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The Cybernetic Matrix of 'French Theory'

Céline Lafontaine

NALYZING THE experiences of identity multiplication in cyberspace, sociologist Sherry Turkle notes in her book *Life On the Screen*: 'More than twenty years after meeting the ideas of Lacan, Foucault, Deleuze and Guattari, I am meeting them again in my new life on the screen' (1997: 15). Far from being obvious, the close intellectual kinship she perceives between what is conventionally referred to as 'French theory' and cyberculture should rather be surprising.

Indeed, how is one to explain that a philosophical movement of French origin seems to embody itself in a typically American technological innovation? This is all the more surprising knowing that the influence of deconstructionist, multitude, rhizome and 'everything is language' thinkers is far more deeply rooted in the United States than in France (Cusset, 2003). Whence does this strange intellectual concord between 'French theory' and postmodern America come? Surely it is not by mere chance that the virtual universe of networks constitutes one of the spaces where the postmodern expression of subjectivity, characterized as flowing and multiple, manifests itself most explicitly (Turkle, 1997: 15). Could this be understood as a sign that the philosophical roots of French theory and the techno-scientific foundations of cyberspace are born of the one and same matrix? Not only would this allow a paradox to be solved, but also, even more significantly, it would unveil the kinship between 'French theory' and postwar America.

This article aims to demonstrate the influence of cybernetics on the development of French thought after the Second World War. We shall see how structuralism, post-structuralism and postmodern philosophy integrated cybernetic concepts in their theoretical approach by radically transforming the conception of subjectivity. We shall also see the link that exists between the deconstruction of the subject in 'French theory' and the identity

mutations associated with the development of new information technologies and biotechnologies. However, it should be pointed out that the expression 'French theory' used in this text is a nod towards François Cusset's (2003) thesis, according to which French post-structuralist authors are more popular in the United States than in France. The thesis I am defending intends to deliver a partial explanation for this diverging reception on the basis of a historical re-reading of the following authors: Lévi-Strauss, Lacan, Foucault, Derrida, Lyotard, Deleuze and Guattari.

However, it is important to point out that, in addressing such authors, one can hardly overlook the crucial influence exerted by the 'masters of suspicion' (Nietzsche, Freud, Heidegger, Kojève) on the questioning of humanism and the transcendental subject. This said, the acknowledgment of cybernetics' conceptual contribution to the development of 'French theory' in the postwar period does allow a better understanding of its popularity and its growing influence in the intellectual and techno-scientific milieu of postmodern America (Cusset, 2003).

In fact, if, as we postulate, the cybernetic project formulated at the end of the Second World War profoundly influenced intellectual life from one side of the Atlantic to the other, it is because it carried a new paradigm combining the scientific and technical discoveries of the day. It thus shows itself as a combination of leanings already spotted as much within philosophy and psychology as in modern physics. Also, this explains why, to this day, no unified definition of cybernetics has been able to impose itself (Lafontaine, 2004). Paradoxically, it is this blurredness, combined with a high level of conceptual flexibility, that has given the informational paradigm the strength to diffuse so widely.

The Postwar Period, Cybernetics and the Triumph of America

Cybernetics took root at the core of the techno-scientific project implemented by the American government during the Second World War. The inflow of renowned scientists fleeing war-torn Europe, and the extensive funding of military and industrial research, thus allowed the United States to mobilize more than 100,000 researchers in order to create the atomic bomb. As we now know, this endeavor, also known as the Manhattan Project, resulted in the bombing of Hiroshima on 6 August 1945.

Although he was not directly involved in the Manhattan Project, Norbert Wiener, historically considered as one of the founders of cybernetics, participated in the war effort by devising a servomechanical shooting device, the AA predictor. In an article titled 'The Ontology of the Enemy' (1994), science historian Peter Galison demonstrated the significance of this military experiment as a defining moment in the elaboration of the cybernetic model. In his article, he states that engineering an artillery system capable of following and identifying its target effectively is what inspired Wiener to develop a theoretical model in which the pilot is integrated as a part of a self-regulated machine. Based on the feedback notion, the

analytical model Wiener developed during this period stems, in fact, from a conceptual absence of differentiation between human and machine. The pilot represents an integral part of the technical device. In fact, the enemy pilot is the first-ever cyborg model created and later becomes the icon of the cybernetic subject after the war. It is in that sense that Peter Galison uses the phrase 'Ontology of the Enemy' (1994).

Based on his work on the AA predictor, Wiener and his colleagues began an epistemological revolution by rejecting the intrinsic study of beings and things and focusing the analysis instead on interactions between objects, regardless of their nature (physical, biological, artificial or human). This is clearly illustrated in a text he co-authored with Bigelow and Rosenblueth in 1943, in which the ontological difference between humans and machines is replaced by a hierarchical classification of behavior, based on a behaviorist model, where teleological behavior dominates (Wiener et al., 1943). Feedback machines are thus promoted to the rank of complex-intelligence entities, alongside human beings.

Far from being alone in laying down the theoretical milestones of cybernetics, the works of Wiener and his colleagues were in keeping with a large field of military research, for which communication became the main question and the soldier the archetype of the cyborg (Edwards, 1996). It was within the same context that engineer Claude Shannon began his research on the techniques of telegraphic information transmission, which led him to formulate *The Mathematical Theory of Communication* (Shannon and Weaver, 1949). Recognized as one of the fathers of information technology, Alan Turing dedicated his wartime years to decrypting enemy codes in cooperation with American intelligence agencies (Lassègue, 1998). It is difficult to address this period and these works, which preceded the 'invention' of cybernetics, without referring to mathematician John von Neumann, who was directly involved in the Manhattan Project and whose place in the history of cybernetics is fundamental (Heims, 1981). Indeed, without the considerable contribution of scientists and intellectuals who had fled a Europe at war, the cybernetic project certainly would not have exerted the scientific impact it did. In this sense, cybernetics combined the most recent knowledge and breakthroughs of European science, notably in the fields of mathematics, physics, psychology and linguistics. It was, however, within the very special context of postwar America that cybernetics was really born as a 'new science' (Heims, 1991; Segal, 2003).

Far from limiting itself to its geographic point of origin in the United States, cybernetics bedded down across America and took root – from an epistemological point of view – partly because of its kinship to behaviorism and pragmatism (Lafontaine, 2004). As a movement of thought liberated from the European heritage, its paradigmatic force of attraction may only be understood within the triumphant postwar context in the United States. The prestige scientists acquired through the A bomb expressed itself, at the time, through the project of creating an intelligent machine. While enabling the establishment of America's intellectual and scientific legitimacy,

cybernetics became – alongside the Marshall Plan – one of the new global power's standard-bearers.

While the epistemological foundations of cybernetics were elaborated during the war, it was only at the end of the war that some of the most acclaimed scientists of the era met, as part of the Macy cybernetics gatherings, and discussed questions of control and communications. Under the revealing theme 'Circular Causal and Feedback Mechanisms in Biology and Social Systems', this series of gatherings constituted the birth of cybernetics (Heims, 1991). In itself, the choice of the title indicates that the idea of grouping all living organisms, machines and society under one single explicative model was already solidly established. Focused on interdisciplinarity, cybernetics represents the course that was set towards convergence in postwar America. Entropy, information and feedback concepts became the foundation principles for a new scientific paradigm and a new vision of the world. We owe to science historian Steve Joshua Heims one of the most comprehensive studies ever made of the socio-political content and context of the Macy gatherings. In *The Cybernetics Group, 1946–1953* (1991), significantly subtitled *Constructing a Social Science for Postwar America*, Heims strives to demonstrate the links that exist between the cybernetic model and the orientation of American humanities after the Second World War. The huge scientific repercussions of the Macy gatherings were not only due to the prestige of its participants, such as Norbert Wiener, John von Neumann, Warren McCulloch, Ross Ashby, Roman Jakobson, Gregory Bateson and Margaret Mead. Indeed, it was the willingness to build bridges between different areas of knowledge, and the wide range of topics addressed during these gatherings, that made the major contribution to their historical repercussions.

The birth of cybernetics during the immediate aftermath of the war occurred in a context fraught with profound political pessimism resulting from the defeat of the humanistic ideals in Nazi extermination camps, the threat of communism, and the strong political conservatism imposed by McCarthyism (Heims, 1991). This explains the lack of political debate in the meetings held by the first cyberneticists. Paradoxically, this political pessimism was accompanied by strong techno-scientific optimism, and American techno-science effectively emerged as the great war-time winner. The basic idea was to create an intelligent machine, capable of governing and controlling society in a more rational way – which was fully suited to the postwar context. It is in *The Human Use of Human Beings: Cybernetics and Society* (1988 [1954]) that Norbert Wiener exposes his vision of the world most clearly. An emblematic figure of the cybernetic revolution, Norbert Wiener was not only one of the founding members of the Macy gatherings, but also one of the first to develop a worldview based on the principles of the 'new science'. Although, scientifically speaking, cybernetics cannot be reduced to the works of Wiener, he was nonetheless one of those who contributed most to the massive spread of this new paradigm in the immediate postwar period, notably through *The Human Use of Human*

Beings (1988), which, as we shall see, had a considerable impact on the reception of cybernetics in French intellectual circles.

Wiener's Cybernetic Vision of the World

As sociologist Philippe Breton (1995) has demonstrated, Wiener elevated entropy to the rank of metaphysical truth. In the wake of the war, it was assimilated to the chaos, disinformation and disorganization that threatened the social order. The unavoidable threat of entropy fueled the political pessimism of Wiener following the end of the Second World War. Nothing better expresses this pessimism than his much-quoted sentence: 'In a very real sense we are shipwrecked passengers on a doomed planet' (Wiener, 1988: 40).

Information, regarded as a negentropical principle, can temporarily fight this force that triggers apathy and destruction (Breton, 1995: 33). Equally as abstract as the concept of energy, the notion of information then becomes a principle of statistical quantification whose universal scope is equaled only by its indifference toward the specific nature of signals (physical, biological, technical or human) (Dion, 1997). Formulated simultaneously by Claude Shannon and Norbert Wiener in 1948, the theory of information met an unparalleled level of diffusion in the scientific community (Segal, 2003). The resemblance between their two models is such that there is talk in certain scientific circles of the Shannon–Wiener theory, as historian Lili Kay reminds us (2000: 91). It should be specified, however, that Wiener always claimed that his model predated Shannon's own. Moreover, Wiener's theoretical model slightly distances itself from Shannon's, notably through the importance given to the concept of circular causality. Whereas Shannon's model presupposes a linear conception of communication, best illustrated by the transmitter/receiver model, the cybernetic idea of communication is circular and endless. In fact, cybernetics transforms information from a simple means to an end in itself. Understood in terms of information exchange, communication becomes the source of any organization. Indeed, the notion of entropy presupposes a representation of the universe essentially based on organizational differences.

Equally fundamental, the notion of feedback is used to support the cybernetic classification of beings. In fact, the concept of feedback provides the basis for the theoretical elimination of the frontier between the living and the non-living. As such, information takes on greater importance than life itself. And this is clearly emphasized by Wiener:

> It is in my opinion, therefore, best to avoid all question-begging epithets such as 'life', 'soul', 'vitalism', and the like, and say merely in connection with machines that there is no reason why they may not resemble human beings in representing pockets of decreasing entropy in a framework in which the large entropy tends to increase. (1988: 32)

When seen from a perspective of entropy, Wiener views the political and cultural world as a vast communicational process at the core of which

'intelligent machines' exist alongside humans. By defining humans based only on the degree of complexity of their intelligence, the father of cybernetics implies and proclaims that the ontological value of the artificial reproduction of a human being would be identical to that of a living being (Wiener, 1988).

Cybernetics represents a major epistemological revolution. In fact, it signifies a complete reversal in modern science, which used to be based – for the most part – on the study of the intrinsic ways in which beings and things functioned. What Norbert Wiener and his colleagues were interested in was not understanding the internal specificity of objects, but their interactions – regardless of their nature (physical, biological, artificial or human) (Wiener et al., 1943). The emphasis put on the interactions of scientific objects, from an epistemological perspective, would especially resonate with the social sciences, notably in the development of structuralism, which was established during the wave of the cybernetic revolution.

Cybernetics and Structuralism

Making their appearance almost simultaneously in the late 1940s, cybernetics and structuralism both represent a form of scientific response to the war and Nazism. Harboring concurrently a techno-scientific optimism and a profound anthropological pessimism, they testify to the loss of confidence in humanity due to the collapse of humanist ideals. From one side of the Atlantic to the other, the questioning of the humanist legacy carried out by the informational paradigm expressed itself, however, in highly different tones. While Norbert Wiener always defined himself as a humanist without grasping the profound contradiction between humanism and his model, Lévi-Strauss and the luminaries of structuralism in France, for their part, came to claim loud and strong both their anti-humanism and their dismissal of the subject. Everything took place as though, on the American side, the reversal operated by cybernetics was felt far less violently than in France. This difference in positions may be interpreted as a sign that political modernity's humanist legacy was able to dissolve more easily in the United States (Freitag, 1994). In this sense, the new humanism heralded by the cyberneticians was already a form of post-humanism. Oddly, it was through the structuralist importation of the cybernetics model to France that the paradigmatic rupture came to assume its whole meaning. Not only did Lévi-Strauss draw from the cybernetics universe his 'spirit without subjectivity' model, but the entire project of structural anthropology consisted in interpreting society as a whole according to a general theory of communication (Dupuy, 1994).

It was in the intellectual stagnancy of postwar France that anthropologist Claude Lévi-Strauss, back from a long stay in the United States, laid down the theoretical bases of his structuralist model. Marked by the dismissal of the figure of the subject and the desire to bestow a solid scientific basis on the social sciences, the Lévi-Strauss project bears the stamp of a profound pessimism. In *Tristes tropiques* (1976), first published in the

mid-1950s, Lévi-Strauss displays a pessimism which strangely recalls Wiener's own. He even proposes to convert 'anthropology into entropology' in a direct reference to the cybernetic conception of entropy (Dosse, 1995a: 162). As with Wiener, the anthropological pessimism of Lévi-Strauss agreed well with a certain positivism. While the famous anthropologist no longer believed in progress, he nevertheless remained a believer in the objectivity of science.

According to François Dosse (1995a: 72), the success of structuralism in France resulted from a special meeting, held in New York in 1942, between Claude Lévi-Strauss and Roman Jakobson. This event marked the historical connection between structuralism and cybernetics. Expatriated to the US during the war, these two academics became friends at the New School for Social Research, where they taught anthropology and linguistics respectively. Another important fact to note is that the name Gregory Bateson also featured on the roster of professors in this renowned New York institution at the time (Wittezaele and Garcia, 1992: 88).

A member of the Prague school of linguistics, Roman Jakobson was striving – as early as 1929 – to elaborate phonology, which would become a seminal discipline of structuralism. Largely fueled by the works of Ferdinand Saussure, among which the *Cours de linguistique générale* is viewed as the structuralist bible, Jakobson integrates in his theoretical model discoveries originating from cybernetics and the theory of information. The Saussurean definition of language as a system of relations fits perfectly with the cybernetic epistemology. As science historian Lily Kay (2000: 12) makes clear, Saussure, Jakobson and Wiener are interested in relations, in signifiers and not in referents or in objects as such.

A special guest at the fifth Macy gathering dedicated to language held in 1948, Roman Jakobson was at the forefront of the discussions surrounding the birth of cybernetics. Basing his theory on the model elaborated simultaneously by Wiener and Shannon, he deconstructed language by treating it as a coding system that structured the exchange of information. Seduced by the possibilities brought forth by the theory of information, Jakobson endeavored to integrate it into linguistics. In his own words, 'the concepts of code and message introduced by the communications theory are much clearer, much less ambiguous, and much more operational than anything the traditional language theory has to offer' (1963: 32).

With phonology, Jakobson radicalizes the Saussurean gap by conceptualizing language as a communicational code. This parallel between language and code is one of the main points that allows for a bridge between structuralism and the cybernetic paradigm. In his research on the laws inherent to the structuring of language, Jakobson elaborates a table of 12 binary oppositions, including the totality of the phonic oppositions contained in human language. This formal universality model led to the whole landscape of the structuralist perspective. In this sense, building on his meeting with Jakobson, Lévi-Strauss proclaimed that 'in social sciences,

phonology cannot avoid playing the same role as nuclear physics, for instance, played in terms of exact sciences' (1958: 95).

Back in France in 1948, Lévi-Strauss brought brand-new discoveries stemming from cybernetics and the information theory that Jakobson had already transposed into phonology. The structuralist program now progressed under the immediate impulse of the cybernetic revolution, since 1948 is, as should be noted, the year when two fundamental books were published, namely *The Mathematical Theory of Communication* by Shannon and Weaver, and *Human Use of Human Beings* by Wiener (Lafontaine, 2004). The cybernetic revolution is what supplies Lévi-Strauss with the foundation on which to build structural anthropology. Fascinated by the mathematical methods which made constructing the great calculation machines possible, he describes, in an article published in 1951, the manner in which he hoped to integrate the scientific knowledge stemming from cybernetics and information theory (Lévi-Strauss, 1958). In fact, in *Anthropologie structurale*, he says of Wiener's *Cybernetics* that: 'its importance should undeniably not be underestimated from a future of the social sciences' (1958: 63).

Stemming from the works of Wiener, Shannon and Weaver, the notion of code quickly gained momentum and ultimately designated the rules of culture structuring. In *Anthropologie structurale*, Lévi-Strauss implied this much by considering 'the rules of marriage and parental systems as a sort of language, i.e. a set of operations designed to ensure a certain type of communication between individuals and groups' (1958: 41). This set of social structures forms what Lévi-Strauss referred to as the structural unconscious.

Far from the Freudian interpretation, Lévi-Strauss's premise lends the unconscious the role of social order administrator. In structuralism, the single function of the unconscious can be summarized as to impose structural laws. In fact, Lévi-Strauss proceeded to discount affect altogether, to take only into account the socio-cognitive aspects of the unconscious, which becomes the place where the symbolic function is embodied, thus bearing a resemblance to the purely communicational definition the cyberneticists lend it. In that sense, it is important to underline the parallel between the approaches of both Lévi-Strauss and Gregory Bateson, the latter of whom was one of the first to introduce cybernetics into the social sciences, especially psychiatry. Without expounding on this subject, we must mention that the structuralist version of the unconscious is much more rigid than that of Bateson and the Palo Alto school. It must be said that the Lévi-Strauss model is based on the concept of the transcendence of the human spirit categories, whereas that of Bateson is articulated around an interaction model in which structures are viewed in terms of immanence and context (Lafontaine, 2004: 103–5). Behind the structuralist unconscious stand universal intellectual structures, the deciphering of which brings to light a combinative logic, whereas with Bateson, the unconscious is comparable to a 'black box' holding the necessary cultural codes for the contextual interpretation of communicational flows.

This interpretation of the unconscious is fundamental, since it is the key to linking Jacques Lacan's psychoanalytic theory to the cybernetic paradigm (Kittler, 1999; Lafontaine, 2004). We only have to remember that his entire 1954–5 seminar was dedicated to the study of cybernetics and the new calculation machines. It is at this exact moment that the imprint of cybernetics features most prominently in his theoretical model. Referring to the structuralist definition of symbolism, Lacan asserted that 'the symbolic function constitutes the interior universe inside which all that is human must be structured' (1978: 43). He then added that 'the symbolic world is the world of the machine' (1978: 63). Using as models machines born as a result of the cybernetic revolution, Lacan provides a more accurate definition of the subject:

> I am explaining that it is in as much as he is committed to a play of symbols, to a symbolic world, that man is a decentered subject. Well, it is with this same play, this same world, that the machine is built. The most complicated machines are made only with words. (1978: 63, my translation)[1]

To understand the key notion here, we must first contend with the fact that Lacan defined cybernetics as a 'science of syntax' (1978: 351). Taking into account the priority lent to syntax by structural linguistics and the determining role assigned to the significant, it does not seem far-fetched to see a transposition of cybernetics in the Lacanian definition of symbolism. For psychoanalysts, it would effectively appear that 'through cybernetics, the symbol is embodied by a device. And it is embodied in a literally transsubjective way' (Lacan, 1978: 112). Therefore, the influence of cybernetics can be found at the core of the Lacanian theory. Commenting on Kittler's analysis, Geert Lovink points out that:

> It was Lacan who elevated psychoanalysis to the level of high-tech. His separation of the imaginary, the real and the symbolic is reflected by the trinity of storage, transmission and computing. While philosophy is still preaching 'the familiarity of one's self', psychoanalysis sticks to the view that consciousness is only the imaginary interior of medial standards. Psychoanalysis is inconceivable without cybernetics . . . (Lovink, 1994: n.p.)

Without necessarily confusing them, it is nonetheless possible to establish a link between the Lacanian concept of 'full speech', or symbolic speech, and Bateson's concept of metacommunication. This is to say the idea according to which 'to communicate something is always tantamount to communicating that we communicate and how we communicate' (Borch-Jacobsen, 1995: 169, my translation). Isn't this what Lacan implicitly suggests when he asserts:

> Even if it does not communicate anything, the discourse represents the existence of communication; even if it denies the evidence, it asserts that speech

> constitutes truth; even if it is meant to deceive, it speculates on the belief invested in testimony. (1966: 128, my translation)

During his seminar on 8 January 1958, on the 'foreclosure of the Father', Lacan refers directly to Bateson's work:

> It so happens that people in America are concerned about the same thing I explained to you here. They seek to introduce communication in the economical determination of psychic disorders, as well as what they sometimes call the message. . . . Mr. Bateson . . . has contributed something that causes us to reflect slightly more profoundly on therapeutic action. (1998: 144, my translation)

According to Lévi-Strauss and Lacan alike, the cybernetic paradigm is, in fact, at the root of the structuralist model. This significant conceptual appropriation can also be understood in regard to the context of postwar France (Lafontaine, 2004). Akin to the events that unfolded in the United States at that time, the 1950s and 1960s represent an unparalleled period of growth for human sciences in France. The communications model at the core of the structuralist project, then, aimed to promote greater scientific legitimacy. Similar to that deployed by cyberneticists, Lévi-Strauss's quest for universality led him to believe that 'social anthropology, economics, and linguistics will one day merge into a single discipline, the science of communications' (1958: 65). In the wake of this prediction, we can see that not only did structuralism borrow some of the theoretical postulates of cybernetics, but that it also borrowed its science unification project. As demonstrated by historian François Dosse, the creation of the University of Vincennes in 1968 constituted one of the most extreme attempts in this regard: 'This grand project consists in making Vincennes a small MIT, an American-style university, a model of modernity, an internationally recognized enclave whose self-professed ambition is interdisciplinarity' (1995b: 172).

Foucault and the Logic of Control

Though less directly than in Lévi-Strauss and Lacan, the influence of the informational model is nevertheless strongly present in Foucault's work. In defining power as a system of relations and emphasizing its discursive nature, Foucault is well and truly in line with the cybernetic rupture. Impossible to classify by virtue of its theoretical displacements as well as the scope of the issues it addresses, the work of Foucault nonetheless bears the mark of the *Zeitgeist*. Depoliticized, decentralized and totalized, the concept of power as developed by Foucault is strangely similar to cybernetic control. As it is conceived in *La Volonté de savoir* (Foucault, 1976), power shares a great deal in common with the cybernetic notion of control, which commands the discursive production of the sexed body. On this point, Katherine Hayles has shown how the idea of a discursive construction of

the body coincided with the latter's cybernetic reduction to the rank of mere informational support (1999: 192–9). It is true that, in asserting that power 'is the name we give to a complex strategic situation in a particular society', Foucault relies on the purely relational logic of the cybernetic model (1976: 123, my translation). This, incidentally, was not lost on sociologist Henri Lefebvre who, while criticizing the structuralist importation of the concept of system, writes, referring to Foucault's theory: 'could it not then be cybernetics in the end, until now ignored . . . by the "pure" philosophers, be they even structuralists' (1967: 85, my translation). It must be said that during the structuralist wave Henri Lefebvre was one of the rare intellectuals to have perceived the crucial influence exerted by cybernetics on the development of postwar French thought.

Taking offense at the theoretical erasure of the subject to the profit of the system, Henri Lefebvre in fact considered structuralism as the result of an American conceptual importation. In *Positions contre les technocrates*, he reproaches Lévi-Strauss, Foucault and Lacan for their Americanization: 'many social scientists have two homelands, the United States and France' (1967: 198). From a historical perspective, there is no doubt that Lefebvre was right in seeing the cybernetic imprint on structuralism.

From Post-structuralism to Postmodernism

The influence of cybernetics on human sciences is obviously not limited to structuralism. The theories of systems, second-order cybernetics and the complex systems model are at the core of contemporary social sciences (Lafontaine, 2004; Segal, 2003). We do lack knowledge, however, in terms of the fundamental influence of cybernetics on thinkers such as Derrida, Deleuze, Guattari and Lyotard, to name only the most famous among them. The mainstream approaches that post-structuralism and postmodernism represent are profoundly influenced by cybernetics.

While voluntarily setting aside all that is related to the philosophy Derrida owes to Heidegger, I will only highlight his connection to structuralism, beyond which we can see a radicalization of the cybernetic postulates, since Derrida is clearly intent on linking his deconstruction theory to the cybernetic revolution. As such, on the first pages of his famous work, *De la grammatologie*, he already announced that 'the cybernetic program will be a field of writing' (Derrida, 1967: 19). Once the importance of the concept of writing is understood in Derrida's way of thinking, it is not far-fetched to assert that he truly intended to consider the model elaborated by Wiener literally, while ridding it of whatever subjectivist slag remains. He was indeed very explicit in this regard: for the 'cybernetic program' to unfold, we must first 'purge it of all metaphysical concepts' such as those related to 'soul, life, value, choice and memory', which were formerly used to mark an opposition between human and machine (Derrida, 1967: 19). And this statement is clearly directed at Wiener, whom he reproaches for not having thoroughly explored the philosophical consequences of cybernetics. As he saw so clearly, all the elements that made it possible to reach beyond

occidental metaphysics were well ingrained in Wiener's model. In this way Derridean deconstruction furthers the cybernetics program, while also radicalizing it, through the concept of Writing.

The concept of writing is closely related to the cybernetic notion of information because of the fact that it is primordial and non-subjective. As a matter of fact, Derrida saw – in the mathematical formulation of the theory of information – a path toward a writing finally liberated from phonocentrism. In *How We Became Posthuman* (1999), American author Katherine Hayles states that the binary codification of computer language promotes the disappearance of the author in favor of the complete authority of the code over the user. In this sense, 'deconstruction is effectively the child of the information age' since it aims to underline the radical exteriority of writing, i.e. its non-subjective nature (Hayles, 1999: 43).

While acknowledging his debt to structuralist decentering, Derrida rejected the signifier/signified opposition by completely ignoring the signified. This rejection presumes a disintegration of the subject figure, considered as the last bastion of occidental metaphysics. Whereas structuralism kept a central referential principle, deconstruction creates the possibility for any uniqueness to become a pluralization of a signifying chain that is then open to infinite and unlimited interpretation. Since there is no 'absolute origin of sense in general', since 'presence is never present', subjectivity can only be an illusion constructed and deconstructed through writing (Derrida, 1972: 362).

In this manner – and as Jean-Pierre Dupuy (1994) noted – the Derridean deconstruction of the subject agrees completely with that operated by cybernetics. There remains, however, a well-known difference as far as the interpretation of informational logic is concerned. Whereas cybernetics implies the transmission of a 'message', deconstruction understands the informational flow as an endless and indeterminate process. In fact, Derrida saw the 'inevitable conjunction of cybernetics and human sciences of writing' as evidence of a profound cultural upheaval (1967: 21). It is probably because he was one of the first to grasp the radical novelty of the cybernetic models that his philosophical project seems to be embodied in what we call *cyberspace*. When approached from this angle, it seems less strange, as sociologist Sherry Turkle (1997: 18) reports, that students rebuffed by the difficulty of the Derridean texts, assert that they have understood the principles of deconstruction by experimenting with hypertext reference links on the Internet. In fact, the concept of hypertexts (also known as 'links') perfectly embodies the logic of deconstruction by acting as an explosive catalyst that renders the basic structure of the text more complex (Landow, 1997). This only confirms more strongly the idea – without limiting its reach – that deconstruction is a prolific child of the cybernetic paradigm.

While it is possible to trace a link between the cybernetic revolution and the philosophical endeavor of deconstruction, it should be pointed out, however, that Derrida showed himself to be highly critical of Wiener's

cybernetics, and rebuked him for his attachment to the old categories of Western metaphysics. In radicalizing the epistemological and ontological rupture carried out by cybernetics, Derrida shed light on an aspect of informational logic which seems to have eluded Wiener himself. In concluding this point, it should also be mentioned that, because our aim was to relay the historical influence of cybernetics on deconstruction, the more recent evolution of Derrida's thought was not taken into consideration for this analysis.

Unlike Derrida, Deleuze and Guattari do not directly refer to the model elaborated by Wiener. The influence of the informational paradigm on the authors of *Anti-Oedipus* (1972) manifests itself through borrowings from second-order cybernetics and theories of self-organization. In fact, their connection to the cybernetic paradigm is more closely related to a concept borrowed from Gregory Bateson's frame of thought. Far from being trivial, this borrowing is at the heart of the philosophical decentering *Mille Plateaux* (1981) aimed to bring to light. As such, as the authors themselves indicate, they owe the central plateau concept to Bateson. Literally: 'Gregory Bateson uses the word plateau to designate something really special: an infinite region of intensities that vibrates unto itself and expands by avoiding any orientation toward a culminating point or an exterior end' (Deleuze and Guattari, 1981: 32). Produced and crossed by the mechanized fluxes of desire, the subject then sees its uniqueness break down into many identities marked by the seal of multiplicity. As a matter of fact, as part of a differential logic, the multiplicity concept is at the core of the philosophical deconstruction devised by Deleuze and Guattari. The breakdown of the barriers between subject and object, between interior and exterior, meets the definition of the spirit according to Bateson. In fact, in the flux of 'desiring machines', individuality only appears as a 'superficial blend' of differential elements (Buydens, 1997: 52). To the 'illusion of self' promoted by psychoanalysis, Deleuze and Guattari (1981) oppose a 'body without organs', i.e. a de-territorialized body composed of machines, mixtures and movement. This liberation of desire from its organic and subjective fantasy shell presents, in the eyes of philosophers, unprecedented revolutionary potential. Based on this logic, multiplicity, as the source of all virtuality, takes on the form of the rhizome.

Opposed to the transcending uniqueness of the 'tree-shaped culture', as well as to the unchanging identity of the genealogical tree, the rhizome presents itself as a system of decentered and non-hierarchical flux, where the mechanized unconscious manifests itself through multiple interconnections (Deleuze and Guattari, 1981). Immaterial and heterogeneous, the interconnections allow any point of the rhizome to link with any other. Anchored in the intellectual heritage of cybernetics, the rhizome concept now seems embodied in cyberspace. In fact, a review of the influence of cybernetics on post-structuralist philosophy shows how strongly cyberculture is rooted in the latter. One only needs to see how American cyborg, multitude and cyberspace activists refer to Deleuze and Guattari to

understand that the key issue is far more about the pursuit of an informational paradigm than a French importation (Lafontaine, 2004). As a result, we gain a better understanding of why American sociologist Sherry Turkle conceives cyberspace's very own identity logic as the concrete embodiment of 'French theory' (1997). In a way, she merely confirms the close intellectual kinship between the latter and postmodern America (Cusset, 2003). In which case it is not surprising in the very least to realize that a work such as *Mille Plateaux* has literally become 'the philosophical bible of the cyber-evangelist' (Spilled, 2002: 96). Though not limited to it, one can hardly contest that the popularity of Deleuze and Guattari in America lies in great part in this sort of technophile interpretation (Buydens, 1997). According to Mireille Buydens (1997), there is indeed a Deleuzian perception of the Internet as a locus of the dissolution of the self and experimentation with multiplicity. This 'Deleuzian perception of the internet' does not mean, however, that cyberspace genuinely fulfills the emancipation designs of the authors of *Anti-Oedipus*, as philosopher Anne Cauquelin (2002) reminds us.

Postmodernism: the Evolution of the Cybernetic Frame of Thought

At the beginning of the 1980s, Jean-François Lyotard opened the door to a redefinition of the social link that encompasses the main post-structuralist themes. In fact, *La Condition postmoderne* predicts the end of the meta-story and the rise of a society founded on language games. No great hermeneutic finesse is required to understand that Lyotard places his reflection in direct line with the cybernetic revolution. This fact is made clear from the very first page: the postmodern age corresponds to a global mutation of the status of knowledge made possible by the development of computer and communications sciences. Whereas genetics, 'which owes its theoretical paradigm to cybernetics', constitutes the most obvious example of the potentialities of research opened by postmodern knowledge, the computer processing of knowledge corresponds to an 'exteriorization' of knowledge, which makes its mercantile circulation possible, according to Lyotard (1979: 12–14, my translation).

Not only is *La Condition postmoderne* brimming with references to cybernetics, Bateson and the Palo Alto theorists, but the whole differential logic of postmodern knowledge rests on the informational model. For Lyotard, modern metanarratives make way for a multitude of small, partial and localized narratives in which each and every one expresses his or her difference. Conceived in terms of 'difference', the postmodern subject loses in autonomy what it gains in integration potential. Indeed, the postmodern concept of the social link rests on a definition of science understood as the creation of propositional difference (Lyotard, 1979: 105). Far from taking the appearance of systemic uniqueness, postmodern society presents itself as the theatre of linguistic 'games', which allows for the communicational positioning of the subjects. It should be pointed out at this time that the

pragmatic approach of the social link in terms of language games refers, notably, to Von Neumann's game theory (Lyotard, 1979: 33).

More than ten years after the publication of *La Condition postmoderne*, namely at the end of the 1980s, Lyotard questioned the systemic rationality that tends to take precedence in the occidental world. For Lyotard, the upheaval of humanity's horizon caused by cybernetics is represented by the passage from human time to cosmic time. He described the transfer operated by techno-science by means of the fact that 'the human species is already seized by the necessity of evacuating the solar system in four and a half billion years' (Lyotard, 1988: 77). According to Lyotard, the ex-centered perspective of the techno-scientific system leads to a desire to disembody human intelligence so that it may eventually continue the cosmic trial of differential complexification that gave it birth. From this perspective, the whole research program inherited from the cybernetic paradigm (computer science, artificial intelligence, robotics, cognitive sciences, biogenetics, etc.) seems to lean toward the creation of a 'bodiless intelligence' or, rather, intelligence without a mortal body (Lyotard, 1988). To this *Inhuman*, Lyotard opposes the inhuman in the body, childhood, the arts and writing, where the human being always reveals himself to be the other of the self.

Lyotard interprets the techno-scientific evolution as the last word of Western metaphysics. Though he denounces the cold inhumanity of cybernetic logic, he nonetheless appears to concede genuine effectiveness to the process of complexification. In addressing the issue of capital development, which, according to him, is more of a Western process of rationalization than an economic and social phenomenon, he specifies that:

> It would appear, however, that the 'ultimate' motor of this movement is not essentially human desire: rather, it consists of the neguentropy process which seems to be 'working' on the cosmic area inhabited by mankind. (1988: 82, my translation)

According to Lyotard, the accomplishment of metaphysics via the rationalization process has contributed to the imposition of a 'cosmic' logic of complexification on human society. In the face of the unhumanness of such a program, the only possible response is to open up to the eventuality, the difference, the evasiveness of the inhuman within ourselves. Forced into its philosophical entrenchments, the entropic horizon of the cybernetic paradigm thus leads to a thought of the inhuman. While Lyotard's position remains ambiguous on the ineluctability of the cybernetic program, Peter Sloterdijk's position is clearer. From the inhuman to the post-human there is but a step, which the author of the *Rules for the Human Park* (Sloterdijk, 2000a) seems keen on taking.

From Cyborg to Post-human

Fueling the contemporary imagination, the figure of the cyborg was, when examined more closely, already taking root in Wiener's philosophy. Already

in *The Human Use of Human Beings* he asserted that: 'We have modified our environment so radically that we must now modify ourselves to live up to scale with this new environment' (1988: 56). Although, for the moment, the cyborg itself remains confined to the imaginary ventures of science fiction and cyberspace, the post-human has, on the other hand, already appeared on the philosophical and political scene. The controversy triggered in Germany and France in the fall of 1999, surrounding what is now commonly called the 'Sloterdijk Affair', fully attests to this eruption. Recognized as a philosopher leaning toward postmodernism, Peter Sloterdijk, by publishing *Règles pour le parc humain* (Rules for the Human Park) (2000a), has indeed provoked a debate about how humans are transformed by biotechnologies. Written for a seminar dedicated to Heidegger, this text created quite a stir among the attending German and French intellectuals because of its ambiguity, which led the academics to believe – wrongly – that it contained traces reminiscent of Nazi eugenics. As we will see, our analysis will lead us instead to add Sloterdijk's reasoning to the long list of contemporary extensions of the cybernetic paradigm.[2]

In *Règles pour le parc humain* (2000a), Sloterdijk maintained that, by bringing back humanist culture via the imposition – by an elite – of a series of texts deemed essential to 'domesticate' youth, and thus participating in the 'training' of humanity, humanism has occulted the fact that human society is the fruit of humans 'breeding' humans. In fact, he based his reasoning on the postulate that the human is a fundamentally undetermined being who must incessantly self-produce. Considering that, in the era of the media, humanism is definitely outmoded as a form of domestication, he intended to reopen the question of the social means used by humanity to self-domesticate. Against humanism, which he deemed obsolete, Sloterdijk therefore promoted anthropo-technological self-domestication. Without, however, defending a modification of humanity by means of biotechnologies, he nevertheless maintained that their use is now unavoidable.

As a response to his numerous detractors, who accused him of attempting to reanimate the demons of eugenics, Sloterdijk sent *Le Monde* an article which revealed in many ways his true ideological allegiances. Quoting the famous Freud statement about the narcissistic wounds inflicted on humanity by modern science, Sloterdijk (1999) described a new cybernetico-biological vexation complex. As such, after Galileo, Darwin and Freud, humanity would now be faced with a new biotechnological upheaval of its references. Biotechnologies would then result mainly in the ultimate abolition of the frontiers between organisms and machines, or even between organisms born naturally and those produced artificially. And this is at the heart of the latest debates on the status of humanity, while the informational model elaborated by Wiener more than 50 years ago remains more current than ever.

Sloterdijk reviewed the idea of humanist narcissism to clarify its scope. Based on the hypothesis according to which history is a series of return trips between periods of vexation and narcissism, he developed a long philosophy about how humanity is constructed by techno-science. In fact,

for Sloterdijk, narcissism corresponds to the delusions that humans entertain about themselves, depending on the era: 'From a systemic point of view, powerful narcissism is the evidence of a successful emotive and cognitive integration of man in himself, in his moral collective and in his culture' (2000b: 42, my translation).

By questioning humanity's own vision of itself, modern science therefore inflicts a series of vexations on humans, who then see their 'narcissistic homeostat' momentarily disrupted. If Copernicus, Darwin and Freud, based on the latter's formula, have successively participated in the decentering of the narcissistic perspectives of humanity, these were only definitely shaken once the biocybernetic revolution occurred. In fact, biotechnologies imposed new sorts of vexations. The latter are, however, in line with the modern shaping of the body by machines. Indeed, for Sloterdijk, machines are – by nature – prostheses. With prosthetics, which includes genetic engineering, robotics and artificial intelligence applications, technoscience therefore continues the remodeling of humanity initiated by modern medicine during the 18th century:

> Prosthetics could have most certainly started as an inclusion or adjunction of a foreign body onto the human body, but it reaches its objective only when it creates extension bodies which not only repair the old body but increase its capacities and transfigure it. From this angle, invalids are the forerunners of the man of tomorrow. (2000b: 78, my translation)

When reading an author such as Sloterdijk more closely, there is no choice but to accept that postmodern philosophy is brimming with philosophical questions inherited from cybernetics. Is it any wonder that Norbert Wiener dedicated the last years of his life to engineering electronic prostheses? In this sense, the current breakthroughs in the fields of artificial intelligence, information technology, prosthetics and genetic engineering are all immediate offshoots of the cybernetic paradigm (Gray, 2002).

When one grasps the extent to which the cybernetic model has influenced the development of 'French theory' since the end of the Second World War, it is not surprising to observe, as Sherry Turkle (1997) does, an intellectual concord between post-structuralist philosophy and cyberspace. Moreover, this explains why 'French theory' has become one of the major references for cyborg and post-human thinkers (Cusset, 2003). The cybernetic genealogy teaches us, however, that the principles of 'deconstruction', 'hybridity' and 'multitude' were already sprouting up in Wiener's thought. It should be stressed, however, that Wiener himself does not seem to have grasped to its full extent the epistemological and ontological rupture achieved by cybernetics. In this sense, the deconstruction project and postmodern philosophy far surpass the framework of the cybernetic project by exposing the deep drive fueling informational logic.

The Philosophical Consequences of Cybernetics and the French Exception

As the true matrix of techno-science, cybernetics made its imprint on the outset of an epistemological revolution, the scope of which we are only beginning to fully measure. Be it through computer networks, genetic engineering or the cognitive sciences, the informational model theorized some 60 years ago tends to impose itself as a paradigmatic horizon. Oddly, its crucial impact on the intellectual world is still too little known about, if not completely ignored. Retracing the influence of the cybernetic model in the theoretical elaboration of some of the most influential philosophical works of the second half of the 20th century proves, however, to be a highly perilous intellectual endeavor. Not only because such an endeavor runs the risk of oversimplifying the authors in question, but chiefly because it brings to light a problematic intellectual filiation, to say the least. It nonetheless appears essential to examine this question, which can shed light on certain trends in contemporary culture and provide a possible reading of the works of Lévi-Strauss, Derrida, Deleuze, Guattari, Foucault, Lacan, Lyotard and Sloterdijk. It goes without saying that by no means should these works be reduced to this re-reading. Nevertheless, at a time when biotechnological deconstruction takes precedence over philosophical deconstruction and the complexity of computer networks makes common cause with genetic reductionism, it is important to examine the philosophical legacy of postmodernity.

Even if the intellectual filiation between cybernetics and 'French theory' might seem unnatural, it nonetheless opens the door to a re-reading of the philosophical destiny of subjectivity at the end of the Second World War. This filiation may also shed light on the discrepancy in reception between authors linked to 'French theory' in the United States and France. Indeed, it is certainly no coincidence that authors associated with the post-structuralist and postmodern currents have even influenced American popular culture, while in France they remain marginalized (Cusset, 2003). Because one paradigm (humanism) logically opposes the other (cybernetics), it is in fact the complete set of humanist conceptions born from political modernity that seems to be evicted from the intellectual heritage of cybernetics. Thus, beyond the historical amnesia that led to losing sight of the crucial influence of cybernetics on postwar French thought, one could interpret the French exception with regard to 'French theory' as a sign of the 'clash of civilizations', whose stakes are nothing less than the redefinition of the subject and its autonomy in a world increasingly marked by cybernetic logic. But that is a wholly different question.

Notes

1. Source of the translation: *The Seminar of Jacques Lacan*, Book II, ed. J.-A. Miller, trans. S. Tomaselli. New York: Norton (1991).

2. Although the work of Peter Sloterdijk evidently does not belong, strictly speaking, to 'French theory', his link with post-structuralism and postmodernism

justifies his inclusion in the present article. To my understanding, his philosophical posture sheds new light on the link between these movements and the cybernetic paradigm.

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