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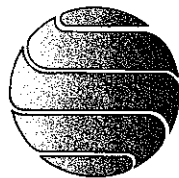
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INTRODUCTION: The Nature of Things

Jan Trembley and Anne Dalke

AS THE FILM *The Way Things Go* opens, a bulging garbage bag cinched with rope spins down into the frame, nudging a tire standing on end against a makeshift seesaw, which flip flops to send a step ladder on wheels trundling down a ramp; burning candles tip over, setting off explosions, traveling fires, and chemical spills; a current of foam moves an old shoe across the floor. The plot is a comic possibility that any one of the household items lined up in an empty warehouse to create a 100-foot chain reaction will miss its target, but none do; the slapstick of grimy determinism ends in a vapor cloud. *The Way Things Go* initially appears to have been shot in one take; that nose gets longer as the wreckage mounts. The improbable sequence of events, basic laws of chemistry and physics notwithstanding, forces the viewer to wonder not only how the film was made but how things really do happen.

High speed computers have allowed us to begin to analyze and predict systems, such as weather patterns, that were until recently considered beyond the reach of science. This way of thinking about the world was earlier and variously known as “unified science,” “cybernetics,” “systems theory,” and “complexity theory.” It is now called emergence and names a particular understanding of systems in which complicated, interesting, high-level functions arise unexpectedly out of the simple interactions of low-level mechanisms.

Emergent ways of thinking originated in the work of a range of independent theorists in a wide variety of disciplines. A recent collection on *The Re-Emergence of Emergence*, by Philip Clayton and

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Paul Davies, traces the long philosophical history of the paradigm shift that is contemporary emergence. In their recounting, that prehistory includes Aristotle and Plotinus; they identify Hegel as the great modern advocate of emergence theory, because he “offered a temporalized ontology, a philosophy of universal becoming,” and they highlight those philosophers who followed Hegel in “construing reality itself as fundamentally in process”: Henri Bergson, William James, and especially Alfred North Whitehead (6).

The eventual collaboration between contemporary science and the conceptual world of emergence was also enabled by the “radically materialist” work of Ludwig Feuerbach and Karl Marx in economic history, and of Auguste Comte and Emile Durkheim in sociology. Taken together, such work “helped establish an emergentist understanding of human society,” and laid the groundwork for what we today call emergence, a study which begins with “the elementary process of the physical and social world,” and — at least in the hands of Clayton and Davis — is not “shy about extending the discussion all the way to the level of religious belief” (7, 28).

Because the contemporary study of emergence draws on so many sources, coming from so many different directions, it is difficult to give an orderly account of its more recent history. One way to organize the story might be to construct a plot of progressive complexity, beginning with the work of Per Bak on sand piles, and Evelyn Fox Keller on slime mold aggregation. This would be followed by Steven Strogatz’s studies of the synchronization of fire fly flashing, and Martin Minsky’s work on the organization of the brain. It would conclude with Stuart Kauffman’s analysis of self-organization and selection in biological evolution, as well as the wide-ranging work of Robert Axelrod, Jane Jacobs and Thomas Schelling on human social behavior.

Also needing mention in any such story is the Santa Fe Institute, which has long seeded multidisciplinary collaborations in the physical, biological, computational, and social sciences. The Institute has focused more recently on the need for understanding complex adaptive systems in order to address key environmental, technological, biological, economic, and political challenges. Spanning this modern story is the work of physicists, from Ilya Prigogine’s explorations of the end of certainty in the

emerging new laws of nature, to Heinz Pagels’ studies of computers and the rise of the sciences of complexity.

Emergence, in short, has a long and complex history, and is now a well-developed intellectual perspective. Courses in the topic are increasingly being offered at the collegiate level, such as one currently cross-listed at Bryn Mawr College in the biology and computer science departments (see Blank and Grobstein). As emergence has garnered increasing attention, it has also been popularized in a number of books, a selection of which are included in our bibliography.

Out of this history comes a new and quite general conceptual framework that is being used to explain phenomena ranging from the evolution of life and consciousness to the boiling of water, the branching of trees, the working of ant colonies and the activity of video gaming. This framework explains phenomena by way of a pragmatic perspective on puzzle solving that assumes no conductor (no one anticipating future outcomes), but only an originally — and still largely — undirected play of entities, which become parts of larger and more complex entities which become parts of still larger and more complex entities and so on.

These are some essential, common, and perhaps surprising characteristics of emergent systems:

Systems of this kind frequently evolve effectively on their own: Relatively simple bi-directional interactions between relatively simple elements produce patterns of coordination and a substantial degree of organization.

An important ingredient in the establishment, function and continuing evolution of ordered complexity is some degree of autonomy and randomness in the behavior of the elements.

The future of such systems can be determined only by playing them out. There is no formula for completely predicting in advance what the system will look like in the future. (Dalke et al. 114)

These principles of emergence hold in a wide variety of different situations. What we here add to this ongoing emergence of emergence is a range of demonstrations of how working from emergence perspectives can change a wide spectrum of disciplinary practices.

This volume of essays is also distinguished by its critical approach. Rather than attempting to “sell” emergence as a theory

The essays in this volume are logs from our explorations over coffee and muffins around a lab room table littered with robot parts and LEGO pieces. The sequence of essays traces the implications of emergence from the study of the beginning of the universe to inquiry into the brain, for work in economics and history, in literature and linguistics, in biology and physics.

The current state of our thinking is thus reflected not only in our individual essays, but in the intersections among them. We hope that this snapshot of a dynamic interdisciplinary activity in progress will give interested readers a realistic and engaging picture of what emergence is, one that they can read for what it has to say about their own particular areas of interest, or in its entirety, for what it has to say about emergence more generally understood.

WORKS CITED

- Axelrod, Robert. *The Evolution of Cooperation*. New York: Basic, 1985.
- . *The Complexity of Cooperation: Agent-Based Models of Competition and Collaboration*. Princeton: Princeton UP, 1997.
- and Michael Cohen. *Harnessing Complexity: Organizational Implications of a Scientific Frontier*. New York: Free Press, 2000.
- Bak, Per. *How Nature Works: The Science of Self-Organized Criticality*. New York: Springer, 1996.
- Blank, Dour, & Grobstein, Paul. "Biology/Computer Science 361: Emergence." Retrieved on February 28, 2007 from <http://serendip.brynmawr.edu/complexity/course/emergence06/>.
- Buchanan, Mark. *Nexus: Small Worlds and the Groundbreaking Science of Networks*. New York: W. W. Norton, 2002.
- Clayton, Philip and Paul Davies. *The Re-emergence of Emergence: The Emergentist Hypothesis from Science to Religion*. New York: Oxford UP, 2006.
- Dalke, Anne, Kim Cassidy, Paul Grobstein and Doug Blank. "Emergent Pedagogy: Learning to Enjoy the Uncontrollable C and Make It Productive." *Journal of Educational Change* 8.2 (2007): 111-30.
- Grobstein, Paul. "Some more meeting thoughts." September 2003. Retrieved on October 7, 2007 from http://serendip.brynmawr.edu/forum/viewforum.php?forum_id=221#6454
- Johnson, Steven. *Emergence: The Connected Lives of Ants, Brains, Cities, and Software*. New York: Scribner, 2001.
- Kauffman, Stuart. *The Origins of Order: Self-Organization and Selection in Evolution*. New York: Oxford, 1993.
- . *At Home in the Universe: The Search for the Laws of Self-Organization and Complexity*. New York: Oxford, 1996.
- Holland, John. *Emergence: From Chaos to Order*. New York: Perseus, 1999.
- . *Hidden Order: How Adaptation Builds Complexity*. Boston: Addison-Wesley, 1996.
- Jacobs, Jane. *The Death and Life of Great American Cities*. New York: Vintage, 1992.

- . *The Economy of Cities*. Vintage, 1970.
- . *The Nature of Economics*. Vintage, 2001.
- Keller, Evelyn Fox. *Making Sense of Life: Explaining Biological Development with Models, Metaphors, and Machines*. Cambridge: Harvard UP, 2003.
- Lewin, Roger. *Complexity: Life at the Edge of Chaos*. Chicago: U of Chicago P, 2000.
- Minsky, Marvin. *The Society of Mind*. New York: Simon and Schuster, 1986.
- Pagels, Heinz. *The Dreams of Reason: The Computer and the Rise of the Sciences of Complexity*. New York: Simon and Schuster, 1988.
- Prigogine, Ilya. *The End of Certainty: Time, Chaos, and the New Laws of Nature*. New York: Free Press, 1997.
- . *From Being to Becoming: Time and Complexity in the Physical Sciences*. San Francisco: W.H. Freeman, 1981.
- Resnick, Mitchel. *Turtles, Termites, and Traffic Jams: Explorations in Massively Parallel Microworlds*. Cambridge: MIT Press, 1994.
- Santa Fe Institute. Retrieved on October 7, 2007 from <http://www.santafe.edu/about/>
- Schelling, Thomas. *The Strategy of Conflict*. Cambridge: Harvard UP, 2007.
- . *Micromotives and Macrobehavior*. New York: Norton, 2006.
- . *Choice and Consequence: Perspectives of an Errant Economist*. Cambridge: Harvard UP, 2007.
- Smith, Adam. *An Inquiry into the Nature and Causes of the Wealth of Nations*. (1776) Ed. Kathryn Sutherland. New York: Oxford UP, 1993.
- Strogatz, Steven. *Synac: The Emerging Science of Spontaneous Order*. New York: Hyperion, 2003.
- . *Nonlinear Dynamics and Chaos: With Applications to Physics, Biology, Chemistry and Engineering*. New York: Perseus, 2001.
- Waldrop, M. Mitchell. *Complexity: The Emerging Science at the Edge of Order and Chaos*. New York: Simon and Schuster, 1992.
- Way Things Go/Der Lauf Der Dinge*. (DVD.) Dir. Peter Fischli & David Weiss. New York: First Run/Icarus Films, 1987. 30 minutes.

WHERE WORDS ARISE, AND WHEREFORE:
Literature and Literary Theory as
Forms of Exploration

Anne Dalke

IT'S A NICE DAY: still and sunny. Or it could be cold and blustery. Whatever the weather outside, what's happening inside is this: The teacher is standing in front of the class — of which you are a member. (You are probably sitting near the back.) She is reading a poem, slowly, carefully, urging you to *hear* the words, to listen to the sounds, to experience them. It's not unpleasant, as the phrases wash over you. You catch one or two, but when the sounds stop, you realize that you haven't held on to any of it.

And then she asks (what they always ask): What did you hear? What *effect* did the reading have on you? (Worse:) What does it *mean*? And *how* does it achieve that meaning? Your sense of inadequacy (as a reader, as a student, as a thinker, as a human being) is even worse if the text was assigned beforehand, if you've been expected to come to class knowing *how* to read what you read, knowing *what* matters, what you *should* be paying attention to.

Anyone who has ever sat in a literature class has likely experienced this fear, the fear of all that space on the page around a poem (not knowing how to fill it), the fear of all you don't know about the context of a novel (not knowing how to learn it), the fear that you don't know what you need to know in order to offer a worthwhile response. My own moment occurred during the first semester of my freshman college writing course. We were reading a Hemingway short story; the professor criticized the staccato dialogue between husband and wife. When I defended it, as appropriate to this exchange, Professor Fehrenbach responded, "All of Hemingway's characters talk that way." And the

world opened up for me into a maze of texts. I realized that to speak with authority about this one story, I needed to read them all. And so I became an English major and begin to read, sort of conversationally, sort of systematically, as each text led me into the others that inform it (Dalke 119).

My awareness of all I needed to know in order to read well motivated decades of work, and resulted in my career as a professional literary critic. For others, such moments may lead instead to paralysis, or to a general dislike of reading, or at least to a distaste for reading-under-instruction. They are not interested in playing a game that seems to be about reading the teacher's mind, about guessing what they *should* notice, if they are to be recognized as having the "right" answer.

Such moments of fear and resistance have been addressed (if also exacerbated) by a well-known methodology in literary studies known as reader-response theory (see Jane Tompkins' collection for a good overview). According to this theory, meaning comes into existence not when the text is written, but when it is read and responded to. Reader-response theory focuses on the transaction readers make with texts, on the ways they actualize them in their own experience. And meaning is persistently revised as readers compare and collate their readings with one another, searching for patterns common among them, recognizing when the patterns break down, where new stories are needed.

The origins of reader-response theory are usually traced to Louise Rosenblatt's influential 1938 book *Literature As Exploration*, which distinguished between what happens when you read a text primarily to extract information from it, and the experience of what happens while reading. It is the claim of this essay that readers should be encouraged to use their various life experiences when they engage texts and that emergence theory explains why this is an effective and enjoyable way to read. Reader-response theory has elaborated at length on *how* to read; emergence theory offers a framework for understanding *why* this approach works.

As the single literary scholar in our Working Group on Emergence, I have often found myself groping to understand the terminology of physics and philosophy, of biology and computer science. I have also found, in my repeated requests for definitions and answers to my questions, a newly refigured disciplinary

tool box for my own discipline, a means of understanding that helps me make sense of the way literary study operates within the complexities of the larger world. I have discovered ways of expanding my understanding of how literature and literary theory evolve. So what I want to discuss here is my own disciplinary angle on — and application of — this thing called emergence: how an English professor has made sense of the process whereby words emerge from words, stories from stories, interpretations from interpretations, meaning from them all, and further meanings from out of those.

Here's the main issue: Emergent phenomena are difficult to understand. Because of the complexity of the interactions that produce emergent effects, it is difficult both to predict them and to reliably trace particular effects back to particular causes. This unpredictability of the future and irreducibility of the present — results of the emergent nature of the universe — lead (in conjunction with many other things) to those remarkable constructions we call language and literature. Indeterminacy prods us to make up stories that explain how we got from what was to what is, from what is to what will be. Literature and literary theory are what we call the places where this meaning-making occurs. They are two of our ways of acknowledging and responding to the unknowability that emergence creates. They are also ways of generating further uncertainty.

I will illustrate this process by working my way through three levels: I will look first at the generation of words in puns and etymologies, then at the production of stories we call literature, and finally at the interpretation of their meanings in literary criticism and theory. The space I traverse is the gaps between the sounds of words and what they mean. In these spaces, we take what is not yet known or not understood and apply to it logic, form, and the rules of symbol manipulation. We then step back to see what else might arise in this new configuration. The movement is "loopy" and endless: We move from the disorder of what we do not comprehend into the order or meaning we make of it. This leads back to disorder when we discover what cannot be incorporated into the story we tell and then, once again, to order when we revise the story (see Dalke and Grobstein).

We see that process, paradigmatically, in the playful constructions we call puns. Puns present a moment of puzzlement fol-

lowed by a solution ("Oh, I get it!"), followed by more puzzlement ("Isn't that curious? What is the logic of the resemblance?"), followed by another answer, a recognition of how-shall-low — or how deep — the resonance is. When we "get" a "perfect" pun ("Why couldn't the pony talk? He was a little horse/hoarse"), we are seeing simultaneously — or perhaps in such rapid oscillation that it seems simultaneous — two alternative meanings of the same word, or two alternative spellings of the same sound. The peculiar pleasure of punning derives from the ability to switch rapidly back and forth, to hold two meanings in mind at (nearly) the same time. ("What do you get when you drop a piano down a mine shaft? A-flat minor/a flat miner.") Writing the puns out, as I have here, can ruin the fun, because it breaks apart what is the key to the game: the delight of doubling. But once its logic is recognized, such doubling can also produce further play ("What do you get when you drop a piano onto a military base? A-flat major/a flat major").

Imperfect puns work quite similarly, although the delight here is in the near misses, the not-quite-exact identity of two closely sounding words. What operates in an imperfect pun is the perception that what appears momentarily as the same is actually different. What pleases here, as in perfect puns, is the perception of distinction emerging out of identity:

A man wanted to buy his wife some anemones, her favorite flower. Unfortunately, all the florist had left were a few stems of the feathery ferns he used for decoration. The husband presented these rather shamefacedly to his wife. "Never mind, darling," she said, "with fronds like these, who needs anemones?" (Zwicky 493)

The literary critic Jonathan Culler argues that the ability of puns to provide "the surprising coupling of different meanings," is akin to the power of etymologies, to "show us what puns *might be* if taken seriously." In the elaborately constructed histories we call etymologies, what gives pleasure is our ability to identify connections between two words, or two meanings of a word, that puns refuse to make explicit. Etymologies "give us respectable puns" by laboriously articulating such connections, and consciously ordering the playful associations that are generated by the unconscious, or emerge serendipitously over time. Etymologies function as "a structural, connecting device," offering the mind "a sense and an experience of an order" (Culler, *On Puns* 1-6).

Not surprisingly, literary scholars are engaged in an ongoing debate about the accuracy of such word-histories. Renaissance writers, for instance, were always constructing faux-etymologies. They also took puns seriously as etymologies. For instance, Edmund Spenser suggests in Book VI of *The Faerie Queene* that "cowherd" was derived from "cowherd." George Herbert shared a similar understanding of the resemblances among words. His poem "The Flower" observes, for example, that such resonances are not accidental, but bear the weight of cosmic meaning: "Thy word is all, if we could spell" (ll. 21). That is, the shape and sound of words are God's doing, and — could we but read them — expressive of the natural order. (I am indebted to Jane Hedley for this insight.)

But contemporary linguists, whose business is to identify the underlying structures that guide language use, are not entirely comfortable with the disequilibrium which can result from punning. Linnea Lagerquist observes that "puns make it clear that the boundaries" of the performance of competence, the knowledge of language and the knowledge of the world "are both highly mutable and indefinite" (186). Catherine Bates expresses considerable discomfiture over what she calls "pun's perfidious status as an aberrant element within the linguistic structure":

Puns give the wrong names to the wrong things, and they disturb the proper flow of communication . . . [I]n confusing sense and sound . . . normal rules governing etymology and lexicography are temporarily suspended while speculation and fancy roam free. (425)

Puns must be "contained," according to Bates, within a structure of rule-determined connections.

My claim here, however, is that the fundamental "uncontainability" of puns, as well as of those etymologies that surprise, that seem to us like "stretchers," are important both as an example of the unpredictability of language use, and of our insistent response, our ordering of what seems to us "aberrant." We make meaning out of the interaction of a set of rules for the use of words, a history of their relations, *and* the insistently random action of generating, then editing and elaborating, connections between words and new experiences.

From our five years' worth of early morning conversations about complex systems, I have come to see that this activity is an

extension of the process we call emergence, that the back story to this way of understanding the relationship between words and their meanings is the irreversibility and unknown potentiality of evolution. As described in a fall 2004 "Report on Progress":

Emergence is a perspective and story-telling genre that is distinctively characterized by efforts to make sense of observations on the presumption that there is no . . . one anticipating future outcomes, nor need there be any conductor. There is only an originally and still largely undirected play of entities which become parts of larger entities which become parts of still larger entities and so on. Over a long period of time, the process has, in a quite recent development, created entities that wonder and ask questions about the process itself and, in doing so, are able to find ways to influence and mimic that process (Grobstein "Emerging Emergence" para. 1).

When applied to literary studies, this means that every story falls short and needs to be extended and exceeded by its interpretation. We make "meaning" as we try to bridge the gap between what we know and what we do not understand, between past and present, between present and future: Our stories are the explanations we "make up" to explain how we got from A to B, how we might have gotten to B from A. The task here is neither discovering the past or dictating the future but rather making use of the past to create something *for* the future. Following the logic of emergence, students need not worry when confronted with a poem they don't "understand," since their task is not to "get it right," but rather to contribute to this process of exploration ("Science" para. 2).

Strikingly, the process is facilitated by the inexactness with which we hear one another's accounts. Recognizing the productivity of our *inability* to hear exactly what one another says constitutes a fundamental revision of one of our primary myths about what is needed to facilitate human interaction. In the Genesis story of the building of the Tower of Babel,

the LORD said, Behold, the people is one, and they have all one language . . . and now nothing will be restrained from them, which they have imagined to do . . . let us go down, and there confound their language, that they may not understand one another's speech. (Genesis 11:1-9)

In the Biblical version, the people are powerless to act without a common language, and the building of the tower ceases.

But emergence offers a contemporary counter-story and alternative explanation: Lacking a common language, people have a means of discovering things they didn't know. Their gap in understanding is itself productive of new meaning:

In a class session devoted to analysis of some poems . . . the conversation turned to the question of differences between "languages." If indeed there were highly unambiguous "languages" (mathematics, as well as, for example, computer programming languages), how come ordinary "language" was invariably highly "ambiguous" in interpretation (so much so that poetry was a legitimate art form and "literary criticism" a legitimate profession, with a method not dissimilar from "science")? What emerged from the discussion was the idea that ordinary language is not "supposed" to be unambiguous, because its primary function is not in fact to transmit from sender to receiver a particular, fully defined "story." Ordinary language is instead "designed" (by biological and cultural evolution) to perform a more sophisticated, bidirectional communication function. A story is told by the sender not to simply transmit the story but also, and equally importantly, to elicit information from/about the receiver, to find out what is otherwise unknowable by the sender: what ideas/thoughts/perspectives the receiver has about the general subject of the story. An unambiguous transmission/story calls for nothing from the receiver other than what the transmitter already knows; an ambiguous transmission/story links teller/transmitter and audience/receiver in a conversation (and, ideally, in a dialectic from which new things emerge). ("Two Cultures" para. 7; see also Norretranders)

The use-value of literary criticism, of the literature it interprets, and of language more generally, emerges in these transitional moments or interstitial places where negotiation is necessary and where, therefore, meanings need to be constructed. We see this in the evolution of new words, new literary forms, new literary interpretations, and in the re-making of the meaning of old ones of each of these. Each time a new story is told, at each of these levels, it identifies — *in ways that are unpredictable beforehand* — other tales not yet articulated.

New stories get generated in an emergent process, as interactions in the environment leave traces (in literature) that are continuously picked up (in literary theory) and re-combined in new configurations. Literary analysis makes new stories out of the stories we have preserved; the most useful of those are continuously generative of that which surprises. There is no general theory of this activity, only multiple individual practices of criticism, in

which the work a reader does while reading becomes the meaning of a literary work (Dasenbrock para. 1).

Reader-response theory is the application, in an academic context, of this notion that every story leads to the making of new ones. Encouraging students to recognize and articulate their own responses to a story is not only "legitimate," but an expression of the process of emergence. Rather than trying to "guess the right answer," students should rely on their own sense of what is happening in, as well as missing from, a story. Stories fill gaps and in doing so create new ones. Readers fill those gaps and thereby make new ones. Making meaning unsettles meaning and so generates new meanings.

Examples of such practices are many. For instance, in 1899, Joseph Conrad published *Heart of Darkness*. In the late 1950's, Chinua Achebe critiqued the novel in "An Image of Africa: Racism in Conrad's *Heart of Darkness*." He then created a new work of fiction, the novel *Things Fall Apart*, to give life and flesh to the sorts of figures Conrad had objectified in his novel. In 1979, the appearance of Buchi Emecheta's *The Joys of Motherhood* called attention, in turn, to the peripheral role women had played in Achebe's novel. In this sequence a story was repeatedly re-worked — first in criticism, then in fiction — in order to bring into the foreground the sorts of characters whose lives had been neglected in earlier fiction. In each case, the attempt to fill one gap unexpectedly created another one.

Something quite similar happened with Charlotte Brontë's 1847 novel *Jane Eyre*. Like Achebe's essay, Gayatri Chakravorty Spivak's 1988 discussion of "Three Women's Texts and a Critique of Imperialism" made problematic the fictional use of people of color as representations of the tortured psyches of Europeans. Spivak's analysis helps explain Jean Rhys's 1966 novel *Wide Sargasso Sea*, in which Bertha Rochester takes center stage. In Brontë's novel, she had been confined to the attic as a madwoman, a figure of Jane Eyre's unexpressed rage.

Similarly, *Herculine Barbin: Being the Recently Discovered Memoirs of a Nineteenth-Century French Hermaphrodite*, first printed in 1838 and reprinted with commentary by Michel Foucault in 1980, gave rise in 2002 to Jeffrey Eugenides's novel *Middlesex*. As Eugenides said in an interview, he found Herculine Barbin's memoir "quite disappointing . . . as an expression of what it is like to be a her-

maphrodite, from the inside . . . she didn't have enough self-awareness to be able to understand what was going on . . . she was pre-psychological in her knowledge of her self" (para. 1).

But Eugenides' fiction ended up, as he went on to say, not being about "a hermaphrodite at all." Rather, he says, "it's about reinventing your identity on different levels, be that Greek to American, female to male . . . Reinvention of self is an enduring theme in American literature in general" (para. 9). Although he set out to gather information about someone with an inescapable genetic mutation, Eugenides instead found himself writing a tale in which the mutation does not make his character who she is, does not determine everything about her life. He discovers that there is still a great amount of free will and possibility in her life, and that is one of the things the novel emphasizes.

The evolution I'm tracing here is more complicated than the interrelations among literary texts described, for example, by T.S. Eliot in *Tradition and the Individual Talent*. Literature emerges out of earlier literature, certainly, but does so in a process that is as much unpredictable as predictable, as much random as it is directed. Because of the undirected play that is emergence, no "naive reductionism" is possible: The properties of the novels described above are not simply explicable in terms of their original motivations; in each case, the story far exceeds its ostensible "cause" (see "Emerging" para. 2).

This same unpredictable process occurs in the production of literary criticism: Critics attempt to explain what has been left out, left unarticulated, often left unrecognized by authors. In the process, they produce something they cannot quite control, something that surprises them. The writing of literature and the interpretations of its meanings generate new accounts. These new stories traverse the gaps between what is and what was, what is and what may be — and in doing so create the unexpected. Filling the gap left by Conrad's treatment of Nigerian men, Achebe created another gap, which Emecheta filled, in turn, by creating a fictional world about the lives of Nigerian women. Rhys's novel brought out of the background a figure created by Brontë; Eugenides's novel highlighted what Barbin could not describe. In each of these cases, new elisions arose, further stories clamored to be told. It is precisely the failure of any story ever to tell the "whole" story, to reliably fill in all the gaps, that makes

them endlessly productive of new ones: "In other words, the text's indeterminate structures acquire a negative force, producing readers to construct their own text" (Goldstein para 5). To put it more positively: The concept of emergence helps explain not how "precarious," but rather how useful and generative the act of reading can be. In the absence of clear cause and effect, stories arise to explain the distance between past, present, and future. It may even be the case that stories *create* the sense of past, present, and future. Certainly stories are what sketch out possibilities for what lies ahead.

This, then, is a contemporary conception of literary theory and literature, of words in the forms of puns, etymologies, and stories. Like biological systems, like artificial intelligence, like history and economics, philosophy and psychology, literature and literary criticism (and their makers) are the products (and the makers) of a process of emergence. Both writer and reader alter and are in turn altered by the shape of literature, and of the world it represents: the world that was, the world that is, the world that is to come.

Let's look again, through the lens of emergence, at the story with which we began. The teacher is reading a poem. It begins with a teacher chastising a student for not being able to distinguish between the meanings of two words. The poem quickly reveals, however, that the student has an experiential understanding (which the teacher lacks) of the objects those words represent. The student is able to share that knowledge with others, by putting his experience into poetic form:

(from) "Persimmons"

In sixth grade Mrs. Walker
slapped the back of my head
and made me stand in the corner
for not knowing the difference
between *persimmon* and *precision*.
How to choose

persimmons. This is precision. . . .

Mrs. Walker brought a persimmon to class
and cut it up
so everyone could taste
a *Chinese apple*. Knowing
it wasn't ripe or sweet, I didn't eat
but watched the other faces. . . .

*Some things never leave a person: . . .
the texture of persimmons,
in your palm, the ripe weight.*
— Li-Young Lee

WORKS CITED

- Bates, Catherine. "The Point of Puns." *Modern Philology* 96.4 (May 1999): 421-38.
- Culler, Jonathan. *On Puns: The Foundation of Letters*. Oxford: Blackwell, 1987.
- Dalke, Anne. *Teaching to Learn/Learning to Teach: Meditations on the Classroom*. New York: Peter Lang, 2002.
- and Paul Grobstein. "Story-Telling in (At Least) Three Dimensions: An Exploration of Teaching Reading, Writing, and Beyond." *The Journal of Teaching Writing*, 23.2 (Spring 2007, forthcoming).
- Dasenbrock, Reed Way. "Stanley Fish." *The Johns Hopkins Guide to Literary Theory and Criticism*. 2nd Ed. Ed. Michael Groden, Martin Kreiswirth, and Imre Szeman. Baltimore: Johns Hopkins UP, 2005. <http://www.press.jhu.edu/books/hopkins_guide_to_literary_theory/stanley_fish.html>.
- Eugenides, Jeffrey. "3am Interview: the Novel as a Mental Picture of Its Era." Sept 2003. <http://www.3ammagazine.com/litarchives/2003/sep/interview_jeffrey_eugenides.html>.
- Goldstein, Peter. "Reader-Response Theory and Criticism." *The Johns Hopkins Guide to Literary Theory and Criticism*. 2nd Ed. Ed. Michael Groden and Martin Kreiswirth. Baltimore: Johns Hopkins UP, 2007. <<http://litguide.press.jhm.edu/>>.
- Grobstein, Paul. "Emerging Emergence, A Report on Progress: From the Active Inanimate to Models to Stories to Agency (and Back Again)." Working Group on Emergence. Bryn Mawr College. October 28, 2004. <<http://serendip.brynmawr.edu/complexity/emergence04/index2.html>>.
- . "Science as 'Getting it Less Wrong.'" March 1, 1993. <http://serendip.brynmawr.edu/sci_cult/truth.html>.
- . "The Two Cultures: A Conversation." January 28, 2001. <<http://serendip.brynmawr.edu/local/scisoc/snow.html>>.
- Hedley, E. Jane. E-mail correspondence. June 10, 2005.
- Herbert, George. "The Flower." *The Temple*. 1633; rpt. George Herbert and the Temple: <<http://www.ccel.org/h/herbert/temple.HO.html>>
- Lagerquist, Linnea. "Linguistic Evidence From Paronomasia." *Papers from the Sixteenth Regional Meeting, Chicago Linguistic Society* (April 17-18, 1980). Ed. Jody Kreiman and Almerindo Ojeda. 185-191.
- Lee, Li-Young. "Persimmons." *Rose: Poems*. Brockport, New York: BOA, 1986.
- Norretranders, Tor. *The User Illusion*. New York: Viking, 1998.
- Tompkins, Jane, Ed. *Reader-Response Criticism: From Formalism to Post-Structuralism*. Baltimore: Johns Hopkins UP, 1980.
- Waldspurger, Daniel. "Reader-Response Criticism." Personal Webpage. <<http://www.calvertonschool.org/waldspurger/pages/reader.htm>>.
- Zwicky, Arnold and Elizabeth Zwicky. "Imperfect Puns, Markedness, and Phonological Similarity: With Friends Like These, Who Needs Anemones?" *PhiLia Linguistica* 20.3-4 (1986): 493-503.