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Communication beyond Meaning:

ON THE CULTURAL POLITICS OF INFORMATION

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Is it possible to draw on scientific concepts to further our understanding of cultural processes? In Order Out of Chaos, Ilya Prigogine and Isabelle Stengers proposed that the emergence of nondeterministic scientific approaches to material processes (e.g., thermodynamics, quantum mechanics, chaos theory) constitutes an important opportunity to forge a "new alliance" between the natural and human sciences.[1] Prigogine and Stengers understand the gap between the "natural" and the "human" not so much as an ontological claim (based on the irreducibility of the human to the deterministic laws of nature) but as the historical product of a schism between physics and metaphysics. Such a schism, they claim, was precipitated by the modern emergence of mechanicism in engineering and reductionism in science with its image of a complex and free humanity endowed with spirit at loss in a universe ruled by strict mechanical laws. The result of this bifurcation of thinking is well known: disciplinarization and specialization reducing the relationship between the natural and the human sciences to sporadic and conflictual encounters.[2]

Typical of this situation is the controversy over the value of the concept of information for cultural analysis. The culturalist allegation that informationalism

equals the triumph of form over matter underestimates the implications of communication and information theory for our understanding of contemporary cultures where informational dynamics are increasingly gaining priority over the formation of meanings. In particular, to say that information is a disembodied and immaterial form casts an unflattering light on what might be called “informational cultures”—that is, cultural milieus that foreground the interplay of information technologies (logarithmic data compression, information architecture, communication management, cultural recombination) and informational dynamics (such as openness, obstruction, resonance, contagion, bifurcation, and emergence).

Postmodern theory captured and anticipated such a development (the primacy of information networks over networks of meaning) when it described the culture of late capitalism as a culture of “floating signifiers,” that is, of signs that have lost their anchorage in networks of signification. The postmodern description of a semiotic world out of control, of signs that only refer to other signs in a relation of preemptive causality, or “hyperreality,” presented this development as the linear outcome of the commodification of culture—that is, the reduction of cultural use value to exchange value (money) and of exchange value to sign value (simulation). The resulting picture was that of an empty cultural milieu (literally, a desert), a real subsumption of culture under capital that problematized even the notion of a cultural politics as such. Is it possible, in fact, to wage a struggle around culture if all culture has become an industry of signification—incessantly drowning meaning in a sea of semirandom noise? More militant strands of cultural theory have thus deemed it necessary to reject the postmodern analysis as simply a sign of cynicism and unconditional political surrender to the state of things (a sign of political reflux

after the turbulent sixties and seventies). Much work has thus been dedicated to rescuing the vitality of the social from the grip of simulation (or exchange value gone irreversible and orbital). Empirical work on audiences has shown the persistence of counterhegemonic decodings and the resilience of meaning to all attempts at pinning it down within stable hegemonic formations or a closed logic of simulation. We know that meaning has not simply disappeared in the infosphere but that it has multiplied and proliferated in its interface with social microstratifications and segmentations emerging out of and giving rise to classes, genders, sexualities, ethnicities, and races. But we cannot still reconcile this proliferation and dispersal of meaning with another dimension of contemporary culture, the one that is not simply structured around the codification and decodification of meaning and its articulation into social practices but which revolves around a disturbing imperative and a characteristic dynamics. This imperative insists that more communication and better communication are supposed to provide the ultimate solution to all social problems; its characteristic dynamics involve the power of the "space of flows" over the solidity of the "space of places."[3] Here it is not so much a question of meanings that are encoded and decoded in texts but a question of inclusion and exclusion, connection and disconnection, of informational warfare, and new forms of knowledge and power (from public relations to public communication and perception management) that address not so much the play of meaning but the overall dynamics of an open informational milieu.

To underscore the challenge posed by this informational milieu to our understanding of contemporary cultural politics, I need to address two common

prejudices about the concept of information: that information is the mere content of a communication; and that information is nothing other than a mode of representation (or form) that has lost all reference to materiality (or substance). This reappreciation of information theory is also an important part of any effort to renew a method of cultural analysis able to live up to the urgent challenges of a multimediated, hyperconnected, and global network culture.

<A>Is Information Simply the Content of Communication?

If sociologists have been debating the value of information as a social force at least since the 1960s, cultural theorists have had less time to get used to the fact that information is more than the mere content of communication. The debate about the postindustrialization of Western economies, starting with Daniel Bell's controversial work, has in fact been crucially concerned with the concept of information. Sociologists and economists of different schools and political orientations have thus been trying to pin down both the value of information as a type of commodity and as a mode of production. While economists regularly refer to the role of information in market dynamics, sociologists indebted to a Marxist tradition have typically rejected the validity of the concept of information in defining social change. For many, the notion of an information society smacks too much of an attempt to relinquish the Marxist understanding of a capitalist society structurally driven by the antagonism of class structures as they are engendered by the exploitative relation between capital and labor.[4] In other words, the uncertainty surrounding the term has induced a crisis in our understanding of value within an informational mode of production.

Cultural theory, on the other hand, has only more recently moved away from an implicit understanding of information as a basic level of signification, providing a kind of minimum condition for the emergence of social meanings (as Roland Barthes described it in his Mythologies phase).[5] From this perspective, information, if such a thing is possible, was meaning at its degree zero, that is, a kind of minimal condition for the ideological work of signification. If a cultural politics was possible at all, such an approach proposed, it was because communication is more than the mere transmission of information, but also involves social and cultural networks of shared meanings that mobilize a whole cultural system of references in the service of shifting hegemonic politics.[6] From this perspective, when a newscaster, for example, reads the news, what she is doing is not simply communicating information about today's events (a bombing, a strike, a presidential speech) but also adding a set of connotations (or meanings) to a basic denotative message (minimally coded) in such a way as to give rise to a particular set of meanings expressing the interests and values of a ruling class or hegemonic bloc. Such a perspective would typically articulate the interests of the capitalist classes who overwhelmingly "own" the media. In this sense, the information transmitted by a news broadcast is secondary when compared with the meanings articulated within it, which in their turn have then to be taken up by social practices to engender a social reality (from support for wars to cultural identities and lifestyles). Information is thus implicitly seen only as a kind of alibi for the communication of social meanings, which is where the "real" cultural politics takes place. In other words, if meanings arise and return to social reality as an active

force, then the political dimension of culture is mainly concerned with the struggle over meaning.

The emergence of communication theory—with its attendant applications in the fields of public relations and public communications, perception management, advertising, and marketing—constitutes a challenge to such an understanding of cultural politics. While the level of the production of meaning has hardly any more secrets for cultural analysts and communication professionals trained in semiotics, psychoanalysis, and deconstruction, it increasingly appears as the least interesting and most repetitive level of communication. The repetitiveness and incessant mobilization of recycled identities and statements in the process of meaning formation, the obscenity that characterizes the reiteration of nationalist clichés, neoliberal ideologies, patriarchal and homophobic formations, overwhelm through their sheer persistence and pervasiveness all attempts at deconstruction and subversion. Political intervention in an informational milieu, on the other hand, involves more than the production of counterinformation but also an engagement with the dynamics of information diffusion as such (opening up channels, selective targeting, making transversal connections, using informational guerrilla tactics).

It is not simply a matter, then, of seeing the "politics of mirrors and metaphors" (as Naomi Klein referred to it in No Logo)[7] replaced by some kind of new engagement with the reality of capitalist production. It is rather a matter of linking transformations in the modes of production to new forms of knowledge and power within an overall field defined by the preponderance of informational dynamics. This informational dimension does not simply address the emergence of new hegemonic formations around signifiers such as active preemption, good and

evil, and war on terror as if it were simply a matter of articulating successful signifiers. The informational perspective adds to this work of articulation another dimension—that of a daily deployment of informational tactics that address not simply the individual statement and its intertextual connections but also the overall dynamics of a crowded and uneven communication milieu where global, national, regional, and local TV networks resonate and interfere with each other and also with other media such as radio, books, telephony, the press, and the Internet.

From a hermeneutic perspective, then, the meanings expressed and proposed by the ruling elites through their privately owned and more or less directly controlled media channels (from TV stations to newspapers) are hardly innovative or original. If we could transplant Barthes from his fifties milieu to the early twenty-first century, he would have no trouble at all in identifying the self-perpetuation of ideology as he analyzed it in post–World War II France. Antonio Gramsci would also easily recognize the features of new forms of national populism as they are articulated through the multiple institutions giving rise to a civil society. The level at which the cultural and political process seems to have truly mutated and innovated, however, is that of informational tactics—the techniques by which information is effectively communicated. Whenever a piece of information is communicated (whether it is a government policy, a series of events, or a new brand), there you find an array of techniques and tactics for which the transmission of meaning is always a temporary objective within a wider campaign. The entire field of culture and media has become the object of a diversified array of knowledges, tactics, and strategies corresponding to a hypermanagement of public opinion and cultural trends.

What I am referring to here, however, is not simply a more sophisticated version of the manipulation of the public by a new breed of "social engineers" of communication, to which we could simply oppose resisting audiences and oppositional meanings. The relationship between the professionals of communication and their audiences takes place within a specific milieu—an informational one—where the dynamics of information take precedence over those of signification. Because such informational dynamics always presuppose a larger, common field, the social elite is not so much manipulating a mass audience but being mutually implicated in a multidimensional, asymmetrical, and yet dynamic process. A more precise understanding of information and informational dynamics would be of great help in understanding the conditions within which a cultural politics of interacting communication networks unfolds.

<A> Information Theory

Information theory, and in particular Claude E. Shannon's paper on the mathematical theory of communication, offers some important insights into such informational dynamics. Published in the Bell System Technical Journal in 1948, the "Mathematical Theory of Communication" was a breakthrough in information theory—a field that had emerged mainly out of a convergence between the nascent telecommunications industry (telegraphy, telephony), radio, and television) and its military applications (command and control systems and encryption).[8] Yet information theory also had larger implications for our understanding of communication as a material process that technological development latched onto and reinvented.

One central assumption of information theory, in fact, is that information can only be defined as a ratio of signal to noise. This description started from a technical necessity. Whenever what we would commonly describe as a piece of information travels from a sender to a receiver, the problem of the channel arises, that is, the necessity of transmitting such information as faithfully as possible. If one wishes to maximize the transmission of a message, one cannot entrust a communication channel to recognize the meaningfulness of a message (it cannot interpret the message). Furthermore, not all information is strictly meaningful. Because the channel has no access to the human capacity to interpret meanings, it needs to rely on some kind of mathematical formula that would enable it to discriminate between information and noise. Information is such only because it displays some pattern of redundancy and frequency that allows a channel to distinguish it from noise. To a human ear, the information contained in encrypted bits might appear literally as hisses and noise (as in the emblematic sound of a modem connecting to the Internet). And yet, when communicated through a channel, this piece of noise also is information; that is, it displays a pattern of redundancy and frequency that can be encoded into a signal and further encoded in what will eventually appear to us as a Web page or simply a piece of random junk mail. In this sense, as information theory explicitly states, information does not involve meaning but only statistical patterns of redundancy and frequency—a modulation of signal to noise.

Shannon's work addressed the technical problem of how to modulate a signal so as to maximize its chances of surviving the adverse effects of the noise that haunts all communication—the interference and static that always threatens to

annul the transmission act. In so doing, however, he also highlighted and focused on the minimum conditions for communication. Before something can be communicated at all, a channel needs to be cleared out, and this involves the suspension of noise—the buzz of the quantum world that at all moments threatens the smooth operationality of the communication act. In other words, communication cannot even start unless some kind of channel is cleared, warding off the interference of a noisy world. A clear channel is the basic condition of the communication act inasmuch as the aim of communication is the creation of a contact that allows a message (regardless of its meaning) to get through.

This scenario substantially departs not simply from hegemony but also from the modern conception of communication as a public sphere guaranteeing the transparent unfolding of democratic life. There is no signifying subject, or even an audience to address; there is no rhetorical play of ideas, but a kind of bare set, where all communication is reduced to a drive to clear out a channel. From an informational perspective, communication is neither a rational argument nor an antagonistic experience that is based on the capacity of a speaker to encode a shared meaning. The purpose of the information flow is to establish a contact between sender and receiver by excluding all interference—by holding off the transformative potential of noise: communication is a signal sent to a receptive partner in a hostile environment.[9] Senders and receivers are not opposed, as in the traditional conception of the dialectical game, but they are assumed to be on the same side. Opposition to the agreement between sender and receiver cannot be subjective but only objective and external, appearing only in the nonhuman form of meaningless noise (or in the form of an enemy intent on disrupting the

communication between two partners in agreement). “To hold a dialogue is to suppose a third man and to seek to exclude him.”[10] The appearance of a modern informational problematic, then, is related to a conception of communication as an operational problem dominated by the imperatives of the channel rather than by a concern with signification, ethical truth, or rhetorical confrontation (a definition that dominates Marxist, liberal, and enlightened concepts of communication).

At the macropolitical level, the tensions introduced by such informational dynamics are well expressed by the permanent crisis undergone by the mechanisms of populist and representative democracy in relation to the remnants of the bourgeois public sphere. This crisis has recently unfolded in the relation between the independent ethics of journalism and those areas of expertise that explicitly draw on a strategic and tactical conception of communication (as in the recent controversy between the BBC and New Labour over intelligence on weapons of mass destruction in Iraq). Such a crisis is increasingly marked by the unfolding of an informational dynamics as visible in the tensions that oppose journalists to communication managers (PR agents, press officers, advertisers, perception managers, information strategists, public communication directors, intelligence officers, and consultants). While conscientious journalists (or even some intelligence officers) would argue that information must be assessed in terms of its accuracy (or truth value) and relevance (meaningfulness), so that the political process can be made more transparent, the social engineers of communications seem to have another type of grasp of the informational dimension of contemporary culture—that they technically reduce to the relation of signal to noise.

The latter, in fact, understand the power of communication as determined by the overall dynamics of the informational milieu, where what counts is the preservation of the message/signal through all the different permutations that such a message/signal is liable to undergo. The process is all the more difficult the larger the targeted audience (in this case the silent majorities that representative democracies nominally defer to). The larger the mass and the more crowded the communication milieu, the more likely the possibility that the message might either disappear in the black hole of the mass or be subjected to transformations and recombinations that might alter its value. Much more dangerously from the perspective of spin doctors, propagandists, and marketers, the whole channel might collapse under the weight of an overwhelming noise (an audience's scarce attention span, competition, or cynicism). If one wanted to study the kinds of permutations that a message can undergo when centralized communication strategies fail, the spread of rumors in postwar Iraq (as reported in Iraqi Web logs, for example) following events such as explosions, power blackouts, and water shortages would offer a suitable case.[11]

It is not by chance, then, that the social engineering of communication favors repetition and the short slogan or even the iconic power of the logo as an effective way to open a channel and get the message through—shortcutting their way to the receiver by using the shortest possible route in the shortest possible time. Communication management today increasingly involves the reduction of all meaning to replicable information—that is, to a redundancy or frequency that can be successfully copied across varied communication milieus with minimum alterations. Whether it is about the Nike swoosh or war propaganda, what matters

is the endurance of the information to be communicated, its power to survive, as signal or pattern, all possible corruption by noise.

When a television debate is held, for example, between competing politicians before an election, can we say that such debates are won or lost on the basis of accurate information or even as a dialectical argument involving the interplay of truth and persuasion? Can we say that politicians are really talking to each other and expressing a real disagreement? Or isn't the more pressing problem that of clearing out a channel through a noisy mediascape, of establishing a contact, with the electorate/audience out there? In this context, the opponent becomes noise and the public becomes a target of communication: not a rational ensemble of freethinking individuals, endowed with reason, who must be persuaded, but a collective receiver to which a message can be sent only on condition that the channel is kept free of noise (competing politicians, but also the whole noisy communication environment to which such politicians relate, where, for example, more young people "vote" for reality TV shows than vote in general elections). Politicians are increasingly elected not because of what they say but how they say it, that is, on the basis of how successfully they manage to engage the majority in a prolonged contact. This is a very specific operation that involves a kind of tuning in to and selective reinforcement of an affective link between political leaders and their electorate (the dynamics of information and those of affect are, in this sense, inextricably related in ways that we are only starting to understand).[12] Or, in another context: don't the techniques of advertising involve, first of all, an attempt to bypass the noise of a crowded informational milieu by establishing a connection with potential customers? It is understandable, then, why cultural activism of the

No Logo variety should have focused so much on what Mark Dery has called "culture jamming"—signal distortion, graffiti on advertising posters, hijacking of corporate events—all attempts at disrupting the smooth efficiency of the communication machine. Or, as Gilles Deleuze suggested, why cultural resistance within control societies might also involve the creation of "vacuoles" of communication. Or why in cases of media monopoly, the exploration of other avenues and topologies of communication (from the interpersonal to television screens to computer networks) assumes such tactical priority.

A cultural politics of information thus unfolds within a communicational environment that has been instrumentally reduced to its "fundamental problem," as Shannon put it (or to its minimum conditions): the successful constitution of a contact, the suspension of all competing signals, and the filtering out of all possible corruption of the message in transit. Information in this sense is a function of the instantiation of a line of command. There is nothing inherently technological here, in the modern sense of a Frankenstein monster created by human will but now threatening to destroy it. It is not so much a question of technology as of techniques and modes of knowledge and power that all converge—through a variety of media and channels—on the terrain of informational cultures.

Does that mean, then, that journalists and activists who hang on to relevance, truth, and meaning have been made redundant by social engineers of communication who have a much better grasp of informational dynamics? The problem here is not that of arguing for the obsolescence of meaning and truth in favor of sheer manipulation within an informational milieu. On the other hand, we cannot simply rely on the instability of meaning as it changes form and quality in its

passage from senders to receivers. The re-production of meaning is still surprisingly stable even as it shifts from enthusiastic agreement to negotiated readings and oppositional decodings. It seems that communication management does not meet its limit in the irreducibility of meaning—that is, in the audience's capacity to recode a message in partially divergent ways. What seems to be at work is a more impersonal, even less human process—albeit one that can still be conceived of as a political field. What such management techniques might have themselves misunderstood is the informational dimension of communication as such, and their repeated efforts at amplifying the signal to drown out the noise might be as counterproductive in a social sense as they would be within the circuit of a stereo system. In a recent interview, for example, Tony Blair's unpopular ex-director of communication, Alastair Campbell, denounced the dangerous cynicism of public opinion, caused and abetted by the media, that, he implied, stops the message of politicians from really getting through to the public. The loss of contact is given the name cynicism, but one might argue that the latter term describes not only a widespread disenchantment but also a physical effect: that of shutting one's ears and closing one's eyes, switching channels and turning off the TV, refusing to participate in the communication act altogether. In this withdrawal from communication, however, another perspective might also see not only the end of politics (as the term cynicism seems to imply) but also the potential for its reconstitution through channels other than the circuit between the TV screen, the newspaper headline, and the ballot box.[13]

The strategy of amplification, the attempt to control the scene of communication by sheer power, by seizing control and monopolizing the infosphere,

might backfire because information managers do not sufficiently take into account the nonlinear powers of feedback or retroaction—cynicism and anger, the diversification of communication niches, or just a kind of social entropy that nonlinearizes the transmission of messages as such. Nonlinearity here implies a kind of nonproportionality or differential between input and output, a tendency of systems subjected to amplification to produce deviations and distortions that are not primarily of the order of meaning but that involve the power of biophysical processes of affections. Thus the information/noise mobilized by war propaganda might also reenter the circuit of communication from other sides and with completely different qualities—manifesting a power of fluctuation capable of producing a qualitative transformation or bifurcation.

This is where some of the limitations of a narrow interpretation of Shannon's information theory come through. Shannon's theory, in fact, started from a linear conception of communication (modeled on the technical configuration of the telecom industry at that time) as implying a circuit linking a sender to a receiver through a channel. Within a channel of communication such as a telephone line or a broadcast, noise can be effectively reduced to a disturbance to be neutralized, because such communication is linear. But what happens, on the other hand, when communication is nonlinearized, when there is no simple causal relation or proportion between input and output, when information is not simply transmitted through a channel from point A to point B but starts to jump around, mutate, and multiply from channel to channel, from network to network, from singularity to singularity? What happens when a channel opens up onto an informational milieu?

<A> Information and Representation

Some could argue that the dynamic relation between information and matter, signal and noise, pattern and randomness that animates our communication environment does not really address what to many appears as the essential problem of information—its alleged immateriality. It is not too difficult to observe how the management of the public sphere and even of cultural markets implies a crucial concern with putting things through, and how complex the techniques of putting a message through have become in today's noisy communication environment. But still, this does not address the problem of the relationship between senders and receivers. Some could argue that this something to be communicated cannot simply be a pattern but must ultimately be some kind of re-presentation of reality. A newscast, after all, still proposes a particular representation of events that have happened somewhere else and that need to be conveyed to an audience. In this sense, some would argue, information ultimately still obeys the rules of signification and meaning, or at least as information theorists might put it; it has a semantic dimension, subject to interpretation, misreadings, and the works of signification. It is through this semantic dimension, perhaps, that a cultural politics of information can still be understood as a struggle over meaning. A newscast can still be analyzed on the basis of the discursive production of the event represented according to whatever hegemonic formation is in the making at any particular time and as it is encoded and decoded by producers for consumers.

This understanding, however, still leaves open the question of the relation between information and materiality. According to the neo-Saussurean approach to language that dominates most contemporary cultural analysis, a representation can

never be said to draw its meaning from reality but only from other representations—that is, from the whole fabric of the signifying knowledges that weave together a common understanding of reality. From this perspective, a shared social reality is constructed through and by language, and is not conceivable or accessible without it. The question of the referent (of the object of representation) is bracketed off. Sociolinguistic constructionism rightly points out that we will never know what an event really was like or what a man, or a woman, or black, or white, or gay really are (after all, they are just linguistic constructions that produce an effect of materiality by virtue of the performative power of speech). Within such a context, the concept of information poses a singular challenge, because information claims to have a relationship with what it represents. Inasmuch as the concept of information does not simply exist within the technical domain of communication engineering but is also crucial to physics, the life sciences, and computation, information has thus become a favorite target of deconstructive critique. Since cybernetic theory (drawing on a larger debate within biology and physics) suggested that information is crucial to the emergence and persistence of life, the notion of information has been identified with a new scientific paradigm advocating a dematerialized understanding of the body. As described by Donna Haraway in her early work on the immune system or by N. Katherine Hayles in her recent work on computation, information emerges as another discursive construction of the body that it subjects to a kind of disembodying effect.[14] Information dematerializes the body; it reduces it to abstract sequences and immaterial flows. Although this is an accurate assessment of the discourse of informationalism (as it has developed within fields such as artificial life and artificial intelligence), it still denies

information any actual capacity to describe material states. Information is thus entirely enclosed within the social network of signification where it comes to signify a kind of transcendental representation—a representation that has lost all anchorage to any social or bodily referent.

What social constructionism cannot help but reproduce is the semiotic gap between meaning and reality—a version of the schism identified by Prigogine and Stengers in Order Out of Chaos. The referent will always be intrinsically outside the world of meaning, as it is basically constituted by the mediation of mental images and their associated signifiers. Representation always encounters reality through the mediation of the sign, and signs always refer mainly to each other: they are solid moments within the ever-shifting chain of associations, differences, and oppositions. To all effects, there is no reality for us outside the composite significations that we use to classify it.

For information theory, however, information is not simply a representation but a technique of data compression that makes it easier for us to relate to the overwhelming complexity and indeterminacy of material processes. Information, as Shannon's formula emphasized, is always a measure of an uncertainty in our knowledge of a state, process, or event. As Jérôme Segal has pointed out, before being adopted by physicists, the question of information was posed first of all in the context of a statistics of populations within biopolitical forms of knowledge. The question that the statistical theory of information addressed was that of "the scientific reduction of a mass of data to a relatively small number of quantities which must correctly represent this mass, or, in other words, must contain the largest possible part of the totality of relevant information contained in the original

data."[15] The mathematical tools through which this reduction was made possible were derived from the field of social physics as inaugurated in the nineteenth century by the Belgian astronomer Adolphe Quetélet (the inventor of the average man in society, a compiler of mortality and criminality tables, and also the author of a statistical study on the propensity to suicide that later came to provide the foundations of Émile Durkheim's famous sociological study).[16] A statistical average (such as that which goes into the production of a criminal profile) never claims in itself a complete power of representation and definition. An average is a temporary suspension of our knowledge of singular variations and improbable states for the purposes of efficient communication (as in the distribution of criminological profiles to police agencies). Within the statistical model proposed by Quetélet's social physics, the average, or norm, is the representation of a macrostate to which can correspond a variety of microstates. An average might be the same for a number of different possibilities (an average height of six feet in a population of one hundred people might be realized by many different distributions of possible heights). As a macrostate, the average does not really exist, but it is a kind of social norm, a strange attractor endowed with the function to regulate the social body and stabilize it. It is the center of gravity to which "all the phenomena of equilibrium and its movement refer."[17]

If Quetélet opened the way for the use of statistics as a form of control of the life of populations (what Michel Foucault called "biopower"), these statistical tools were to find quite a different use in physics. Statistics played an important part in the redefinition of the problem of entropy in physics (as the law that dictates that heat tends to irreversibly dissipate, that is, a hot cup of coffee will cool down on its

own, but it will heat up only on conditions that some work will be employed to rewarm it). Once the problem of heat dissipation or entropy was understood as a measure of the speed and state of the population of molecules that make it up, then statistical tools could be employed to calculate entropy as some kind of average measure of the probable distribution of such populations of molecules. In the nineteenth century, Ludwig Boltzmann adopted statistical tools to define the entropy of a system as the measure of our uncertainty in our knowledge of the probable state of the distribution of a population of particles at any given time. The introduction of the concept of probability in physics coincides with the emergence of information as a concept able to describe the implication of subjectivity, knowledge, and matter.

The concept of information, that is, always marks an approximation or uncertainty in our system of knowledge—but an uncertainty that, as the successive emergence of quantum mechanics formalized, is constitutive of knowledge as such. All physical laws, inasmuch as they express a certain type of information about physical processes, are similarly understood as probabilistic descriptions. Thus, as Marco d'Eramo has put it, the probability of a system to be in a certain state is not a property of its being. Probabilities do not exclude the existence of singularities that defy them. "If we say that water boils at 100˚ Celsius, we are really saying something else: that, at 100˚ in a pot, water has a very high chance of boiling, but, at the same time, there is a possibility that at 100˚ water freezes. It is an infinitesimal possibility (we can calculate it), but it exists."[18] The freezing of water at 100 degrees might be said to partially correspond to a singularity: it is a zone that both defies and is included in the function that describes the boiling of water.

This is quite different from saying that all our knowledge is exclusively a function of representation or our mental concepts, which brackets off all material processes, outside human culture. Our system of knowledge does not simply construct but limits and shapes our perception of the complexity and indeterminacy of matter. Material processes can be described but always probabilistically as an approximation, not simply because information is always incomplete but because this incompleteness corresponds to what Norbert Wiener named an "incomplete determinism, almost an irrationality in the world . . . a fundamental element of chance."[19]

Shannon's mathematical theory of communication also inherently acknowledged that, as a statistical measure, information is somehow inherent in a physical reality, but only as a measure of the irreducible uncertainty that characterizes our knowledge of physical states. In its technical and scientific sense, then, information implies a representation of a physical state, but there is no simple coincidence between the representation and the states that such information describes. Or at least this relationship is cast in terms that radically undermine the framework within which we have come to think of representation as a copy, or true reflection, of reality. As Jean Baudrillard has insisted, we have been long outside the regime of the original and the copy. Information theory acknowledges that a macrostate or a molar (opposite of molecular) formation that can be represented by a number or a description (such as an average temperature, or an organism, or an identity) does not have a linear or deterministic relation to the multiplicity of the microscopic states that define it (the singular particles and their speed, the microscopic relations that make up an organism, all the mutations

and divergences and singularities subsumed under an identity). Information can only describe a distribution of probabilities rather than an essential property that defines a being.

Shannon information (or classical information) solves the problem of such indeterminacy (or noise) through a form of data compression. “Like astronomy and physics, information technology must grapple with numbers too large for human comprehension. They can be brought down to a manageable level by the use of a mathematical curve called the natural logarithm.”[20] As a technique of data compression, information theory uses the logarithm to bring down the uncertainty that is a function of the sheer magnitude of data yielded by the physical world. The logarithm mediates between a world graspable by the human senses and those processes too complex for our comprehension, that is, processes that “change geometrically, exponentially or multiplicatively: probabilities and explosions, compound interest, populations and proliferating neural connections.”[21] In doing so, the logarithm mimics the way that human senses work. “The ear, too, perceives approximately logarithmically. The physical intensity of sound in terms of energy carried through the air, varies by a factor of one trillion (10^{12}) from the barely audible to the threshold of pain; but because neither the ear nor the brain can cope with so immense a gamut, they convert the unimaginable multiplicative factors into a comprehensible additive scale. The ear, in other words, relays the physical intensity of the sound as logarithmic ratios of loudness.”[22]

If at some level, then, information makes the sheer magnitude and uncertainty of the world manageable, it also makes us a lot more aware of the approximate nature of all knowledge. Whether it is about contradictory and ever-

changing opinion polls or proliferating databases, information technologies have helped make the complexity of the socius manageable by compressing variations in tastes, timetables, and orientations, bypassing altogether the self-evident, humanistic subject, going from masses to populations of subindividualized units of information.[23] Gender, race, and sexuality, the mantra of the cultural politics of difference in the eighties and nineties, have been disassociated from stable subjects and recomposed on a plane of modulation—a close sampling of the microvariations of the social moving to the rhythm of market expansions and contractions. This does not imply, of course, that identities, differences, and representations have become irrelevant or lost their psychic power of identification or their function in the reproduction of relations of exploitation. At the same time, however, information technologies have also made us more aware of their nature of metastable compounds, held together by specific social forces and distributions of power, that lose their imagined consistency every time different functions are applied. Unwittingly, that is, the informational dimension reveals the turbulent play of singularities, or singular essences, disturbances in the organized space of the logarithmic function that go way beyond the postmodern game of identity and difference.[24]

Information operates according to different rules than does signification. Its conception of difference is not relational and structural but probabilistic and uncertain. It refers to material processes in discontinuous transformations in the play between the probable and the unlikely. The concept of information captures material dynamics (including cultural dynamics) at their most fluid and discontinuous. It involves an understanding of material processes that is

nondeterministic and nonreductionist. Material processes cannot be completely defined by information, because the latter can only ever express some of the former's dimensions. In this sense, representations, identities, and meanings are large nets cast onto a turbulent play of singularities—of all those points that defy the defining power of the function. They communicate only a very coarse and loose type of information—not so much untrue as simplistically informed, endowed only with a limited capacity to describe the interplay of singularities.

What the concept of information has to offer the analysis of culture is not only a more nuanced appreciation of the relationship between signs and material fluxes (of the kind, for example, attempted by Félix Guattari's schizoanalytic practice, where semiotic diagrams proliferate in an attempt to map multiple modes of interplay between singularities) but also something more immediately intuitive and pragmatic. It could help us, for example, make sense of the hyperconnected and asymmetrical culture that we share across continents in ways that appreciate the importance of informational dynamics to cultural politics. If the work of communication management is that of modulating the overall milieu of communication and submitting it to the action of economic and political command, something else is also taking place. The noisy field of communication, the proliferating clutter of information that asymmetrically impinges on and reconfigures the planet, does not address a static mass subdued but a probabilistic, discontinuous, and mutable cultural milieu. The concept of information implies the existence of probabilistic and variable processes that cannot so much be represented as observed and experimented with. Beneath the propagandistic reiteration of clichés lie a social dynamics in turbulent reconfiguration where

cultural experimentation with informational tactics can and does take place at a diffuse level. This does not imply that we are living in a kind of informational utopia where all singularities are free to express themselves. What is opened up by the concept of information is not a static world of forms in automated self-regulation—it is not the self-reproducing and automated factory that was supposed to mark the end of capitalism. From many points of view, an informational milieu resembles more the open battlefield of asymmetrical warfare conceptualized by post–cold war military strategists than a capitalist paradise.[25]

<A>Informational Power

It should be clearer at this point, then, why the theory of communication proposed by Shannon information is somehow inadequate to describe the dynamism of informational milieus. If, as Wiener states, information implies the existence of an "uncertainty and irrationality in the world," of an irreducible magnitude or noise, how can we accept that communication implies a simple transfer of information from A to B?[26] **{AU: Please provide page number in note 26 for quotation.}**How can we accept that noise can be just bracketed off somewhere in a box outside the communication diagram? As I have shown, even the process of hearing a sound (which we can understand as information) implies an active process of compression and simplification—involving layers of unconscious perception. Neurobiology has studied this process and given us a glimpse of the complex transformations that take place from the moment the sound hits our ears to its transit through the nervous system to the complex mappings in the brain—as if information had to go through many more different transformations before

actually reaching consciousness.[27] Furthermore, we have also become aware of the transformations implied by the incorporation of technological devices such as TV, computer screens, or wireless devices in our perceptual horizon. How can we still believe that information simply flows from sender to receiver (or from producer to consumer) without any of the noise, indeterminacy, and uncertainty having any effect on the process at all at some level?

The critique moved by Gilbert Simondon to the technical theory of communication (as he called the work of telecom engineers) opens up an interesting perspective on the dynamics of communication beyond meaning. For Simondon, the mathematical theory of communication underestimated information by reducing it to what is transmitted between two distinct and individuated points: a sender and a receiver (or producer and consumer). In this way, information theory screened out noise effectively not simply from the channel but also from the physical model of the universe that it drew on and implied (thermodynamics and quantum mechanics, with their emphases on probability and uncertainty). The relation of communication for Simondon does not take place between two preconstituted individuals (such as a journalist and her or his audience, for example), but within a larger field characterized by cumulative and differential levels of potential energy that exist in tensions with each other. These tensions are temporarily solved by way of quantum leaps from one form to another—leaps that always imply an active power of invention rather than simply the execution of a command. Simondon emphasized substituting the notion of the individual (to which the concepts of sender and receiver refer) with that of the preindividual (what within the formed individual remains as a potential for further divergent and

singularizing individuations or the magnitude that is logarithmically reduced by our senses and information technologies). Inasmuch as such preindividuality always contains a tension between diverging and even conflicting potentials and tendencies, the action of information cannot be reduced to an act of communication in the sense of the production of a pattern, as identified above.[28]

Information is not simply the name for a kind of form meant to survive the attack of noise but more a quasi cause or catalyst for an active power of constitution and transformation that it does not contain in itself.[29] As we know now, the DNA strings mapped out by the field of bioinformatics are not a form in the Platonic sense of an immaterial and transcendent Idea looking for some kind of female Substance on which to imprint its mark. The emergence of a living organism involves an active process of transduction, where information expresses simply the direction along which a living organism individuates itself through the expression of a tension or potential within the overall field.[30] For Simondon, an understanding of informational dynamics actually offers the key to a reconceptualization of the relation of form and matter in terms of mutual affection that always involves the power of an overall milieu. This process of individuation involves the active participation of a material milieu that is itself capable of active and passive syntheses. Information is always entangled with and dependent on a material milieu defined by its tensions and incompatibilities in a process that can only be described in terms of the different tendencies that it gives expression to. Simondon suggested that a theory of information developed along these lines could help us understand not simply the formation of physical individuals (such as salt crystals) or living organisms but also social and technical processes of emergence (from

technological innovation to group formations). Simondon also observed that such processes of individuation often happen through abrupt changes of state (what chaos theory calls phase transition) where such systems manifest an active power of invention of new forms.[31] The recent history of the Internet, an open network undergoing exponential growth over a short span of time, witnesses some of these active powers of invention. In the case of my original example of communication management, the relationship between senders and receivers, politicians or their directors of communication and their audience, is misunderstood if understood exclusively as points of passage for the transcendental power of information. Information does not simply flow from point A to point B as if through a void. Both sender and receiver are immersed within a larger field of interactions that packs within itself a potential for transformation and even divergent tendencies that the mathematical theory of communication does not capture. Information implies the unfolding of a duration—an active temporality where consequences hardly ever follow linearly from causes.

The relationship between informational dynamics and cultural expression has been partially obscured by the predominance of linear communication media in the modern and late modern period. We have become used to thinking of communication as being about messages (i.e., information, meanings, and representations) essentially transmitted from a sender to a receiver through a channel. We have thus come to place undue importance on the mental images or representations of communication—as if information was simply another name for Ideas that flow from the minds of the ruling classes to those of the passive majorities. The multiplication of communication channels and media is making us

more aware of the importance of nonlinear dynamics in the unfolding of sociocultural effects. Because information proliferates, resonates, recombines, and interferes all over the place, it is hard not to become increasingly aware that it is neither mere meaning nor immaterial form. There is also a widespread, informal, and intuitive recognition of the cynical tactics of informational warfare, for example—as when the timing of a piece of information about a terrorist attack is made to coincide with a specific political event. The significance of releasing information at a particular time (as in the stock market) is also easily observable. Inasmuch as information always involves a noise—a material interference without which it cannot stand out—it always implies a nonlinear, active relation with material changes of state or transformations (e.g., in the sphere of affects, it involves the induction of feelings of fear or panic or pride).

All communication of information always involves some kind of resolution of a tension, characterized by an incompatibility among different dimensions of an overall milieu. Information is thus not so much the content of communication as a "transductive arrow"—as it attempts to determine a direction for future actualization. Hence all communication of information, as the cyberneticians well knew, is also a form of control over the fluctuations of an unstable physical milieu. The message does not simply subject the receiver to the action of a sender (including that of accepting/ negotiating/rejecting a meaning), but the overall interplay of multiple information flows with an active power to determine material changes of states. No communication of information can be cut off from the specific interplay of tensions and instabilities, and all information can be assessed also on the basis of the chain of events by which it is set in motion and which it sets in

motion. The information communicated by a speech or an act of warfare or terrorism is not simply mediated by cultural codes, but it has multiple and nonlinear effects that cannot be strictly calculated beforehand or even exhaustively marked.

What this comes down to, in relation to our understanding of the cultural politics of information, is that, fortunately, the act of establishing a contact cannot be reduced to the injection of information in the bodies of individual receivers after the field has been cleared of noise (as in the behaviorist model of media effects). On the contrary, the informational dimension of communication seems to imply a material potential for dynamic transformations, an unfolding process of constitution that neither the liberal ethics of journalism, the cynicism of public relations officers, nor the theory of cultural hegemony can really address. A cultural politics of information addresses both the development of forms of knowledge and power that explicitly address not only the field of communication but also the potential of the event as it erupts within the closed circuit of communication or the power of the invention to displace the closed horizon of the communication channel. In this sense, the cultural politics of information involves not only culture jamming and interference but also an active analysis of and experimentation with tactics adequate to the nonlinearity of informational flows and the instability of the socius that they address.

<A>Coda on Informational Materialism

As I have described it, an engagement with information as a material force involves a reassessment of some of the predominant methodological underpinnings of cultural analysis and specifically of social constructionism. In particular, it seems

that an engagement with information opens up the question of the referent beyond the relationship between signification and the social relations of production. The question then becomes that of not only mapping the formation of meaning onto political and economic structures but also capturing the dynamic processes within which a transformative cultural politics unfolds. This does not mean that the formation of meanings is irrelevant or even obsolete in an informational milieu. Although I have focused here on communication beyond meaning, we cannot deny that information has two sides, or that it belongs to two types of articulations (as Guattari would call them). On the one hand, it involves a physical operation on metastable material processes that it captures as probabilistic and dynamic states; on the other hand, it mobilizes a signifying articulation that inserts such description into the networks of signification that make it meaningful. This first operation is becoming increasingly central to cultural and political struggles over media and communication in twenty-first-century cultures. Whether it is about the technical management of public communications or the dynamic emergence of a collective and networked subjectivity, a cultural politics of information does not simply address the proliferation of representations but, more fundamentally, the turbulent dynamics of sociocultural emergence within an open informational milieu.

<A>Notes

1. Ilya Prigogine and Isabelle Stengers, Order Out of Chaos: Man's New Dialogue with Nature (New York: Bantam, 1984).

2. It is worth mentioning here that this new alliance is not meant to dismiss the important sociological argument about the social organization of scientific research

and the interdependence between science, capital, and state formations. On the other hand, it is important to distinguish such a critique from the epistemological argument put forward by social constructionism that all scientific knowledge is social in a narrow sense: that is, exclusively expressive of social knowledge rather than also involving an experimental relation with material processes and forces (see Isabelle Stengers's Power and Invention: Situating Science [Minneapolis: University of Minnesota Press, 1997]). Gilles Deleuze and Félix Guattari have also introduced an important distinction between what they call a "Royal Science" and a "Nomad Science." Such a distinction is in no way exclusive to the natural sciences, but it indicates a certain predisposition of thinking as such inasmuch as it either privileges stable, homogeneous, and regular processes or singular, smooth, and vague ones (see Gilles Deleuze and Félix Guattari, A Thousand Plateaus: Capitalism and Schizophrenia [London: Athlone, 1984]). What distinguishes science from other domains such as the arts and philosophy is for Deleuze and Guattari the importance of quantitative functions, or laws, versus the philosophers' concepts or the artists' percepts; see Gilles Deleuze and Félix Guattari, What Is Philosophy? (New York: Columbia University Press, 1994).

3. This hypothesis is at the basis of Manuel Castells's analysis of network societies in his influential The Rise of the Network Society (Oxford: Blackwell, 1996).

4. See, for example, Frank Webster's assessment of the information society debate in Theories of the Information Society (London: Routledge, 1995).

5. See Roland Barthes, Image, Music, Text, ed. and trans. Stephen Heath (London: Fontana, 1977). Here Barthes acknowledged that the level of denotation (with which information is associated) was somehow always more full than the

connotative level. In his famous example of the black soldier saluting the French flag, the denotative level includes always more than connotation: it is about the specificity of the soldier's life and his experience, the history of the flag, and their interplay in the image as such. Connotation reduces the wealth of meaning to be found at the denotative level by reducing them to a few ideological motifs or myths. See Barthes, Mythologies (London: J. Cape, 1972).

6. See Stuart Hall's influential essay "Encoding/Decoding," in Culture, Language, Media: Working Papers in Cultural Studies, 1972–79, eds. Stuart Hall, Dorothy Hobson, Andrew Lowe, and Paul Willis. (London: Routledge, 1980).

7. Naomi Klein, No Space, No Choice, No Jobs, No Logo: Taking Aim at the Brand Bullies (New York: Picador, 2000).**{AU: Please confirm title, as found in OCLC library database.}**

8. Claude E. Shannon, "A Mathematical Theory of Communication," Bell System Technical Journal, vol. 27 (1948): 379-423, 623-656.

9. George Simondon, L'individuation psychique et collective: À la lumiére des notions de forme, information, potentiel et métastabilité (Psychic and Collective Individuation: In the Light of Notions of Form, Information, Potential, and Meta-stability) (Paris: Editions Aubier, 1989).

10. Michel Serres, Hermes: Literature, Science, Philosophy, ed. J. V. Harari and D. W. Bell (Baltimore: Johns Hopkins University Press, 1982), 67.

11. For daily Web logs from post-Saddam Iraq in 2003, Zeyad's page Healing Iraq was a popular portal; healingiraq.blogspot.com/ (accessed 22 November 2003).

12. For a further elaboration of the relationship between information and affect, see Tiziana Terranova, “Communication’s Biopower,” in Network Culture: Politics for the Information Age (London: Pluto, 2004).

13. “What Next for a Cynical Society?” BBC News, 18 February 2004, news.bbc.co.uk/1/low/magazine/3497121.stm (accessed 20 February 2004).

14. See Donna Haraway, Simians, Cyborgs, and Women (London: FA Press, 1991); and N. Katherine Hayles, How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics (Chicago: University of Chicago Press, 1999).

15. Jérôme Segal, “Théorie de l’information: Sciences, techniques et société de la seconde guerre mondiale à l’aube du XXIe siècle” (“Information Theory: Sciences, Techniques, and Society from World War II to the Dawn of the Twenty-First Century”) (PhD diss., Faculté d’Histoire de l’Université Lyon II, 1998), www.mpiwg-berlin.mpg.de/staff/segal/thesis/ (accessed 21 August 2003).

16. Armand Mattelart, The Invention of Communication, trans. Susan Emanuel (Minneapolis: University of Minnesota Press, 1996).

17. Quoted in ibid., 228.

18. Marco d’Eramo, “L’abisso non sbadiglia più” (“The Abyss No Longer Yawns”), in Gli Ordini del Caos (The Orders of Chaos), ed. G. Baglione, F. Carlini, S. Carrà, M. Cini, M. d’Eramo, G. Parisi, and S. Ruffo (Rome: Manifesto Libri, 1991), 19-70.

19. Norbert Wiener, The Human Use of Human Beings: Cybernetics and Society (London: FA Books, 1989), 11.

20. Hans Christian von Baeyer, Information: The New Language of Science (London: Weidenfeld and Nicholson, 2003), 81.

21. Ibid., 88.

22. Ibid., 84.

23. See Lev Manovich, The Language of New Media (Cambridge, MA: MIT Press, 2001). On this subject, see also Pierre Levy, Becoming Virtual: Reality in the Digital Age (New York: Plenum Trade, 1998).

24. See Michael Hardt and Antonio Negri's suggestion in Empire (Cambridge, MA: Harvard University Press, 2000) that the concept of singularity (from Duns Scotus to Gilles Deleuze) expresses a constitutive dimension of the active power of a multitude. In Hardt and Negri's political philosophy, inasmuch as the multitude works, it produces itself as a singularity—a zone of existence not reducible to the empty time of exchange value. For a political philosophy of singularity, see Giorgio Agamben, The Coming Community, trans. Michael Hardt (Minneapolis: University of Minnesota Press, 1993).

25. For an analysis of warfare in a one-world power system, see Qiao Liang and Wang Xiangsui, Unrestricted Warfare (Beijing: PLA Literature and Arts, 1999), extract translated at www.cryptome.org/cuw.htm (accessed 22 November 2003).

26. Wiener, The Human Use of Human Beings.**{AU: Please provide page number.}**

27. See Antonio Damasio, Looking for Spinoza: Joy, Sorrow, and the Feeling Brain (London: William Heinemann, 2003).

28. See Simondon, Individuation psychique et collective.

29. On the quasi cause, see Gilles Deleuze, Difference and Repetition (New York: Columbia University Press, 1994); and Deleuze, The Logic of Sense (New York: Columbia University Press, 1990).

30. See Luciana Parisi, Abstract Sex: Philosophy, Biotechnology, and the Mutations of Desire (London: Continuum, 2004).

31. See Manuel De Landa's exploration of the implication of chaos theory for our understanding of social and historical processes in A Thousand Years of Nonlinear History (New York: Zone, 1997).