RE-PROGRAMMING LYOTARD: FROM THE POSTMODERN TO THE POSTHUMAN CONDITION
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INTRODUCTION

The work of Jean Francois Lyotard has often been interpreted as the philosophical justification for a certain concept of "postmodernism"—namely, the idea that science and culture provide competing narratives for understanding reality—yet such an interpretation fails to understand the function that the techno-scientific system is supposed to perform in "computerized" societies, or the manner in which the diffusion of new technologies alters the cultural infrastructure of the life-world. In order to respond to this situation, I propose to adopt the new perspective outlined by Lyotard in *The Inhuman*,[1] a series of lectures that reflect upon the cultural significance of the "dialectic of scientific research" described in *The Postmodern Condition*.[2] Now, while it would be a mistake to describe the tone of *The Inhuman* as "optimistic" (for the reason that Lyotard maintains his critique of the functional integration of science, technology and education in advanced capitalist societies), there is nevertheless an acceptance that the future of humanity will be determined by its capacity to negotiate a more creative, symbiotic relationship with these technologies. It is for this reason that he turns to the "saving" power of art to counter the dehumanizing effects of technology, for he suggests that the invention of new language games and practical techniques remains dependent upon the creative impulse that motivates the production of artworks.[3] Taking into account this change of perspective, it might therefore be more accurate to describe the tone of the *Inhuman* as one of "resignation", in the sense that the critique of scientific discourse in *The Postmodern Condition* must now be accepted as an adequate description of the social function of the knowledge-system in

"computerized" or "information" societies. If we are to take this new perspective seriously, then we will necessarily have to abandon the popular conceptions of "postmodernism" that have been spawned by the appropriation of this book in the Anglo-American scholarly community.[4] Rather than accepting the naive view that both scientific and mythic world-views are legitimated by narratives (a position that tends to level the distinction between science and society), the purpose of this paper is to investigate the "performative" manner in which human subjects are directly *socialized* by the invention and use of new technologies. Indeed, if technologies of communication are understood as the medium in which the structure of the life-world is reproduced, then the dialectic of science and technology can no longer be simply understood as a form of instrumental rationality, but rather as a productive force that supplies the media of social interaction in computerized societies. Perhaps "the posthuman condition" provides a better expression to connote the interaction between science, technology and culture in computerized societies, because it captures the new perspective on the "postmodern condition" implied by Lyotard's notion of the "inhuman".

Rather than seeking to formulate Lyotard's own position on the "postmodern condition" or the "inhuman", this paper will attempt to extend the description of the techno-scientific-industrial complex to the point at which the scientific knowledge embodied in technology begins to transform the habits of users and the cultural infrastructure of the lifeworld. Seeking to re-interpret Lyotard's description of scientific research through the concept of the inhuman, I shall use the term "posthuman condition" to describe the cultural effects of the expansion of science and technology in computerized societies. By focusing upon the diffusion of information and communication technologies (ICTs) through the market-place, I would like to suggest that *the privatization of the knowledge use to construct networks of communication leads paradoxically to an increase in the possibilities of public communication.*[5] By pointing to a new configuration of the "public sphere" in computerized or information societies, it would appear that I am contradicting the explicit intentions of Lyotard himself, for much of his work has been interpreted as a polemic against Habermas' notion of a rational society unified by the tri-partite structure of communicative action.[6] While it would be true to say that Lyotard constantly seeks to differentiate his own position from Habermas', it must be recognized that Lyotard's description of "the pragmatics of scientific research" is heavily indebted to the discussion of the same topic in Habermas' *Knowledge and Human Interests*.[7] Indeed, to the extent that both thinkers adopt the concept of the rule-based language games from Wittgenstein,[8] and the notion of the "performative" from the speech-act theory of J. L Austin,[9] it can be concluded that both are operating within a tradition of pragmatic thought that shares many of the same preoccupations. As it is well-known, Lyotard disputes the idea that any cultural narrative can legitimate the knowledge of the sciences, for the fragmentation of scientific discourses into a multiplicity of heterogeneous language games causes such knowledge to withdraw from public view (becoming accessible only as private "information" stored in a memory bank). Although Lyotard believes the Habermasian notion of the public sphere to be an outdated concept, he nevertheless traces the issue of legitimacy to the capacity of "humanity" to formulate its own laws through the use of reason:

Knowledge finds its validity not within itself, not in a subject that develops by actualizing its learning possibilities, but in a practical subject—humanity. The principle of the movement animating the people is not the self-legitimation of knowledge, but the self-grounding of freedom or, if preferred, its self-management. The subject is concrete, or supposedly so, and its epic is the story of its emancipation from everything that prevents it from governing itself. It is assumed that the laws it makes for itself are just, not because they conform to some outside nature, but because the legislators are, constitutionally, the very citizens who are subject to the laws. As a result, the legislator's will—the desire that the laws be just—will always coincide with the will of the citizen, who desires the law and will therefore obey it.[10]

Citing Habermas' historical study of *The Structural Transformation of the Public Sphere*, Lyotard suggests that the scientific community retains the power to criticize the instrumentalization of knowledge by the state, for as he puts it, "this type of legitimation grants them the authority, as practical human beings, to refuse their scholarly support to a political power they judge to be unjust."[11] While it is the explicit intention of the *Postmodern Condition* to suggest that the fragmentation of scientific knowledge makes such public critique impossible, I would like

to suggest that this normative concept of "humanity" returns to haunt the remainder of the work. Indeed, in the final chapter of the book, Lyotard suggests that post-modern science can still perform a *critical* function in society, for there is a potential conflict between the instability of the language games invented by the post-modern scientist (who is oriented towards the "truth" of the theory) and the stability of the social system run by the technocrat (who is oriented towards the "efficiency" of the performance). Although Lyotard adopts the perspective of Luhmann's systems-theory, analyzing the "performative" manner in which the system legitimates itself, he still retains this normative concept of humanity in order to critique the *dehumanizing* effects of the techno-scientific-industrial complex.[12] While the theory of communicative action cannot supposedly replace the function of a meta-narrative in a "post-modern" society, the loss of "humanity" as a collective political subject nevertheless become the central theme of the discussion in *The Inhuman*. In the latter text, we shall see that the development of information and communication technologies alters the structure of the lifeworld in such a manner that individuals are directly *socialized* by the expanding infrastructure of the techno-scientific system.

HABERMAS, LYOTARD AND THE CRITIQUE OF SCIENTIFIC DISCOURSE

In seeking to bring about a *rapprochement* between Lyotard's description of techno-science and Habermas' theory of modernity, we need to clarify the supposed difference between these two thinkers. On the one hand, Habermas' theory of communicative action[13] is supposed to mediate between the cultural institutions that become differentiated in rationalized societies (science, religion and art), for by performing speech-acts that integrate cognitive, normative and expressive attitudes, and raising corresponding claims to validity (truth, rightness and sincerity), speakers oriented towards reaching understand can arrive at a consensus that allows them to co-ordinate social action. On the other hand, Lyotard's conception of the *differend* entails that the two parties engaged in a conflict should not be judged according to the rules of a single discourse (which constitutes rules for linking "phrases" of the same regimen), for the parties speak incommensurable genres of discourse, and the adjudicating discourse cannot resolve the conflict without causing an injustice to one or both of the parties. "As distinguished from litigation," writes Lyotard, "a differend would be a case of conflict, between at (least two) parties, that cannot be equitably resolved for lack of a rule of judgment applicable to both arguments."[14] In short, the central point of contention seems to be the claim that the linguistic structure of communicative action can provide a meta-discourse that is capable of mediating between the expert discourses produced by the differentiated sub-systems of a rationalized or modernized society. According to the argument put forward by Lyotard in *The Differend*, it is impossible for speakers "to come to an agreement on which rules or metaprescriptions are universally valid for language,"[15] for the different genres of discourse remain incommensurable with another. Furthermore, consensus cannot be interpreted as the end of communication processes in a technocratic society, for "consensus" is simply a transitional state of an ongoing dialogue that is ultimately oriented towards the end of efficiency.[16] At an even higher level, it would seem that the two competing forms of legitimation give rise to a differend, for as Forester puts it, "the forms of discourse oriented towards truth and efficiency represent incommensurable configurations of rationality."[17] When interpreted in the light of his later work, Lyotard's account of the postmodern condition can be interpreted as staging the struggle between the cultural and technocratic modes in which scientific knowledge can be legitimated. While the legitimation of scientific knowledge in the public sphere has been traditionally achieved through a narrative of emancipation that promises citizens the "right" to science, the evolution of the education system in computerized societies introduces a dislocation between science and society, for the language games invented by scientists remain incommensurable with one another, and cannot be reduced to a meta-discourse that bridges the difference.

Rather than focusing upon the dispute between Lyotard and Habermas, which is centred around their different conceptions of linguistic interaction, I would like to focus upon the pragmatic description of the scientific method that both thinkers use to criticize the knowledge of the scientific community. As we shall see, Lyotard's description of the "pragmatics of scientific knowledge" builds on the account already given by Habermas *Knowledge and Human Interests*, a text which the former cites to articulate the practical interests that motivate

the production of knowledge.[18] In a chapter titled "The Self-Reflection of the Natural Sciences", Habermas argues that the progress of the natural sciences is in fact motivated by a form of instrumental action whereby scientists measure and control nature for the practical purpose of verifying hypotheses. Following the logical model adopted by Peirce, Habermas suggests that the process of making inferences allows the scientist to transform his beliefs into "synthetically valid statements", i.e. categorial judgments that are verified by sensations, and distinguishes three forms of inference that in their unity constitute "the rules of synthesis": abduction, deduction, induction.[19] In very simple terms, abduction involves the formation of new hypotheses, deduction the formulation of a syllogism to express the law-like relationship between cause and effect, and induction the verification of the law through experimentation and observation. To the extent, however, that the natural scientist limits himself to a monological form of discourse (the syllogism) when formulating hypothesis, deducing proofs, and inducing laws, Habermas remains broadly critical of the scientific method, for he argues that "truth" of a particular theory can only be verified through a public dialogue conducted by the scientific community as a whole. While it might be naively assumed that this public discourse can be described as an open-ended, interactive process, oriented towards reaching understanding and agreement, Habermas makes it clear that the "truth" of the scientific method is ultimately motivated by a collective belief in the progress of science.[20] To the extent that the "transcendental necessity" of these rules is bound to a belief in the ultimate progress of science, the public discourse of the scientific community becomes structurally coupled to the rational action of the experimenter who controls nature in order to observe it. In the same way that Lyotard criticizes the genre of scientific discourse for limiting itself to the meaning of denotative statements, we can see that Habermas also remains critical of the tendency to assume that logical statements have a monopoly on the description of "reality".

Following Peirce, Habermas describes the procedure of verification as a form of instrumental action in which the scientist seeks to increase his technical control of nature and thereby reduce the uncertainty of the surrounding environment. While the rules of inference do not necessarily guarantee the truth of a particular theory at a particular point in time, they nevertheless "establish a procedure that increases intersubjectively recognized beliefs if it is carried out continuously under empirical conditions."[21] When placed in the objective life-context of the scientific community, the rational-purposive action of the scientist is guided by beliefs, and such beliefs have the status of behavioural rules. If recognized as valid by the scientific community, a belief becomes a habit that functions as a plan of action. Significantly, Habermas adopts the model of a feed-back controlled, cybernetic system when describing the progress of science, for as he puts it, "the results of synthetic reasoning have a function only in the behavioural system of this purposive-rational, feedback controlled, and habitual behaviour."[22] According to this logic, the scientific community as a whole can be understood as a cybernetic organism that attempts to reduce the uncertainty of the environment by falsifying old theories and inventing new theories. To the extent that the formation of habits involves the repetition of verification procedures, the scientific system becomes bound to a form of experimental action that involves the technical control over nature:

> Experimental action is only a precise form of instrumental action in general that has been made possible by operations of measurement. The behavioural system of experimental or quasi-experimental action has the function of a transcendental framework: under conditions of experimentation, reality is objectified such that an observable reaction to initial conditions is with transcendental necessity a singular event that *per se* represents a universal effect.[23]

When it comes to analyzing the legitimacy of this procedure, Habermas points out that the transcendental structure of instrumental action possesses an internal source of legitimacy, for the rules of synthesis provide a procedure that can guarantee the truth of science *in the long run*.[24] On the other hand, the syllogisms of the individual scientist remain a private language that can only attain the status of a belief (and habit) when accepted in public by the scientific community. As a consequence, the cognitive and normative truth-claims of science seem to be bound up with a system of action that is ambivalently oscillating between the ends of technical control and public communication.

Despite Lyotard's skepticism towards the idea that the knowledge of science can be effectively communicated to the subject of "humanity" in the public sphere, an ideal that he attributes to Habermas, his description of the scientific method draws upon the tradition of American and British pragmatism (Peirce, James, Mead, Dewey, Austin), and relies upon the concept of the "language game" developed by the later Wittgenstein. In describing the rules of the language game known as science, Lyotard specifies three conditions: (1) the rules of a discourse cannot legitimate themselves, but are legitimated by a social contract between speakers who agree to obey the rules of the game; (2) changing the rules of the game changes the nature of the game; and (3) every utterance is understood as a "move" in the game.[25] With respect to the pursuit of scientific knowledge, these three rules correspond to (a) the requirement that the scientific community reaches consensus about the truth of a theory, (b) the imperative to invent new theories to progress the state of scientific knowledge, and (c) the proof required to verify the "reality" of a scientific theory. In formulating the manner in this way, Lyotard stresses the social basis for the legitimation of scientific knowledge, the practical interest that motivates the progress of science, and the calculative reasoning that is used to actually prove a theory. When it comes to describing the actual rules of the scientific language-game, Lyotard draws upon the distinction between the "performative" and "constative" dimensions of a speech-act. While the latter purport to represent the "reality" of the world, the former invokes conventions that regulate the social interaction between speakers. More specifically, Lyotard analyses scientific discourse as a language game in which a speaker raises a truth-claim about a factual situation and calls upon the listener to accept or deny the statement: "the utterance places (and exposes) the sender in the position of 'knower' … the addressee is put in the position of having to give or refuse assent, and the referent itself is handled in a way unique to denotatives, as something that demands to be correctly identified and expressed by the statement that refers to it."[26] This is effectively a re-formulation of Habermas' notion of a truth-claim.

In the context of scientific discourse, the normative foundation of scientific discourse is systematically repressed, yet this contradiction between the performative and constative aspects of the language game may help us to reconcile the positions of Lyotard and Habermas. Despite the fact that the genre of scientific discourse is limited to the utterance of denotative statements that either identify referents or express meanings, it nevertheless relies upon the *performative* dimension of speech-acts in order to raise a truth-claim, for the act of making an assertion introduces a social contract that *constitutes* the genre of scientific discourse. Despite the fact that scientists must adopt a performative attitude in making denotative statements, and frequently use prescriptives when proving a theory,[27] Lyotard argues that they must systematically repress the normative foundation of the discourse. This form of communicative pathology is reinforced at a structural level, for the rules of the scientific language game dictate that participants in the dialogue must act *as if* they were engaged in monological discourse, excluding from the "denotative" meaning of their propositions any "connotative" meaning that the same terms may have derived from their use in the context of cultural narratives. Indeed, insofar as a scientific statement ("the path of the planets is circular") needs to be proved in order to command the assent of the scientific community, the dialectical or rhetorical manner in which the proof is articulated must be repressed from the actual meaning of the theorem, for as Lyotard puts it, "Scientific knowledge requires that one language game, denotation, be retained and all others excluded. A statement's truth-value is the criterion determining its acceptability."[28] Of course, one must not confuse Lyotard's description of the scientific language game from the actual intentions of the scientists, for it is precisely the aim of *The Postmodern Condition* to expose the problem of legitimation as the normative foundation of scientific discourse.

In Habermasian terms, the scientific language game might be analysed as a form *systematically distorted communication*, for the goal of reaching understanding cannot be achieved by appealing to the shared cultural knowledge of the speakers, but can only be artificially produced by performing upon a verification procedure that remains bound to the transcendental structure of experimental action.[29] In a lecture titled "Reflections on Communicative Pathology"[30] Habermas defines systematically distorted communication as the situation in which at least one of the three validity claims of linguistic interaction is suspended, and yet communication is maintained under the false *presupposition* that the speakers are oriented towards reaching mutual understanding.[31] In the context of scientific discourse, the normative rightness of each denotative statement is suspended from

the discourse, yet the appearance of communicative action is still maintained by means of an appeal to the direct obervation of nature.[32] Systematically distorted communication may be caused by the pathologies of individual speakers or the norms of social institutions, but in most cases the two are caught in a negative feedback loop that amplifies the distortion. By splitting scientific discourse into a private and a public process, the logic of instrumental action becomes differentiated from the legitimation of science in the public sphere. As we shall see, Lyotard rejects the idea that the scientific community can provide a public forum in computerised societies which could decide upon the competency of a scientist or the truth of a theory. Under the new discourse of "performativity", he argues that denotative statements are directly legitimated by the efficiency of experimental procedures. Consequently, the so-called "post-modern condition" can be analysed as a form of systematically distorted communication, for the pathology of the individual scientist (the repression of connotation) becomes structurally bound to the social function that scientist is supposed to perform in order to reproduce the technological infrastructure of research (the experimental control of nature). The concept of systematically distorted communication therefore provides us with a means of reconciling the theoretical differences between Habermas and Lyotard.

CIRCUMVENTING DIALOGUE; OR PRODUCING "COMPETENT" SCIENTISTS

If we turn to the social problem that Lyotard confronts in *The Postmodern Condition*, then it can be seen that the issue of legitimacy is centred around the structural separation of science and culture, for Lyotard foregrounds the question of whether the scientific method possesses an internal mechanism for legitimating the knowledge that it produces. At the beginning of the book, Lyotard identifies the field of inquiry as "knowledge in computerized societies", and from an empirical point of view, observes that the knowledge produced by science can no longer be separated from the infrastructure that is used to produce it. Indeed, it is no coincidence that Lyotard focuses upon the invention of the computer to designate this social field of this new era, for this tool involves the integration of software and hardware components that makes the mental activity of programming dependent upon physical activity of performing calculations (and vice-versa). When the production of scientific research becomes bound to the operation of computers, quantification and calculability become the minimum conditions for the production of knowledge as information. Although Lyotard never makes the distinction explicit, it can be inferred that knowledge becomes information when the means of producing it becomes bound to the possession of fixed capital (the computer), and the means of distributing it dependent upon the market (the commodification of knowledge as information).[33] Traditionally, the knowledge of science has been communicated to the citizens of a democracy through the education system or the public sphere, but with the computerization of scientific research access to information becomes restricted, either because the general public lacks the infrastructure to process it, or the competence to understand it. When Lyotard was writing *The Postmodern Condition* in the 1970s, access to computers was still limited to state institutions and large corporations, for the "personal computer" (PC) had not yet been invented, and the internet was still in its infancy. For this reason, he interpreted the structural differentiation between science and culture as the source of a "legitimation crisis",[34] because he believed that the knowledge of science could no longer be unified by the university system or disseminated via the public sphere. In his later lectures on *The Inhuman*, however, Lyotard recognizes that the growing information network becomes capable of directly socializing subjects to the techno-scientific system, such that the "performativity" of individuals becomes a measure of their adaptation to this new informational environment. Taking into account this change of perspective, I will use the term "posthuman condition" to refer to the state of society in which individuals are directly socialized to the techno-scientific system by means of their performance of operations that not only draw on the resources of the information network but also contribute to its expansion.

As we shall see, the concept of "performativity" provides an alternative mode of legitimating the knowledge of natural sciences, for it circumvents the requirement that the competency of scientists be judged by the public discourse of the scientific community. When it comes to analysing the concept of legitimation, however, Lyotard makes it clear that the *cognitive* statements of scientific discourse have been traditionally legitimated by means of *normative* rules that distinguish between scientific and non-scientific statements:

Legitimation is the process by which a legislator is authorized to promulgate such a law as a norm. Now take the example of a scientific statement: it is subject to the rule that the statement must fulfill a given set of conditions in order to be accepted as scientific. In this case, legitimation is the process by which a "legislator" dealing with scientific discourse is authorized to prescribe the stated conditions (in general, conditions of internal consistency and experimental verification) determining whether a statement is to be included in that discourse for consideration by the scientific community.[35]

Despite the fact that scientific community believes itself be an autonomous system of society, capable of legitimating itself through the repetition of verification procedures, Lyotard here suggests that there is a "strict interlinkage between the kind of language called science and the kind called ethics or politics."[36] While the genre of scientific discourse appears to be limited to the formulation of logical propositions, denotative statements that refer directly to the "reality" of nature, Lyotard here argues that the *rules* of this genre are determined by a social contract that not only regulates the status of speakers, but also determines the kinds of statement that can be made within this discourse. By exposing the normative foundations of science as a genre of discourse, Lyotard makes it clear that the legitimation of science can only be achieved by the appeal to a tribunal that lies beyond its discursive boundaries. As a consequence, the generic distinction between "science" and "politics" would seem to problematize the claim that the truth of a scientific theory is dependent simply upon the verification natural laws through experimentation and observation.

By introducing the concept of the "performative" in his account of the scientific statement, Lyotard not only reveals that the rules of discourse are governed by a social contract shared by participants, he also shows that the reproduction of scientific discourse requires that speakers must be *socialized* in order to perform the roles of sender and addressee in the communication network. In a chapter titled "The Pragmatics of Narrative Knowledge", Lyotard points out that the meaning of the French word for "knowledge" (savoir) must not be reduced simply to the "learning" (*connaissance*) that it produces as its content, but rather must include the "know-how" (*savoir-faire*) or competence that makes possible the production of such learning. The discussion here is not simply linguistic, for it points to an essential distinction between capacity and performance.[37] According to good Aristotelian logic, the capacity to do something is an actual potentiality that can be actualized through work. Although the content of scientific knowledge can be expressed in denotative statements, the capacity to produce such statements can only be determined by a juridical discourse that distinguishes between good and bad statements. "What is a good 'prescriptive' or 'evaluative' utterance, a 'good' performance in denotative or technical matters?" asks Lyotard, "They are all judged to be good because they conform to the relevant criteria (of justice, beauty, truth and efficiency respectively) accepted in the social circle of the knower's interlocutors."[38] Here we can see that the cognitive content of a scientific statement is judged by a normative discourse that distinguishes between competence and incompetence. In the context of narrative knowledge, the competence of the story-teller to reproduce a narrative is simply dependent the fact that he has heard the story. The "authority" of the story-teller is determined by the extent to which he is perceived to be faithfully transmitting the story.[39] In the context of scientific knowledge, however, legitimation is not immanent to the process of transmission, for the truth of a denotative statement can only be verified by recourse to a "proof". As the validity of the "proof" requires that it be expressed in scientific discourse, it necessarily excludes other types of language game, yet it still needs to be legitimated through a process of transmission in which the knowledge of the "expert" is communicated to his "student". It is at this stage of Lyotard's account that the field of education or "didactics" becomes crucially important, for the public discussion of the scientific community does not simply concern itself with the truth or falsity of theories, but it also decides upon the competence of speakers. As Lyotard points out, competence does not precede the event of communication, but is rather produced via the transmission of the message:

> Not only the truth of a scientist's statement, but also his competence, is at stake in that debate. One's competence is never an accomplished fact. It depends upon whether or not the statement proposed is considered by one's peers to be worth discussion in a sequence of argumentation and refutation.[40]

Not only does the determination of competence constitute a *precondition* for a public discussion concerning the truth of the theory (and presumably an on-going process of falsification), but it also ensures the social reproduction of the language game, for the student becomes a "competent" scientists when he receives and internalizes the messages sent by his teacher. In this way, we can see that the "competence" can never be simply established through the pursuit of the scientific method, but can only be brought upon through a process of transmission in which the "expert" communicates his knowledge to the "audience".

Despite Lyotard's skepticism concerning the emancipatory potential of human freedom in the public sphere, Habermas' notion of a communicative space between the market and the state can nevertheless provide us with an effective way of interpreting the relationship between scientific research and education, and the "performative" manner in which both action-spheres are legitimated. From the perspective of scientific research, the axiomatic rules of particular language games can be legitimated through the consensus of the scientific experts engaged in public dialogue.[41] When it comes to supplying a proof for each theory, however, the accurate perception of reality remains inseparable from the technology used to measure, record and control the motion of nature. As Lyotard points out, the functioning of this technology obeys a logic that is indifferent to the consensus of the experts, for the criteria of competence is not socialization to the language game, but rather the principle of optimum performance: "maximising output (the information or modifications obtained) and minimizing input (the energy expended in the process)."[42] It is the subordination of the public dialogue to the ends of efficiency that is ultimately responsible for the structural differentiation of science from society. Not only does this reliance on technology transform the scientific method into a form of instrumental action, but the wealth required to purchase the infrastructure links the progress of science to the reproduction of fixed capital in the market-place. There are two ways in which the technological infrastructure can produce enough "surplus" value to ensure that the dialectic of research continues. On the one hand, the knowledge of science can be used to produce technological appliances that are distributed as commodities in the market-place.[43] The cultural effect of this process is to transform the structure of the life-world, for through the diffusion of "innovations", the habits and values of consumers become entrained towards the functioning of tools that solve practical problems and reduce uncertainty.[44] This application of scientific knowledge to the resolution of practical problems and the development of new technologies can be interpreted as a *privatization* of science, for the production of commodity is motivated by the *private interests* of the developers. On the other hand, the state can promote research in specific areas of expertise through the provision of subsidies and grants, yet such research must contribute to the stability of the social system or the efficiency of the economy. This can also be seen as a form of *privatization*, for the technical knowledge of such experts is beyond the competence of the general public. Despite the fact that these two processes are pursued by both private corporations and public authorities, both bring about the privatization of science, for not only does the "know-why" withdraw from public view, but the search for truth is subordinated to the reproduction of the means necessary to undertake research.

The privatization of the knowledge system is also accompanied by a transformation in the education system, for it leads to the creation of a new class of "technical" elites who service the new infrastructure of scientific research and development. When the goal of education is reduced to the function of training skilled professionals in new industries, the education system becomes legitimated by the role that it performs in the social system as a whole, for "the desired goal becomes the optimal contribution of higher education to the best performativity of the social system."[45] Indeed, to the extent that Keynesian economic policies can create linkages between public investment and private profit-making, the technical specialization of scientific research can explain the tendency of the public sphere to become "refeudalized" in the context of the "welfare state mass democracy".[46] While the goal of a technical or vocational education is to produce professionals that can perform a function in the social system, the re-orientation of the education system to the ends of technical efficiency also has effects on educators, for the stock of knowledge possessed by individual minds can effectively be replaced by a memory bank. Under such conditions, the critical task of questioning discourses and institutions is struck from the curriculum, and the oral medium of the lecture becomes obsolete, replaced by ICTS that give students access to the memory bank. With no direct process of transmission to socialize students to the performativity

of the scientific language game, the reproduction of knowledge becomes reduced to the process of selecting information and inventing new ways to manipulate the data. This new form of education is essentially tied to the development of the computerized infrastructure required to undertake research. Despite the conservative politics that motivate the reduction of education to a part of the social system, Lyotard asserts that post-modern science is motivated by the search for instabilities, posing a potential threat to the stability of the system. For this reason, the technocratic elite tend to suppress new or controversial theories, silencing dissent either through threats, or simply by withdrawing funds.[47]

As we have seen, Lyotard associates the concept of "humanity" with the collective political subject of a capitalist democracy, which not only believes in the right to science, but also has the capacity to formulate its own laws and indirectly govern social action (albeit through the mediation of elected representatives). Despite the personal freedom that this idea of "humanity" entails, the use of public opinion to legitimate the formal laws of the state can perform a repressive function in democratic societies, for the majority can use the so-called "voice of the people" to coerce the minority. The philosophy of liberalism is one response to this paradox. Indeed, only when the minority have the capacity to express their opinion through the public use of reason is there any mechanism for avoiding the tyranny of majority rule. When we analyse the functioning of the techno-scientific system, however, it can be seen that the reduction of research and education to the ends of efficiency can have a similar repressive effect. The reliance of research upon investment in the technological infrastructure has the capacity to alienate the working population, for the progress of the scientific system is motivated by the ends of efficiency and the extraction of surplus-value. Nevertheless, the functionalization of the education system compensates for these ill effects by socializing workers to the new technologies. We can theorize the relationship between research and education as a dialect of *dehumanization* and *rehumanization*, for as Lyotard puts it, "the system seems to be a vanguard machine dragging humanity after it, dehumanizing it in order to rehumanize it at a different level of normative capacity."[48] From this account, we can see that the techno-scientific-industrial machine has no sympathy for the suffering of the weak or disenfranchised, for incompetence can be supplied through education. As the progress of science is dislocated from the public use of reason, humanity must be understood as the "will" of a political subject that can only adapt in order to survive. What emerges from Lyotard's account of the postmodern condition is therefore the idea that the development of science and technology is governed by the internal logic of scientific discourse and the external logic of the market. Without the narrative of emancipation to counter the dehumanizing effects of technology, Lyotard has no option but to accept the advance of techno-science as the condition of both knowledge-production and socialization in "computerized societies".

THE INHUMAN AND "THE POSTHUMAN CONDITION"

Between the writing of the *Postmodern Condition* (1979) and the *Inhuman* (1988) it seems that Lyotard slightly modifies his perspective, for he no longer appeals to the concept of humanity as a normative critique of the techno-scientific system, but embraces the evolution of technology as part of the essential destiny of the human species. This change in perspective is perhaps most marked with regard to the question of language, for rather than focusing upon the public discussion of the scientific community, which implies a spoken form of interaction, Lyotard now links the principle of performativity to the technique of writing.[49] In general terms, this shift from a spoken to a written model of human communication can be linked to the reduction of knowledge to information in computerized societies, for Lyotard conceptualizes writing as a means of selecting, storing and retrieving information. In the field of culture, the task of storing information has been traditionally performed by narratives, which remain rooted to a specific locale, language and population. With the expansion of the techno-scientific system, however, the knowledge contained in cultural narrative becomes increasingly supplanted by the information circulating in a global communications network, for as Lyotard puts it, "the electronic and information network spread over the earth gives rise to a global capacity for memorizing which must be estimated at the cosmic scale, without common measure with that of traditional cultures."[50] Comparing the information network to the "great Monad" (God) of Leibnizian metaphysics,[51] Lyotard analyses the advance of the techno-scientific system as a form of instrumental rationality that increasingly reduces the contingency

of temporal events to economically motivated forms of calculation and control.[52] The only form of resistance to this system of control seems to be the phenomenon of the sublime in art, a pure experience of the event that exposes the limits of the imagination, and reveals an alternative destiny for the future of the human species.[53] Despite his belief in the "saving power" of art, Lyotard remains skeptical that the aesthetic of the sublime can actually overcome the hegemony of the techno-scientific system, for the "culture industry" tends to reduce the function of art to entertainment, programming the audience to perceive the world through a fixed system of stereotypes.[54] Under such conditions, human subjects are no longer socialized through the transmission of narratives, or the performance of speech-acts, but are rather acculturated to the technoscientific-system through the consumption of commodities that are distributed through the market.

While Lyotard remains skeptical that the spread of this information network can lead to a reconfiguration of the public sphere, I would like to maintain that *the privatization of the information-network paradoxically leads to an increase in the possibilities of public communication*. Although users lack the "know-why" to build or program the new technologies of distance communication, they nevertheless possess the "know-how" to establish a line of communication. In order to understand why the advance of techno-science can increase the possibilities of public communication, it is necessary to make a fundamental distinction between practical technologies and communication technologies.[55] In the case of the former, the design of the tool is oriented toward the resolution of practical problems, for the use of the tool makes human behaviour more efficient (satisfying the principle of "performativity"), and reduces the uncertainty of the surrounding environment. When using a practical tool, the user is engaging in purposive-rational activity, for the successful performance of the task is guided by the actor's self-conscious intention. Although the actor may not know "why" the tool works, i.e., he lacks the theoretical knowledge to design the tool, he nevertheless knows "how" it works, and the repeated use of such tools modifies the capacities and habits of the user. As we have seen, the distribution of practical tools in the market-place is one of the driving forces of scientific research in capitalist societies, for the diffusion of practical tools generates surplus-value that can be subsequently re-directed into scientific research.

With regard to the use of communication technologies, however, the user is not engaged in rational-purposive activity, but is engaging in an open-ended process of social interaction that remains dependent upon the contingent responses of other individual human subjects. Even if the inventor is acting purposively when designing the communication technology (the telephone, the PC, the modem, the internet, email, applications etc…), the interactive use of such technologies re-orients the private interests of the producers towards the public interests of the consumers. While the technical expert is concerned with the problem of efficiently transmitting a message over a noisy channel, the everyday user is concerned with establishing a line of communication at a semantic and pragmatic level.[56] As a consequence, the knowledge division between "technical" experts and citizens does not prove to be a diremptive force in rationalized or modernized societies, but in fact provides a more efficient way of organizing the processes of public communication, for the practical interests of the producers is continually *appropriated* by the public interests of the consumers. While the use of practical technologies tends to alter the habits of the users, and thereby transforms the knowledge of science into a form social engineering, the use of information and communication technologies alters the *habits of the mind*, such that processes of thought become interwoven with the networks of information that they inhabit. Rather than analyzing ICTs as tools that solve practical problems in the external environment, one must recognizes that telephones, modems and the internet now constitute the real "environment" of the posthuman condition, for it is precisely through these lines of communication that human subjects are now socialized. To the extent, furthermore, that the evolution of the information network automatically memorizes the interactive behaviour of citizens engaged in public communication, it can be argued that the "Great monad" provides the cultural infrastructure of the life-world, for it is this archive of information that now provides the stock of theoretical paradigms of interpreting the meaning of any action situation.

Despite the divergence between the views expressed by Lyotard and the conclusions reached in this paper, I would like to maintain that my own position remains concordant with the logic expressed in *The Inhuman*. Indeed, when it comes to defining the concept of the "inhuman", Lyotard argues not only that human beings

are socialized through language, but furthermore that the essence of the language (the *logos*, or *techne-logos*) cannot be separated from the technology of writing conceived as spatial inscription. Significantly, Lyotard traces the origin of the concept of "publicity" to the invention of writing, for as he puts it, "inscription, putting into traces, on the one hand … opens a public space of meaning and generates a community of user-producers, and on the other (?) because it is endowed with persistence by its being marked on a spatial support, conserves the sign of a past event, or rather produces it as available, presentable and reactualizable memory."[57] According to this definition, writing can either be interpreted as public knowledge that founds a community of user-producers, or an archive of information that remains accessible. In fact, when it comes to defining the essence of "humanity", Lyotard argues that it is the socializing force of language that transforms the first nature of the child into the second nature of the adult, for as he puts it, "What shall we call human in humans, the initial misery of their childhood, or their capacity to acquire a 'second nature' which, thanks to language, makes them fit to share in communal life, adult consciousness and reason?"[58] By phrasing the question in this way, Lyotard suggests that the concept of humanity is either identified with the innocence of the child (humanity as nature) or the maturity of the adult (humanity as culture), yet to the extent that the technological medium of language is responsible for facilitating the transition from one state to the other, it would appear that the process of becoming-human is guided by the destiny of the "inhuman".[59] While this concept of the inhuman is associated with the advance of the techno-scientific system, which socializes individuals as "functions" of the industrial machines, it nevertheless also contains a creative principle that not only drives the invention of new language games, but also threatens to de-stabilize the system. According to this double meaning of the concept of the inhuman, the expansion of the information network can either bring about the *privatization* of scientific knowledge or the *publicization* of interpersonal communication. In truth, the two possibilities are never simply opposed, but are rather interwoven with one another. Indeed, when the mathematical theories of the post-modern scientist become motivated by the search for instabilities in the system (exemplified by the development of chaos theory and fractal geometry), the progress of scientific research becomes synchronized with the search for new forms of human communication and organization. Rather than simply taking a positive or negative view of the role of the information network as socializing post-human subjects, I would suggest that the technology of inscription remains essentially ambiguous, either contributing to the rationalization of society (through the development of the communicational infrastructure) or to the unification of the life-world (through the formation of interpersonal networks and virtual communities).

CONCLUSION

In arriving at this description of the "posthuman condition", it should be noted that I have almost entirely overlooked the discussion of the Kantian sublime in *The Inhuman*.[60] Contrary to the intentions of Lyotard, I have tried to suggest that the privatization of knowledge as information does not lead to the absolute demise of the public sphere, but rather leads to a new configuration of the public sphere in which there exists a structural divide between the inventors and users of information and communication technologies. As Lyotard interprets the "theory of communicative action" as a form of rationality that attempts to reduce the heterogeneity of language games to a single, meta-discourse, he can only appeal to the occurrence of singular events that appear to transcend the capitalist market and the techno-scientific system. By appealing to the Kantian notion of the beautiful, Lyotard suggests that aesthetic feelings can create human communities that precede any form of communication. On the other hand, the feeling of "pleasure in pain" associated with the experience of sublime exposes the human subject to the materiality of the event, revealing not only limits of the imagination, but signifying an idea of Reason that commands the subject to obey. While there is certainly something to be learned from Lyotard's aesthetic theory, the opposition between the beautiful (the conventions of taste) and the sublime (the avant-garde) tends to reinforce the humanistic distinction between social control and individual freedom. In order to be productive, the difference between the beautiful and the sublime must be reconfigured in terms of the theory of rationalization developed by Weber and Habermas.[61] If we were to reconfigure the Kantian problematic as an expression of the problem of modernity, then the conflict between the beautiful and the sublime might be interpreted as an allegory for the conflict between the understanding (theory, science) and reason (practice, technology) through the medium of aesthetic feelings. For the time being, however, we

must be content to observe that the increasing specialization, technicization and professionalization of science is creating the infrastructure of a global communications network that is both increasing the privatization of scientific knowledge and the possibilities of public communication ∎

NOTES

1. Jean-Francois Lyotard, *The Inhuman: Reflections on Time*. Trans. Geoff Bennington and Rachel Bowlby. Cambridge: Polity Press, 1991.

2. Jean-Francois Lyotard, *The Postmodern Condition: A Report on Knowledge.* Trans. Geoff Bennington and Brian Massumi. Minneapolis: University of Minnesota Press, 1984.

3. Describing the role of the imagination in the production of art and writing, Lyotard asserts that "such an imagination plays no less role in science itself, the role of the heuristic moment it needs if it is to progress." Lyotard, *The Inhuman*, 73.

4. In *Deconstruction and 'The Unfinished Project of Modernity'*, Christopher Norris suggests that Lyotard's version of the post-modern condition has become the basis for "The tolerant postmodern-pluralist view that there exist any number of 'first-order natural pragmatic narratives', each of them having a right to express its own distinctive values, belief system, or criteria for what should count as 'truthful' or 'valid' statement." Christopher Norris, *Deconstruction and 'The Unfinished Project of Modernity'*. London: Athlone Press, 2000, 11.

5. In *The Structural Transformation of the Public Sphere*, Habermas makes it clear that the public sphere is located between civil society and the state, so it should not come as any surprise to discover that the infrastructure of the public sphere has become privatized in information societies. Jürgen Habermas, *The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society*. Trans. Thomas Burger with the assistance of Frederick Lawrence. Cambridge: Polity Press, 1989.

6. In the "foreword" to the *Postmodern Condition*, for example, Frederic Jameson claims that Lyotard's discussion of scientific research is "a thinly veiled polemic against Jürgen Habermas' concept of a 'legitimation crisis' and vision of a 'noisefree', transparent, fully communicational society." Frederic Jameson, Foreword to *The Postmodern Condition*, vii. Such a judgment was quickly re-iterated by Richard Rorty (see his "Habermas and Lyotard on Post-Modernity" *Praxis International* 4 (1984), 32-44.), who reinforces the opposition between Habermas and Lyotard. Rorty quotes heavily from Habermas' article on "The Entwinement of Myth and Enlightenment" (with Thomas Levin. *New German Critique* 26 (1982), 13-30) and identifies Lyotard with Adorno and Horkheimer, who are justly criticized by Habermas for lacking any rational basis of critique.

7. Jürgen Habermas, *Knowledge and Human Interests*. Trans. Jeremy Shapiro. London: Heinemann Educational, 1972.

8. Ludwig Wittgenstein, *Philosophical Investigations*, 3rd edition. Trans. by G.E.M. Anscombe. New York: MacMillan, 1958.

9. J.L. Austin, *How to do things with words*. Oxford: Clarendon Press, 1962.

10. Lyotard, *The Postmodern Condition*, 35.

11. *Ibid.*, 36

12. Following Richard Beardsworth, I believe that the philosophical legacy of Derrida, Levinas and Lyotard must be situated within a theory of modernity that analyses the institutional structures that produce differences. Focusing on the divide between the finite and infinite in French thought, he suggests that their central preoccupation has been "the idea that difference and individuality are to be affirmed less through their conceptual and institutional apprehension and determination than through negotiation with the excess of such apprehension and determination." Richard Beardsworth, "Modernity in Recent French Thought" *Telos* 137 (2006), 68. Rejecting this search for an outside beyond the system of capitalism, Beardsworth concludes that we must turn to the theory of rationalization developed by Habermas in *The Theory of Communicative Action* to articulate how such differences can be represented and articulated within democratic nation-states.
Jürgen Habermas, *The Theory of Communicative Action: Reason and the Rationalization of Society*. Vol. I Trans. Thomas McCarthy. Boston: Beacon Press, 1984.

13. Jean-Francois Lyotard, *The Differend: Phrases in Dispute*. Trans. Georges Van Den Abbeele. Minneapolis: University of Minnesota Press, 1988, xi.

14. *Ibid.*, 65.

15. "This double observation (the heterogeneity of the rules and the search for dissent) destroys a belief that still underlies Habermas' research, namely, that humanity as a collective (universal subject) seeks its common emancipation through the 'regularization' of the moves permitted in all language games and that the legitimacy of any statement resides in its contributing to that emancipation." Lyotard, *The Postmodern Condition*, 66.
 Roger Forester, "Strategies of Justice: the project of philosophy in Lyotard and Habermas" *Philosophy & Social Criticism* 25 (1999), 90.

16. Lyotard cites Habermas to support the assertion that "Knowledge is and will be consumed in order to be valorized in a new production: in both cases, the goal is exchange. Knowledge ceases to be an end in itself, it loses its 'use value.'" Lyotard, *The Postmodern Condition*, 5.

17. Habermas, *Knowledge and Human Interests*, 113.

18. "The modes of inference cannot be viewed simply as transcendentally necessary because they are not valid universally, at all places and times. They only justify the validity of a method that leads to true statements in *the long run*. The synthetic forms of inference allow justifiable conclusions that are not necessarily true or probable. They owe their validity exclusively to the circumstance that they are the results of a method "which if steadily persisted in must bring the reasoner to the truth of the matter or must cause his conclusion in its changes to convert to the truth as its limit." *Ibid.*, 118-119.

19. *Ibid.*, 119.

20. *Ibid.*, 120.

21. *Ibid.*, 128.

22. "*How is scientific progress possible?* Pragmatism answers this question by legitimating the validity of synthetic modes of inference on the basis of the transcendental structure of instrumental action." *Ibid.*, 121.

23. Lyotard, *The Postmodern Condition*, 10.

24. *Ibid.*, 9.

25. "Of course, we find other classes of statement, such as interrogatives ('How can we explain that …?') and prescriptives ('Take a finite series of elements ...'), but they are only present as turning points in the dialectical argumentation, which must end in a denotative statement." *Ibid.*, 25.

26. *Ibid.*, 25.

27. In a lecture titled "Truth and Society: the discursive redemption of factual claims to validity", Habermas rejects Kamlah and Lorenzen's claim that competent judges must have expert knowledge that enables them to perform appropriate verification procedures, for the reason that "we cannot specify any independent criteria for what counts as 'expertise'; deciding on the choice of these criteria itself depends on the outcome of a discourse." Jürgen Habermas, "Truth and Society: the discursive redemption of factual claims to validity" *On the Pragmatics of Social Interaction*. Trans. Barbara Fultner. Cambridge: MIT Press, 2001, 95.

28. In Habermas, *On the Pragmatics of Social Interaction*, 131-170.

29. "Communication can be systematically distorted only if the internal organization of speech is disrupted.

This happens if the validity basis of linguistic communication is curtailed surreptitiously; that is, without leading to a break in communication or to the transition to openly declared and permissible strategic action." *Ibid.*, 154.

30. Of course, one should not confuse the performative attitude of a cognitive statement ("I assert") from the constative meaning of the proposition ("that the path of the planets is circular"). Although the content of a theoretical discourse is cognitive, and refers exclusively to the objective world, the interaction of speakers is still governed by the normative rules of linguistic interaction.

31. "Knowledge in the form of an informational commodity indispensible to productive power is already, and will continue to be, a major—perhaps *the* major—stake in the worldwide competition for power." Lyotard, *The Postmodern Condition*, 5.

32. Jürgen Habermas, *Legitimation Crisis*. Trans. Thomas McCarthy. Boston: Beacon Press, 1975.

33. Lyotard, *The Postmodern Condition*, 8.

34. *Ibid.*

35. *Ibid.*, 18.

36. *Ibid.*, 19.

37. When applying the pragmatics of narrative knowledge to the legitimation of science, Lyotard pays specific attention to the genre of the *bildungsroman* developed, for it deals with the education of citizens and their relationship to society as a whole: "the popular stories themselves recount what could be called positive or negative apprenticeships: in other words, the success or failures greeting the hero's undertakings." *Ibid.*, 20. Depending upon the outcome of the narrative (socialization or alienation), these narratives have the capacity to either legitimate social institutions or represents models of biographical development (positive or negative). With the development of the idea of the university as a social institution charged with the responsibility of integrating scientific knowledge with practical behaviour, Hegel's *Encylopaedia* performs the tasks of combing theory and practice, for it provides a metanarrative in which the life of the individual is subsumed by the historical development of "Spirit" or "Life". *Ibid.*, 33.

38. *Ibid.*, 24.

39. With the subordination of scientific discussion to the ends of technical efficiency, the concept of performativity undergoes a radical transformation. Indeed, when Lyotard first introduces the notion of the "performative", it is borrowed from the speech-act theory of J. L. Austin, and is designed to distinguish the social contract between the speakers from the "constative" meaning of the "denotative" meaning of logical statements used to prove the validity of a scientific theory. With the binding of such proofs to the efficient operation of a machine, which minimises input and maximises output, the legitimation of scientific research becomes dependent upon the "performativity" of the machine, which has nothing to do with the socialization of speakers, and everything to do with the generation of "surplus value" to ensure the reproduction of capital. For further discussion see Chris Rojek, "Lyotard and the Decline of Society" *The Politics of Jean Francois Lyotard: Justice and Political Theory.* Eds Chris Rojek and Bryan Turner, 10-24. London: Routledge, 1998.

40. Lyotard, *The Postmodern Condition*, 44.

41. *Ibid.*, 45.

42. See Everett Rogers, *Diffusion of Innovations*. New York: Free Press, 2003.

43. Lyotard, *The Postmodern Condition*, 48.

44. Jürgen Habermas, S. Lennox, and F. Lennox, "The Public Sphere: an encyclopaedia article" *New German Critique* 3 (1974), 49-55.

45. "By terror I mean the efficiency gained by eliminating, or threatening to eliminate, a player from the language game one shares with him. He is silenced or consents, not because he has been refuted, but because his ability to participate has been threatened (there are many ways to prevent someone from playing). The decision makers' arrogance, which in principle has no equivalent in the sciences, consists in the exercise of terror." Lyotard, *The Postmodern Condition*, 63-4.

46. *Ibid.*, 63.

47. "All technology, beginning with writing considered as a techne, is an artefact allowing its users to stock more information, to improve their competence and optimize their performances." Lyotard, *The Inhuman*, 62.

48. *Ibid.*, 64.

49. *Ibid.*, 60-61.

50. *Ibid.*, 66-68.

51. See *Ibid.*, Ch. 5.

52. *Ibid.*, 63-64.

53. The distinction between rational-purposive action and linguistic interaction is taken from Habermas' essay on "Actions, Speech Acts, Linguistically Mediated Interactions, and the Lifeworld" *On the Pragmatics of Communication*. Ed Maeve Cooke, 215-56. Cambridge: MIT Press, 1998.

54. In an introductory essay to Shannon's *Mathematical Theory of Communication*, Warren Weaver distinguishes (1) the technical problem of efficiently transmitting information over a noisy channel from (2) the semantic problem of composing a message and (3) the pragmatic problem of persuading an audience. Warren Weaver, "Introductory Note on the General Setting of the Analytical Communication Studies" *The Mathematical Theory of Communication*. Claude Shannon and Warren Weaver, 3-28. Urbana: University of Illinois Press, 1949.

55. Lyotard, *The Inhuman*, 48.

56. *Ibid.*, 3.

57. In his article titled "Lyotard's and Posthuman Possibilies", Richard White has argued that the concept of humanism can be traced to either the relativism of Protagoras or the Creation myth of the Old Testament. Richard White, "Lyotard and Posthuman Possibilities" *Philosophy Today* 50 (2006), 183-189.

58. For a good discussion of the Sublime in The Inhuman, see Temenuga Trifonova, "The Question of the Appendix: The Kantian and the *Inhuman* (Postmodern) Sublime" *International Studies in Philosophy* 35 (2003), 51-92.

59. Habermas, *Theory of Communicative Action*.