Future Matters

TECHNOSCIENCE, GLOBAL POLITICS, AND CULTURAL CRITICISM

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In the introduction to what became an infamous set of essays published in *Social Text* in 1996, Andrew Ross pointed to the connection conservative critics were drawing between what had been called the "culture wars" and what was then being called the "science wars." While Ross noted with some disdain that the critics were filling op-ed pages with warnings about the demise of science at the hands of "pinkos, feminists and multiculturalists of all stripes,"[1] his introductory remarks nevertheless made it clear that the cultural studies of science were informed by a demand for diversity, a demand that the various perspectives of the oppressed, the disenfranchised, and the marginalized be recognized in the production of scientific knowledge. His remarks also made it clear that the demand for diversity was being articulated, in the cultural studies of science, both through a deconstruction of the seemingly inherent connection of rationality, truth, and value-free methodologies presumed in the Western discourse of science and through a rethinking of capital investment in technoscientific development.

But it was not only the conservative critics who strongly dissented from supporting this assemblage of concerns motivating the cultural studies of science. Even among the Left, there was heated debate. Indeed, the infamy that would attach itself to that 1996 collection came with the controversy over Alan Sokal's contribution, in which Sokal drew support from the field of physics for Derridean deconstruction, feminist theory, Marxist cultural studies, and the cultural studies of science.[2] Shortly afterward, in an article published in *Lingua Franca*, Sokal revealed that his *Social Text* paper had purposely offered insupportable arguments and had drawn illogical conclusions; the hoax had gone unrecognized by the journal's editors, he proposed, because of their unquestioned presumption of the "political correctness of the cultural criticism of science."[3] The hoax was perpetrated, claimed Sokal, to counter what he described as cultural studies' refusal of the existence of an external material world or the possibility of science obtaining knowledge of it as such. In all, Sokal hoped to teach those leftists engaged in cultural studies that they did not know science or politics, not if they meant to turn the latter against the former and break with what he described as "the two century old identification"

of the Left with science in order to lay bare "the mystifications promoted by the powerful."[4]

While it is difficult to determine the long-term effects of the Sokal affair, it would seem that in the years since then, cultural studies of science have been turned over to disciplinary studies of science—specialized fields of science studies within anthropology, sociology, philosophy, history, and psychology—as if to assure the disciplinary and methodological rigor of those engaged in science studies. The study of science differently inflected across the disciplines, in fact, seems to have contained the critical probing that motivated the cultural studies of science. The questions once raised about the legitimacy and authority of Western discourses of science, reason, truth, and disciplinary methods have been quieted, and the relationship of these questions to the interarticulated differences of gender, sexuality, class, race, ethnicity, and nation, for so long productively explored in the critical theories of the late twentieth century, has ceased to be central to social criticism. Even more, it has become difficult, seemingly even undesirable, to engage technoscience, not so much as an object of social criticism but as a resource of thought, that is, to return to the ground Sokal cultivated, albeit with the seeds of bad intentions, to seek support from the thought of technoscience in elaborating a framework for social criticism and thus to face the challenges technoscience now poses for late-twentieth-century critical theories.

Indeed, even when those critical theories are more robustly, if not more accurately, characterized than Sokal's characterization of them, they nonetheless face challenges posed by technoscience, as it pressures a rethinking of dynamism and change, shifting the question of "what matters" from an epistemological domain to an ontological one. While feminist theory, postcolonial theory, queer theory, and critical race theory were not merely dismissive of the existence of an external material world or the possibility of science knowing it, they did nonetheless focus their criticism on epistemological issues, thereby locating dynamism and change in the disavowed forces of knowledge, such as desire and power, that constitute the identity of the knowing subject. This is why or at least how the culture wars became the science wars. The late-twentieth-century critical theories provoked an epistemological crisis in Western thought, a crisis of representation, language, and narrative logic, while insistently interrogating the working of reason and intentionality in the construction of the subject's knowledge. Even when the interrogation turned to questioning the materiality of bodies, it was the subject's body that mattered, the body of the subject of knowledge. Bodies and matter often were taken to be inert, passively awaiting the imposition of significance through "a cultural construction."

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But if what is implied by *technoscience* is the inseparability of knowledge production from technological innovation aimed at reaching beyond human limitation, then not surprisingly technoscience is producing knowledge through experimentation with the structure and organization of bodies, matter, and life. Along with the high-powered mathematical technologies that allow us to "see" matter as inherently dynamic, operating as a complex, open system under far-from-equilibrium conditions, and the biotechnologies that mass-produce genetic materials outside the organism, there also has been a development of information technologies, both entertainment and surveillance technologies, which are increasingly less about representation and the narrative construction of subject identities and more about affecting bodies, human and nonhuman, directly. These technologies mean to control bodies of information and to treat bodies as information. Even when appealing to the human subject, these technologies aim to affect the subject's subindividual bodily capacities, that is, capacities to be moved, to shift focus, to attend, to take interest, to slow down, to speed up, and to mutate. Technoscientific experimentation calls forth new bodily matters while raising the conjoined questions of time and technicity. While epistemologically challenging, technoscientific experimentation also provokes an ontological crisis, thus pressuring a rethinking of the symbolic mix—culture, language, representation, and narrative—as the sole resource of dynamism and change.

It was to face what seemed difficult, even undesirable, that is, to think about technoscience not only as an object of social criticism but as a resource of thought for social criticism, that in 2000 I began to plan a symposium titled "Future Matters: Technoscience, Global Politics, and Cultural Criticism." As the director of the Center for the Study of Women and Society (CSWS) at the Graduate Center, CUNY, I hoped to have as symposium cosponsors other scholars who directed centers and programs with research agendas focused on critical theory and cultural criticism, especially on the differences of gender, sexuality, class, race, ethnicity, and nation. With these colleagues, I hoped to invite other scholars and cultural critics to join us in rethinking late-twentieth-century critical theories in terms of the future of technoscience and thereby to draw from the thought of technoscience a framework for social criticism. Carolyn Dinshaw at New York University, Janet Jacobsen at Barnard College, Rosalind Morris at Columbia University, Linda Nicholson at Washington University in St. Louis, Joanna Regulska at Rutgers University, and Robyn Wiegman at Duke University agreed to be cosponsors.

However, it should be said that the intellectual direction of "Future Matters" came, for the most part, from CSWS at CUNY, where ongoing scholarship and research has been concerned with a line of thinking about

life, matter, bodies, technicity, and time, which is indebted in part to a Derridean treatment of *techne* and the forces of a generalized *writing*, and also to a Deleuzian treatment of matter-energy flows and the machinically assembled bodies that are neither organic nor mechanical. At first, CSWS pursued this line of thinking as an extension of late-twentieth-century critical theories. But as we were increasingly drawn to debates over changes in political economy, referred to as "globalization," and to the provocative rearranging of the nation, state, civil society, and the public and private spheres around the world, our thinking about life, matter, bodies, technicity, and time was pursued in *differance* with, but by no means indifferent to, what was crucial to these critical theories: their rethinking of difference and identity.[5]

While the cosponsors of "Future Matters" neither agreed nor disagreed with this line of thought, we did agree that centers and programs like ours should become engaged with technoscience in the context of global politics and cultural criticism. Thus the invitation to be a presenting participant of "Future Matters" was extended to a number of scholars and cultural critics in cultural studies, literary studies, film/television/new media studies, science studies, philosophy of science, ethnic studies, women's studies, LGTBQ studies, and the cultural studies of war and terrorism. Each was invited to think about technoscientific experimentation by thinking all together what had not sufficiently been thought together: mass-media technologies and entertainment technologies, technologies of production and reproduction, biotechnologies and genetic technologies, technologies of surveillance and control. It was proposed that taken together, these technologies are registering certain political, economic, and cultural tendencies while provoking shifts in thought: in politics, from disciplining to biopolitical control; in economy, from the productivity of human laborers to the circulation of affects; in biophilosophy, from organic life to nonorganic life; in the physical sciences, from the closed system to the complex system under far-from-equilibrium conditions; and in culture, from representation and meaning to information. The proposed aim of "Future Matters" was to explore these shifts as coming from the future, indeterminate yet registering political, economic, and cultural tendencies. It was hoped that symposium participants would thereby engage the tension between exploring technoscience as an object of social criticism and as a resource of thought for social criticism.

The essays, which are collected in this special issue of *Social Text*, work this tension, more or less; their authors unleash the thought of technoscience, giving it over to the invention of a framework of social criticism. However, before saying more about these essays, I want to elaborate further the political, economic, and cultural tendencies in which technosci-

ence is a force and the shifts in thought that register those tendencies. In taking up these shifts, I hope to sketch the challenge that technoscience poses for late-twentieth-century critical theories and what the thought of technoscience offers as a framework for social criticism. In doing so, I want to take up the works of many of the symposium participants, since they informed the intellectual direction of "Future Matters" long before it came to be the event it was.

The Thought of Technoscience/
The Capture of Technoscience

Many of the scholars and cultural critics invited to be presenting participants of "Future Matters" have come to the thought of technoscience not only to investigate its potential contribution to a framework for social criticism but also to grasp the relationship of technology and contemporary capitalism. They have been working with the thought of technoscience, which is virtually full of potential actualizations but which also holds histories of political and economic capture of potential—histories of realizations of limited possibilities that burden the future with past remains. What the thought of technoscience nevertheless proposes in its shifting the focus of social criticism from disciplining to biopolitical control, from the productivity of human laborers to the circulation of affects, from organic life to nonorganic life, from the closed system to the complex system under far-from-equilibrium conditions, and from representation and meaning to information are ways to reformulate the relationship of realized limitations and virtual potentials, ways that the symposium participants articulated in terms of changing understandings of image, information, entropy, and noise as well as turbulence, dynamism, energy, bodies, and matter.

To sketch the influence of these changing understandings in the works of the presenting participants of "Future Matters"[6] and to draw out the connections between their works, which laid the groundwork for the symposium, perhaps a good place to start is with Richard Dienst's work from the early 1990s on television and theorizing "after television."[7] In his work, Dienst (a symposium participant) begins to shift the focus of Marxist cultural studies away from questions of representation, ideology, and subject identity to rethink technology and the recent global expansion of capitalism. Dienst not only makes thinking about television an opportunity to rethink technology in the context of global capital, he does so by exploring a certain relationship of technology and thought. For Dienst, the thought of a technology arrives before the technology can be technically

materialized, so that the thought of a technology is thought pulled to the future. In this vein, Dienst argues that with its drive to transmission, its drive to transmitting immediately what it records, television makes it more apparent that other media technologies— cinema, for example—might be thought of as compensatory technologies. That is, since the purpose of editing, cutting, or suturing in cinema is to produce the effect of transmitting in real time, which is something that television will be better able to do without compensatory devices, the thought of television is both before and after cinema.

In these terms, however, television also can be thought of as a compensatory technology, which is open to the future of technological development. Therefore, after television, as Dienst suggests, technology no longer should be critically engaged only with those theoretical approaches drawn from a criticism of cinema, such as post-Althusserian, Lacanian psychoanalytic approaches, which have been central to late-twentieth-century critical theories, with their provocations of crises of epistemology, representation, language, and narrative logic. This is so not only because television transmission "absorbs the entirety of the televisual textual process,"[8] making circulation what matters and not the messages circulated, but also because television is open to the future, to the "after television" of technoscientific experimentation in biotechnology and in surveillance and control technologies, for example. Television is the becoming of technology as something other than a medium of representation, ideology, and subject identity, something other than a mechanism of unconscious interpellation constituting the subject through familial and national ideologies. As Dienst's treatment of television suggests, television points to the becoming of technologies that are productive of value through the modulation of subindividual bodily capacities or affect.

Dienst would have us quit watching television so that we can see television differently, as an "unofficial conduit of value." Thus he conceives of television as producing value through socializing time—that is, time that has not already been socialized as labor time. Just as industrial capitalism collectivized or socialized labor time into abstract labor power, television "performs the same function for other segments of time: pleasure time, public or community time, household time, parenting time, childhood time, even animal and vegetable time."[9] As such, free time can only be free because it has already been collectivized by television. In doing so, television makes it possible to fuse units of "free" time with "free" images and to calibrate the investment of each image/time unit "according to estimates and averages of productivity and potential return."[10] When viewers view already invested images, there is return in the realization, image by image, of value, so that the work of television watching is productive when viewers

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merely attend, are merely bodily engaged with the passing of images, one after another. At least in relationship to value production, the image is released from narrative and representative requisites, no longer merely a vehicle of meaning, if meaningful at all. The image instead becomes the image of time passing, the image of time's force, or its productivity in passing. Of course, this does not mean that viewers watch in order to produce value; after all, many watch TV just to "waste time." But this is the point, and this point underscores the viewers' affective relationship to watching.

The thought of socialized free time and of viewing television as value-producing labor breaks with cultural studies of television, inaugurated with Stuart Hall's groundbreaking 1973 essay, "Coding and Decoding in the Media Discourse," in which Hall critiqued information theory and its model of a direct linear transmission of messages from input to output.[11] Hall insisted on the impossibility of any transmission of messages without various (actually three) strategies of interpretation coming into play for those receiving a message. Dienst refuses to think television, along the lines suggested by Hall, as a machine of reproduction, consumption, or advertising, a matter of interpreting the meaning of messages. Instead he thinks of television as a machine of production, the production of (exchangeable) time units, when consumption already has been subsumed into capital, that is, when laborers' consumption already has become a force of production. Dienst makes us see television as transmitting images of time, "time-images" without narration or representational requisites. So the connection between the viewer and the television screen is not primarily a matter of representation, subject identity, or ideological interpellation. In making what matters the mere passing of one image after another, television is the becoming of technologies that function to modulate the force of time, that is, technologies that are affective, functioning to intensify or deintensify subindividual bodily capacities.

Dienst suggests that television initiates the joint questioning of technicity and time, so that in theory, after television, time must be thought differently, where time is no longer thought as a coherent sequence grounded in origins and ends, not even as an endless circulation. Instead time is thought as a matter of *virtuality*, or an inexhaustible multiple force or the forces of multiplicity, that is, pure potential for actualization or invention, where the rules of actualization are not those of representation, narrative, resemblance, identity, or limitation but those of difference, divergence, and creation. To think the virtual is to think time's productivity as a multiple force, to recognize time's capacity to take off by chance in another direction, in a swerve, and therefore to affect bodies, to move them, affectively, before the retrospective narration of conscious knowing. As such, the

past is coextensive with the present, such that the past cannot be thought only as time continuing to have an effect on the present or as past-times surviving into the present. The latter would be to think time in terms of a spatial analogy such as narrative provides, rather than think in terms of the multiple force of time, or its "event-ization." The virtual cannot be thought in terms of the spacing of time; rather, it must be thought in terms of the time of the interval; it is the time of the in-between, the time of affective shifts.

In mapping theory after television, Dienst does more than draw critical theory away from the line of thinking initiated by Hall and continued in cultural criticism, from feminist criticism to postcolonial criticism, from critical race theory to queer theory. Dienst also makes us rethink time in a way that opens up his own take on television watching as productive of value, that is, the thought of the viewing subject is opened up to the multiple force of time and to the subject before and beyond itself in subindividual and collective singularities—the inexhaustible virtual that is irreducible to capitalist productivity.[12] Therefore, while Dienst makes it necessary to revisit Hall's dismissal of information theory in order to rethink information in relationship to time, technicity, labor, and bodily affects, an additional guide is needed. In her work, Tiziana Terranova (a symposium participant) offers a path to think bodily affectivity and complexity theory and to rethink labor, time, and the model of information transmission taken up by Hall.[13]

Although Hall rightly rejected the unidirectional model of input and output, which Claude Shannon first proposed in the late 1940s in his mathematical definition of information,[14] Hall does so, Terranova argues, to focus critical engagement with information technologies on a hermeneutics of meaning. But Shannon's definition of information as the measure of the probability of a message's transmission, regardless of meaning or context, might be thought, in its own terms, to be shifting the focus of critical engagement with information technologies away from meaning and interpretation and toward time, labor, and bodily affectivity. After all, in positively correlating information with noise or turbulence, or what is termed entropy in the nineteenth-century laws of thermodynamics, Shannon's definition of information leads to questions about the relationship of information to the organization of bodies, labor, and time from the late nineteenth century to the early twenty-first century.

Positing that energy can be neither created nor destroyed in its transformation from one form to another, the first law of thermodynamics makes it possible to think of energy abstractly, across all forms. It is therefore possible to think of labor abstractly as labor power and to think of the transfer of energy from the laborer to the product through work without

the loss of energy (points of importance to capitalists but also for Marx's theorization of labor power in the labor theory of value). However, the second law of thermodynamics points to the dissipation of energy and the inevitable increase of entropy in a closed mechanical system: a heat death in a steam engine. In terms of the second law of thermodynamics, entropy is defined as energy that can no longer be put to work, no longer can be organized to do something, having become chaotic, like microparticles moving out of order, aimlessly. As such, entropy is the measure of turbulence or disorder in a closed system.

It is this idea of entropy that is engaged in Shannon's mathematical definition of information where information is positively correlated with entropy or noise, where information is understood as arising out of noise. Shannon reverses the thinking about information as antithetical to noise while rethinking the presumption that the more information, the less noise. He proposes instead that the more noise or turbulence, the more uncertainty and the greater the probability for information, where information is the measured probability of a message being transmitted, or a pattern being apprehendable in being sent from sender to receiver. For information to be transmitted from sender to receiver, there cannot be pattern redundancy or, at least, not too much redundancy; information is the difference that makes a difference. Furthermore, since there is always noise in the channel of transmission, the message will always have more information when received than when sent. There is the potential of a viral expansion of information, a profusion of differences that suggests that entropy or turbulence might be productive of an information surplus. Shannon's theory of information, indeed, led to the linking of entropy with turbulence, where turbulence was rethought in terms of the potential for levels of increased complexity, both in life and in matter, rather than as their inevitable destruction or death. Reconceptualizing entropy as the force driving systems to self-order at levels of greater complexity is a turning point in thought, which also initiates a rethinking of matter, life, and the body.

Information and Bodily Matter

It would be in terms of the postcybernetic thought of complexity that the positive correlation of information and entropy or noise is extended to rethink matter in terms of open systems, under far-from-equilibrium conditions, such that matter is thought as dynamic, as having potential for self-organization or self-patterning and, as such, is "in-formational." A different thought of dynamism and change is given as matter is thought

as energetic, a matter of continuous variation, such that there are no fixed forms but processes of deformation and transformation, arising out of dynamic matter. In this context, change is understood as an unpredictable but noncapricious emergence out of nonlinear fluctuations, without need of the thought of a linear development of a subtending substance. In terms of complexity theory, change occurs instead at thresholds of matter-energy flow, where there is a "bifurcation," or a breaking of symmetry, such that flows can go in multiple directions, making possible a reordering at higher levels of complexity. In their elaboration of complexity theory, Ilya Prigogine and Isabelle Stengers describe the order that emerges out of disorder as "dissipative," where the move from disorder to order dissipates the dissipation of entropy.[15] It is this ongoing movement from order to disorder to an order of greater complexity, this unending deferral of entropy, which not only transforms the understanding of matter but the understanding of life as well, forcing a rethinking of life and the organism as the privileged form of living matter.

As information theory crossed, through cybernetic theory, from physics to biology, in the production of biogenetics and the like, an understanding of the body-as-organism was threatened with a genetic reductionism. But cybernetic theory also provided a defense of the body-as-organism, which was articulated in conceiving the body as an autopoietic system. Drawing on cybernetic theory to resist genetic reductionism, Humberto Maturana and Francisco Varela defined the organism as a closed system, closed to information while open to energy.[16] As such, the organism maintains the organization of its functioning parts unto its own survival or maintenance of its organization, its autopoiesis. The organism interacts with the environment by screening inputs in keeping with its self-maintenance. Although correctly resisting genetic reductionism, Maturana and Varela's definition of the body as an autopoietic organism nonetheless treats disturbances to the organism's closed organization as destructive, even deadly. And yet, in terms of a postcybernetic complexity theory, disturbance is to be understood as turbulence, the potential for self-organization at levels of greater complexity.

Drawing on complexity theory and Deleuzian biophilosophy, Keith Ansell Pearson argues that the definition of the body as autopoietic places "the emphasis [on] the living system's concern with its survival and self-maintenance even though these are to be understood as endogenously driven and monitored."[17] Giving life over to this "stark choice between either entropy or maximum performance," the thought of the body as autopoietic organism "blocks off access to the dynamic and processual character" of what Pearson refers to as "machinic evolution."[18] Consistent with the contentious rethinking of evolution in the work of Lynn Margulis

and Dorion Sagan, the thought of machinic evolution implies what Pearson describes as "a crossing of the techno-ontological threshold without fidelity to relationships of genus or species."[19] The thought of machinic evolution recognizes the dynamic boundaries of species or genus and engages them in terms of disequilibrium in open systems under far-from-equilibrium conditions.

Complexity theory, therefore, is the thought of the organism's openness to information, signaling the *becoming* of technoscientific bodies, or machinic assemblages, where there is exploration and experimentation with the molecular or subindividual elements of living matter, machinically assembled. Machinically assembled bodies are compositions of elements, assembled even across techno-ontological thresholds, in order to do something, to transform, expand, or contract themselves and other bodies, to move bodies or to speed up bodies or to keep bodies at given speeds. Machinically assembled bodies have no organizing center; instead, they arise out of a plane of dynamism in a continuum of forces. They are becoming bodies rather than being located between the two opposing planes of nature and culture, *physis* and *techne*, matter and image, where one of the elements is the only resource of force or dynamism. They are bodies in the time of becoming, in the time of in-between, of emergence or transformation. They are bodies of virtuality.

In this sense, the thought of machinic assemblage comes with the thought of evolution by "artificial selection" and the recognition that the environment with which human life is interacting is anything but "natural."[20] It is, rather, "in-formational," where information has become "self-reflexive," as Mark Taylor puts it, such that information acts on itself "to form feedback loops that generate increasing complexity."[21] For Taylor (a symposium participant), entrance into the "information age" is not a matter of the "growing abstraction and increasing dematerialization" of bodies but the further "complication of the relationship between information and the so-called material conditions of life."[22] Holding together a revision of evolutionary theory and a rethinking of matter as dynamic, postcybernetic complexity theory proposes a revision of the relationship of information and bodies. As such, information is to be thought less in terms of meaning and interpretation and more in terms of bodies of matter that have what Karin Knorr-Cetina (a symposium participant) refers to as a "volatile ontology."[23]

But linking information with the volatile ontology of bodies instigates a move away from those critical theories that located dynamism not in matter but in the gap between referent and sign, pointing to a distribution of *lack* through a signifying chain, a lack that, nonetheless, persists such that it is presumed that there can be no completely successful transmission

of the message's meaning from sender to receiver. It is not that this under-standing of meaning is disputed. It is that information might better be critically engaged in the context of the probabilistic or volatile ontology of bodily matter. Terranova argues that "information . . . is not represen-tational but affective, directed towards an increase in the degree of power of a body, that is its capacity to affect and be affected by other bodies."[24] As such, information is not meaning, but it is the condition of possibility of meaning's (im)possibility.

This move away from cultural studies' focus on the interpretation of the various meanings of a message in order to focus instead on bodily affects is motivated by a shift in the thought of politics and economy as well. As Terranova has argued in her work with Luciana Parisi (a sympo-sium participant), the rethinking of information, time, labor, and bodily matter has particular relevance in "these times," when there is an ongoing shift in emphasis in governance from disciplining to biopolitical control.[25] For Parisi and Terranova, this shift is best understood in terms of bodies, where the body is no longer taken only as a matter of cultural construction through representation, narrative, or the imaginary, that is, where culture or the image informs the human body with meaning or signification—a matter of materializing an incorporated imaginary. Indeed, some of the most provocative critics of a cultural constructionist approach to the body already have argued that while such an approach proposes to go beyond the opposition of nature and culture, matter and image, *physis* and *techne*, content and form, it instead reconstitutes these oppositions in attributing dynamism only to culture, to the human subject. Critics such as Karen Barad, Elizabeth Wilson, and Pheng Cheah (all symposium participants) have suggested that while the cultural constructionist approach to the body correctly resists biological reductionism, it has failed to grasp the dynamism of matter, even the matter of the human body.

Going beyond these critiques, Parisi and Terranova understand bod-ies as modes of organization, each of which arises out of dynamic matter but which also is invested with capital; bodies, therefore, are partly effect of and partly productive of historically specific political, economic, and cultural formations. For example, Parisi and Terranova discuss the body-as-organism as an index of a certain political, economic, and cultural formation, the expansion of which was enabled by investment in the body-as-organism. Parisi and Terranova refer this body to a disciplinary society and to the thermodynamic cycles of energy accumulation and expenditure in industrial capitalism. As they put it: "The organism was not so much produced as reinforced and given strength by the disciplinary society so that it could become the ultimate definition of what a body is. The body becomes abstracted and organized so that it can be trained: to reproduce

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with a thermodynamic cycle of accumulation and expenditure; and trained to work."[26]

This is the laboring body of Western industrial capitalism, where there is a distinction between nation, state, civil society, and public and private spheres. This is the body of the national, sovereign subject born of colonialism. This also is the body of Darwinian evolutionary theory and the form of sexual reproduction that evolutionary theory underwrites, that of coupling and filiation. This is the body of gender, sexual, ethnoracial, class, and national differences and what these have since come to mean. So what has been the destabilizing of identities of sexuality, race, ethnicity, gender, and class, and the work of thinking the interarticulation of these in reformulating difference and identity, is not only part of the ongoing deconstruction of the subject. The deconstruction of the subject and all that it has entailed is also to be thought as registering the shift from the body-as-organism to machinically assembled bodies and nonorganic life.

As Parisi and Terranova suggest, it is the body-as-organism that is being displaced in thinking bodies in terms of complexity and open systems under far-from-equilibrium conditions, where life is defined as "turbulent rather than derived from entropic collapse."[27] Unlike the body-as-organism, bodies arising out of turbulence are bodies of dynamic matter; as such, a body is defined as "the material elements belonging to it under given relations of movement and rest, speed and slowness: the sum total of the intensive affects it is capable of at a given power or degree of potential."[28] These bodies are the bodies of late-twentieth-century technoscientific, capitalist investment, registering the shift from disciplining to biopolitical control in relationship to the subsumption of life into capital. Yet these bodies also are in excess of the historicity of capitalist capture. After all, the history of capitalism being narrated here profoundly unsettles grounding historical narrativity on the subject or the body-as-organism, an unsettling with indeterminable effects.

Biopolitical Control and an Affect Economy

Gilles Deleuze referred to *societies of control* in order to mark the diversification and diffusion of forces of state power throughout social space, including the reappropriation of these forces for and by the state. Control therefore is an intensification and transformation of what Michel Foucault had referred to as the "governmentalization of the state" in disciplinary societies.[29] As Foucault argued, in disciplinary societies, the "governmentalization of the state" enabled the state to extend its disciplinary practices through institutions such as the church, the school, the prison, the family,

and the union, "the enclosures of civil society."[30] The state is thereby able to move deep into the lives of individual subjects through disciplining, but it does so through complex strategies of socialization that the institutions of civil society deploy in managing sociality and the moral order. Although aimed at the production of "docile bodies," disciplining is a deployment of biopower that nonetheless engages bodily matters through a politics of representation, by which familial and national ideological apparatuses function to constitute subject identities, and where resistance to these identities, and the transgression of the institutional norms that support them, is possible, even enabled, by the instability of the strategies of disciplining. The institutions of civil society have constituted the space for a whole range of oppositional identity politics focused on gender, sexual, ethnoracial, class, and national differences.

The shift from disciplining to biopolitical control refers to the transformation of governance and a politics of representation occurring under the conditions of the reconfiguration of the relations of power across international organizations, the nation and civil society, the state and the economy, and the public and the private spheres. Such a reconfiguration is due in part to the disorganization of nationally organized capital, effected since the 1970s by globalization and structural adjustment and the increased complexity added with flexible accumulation of capital and flexible employment of labor power, and the globalization of information technologies, as well as to the ongoing social and political responses to these changes locally and globally. Control addresses the added complexity, as the turbulence arising with the reconfiguration of governance across community, national, regional, and international organizations is being turned over to risk management, militarism, and policing.[31]

Control is a deployment of biopower dispersed over networks of information and communication, where the targets of control are not subjects or their behavioral expression of internalized social norms; rather, control is aimed at populations, a never-ending modulation of moods, capacities, affects, potentialities statistically assembled in genetic codes, identification numbers, ratings profiles, preference listings, risk statuses, that is, bodies of data and information (including human bodies as data and information). Control works at the subindividual, molecular level of bodies and not necessarily, or only, human bodies. Control therefore points to the increasing abandonment of support for socialization and education of the individual subject through interpellation to and through national and familial ideological apparatuses. The production of normalization is not only, or even primarily, a matter of socializing the subject; increasingly, it is a matter of directly bringing bodies and bodily affective capacities

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under an expanded grid of control, especially through the marketization of affective capacity.

As such, control accompanies the subsumption of affective capacity, or life itself, into capital. That is, the subsumption of labor into capital is now transforming the Fordist-Keynesian regime of accumulation, when the laborers' social reproduction had itself become a force of production and where laborers' demands for higher wages, shorter hours, increased job security, and a raised standard of living for themselves and their families had been met with technological development and the expansion of consumer markets for the demanded products and services. With the transformation of the Fordist-Keynesian regime, in what has been called postmodern or global capitalism, there is ongoing investment in technologies, including biotechnologies, and a deepening of the commodification of human services through their biomedicalization. This is not only the case of the political economies of the first world; the biopolitics of an affect economy is felt globally with profound effects.

Accordingly, capitalist accumulation has shifted to the domain of affective, subindividual bodily capacities (body parts, functions, and powers). There is a collectivization or socialization of affectivity, so that affect, as Brian Massumi (a symposium participant) puts it, must be thought of as "an impersonal *flow* before it is a subjective content."[32] The collectivization of affectivity allows for the realization of value in the modulation of affect, in the realization of the multiple force of time on bodies, that is, in the affective switching of bodies from one mode to another in terms of attention, arousal, interest, receptivity, stimulation, attentiveness, action, reaction, and inaction. In an affect economy, value is not only a matter of consuming products; rather, value is sought in the expansion or contraction of affective capacity. Therefore, affect is "beyond measure." It not only is beyond the measure of the consumption of use value in the production of surplus value; affect is beyond measure because it is power or potential that cannot be limited. It faces obstacles, not limits.[33] While beyond measure, affect is susceptible, however, to biopolitical control, or what Massumi refers to as the "powering-up—or the powering-away—of potential," such that the effort to capture the intensity of each, often short-lived, outburst of resistance in the struggle over the biopolitical control is the very stuff of economic productivity in the becoming of a worldwide or global political economy of affect.[34]

At the global level, for example, there is a reconfiguration of state power, in relationship to the power of international and regional organizations, including all sorts of NGOs. Of these organizations, those engaged in relief work and the protection of human rights not only serve at times to

provide the moral justification for "exceptional" political intervention, if not military intervention, overriding national sovereignty; they also allow for a network of economic flows, effected by and effecting the expansion of technoscientific development of information technologies and biotechnologies worldwide. These organizations are made to risk lending themselves to the expansion of a political economy of insecurity and control, as they function in the wake of imposed structural adjustment of economies of debt and are asked to manage the devastating effects. Assisting in making debt more productive by treating it with a microfinanced affect economy shaped in the demand for human rights and human security policy commitments, these organizations come to play a part in tilting world political economy to the deployment of biopolitical control. All around the globe, there is an overriding of a representational politics of recognizing individual subjects in terms of communities of belonging by a political economy of biopolitical control where human life is being deterritorialized into statistical populations that become the condition of possibility for the distribution of chances for life and death, health and morbidity, fertility and infertility, happiness and unhappiness, freedom and imprisonment.

Increasingly, these are the terms in which gender, sexual, ethnoracial, class, and national differences are being embodied as bodies of information and data, which are circulated globally and financially leveraged on the same scale. Whether looking at the worldwide treatment of HIV/AIDS, trafficking in persons, the drug trade, or intercountry adoption, all as ways for producing what Laura Briggs (a symposium participant) has referred to as "the biologically suspect," what emerges is a new experiment with governmentality, where the state, market, and technoscientific discourses now meet in the deployment of biopolitical control.[35] Pointing to the practices of state and nonstate agencies deploying global and local biopolitics, João Biehl (a symposium participant) has argued that in this experiment with governmentality, there is an intensifying "contradiction between a generalized culture of human rights and emergent exclusive structures through which these rights are realized, biologically speaking, but only on a selective basis—who, for how long, and at what cost? In this context, 'letting die' is a political action, continuous with the biomedical and political power that 'makes live.'"[36]

Biehl draws on Foucault, Deleuze, and Giorgio Agamben, retracing the link between biopolitics and the rise of the modern state, where the demand for "the free life," "the good life," has resulted in the drawing of biological life, or "bare life," as Agamben calls it, under the control of the state's calculations.[37] However, as Agamben sees it, this individualizing of human life by making it an object of state power also underlies modern democracy, where the individual seeks to become the subject rather than

the object of state power. Thus with the modern state a threat arises of the possible reduction of democracy to totalitarian biopolitical control: Agamben's point of reference is Nazism and the Holocaust. But surely it is not just the past but the future that draws us to this line of thinking. Achille Mbembe has argued that although biopolitics has been linked to the modern state and the Holocaust, it is the case that colonialism had already been a form of the politics of life and death, its mechanisms of biopolitical control intensified in Nazism.[38] But this point also is made to suggest that in neocolonialism, at the beginning of the twenty-first century, biopolitical control has intensified again and has become what Mbembe calls "necropolitics," where politics (state and nonstate politics) has become the deployment of the right to kill on the basis of enmity within systems that can only function in the turbulence of a state of emergency.

Mbembe points to the sign of a new machinic assemblage emerging out of turbulence and complexity, where necropolitics intensifies biopolitics, that is, when politics is a form of war engaging, if not provoking, the ongoing activity of what Gilles Deleuze and Félix Guattari describe as "a war-machine." As a military power that is bought and sold, the war machine arrives in part with the failure of the state to maintain an economic infrastructure of political authority, such that war can be waged by those who have no state but who have gained control over a given territory. With this form of war, a question is raised as to how bodies, life, and death are related to power. This question is raised not only because the technologies of destruction are now "more tactile, more anatomical and sensorial." The question also is raised because the practices of necropolitics, as Mbembe sees it, "are less concerned with inscribing bodies within disciplinary apparatuses as inscribing them, when the time comes, within the order of the maximal economy now represented by the 'massacre.'"[39] The war machine not only kills outright, it also takes possession of the resources for life in a given territory, an economic function of the war machine that either disperses populations or immobilizes them, leaving them to a life of living death. In this context, Mbembe concludes, suicide bombers appear to be a sign of an agency of resistance. But what of this politics of resistance?

As a human body becoming exploding metal, a suicide bomber takes his or her life and the other's all at once. There is no overcoming, no living through death in order to become, no gain in the eradication of the other, only the instantaneous move to the realm of the dead and to the world beyond this world, where it has become impossible to live, especially for those marked to live only terror and death. As such, suicide bombers are a sign of the becoming equivalence of an affect economy with (in)security and surveillance, war and terror, where biotechnologically induced death

and biotechnologically simulated life meet. We are thus horribly reminded of the necessity for rethinking a framework of social criticism, of shifting focus from epistemological concerns to ontological ones. When reporting massive destruction that already is embedded in, becomes part of, the destruction, then every surveying of data about costs of war, the numbers of bodies blown away and those left to die in social abandonment, becomes part of the turbulence that offers no fixed place, no standpoint on which to authorize knowledge. When there is no outside of turbulence, an external material world, thought as a closed system, cannot offer a model of authoritative knowledge with which to frame social criticism. This is not merely an effect of the epistemological crisis intensified with cultural studies and late-twentieth-century critical theories, or a dismissing of an external material world, as cultural studies and critical theories were accused of doing. Rather, there has been an ontological shift in thought; the dynamism of matter that has come with the thought of technoscience, along with turbulence in complex systems, under far-from-equilibrium conditions, offer themselves for rethinking a framework of social criticism.

Politics and Difference

If there is no outside to turbulence, that is, if there is something more than intimacy between power and resistance in the ever-growing dependency of power on the usurpation of resistance, then social criticism may need to take on the speed of every outburst of resistance, affectively engaging in modulating the speed, rather than merely trying to articulate a strategy that connects each event of resistance to all others. In the global biopolitics of an affect economy, events of resistance already are linked; at least, each outburst has reverberations that are felt everywhere, which, while indeterminable, result from the command of control and instigate further demand for control. Social criticism must find ways to stop underestimating that events of resistance give substance to or add value to the global biopolitics of an affect economy. Where biopolitical control means to capture the movement of the event itself, then events of resistance give control its future. This is not a matter to celebrate or lament.

It is in the terms of the biopolitics of an affect economy that the power of capital can be thought of as "spectacular" or "parasitical."[40] Having set out to free the potential or power of affective capacity from any blockage to its collectivization and exchange, capital has no power unto itself, alone. All potential dispersed and potentially "ours," the power of capital is spectacular or parasitical, and if spectral as well, it is because the "ours" is also within the grasp of capital's capture. What capitalism means to

usurp is, as Massumi puts it, "the very expression of potential," or what he also refers to as "relationality," "becoming together," "belonging."[41] Thus even the spectral is not a matter of a lack in being that refers us to the cultural imposition of form on matter, productive of a melancholic bodily matter. The spectral refers rather to the excess in capital's usurpation of belonging, a letting loose of singularities in the control of communication and information, out of which, nonetheless, a chance for difference comes from the future, the virtual.

Singularities are in excess of the capture of capital, an excess irrecoverable through a return to an imaginary wholeness of the body-as-organism or any other metastable entity (that is, all those entities that take the organism as model, the nation-state or the economy, or history). Not reducible only to the field of ideology or recovery through a return to an imaginary wholeness, the power of singularities is instead in the larger field of information and control. As such, singularities become a blockage in the flow of information and control, "a block of becoming" rather than memories of (the lack in) being. So here "block" is thought differently; as Deleuze and Guattari suggest, block is to be thought as an assemblage, a composition through an attractor of singularities that can set off ordering and reordering, not through a regressive return to an imaginary whole but through a creative involution, a deterritorialization.[42] Although deterritorialization is dangerous, given that capital already is doing this as its way of subsuming life, as its way of living, deterritorialization also is creative in that it puts the past and present on the same plane, where interiors and exteriors are reconfigured out of transversal communication, that is, there is the possibility of a communication without fidelity to linearity, genealogy, or family hierarchies. There is a composing of blocks of becoming that have a chance and direct social criticism to the chance of the future.

This thought of blocks of becoming unsettles cultural criticism and late-twentieth-century critical theories that assumed a certain politics of identity and the further elaboration of a general politics of difference of gender, sexuality, class, race, ethnicity, and nation. In this general politics of difference, difference was pitted against the reproduction of the same (where the same was referred to as sexism, ethnoracism, heterosexism) and where the notion of reproduction worked across domains of subject-identity, ideology, representation, and the state, as well as bodies, labor, production, and economy. With the turbulence of the reconfiguration of nation, state, civil society, and public and private spheres, and with capital investment in affective manipulation of subindividual capacities, there is an investment as well in changing understandings of bodies, matter, information, and entropy. The notion of reproduction of the same yields to the thought of pure repetition, that is, repetition without an origin or a

transcendental principle. Neither a oneness turning into multiplicity nor different versions of a concept that remains the same, the thought of pure repetition allows gender, sexuality, class, race, and ethnicity to be something different than what they have been thought to be; it allows them to be thought as bounded in time and space but also in motion, not because of the deconstruction of their identities but because they arise out of dynamic matter and are open to future actualizations. Social criticism must develop the capacity to treat gender, sexuality, class, race, and ethnicity in terms of the dynamics of their territorialization and deterritorialization, their singularities attracted to machinic assemblages in the changing configurations of family, community, nation, and region. As such, social criticism may contribute to the becoming of blocks of solidarity.

The following articles contribute to the development of this capacity for social criticism. In Parisi's article, there is a discussion of a theory of evolution, endosymbiosis, where evolution does not occur through adding up of parts or summing up already actualized bodies to form new wholes. Against a Darwinian and neo-Darwinian treatment of evolution, where there is gradual accumulation of variations through genetic filiation, suggesting a movement from simple to complex in terms of the progressive and regressive temporalities of linearity, Parisi points to a virtual multiplicity out of which novelty emerges through swerves. So there is a shift from thinking of evolution in terms of a tendency toward disorder, entropy, and death to thinking of evolution as a heterogeneous process, assembling distinct modes of transmission unpredictably.

If Parisi brings us deep into debates around evolutionary theory that give insight into biotechnology, Terranova reminds us that information and communication technologies are biotechnologies, ontologically constitutive and affective in that they are about the complexity of the different microdimensions of metastable states, where the former does not have a determinantal relation to the latter. If both Terranova's and Parisi's articles suggest a framework for social criticism that attends to the excess that escapes biopolitical control, João Biehl's article traces the very process of control, where a socius is constituted through the provision of a technical infrastructure that supports technical solutions to a "biological crisis." As these technical solutions take priority over providing "political representation," they displace "metasocial guarantees of social order." In this context, political resistance struggles to find forms of articulation between representation and a biopolitics of control.

In her article, Amy Villarejo also takes up this struggle, staged in the agitprop art of the collective Think Again, asking: how does political art command or develop the capacity for attention, if not critique, in terms of

the control exerted by dominant media cultures? Villarejo reminds us of the difficulty political artists face in responding to new ways of working affectively with this tension between representation and a biopolitics of control, where there is a refusal of old forms of solidarity and connection but where there also is a presumption of a common sense of "being against." Jasbir K. Puar and Amit S. Rai also are concerned with political resistance and solidarity. They turn our attention to the South Asian racial formation to do cultural criticism at this moment of intense policing of South Asian bodies, when "surveillance slides into profiling," a sliding from discipline to control where, however, "perverse projectiles of desire" are let loose, opening up measures of solidarity to the immeasurable capacities of the becoming of "monstrous crossbreeds." Machinic nature, singularities, human and nonhuman bodies, all open to the future, which is experienced now, as a block of becoming between territorialization and deterritorialization, at different times, and all the times of the virtual.

Notes

1. Andrew Ross, "Introduction," *Social Text*, nos. 46–47 (1996): 1–13.

2. Alan Sokal, "Transgressing the Boundaries: Toward a Transformative Hermeneutics of Quantum Gravity," *Social Text*, nos. 46–47 (1996): 217–52.

3. Alan Sokal, "A Physicist Experiments with Cultural Studies," *Lingua Franca*, May–June 1996, 64.

4. Ibid.

5. I have been engaged with many CUNY graduate students and faculty (some of whom are mentioned above) who have been participants of two ongoing seminars hosted at CSWS. One, the Conviction Project Seminar, focuses on mass incarceration and women's postincarceration experience; the other, a Rockefeller Foundation–funded seminar, Facing Global Capital, Finding Human Security: A Gendered Critique, focuses on producing a gendered critique of the relationships between human security, human rights, and global capital. Both seminars have been the site of working out a line of thought about life, matter, information, and bodies. The seminars have shown the utility of this line of thinking for critically

engaging the effects of neoliberalism and the growing dependency of national, regional, and transnational governance on technical solutions to social problems and cultural upheavals, solutions that are themselves extensions of and extending technoscientific capacity.

6. Besides the scholars to whom I refer in what follows, others who presented at "Future Matters" are Natalie Jeremijenko, Anna McCarthy, Banu Subramaniam, Margaret Morse, Sandra Harding, Joan Roughgarden, Cindy Patton, Marilyn Ivy, and Sandy Stone.

7. Richard Dienst, *Still Life in Real Time* (Durham, NC: Duke University Press, 1994).

8. Ibid., 33. I have snatched this phrase from Dienst's intriguing discussion of the concept of *flow*, deployed in Marxist cultural studies of television.

9. Ibid., 55.

10. Ibid., 61.

11. Stuart Hall, "Coding and Decoding in the Media Discourse," in *Culture, Media, Language*, ed. Stuart Hall, Dorothy Hobson, Andrew Lowe, and Paul Willis (London: Hutchinson, 1980), 128–38.

12. Television is not evenly distributed around the world, nor are its messages circulating everywhere. Dienst proposes that television "should not be expected to saturate everyone's lives equally: it can expand only when a reflux of value justifies its efforts." Still, because in all kinds of situations of TV ownership, everybody is permitted to pay for a share of TV watching, television "can be seen as a continuous extension—through 'economic democracy' of previous technologies of distribution, albeit an extension that alters the composition and strategy of the world market" (*Still Life in Real Time*, 59–60).

13. Tiziana Terranova, "Cybernetics' Surplus Value: Embodiment and Perception in Informational Capitalism" (unpublished manuscript, 2001), 1–32.

14. Claude Shannon and Warren Weaver, *The Mathematical Theory of Communication* (Urbana: University of Illinois Press, 1949). While Shannon published his theory in 1948, in 1949 this larger work was published including Shannon's theory with commentary by Weaver.

15. Ilya Prigogine and Isabelle Stengers, *Order Out of Chaos* (New York: Bantam, 1984). For a discussion of bifurcation and multiple virtualities, see Manuel De Landa, *Intensive Science and Virtual Philosophy* (London: Continuum, 2002).

16. Humberto Maturana and Francisco Varela, *Autopoiesis and Cognition* (Boston: Reidel, 1980).

17. Keith Ansell Pearson, *Germinal Life: The Difference and Repetition of Deleuze* (New York: Routledge, 1999), 170.

18. Ibid.

19. Ibid. Pearson is drawing on Lynn Margulis, *Symbiosis in Cell Evolution* (San Francisco: W. H. Freeman, 1981); and Lynn Margulis and Dorion Sagan, *Microcosmos: Four Billion Years of Evolution from Our Microbial Ancestors* (New York: Summit, 1986).

20. Ansell Pearson, *Germinal Life*, 216.

21. Mark C. Taylor, *The Moment of Complexity: Emerging Network Culture* (Chicago: University of Chicago Press, 2001), 106.

22. Ibid.

23. Karin Knorr-Cetina, "Sociality with Objects, Social Relations in Postsocial Knowledge Societies," *Theory, Culture, and Society* 14 (1997): 1–30.

24. Terranova, "Cybernetics' Surplus Value," 17.

25. Luciana Parisi and Tiziana Terranova, "Heat-Death, Emergence, and Control in Genetic Engineering and Artificial Life," *CTheory*, 1–18, www.ctheory .com/article/a84.html.

26. Ibid., 3.

27. Ibid., 5.

28. Ibid.

29. Gilles Deleuze, "Postscript on Societies of Control," *October* 59 (1991): 3–7.

30. Michel Foucault, "Governmentality," in *The Foucault Effect: Studies in Governmentality*, ed. Graham Burchell, Colin Gordon, and Peter Miller (Chicago: University of Chicago Press, 1991), 87–104.

31. For an interesting treatment of governmentality in terms of control, see Michael Hardt, "The Withering of Civil Society," *Social Text*, no. 45 (1995): 27–44. For a treatment of the reappropriation by and for the state of international and nonstate forces of power, see Julia Elyachar, "Mappings of Power: The State, NGOs, and International Organizations in the Informal Economy of Cairo," *Comparative Studies in Society and History* 45 (2003): 571–605.

32. Brian Massumi, "Requiem for Our Prospective Dead," in *Deleuze and Guattari: New Mappings in Politics, Philosophy, and Culture*, ed. Eleanor Kaufman and Kevin Jon Heller (Minneapolis: University of Minnesota Press, 1998), 61.

33. Brian Massumi, *Parables for the Virtual* (Durham, NC: Duke University Press, 2002), 88.

34. Antonio Negri, "Value and Affect," *boundary 2* 26 (1999): 77–88; Michael Hardt, "Affect Labor," *boundary 2* 26 (1999): 89–100.

35. Ana Teresa Ortiz and Laura Briggs, "The Culture of Poverty, Crack Babies, and Welfare Cheats: The Making of the 'Healthy White Baby Crisis,'" *Social Text*, no. 76 (2003): 39–57.

36. João Biehl, "Vita: Life in Zone of Social Abandonment," *Social Text*, no. 68 (2001): 138.

37. Giorgio Agamben, *Homo Sacer, Sovereign Power, and Bare Life*, trans. Daniel Heller-Roazen (Stanford, CA: Stanford University Press, 1998).

38. Achille Mbembe, "Necropolitics," *Public Culture* 15 (2003): 23.

39. Ibid., 34.

40. I am borrowing these terms from Michael Hardt and Antonio Negri, *Empire* (Cambridge, MA: Harvard University Press, 2000), 62.

41. Massumi, *Parables for the Virtual*, 88.

42. Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, trans. Brian Massumi (Minneapolis: University of Minnesota Press, 1987), 149–66.