Jessica Yood, Conference on College Composition and Communication March 2012

COMPLEXITY COMPOSITION

After years of research on the margins of their fields, a group of scientists came together to find out what their work had in common with each other and with Science itself. One of the first things they did was decide to host a conference and to settle a name for that gathering, a title that might unite their disparate endeavors in "living" or "informational" systems. They agreed on complexity. But rather then define the term, they set out to do something with it. Here's how one of the conference founders, Chemist George Cowan, put it. We want to "explore the connection between definitions of complexity which include time and the fact that components at different levels in the natural hierarchy of complexity can be assigned to the appropriate level by characteristic interaction times."

More on whatever that means later. But this exploration led to the now well-known 1994 conference held at the Sante Fe Institute and the 700 plus page collection of talks and recorded discussion published as *Complexity: Metaphors, Models, and Reality.* By tackling the two-fold, high stakes goal of both creating meaning for a term and generating what one member called a "complex community," these scholars wanted nothing less than a new reality for science. It was the end of the millennium…why not? As Cowan puts it, our findings will "demonstrate that in the 1990's the elements of a science of complexity are beginning to come into view."

How that picture of a science of complexity developed is something I'll take up in a bit. But for now, when it is clear that elements of complexity are in

our view, we want to use the occasion of this conference to stop and consider the origins between Composition and Complexity or, more commonly, Writing Studies and System. It's time, to question the "interaction times" between aspiration, innovation, and discipline.

In the last few years, it is not the practice, theory, or study of "writing" that is linked to complex systems. Rather it is the entity of Writing Studies that has become synonymous with systems in a futuristic, even fundamentalist way. I don't *only* mean the most recent argument, put forward by Sidney Dobrin, alongside Sanchez, Crowley, Russell, Bazerman, and others that writing become Writing Studies, detangled from its historical trappings in Rhetoric and separate from first-year students. Rather I am talking about Writing as System becoming a kind of antidote to all that ails us, sick as we are with the attempt to do everything all at once: write, teach, program, think, research, critique, advocate. Writing as Systems on the other hand streamlines our activities. In its clear definition of the discipline—our task is writing—it names the problem that Composition has always had: it is both too scattered (about everything under the sun) and too narrow (isolated by its focus on student writing and services to other disciplines). It won't settle down and it won't look ahead. In turn, it lacks in Sidney Dobrin's words, a real "intellectual" future.

In the next few minutes, I will consider complexity in terms of a "future" for Composition. To do that, I'll revisit the story of complexity-science, placed next to our own recent history. I'll begin with that 1994 conference.

While George Cowan and Melanie Mitchell and Stuart Kauffman were studying the origins of life and creating mathematical equations to describe the newly created internet or population or traffic patterns, what were we up to? In the early and mid 1990's, those of us in English departments weren't just talking complexity and chaos, we were living it. The culture wars were heating up to the point of explosion. Public criticism was high, budgets were low, internal debate debilitating. Critics and theorists crafted obituaries for English in scary titles like *What's Happened to the Humanities? The Rise and Fall of English, The University in Ruins.*

On the contrary, the mood in Composition was less crisis more construction. This was the era of our declarations of independence—from literature, English, process—and the beginning of an expansion of graduate programs and other WPA initiatives.

Interestingly, we had little or nothing to say about complexity back then. Literary studies produced some work, but a black hole fills the search results for queries on "complexity" or "systems" in the Composition-rhetoric literature of the 1990's. With a few exceptions, notably the early adaptors of computers and composition and the pioneers of ecological composition, complexity drops out as a term during our post-process period, and doesn't appear again until early 2000's taking off in earnest in 2006.

Since 2006, scholars affiliated with systems and Writing Studies have challenged treasured but often dogmatic and limited dictums of our identity. Writing, rhetoric and pedagogy will never be the same once understood as "vital"

by Hawk, emergent by Cooper or “beyond post-process” by Dobrin, Rice, Vastola and others. And yet something happened on the way out of chaos, into independence and onto Writing Studies-Systems. We lost complexity.

Having gained some distance from the 1990’s, might it be time to reconsider the findings of crisis and construction? What happens when we end and begin something—both writing things—at the same time? Though it seemed back then that our fields were creating distinctions, we were actually practicing a central feature of complex systems—opening and closing in an autopoetic system. More on that later. But first, let’s consider the 1994 complexity conference again. After every discussion there, the participants return to Cowan’s definition that complexity “include time and the fact that components…can be assigned by characteristic interaction times”. Participants had to show that the “rather mysterious process of self-organization” can “become more ordered and more informed” when operating in “in approximate thermodynamic equilibrium with their surroundings.”

How can Writing gauge the interaction times of its systems, and come to know its relationship to surroundings, and thus to the world of now, the world of complexity? For Murray Gell-Mann, 1969 Nobel Prize winner in Physics, the answer is to readdress the question, to return to the convergences in all systems. For example, he tackles a question about genetic adaptation by turning to the surroundings of the conference itself. Gell-Mann insists that

> [Conference participants] come back and reexamine discussions… and see how we want to modify our original ideas in the light of criticism by the

> other general theorists, but especially in the light of what we've heard from the people who are doing the work in the specific fields….That's what we'll come back and discuss …how we want to modify our general ways of talking.

Experiments and research, empirical data and observable phenomena were clearly at the heart of his work. But results need to mix with reality. And reality is embedded in results.

Brian Arthur, author of the recent award winning book *The Nature of Technology* sums up the idea succinctly when he claims that complexity researchers are "more interested in things that are in process, and pattern change" with the central question being: "How do we talk about that?"

"How do we talk about that" might well be the best definition of "second order cybernetics" we have. Drawn from neurobiology and original models of computing, what's now called "second order observation" is a central activity and reality of complex systems. As applied to social systems, most notably by German sociologist Niklas Luhmann, it focuses on "ever-larger ensembles" where "distinctions" are the fact of all observation, all "vibrant matter" to use philosopher Jane Bennet's term. Second order observation is interested not in dissecting or interpreting subjects but in observing and articulating the position of the observer in the systems in which all is embodied. The cultural critic Ira Livingston reflects that such recursive ensemble-ing forces a continued return to origins in context of embodied environments. "Whatever comes to be (observed)

owes its term of being to systems within its environment" says Bruce Clarke and Mark Hansen.

For Livingston, that means thinking of complex observation as a continual "midlife crisis"—not in a bad way, because the "radical middle ground" is where, for the scientists featured in *Complexity: Metaphors, Models and Reality*, sustained interest in reality lives.

Some ten years after the 1994 conference, one of the participants, the computer scientist and writer Melanie Mitchell, set out to write an almost-readable description of major findings in complexity science. At the end of her book, *Complexity: A Guided Tour,* Mitchell draws attention to what was then an unpublished manuscript that could define "where the field of complexity is going." *Complexity: Five Questions*, now published, features twenty-four of the world's most important scientists, many of whom were present at the complexity conference. Their task was to answer these five questions about their work in complexity.

I will quote from two of them, first from economist Bruce Edmonds, and second from engineer and non-equilibrium management theorist Peter M. Allen. Both are answering the fifth question posed: "How do you see the future of complexity?" Here's Edmonds:

> It (complexity) *has no future* as an identifiable field….Like Systems Theory or Cybernetics before it, it will slowly fade away and across into the humanities and public discourse. It is a flash-in-the-pan, but it signals slower and more fundamental changes in the way science

works, as science continues to adapt to the subject matters it can cope with."

And now Allen:

> …models of urban and regional systems…reveal spontaneous pattern formation in chemical systems….They confirm *that the future does not exist,* and therefore we are part of its creation. This is fundamentally optimistic.

As a way to conclude, I'd like to return to the problem with Composition, and, finally, to optimism. The Writing Studies critique of Composition is right. It does insist on returning to its origins and to pressing needs of the immediate, those simple concerns of what is in front of us, while feed backing with our fractured past. Some calls such needs "basic writing," some call it "reflection," some "rhetoric" or historiography, or "pedagogy," or "programs." But Neurobiologist Francesco Varela, following the Buddhist leader Shunryu Suzuki, called it foundational. The search for presence and immediacy, the desire to always be attentive to the "beginner's mind" is at the core of Varela's research in "autopoesis"—self-generative systems—and a principle of all his work in cognition.

For in the beginner's mind there is nothing outside of the system. In the "beginner's mind," writes Suzuki, "there are many possibilities, in the expert's there are few." Writing Studies as our system streamlines and offers expertise. But the view from the top limits. When Writing, Writing Studies, or even complexity looks too far afield, it becomes an aspiration and *not* an innovation.

Aspirations are future oriented. Innovations are decidedly more practical and present, approachable—to the point of optimistic complexity.