Gordon E. Slethaug. ***Beautiful Chaos: Chaos Theory and Metachaotics in Recent American Fiction.*** Albany: State University of New York Press, 2000. 206p.

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Since N. Katherine Hayles first tantalized the critical establishment of the potential of chaos theory a decade ago, chaos-based studies have proliferated. If canonical works from Milton to Joyce have been viewed through its lens, remarkably few studies have addressed works of the contemporary writers who actually lived and witnessed the computer revolution that brought chaos theory into being. Gordon Slethaug's *Beautiful Chaos: Chaos Theory and Metachaotics in Recent American Fiction* makes an important gesture toward filling this gap. Slethaug reflects on works by a cross-section of nine American writers of the past four decades, including Thomas Pyncheon, John Barth, Don DeLillo, Toni Morrison, and Cormac McCarthy. The works under consideration derive largely, though not exclusively, from the period between 1985 and 1995, when chaos theory achieved its largest popular following. Slethaug's approach owes much to Hayles; he does not, unfortunately, follow her rigorous historicity as he touches upon the several theories from modern physics that Hayles subsumes under the general heading "chaotics." While most have nothing to do with chaos theory per se, in its order-in-chaos or chaos-to-order manifestations, Slethaug tends to draw analogies that render these theories as interchangeable parts. His study achieves complexity as much from the need to sort out what properly accrues to chaos theory (or dynamical systems theory, as it is known to scientists and mathematicians) as from the wide range of applications—factual, conceptual, metaphorical, and structural—that Slethaug proposes.

In spite of his greater interest in chaos as content—works by scientifically savvy writers who take as their subject the intricate interplay between order and disorder—Slethaug devotes roughly equal space to explorations of form. After a brief initial overview of select scientific theories since 1850 and of the critical studies that informed his work, notably Tom LeClaire's studies of the systems novel, Slethaug organizes his study largely around the vocabulary of chaos theory. Using *The Crying of Lot 49* as a baseline, he begins with "orderly systems," once viewed as normative, and in subsequent chapters offers a meditation on one or more key terms, such as "iteration," "strange attractors," or the less familiar "juxtapositional symmetry." Among these, he embeds a chapter on information theory, though Claude Shannon's work predates chaos theory by some two decades. Grounded

in Hayles' assertion that we live in a period with an increasing tolerance for disorder, Slethaug's close readings begin and end by focusing on characters' perceptions of disorder. Oedipa Maas with her fixation on order becomes his negative touchstone. The truth of the matter, it should not be forgotten, is that chaos theory with its revelation of the intricate mathematical intertwining of order and disorder did not render the ordering process itself passe. Lorenz and Feigenbaum succeeded where Oedipa failed. Their important contributions to this multi-faceted theory, ironically enough, were posited on fortuitous observations, using new computer technology, of order in what had always appeared to be random.

Slethaug's vocabulary-based approach leads to a major weakness in this study, for Slethaug largely ignores the workings of chaos theory, how its discrete elements relate to one another. His synoptic chapter, finally, owes more to Bakhtin than to chaos theory. Beyond this, Slethaug relies heavily on readers' preexisting knowledge to inform his work, while virtually eliminating mathematics from his discussion. Inasmuch as chaos theory at its most persuasive is a theory of nonlinear mathematics, this is highly problematic. While taking pains to distinguish between iterations and strange attractors, for example, Slethaug does not point out that strange attractors result from thousands upon thousands of iterations of an equation graphed in multi-dimensional, topological phase space, which has nothing to do with space as we know it. He compounds the potential for misunderstanding when he equates maps of characters' beginning-to-end journeys with their point-to-point logic and attractors, constructed by a process that is not only infinite but appears utterly random during the graphing. While Slethaug clearly explicates the role of stochastic process in creating the butterfly effect (sensitivity to initial conditions, as the phenomenon is known to scientists), which is the hallmark of chaos, he himself sometimes uses "random" to describe chaotic phenomena.

With his discussion of entropic crisis in the protagonist of Don DeLillo's *Mao II*, Slethaug misses the opportunity begin an interrogation of what may well be the most important issue for any critic who wishes to employ dynamical systems theory: namely, does an individual constitute a system? If "A River Runs Through It" establishes a carefully drawn analogy between an individual and a turbulent natural system, Slethaug more often approaches characters as if they themselves were systems. Any use of chaos theory (as opposed to metachaotics) that centers on the actions of a fictional protagonist—responding affirmatively to this question—contradicts the caveat of Nobel Prize-winning chemist Ilya Prigogine, both a key theorist and a popular writer of chaos, that an individual is *not* a system. This important question is obscured as Slethaug repeatedly elides two distinct

critical approaches, chaos theory and metachaotics. Moving back and forth between them is problematic in other ways as well, especially when it leads to the confusion of theoretical vocabularies. It is sometimes not clear just which concepts fall under the rubric of chaos theory (really an aggregate of loosely related theories). The term "complementarity," the basis for Slethaug's discussion of the dual protagonists in Robert Stone's *Outerbridge Reach,* is a case in point. Chaos theorists do discuss systems that exist in multiple states, but typically in terms of bifurcation theory, an area Slethaug does not examine in any detail. Even in his conclusion Slethaug fails to distinguish between chaos theory and metachaotics. With Barth his sole example of novelists consciously using chaos theory, Slethaug's claim that its most widespread application in fiction is the "conscious articulation of facts and ideas drawn from chaos theory" rings false.

It is truly unfortunate that the only two works by minority writers in this study have been selected as examples of the pessimistic anti-life stance that Slethaug associates with recursive form. While disorder becomes life-enhancing in many of the novels under consideration, order and repetition are anathema, sometimes literally death. Slethaug invents critical vocabulary to describe narrative structures based on repetitions of various kinds. If the term "recursion of lack" characterizes the narrative structure of Michael Dorris' *Yellow Raft in Blue Water*, it might equally well describe the more familiar narrative structure of *The Sound and the Fury.* When Slethaug addresses himself to the self-similar recursion characteristic of strange attractors, he can offer but one example—John Barth's example of the frame tale as fractal—that takes us beyond the traditional notions of macrocosm and microcosm, terms Slethaug himself uses. That these terms are so closely tied the conception of a determined, ordered universe would seem to foreclose the very discussion that chaos theory has complicated. ❋