

Theory of a Different Order: A Conversation with Katherine Hayles and Niklas Luhmann Author(s): Katherine Hayles, Niklas Luhmann, William Rasch, Eva Knodt and Cary Wolfe Source: *Cultural Critique*, No. 31, The Politics of Systems and Environments, Part II (Autumn, 1995), pp. 7-36 Published by: <u>University of Minnesota Press</u> Stable URL: <u>http://www.jstor.org/stable/1354443</u> Accessed: 16/02/2015 02:18

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at http://www.jstor.org/page/info/about/policies/terms.jsp

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.



University of Minnesota Press is collaborating with JSTOR to digitize, preserve and extend access to Cultural Critique.

http://www.jstor.org

Theory of a Different Order: A Conversation with Katherine Hayles and Niklas Luhmann

This discussion was conducted on September 21, 1994, at the Institute for Advanced Study at Indiana University, Bloomington, where Niklas Luhmann was a guest Fellow for two weeks during the month of September. Both Luhmann and Katherine Hayles were participating in a conference at the university later that week, organized by William Rasch and Eva Knodt, entitled "Systems Theory and the Postmodern Condition." As a basis for discussion and exchange, Hayles reviewed in advance Luhmann's essay "The Cognitive Program of Constructivism and a Reality That Remains Unknown," and Luhmann likewise reviewed Hayles' "Constrained Constructivism: Locating Scientific Inquiry in the Theater of Representation." The conversation was organized and moderated by William Rasch, Eva Knodt, and Cary Wolfe.

Cary Wolfe: I'd like to begin with a general question. In your different ways you have both explored a second-order cybernetics approach to the current impasse faced by many varieties of cri-

^{© 1995} by Cultural Critique. Fall 1995. 0882-4371/95/\$5.00.

tique. And that impasse, to schematically represent it, seems to be the problem of theorizing the contingency and constructedness of knowledge without falling into the morass of relativism (as the charge is usually made) or, to give it a somewhat more challenging valence, without falling into philosophical idealism. You both have worked on this, and I'm wondering if each of you could explain, in whatever order you'd like, what makes second-order theory distinctive, and how it might help move the current critical debates beyond the sort of realism versus idealism deadlock that I've just described.

Katherine Hayles: Would you care to go first?

Niklas Luhmann: OK. Well, I reduce the general term "secondorder" to second-order observing, or describing, what others observe or describe. One of the distinguishing marks of this approach is that we need a theory of observation which is not tied to, say, the concept of intelligence, the mind of human beings, but a more general theory of observation that we can use to describe relations of social systems to each other, or minds to social systems, or minds to minds, or maybe bodies to neurophysiological systems, or whatever. So, it needs to be a general theory of observing-and I take some of these things out of The Laws of Form of George Spencer Brown-to think of observing as an operation that makes a distinction and is then bound to use one side of the distinction, and not the other side, to continue its observations. So we have a very formal concept of observation. And the problem is then, if you link different observing systems, what can be a cause of stability, how can-in the language of Heinz von Foerster and others-eigenvalues, or stable points or identities, emerge that both sides of a communication can remember? And I think this is the idea which goes beyond the assumption that relativism is simply arbitrary: every observation has to be made by an observing system, by one and not the other, but if systems are in communication then something emerges which is not arbitrary anymore but depends on its own history, on its own memory.

KH: For me, second-order theory would be distinct from firstorder theory because it necessarily involves a component of reflexivity. If you look at first-order cybernetics, it's clear that it has no really powerful way to deal with the idea of reflexivity. In the Macy conference transcripts, reflexivity surfaced most distinctly in terms of psychoanalysis, which was threatening to the physical scientists who participated in the Macy conferences because it seemed to reduce scientific debate to a morass of language. When they would object to Lawrence Kubie's ideas, who was the psychoanalyst there, he would answer with things like "Oh, you're showing a lot of hostility, aren't you?" To them, that was almost a debasement of scientific debate because it kept involving them as people in what the conference was trying to do. As Steve Heims's book makes clear, there were strong voices speaking at that conference in favor of reflexivity-people like Gregory Bateson and Margaret Meadfrom an anthropological perspective. But because reflexivity was tied up with psychoanalysis and the complexities of human emotion, it seemed to most people at the Macy conferences simply to lead to a dead end. When Maturana and Varela reconceptualize reflexivity in Autopoiesis and Cognition, they sanitize reflexivity by isolating the observer in what they call a "domain of description" that remains separate from the autopoietic processes that constitute the system as a system. I think Prof. Luhmann's work is an important refinement of Maturana's approach, because he has a way to make the observer appear in a non-ad hoc way; the observer enters at an originary moment, in the fundamental act of making a distinction. Nevertheless, I think that the history I've just been relating is consequential-the point that you can get to is always partly determined by where you've been. The history of second-order cybernetics is a series of successive innovations in which the taint that reflexivity acquired through its connection with psychoanalysis has never completely left the theorizing of the observer as it appears in that tradition. This is quite distinct from how reflexivity appears in, say, the "strong program" of the Edin-burgh School of Social Studies of Science, where they acknowledge that the act of observation is grounded in a particular person's positionality.

Reflexivity has been, of course, an ongoing problem in both science and the history of science. When reflexivity enters relativity theory, for example, it has nothing to do with a particular person's personality, cultural history, or language; it has only to do with the observer's physical location in space and time. Relativity theory is not reflexive; it is only relative. To try to arrive at a theory of reflexivity which would take into account the full force of the position of the observer, including personal history, language, a culture, and so forth, has been, I think, a very important and extremely difficult problem to solve. To me, it's essential to talk about the observer in terms that would take account of these positional and locative factors as well as the theoretical question of how it is that we can know the world.

CW: To what extent do you think that, in their recent work, Maturana and Varela have tried to move in this direction? I'm thinking now of the collaboration of Varela, Thompson, and Rosch in *The Embodied Mind*, but more broadly of the whole concept of embodiment in second-order cybernetics, which has certain affinities with Donna Haraway's work on this problem, which is very much in the register that you were emphasizing. I'm thinking, too, of the explicit derivation of an ethics at the end of *The Tree of Knowledge* from second-order cybernetics. To what extent, then, do you see much of this work moving in that direction? And is it moving in the way that you would like?

KH: You know, it's difficult to try to coordinate all these works, because they seem to me all significantly different, maybe because I'm geared to thinking about texts, and therefore about the specific embodiment of these ideas in the language they use. But to compare just for a moment Autopoiesis and Cognition with The Tree of Knowledge: In the latter the authors write for a popular audience, and in the process the work changes form. It goes from an analytical form into a circular narrative. And with that shift come all kinds of changes in their rhetorical construction of who the observer of that work is, as well as of themselves as observers of the phenomena that they report. In this sense, The Tree of Knowledge is more positioned. But it does not solve a problem also present in Autopoiesis and Cognition-that is, using scientific knowledge to validate a theory which then calls scientific knowledge into question. I'm thinking here specifically of "Studies in Perception: Reviews to Ground a Theory of Autopoiesis." Autopoiesis leads to a theory of the observer in which there is no route back from the act of observing to the data that was used to generate the theory in the first place. The problem is exacerbated in *The Tree of Knowledge*. Even as they move from a "domain of description" to a more capacious idea of a linguistic realm in which two observers are able to relate to each other, there arise other problems having to do with the work's narrative form.

William Rasch: What is your reaction to this?

NL: Well, there are several reactions. One is that I have difficulties, regarding the later work, comparing Maturana and Varela. Maturana advanced in the direction of a distinction between the immediate observer and the observer who observes another observer. The "objective reality" is that there are things, or niches, which are not reflected in the immediate observer's boundaries. But on the other hand, if you observe that observer, then you see how he or she sees the world by making this distinction. But the limit of this type of thought is the term "autopoiesis" itself as a system term. Autopoiesis was another term for circularity; that was its beginning. Maturana talked about cells in terms of circular reproduction and then, after some contact with philosophers, used autopoiesis," finding the Greek term more distinctive. But there remains in Maturana the idea that circularity is an objective fact, and so the problem of self-reference is not really confronted in the theory—not in the sense of, for example, the cyberneticians who would say that a system uses its output as input and then becomes a mathematical cosmos with immense amounts of possibilities which cannot be calculated anymore, as in Heinz von Foerster or Spencer Brown's discussion of a "re-entry" of the distinction into the distinguished. And there are, within these more mathematical theories, possibilities which are not visible, I think, in the writings of Maturana and Varela. They are too empirically tied to biology. And then of course we have always this discussion of whether one can use biological analogies in sociology or in psychology or not, which doesn't lead anywhere.

WR: I have a question. Prof. Luhmann, you said that you wanted to find a definition of observation that is on a very formal basis, that does not only apply to consciousness, but to systems of all

sorts. When you, Prof. Hayles, talked about observation, the sense of an individual came out more because you were talking about the person's locality, the observer's situation. Do you have a sense that observation is tied strictly to consciousness? Or is observation also for you a more formal definition that can be applied to systems other than consciousness?

KH: For me, observation is definitely tied to consciousness. In Prof. Luhmann's article "The Cognitive Program of Constructivism and a Reality That Remains Unknown," you have a paragraph where you're talking about the observer, and you list a series of things like a cell, a person, and so forth. On my own copy of that article I put a big question mark in the margin: can a cell observe? Of course, I realize that it's partly a matter of definition, and you're free to define the act of observation however you want. But, for me, a cell could not observe in the way I use the term.

Eva Knodt: Could you maybe clarify . . .

WR: Let's let Prof. Luhmann clarify how a cell can observe.

NL: Well, it makes distinctions. It makes a distinction with input/ output, what it takes in or what it refuses to take in, or a distinction about its own internal reproduction, to do it in a certain way and not in another way. I'm not sure whether making distinctions implies the simultaneity of seeing both sides, or whether it is just discrimination. The immune system discriminates, of course, but does it know against what it is discriminating? And if you require for a concept of observing that you see both sides simultaneously, and the option becomes an option against something, then I would not say that cells are observing or immune systems are observing. They just discriminate. But for me this is not very important. It would be very important for Maxwell's Demon, for example, that he can distinguish-or it, whatever it is, can distinguishwhat belongs on which side. But it is hardly thinkable for us, because we are always using meaning in constructing reality. So the problem is to think of distinction, of observation, without the idea of seeing out of the eyes, out of the corner of the eyes, the other thing which we reject or give a negative value. So we, psychologically and socially, use the idea of meaning, so that "observing" becomes a distinct characteristic. And there is a question, of course, of whether we should extend it. But this is I think a terminological . . .

EK: I have a follow-up here, because I also was puzzled in the beginning when I started reading your work about this use of observation, and how it is different from this metaphorical idea that one thinks one sees with the eyes. It's very hard to separate oneself from it. Where exactly do you see the advantage of widening this concept of observation to an extent that it is no longer located in consciousness?

NL: For me, the advantage is to make possible a kind of interdisciplinary commerce, a kind of transference of what we know in cybernetics or biology into sociology or into psychology. Saying that there are very general patterns which can just be described as making a distinction and crossing the boundary of the distinction enables us to ask questions about society as a self-observing system. What happens in a self-observing, self-describing system? This is not only a question for conscious systems. I mean, there are five or more billion conscious systems, and you cannot make any theory of society out of adding one to another or dissolving them all into a general notion like the transcendental subject. But you can make some headway, perhaps, by using the formal idea of observing, and of making distinctions, to understand a system that has a recursive practice of making distinctions and guiding its next distinctions by previous distinctions, using memory functions, and all this. There are formal similarities between psychic systems and social systems, and this is for me important in trying to write a theory, a social theory, of self-describing systems, in particular of society.

WR: Shall we move on to a topic that is perhaps broached more directly in the two articles, and that is the topic of reality? Based on your reading of each other, how would each of you distinguish your notions of reality from the other? Both of you use the term "reality," and yet strict realists would not recognize the term as each of you use it. But how do you observe each other using the term "reality"? Either one of you start.

KH: I'll be glad to start. In Prof. Luhmann's article I alluded to before, the sentence that I found riveting was this: "Reality is what one does not perceive when one perceives it." It was when I got to that sentence that I thought I was beginning to grasp his argument, because I fully agree with that, with one important reservation. I, too, agree that whatever it is that we perceive is different, dramatically different, than whatever is out there before it is perceived. If you want to call what is out there before it is perceived "reality," then we do not perceive it, because the act of perception transforms it. Where I would differ is with the distinction between reality and nonreality, the binary distinction which he uses so powerfully in a theoretical way. I am concerned about a fundamental error that has permeated scientific philosophy for over three hundred years: the idea that we know the world because we are separated from it. I'm interested in exploring the opposite possibility, that we know the world because we are connected to it. That's where I would distinguish the approach I take. It is not really even a disagreement; it's more a matter of where you choose to put the emphasis. Do you choose to emphasize the interfaces that connect us to the world, or do you choose to emphasize the disjunctions that happen as distinctions are drawn?

CW: Prof. Luhmann, I imagine you would like to respond . . .

NL: This formulation has a kind of ancestry, and in former times was associated with the idea of existence, with the idea, to put it another way, that I see trees, but I don't see the reality of trees. And if reality refers to *res*, and *res* is the thing, then you have visible and invisible things—and that's the world. In this philosophical tradition, the problem simply was not possible to formulate. But the formulation that reality is what you don't see if you see something can be phrased in different ways. And one of these other possibilities is to say that reality emerges if you have inconsistency in your operations; language opposes language, somebody says "yes," another says "no," or I think something which is uncomfortable given my memory, and then you have to find the pattern of resolution. Reality is then just the acceptance of solutions for inconsistency problems, somewhat as, in a neurophysiological sense, space is just produced by different lines of looking at it, by internal confusion and then a solution to the internal confusion, which is in turn produced by memory that could not remember if it could not make differences in time. I am here now, but before I was in the hotel, and before that I was in the restaurant, and were this everything at the same moment, then I could not have any kind of memory. So time is real because it tries to create consistency and solve inconsistency problems. And this explains why reality is not an additional attribute to what you see, but is just a sign of successful solutions. This also helps us to see the historical semantics of reality. For example, "culture" at the end of the 18th century is a term which is able to organize comparisons-regional ones (French, German, and so on, or Chinese or European) and historical ones—so that there is a new pattern, some striking insight that is possible because the compared things are different. And "reality," as a result of functional comparisons, is just this kind of insight. You needn't have a more abstract notion of culture or identity or society, or whatever, to be able to handle contradictions which otherwise would obstruct your cognition.

CW: Let me just ask, for clarification, is this reality to which you are referring here different from the reality which is a kind of a creation or accumulation of what you elsewhere call *eigenvalues*, or is that in fact what you are describing?

NL: No, I think that is just another formulation.

CW: OK, all right. I'd like to come back to something you said, Prof. Hayles, and ask you about this issue of connection versus separation that you're interested in. One of the things that's distinctive to me about second-order cybernetics—its central innovation, I think—is that it theorizes systems that are both closed *and* open: in Maturana and Varela, the attempt to theorize closure on the level of operations or organization, but openness to the environment on the level of structure. So, in a sense, isn't that a theory of self-referential systems which are nevertheless connected to the reality in which they find themselves?

KH: Well, for Maturana and Varela, systems are connected by structural coupling. What that gets you in explanatory power is a

way to explain the plasticity of systems and changes in structure. Where I have a fundamental difference with Maturana and Varela is in their assumption that there is no meaningful correlation between stimuli that interact with receptors and information that the receptors generate. This may finally come down to religious dogma: I am of one faith, and they are of another. I have studied the articles on perception which Maturana and his co-authors published on color vision in humans and on the visual system of the frog. I do not believe the data support his hypothesis that there is no correlation between inside and outside. It was a bold and courageous move to make that assumption, because it allowed them to break with representation and to avoid all of the problems that representation carries with it. It did get them a lot of leverage. But it's one thing to say there is no correlation, and another to say that the transformations that take place between the perceptual response and outside stimulus are transformational and nonlinear. The latter, I believe, is more correct than the former. I think it's important to preserve a sense of correlation and interactivity. This is primarily where I differ from them.

WR: I will follow up, and then maybe both of you could comment. You mentioned before that where you had differences with Prof. Luhmann's work was with the assumption that knowledge of the world is attainable because of separation from the world. If now you're saying that there is some way of thinking of a correlation between an outside and an inside, doesn't that ontologize separation from the world, and doesn't that get you back into what you were trying to get out of—that is, the idea that we can only know the world because it is outside of us and it has causal effects on us through sensory perception? Doesn't that solidify the inside/outside distinction? Why not talk instead about closure and knowledge coming from the inside, where the inside/outside distinction is made in the inside, and there is thus a more fluid relationship between the two, where you know the world because you are the world?

KH: Well, if you allow the distinction to fall into an inside/outside, as it certainly can, then you're back essentially to realism in some form and also representation. What I was trying to do in my article

on constrained constructivism was to move the focus from inside/ outside into the area of interaction, where inside and outside meet. That precedes conscious awareness, but it is in my view an area of interaction in which, precisely, a correlation is going on between stimuli and response. So . . .

EK: Could you elaborate a bit? I have a problem here because you said a little earlier that whether or not you accept the idea of closure comes down to dogma or faith, and now you're referring to some observations that seem to confirm the model that you're proposing. Could you say a little bit more about what kind of evidence leads you to your particular choice?

KH: If we start from the frog article of Letvin and Maturana, which was the beginning for Maturana, what the article concludes (this is a near quotation) is that the frog's eyes speak to the frog's brain in a language already highly processed. It does not, however, show that there is no correlation between the stimuli and the response.

EK: Yes, but what is the status of this correlation? I mean, that's what the observer constructs as the frog's reality.

KH: Yes, that's right—that is, what is constructed is the frog's reality.

EK: From the human point of view.

KH: Yes. From the experimental point of view, to be more precise.

NL: But then you have the question: Who is the observer? If it is a scientist, he or she can make theories and can see correlations, but if it's a frog itself, then things are different. Maturana talks about structural couplings and so on, but the frog as such constructs his reality as if it were outside, to solve internal conflicts. So, in this sense, the question is, why does a closed system like a brain need a distinction inside/outside to cope with its own problems, and why does it construct something outside that external-

izes the internal problems of the workings of the brain, just to order his world, in which he himself is, of course, given?

WR: Can I follow up on that? This brings us to the notion of consistency, which Prof. Hayles talks about in her article. And if I understand that correctly, the fact is that each one of us in this room would probably open that door to try to walk out of this room. We're all constructing the world based on internal contradictions, but it all happens to be the same world with reference to this room and these five people. How is that possible?

NL: Well, I think it would be—to take an example from the article of Prof. Hayles—that if we jump out of the window we would contradict our own memory. We have never seen someone stop before they hit the ground, so we simply sort out our contradictions, as long as it is not necessary to change it, within the old pattern. So we go through the door and take the elevator, and this is reality as a solution of formal contradictions. Maybe we try once to jump from too high a place, but we never see apples or something stopping in the middle of the fall.

WR: So it's strictly experiential?

NL: It is just the solution of an internal conflict of new ideas or of variations within your memory.

WR: So, in a sense, you both believe in constraints. If I understand you correctly now, Prof. Luhmann, you would phrase constraints in terms of internal operations, especially memory, in this case. How do you, Prof. Hayles, see the constraints that would prevent us from walking out of this window or trying to walk through that door? If you don't want to be a realist, and say because it's a door, or because of gravity, how do you define what the constraints are?

KH: Well, the way I think about it is that "reality" already carries the connotation of something constructed, so I prefer to use the term "unmediated flux." The unmediated flux is inherently unknowable, since by definition it exists in a state prior to perception.

Nevertheless, it has the quality of allowing some perceptions and not others. There is a spectrum of possibilities that can be realized in a wide range of different ways, depending on the perceptual system that's encountering them, but not every perception is possible. Therefore, there are constraints on what can happen. We can all walk out the door together because we share more or less the same perceptual system—more importantly because we share language, which has helped to form our perceptual systems in very specific ways.

WR: How does that differ from memory as Prof. Luhmann described it? In other words, I'm being very devious here in trying to coax the word "physical" out of you. How can you describe what you're describing without using the term "physical constraints"? Or are the constraints strictly in the way the brain is structured?

KH: I believe there are constraints imposed by our physical structure; I have no doubt of that. I think there are also constraints imposed by the nature of the unmediated flux itself.

WR: What one would conventionally call the actual physical structure of the unmediated flux?

KH: Yes, that's right.

NL: Then, if you use for a moment the idea that reality is tested by resistance—that's Kant—how can you have external resistance if you cannot cross the boundary of the system with your own operations? You cannot touch the environment with your brain, and even if you touch it you feel something here [points to his head] and not there, and you make an external reality just to explain that you feel something here [points again] and not in other places on your body. So, finally, it's always an internal calculation; otherwise, you should simply refuse the term "operational closure." But if we have operational closure, we have to construct every resistance to the operations of a system against the operations of the same system. And reality then is just a form—or, to say it in other terms, things or objects outside are simply a form in which you take into account the resolution of internal conflicts. **EK:** If that model holds, can you account for the historical emergence of this idea that there is, and ought to be, a difference between the reality as unmediated flux—what we do not perceive when we perceive—and the world of objects that we encounter in everyday life. I mean, does this idea itself have a similar function?

NL: I'm not sure . . .

EK: Starting with Kant, we find the distinction between the unknowable noumena and phenomena, where you locate some sort of reality outside and then you talk about constructed phenomenological reality. Could one apply this idea that you just mentioned that reality has the function of neutralizing contradictions—to account for the emergence of this historical distinction?

NL: The emergence of this kind of internal distinction between inside and outside is even earlier. A system makes a distinction because it couples its own operations to its environment over time and has to select fitting operations, or it simply decays. Then, if it makes such a distinction, it has no way to handle the environment except by reconstructing or copying the difference between system and environment into the system itself, and then it has to use an oscillator function to explain to itself something either as an outcome of internal operations or as the "outside world." In Husserl, it's clearer than in Kant that you have noesis and noema, and you have intentions, and you can change between the two and put the blame on your own thinking or be disappointed with the environment. And to explain how our system copes with this kind of distinction, instead of just checking out how it is out there, we need an evolutionary explanation of how systems survive to the extent that they can learn to handle the inside/outside difference within the system, within the context of their own operation. They can never operate outside of the system.

WR: Do you have a response?

KH: This is not really so much a response to the thought that Prof. Luhmann was just developing as a more or less independent comment. For me the idea of closure as reproduction of the organ-

ization of the system is perfectly acceptable. It seems like a wonderful insight. But I don't share the feeling Maturana and Varela have that organization is a discrete state. According to them, if a system's organization changes, the system is no longer the same system-it is a different system if its organization changes. It seems to me that organization exists, on the contrary, on a continuum and not as a discrete state. Consider for example evolution, in which all kinds of small innovations and mutational possibilities are tried out in different environments. It's problematic when these mutational possibilities constitute a new species. Drawing distinctions between species is to some extent arbitrary, especially when there is an extensive fossil record. There are many instances in contemporary ecologies where it is impossible to say if an organism falls within the same species or constitutes a different species. Clearly the organizational pattern of that system has changed in a substantive way, enough to allow one to make a distinction, but the change falls along a spectrum. It is not black and white-either no change, or a completely different system. While it's an important insight to see that the living is intimately bound up with the reproduction of a system's organization, I don't see that it's necessary to insist there is a definitive closure in what constitutes an organization.

CW: The way I read Maturana and Varela's point is in a more cognitive or epistemological register, which is to say that if you observe something, you either call it X or not-X, X or Y, and that to cognize *at all* is to engage in the making of that distinction. Your description, it seems to me, is talking as if all these things are going on out there in nature, and then the question is, do our representations match up with them or not? That seems to me to be the pretty strongly realist and representationalist premise of the scenario you just described.

KH: Yes, but in this I don't differ in the least from Maturana and Varela, who are constantly using arguments based on exactly the kind of natural history case studies that I just mentioned in order to demonstrate the closure of the organism. I grant your point, that I'm assuming there is some way to gain reliable knowledge about these things. And of course it's always possible to open up scientific "facts"—or, as Bruno Latour calls them, "black boxes"—

and bring them into question again. But one has to argue from some basis.

WR: Can I ask you, Prof. Luhmann, about your black box? In a sense, your black box is operational closure, beyond which you will not go. You do not want to dispense with it; it's the fundamental element of your system or your theory. As we discussed before, if we are talking about leaps of faith, that's your leap of faith. What is at stake in retaining operational closure? Why is it so important for your theory?

NL: Certainly, in sociological theory, or in social theory in general, you have the problem of how to distinguish objects or areas of, say, law, the economy, and so on. You can say that the economy is essentially coping with scarcity, or something like this. And to avoid these kinds of essentialist assumptions, I try to say that the law is what the law says it is, and the economy is just what the economy in its own operation produces out of itself. This is, I think, the alternative, in which I try to opt for a tautological definition. And then I'm obliged to characterize how the operations of the system-say, communication as the characteristic operation of society-follow a certain binary code, like legal versus illegal, to be able to reproduce, say, the legal system. Recursive decision-making reproduces an organization. But then I have this problem: I do not share the opinion of Maturana and Varela that outside relations are cognition, that you have already a cognitive theory if you say "operational closure." Maturana and Varela present structural coupling, structural drift, and these terms as cognitive terms. But I would rather think that a system is always, in its operation, beyond any possible cognition, and it has to follow up its own activity, to look at it in retrospect, to make sense out of what has already happened, to make sense out of what was already produced as a difference between system and environment. So first the system produces a difference of system and environment, and then it learns to control its own body and not the environment to make a difference in the system. So cognition then becomes a secondary achievement in a sense, tied to a specific operation which, I think, is that of making a distinction and indicating one side and not the

other. It's an explosion of possibilities, if you always have the whole world present in your distinctions.

WR: OK, maybe we should move on to the topic of negation. Could you summarize for us, Prof. Hayles, your use of the semiotic square in your notion of double negation in your article on constrained constructivism?

KH: I don't know how to give a short answer to this, so I'll have to give the long answer.

WR: Good.

KH: As I understand Greimas's work, he developed the semiotic square in order to make simple binaries reveal complexities that are always encoded in them but that are repressed through the action of the binary dualism. The idea is to start with the binary dualism and then, by working out certain formal relationships, to make it reveal implications that the operation of the binary suppresses. To give you an example, consider Nancy Leys Stepan's article about the relation between race and gender in physiognomic studies in the late 19th and early 20th centuries; Stepan notes the circulation within the culture of expressions like "women are the blacks of Europe." To analyze this expression, consider a semiotic square that begins with the duality "men and women." What implications are present in that duality which aren't fully explicit? Some of those implications can be revealed by putting it in conjunction with another duality, white/black. By using the semiotic square and expanding the men/women duality, it is possible to demonstrate, as Ronald Schleifer and his co-authors have done, that "men" really means "(white) men" and "white" really means "white (men)." By developing formal relationships of the semiotic square, one can make the duality yield up its implications. It is important to remember that there is no unique solution to a semiotic square. Any duality will have many implications encoded into it, connotations which are enfolded into that duality but which are not formally acknowledged in it. So there are many sets of other dualities that can be put in conjunction with the primary one. If they're doing the work they should do in a semiotic square, each

second pair would reveal different sets of implications. This is a preface to explain what I think the semiotic square is designed to do. Beyond this, the semiotic square is formally precise. It is Greimas's hypothesis that there are certain formal relationships that dictate how dualities develop. So it's not arbitrary how the relationships within the square are developed.

In the semiotic square I used, I wanted a binary which is associated with scientific realism: true and false. If a hypothesis is congruent with the world it's true. Popper argued that science cannot prove truth, only falsity. According to him, a hypothesis must be falsifiable to be considered scientific. The true/false binary is rooted in scientific realism. In order to have the "true" category occupied, you have to be in some objective, transcendent position from which you can look at reality as it is. Then you can match your hypotheses up with the world and see if the two are congruent. Thus the true/false binary comes directly out of realist assumptions. The binary I proposed to complicate and unravel the true/ false dichotomy with was "not-false" and "not-true." I claim that the "true" position cannot be occupied because there is no transcendent position from which to say a hypothesis is congruent with reality. The "false" position can be occupied, because hypotheses can be falsified, as Popper argued. More ambiguous is the "notfalse" position. This position implies that within the realm of representations we construct a hypothesis is not inconsistent with the unmediated flux. Notice it is not true, only consistent with our interactions with the flux. Even more ambiguous is the "not-true" position; it represents the realm of possibilities which have not been tested, which have not even perhaps been formulated, and which may never be formulated because they may lie outside the spectrum of realizable experiences for that species. It is this position on the lower left of the square, the negative of a negative, that is more fecund, for it is the least specified and hence the most productive of new insights. Hence Shoshana Felman's phrase for it, "elusive negativity."

CW: It's very important to you, it seems to me, to insist that those other possibilities that are opened up are not solely possibilities dependent upon the context of inquiry. This goes back to what you were talking about earlier with the unmediated flux containing or

acting as a constraint, a finite set of possibilities—that's what these constraints finally are. So it's important to you to insist, versus say Maturana, that these unfolding possibilities do not tell us only about the *context* of inquiry, but about the *object* of inquiry. Would that be fair to say?

KH: Yes. That would be true to say.

WR: What is your reaction to the schema?

NL: Well, again, a long one. The first is that I would distinguish between making a distinction and positive/negative coding, so that negation comes into my theory only by the creation of language, and with the special purpose of avoiding the teleological structure of communication, its tendency to go by itself to a fixed position, to a fixed point, to a consensus point. So, if we have a situation in which every communication can be answered by "yes" or by "no"-I accept or I reject your proposal-then every selection opens again into either conformity or conflict. So, negation in this sense comes into my theory of society only by coding language, or doubling language so to speak, in a "yes" version and a "no" version. And of course it is important that you have the identity of the reference, the possibility to say "yes" or "no" to the same thing, and not to something else. I say "this is a banana," and you can say "yes" or "no," but if you think that maybe it is an apple, then you have to make a distinction to talk about this. So this concerns negation. But I have also, independently of this, thought about an open question concerning distinction: distinction from what? And there are in principle, I think, two possibilities: distinction of an object from an unmarked space, from everything else (again, this is not a glass of wine, and not a tree, and so on). So, one type of distinction is that you create an unmarked space by picking out something. But then there is another type of distinction where you can cross the boundaries-male/female, for example, or in this example, true/false. And then you can oscillate between the two, and say, well, this is a job for a man or a job for a woman, this is good or this is bad, this is expensive, given our budget, and so on. But if you can indicate both sides by this distinction, then you also create by this very distinction an unmarked space, because then you

can change from the distinction true/false to the distinction good/ bad. Or to the distinction male/female. And then you can make a kind of correlation or coupling between different distinctions. But this always creates the world, creates an unmarked space, a kind of thing which you cannot indicate. Or if you indicate the unmarked space, then you have two marks, marked and unmarked.

WR: Then you'll have another unmarked space ...

NL: Yeah, yeah, then you create another unmarked space beyond this distinction. And if I look at this four-fold scheme of Greimas's, I think that first it is quite clear that false/true is a specifiable distinction, specifiable on both sides. You can give arguments for true and you can give arguments for false, and you can have true arguments that something is false and false arguments that something is true. In this sense, it is complete. But then, when you make this distinction you also specify the unity of this distinction-which is, I would say, the code of science—and then you do not use, say, a political code (powerful or less powerful), or the gender code, or the moral code, or the legal code, or the economic code, or whatever. And when I look at this enlargement, I wonder whether it would be possible to say that indeed the false/true distinction is not a complete description of the world, that it leaves out the unmarked space, or it leaves out what you do not imagine, what you do not see, what you do not indicate, if you operate within this kind of framework. And this is important for my theory of functional differentiation, because if I identify codes and systems, then of course I need always a third value or third position: the rejection of all other codes. So, if I am in the legal code, then I am not in the economic code; the judge doesn't make his decision according to what he is paid for his decision . . .

CW: Sometimes! [general laughter]

NL: Well, yes, but then that's a problem of functional differentiation. And if I look at Greimas's table with its four positions, I think first that the lower line, the "not-true" and "not-false" line, is simply representing the unmarked space. Then I would change the positions; in other words, I would make the distinction between "false" and "not-false." "False" is something which is verified as "false"; "not-false" is everything else. Or "true" and "not-true." I don't know whether this makes any sense, but the essential point is that for my theory, especially for the theory of functional differentiation, we need something which Gotthard Günther would call "transjunctional operation"—that means, going from a positive/ negative distinction to a meta-distinction, rejecting or accepting this kind of distinction. And you can, of course, have a metadistinction, then a meta-meta-distinction, and that would always mean "marked/unmarked." And at that point, of course, you are in the middle of the question of how systems evolve by marking, by making marks in an unmarked space, and then you can have a history of possible correlations between structural developments and semantic developments in the history of society.

EK: Now your reinterpretation of this scheme, Prof. Hayles, makes it look like it can no longer fulfill the function that, as I understand you, it's supposed to fill: namely, as far as I understand it, it's supposed to somehow assure us that we can somehow reach out of language and get language into contact with some sort of physical constraint. And when you interpreted the scheme . . .

WR: Negation is simply part of . . .

EK: ... part of the inside. Then you don't need a constraint anymore. I mean ...

NL: ... self-imposed constraint ...

EK: . . . in your reinterpretation of the scheme you get rid of the external constraints, and I think I have trouble really understanding how we can reach, with the square, the idea of an external constraint.

WR: I guess the question is, how? What evidence does double negativity give? What evidence not only of the outside world, but in a sense what evidence does double negativity give that it does deal with . . .

KH: It does not give any evidence, I think. I did not intend to say that it gave evidence. But Prof. Luhmann was, I think, exactly right in identifying something in that second line with what he calls the unmarked, that which lies outside distinction, and that's exactly the category that I meant to designate by "not-true." "Nottrue" is absence of truth, which is not to say that it's untrue; it's to say that it is beyond the realm in which one can make judgments of truth and falsity. It's an undistinguished area in which that distinction does not operate. So his idea of distinctions is very applicable to what I was trying to do there. What I was trying to ask was, is there a place in language that points toward our ability to connect with the unmediated flux? This does not prove that the unmediated flux exists; it does not prove that the unmediated flux is consistent; it does not prove that the unmediated flux operates itself through constraints. It's simply asking the question, if we posit the unmediated flux, then where is the place in language that points toward that connection? That place is "not-true" or "elusive negativity," because that's the area in language itself which points toward the possibility I'm trying to articulate as "unmediated flux." It's no accident, I think, that in Greimas's article on the semiotic square he talks about this position emerging through the constraints that are present in the structure of language itself. In other words, his idea is that the structure of the semiotic square is not arbitrary; it's embedded in the deep structure of language. That, of course, is a debatable proposition. But just say for a moment that we accept the proposition. Then my argument is that the structural possibilities offered to us by language contain logically and semantically a category which points toward something we cannot grasp but is already encoded into our language.

CW: Can I jump in here at this specific point? What I hear you saying is that language as such does not presuppose any particular referent, but it does presuppose reference as such, right? Would that be fair?

KH: Well, I don't know that I was saying that. I thought I was saying that language has a logical structure, and part of that logical structure is to provide for a space for the unknowable and the un-

speakable, even though paradoxically that space has to be provided within the linguistic domain.

CW: Right, but it's presupposed that it could be knowable and could be speakable, and moreover that that knowable and speakable is finite, right?

KH: The knowable and the speakable . . .

CW: . . . or contains a finite set of applications in language.

KH: What is in the category "absence of truth" could always be brought into the category of either "not-false" or "false." It would be possible to have a scientific theory which brings something which was previously unthought and unrecognized into an area of falsifiability. But no matter how much is brought into the area of falsifiability, it does not exhaust and cannot exhaust the repertoire of those possibilities. So, this goes back to Prof. Luhmann's idea that there is a complexity outside systems which is always richer than any distinction can possibly articulate.

CW: I guess the difference that I'm trying to locate here is that, in Prof. Luhmann's scheme, this outer space is automatically produced by the deployment of distinctions—marking produces an unmarked space—but the difference is, in principle it seems to me, your claim about constraint, as we talked about it earlier: that it depends upon this set being finite. For you, it's not possible in principle to just go on and on and on deploying yet another distinction.

KH: Right.

CW: Because otherwise the claims about reality and the constraints that it imposes seem to me to fall apart at that point.

KH: Well, here maybe I can invoke some ideas about mathematics and say that I'm not sure the range of things that can be brought in to the realm of "not-false" and "false" is finite. It may be infinite, but if it is infinite, then it is a smaller infinity than the infinity of the unmediated flux, and as you know, Cantor proved the idea that one infinity can be smaller than another. So, if it's an infinity, it is a smaller infinity than the set of all possibilities of all possible constructions.

NL: In my terms, you would then have the question, what do you exclude as unmarked if you make the distinction between infinite and finite? [laughter] But that's a book of Phillip Herbst from the Tavistock Institute entitled Alternatives to Hierarchies, where he refers to Spencer Brown and raises somewhere the question, what is the primary distinction? You could have the distinction finite/infinite, you could have the distinction inside/outside, you could have the distinction being/not-being to start with, and then you can develop all kinds of distinctions in a more or less ontological framework. And I find this fascinating, that there is no exclusive, one right beginning for making a distinction. The classics would of course say "being" and "not-being," and then the romantics would say infinite/finite, and systems theory would say inside/outside. But how are these related? If you engage in one primary distinction, then how do the others come again into your theory or not? This is part of the postmodern idea that there is no right beginning, no beginning in the sense that you have to make one certain distinction and you can fully describe the start of your operations. And that's the background against which I always ask, "what is the unity of a distinction?" or "what do you exclude if you use this distinction and not another one?"

CW: For me at least, the interest of your work, both of you, is that it is trying to take that next step beyond the mere staging or positing of incommensurable discourses. It seems to me that both of you—in finally somewhat opposed ways—are trying to move beyond this paradigmatic type of postmodern thought and move on—in your case, Prof. Luhmann—to what you call a universally applicable or valid description of social systems. And in your case, Prof. Hayles, that effort is revealed in your attempt to work out this problem of constraints—in a way, to try to rescue some sort of representationalist framework—to say that in fact there is a reality out there that does pose constraints and, moreover, can be known in different and specifiable ways by these discourses. It's possible, in other words, to see beyond that incommensurability . . .

KH: Yes, though I would not say—this sounds like a nit-picking correction, but to me it's the essence of what I'm trying to say—I wouldn't say that what is out there can be known; I would say our interaction with what is out there can be known.

CW: Then I think the question has to be, for me at least, in what sense are you using the term "objectivity" at the end of the "Constrained Constructivism" essay? A point that Maturana makes in one of his essays is that to use the subjective/objective distinction is to automatically presuppose or fall back on representationalist notions, which immediately recasts the problem in terms of realism and idealism.

KH: I don't use the word "objectivity."

CW: I have the *New Orleans Review* version . . .

KH: I don't think I use it in that essay . . .

CW: "In the process,"—this is about three paragraphs from the end . . .

KH: . . . oh, OK . . .

CW: "... in the process, objectivity of any kind has gotten a bad name. I think this is a mistake, for the possibility of distinguishing a theory consistent with reality, and one that is not, can also be liberating"—and you go on to talk about how this might be enabling politically, which is, I think, interesting because it does accept the challenge of moving beyond just saying, "well it's all incommensurable."

KH: Here, I accept the kinds of arguments that have been made by Donna Haraway and Sandra Harding about "strong objectivity," that to pretend one does not have a position is in fact not being "objective," in the privileged sense of "objective," because it ignores all those factors that are determining what one sees. And to acknowledge one's positionality, and explore the relationship between the components that go into making up that position and what one sees, in fact begins to allow one to see how those two are interrelated, and therefore to envision other possibilities. Sandra Harding's formulation of "strong objectivity" takes positionality into account, and is therefore a stronger version of objectivity than an objectivity that is based on some kind of transcendent nonposition.

CW: Let me follow up here. I guess the problem I have, and this is the case with Harding's work, is that what you're describing is inclusion. I see how that means more democratic representation of different points of view, but I don't see how it adds up to "objectivity" in the sense that it's usually used. Unless the sense of objectivity here is procedural, that we all agree to follow certain rules of a given discourse.

KH: As a philosopher, Harding doesn't want to relinquish the term "objectivity."

CW: Yes, that's quite clear.

KH: I don't have any vested interest in keeping the word "objectivity," but I think the idea of what she's pointing to, whether one calls it "objectivity" or not, is no matter how many positions you have, they will not add up to a transcendent nonlocation.

CW: Right. The God's-eye view.

KH: P_1 plus P_2 plus . . . P_n is not God.

CW: Right.

WR: So actually what you're talking about is what you mentioned in the very beginning, the word "objectivity" basically means "reflexivity"—the reflexivity that you were missing in the early cybernetic tradition?

KH: Yes. I don't know if anybody's used the word "strong reflexivity," but I would like to. Strong reflexivity shows how one can use one's position to extend one's knowledge. That's part of what is implied in the idea that we know the world because we are connected to it. Our connection to it is precisely our position. Acknowledging that position and exploring precisely what the connections are between the particularities of that position and the formations of knowledge that we generate is a way to extend knowledge. There is a version of reflexivity that, in the early period of science studies, was like an admission of guilt: "Well, I'm a white male, and so therefore I think this." There was a period when you couldn't write an article without including a brief autobiography on who you were. But that really missed the point, because the idea is to explore in a systematic way what these correlations are and precisely why they lead to certain knowledge formations, and therefore to begin to get a sense of what is not seen.

NL: Then my opponent should be not so much for the term "objectivity," but for the term "interaction," and who sees the interaction.

WR: Interaction between us and an environment . . .

NL: Yeah, yeah. I have no trouble in posing external observers, a sociologist who sees an interaction between the capitalistic economy and the political system, or between underdeveloped countries—center/periphery, and so on—but how could we think that the system that interacts with its environment is itself observing the interaction as something which gives a more or less representational view of what is outside? How can we see this without seeing that this is a system which does the observing? How could we avoid involving the system—which means a radically constructivist point of view—when we ask the question, "who is the observer?" We say "the outside observer, of course." He sees interactions of any kind, causal or whatever, as objective reality in *his* environment, because *he* sees it. But if the system *in* interaction tries to *see* the interaction, how could we conceive this?

KH: There may be many ways to use the word "interaction," and I'm not sure I'm using it in the sense you mean. For me, when I say the word "interaction," it already presupposes a place prior to observation, whether self-observation or observation by someone else. It's the ultimate point that we can push to in imagination, it's the boundary between the perceptual apparatus and the unmediated flux, and as such it is anterior to and prior to any possible observation. So, I would say that the interaction is not observable.

NL: Then you can drop the concept.

KH: You could drop the concept, except then you have a completely different system. What interaction preserves that I think is important is the sense of regularities in the world and the guiding role that the world plays in our perception of it. If representation and naive realism, with their focus on external reality, only played one side of the street, Maturana's theory of autopoiesis, with its focus on the interior organization of systems, only plays the other side. I am interested in what happens at the dividing line, where one side meets the other side. Maturana's theory is important for me because it shows, forcefully and lucidly, how important perception and systemic organization are in accounting for our view of the world. It also opens the door to a much deeper use of reflexivity than had been possible before—an insight significantly extended by your positioning of the observer as he (or she) who makes the distinctions that bring systems into existence as such. But for me, this is not the whole picture. If it is true that "reality is what we do not see when we see," then it is also true that "our interaction with reality is what we see when we see." That interaction has two, not one, components-what we bring to it, and what the unmediated flux brings to it. The regularities that comprise scientific "laws" do not originate solely in our perception; they also have a basis in our interactions with reality. Omitting the zone of interaction cuts out the very connectedness to the world that for me is at the center of understanding scientific epistemology.

WR: Well, I think that we've hit that outer limit right here, where we are redefining boundaries. Do we have any other general questions? Maybe the system in question ought to be dinner . . .

CW: Let me just ask one more very general question, since we're on this point, and it's something we've touched on. At the end of the "Constrained Constructivism" article, Prof. Hayles, you make it clear that this rethinking you're engaged in has pretty direct ethical imperatives. Objectivity, for you and for Sandra Harding and for Donna Haraway, is an ethical imperative as well as an epistemological or theoretical one, and you go on to specify what those imperatives are. I take it for you, Prof. Luhmann, that you want to be very careful to separate ethics as just one of many social systems from other types of social systems, all of which can be described by systems theory. So what I'm wondering is, could you all talk a little bit about what you see as the ethical and political imperatives, if there are any, of second-order theory, to reach back to where we started?

KH: I don't know that I really have anything to add beyond what you just said, but it is clear for me that there are ethical implications of strong reflexivity and strong objectivity. I'm not really versed in ethics as a kind of formal system, so I'll defer that to Prof. Luhmann.

NL: Well, for me ethics or morality is a special type of distinction, and a particularly dangerous one, because you engage in making judgments about others—they are good or bad. And then if you don't have consensus, you have to look for better means to convince them or to force them to agree. There is a very old European tradition of this: the relation between standards and discrimination. If somebody is not on your side, then he is on the wrong side. And I think my work is a sociologist's way to simply reflect on what we engage in if we use ethical terms as a primary distinction in justifying our cognitive results: if you accept this you are good, and if you don't you have to justify yourself.

Works Cited

Greimas, A. J. "The Interaction of Semiotic Constraints." On Meaning: Selected Writings in Semiotic Theory. Trans. Paul J. Perron and Frank H. Collins. Minneapolis: U of Minnesota P, 1987. 48–62.

- Günther, Gotthard. "Life as Poly-Contexturality." Beiträge zur Grundlegung einer operationsfähigen Dialektik. Vol. 2. Hamburg: Meiner, 1979. 283-306.
- Haraway, Donna J. "Situated Knowledges: The Science Question in Feminism as a Site of Discourse on the Privilege of Partial Perspective." *Feminist Studies* 14 (1988): 575–99.
- Harding, Sandra. "Introduction: Eurocentric Scientific Illiteracy—A Challenge for the World Community." The "Racial" Economy of Science. Bloomington: Indiana UP, 1994. 1–22.
- Hayles, N. Katherine. "Constrained Constructivism: Locating Scientific Inquiry in the Theater of Representation." *New Orleans Review* 18:1 (Spring 1991): 76-85.
- Heims, Steve Joshua. Constructing a Social Science for Postwar America: The Cybernetics Group, 1946–1953. Cambridge: MIT P, 1993.
- Herbst, Phillip. Alternatives to Hierarchies. Leiden: Nijhoff, 1976.
- Letvin, J. Y., et al. "What the Frog's Eye Tells the Frog's Brain." Proceedings of the Institute for Radio Engineers 47 (1959): 1940–51.
- Luhmann, Niklas. "The Cognitive Program of Constructivism and a Reality That Remains Unknown." Selforganization: Portrait of a Scientific Revolution. Ed. Wolfgang Krohn, Gunter Kuppers, and Helga Nowotny. Dordrecht: Kluwer Academic, 1990. 64–85.
- Maturana, Humberto. "Science and Daily Life: The Ontology of Scientific Explanation." Research and Reflexivity. Ed. Frederick Steier. London: Sage, 1991. 30-52.
- Maturana, Humberto, and Francisco Varela. Autopoiesis and Cognition: The Realization of the Living. Dordrecht: D. Reidel, 1985.

- Popper, Karl L. Conjectures and Refutations: The Growth of Scientific Knowledge. 2nd ed. New York: Basic, 1965.
- Schleifer, Ronald, Robert Con Davis, and Nancy Mergler. Culture and Cognition: The Boundaries of Literary and Scientific Inquiry. Ithaca: Cornell, UP, 1992.
- Spencer Brown, George. Laws of Form. 2nd ed., rpt. New York: Dutton, 1979.
- Stepan, Nancy Leys. "Race and Gender: The Role of Analogy in Science." Isis 77 (1986): 261–77.

Varela, Francisco, Evan Thompson, and Eleanor Rosch. The Embodied Mind: Cognitive Science and Human Understanding. Cambridge: MIT P, 1993.

von Foerster, Heinz. Observing Systems. Seaside: Intersystems, 1981.