamic" (Ramachandran and Blakeslee 1998:56).

6. There are other opponents of neuroreductionism, most notably, the "new mysterians," who argue that consciousness is irreducible. For lack of space, I do not discuss them here, but an accessible text is Chalmers 1996. Searle provides a critique in *The Mystery of Consciousness* (1997). For an earlier view of the possibility of seeing consciousness as an emergent property of a complex system, see Sperry and Henniger 1994.

7. See Churchland 1996:395 for more on the irrationality of folk psychology.

8. Holland and Valsiner point out, contra Lakoff and Johnson, that metaphors may be affected by cultural models, as well as the reverse. "Highlighted by a new metaphor, a cultural model may be developed in different directions, and similarly the meaning of the 'new' metaphor itself may come to be elaborated in new ways" (Holland and Valsiner 1988:264).

9. This redefinition, highly specific to the present social context, ignores as much as it illuminates. But this makes it no less interesting.

10. Manic depression, for all the pain it entails, keeps one in constant motion. Jamison uses many metaphors of moving through space to convey what it is like: "I now move more easily with the fluctuating tides of energy, ideas, and enthusiasms that I remain so subject to. . . . My high moods and hopes having ridden briefly in the top car of the Ferris wheel will, as suddenly as they came, plummet into a black and gray and tired heap . . . then at some unknown time, the electrifying carnival will come back into my mind" (1995:213).

11. In 1999, more than 43 million Americans had no health insurance. In 1997, 18 percent of Americans who worked (24.6 million) had no health insurance (Kilborn 1999).

12. In the 1930s, Warren Buffet's mentor, Benjamin Graham, referred to the mood swings of Mr. Market, a personification of all investors, as "a manic-depressive who gets wildly excited about stocks one day and deeply pessimistic the next" (Glassman 1999:1).

13. Bethlehem Steel employed 30,000 in 1970 and employs less than 5,000 today, making the same amount of steel (Harvey in press:3).

14. Akhil Gupta describes the weakening of the nation-state in these terms:

There is a growing tension between nation and state so that the particular enclosure that was conjured by their historically fortuitous conjunction may slowly be falling apart. The clearing does not hold in the hyperspace of late capitalism. The kinds of activities and meanings that were ideally brought together by nation-states—the regulation of industries, goods, and people; the control and surveillance of populations; the exercise of the monopoly on violence within the territory; the provision of "security" with respect to other nation-states. . . ; the employment of laws; the feeling of belonging to "a people"; the belief in particular historical narratives of identity and difference—may be untangling. . . . National states are by no means obsolete, but their statelike functions are being increasingly "privatized" except insofar as they represent direct subsidies to transnational corporations. [1998:318–319]

15. *USA Today* carried an article on February 18, 1999, titled "Hot Asset in Corporate: Anthropology Degrees" (Jones 1999).

16. As Marilyn Strathern said about Margaret Thatcher's enterprise culture, it "brings uncertainty to conceptualising that counterpart to the individual, namely 'society'" (1992:8).

references cited

AFX News

1996 Sandoz, Ciba-Geigy Merger Seen Bringing "Significant Synergies." AFX News, March 7:1.

Asad, Talal

1994 Ethnographic Representation, Statistics and Modern Power. *Social Research* 61(1): 55–88.

- Bloch, Maurice
 1998 *How We Think They Think: Anthropological Approaches to Cognition, Memory, and Literacy*. Boulder, CO: Westview Press.
- Butler, Judith
 1993 *Bodies that Matter: On the Discursive Limits of "Sex."* New York: Routledge.
- Chalmers, David J.
 1996 *The Conscious Mind: In Search of a Fundamental Theory*. New York: Oxford University Press.
- Churchland, Patricia
 1996 *Neurophilosophy: Toward a Unified Science of the Mind/Brain*. Cambridge, MA: MIT Press.
- Churchland, Patricia, and Terrence J. Sejnowski
 1992 *The Computational Brain*. Cambridge, MA: MIT Press.
- Churchland, Paul
 1998 Betty Crocker's Theory of Consciousness. *In On the Contrary: Critical Essays, 1987–1997*. Paul Churchland and Patricia Churchland, eds. Pp. 113–122. Cambridge, MA: MIT Press.
- Churchland, Paul, and Patricia Churchland
 1998 *On the Contrary: Critical Essays, 1987–1997*. Cambridge, MA: MIT Press.
- Crapanzano, Vincent
 1992 *Hermes' Dilemma and Hamlet's Desire: On the Epistemology of Interpretation*. Cambridge, MA: Harvard University Press.
- D'Andrade, Roy G.
 1981 The Cultural Part of Cognition. *Cognitive Science* 5(3):179–195.
- Das, Veena
 1998 Wittgenstein and Anthropology. *Annual Review of Anthropology* 27:171–195.
- Doerner, Klaus
 1981 *Madmen and the Bourgeoisie: A Social History of Insanity and Psychiatry*. Oxford: Blackwell Publishers.
- Farnham, Alan
 1998 Crazy and in Charge: Brilliant Tycoons Have Had a Tendency to Get Eccentric, or Worse. *Time* 152(23):207–208.
- Flanagan, Owen
 1996 The Moral Network. *In The Churchlands and their Critics*. Robert N. McCauley, ed. Pp. 192–215. Cambridge, MA: Blackwell Publishers.
- Geertz, Clifford
 1962 The Growth of Culture and the Evolution of Mind. *In Theories of the Mind*. Jordan M. Scher, ed. Pp. 713–740. New York: Free Press.
- Gilman, Sander L.
 1985 *Difference and Pathology: Stereotypes of Sexuality, Race, and Madness*. Ithaca, NY: Cornell University Press.
- Glassman, James K.
 1999 Psyching Out Mr. Market. *The Washington Post*, February 21:H, 1.
- Goodwin, Frederick K., and Kay R. Jamison
 1990 *Manic-Depressive Illness*. New York: Oxford University Press.
- Gordon, Avery F.
 1997 *Ghostly Matters: Haunting and the Sociological Imagination*. Minneapolis, MN: University of Minnesota Press.
- Grant, James
 1993 *Minding Mr. Market: Ten Years on Wall Street with Grant's Interest Rate Observer*. New York: Farrar, Straus and Giroux.
- Greider, William
 1997 *One World, Ready or Not: The Manic Logic of Global Capitalism*. New York: Simon and Schuster.

Grosz, Elizabeth

1993 Bodies and Knowledges: Feminism and the Crisis of Reason. *In Feminist Epistemologies*. Linda Alcoff and Elizabeth Potter, eds. Pp. 187–215. New York: Routledge.

Gupta, Akhil

1998 Postcolonial Developments: Agriculture in the Making of Modern India. Durham, NC: Duke University Press.

Gupta, Akhil, and James Ferguson

1992 Beyond "Culture": Space, Identity, and the Politics of Difference. *Cultural Anthropology* 7(1):6–23.

Gusterson, Hugh

1999 Nuclear Weapons and the Other in the Western Imagination. *Cultural Anthropology* 14(1):111–114.

Harvey, David

In press The Spaces of Utopia. *In Between Law and Culture*. Lisa Bower, David Goldberg, and Michael Musheno, eds. Minneapolis: University of Minnesota Press.

Hill, Jane H., and Bruce Mannheim

1992 Language and World View. *Annual Review of Anthropology* 21:381–406.

Holland, Dorothy, and Jaan Valsiner

1988 Cognition, Symbols, and Vygotsky's Developmental Psychology. *Ethos* 16(3): 247–272.

Jamison, Kay R.

1995 *An Unquiet Mind*. New York: Knopf.

Jones, Del

1999 Hot Asset in Corporate: Anthropology Degrees. *USA Today*, February 18:B2, 1.

Jordanova, Ludmilla

1989 *Sexual Visions: Images of Gender in Science and Medicine between the Eighteenth and Twentieth Centuries*. Madison: University of Wisconsin Press.

Kahn, Joseph

1999 The Markets: Market Place; For a Triple Threat, a Less-Than-Stellar Season. *The New York Times*, February 25:C2, 1.

Kilborn, Peter T.

1999 Help for the Uninsured May Rest in Tax Code. *The New York Times*, March 12:A5, 14.

Lakoff, George, and Mark Johnson

1980 *Metaphors We Live By*. Chicago: University of Chicago Press.

1999 *Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought*. New York: Basic Books.

Laqueur, Tom

1990 *Making Sex: Body and Gender from the Greeks to Freud*. Cambridge, MA: Harvard University Press.

Lloyd, Genevieve

1984 *The Man of Reason*. Minneapolis: University of Minnesota Press.

Lucy, John A.

1998 Space in Language and Thought: Commentary and Discussion. *Ethos* 26(1):105–111.

Lunbeck, Elizabeth

1994 *The Psychiatric Persuasion: Knowledge, Gender, and Power in Modern America*. Princeton, NJ: Princeton University Press.

MacCormack, Carol, and Marilyn Strathern

1980 *Nature, Culture and Gender*. Cambridge: Cambridge University Press.

Magnier, Mark

1998 Dramatic Surge in Japan's Yen Spurs New Fear. *Los Angeles Times*, October 9:C, 1.

Marshall, John C., and Jennifer M. Gurd

1996 The Furniture of the Mind: A Yard of Hope, a Ton of Terror? *In The Churchlands and Their Critics*. Robert N. McCauley, ed. Pp. 176–191. Cambridge, MA: Blackwell Publishers.

Martin, Emily

1999 Flexible Survivors. *Anthropology Newsletter* 40(6):5–7.

In press Fluid Minds. Princeton, NJ: Princeton University Press.

Maurer, Bill

1995 Complex Subjects: Offshore Finance, Complexity Theory and the Dispersion of the Modern. *Socialist Review* 25(3 and 4):113–145.

Merchant, Khozem

1996 World “Heads for Grotesque Inequalities.” *Financial Times* (London, England), July 16:4.

Morgenson, Gretchen

1998 A Manic-Depressive Market Befuddles Even the Professionals. *The New York Times*, September 11:C1, C6.

Pinker, Steven

1999 On Language and Connectionism: Analysis of a Parallel Distributed Processing Model of Language Acquisition at <http://cogsci.soton.ac.uk/~harnad/Papers/Py104/pinker.conn.html>. Accessed March 5.

Pocock, John

1985 *Virtue, Commerce, and History*. Cambridge: Cambridge University Press.

Poovey, Mary

1998 *A History of the Modern Fact: Problems of Knowledge in the Sciences of Wealth and Society*. Chicago: University of Chicago Press.

Posner, Michael I., and Marcus E. Raichl

1994 *Images of Mind*. New York: Scientific American Library.

Postrel, Virginia

1998 *The Future and Its Enemies: The Growing Conflict Over Creativity, Enterprise, and Progress*. New York: Free Press.

Pulley, Mary L.

1997 *Losing Your Job—Reclaiming Your Soul*. San Francisco, CA: Jossey-Bass.

Putnam, Hilary

1988 *Representation and Reality*. Cambridge, MA: MIT Press.

Quinn, Naomi

1991 The Cultural Basis of Metaphor. In *Beyond Metaphor: The Theory of Tropes in Anthropology*. James W. Fernancez, ed. Pp. 56–93. Stanford, CA: Stanford University Press.

Ramachandran, V. S., and Sandra Blakeslee

1998 *Phantoms in the Brain: Probing the Mysteries of the Human Mind*. New York: William Morrow.

Read, Stephen, and Lynn C. Miller, eds.

1998 *Connectionist Models of Social Reasoning and Social Behavior*. Mahwah, NJ: Lawrence Erlbaum Associates.

Saltzman, Amy

1996 How to Prosper in the You, Inc. Age. *U.S. News and World Report*. 121(17):66–79.

Schaeffer, Robert K.

1997 *Understanding Globalization: The Social Consequences of Political, Economic, and Environmental Change*. Lanham, MD: Rowman and Littlefield.

Searle, John R.

1997 *The Mystery of Consciousness*. New York: New York Review of Books.

1998 *Mind, Language, and Society: Philosophy in the Real World*. New York: Basic Books.

SerVaas, Cory

1999 The Post Investigates Manic-Depression. *Saturday Evening Post* 268(2):46–52.

Smith, Eliot R., and James DeCoster

1998 Person Perception and Stereotyping: Simulation Using Distributed Representations in a Recurrent Connectionist Network. In *Connectionist Models of Social Reasoning and Social Behavior*. Stephen J. Read and Lynn C. Miller, eds. Pp. 111–140. Rahwah, NJ: Lawrence Erlbaum Associates.

- Smolensky, Paul
1988 On the Proper Treatment of Connectionism. *Behavioral and Brain Sciences* 11(1): 1-74.
- Sperry, Roger W., and Polly Henniger
1994 Consciousness and the Cognitive Revolution: A True Worldview Paradigm Shift. *Anthropology of Consciousness* 5(3):3-7.
- Strathern, Marilyn
1992 *Reproducing the Future: Anthropology, Kinship and the New Reproductive Technologies*. Manchester, UK: Manchester University Press.
- Strauss, Claudia, and Naomi Quinn
1997 *A Cognitive Theory of Cultural Meaning*. Cambridge: Cambridge University Press.
- Time
1998 100 Builders and Titans of the 20th Century. Theme issue. *Time* 152(23).
- Uchitelle, Louis
1997 Confusion as an Economic Indicator. *The New York Times*, November 2(4):1, 6.
- United Nations Development Program
1999 *Human Development Report, 1999*. New York: Oxford University Press.
- Vranna, Debora
1998 California Dealin'. *Los Angeles Times*, December 28:C1.
- Walker, Tom
1998 Market Cools Down While the Weather Heats Up. *Atlanta Journal and Constitution*, July 1:F1.
- Wolfe, Tom
1998 *A Man in Full*. New York: Farrar, Straus and Giroux.
- Zürn, Unica
1994 *The Man of Jasmine and other Texts*. London: Atlas Press.

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