Geoffrey Winthrop-Young

Silicon Sociology, or, Two Kings on Hegel's Throne?
Kittler, Luhmann and the Posthuman Merger of German Media Theory

Introduction

In 1999 Rudolf Maresch and Niels Werber co-edited a Suhrkamp volume entitled Kommunikation Medien Macht ("Communication Media Power") that aspired to reclaim the abandoned peaks of German philosophy. In their letter of invitation, the editors solicited contributions that would respond to "a philosophical, intellectual, creative and political challenge of the first order" by helping to merge the poststructuralist media theory of Friedrich Kittler with the autopoietic systems theory of Niklas Luhmann. With its focus on communication, media and power as "*the* building blocks of the emerging global society," this *Über*theory would be able to occupy "the place of the king that has been vacant since Hegel's death."[1] Maresch and Werber argued that the strength of this royal hybrid would result from the partners' ability to correct each other's blind spots: Kittler would supply the technologically informed focus on the materialities of communication excluded by Luhmann, while Luhmann would provide a compatible understanding of communication, that is, a complementary analysis of how understanding, the construction of meaning, and social evolution emerge from the processing of communicative events, all of which is of little importance to Kittler. In short, the imperial theory would be made up of a combination of Kittlerian hardware and Luhmannian software.

What is surprising--not to mention entertaining--is not only the retrieval of the lost belief in grand theory narratives, or the desire to introduce a double-headed alpha-male into an acephalous theory habitat, but also the evident gap between motion and act. Neither the contributors nor the editors really seem to believe in the feasibility of the project. The papers either stick to one of the theorists and disregard the other (and those that do discuss both tend to clearly favor one over the other), or both are abandoned and the authors happily present their

own, homegrown, theories. Upon closer inspection, however, it becomes clear that given certain basic incompatibilities, some of which will be discussed below, the merger was doomed from the outset. But then why write about it, or why try to initiate it in the first place? Because in matters of theory--just as in matters of love and business--ambitious failure is a great deal more interesting and revealing than moderate success; and what makes this particular failure so intriguing is that it grows out of an exemplary move within the space of posthuman theorizing. Following N. Katherine Hayles, "posthuman" does not refer to the absence of humans but to a historically specific construction that recently emerged from the changing constellation of media, technology, and culture. As Hayles argues, the 'posthuman' is a point of view characterized by a set of (highly debatable) assumptions including the privileging of informational pattern over material instantiation, the debunking of consciousness "as an evolutionary upstart trying to claim that it is the whole show when in actuality it is only a minor sideshow," and, most importantly, the redesign of the "human being so that it can be seamlessly articulated with intelligent machines."[2]

No doubt Luhmann and Kittler, whose theories are related to the project of rethinking the evolving human/machine and communication/consciousness boundaries, would share many of Hayles's objections, above all her critique of persisting notions of possessive individualism in the instrumentalist treatment of increasingly gadget-endowed bodies. But it is also clear that Kittler and Luhmann are not only posthuman thinkers in Hayles's sense of the word, they are clearly and unapologetically posthuman*ist*: Luhmann for removing humans from their traditional place at the center of the analysis of social systems and replacing them with the autopoietic reproduction of communication, and Kittler for his claim that "so-called Man [*der sogenannte Mensch*] is not determined by attributes which philosophers confer on or suggest to people in order that they may better understand themselves; rather, He is determined by technical standards."[3]

In the case of both theorists, these post- or antihuman(ist) aspects are their most interesting features; and all the more so for the strange attempt to fuse them. In order to make sense of this quixotic endeavor, the following remarks will center on these aspects and weave their way between Kittler and Luhmann. Given the complexities of the theorists involved, this paper will proceed in a highly selective fashion. Following a short section ("Grounding

Foucault") that relates the Foucauldian background of Kittler's media theory to the merger project, a long section ("A Porcupine Union") explores what, if anything, unites Kittler and Luhmann. The next two sections ("Informed Media: Luhmann" and "Informed Media: Kittler") focus on what Kittler and Luhmann mean when they speak of 'media.' Despite considerable differences one apparent commonality will emerge: the formal similarity between Luhmann's form/media distinction and the conceptualization of information as proposed by Claude Shannon, which is of pivotal importance to Kittler's account of media. However, the next section ("Questionable Observers") focuses on the fact that this alleged similarity points toward a basic incompatibility that more than any other precludes the merger, the role of the observer in Luhmann's theory. The last section prior to the conclusion centers on yet another promising commonality, the account of how computers will reshape communication, but once again a the differences will outweigh the alleged similarities.

Grounding Foucault

In retrospect, the merger project appears to have been lurking in the background of a decade-long fairly one-sided courtship that had Luhmann's systems theory alternately praised and criticized by poststructuralist media theorists (and throughout which Luhmann remained a rather unresponsive wooee). The initial conditions were set by Kittler's essay "Protected Mode" (first published 1991) that recommended abandoning the usual account of power as a function of "so-called society" in favor of an analysis that focused on the increasingly technologically mediated conditions of access to power.[4] At first glance, this places Kittler in the company of politically more outspoken theorists who argue that in the late capitalist regime of flexible accumulation, in which perishable information has assumed the position previously occupied by durable goods, the constraining factor separating the haves from the have-nots is access rather than possession. Kittler, however, is less interested in extending Karl Marx than Carl Schmitt. The latter's account of *Korridorbildung* ("formation of corridors") had centered on how growing bureaucratic structures--materialized in lobbies, antechambers, offices and the mushrooming secretarial domain--limit the access to, and thus usurp the position of, an increasingly inaccessible center of power.[5] These corridors, as it were, are now inscribed on silicon chips that regulate access to data and operating levels, hence an up-to-date analysis of power and society

has to take into account technically implemented privilege levels. This raises the question "what a sociology would look like that no longer is about humans and angels, as in the days before Kant, but about humans and programs, and that would make the unhuman (*unmenschliche*) systems part of our social structure."[6]

In order to understand why Kittler would suggest such a silicon sociology it is necessary to briefly recapitulate the most important ingredient of what is sometimes called media discourse analysis or poststructuralist media theory, but what some of its practitioners like to refer to as 'media science' (*Medienwissenschaften*). At first glance, the media-related work of Kittler represents a technologically focused German appropriation of French poststructuralist theory, whose basic move is to elaborate and update Foucauldian discourse analysis by providing an attention to the materialities of communication that shape and pre-process all discursive practices. Where Foucault had spoken of epistemes or sets of constraint and limitations that govern the production of what is considered to be truth and knowledge, Kittler goes a step further and examines 'discourse networks' or "networks of technologies and institution that allow a given culture to select, store and process relevant data."[7] Where Foucault had asserted that "what counts in the things said by men is not so much what they may have thought or the extent to which these things represent their thoughts, as that which systematizes them from the outset,"[8] Kittler adds the specification that what really counts is the media apparatus which precedes and predetermines these systematisations. The archeological Foucault of the sixties is both extended and grounded: he is extended insofar as his particular type of analysis, which had been limited to the domain of scriptography and typography, is now also applied to the domains of post-Gutenberg media technology; and he is grounded insofar as the very discursive formations which Foucault uncovered while frequenting archives and libraries are revealed to be the effects of media dispositives. Foucault's epistemic or discursive apriori is replaced by a "medial apriori" which posits that all social, cultural and epistemological structures are the effect of the changing technological means of mediation. With his information-theoretical materialism Kittler is playing, as it were, Marx to Foucault's Hegel: discourse analysis is pulled off its textual head and placed on its media-technological feet.[9]

This may be labeled in somewhat peremptory fashion a union of French poststructuralism with the work of Marshall McLuhan. To a certain extent this is true: if the basic point of

discourse analysis--namely, that discursive rules and structures do not originate in a socioeconomic or cultural outside but are shaped by the internal mechanism of discourse--is applied to media, then the medium indeed becomes in McLuhanese fashion the message. What is problematic, however, is McLuhan's tendency to view media primarily as protheses and extensions of the human body. From Kittler's point of view (informed, no doubt, by Heidegger's take on technology[10]) the notion of media as means, no matter how formative, still reserves a central position for humans. Against this instrumentalist anthropocentrism he posits media as "anthropological aprioris"[11]: humans are appendages of media technologies rather than beneficiaries of their storage and communication potential. Subsequently, McLuhan's vision of a technologically mediated global community as an all-encompassing electronic noopshere is replaced with the vista of machines that can connect and operate without any detour into human consciousness because, just like humans before them, they have learned to read and write on their own.

What remains under these circumstances is to plot self-descriptions, that is, to analyze how changing media conditions change the way in which societies react to these changes. The very notion of "society" will, of course, have to be fundamentally reconceptualized in order to be compatible with the medial apriori of a decidedly posthermeneutic and posthumanist media theory. Media theories that describe society primarily as "noise and wrangling on all channels,"[12] which, subsequently, is surveyed, addressed, disciplined, punished and ordered by the central processing authorities into manageable units known as subjects or nations, will refuse to merge with sociological theories that have as their base unit the individual (with its agency, actions and/or consciousness), some type of meaningful action or interaction involving one, two or more subjects, the notion of production, or an overdetermined 'social'. The fact that Luhmann appears to espouse an equally posthermeneutic and posthumanist view of society as the production and reproduction of communications--an approach that cannot but credit changes in communication technology with fundamental impact on social evolution--makes him the prime candidate for the posthuman techno-sociological theory merger..

A Porcupine Union

A German proverb has it that whenever two are quarreling there will be a third party joyfully reaping the benefits--*wo zwei sich streiten, freut sich der Dritte*. In the case of Kittler and Luhmann the logic seems to be reversed: for 'media science' and systems theory to successfully cooperate, there has to be a common enemy. The image that comes to mind is Arthur Schopenhauer's parable of the porcupines in winter: in order to survive inhospitable conditions, they have to move together, but they cannot move too close without the threat of serious injury. Or, to paraphrase Michel Serres, for two partners to successfully communicate, they have to create a domain of mutual understanding directed against the perennial threat of an inimical third party, the noisy *parasite*, who is to be barred from interfering in the exchange. The principal parasites against whom Kittler and Luhmann take common aim are the professionally established tradition of hermeneutics from Schleiermacher to Gadamer and beyond and the equally established extended family of the Frankfurt School, especially Jürgen Habermas. But what exactly do Kittler and Luhmann jointly oppose? Four interrelated points or gestures of farewell are of particular importance:

1. *A farewell to "so-called Man" and human subjects*. In Kittler's analysis, "so-called Man" (*der sogenannte Mensch*)--the autonomous, self-determined human subject credited with producing meaningful texts and performing responsible acts--is said to have emerged as the effect of a historically contingent technology of the letter known as the "discourse network 1800." A feedback involving changes of reading, writing and language acquisition practices, in connection with the burgeoning literary, military and bureaucratic institutions of the modern nation state and the consolidation of the nuclear family, facilitated the transformation of language from a recalcitrant material force into the spiritualized vessel of a transcendental inner voice. Compulsory education assured that people learned to read and write in ways that allowed for the construction of hermeneutically accessible entities such as the authorial subject. Given that the most important constituent element of the discourse network 1800 was the fact that "the homogenous medium of writing also became homogenous in the social sphere,"[13] its operations may be summarized in a simple algorithm: Where letters were, there subjects shall be.[14]

But if subjects arise from a technology of the letter, their fate will be sealed once that technology is superseded by post-typographic alternatives. At one point in the long history of the encounter between media and bodies, there was a place and maybe a need for subjects; but once

machines able to read and write without human assistance can take care of business on their own, such cultural prostheses become obsolete. Yet Kittler is not simply rehashing the well-worn anthropocentric substitution story according to which machine slaves programmed to simulate human thought processes will replace their human masters. He adds a Lacanian spin by emphasizing that the crucial feature which turns mere machines into "machine subjects" is the implementation of conditional jump instructions or IF/THEN-commands. Quoting Lacan, Kittler insists that the difference between a straightforward mechanical command that determines exactly how an operation should be executed from beginning to end, and a programme which enables the operator to alter its behavior during the operation once or if certain conditions have been met, is the same as the distinction between an animal code and a language involving human subjectivity:

> For example, the dance of bees, as is has been researched by von Frisch, "is distinguished from language precisely by the fixed correlation of its signs to the reality they signify." While the messages of one bee control the flight of another to blossoms and prey, these messages are not decoded and transmitted by the second bee. By contrast, "the form in which language is expressed (. . .) itself defines subjectivity. Language says: 'You will go here, and when you see this, you will turn off there.' In other words, it refers itself to the discourse of the other." In yet other words: bees are projectiles, and humans, cruise missiles. One is given objective data on angles and distances by a dance, the other, a command of free will.[15]

Subjective agency is conceived of as operational reflexivity which, translated into the computational realm, takes on the shape of feedback commands. This allows Kittler to establish a functional equivalence between human operators and cruise missiles as "machine subjects" and to claim that the latter have ousted the former since they are able to receive, process, and execute incoming information in superior fashion. Once again, this does not mean that computers are artificial human brains, or that they digitally ape specifically human ways of thinking. Rather, they optimize certain patterns of information processing that were also imposed on human beings but subsequently were mistaken to be innately human qualities. Where subjects were, there programs shall be--because programs were there in the first place.

In light of the increasingly important position media technologies occupy in his writings, it is not surprising that Luhmann's subject owes its existence, at least in part, to developments similar to those that gave rise to Kittler's media-indebted subject. In an uncharacteristically sweeping and straightforward summary Luhmann claims that at rock bottom there are only two fundamental features of society--that is, two basic evolutionary achievements--that will allow observers to clearly distinguish historical stages from each other: social differentiation and media evolution.[16] Observers may either choose to center on the differing forms of social differentiation and describe societies as segmentary, stratified, organized around a center/periphery-structure, or functionally differentiated; or they may foreground the levels of medial differentiation and distinguish, say, oral from literate societies. Given his strong aversion to causal explanations that distort the complexities of social evolution, Luhmann refuses to elaborate how exactly these two sequences interact in history. The impact of the printing press, no doubt, was involved in the switch from a stratified to a functionally differentiated social organization, just as, in turn, the evolving features of functional differentiation contributed to the switch from orality and scriptography to the typographic world. Yet neither can social differentiation be reduced to changes in the media sphere nor can media shifts be referred back to basic changes in social organization. Under these circumstances what makes the notion of the subject--or, to quote Luhmann's revealing section heading, the "escape into the subject"[17]--so interesting is that it bridges the gap between social and media-related development insofar as it represents a compensatory reaction to both.

The function of the subject may be illustrated by a short Luhmannian catechism. What does the notion of the subject imply? It implies that a "position of highest value" has been ascribed to the individual.[18] What particular feature does the individual possess that it should deserve such a generous promotion? That fact that a person is not determined from the outside and does not change with every change of social scenery, but "brings to *different* situations the *same* personality traits and thus guarantees a certain predictability."[19] Under what circumstances is this predictability or constancy especially desirable? When society evolves autonomous functional spheres (law, economics, science, etc.) which eschew the recourse to transcendental foundations and instead base themselves on the "individuality of those working within them."[20] According to this type of societal self-description the economy, for instance, operates according

to its own, exclusive laws, but the individual by virtue of its productivity remains the base unit as well as a principal integrative moment since it allows for connections to other spheres, be it law (e.g., questions of property rights), politics (e.g., questions of government intervention etc.) or science (e.g., the feedback between technology and economics). As an artefact of ascription, then, the subject has an obvious mediating function: within the confines of a philosophically embellished self-description it manages to unite what in the face of functional differentiation can no longer be united. The subject guarantees a certain amount of social cohesion and predictability of human intercourse, and it does so by paradoxically asserting that the features of self-reflexivity that make each of us a unique subject applies in equal measure to all The figure of the subject, then, has the function to "justify the inclusion of *all* into society by appealing to the self-reference of *every single* person."[21] To put it bluntly, social cohesion is based on the commonality of individual uniqueness: I am I and You are You, and that fundamentally separates us, but I relate to Myself in the same way as You relate to Yourself, and this identical feature of subjective self-reflexivity allows us to overcome the "dark inwardness"[22] of our respective consciousnesses to form a social We.

It is precisely this generalization of the concept of the human subject--the paradoxical features of which Luhmann exposes with great relish--that also occurs in the face of the spread of typography. According to Luhmann, the most far-reaching effect of the spread of the printing press was to retire the primacy of face-to-face oral exchange and to install communication over time and space as the basic "model of social rationality."[23] This, however, takes place against formidable resistance, since a lot of philosophical energy is expended in the effort to maintain, albeit on a more abstract level, the basic dynamics of interaction:

> The enlightenment still uses the interactive model as a means of orientation, that is, in final analysis it orientates itself using oral communication, but it already replaces the mutual disciplining of those present with the presupposition of an interest of reason that is feigned into (*hineinfingiert*) the individuals of the reading class. Subsequently the concept of the human is generalized. This, in turn, is surpassed by the theory of transcendental consciousness, that is to say, the paradoxical assumption that self-reference can be generalized.[24]

The subject, then , is a kind of philosophically equipped palliative designed to compensate for social as well as for communicative disjuncture brought about by the emergence of functional differentiation and the communication media, respectively. With regard to the latter, there are obvious similarities between Luhmann and Kittler. Both provide an account of the constitution of the subject within a media-historical framework by focusing on discursive practices related to the impact of the ubiquitous printing press; both take aim at attempts to enthrone the reflexive individual as the principal operator in history and human consciousness as the principal originator of messages; and in both cases the conditions that give rise to such a central position of Man-the-subject are, at least in part, technologically mediated.

2. *A farewell to communication as communion and consensus.* According to a recent account by John Durham Peters, the history of the idea of communication can be told as a manichaean tale unfolding between the opposing poles of dialogue and dissemination. Modern notions of dialogical communication from Locke to Habermas express a yearning for a "mutual communion of souls," a "fierce longing for contact with an untouchable other," that is diametrically opposed to the denial of dialogue and the suspension of reciprocity which characterizes the mediated dissemination or diffusion of messages.[25] The pivotal point is that the conceptualization of the former presupposes the latter: "Communication as a person-to-person activity became thinkable only in the shadow of mediated communication."[26] This retroactive creation of a communicative state of nature is instrumental to Luhmann's analysis of the philosophical notions that were generated in order to retain interactive features for the modeling of communication, culminating in inflated notions of subject, reason and/or self-reference. These features are then said to be apply to all humans alike and thus guarantee consciousness-based communicative coherence even in the face of communicative differentiation brought about by media technologies. The dismissal of communication as a meeting and sharing of minds, however, reaches deeper. In the case of Kittler, communication does not communicate because media do not mediate. Given the extent to which media standards rule the selection and encoding of the message (and sometimes even trigger the communicative act itself), whatever 'message' is produced turns out to be a surface effect of the media logic itself. As a result, the issues of consensus, intersubjectivity or the fusion of horizons, so important to the German hermeneutical tradition, are sidelined since these notions presuppose the communicative exchange of intentions

between two or more subjectivities, that is, they appear to ontologize media-generated cultural constructs.

In the case of Luhmann, the dismissal of communication as transmission or even consensus is related to two constituent elements of his theory: the notion of structural coupling and the break-down of communication into the triad of information (*Information*), utterance (*Mitteilung*), and understanding (*Verstehen*). As first developed by Humberto Maturana and Francisco Varela in their work on autopoietic systems, structural coupling refers to the ongoing engagement between a structure-determined system and its environment or to the recurrent interactions between two (or more) structure-determined systems. A child learning--and an adult continuing--to walk is an example of a system coupling with its environment, while a child talking--and continuing--to talk with its parents is an example of a system interacting with other systems. Language is an essential form of structural coupling since it establishes (in Maturana's term) a "consensual domain" that allows for mutual co-adaptation. The important point is that communicational behavior changes from conceptual trafficking to mutual orientation. 'Sender' A does not 'communicate' an information quantum to 'receiver' B who decodes or interprets the message according to its semantic content and/or her appreciation of A's intention. Rather, by a process of selections A produces a communicative offer which B processes on her own terms; and the more her processing resembles A's system-specific processing the more it will appear to an observer as a successful transmission of information. However, the "observed communication of meaning and the practical efficacy of language do not reside in the words and terms employed themselves but reflects similarities in the organisms' structures developed though their history of interaction."[27] Communication is not transmission; it only emerges to the extent that A's selection proposal is picked up, that its stimulation is processed by B.[28]

What does this processing entail? For Luhmann, communication comes about when its constituent units--information, utterance, and understanding--have been related to each other. Briefly put, "information" involves the What and "utterance" the How of a given statement, while "understanding" refers to the fact that the difference between information and utterance has been perceived and understood by the communication partner who may, or may not, decide to take up the communicative offer. This tripartite division resembles John Austin's classification of locutionary, illocutionary and perlocutionary speech acts. I may point out a red

light to a driver (information or locutionary component) in a tone of voice that is clearly intended to express my fear of an imminent accident (utterance or illocutionary component); relating the two to each other may enable the driver to understand what I am attempting to communicate and act accordignly (understanding or perlocutionary component). The crucial point is that the introduction of media technologies will have a direct impact on the processing of these units. In the case of oral interaction and co-presence, information, utterance and understanding tend to come, as it were, in a single package. "One cannot speak without simultaneously communicating that one is speaking and that one wants to be heard and understood."[29] Writing, however, pulls apart these constituent elements and makes it difficult to negotiate between information and utterance without the development of fairly sophisticated reading practices; television broadens the gap between information/utterance on the one and understanding on the other hand; and the computer--as we shall we see at the end--may serve to altogether erode this tripartite unity by offering an alternative to structural coupling.

Though there are obvious wide-ranging differences between Kittler's and Luhmann's approaches to communication, both take aim at the "friendly militancy" of a society that fetishizes "the liberal and emancipated idols of communication and consensus."[30] Briefly put, Kittler replaces the conventional A-to-B model that has A approach and use an information system for the purpose of transmitting a message to B with a rigorous focus on the storage and delivery system that not only structures the message but also constructs A and B as sender and recipient. Eschewing such materialities of communication, Luhmann moves in the opposite direction by foregrounding what goes on inside A and B and then conceptualizing communication as process of mutual adjustment between these internal processes. Nevertheless, their common assumptions are unmistakable: i) communication does not equal transmission; ii) communication cannot be taken for granted, it is far more improbable than probable; iii) communication does not create consensus but only the need for further communication; and iv) communication will be decisively shaped by the arrival of new media technologies.

3. *A farewell to smooth continuity*. Kittler's indebtedness to the archeological writings of Foucault resulted in his inheriting Foucault's proclivity for unexplained epistemological ruptures. Just as the focus on the episteme or the "discourse network" provocatively shifts attention away from individual authors or scientists to the discursive rules and technologies of

mediation that underlie their work, the emphasis on discontinuities is aimed at traditional notions--especially prevalent in German *Geistesgeschichte*--of cultural and intellectual continuity. Yet since it is Kittler's goal not only to extend French discourse analysis into a post-Gutenbergian present but also to ground it in the materialities of communication, his analyses of discourse networks also serve to explain the baffling change of Foucauldian epistemes by relating them either to the dissemination of new technologies or to changes in the ways in already existing technologies are implemented. Thus, the switch from the "Scholar's Republic" to the "Discourse Network 1800"--which roughly corresponds to the shift from Foucault's's "Classical" to the "Modern" episteme--is related to the fact that around 1800 the institutionalization and construction of writing changed dramatically. In turn, the switch from "1800" to "1900"--analogous to Foucault's return of language around 1900 in the shape of psychoanalysis, ethnology, and linguistics--is caused by the supersession of the monopoly of writing by the Edisonian trinity of gramophone, film, and typewriter. And which informed reader can ponder the famous wager at the conclusion of *The Order of Things* that--in consequence of some "outside event" Foucault refuses to specify--"man would be erased, like a face drawn in sand at the edge of the sea"[31] without wondering whether it is not precisely the compression of that very sand into silicon that erases the face and gives rise to a post-human(ist) techno-episteme?

If Kittler's medial apriori helps to explain specific instances of Foucault's discursive ruptures, Luhmann's association of social and media-technological evolution serves as a general framework for linking basic changes in social configurations to the introduction of new storage and communication technologies. As already pointed out, Luhmann's insistence that changes in one area cannot be reduced to changes in the other makes it difficult to understand how exactly one is to conceive of the feedback processes that link the stabilization of communication technologies as "evolutionary achievements" to social change. Within this context, one of the most crucial--and interesting--moves on Luhmann's part is the recruitment of a Darwinian evolutionary model that conceives of media technologies such as writing and typography in their early stages as "preadaptive advances" or, as Stephen Jay Gould and Elisabeth Vrba have termed them, exaptations.[32] Just as the wings of an insect, for instance, were first used as a thermoregulatory device and later as a balancing feature before being co-opted for flight, the

printing press was first designed and used as a technology for calligraphic standardization, before its exposure to market forces foregrounded its ability to produce immaculate repetitions and standardized knowledge.[33] A given feature is introduced and fulfils a given function, but in the course of environmental change the very same feature may be drastically refunctionalized. The precondition for the interaction between social forms of organization and the deployment of media technologies, then, is the ability to exploit--in unpremeditated fashion--multifunctonality over time.[34] That, however, is one of the core features not only of evolution but of the very notion of evolvability. It not only serves to remove any kind of foresight or teleological underpinning from history, it also emphasizes the degree to which Kittler and Luhmann share the notion that history must be conceptualized in terms of punctuating discontinuities, and that media technologies are fundamentally involved in bringing about and stabilizing basic social change.

4. *A farewell to 'emancipatory' theorizing.* All theory aside, many exasperated readers would agree that what really unites Luhmann and Kittler is their tendency to produce illegible or overly complex precocious prose. Luhmann has countered such complaints by asserting in Adornian fashion that in order to adequately represent the complexities of modern society the concepts have to reflect that complexity. The theorist's language cannot adhere to a didactic convoy principle that has the slowest unit--read: the most inept reader--dictate the speed.[35] As is known, similar charges have been leveled at many a German thinker, but in the case of Kittler and Luhmann stylistic objections frequently tend to slip into ideological critique. Underlying these charges brought against him Luhmann detects a tendency to associate increased abstraction--especially when based on terminological imports from the hard(er) sciences for the purpose of analyzing social phenomena--and the explicit goal to view theory a tool of description rather than as a instrument of social change, with 'conservative' or 'affirmative' theorizing devoid of progressively praxis-oriented and sociocritical value. By the same token, critics have charged that it is Luhmann's 'cool' and distanced "moral minimalism" which appears to have added to his appeal in a post-rebellious age of moral or critical hangovers.[36]

A lot could be said about the binaries structuring these accusations: about the ways in which the dichotomy of 'conservative' versus 'progressive' has been eroded since the heyday of the Frankfurt-Bielefeld debate of the early 1970s; about the ways in which Luhmann, despite

growing disdain for the "emancipatory conservatism" of the left, has indeed addressed some of the basic weaknesses of his theory pointed out by Habermas; or about the question whether Kittler's admitted paranoia concerning the new monism of silicon power is not, ultimately, politically more perspicacious than the belief that "proper" or "emancipated" use of media will liberate their emancipatory social potential. However, the fact remains that the discourse-analytical heritage behind Kittler's media theory, with his recurring gestures towards technologically informed "*Klartext,*" and the phenomenological heritage behind Luhmann's autopoietic systems theory add to the bias in favor of describing what is, rather than what could, or should, be--that is, what "is" under media-technological conditions, or from the point of a view of an observer observing self-organized and functionally differentiated systems.

If one were to link up these four points inimical to Kittler and Luhmann into a coherent narrative, the result would be a story bearing a certain resemblance to theories advocated by well-known philosophers past and present: enlightenment and emancipation come about when two or more appropriately endowed subjects engage in smooth, continuous communication. But while such common dislikes may explain why it is in particular Habermas who has been subjected to continuous attacks by poststructuralist media theorists and more stiff-lipped dismissals by Luhmann, it does not in any way show how the porcupines can move together to create their joint Hegelian theory edifice. If the Kittler/Luhmann merger project were to move beyond grandiloquent announcements and provide a first glimpse of the specifics of a future supertheory, key terms and concepts would have to be defined, related to each other, and finally integrated into a common framework. Above all, the parties involved would have to reach an understanding of what they have in common when they talk about "information, ""communication" and, above all, "media." It stands to reason, though, that this will create more difficulties.

Informed Media: Luhmann

Luhmann analyzes communication as a process of coordinated selectivity that involves the combination of information, utterance, and understanding. Unfortunately, corresponding to these three constituent elements are three types of communicative difficulty that render successful communication increasingly improbable. It is improbable that Ego will understand what Alter

means; it is improbable that Alter will reach Ego beyond the boundaries of the interaction system; and it is improbable that the communication will be successful, that is, that Ego will not only understand Alter but also engage with the communicative offer. Fortunately, all three communicative improbabilities have given rise to media designed to neutralize these difficulties; hence Luhmann's definition of media as "evolutionary achievements that enter at those possible breaks in communication and that serve in a functionally adequate way to transform what is improbable into what is probable"[37] These three media are spoken language, media of dissemination, and symbolically generalized media. Language will increase the understandability of communication beyond the sphere of perception; media of dissemination (writing, printing, and electronic broadcasting) will ensure access beyond the limited spatiotemporal sphere of interaction; and symbolically generalized media (love, truth, power, money etc.) will increase the chances of communicative success by providing persuasive means of motivation.

Rephrasing this in a more straightforward manner may serve to show that media do not only originate with reference to the particular communicative improbability they are supposed to ameliorate; media also give rise to as well as burden each other. In oral intercourse, communication and metacommunication are inevitably fused: I cannot speak to you without simultaneously communicating that I am speaking to you, and short of removing yourself from my presence it will be difficult for you to disentangle yourself from this communicative offer, regardless of whether you have anything to say or not. On the other hand, I am only speaking when I am speaking, which poses severe limits on the number of potential communication partners I can reach in time and space. This shortcoming of spoken language is compensated by media of dissemination. The drawback is that my chances of communicative success tend to be lower when I am merely dropping you a line than when I am in your face. In turn, symbolically generalized media evolve in order to supply motivational resources to communications across time and space: you will understand (in Luhmann's sense of the word) this letter, book or broadcast and act accordingly because I can punish you, because I love you, because I will give you money, or because they contain the truth.

So far, these elaborations contain little that would be unacceptable to media scientists. They may detect an unwelcome residue of a subject-centered emphasis on consciousness in the importance given to how Ego understands Alter; or they may object to the fact that symbolically

generalized media--which in their eyes belong to the level of discourse--are treated on the same level as the technological media of dissemination. The real problems--but also some of the greater promises--are related to that more fundamental concept of 'medium' that underlies Luhmann's discussion as language-as-medium, media of dissemination, and symbolically generalized media. Retrieving and modifying a distinction originally introduced by Fritz Heider between "thing" and "medium," Luhmann uses the term 'medium' as one side of a difference with 'form' on the other. This distinction, which is of course itself a form (Luhmann's theory is nothing if not self-reflexive), has far-reaching consequences that deserve close attention among media theorists.

What does this distinction entail, and what are its consequences? The difference between 'medium' (or 'medial substrate') and 'form' is said to be one between the loose and rigid coupling of elements, respectively. Loosely coupled air, for instance, cannot be heard on its own; for that to be possible it has to be processed into more tightly coupled, audible sound waves, in which case air becomes the medium and sound becomes the form. Sound, in turn, may be coupled into words, thus turning sound into the medium with linguistic meaning as its form. As a medium, light can be coupled to carry the 'form' of objects; in a Gothic cathedral, however, light itself is used as an ornament and hence becomes a form. Within the realm of literary theory this processing of forms into media for further forms is reminiscent of Russian Formalism's focus on how older literary forms become the substrate for subsequent recycling and reworking. The inevitable example is *Don Quixote*: the old tales of chivalry*,* once a form on their own, are recycled as the medial substrate of Cervantes's novel. These preliminary remarks already indicate the degree to which Luhmann has removed himself from the traditional definitions of form (despite the fact that his rhetoric of 'loose' media and 'rigid' forms continues the genderized binary of form and content). Following an excellent summary by Sybille Krämer, Luhmann's concept of form can be characterized by briefly checking off what it is *not*.[38] Luhmann is not Plato: forms are not eternal essences. Luhmann is not Aristotle: forms are not universals that apply to many particulars. Neither is Luhmann Leibniz: forms are not active, generating principles of appearance. Luhmann is not even Kant: forms are not apriori conditions of cognition. And--despite considerable similarities and filial indebtedness--Luhmann is not Husserl: form is not an idealized methodological procedure that produces objects of perception.

Against these traditional notions of form Luhmann endows the form/media distnction with three crucial characteristics. First, media and forms are not independent entities but differences; and these differences are always observer-dependent: one observer's medium may be another observer's form. Second, forms do not exhaust media; four hundred years of bulky novels notwithstanding, there is still enough language available for future processing. What does happen, in thoroughly Darwinian manner, is that certain forms become very important and are thus able to "condensate" the semantic range of future uses.[39] Third, the relationship between medium and form is contingent: media do not determine forms; whatever media we use may limit but not motivate, proscribe but not prescribe, forms. "In this fashion language for instance can be viewed as a medium that allows for a huge amount of possible utterances, but as a medium language does not determine which sentences will really be spoken and registered and remembered in the medium."[40] This third point implies that the form chosen cannot be understood as the only possible one (this would imply a non-contingent relationship between medium and form), but has to be seen against the backdrop of those not chosen. Or, translated into more formal terms, the informational content of a given system is neither measured by the actual, present connection of its elements (H) nor by all the possible connections it can assume (H_{max}) but by establishing the relationship between the two (H/H_{max}). This points toward a possible analogy between the form/medium difference and Claude Shannon's information theory, since the 'information' offered by a form must be assessed by observing the relationship between the actual and the probable rigid couplings within the limits set by the medium.

If this analogy holds true, it could act as a framework for the posthuman alliance of systems theory and media science, given that Shannon's work is central to Kittlerian media science. Indeed, Kittler himself suggested that information theory may provide the necessary common ground.[41] To understand what this proposal entails, however, requires an understanding of how information theory is worked into media science.

Informed Media: Kittler

In his contribution to the Maresch/Werber volume, Siegfried Schmidt pointed out that in current discussions the term 'medium' is inflated and ill-defined, especially among the more verbose proponents of media science.[42] This is no doubt true, but closer inspection reveals that the

principal difficulty has less to do with what media scientists like Kittler consider to be media, since the term is still used in rather conventional fashion to refer to storage, communications and sometimes transportation technologies, than with the fact that these heterogenous media tend to be treated as if they were all information media. The best way to understand this hegemony of information and information technology is to study how Kittler plots the evolution of media. It is said to be structured by two decisive breaks: first, the decoupling of interaction and communication, and second, the decoupling of communication and information, with the latter being followed by the sublation of everything that came before into information. The decoupling of interaction and communication (of pivotal importance to Luhmann) is standard fare: writing-- in particular, its mechanized dissemination--alters the basis of communication because it facilitates a spatiotemporal extension of communication beyond the physical co-presence of the communication partners. The decoupling of information and communication, however, is more difficult to grasp.

To begin with, it implies that with the arrival of telegraphy in the early nineteenth century communication is delinked from transportation. With ever more goods and people traveling ever faster it became necessary to install control technologies that--unlike the carriages and coaches that communicate physical data and humans at the same speed and along the same channel-- move data in even faster, immaterial fashion. This historical differentiation is said to be superseded by a technological dedifferentiation. Despite the fact that communication systems, as opposed to information systems, also include the traffic of goods and peoples and hence comprise all kinds of media from road systems to languages, Kittler claims that the distinction between the two has become obsolete since with the arrival of digital media the communication of information, people, and goods can be reformulated in terms of information theory:

> First, messages (*Nachrichten*), as is evident from its German etymology, are commands that people are expected to follow (*'nach' denen Personen sich zu 'richten' haben*). Secondly, as systems theory teaches, people are not objects but addresses that enable the assessment of further communication. Thirdly, as ethnology since Mauss and Lévi-Strauss has taught, goods represent data in an order of exchange between said people. But if data enable storage operations, addresses enable transmission, and commands enable data processing, then every communication system, as a link made up of these three

operations, is an information system. It depends solely on whether the three operations are implemented in physical reality to what extent such a system becomes an independent communication system. In other words, the history of these technologies comes to an end when machines not only handle address transmission and data storage, but are also able, via mathematical algorithms, to control the processing of commands. It is thus no coincidence that not until the start of the computer age, that is, when all operations of communication had been mechanized, was [Claude] Shannon able to describe a formal model of information.[43]

This paragraph would deserve close scrutiny since it includes certain basic axioms that have come to determine Kittler's recent work as well as certain argumentative shifts that are no less revealing. At this point, however, the crucial claim concerns the quasi-Heideggerian etymological invocation of "*Nachrichten*." Do all messages amount to orders? But Kittler is in fact alluding to what Warren Weaver, in his famous commentary on Shannon's mathematical theory of communication, calls the "effectiveness" problem Weaver specified that when dealing with communication problems, the technical "Level A" of information theory is concerned with the accuracy of transference of a message regardless of its meaning, while the semantic "Level B" focuses on the interpretation of meaning by the receiver. The question of effectivenes*s* or "Level C", in turn, deals with whether or not the message conveyed has led to the desired conduct on the part of the receiver. Weaver conceded that "it may seem at first glance undesirably narrow to imply that the purpose of all communication is to influence the conduct of the receiver. But with any reasonably broad definition of conduct, it is clear that communication either affects conduct or is without any discernible and probable effect at all."[44] What Weaver refers to a effectiveness, Luhmann had dealt with in terms of "success."

Weaver suspected that his readers would consider the technical level A with its narrow focus on "engineering details" to be the most superficial, since levels B and C "seem to contain most if not all of the philosophical content of the general problem of communication."[45] He was, however, quick to add that the higher levels B and C can only make use of those signal accuracies which have been deemed possible when analyzed at level A. The technical level can stand on its own, semantics and effect cannot. This subordination of "philosophical content" to engineering details is of obvious appeal to Kittler's information-theoretical materialism, not to

mention his worship of engineers and engineering.[46] But what is most striking is that Kittler's dramatized rephrasing of the effectiveness problem follows a certain logic which can be referred back to his intellectual background, in particular his indebtedness to portions of French poststructuralism. According to Shannon and Weaver, to analyze the ways in which communication affects people presupposes that one first analyze the rules of communication regardless of communicative meaning or intent. Translated into a terminology closer to Kittler's heritage: to analyze the effects of discourse presupposes the non-hermeneutic analysis of the order of discourse.

This is not to say that information theory is formalized discourse analysis, or that discourse analysis is information theory minus the formulas. Rather, the question is one of functional equivalence within each theory's own evolutionary trajectory. Bracketing all semantic issues, Shannon defined information as a statistical measure of uncertainty to be measured by the logarithm to the base of 2 of the number of available choices. As Weaver emphasized, this concept of information applies not to the individual message but to the situation as a whole: the term information in communication theory "relates not so much to what you *do* say, as to what you *could* say."[47]. Information, in other words, does not reside in the semantic dimensions of what I say, or in all I could say, but in the probabilistic relationship between the former and the latter: always keeping in mind, however, that my choices may be very limited, in which case the information is low. (If a speaker of English starts a word with the rather improbable letter q, she is all but forced to follow it with a u, in which case the information value of the q is fairly high while that of the extremely probable u is very low.) Likewise, when in the late seventies Kittler and other German poststructuralists appropriated Foucault, they emphasized that discourse analysis dealt with ensembles of statements rather than with isolated utterances; that it did not center on the (hermeneutic) question of meaning rather than on the fact that statements were made rather than not; that whatever is said had to be seen against a background of excluded alternatives; and that, finally, there are discursive regularities which determine that the selection of an individual element within a statement or an ensemble of statements will impact on the probability of the contiguous element (similar to the q/u example above, or, more generally, similar to the mechanism of a Markoff chain). Given that discourse analysis is instrumental to Kittler's attack on "[m]eaning as the fundamental concept of hermeneutics and labor as the

fundamental concept of the sociology of literature,"[48] and given that information theory, in turn, is used to dismiss media sociology or media-blind content analysis, it appears that Foucault's discourse analysis is to traditional literary scholarship what Shannon's information theory is to traditional communication theory.

But how realistic is Kittler's proposal to use Shannon's information theory as a common ground for this posthuman alliance? The information-theoretical rephrasing of the form/medium distinction appears at first glance to move the systems-theoretical approach closer to the tenets of media science, especially to Kittler's claim that the decoupling of interaction and communication facilitated by writing and the printing press has now been followed by a decoupling of communication and information, or rather a collapse of communication into information. Writing in the Maresch/Werber volume, Dirk Baecker provided the most detailed follow-up to Kittler's proposal.[49] Baecker claims that by collapsing communication into information Kittler is effectively collapsing the distinction between form and medium. By describing a medium that uses the manipulation of symbols to select, operate and transmit as well as to control its selections, operations, and transmissions, Kittler is said to threaten to turn the contingent relationship between medium and form into a causal one. If one of the most important reasons to introduce the concept of medium had been to show that communicative limitations are not only due to limitations imposed by the social environment, but also related to the materialities of communication, then Kittler is said to move to the other extreme by positing that the digital medium has become so powerful and autonomous that communicative limitations are solely due to the workings of the machine.

Baecker's assessment of Kittler, then, amounts to a rephrasing of the charge of technodeterminism in an information-theoretical guise--which, given Baecker's affinity to Luhmann, comes as no surprise. It is more productive, however, to use the Shannon connection to demonstrate the differences between Kittler and Luhmann by showing how their theories branch off from different points from the history of cybernetics.

Questionable Observers

Shannon's formalized decontextualization of information did not meet with unanimous approval among early cyberneticists. In her overview of the history of cybernetics, N. Katherine Hayles

has drawn attention to the work of Donald MacKay, who already in the early days of first-generation cybernetics proposed an information theory that would take meaning into account. As opposed to Shannon's probabilistic account of "selective information" that rigorously excludes meaning and context, MacKay introduced the idea of "structural information" which indicates how a selective information is to be understood. In effect, it is a message about how to interpret a message, a metacommunication:

> To illustrate, say I launch into a joke and it falls flat. In that case, I may resort to telling my interlocutor, "That's a joke." The information content of this message, considered as selective information (. . .) is calculated with probability functions similar to those used in the Shannon-Weaver theory. In addition, my metacomment also carries structural information (. . .) for it indicates that the preceding message has one kind of structure rather than another (a joke instead of a serous statement).[50]

If structural information amounts to metacommunication, that is, communication about how a communication is to be understood, the relationship between communication and metacommunication is similar to Luhmann's distinction between information and utterance (the 'what' and the 'how' of a statement). And just as in Luhmann's analysis 'understanding' requires observing a difference between information and utterance, structural information is yielded when the observer successfully recognizes and works with the difference between selective and structural information. But how can structural information be measured? By calculating the change it brings about in the receiver's mind, which is to say by measuring the difference between before and after she has been told that the unfunny comment she just heard was, in fact, a joke.

MacKay, then, was in effect proposing to measure communicative success (to quantify Luhmann's understanding, as it were), but this was a procedure that obviously required a third party in the shape of an observer. However, by including the observer--who obviously has a mind of her own the changes of which can only be measured by yet another observer--MacKay came dangerously close to the potentially infinite regression of self-reflexivity that first-generation cybernetics scrupulously avoided. This explains why his proposal found few followers among early US cyberneticists: "His [Mackay's] model was fundamentally different from the Shannon-Weaver theory because it triangulated between reflexivity, information, and

meaning. (. . .) [H]is conclusions qualified as radical: subjectivity, far from being a morass to be avoided, is precisely what enables information and meaning to be connected."[51] It was precisely this taking into of account of "subjectivity" in the shape of the observer as a central paradigm that distinguished the second generation-cyberneticists such Heinz von Foerster and Gregory Bateson from their first-generation forebears. Exploring the epistemological implications of including the observer was closely linked to the switch from physics to biology as the paradigm for system analysts, a development that culminated in the work of Maturana and Varela who, in turn, were of pivotal influence on Luhmann's autopoietic turn from a more 'physical' type of systems analysis to one that takes its cue form the analysis of living systems.

But this is also precisely where some of Kittler's main objections to Luhmann are located. There is no observer in Kittler's theory, no before/after in a receiver's mind that may or should be measured; above all there is no link between an observer, observer-based distinctions, and the proliferating growth of communication that feeds on itself. Indeed, Luhmann's emphasis on evolution and evolvability of communication is a mayor irritant, since it appears to be based on a "suppression" of hardware in favor of softer living systems:

> The basis of Luhmann's sociology is of course systems theory as it has been developed by biologists. Starting with actually existing inorganic systems--information technology, telephone, telegraphy, and today's digital technology--they tried to servomotorically connect these circuits to organic system using feedback loops; in this way they developed a model of organic life based on Norbert Wiener's cybernetics. But since only the soft, biological and metaphorical aspects of the electronic systems enter into Luhmann's sociology, it displays in my opinion an emphatic concept of life and mortality. While it is never used it is always present, because systems never perish but always go on evolving. To include silicon into sociology, however, would mean to also conceptualize death and the inorganic.[52]

Cybernetics' adoption of biological principles amounts to a fall from technological grace, as it were, since it places undue emphasis on biological notions of life and mortality. From Kittler's point of view, this introduces a host of factors into the realm of communication and mediation that are of secondary importance and that threaten to sideline primary concerns related to the decisive role of the observer- and consciousness-independent materialities of communication.

Indeed, it may be helpful to relate Kittler's' audible distaste for such an "evolution-prone" (*evolutionsfreudig*) systems theory to one of the major differences that separated the physics-inspired from the biology-inspired systems analysis; a difference that was already latent in the distinction between Shannon's selective and and MacKay's structural information. Hayles notes that it took some time before some of the deeper implications of the concept of structural information were fully appreciated.:

> Shannon's distinction between signal and noise had a conservative bias that privileges stasis over change. Noise interferes with the message's exact replication, which is presumed to be the desired result. The structure of the theory implied that change was deviation and that deviation should be corrected. By contrast, MacKay's theory had as its generative distinction the differences in the state of the receiver's mind before and after the message arrived. In his model information was not opposed to change; it was change.[53]

Simply put, Shannon defined information in terms of what it is, MacKay in terms of what it does; and it is this difference between homeostasis and change that reappears in the Kittler's critique of Luhmann's emphasis on evolution and evolvability.

In final analysis, then, it is futile--if not misleading--to employ the formal resemblance between Shannon's information theory and Luhmann's form/medium distinction in an attempt to establish a common ground for Kittler or Luhmann, or to use it to prove that one theory is superior to the other. What is more interesting is to show how Kittler's and Luhmann's theories are linked to first- and second-generation cybernetics, respectively, and how their differences replay within the realm of German media and communication theory some of the basic differences in the evolution of American cybernetics. In today's world, media science argues, to talk of communication only makes sense if one conceptualizes it in terms of selective information and concentrates on standardized input and circulation that effectively collapse the distinction between code, data and programme in the digital medium. Luhmann's systems theory, in turn, responds that as the basic social event communication only makes sense if observed in terms of its effective output, which presupposes specific distinctions within the very structure of communication as well as an observer that operates with these distinctions. To return one final time to the Shannon/MacKay debate, MacKay had liked to envision "[Shannon's]

selective information as choosing among folders in a file drawer, whereas structural information increased the number of drawers (jokes in one drawer, academic treatises in another)."[54] To 'understand'--in Luhmann's sense of the word--implies that one recognize how a given file and a given drawer have been combined. In Kittler's mediascape, however, all the drawers have been assimilated into one digital drawer; and the selection, processing, and addressing, of any particular file is now being undertaken by the drawer itself.

At this pont, the observer observing these theories observing each other may well ask if there are any similarities or compatibilities left that transcend common dislikes or that contain more than general assumptions about the importance of information and communication. Surely, there must be more involved for media scientists to ponder such a merger. Indeed, there appears to be one important point, or, to be more precise, a common vanishing point: the perspective of intelligent machines fundamentally reshaping evolution and society.

Theory in the Early Age of Intelligent Machines

Although aware of charges that he paid insufficient attention to the materialities of communication, Luhmann refused to include them in his analyses:

> While we, regardless of their importance, exclude the technical apparatuses, the 'materialities of communication', from the operation of communication, we include the (understanding or misunderstanding) reception. Communication only comes about when somebody sees, hears or reads--and understands to such a degree that further communication can follow from it.[55]

In an interview with Rudolf Maresch--in which the latter reiterated all the critiques raised by Kittler--Luhmann conceded that the technologizing of a communication system is a "special case" that would have to be studied on its own, but maintained that to technologize systems theory as a whole by resorting to input/output descriptions would amount to a "mistake."[56]

Nevertheless, a strangely Kittlerian scenario makes a short, fleeting appearance in Luhmann. It is more of a glimpse or a suspicion than a clear prediction, but it follows a logic that is fundamental to Luhmann's account of communicative and social evolution. As already discussed above, the impact of writing, print, and electronics is predicated on their reshaping of the basic triad of

information, utterance, and understanding. Now, however, Luhmann briefly ventures beyond this triad and suggests a veritable, though somewhat elusive, Science Fiction scenario:

> Already today computers are in use whose operations are not accessible to the mind or to communication (. . .) Although manufactured and programmed machines, such computers work in ways that remain intransparent to consciousness and communication--but which by way of structural coupling nevertheless influence consciousness and communication. They are, strictly speaking, invisible machines. To ask whether computers are machines that operate in ways analogous to the mind or whether they can replace or even surpass it, is to pose the wrong question, if not to make light of the issue. Neither does it matter whether or not the internal operations of the computer can be conceived of as communications. Rather, one will have to drop all these analogies and instead ask what the consequences will be when computers can create a fully independent structural coupling between a reality they can construct and psychic or communicative systems.[57]

At this point, Luhmann drops the ball and returns to safer grounds while the reader is left to ponder this cryptic passage. Indeed, some media scientists have perused it in order to pinpoint whether it moves Luhmann closer to Kittler, or whether it once again reveals his indifference to the technical aspects of communication

To begin with, Luhmann's insistence on dismissing all mind/machine analogies recalls Kittler's dismissal of anthropocentric substitution scenarios that have machines replace humans because (or although) they are programmed in the human image. In addition, to contemplate what will happen when computers "create a fully independent structural coupling" corresponds to Kittler's inquiry what will happen those media can fully "think and write for themselves." Finally, given the ramifications of the concept of structural coupling, Luhmann's vista can be rephrased as one in which digital media occupy the same central position in the co-evolution of society, consciousness and communication that up until was reserved for language. To a degree which dwarfs all the talk about the increasing dependence of modern societies on information technologies, computers will come to fundamentally shape society because their internal operations define what can be conceptualized as society.

Obviously, describing computers as occluded or "invisible machines" is based on an observer-dependent distinction between machines that can be understood and those that defy all

introspection. For media scientists, however, this distinction involves a rather ignorant observer, that is to say one who has not yet read Kittler's recent essays on the hardware and software. To call computers "invisible" and leave it at that is to ontologize technological distinctions between user mode and trusted mode that were installed in order to prevent "'untrusted programs' or 'untrusted users' from any access to the operating system's kernel and input/output channels."[58] Here we are back at the beginning of this essay. What is at stake for Kittler is to understand how code works, in particular, how code is employed to create so-called software designed to lull computer users into the believing that they are dealing with obedient machine slaves at the beck and call of digitally empowered masters. User-friendly machines that conceal their inhuman internal operations, in other words, allow humans to conceal from themselves that their self-description as humans rely on equally inhuman discursive processes. Hence Kittler's repeated exhortations that people study basic programming and operating languages to overcome their dependence on the software opium handed out by the industry. It is not difficult to detect a purist streak in these attacks: they amount to a kind of computer-age *sola scriptura*, a digital Lutheranism in which Microsoft takes the place of the Vatican. A good Christian needs no clerical infrastructure to achieve a connection to God; a good user needs no fancy software interface to connect to cyberspace. Just as the Catholic church peddled indulgencies and other short-cuts to salvation to keep its sheep within the flock, the software industry through "the use of keywords like user-interface, user-friendliness or even data-projection (. .) has damned humanity to remain human."[59] Even worse, not only do anthropophile computers allow humans to remain caught--like characters in an Ibsen play--in blinding dreams of humanity, the industry also creates the impression that the human state is precisely what intelligent machines suffering from Pinocchio's syndrom are striving for by spreading "the fairytale of a development of software that would become increasingly innocuous and user-friendly, more spiritual and intelligent, until one day in the not so distant future it would effectively lead to German idealism--that is, it would become human."[60]

Thus, media scientists will approve of Luhmann's analysis of the computer as an "invisible machine" only insofar as describing a computer as a black box means that the observer remains unimpressed by a software interface that appears to promise unfettered ease of access

and manipulation. Ultimately, however, it is no more than a passive observation that lets others do the real work:

> The act of opening "black boxes," of looking inside, and describing its relays, code and circuits, the sociologist leaves to engineers, technicians and media scientists. The sociologist is satisfied with observing and describing *outputs of postmodern interface culture*, that is, *surfaces, simulacra, semantics*. (. . .) In our media-based age, the sociological observer, like any other random observer, is surfing across the surfaces of prints and screens, coolly registering why that which is heard, seen or read is validated in time and turns out to be consistent and worthy of preservation, while the engineers, computer scientists, and software specialists in their laboratories are under the observation of retailers obediently programming the present and future *frames of observation and communication*.[61]

It is interesting to see how a theory that has so vociferously removed itself from class-based social analysis at times recycles a Morlock/Eloi distinction between those engaged in real work at the base and surface-based creatures that waste their time on theoretical reflections. Once again, it is necessary to point out that turning software engineers into social engineers is not without antecedents in German cultural history--just as Luhmann 'cool' withdrawal into observation has it progenitors. But for the purposes of this paper is its more important to realize that this quote by Maresch pinpoints the basic incompatibility that precludes any Kittler/Luhmann theory merger. What observer-based system theory offers, despite all the emphasis on the sophisticated communicative dynamics, remains within an instrumentalist account of technology. Whether transparent or invisible, obedient or rebellious, enabling or limiting, media remain means that are dealt with in terms of functional simplification and that only become an issue once they no longer function (in Heidegger's terms: when they are no longer ready-to-hand or *zuhanden*). But "*that* technology does *that which* it does, the *fact that* and the *ways in which* it forms, formats and sets in motion communication and formulates its modes of operation, this 'question concerning technology' is elided."[62]

Thus, media science counters what it considers to be a (Husserlian) simplification of technology with a (Heideggerian) reminder that it is a self-effacing technology which creates the conditions of its own description. To remain caught in an instrumentalist view of technology is to

fail to understand that technology, far from being a mere means toward the ends determined by an observer, defines the very ways in which means, ends and observers are defined. The computer conforms the Foucauldian suspicion of media science that information technologies, like discursive practices, are so powerful precisely because they are not noticed; and they are most powerful when they themselves define the ways in which they are noticed and evaluated. Kittler is fond of quoting Nietzsche's observation--made after acquiring an early typewriter--that "[o]ur writing tools are also working on our thoughts."[63] Those who do not accept the full consequence of this premise, however, will also refuse the self-reflexive consequence that our writing tools are working on our thoughts about our writing tools. "This is probably also why the latest varieties of systems theory simply deny, at the highest theoretical level, the finding that information systems control input and output."[64] This is a quote from Kittler's essay "Protected Mode," the essay which for some acted as an incentive to explore a possible merger between his work; it also already contained the most basic reason why the project is doomed from the outset. *In silico veritas*: the truth is not out there, it is within, inside the intelligent machines.

Conclusion

The project of fusing Kittler and Luhmann into a media-oriented, silicon-based sociological "super theory" of Hegelian scope and impact is ironic insofar as both Kittler and Luhmann, despite their repeated debunking of Hegel, have themselves been accused of harboring secret Hegelian agendas. Kittler is said to retrace the unfolding of the "media spirit" from the "Discourse Network 1800" over the Edisonian differentiation of the "Discourse Network 1900" to its digital sublation in the "DN 2000" in recognizably Hegelian fashion, while Luhmann, notwithstanding all emphasis on differentiation, is charged with continuing an "Old European" Hegelian line of thinking that has difference emanate from identity.[65] Such similarities notwithstanding, it is difficult not to conclude that the attempts to manufacture this grand theory must founder on the incompatible views of media and communication. Kittlerian media science decrees that where letters were, there subjects shall be, and where subjects were, there encoded programs will be. Systems theory responds that the connections between letters and also that between letters and programs depend on observes reacting to and catalyzing further exchange of letters and programs. In a fully digital environment media science argues, to talk of

communication only makes sense if one starts at the beginning, with the input standardization imposed by digital machines, while systems theorists respond that as a social event communication only makes sense if observed in terms of its observer-based effective output, which presupposes specific distinctions within the very structure of communication. Or, to reduce it to the shortest possible formula: in their collection, Maresch and Werber had suggested a merger in which Kittler would provide the hardware and Luhmann the software; the only problem is that Kittler, as one of his recent essays already announces with its (English) title, contends that "[t]here is no software."[66] Even the base terms--'media,' 'information,' 'communication'--do not agree. The merger attempts are bound to fail because the superficial similarities that give rise to hopes of a merger (but which are mostly tied to common dismissals) tend to get bogged down in terminological and conceptual incompatibilities. What Norbert Bolz once said about the (non)relationship between Critical Theory and poststructuralism also applies to that between media science and systems theory: the parties involved are not even capable of defining the level on which they constantly misunderstand each other.[67] In one respect, at least, Luhmann was right: the ongoing attempt to fuse his theories with Kittler proves the axiom that communication is catalyzed by the constant deferral of an always improbable consensus; for if consensus were achieved, what would there be left to communicate? The rest would be silence.

When the physicist Werner Heisenberg announced his ambitious 'world formula' or *Weltformel*, his friend, colleague, critic, and fellow Nobel laureate Wolfgang Pauli responded by circulating a piece of paper on which he proclaimed: "This is to prove to the world that I can paint like Titian." Underneath this announcement was nothing but an empty square. At the bottom, Pauli had written: "There are just a few details missing."

Notes

[1] Letter quoted in Siegfried Schmidt, "Technik--Medien--Politik. Die Erwartbarkeit des Erwartbaren," in *Kommunikation Medien Macht*, ed. Rudolf Maresch and Niels Werber (Frankfurt/M: Suhrkamp, 1999), 108.

[2] N. Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics Literature, and Informatics* (Chicago: University of Chicago Press, 1999), 3.

[3] Friedrich Kittler, *Literature, Media, Information Systems*, ed. and intr. by John Johnston (Amsterdam: Overseas Publishers Association, 1997), 133.

[4] See Kittler, *Literature, Media, Information Systems*, 162,

[5] Carl Schmitt, *Gespräch über die Macht und den Zugang zum Machthaber* (Pfullingen: Günther Neske, 1954), 15: "In front of every space of direct power there is an antechamber of indirect influences and forces, an access to the ear, a corridor to the soul of the ruler. There is no human power without this antechamber and without this corridor." The particular attraction for Kittler lies in Schmitt's modern concept of power as a quantity that has developed in close association with modern technology: "The human arm holding the atom bomb, the human brain innervating this human arm, are at the decisive moment less a part of the individual human being than a prosthesis, a part of the technological and social apparatus which manufactures and puts to use the atom bomb. The power of the individual ruler is merely the effect of a situation which results from a system of unpredictably excessive division of labor." (ibid., 25)

[6] Kittler, "Wenn die Freiheit wirklich exisitiert, dann soll sie heraus," *Am Ende vorbei*, ed. Rudolf Maresch (Vienna: Turia and Kant, 1994), 111.

[7] Kittler, *Discourse Networks*, trans. Michael Metteer, with Chris Cullens. Foreword by David E Wellbery (Stanford: Stanford University Press, 1990), 369.

[8] Michel Foucault, *The Birth of the Clinic* (New York: Pantheon, 1973), xix

[9] Geoffrey Winthrop-Young and Michael Wutz, "Translators' Introduction: Friedrich Kittler and German Media Discourse Analysis," in Kittler, *Gramophone, Film, Typewriter* (Stanford: Stanford University Press, 1999), xxii.

[10] Kittler is on record for stating that he "essentially only transferred Heidegger's concept of technology to media" (Friedrich Kittler and Stefan Banz, *Platz der Luftbrücke. Ein Gespräch*, ed. Iwan Wirth [Berlin: Oktagon, 1996], 21). For a recent link between Heidegger's language philosophy and Kittler's information-theoretical materialism see Frank Hartmann, *Medienphilosophie* (Wien: Universitätsverlag, 2000), 184-188.

[11] Kittler, *Gramophone, Film Typewriter*, 109.

[12] Bernhard Siegert, *Relays: Literature as an Epoch of the Postal System*, trans. Kevin Repp (Stanford: Stanford University Press, 1999), 1.

[13] Kittler, *Gramophone, Film, Typewriter*, 8.

[14] This particular phrasing emerged in a dialogue with Shirin Shenassa.

[15] Kittler, *Gramophone, Film, Typewriter*, 259. The quotes are from Jacques Lacan, *Ecrits. A Selection*, trans. Alan Sheridan (New York: Norton, 1977), 84-85.

[16] See Niklas Luhmann, *Die Gesellschaft der Gesellschaft*, 2 vols. (Frankfurt/M.: Suhrkamp, 1997), I: 515-516.

[17] Luhmann, *Gesellschaft der Gesellschaft*, II: 1016.

[18] Luhmann, *Gesellschaft der Gesellschaft*, II: 1066 ("Höchstwertposition des Individuums"). For a more detailed analysis see Luhmann, *Gesellschaftsstruktur und Semantik. Studien zur Wissenssoziologie der modernen Gesellschaft* 3 (Frankfurt/M.: Suhrkamp, 1989), 149-258.

[19] Luhmann, *Gesellschaft der Gesellschaft*, II: 1016 (emphasis in the text).

[20] Luhmann, *Gesellschaft der Gesellschaft*, II: 1017.

[21] Luhmann, *Gesellschaft der Gesellschaft*, II: 1025 (emphasis in the text)..

[22] Luhmann, *Gesellschaft der Gesellschaft*, I: 202. In a footnote, Luhmann identifies the phrase "finstere Innerlichkeit ihres Bewußtseins" as an ironic almost-quote of Hegel's "finstere Innerlichheit des Gedankens."

[23] Luhmann, *Gesellschaft der Gesellschaft*, I: 300.

[24] Luhmann, *Gesellschaft der Gesellschaft*, I: 300-301.

[25] John Durham Peters, *Speaking Into the Air: A History of the Idea of Communication* (Chicago: University of Chicago Press, 1999), 1, 37.

[26] Peters, *Speaking Into the Air*, 6.

[27] John Mingers, *Self-Producing Systems: Implications and Applications of Autopoiesis* (New York and London: Plenum Press, 1995), 75-76.

[28] See Luhmann, *Social Systems*, trans. John Bednarz, Jr., with Dirk Baecker. Foreword by Eva M. Knodt (Stanford: Stanford University Press, 1995), 139.

[29] Luhmann, *Gesellschaft der Gesellschaft*, I: 250.

[30] Jochen Hörisch, *Kopf oder Zahl. Die Poesie des Geldes* (Frankfurt /M.: Surkamp, 1996), 37.

[31] Michel Foucault, *The Order of Things. An Archaeology of the Human Sciences* (New York: Vintage, 1994), 387.

[32] Luhmann, *Gesellschaft der Gesellschaft*, I: 512; and Stephen Jay Gould and Elisabeth S. Vrba, "Exaptation--a Missing Term in the Science of Form," *Paeleobiology* 3 (1977): 115-151. Given that for Luhmann, just as for Darwin, the prefix "pre-" does not express foresight or teleology, it may have been better to use 'exaptation.'

[33] See Luhmann, *Gesellschaft der Gesellschaft*, I: 292. Here, as in other parts of the section on the printing press, Luhmann is drawing heavily on Michael Giesecke, *Der Buchdruck in der frühen Neuzeit. Eine historische Fallstudie über die Durchsetzung neuer Informations- und Kommunikationstechnologien* (Frankfurt/M.: Suhrkamp, 1991).

[34] Luhmann , *Gesellschaft der Gesellschaft*, I: 511.

[35] "Es ist ganz gewiß nicht möglich, die Theoriesprache nach dem Konvoiprinzip zu fahren und auf das Verständnis des Letzten zu warten." Luhmann, quoted in Walter Reese-Schäfer, *Luhmann zur Einführung* (Hamburg: Junius, 1992), 26.

[36] See Sighard Neckel and Jürgen Wolf, "The Fascination of Amorality: Luhmann's Theory of Amorality and its Resonances among German Intellectuals," *Theory, Culture and Society* 11 (1994): 69-99.

[37] Luhmann, *Social Systems*, 160.

[38] See Sybille Krämer, "Form als Vollzug oder: Was gewinnen wir mit Niklas Luhmanns Unterscheidung von Medium und Form?," *Rechtshistorisches Journal* 17 (1998), 558-573.

[39] Luhmann, *Gesellschaft der Gesellschaft,* 200.

[40] Luhmann, *Die Wissenschaft der Gesellschaft* (Frankfurt/M.: Suhrkamp, 1990), 182.

[41] Kittler, "Count Nolimetangere Down." *Symptome. Zeitschrift für epistemologische Baustellen* 7 (1991): 65.

[42] Schmidt, "Technik--Medien--Politik," 111.

[43] Kittler, "Geschichte der Kommunikationsmedien," *Raum und Verfahren*, ed. Jörg Huber and Alois-Martin Müller (Frankfurt/M.: Stroemfeld/Roter Stern, 1993), 170-171.

[44] Claude Shannon and Warren Weaver, *The Mathematical Theory of Information* (Urbana: University of Illinois Press, 1949), 97.

[45] Shannon and Weaver, *Mathematical Theory*, 97

[46] See Winthrop-Young and Wutz, "Translators' Introduction," xxxvii. For an excellent study of the German cultural imagery surrounding and occasionally glorifying the engineer see Harro Segeberg, *Literarische Technik-Bilder, Studien zum Verhältnis von Technik- und Literaturgeschchte im 19. und frühen 20. Jahrhundert* (Tübingen: Niemeyer, 1987).

[47] Shannon and Weaver, *Mathematical Theory*, 100.

[48] Kittler, *Discourse Networks*, 370.

[49] See Dirk Baecker, "Kommunikation im Medium der Information," *Kommunikation Medien Macht*, 174--191, especially 182-186.

[50] Hayles, *How We Became Posthuman*, 55.

[51] Hayles, *How We Became Posthuman*, 56.

[52] Kittler, "Wenn die Freiheit wirlich exisitiert, dann soll sie heraus," 112.

[53] Hayles, *How We Became Posthuman*, 63.

[54] Hayles, *How We Became Posthuman*, 55.

[55] Luhmann, *Die Realität der Massenmedien* (Opladen: Westdeutscher Verlag, 1995), 7.

[56] Luhmann, "Unsere Zukunft hängt von unseren Entscheidungen ab," <u>Am Ende vorbei</u>, ed. Maresch, 165.

[57] Luhmann, *Gesellschaft der Gesellschaft*, I: 117-118.

[58] Kittler, *Literature, Media, Information Systems*, 151.

[59] Kittler, *Literature, Media, Information Systems*, 157.

[60] Kittler, *Literature, Media, Information Systems*, 156.

[61] Maresch, "Die Kommunikation der Kommunikation," *Kommunikation Medien Macht*, 276 (emphasis in the original).

[62] Maresch, "Kommunikation der Kommunikation, 275 (emphasis in the original).

[63] Nietzsche, quoted in Kittler, *Gramophone, Film, Typewriter*, 200.

[64] Kittler, *Literature, Media, Information Systems*, 162.

[65] See Thomas Steinfeld, "Diskursive Handgreiflichkeiten. Friedrich A. Kittlers Geschichtsphilosophie der Medientechnik," *Merkur* 43:5 (1989), 429-435; and Gerhard Wagner,

"Am Ende der systemtheoretischen Soziologie. Niklas Luhmann und die Dialektik," *Zeitschrift für Soziologie* 23 (1994), 275-291.

[66] See Kittler, *Literature, Media, Information Systems*, 147-155.

[67] Norbert Bolz, *Am Ende der Gutenberg-Galaxis. Die neuen Kommunikationsverhältnisse* (Munich: Fink, 1993), 59.