

IUPUI Nonlinear Systems Group

The dance along the artery  
The circulation of the lymph  
Are figured in the drift of stars (I.52-54)

No talk I've ever given has intimidated me more than this one—not only as a scientific dilettante speaking to a room of scientists, but also as an anthropological and religious dilettante sharing a platform with professors of anthropology and religious studies. To overcome, partially, this fear, I have written out my 20 minutes of remarks.

My epigraph was from T. S. Eliot's *Four Quartets*, in my judgment one of this century's best poems. In the lines I read, Eliot finds parallels in the microcosmic and macrocosmic, as he plumbs the world of 20th-century science in order to give himself a fresh look at his 20th-century existential anxiety. I, too, often turn to 20th-century science to give myself a fresh look at my life and work. In particular, for the past twenty years, systems theory has been a recurring catalyst in my professional life, often moving me into productive chaos when I've felt stuck in the steady-state conventional wisdom of my discipline.

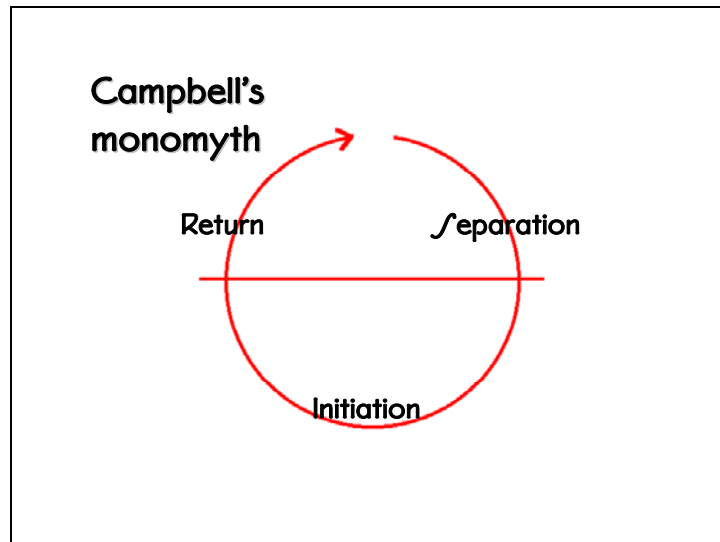
My discipline is English, which for historical reasons includes both the teaching of reading literature, and the teaching of writing. Within this discipline, I regard myself as a business communication specialist who also teaches literature. I would like to talk today about the impact of systems theory and, more recently, chaos theory on my teaching—first

my teaching of literature, and then my teaching of business communication.

My 1975 dissertation, for a Michigan Ph.D. in both English and education, was about the teaching of mythology in high schools. In it, I surveyed the then-current state of myth pedagogy, and found that it consisted largely of such activities as having students construct genealogical charts of the Greek pantheon and search supermarket shelves for products with names from classical myth and legend. Almost nobody was applying to the high school classroom the fascinating work of such scholars as Joseph Campbell, Ernst Cassirer, Claude Lévi-Strauss, Bronislaw Malinowski, Vladimir Propp, and Stith Thompson.

In an immodest effort to remedy this situation, I constructed and tested a fifteen-lesson unit on mythology for high school English classes, using as texts fifteen myths from as many cultures. My chief organizing principle was what Joseph Campbell called the “monomyth.” (*Monomyth*, incidentally, is one of the two words that the novelist James Joyce unintentionally contributed to our language. The other, as you may know, is *quark*.)

Campbell, like others before him, recognized a common pattern, or structure, that underlies myths and other folk narratives from around the world.



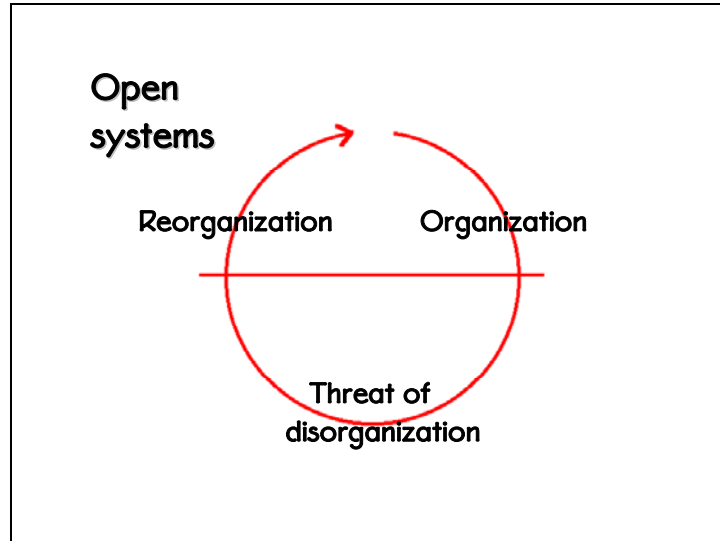
In his book *Hero with a Thousand Faces*, Campbell summarizes this monomyth this way:

A hero ventures forth from the world of common day into a region of supernatural wonder: fabulous forces are there encountered and a decisive victory is won: the hero comes back from this mysterious adventure with the power to bestow boons on his fellow man (30).

For Campbell, the monomyth parallels the three stages of typical rites of passage: *separation*, *initiation*, and *return*. Campbell points out that the monomyth is often apparent in stories of entire communities as well as individual heroes or heroines. In tales and rituals often tied to the changing seasons of the year, communities see themselves as undergoing loss and renewal.

While researching my dissertation, through a chain of reading I can no longer reconstruct, I first came across what was being called “general systems theory,” primarily through the work of Ervin Laszlo and Ludwig von Bertalanffy. I became excited by Laszlo’s account of “open systems,” systems that exchange matter and energy with their environment. I eventually summarized Laszlo in my dissertation this way:

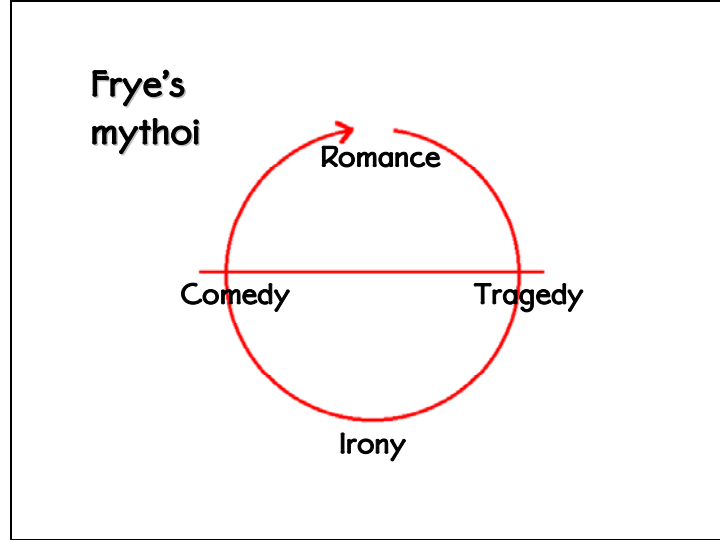
Consider . . . the activity of any open system, from atom to Earth: the system is in a *status quo*, a steady state in which internal and external forces are balanced. When, from time to time, new external forces disrupt the system, it quickly “corrects” and settles back into the *status quo*. Sometimes, however, greater external forces—forces ultimately directed toward disorganization and “death”—threaten the very existence of the system. The system is unable to correct itself, and so, at first, succumbs to those forces. But, in so doing, it uses them as a means toward reorganization. If this reorganization is successful, the system emerges into a *new* steady state, one more resistant (135).



This cycle of open systems, from organization, through the threat of disorganization, to reorganization—seemed to me to parallel closely the cycle of Campbell’s monomyth. In an article from that time, called “The Quest for the Negentropic Grail,” I wrote “If, as Jung contends, the monomyth is an archetype, a pattern inherited as part of one’s collective unconscious, it’s a small wonder. Man is the result . . . of the precise process the monomyth recounts, over and over since the universe began. If any story is structured into man’s consciousness, it must surely be that one” (6).

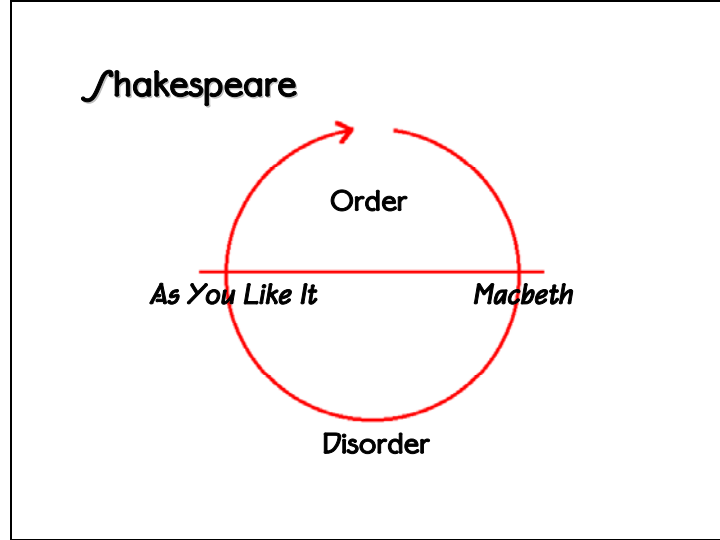
In my dissertation, of course, I cautiously avoided such rhapsodizing, instead sticking to ways that students could use the parallel between monomyth and systems theory to take what they were learning from myths and apply this learning to other systems—biological, ecological, social.

I found another parallel in the work of the literary critic Northrop Frye. Frye, in an effort to demystify and structure the teaching of literature, suggested that *literary* narratives—such as plays and novels—could be thought of as retelling *portions* of the older folk narrative cycle.



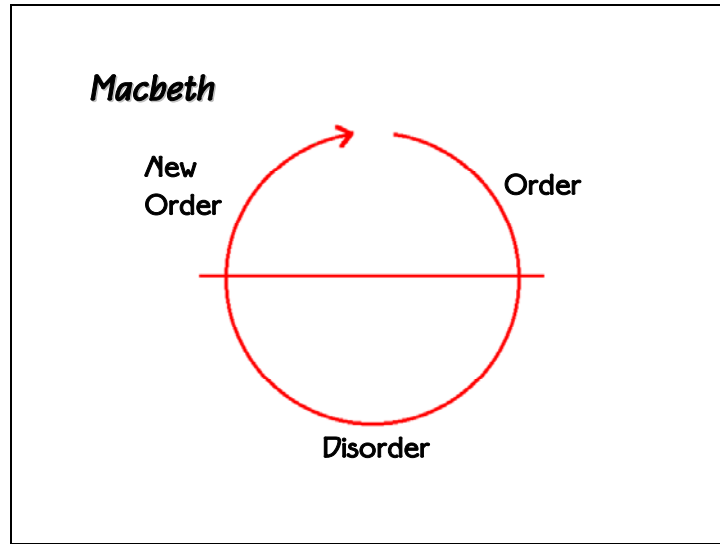
Frye divides that cycle into four quadrants. The top quadrant consists of *romances*, works like *The Faerie Queen* or the Indiana Jones adventures that are set in the fantasy world of human desire. The next quadrant includes *tragedies*, like *Oedipus Rex* or *Death of a Salesman*, that move from the desirable to undesirable worlds, from order to disorder. The bottom quadrant includes what Frye calls “*ironies*,” works like *1984* or much of *Gulliver’s Travels*, set in the undesirable world of disorder and despair. The remaining quadrant consists of *comedies*, not always in the modern sense of “funny” stories, but in the classical sense of plots that move from disorder to order, from undesirable states to desirable states.

Though Frye has fallen from fashion in this postmodern age, I still find his scheme very helpful in teaching literature. I’ve used it, for example, in my book *Rehearsing the Audience*, a guide to teaching drama in performance. Students who read, or better yet, see, Shakespeare’s *Macbeth*, can understand and appreciate this tragedy more if they can visualize its plot as a movement from order to disorder, from community to isolation, from life to death. By contrast, students can better understand and appreciate a comedy like *As You Like It* if they can see it as a movement from disorder to order, from isolation to community, from death to life.

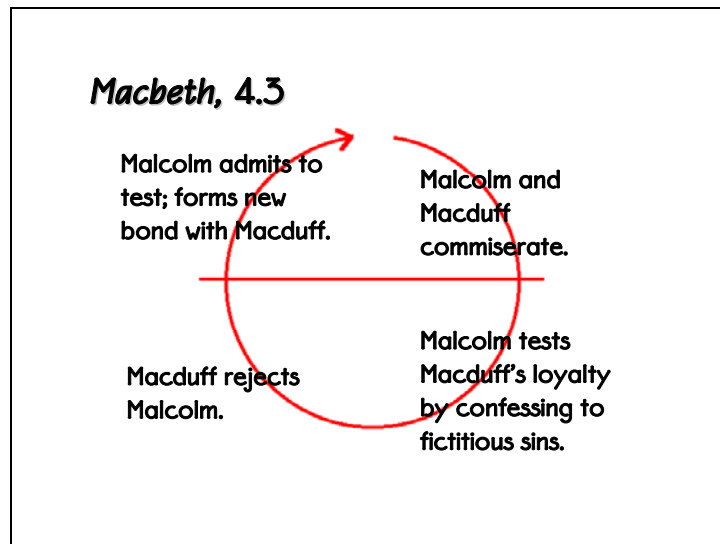


Remember that *As You Like It* begins with a usurping Duke on the throne; his brother, the rightful Duke, in exile; a good young man denied his rightful inheritance, a good old man cruelly beaten by his master; and a good young woman exiled on threat of death. The play ends with the dukedom restored, the usurper converted, the inheritance reclaimed, and not one, but four, weddings.

As I've learned more about chaos theory, I've been struck by the ways in which literary works are *fractal* in their structure, showing self-similarities at all levels of scale. Thus at one level of scale, *Macbeth* represents the downward half of the monomyth circle, from order to disorder. But seen as a single plot, *Macbeth* also has a complete cyclical movement, from the order of King Duncan's reign, to the disorder of Macbeth's reign, to the new order established under Duncan's son Malcolm.



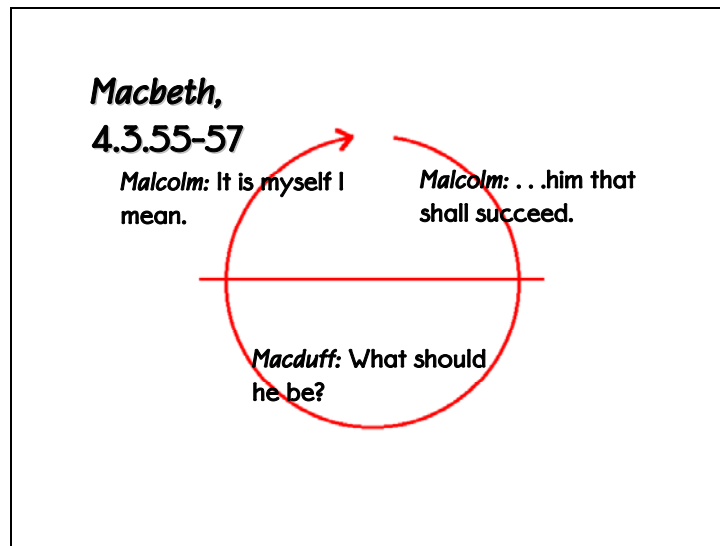
At an even larger scale, individual scenes have this same structure.



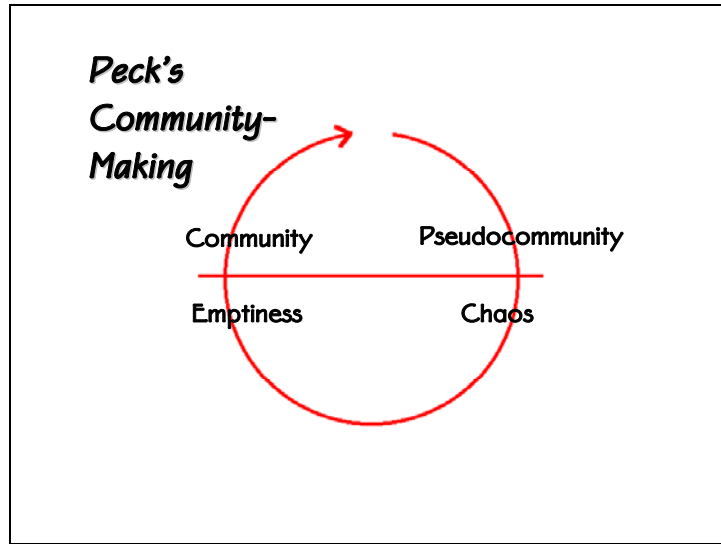
Act 4, Scene 3 of *Macbeth* opens with community and stability, as the rightful heir, Malcolm, and his supporter Macduff commiserate, in friendship, about the sad state of Scotland under the tyrant Macbeth. Almost immediately, however, Malcolm begins asserting that the kingdom will be in an even worse state under his own rule, as a result of his many vices. At first, the astonished Macduff maintains his support

for Malcolm, contending that Malcolm's vices cannot equal Macbeth's. But at last, the list of vices becomes so horrible that Macduff, in despair, rejects Malcolm and withdraws his support, ending their friendship and alliance. At this point, Malcolm admits that as a result of his fear of spies and traitors in his camp, he has merely been testing Malcolm's loyalty. The vices he has claimed for himself are all fictitious. Their friendship and alliance are thus restored, even stronger than before.

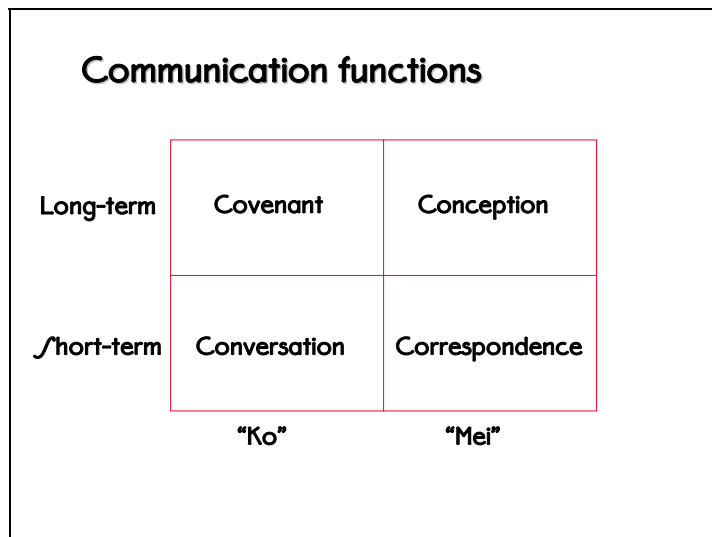
As we move even "deeper" into the fractal, individual exchanges of lines share this same pattern. In lines 55-57 of the scene we have been discussing, Malcolm makes his first assertion that Scotland will be worse off under "him that shall succeed." Macduff, confused, asks "What should he be?" Malcolm resolves this momentary confusion by his answer, "It is myself I mean."



Despite my interest in literature, my main research and teaching specialty is writing, especially as it is used in businesses and other organizations. Here, too, systems theory and chaos theory have influenced my work. First, as someone concerned with the role of communication in organizations, I have learned much from the many theorists who have studied organizations as *systems*, evolving through the same cycles of organization, threatened disorganization, and reorganization. As just one of many such analyses, the psychiatrist and popular writer M. Scott Peck lists four stages in what he calls "community-making": *pseudocommunity*, *chaos*, *emptiness*, and *true community*.

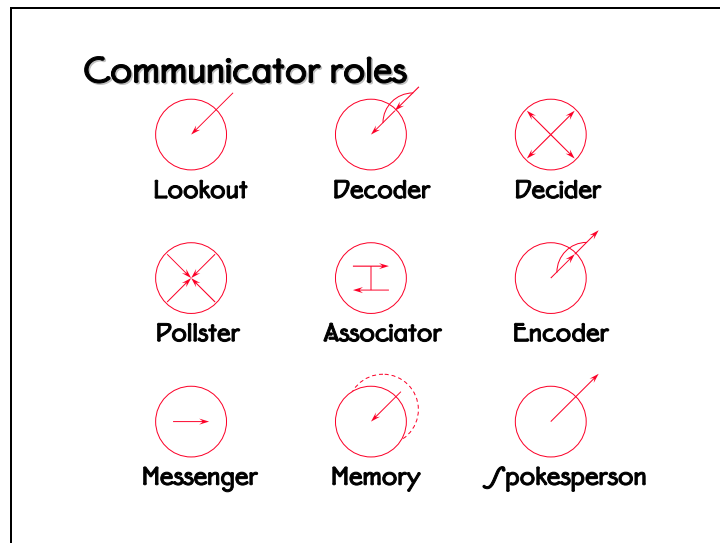


I have learned much about how communication functions in social systems by looking at how it functions in much smaller systems like the living cell. (Just this past week, I've been reading *The Language of the Cell*, by Claude Kordon, research director at the French National Scientific Research Center.) I've come to understand, for example, that communication in all systems has two functions: the function of holding the system together and the function of allowing the system to change.



I call these the “ko” function and the “mei” function, from the Indo-European words for “together” and “change”—roots that, together, led to the words “communication” and “community,” in English and in some other languages. I’ve also learned that communication in systems carries both long-term information (like the information in a cell’s DNA) and short-term information (like the information about the changing temperature of the cell’s environment). When I graph these two variables against each other, I have a useful matrix for helping organizations understand the four kinds of communication that take place within them: long-term “covenants” that define their very existence, long-term “conceptions” that define their goals, short-term “correspondence” that gets work done, and short-term “conversation” that keeps people in community.

I have also drawn on systems theory for a taxonomy of the roles played by communicators within organizations. In my article “The Circle Game” and in two writing textbooks, I have borrowed James G. Miller’s list of nine information-processing subsystems in any living system, and diagrammed and renamed them to help students and clients understand the ways in which *they* process information for the social systems of which *they* are a part.



Most recently, chaos theory has given me a way of understanding and explaining how the writer-reader system always exhibits what chaos theorists call “sensitive dependence on initial conditions.” Like the often-

cited butterfly in Beijing, the choice of a single word over another, early in a document or a series of documents, can have an absolutely unpredictable effect on the entire climate of the writer-reader relationship, or even of the larger organization. The reader's unforeseen response to a single word can affect the way he or she responds to the next word, and so on into chaos.

Finally, a very personal note. Even my own spirituality has been influenced by my admittedly tentative excursions into systems theory. My small, but growing, understanding of the patterns shared by stories and systems of all kinds has helped make the universe both a more wondrous and a more friendly place for me. For me, and for many others, the final lines of Eliot's *Four Quartets* are as spiritually profound as they are poetically beautiful. I invite you to listen to what they say about the cycle of the heroic quest, and to what they say about *systems*—chemical systems, biological systems, human systems:

We shall not cease from exploration  
And the end of all our exploring  
Will be to arrive where we started  
And know the place for the first time.  
Through the unknown, remembered gate  
When the last of earth left to discover  
Is that which was the beginning;  
At the source of the longest river  
The voice of the hidden waterfall  
And the children in the apple-tree  
Not known, because not looked for  
But heard, half-heard, in the stillness  
Between two waves of the sea.  
Quick now, here, now, always—  
A condition of complete simplicity  
(Costing not less than everything)  
And all shall be well and  
All manner of thing shall be well  
When the tongues of flame are in-folded  
Into the crowned knot of fire  
And the fire and the rose are one (4.239-59).

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